AGRICULTURE

Agriculture in a global context

Lecture 5

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MLA Vilnius Tech

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Roger Raveel, Voor een blauw gelijnde akker en een grijze lucht , 1975

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Agriculture

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I. Introduction and Key Concepts

Agriculture

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1.1. Concept of Agriculture and Agricultural Activities

Agriculture is the most comprehensive word used to denote the many ways of cultivating plants and animals (Harris and Fuller 2014).

Spektrum of the agricultural activities;

cultivation,

domestication,

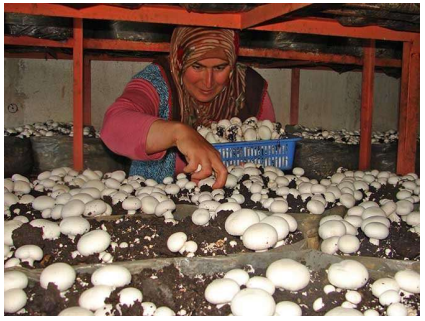
horticulture,

arboriculture,

vegeculture

Ornamental plants

mushroom cultivation



seed and seedling cultivation

I. Introduction and Key Concepts

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1.1. Concept of Agriculture and Agricultural Activities

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as well as animal husbandry including fisheries.

cattle breeding

sheep breeding

goat husbandry

pig farming

poultry farming

aquaculture

fishing

beekeeping

apiculture

bumblebee production, insect production

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1.2. Agriculture and Economy

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What exactly is the role of agriculture in the countries?

Agriculture is important because of (a) national food security and food quality, (b) dependency of many rural regional economies.

1. Source of Food Supply: As aforementioned, agriculture has been the basic source of food supply for mankind for centuries.
2. Contribution to National Income: Agricultural prosperity has significantly contributed to and fostered the economic advancement of several countries.
3. Relief from Capital Shortage: The development of agriculture in developing countries has helped save them from capital shortages.
4. Providing Raw Materials: Besides providing just food products, agricultural advancement has also made this industry a hub for raw materials.
5. Creation of Infrastructure: Agricultural development subsequently requires the development of other national infrastructures.
6. The agricultural sector also creates markets for other economic sectors.

I. Introduction and Key Concepts

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1.3. Farm and Farmer (Farm Holdings)

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A farm is an area of land that is devoted primarily to agricultural processes with the primary objective of producing food and other crops; it is the basic facility in food production.

It includes;

ranches,

feedlots,

Barn-stables

orchards,

plantations

Tea plantations

Hencoop

and estates,

I. Introduction and Key Concepts

1.3. Farm and Farmer (Farm Holdings)

Farm holdings include the farmhouse and agricultural buildings as well as the land.

An agricultural holding is an economic unit of agricultural production under single management consist of all resources for agricultural production purposes, without regard to title, legal form or size (FAO 2020).

The European Union regulations refer agricultural holding as: (a) agricultural holdings where the agricultural area utilized for farming is one hectare or more; (b) agricultural holdings less than one hectare, if those holdings produce a certain proportion for sale or if their production unit exceeds certain physical thresholds (Regulation (EC) No 1166/2008).

I. Introduction and Key Concepts

1.3. Farm and Farmer (Farm Holdings)

1. How many farmers are there in the EU?
2. What is the average farm size (hectare) in the EU?

1. Number of farmers: 11 million
2. Average farm size: 17.4 ha

3. How many farmers are there in Turkey?
4. What is the average farm size (ha) in Turkey?

3. Number of farmers:
   2.000.172 (Registered in the farmer registration system, Ministry of agriculture and forestry, 2022)
   4.893.585 (Registered in Chambers of farmers, 2021)
4. Average farm size: 6.1 ha

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1.3. Farm and Farmer (Farm Holdings)

Agriculture

Farming Framework - Agriculture and City Relationship

URBAN AREA

THE MARKETS FOR FACTORS OF PRODUCTION

RURAL AREA

FARM HOLDINGs - FARMERs

RESOURCES (ASSETS)		IN-BUSINESS ACTIVITIES	OUTPUTS Ecosystem services
Factors of production	**Inputs**		
1. Nature ➢**Land** ➢**Climate** ➢**Water** ➢**Ecology** **2. Labor** **3. Capital** **4. Entrep-reneur**	➢**Land** ➢**Labor** ➢**Manager** ➢**Agr. buildings** ➢**Plants** ➢**Machines and equipment** ➢**Livestock** ➢**inventories** (Seed, chemicals, feeds etc.)	**PRODUCTION PROCESS** **FARMING SYSTEMS:** ➢**Subsistence** ➢**Commercial** ➢**Industrial** ➢**Organic** ➢**Good farming practices**	**1.Provisioning** Food - Nutrition Row materials Fuel (Wheat, Maize, Cotton, Apple Tomatoes, Milk Meat, Etc.)

Land use, Crop pattern Agricultural landscape

2.Regulating (Climate, Flood, Water, Waste, Carbon)
3. Cultural (Recreation, Aeshetic, Spintual, Educatinal)
4. Supporting

COMMODITY MARKETS

MARKETİNG CHANNELS

CONSUMERS

URBAN AREA

1.4. Farm Classification and Farm Typology

The Family Farm

FAO defines a "family farm" as one that relies primarily on family members for labor and management.

Family farming is the predominant form of agriculture both in developed and developing countries. There are over 500 million family farms in the world (FAO, 2022).

The United Nations nominated 2014 as the International Year of Family Farming

The Mechanized Farm

Factory farming

Agribusiness

The primary goal of agribusiness is to maximize profit while sustainably satisfying the needs of consumers for products related to natural resources such as biotechnology, farms, food, forestry, fisheries, fuel, and fiber.

1.4. Farm Classification and Farm Typology

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Farms are classified into different types according to their dominant activity:

The EUROSTAT has developed a farm typology, or farm classification, that divides the European Union farms into relatively 9 main groups:

1. Specialist field crops
2. Specialist horticulture
3. Specialist permanent crops
4. Specialist grazing livestock
5. Specialist pig poultry
6. Mixed cropping
7. Mixed livestock holdings
8. Mixed crop-livestock
9. Non-classifiable holdings

EU farm holdings are classified based on **Standard Gross Margin** (SGM). The sum of standard gross margins in a farm is a measure of its overall economic size, expressed in European Size Units (ESU).

1 ESU is a 1200 euro SGM.

1.4. Farm Classification and Farm Typology

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The U.S. Department of Agriculture (USDA) defines a farm as any place from which $1,000 or more of agricultural products were produced and sold.

Family farms are classified based on gross cash farm income (GCFI).

The USDA's Economic Research Service (ERS) has developed a farm typology, or farm classification, that divides the 2.1 million U.S. farms into relatively homogeneous groups:

1. **Small family farms** – GCFI less than $350,000 Low-sales farms – GCFI less than $150,000.
2. **Moderate family farms** – GCFI between $150,000 and $349,999.
3. **Midsize family farms** – GCFI between $350,000 and $999,999.
4. **Large-scale family farms** – GCFI of $1,000,000 or more.
5. **Large family farms** – Farms with GCFI between $1,000,000 and $4,999,999.
6. **Very large family farms** – Farms with GCFI of $5,000,000 or more.
7. **Non-family farms** – Any farm where the producer and persons related to the producer do not own a majority of the business.

I. Introduction and Key Concepts

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1.5. Urban Agriculture

Urban agriculture, urban farming, or urban gardening is the practice of cultivating, processing, and distributing food in or around urban areas.

Can we say «urban agriculture» bear same functions or has similar structures in the developed and developing world?

Urban agriculture in the world shows a dual structure.

1. Urban agriculture in developing countries:

According to the United Nations (UN-HABITAT 2010), about 12.6 % of the global population (32.7 % of urban population) lives in areas classified as slums. Furthermore, more than half of the urban population lives below the poverty line in many developing countries.

Key motivations for urban agriculture in the developing world: food security, nutrition, and income generation.

I. Introduction and Key Concepts

Agriculture

1.5. Urban Agriculture in Developing World

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Main Typology of Socio-Economic Profiles of Urban Farmers (Orsini at all. 2013)

Item	Small-scale agriculture	Small-scale commercial agriculture	Farming enterprises	Nonspecialized farming
Main location where it is found	Urban (peri-urban)	Urban and peri-urban	Peri-urban (urban)	Peri-urban
Product destination	Household	Urban markets	Urban market + export	Household + urban markets
Main aim	Self-consu mption	Small income generation	Main or part-time activity for income generation	Self consumption + small income generation
Size	<100 m^2	<1,000 m^2	>2,000 m^2	>5,000 m^2
Products	Leafy veggie, cassava, plantain, corn, fruits, chickens, sheep	Leafy veggie, other vegetables, chickens, sheep, milk	Leafy veggie, other vegetables, chickens, animal rearing, aquaculture	Cereals, legumes, roots and tubers, traditional vegetables
Technological level[a]	Low	Low to medium	Medium to high	Very low
Main gender	Women	Both	Men	Both
Limiting factors	Land size	Land size, access to land and to agricultural input, market fluctuations	Technical knowledge, market fluctuations	Access to agricultural inputs, soil fertility

1.5. Urban Agriculture

2. Urban agriculture in developed countries:

The emphasis is on ecological and social values.

Benefits of Urban Farming

a) Ecosystem services: Urban and peri-urban agricultural systems can improve urban environments through provisioning, regulating, supporting and cultural ecosystem services.

- Through the use of vacant lots and open spaces in urban and man-made environments, contribute to the increase of ecosystem services.
- Also, the increase of food production capacity in urban and peri-urban areas allows the decrease of the conversions of non-agricultural land to farmland.
- Increases surrounding property values, beautifies vacant properties,
- increases a sense of community, and provides recreational and cultural uses.
- Increases infiltration of rainwater, reducing storm water overflows and flooding, decreases erosion and topsoil removal,

1.5. Urban Agriculture

Benefits of Urban Farming

- improves air quality, and reduces waste by the reuse of food and garden wastes as organic material and compost (nutrient cycling), and contributes temperature regulation.
- Promotes healthy communities: Increases physical activity and educates new gardeners on the many facets of food production from food security to nutrition and preparation of fresh foods.

Supporting

- Helps boost the local economy.
- For agricultural sustainability is not only about agricultural production but also about managing the landscapes surrounding the agricultural activities and urban agriculture also contributes in this respect.
- Urban agriculture zones are key drivers for sustainability and urban biodiversity.
- Urban agriculture has higher quality soil formation than agricultural soils, because of the regular inputs of organic matter, such as composts and manures.

b) Peri-urban agriculture is multifunctional. "Multifunctional agriculture" refers to agriculture beyond its primary role of producing food and fibre, but as also having other functions.

1.5. Urban Agriculture

Challenges

Challenges for urban agriculture, like its benefits, arise from its proximity to densely built urban areas.

Competition for resources with other urban sectors, aspects of agriculture that may be unpleasant for city resident and quality of inputs must all be monitored.

Urban agriculture produces some aspects that may be unpleasant for urban residents, including smells, noises, pollution, and disease.

Pathogens are often spread from wastewater reused for irrigation, from live animals in close proximity to dense human populations, and the disposal or sale of manure.

Crops are an opportunity to reuse urban waste productively. Waste water as an irrigation source in particular has been explored by some cities to conserve water. If not treated properly before application, this wastewater can contaminate crops that make them unsafe for human consumption.

I. Introduction and Key Concepts

1.6. Agricultural Landscapes (Agricultural Land Use)

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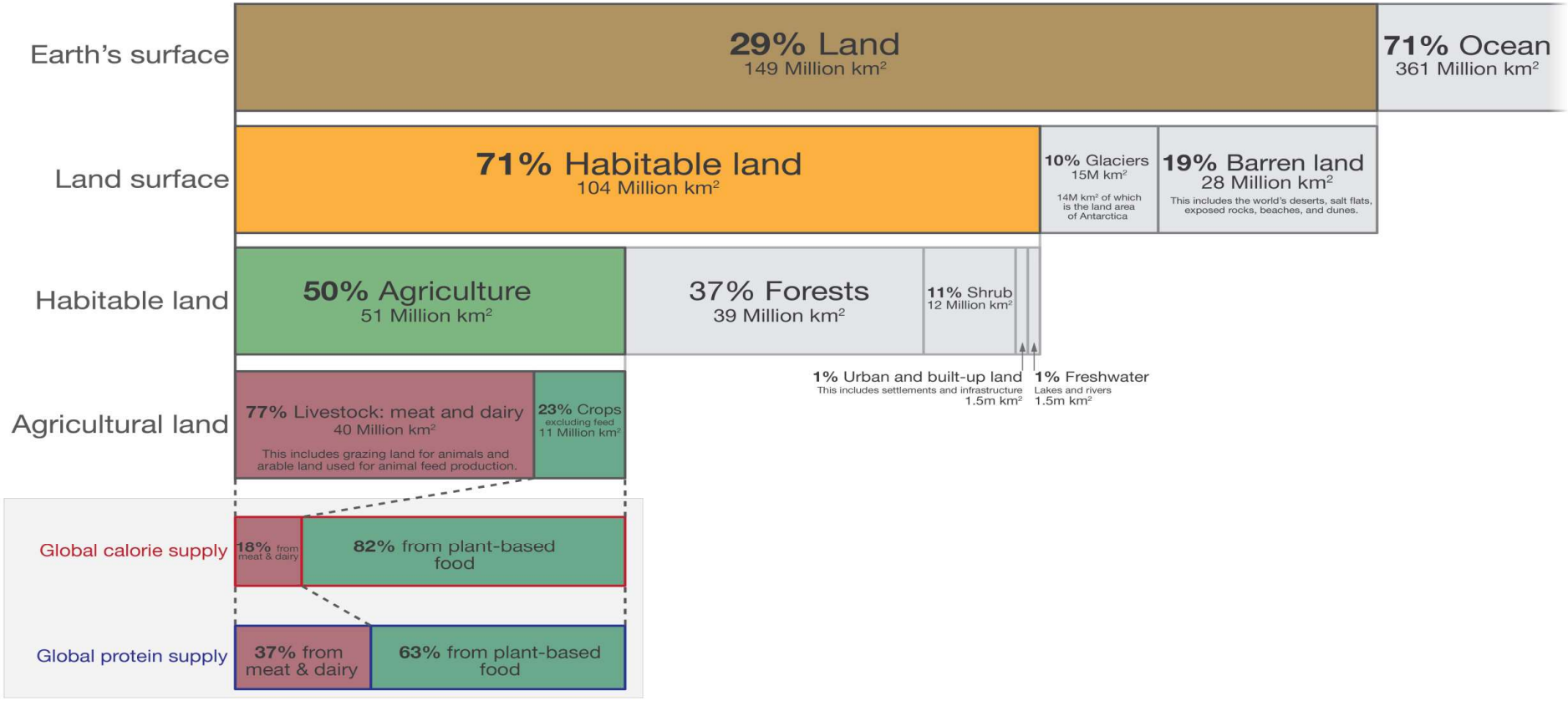
Global land use for food production

Our World in Data



Data source: UN Food and Agriculture Organization (FAO)
OurWorldinData.org – Research and data to make progress against the world's largest problems.

I. Introduction and Key Concepts

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1.6. Agricultural Landscapes (Agricultural Land Use)

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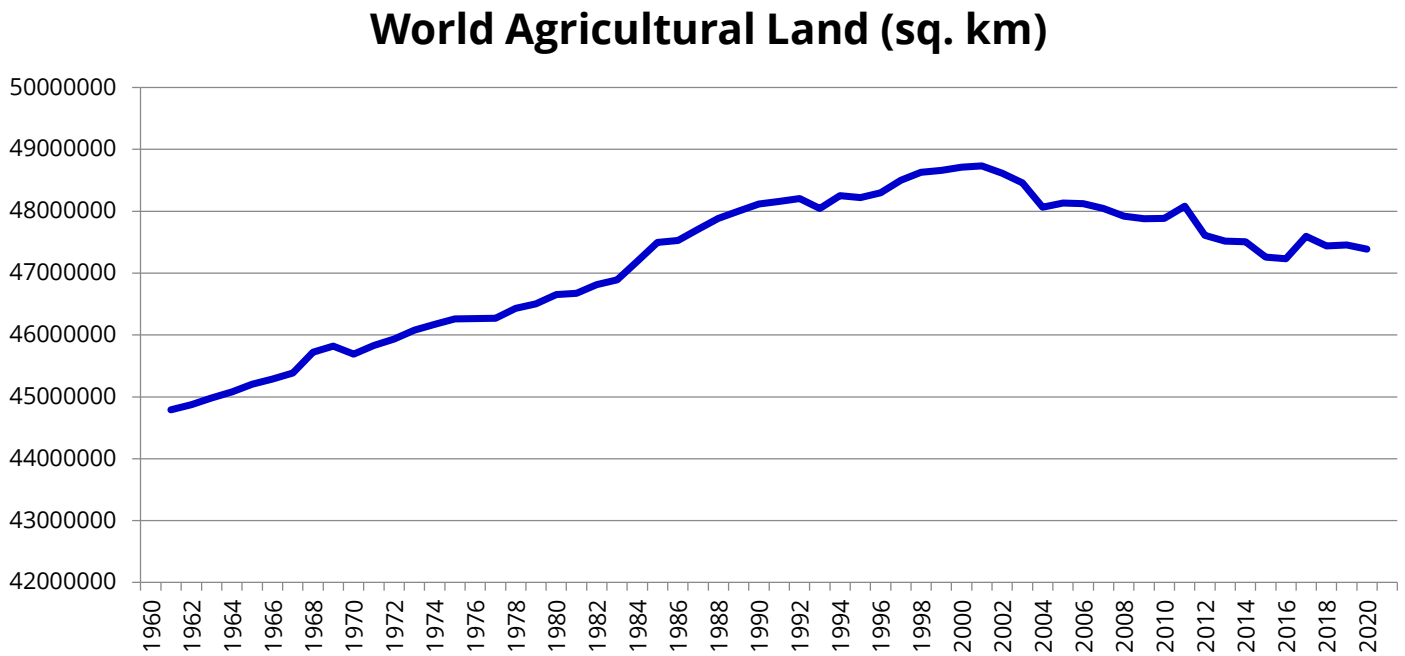

1961	44 790 648 sq. km
2001	48 731 764 sq. km
2020	47 388 929 sq. km

https://data.worldbank.org/indicator

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1.6. Agricultural Landscapes (Agricultural Land Use)

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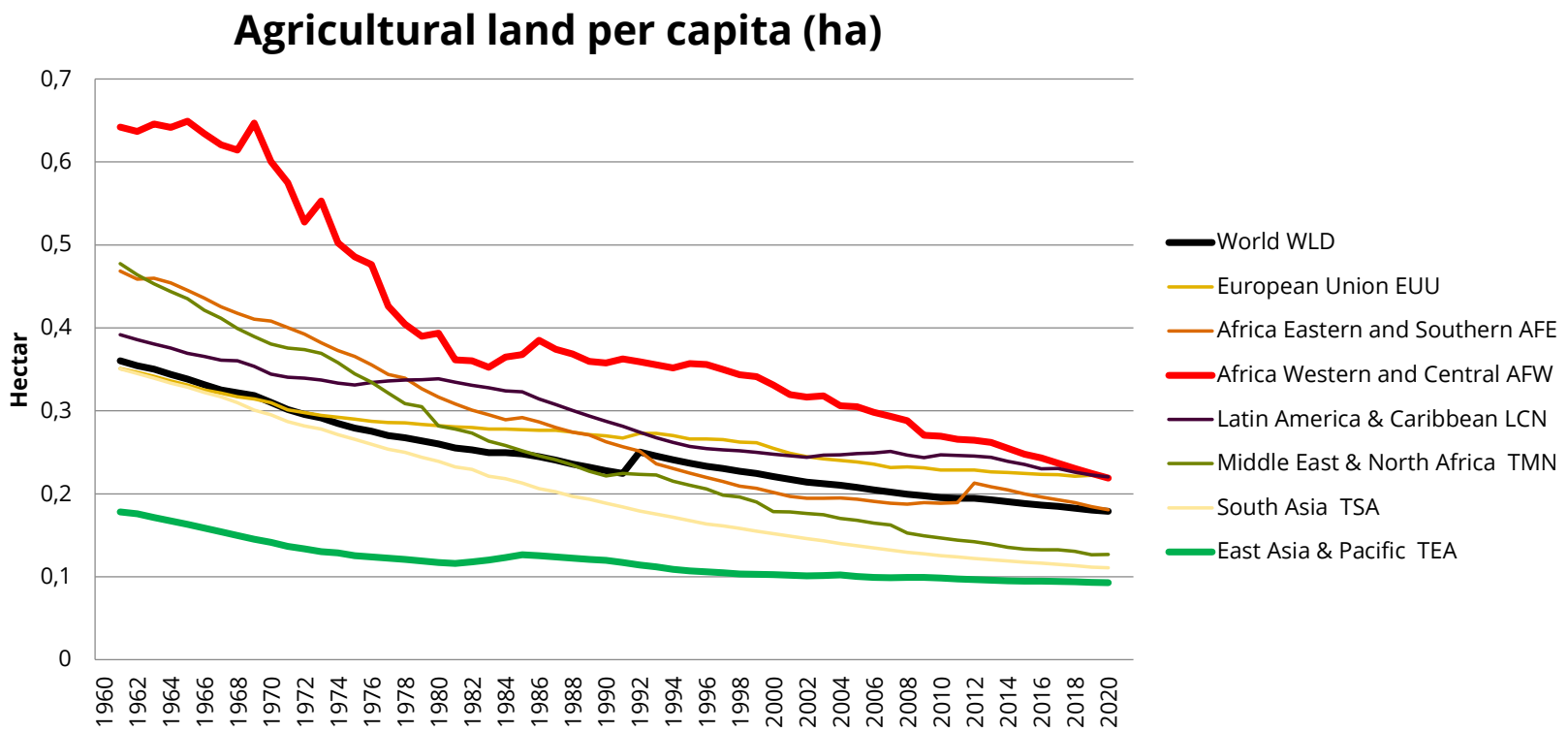

https://data.worldbank.org/indicator

I. Introduction and Key Concepts

1.6. Agricultural Landscapes (Agricultural Land Use)

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Agricultural landscapes are extremely variable across the globe, varying with cropping system, topography and intensity of management.

The interactions between land use and land form are profound, leading to landscape mosaics.

Tea (*Camelia chinensis*)

Rize, Black Sea Region, Tea Gardens

I. Introduction and Key Concepts

1.6. Agricultural Landscapes (Agricultural Land Use)

AGRICULTURE

Tea (*Camelia chinensis*)

1.6. Agricultural Landscapes

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Greenhouse and Citrus Production

Kumluca – Antalya

In intensive systems, land is typically enclosed and delineated with field boundaries. Most production areas are enclosed; that is, they are delimited or fenced into discrete areas.

1.6. Agricultural Landscapes

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Olive
(*Olea europea*)

Banana
(*Musa cavendish*)

Gazipaşa – Antalya

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1.6. Agricultural Landscapes

Cotton

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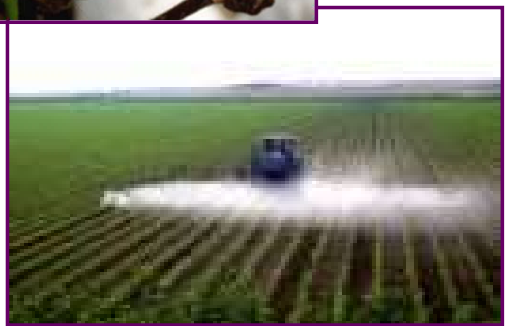

1.6. Agricultural Landscapes

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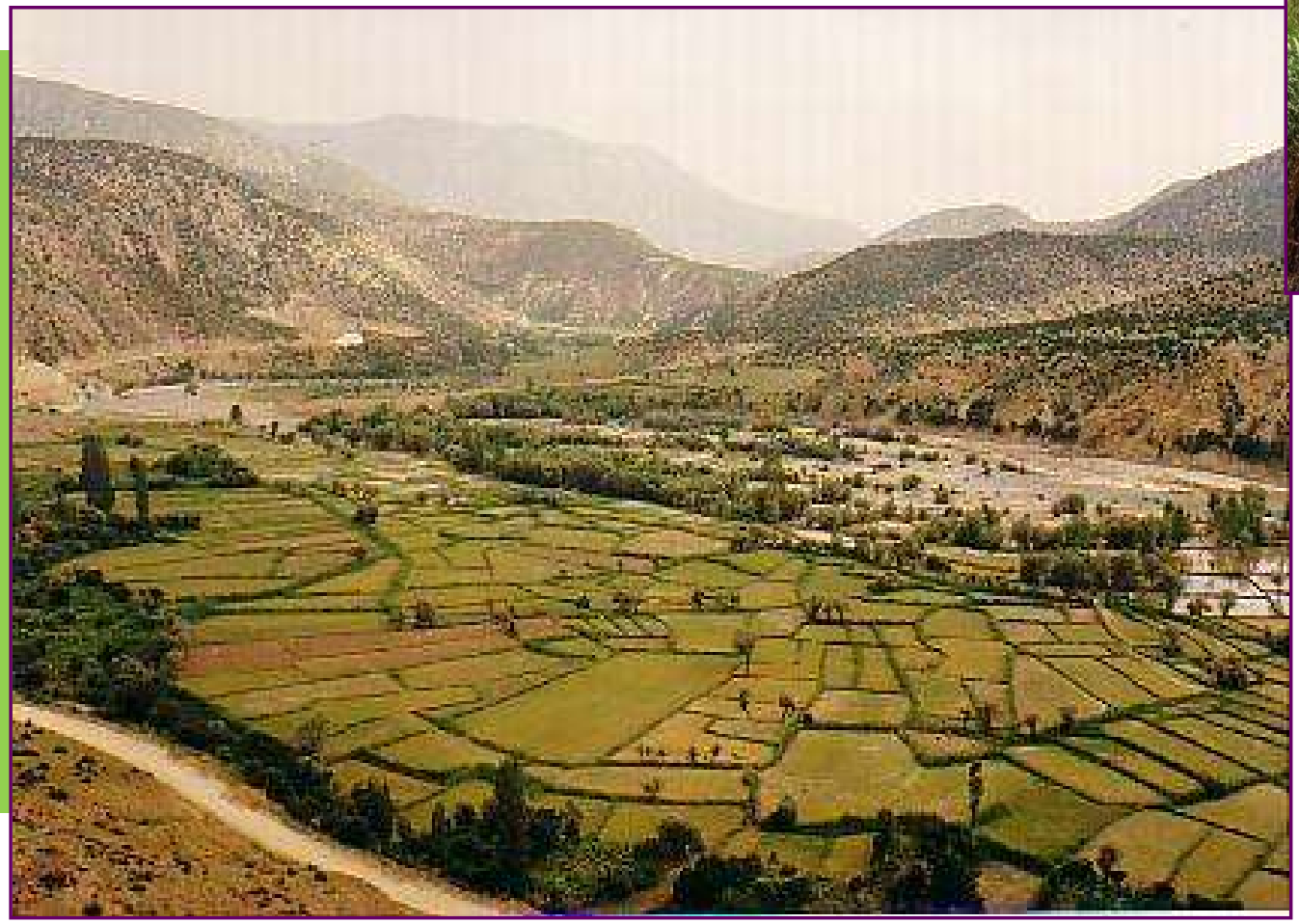

Paddy Fields, Kıbrısçık- Bolu, Black Sea Region

2. Past and Present Trends and Impacts of Agriculture

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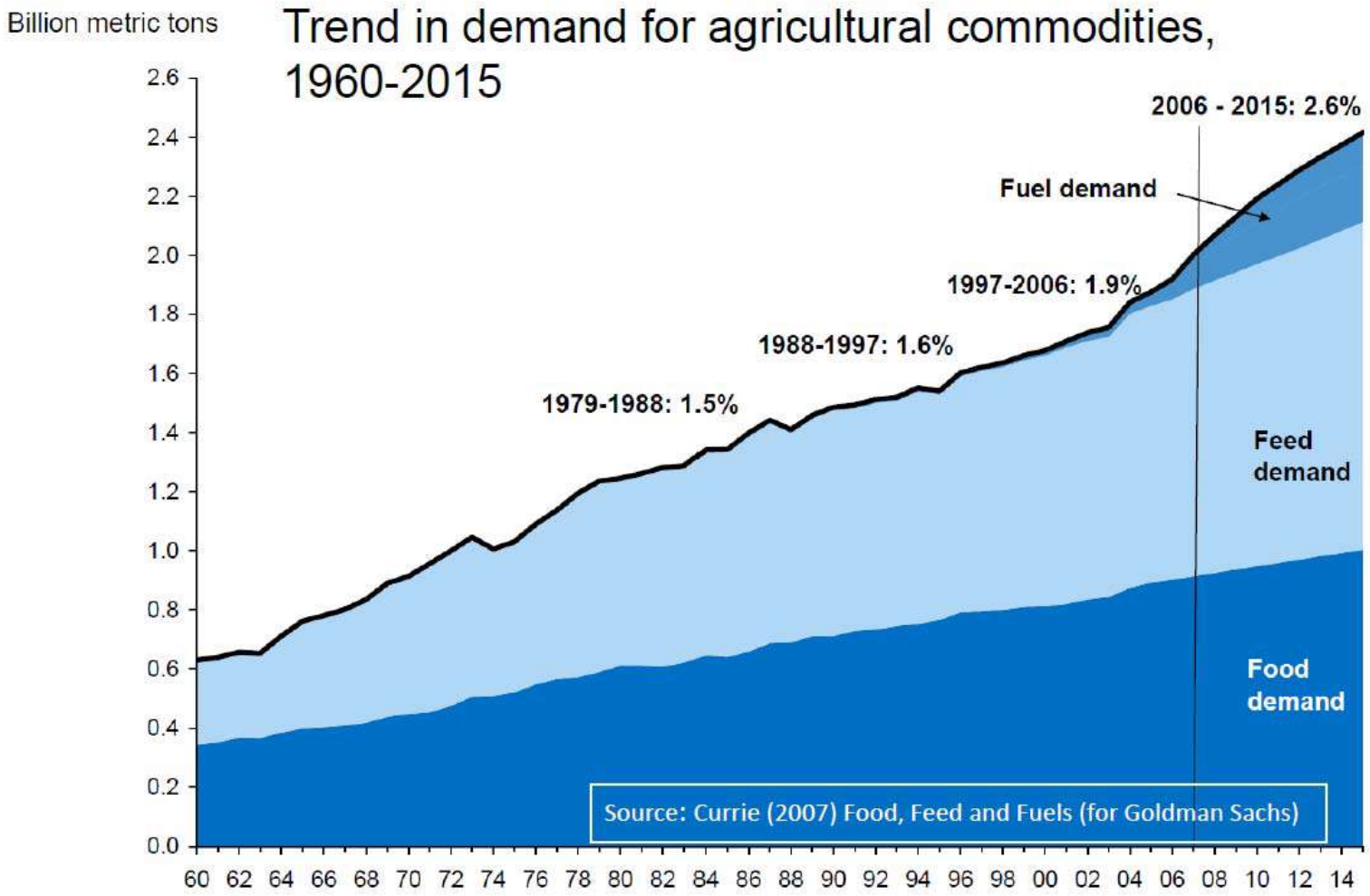

2. Past and Present Trends and Impacts of Agriculture

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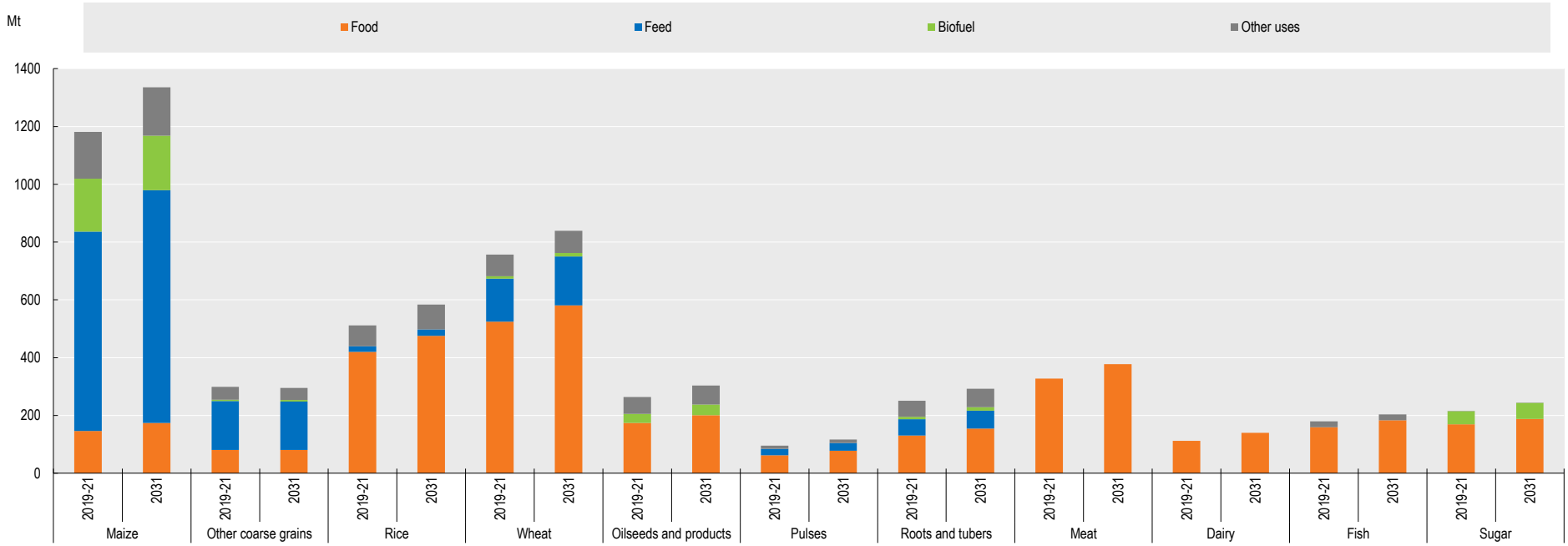
Global Consumption



Source: "OECD-FAO Agricultural Outlook", OECD Agriculture statistics

2. Past and Present Trends and Impacts of Agriculture

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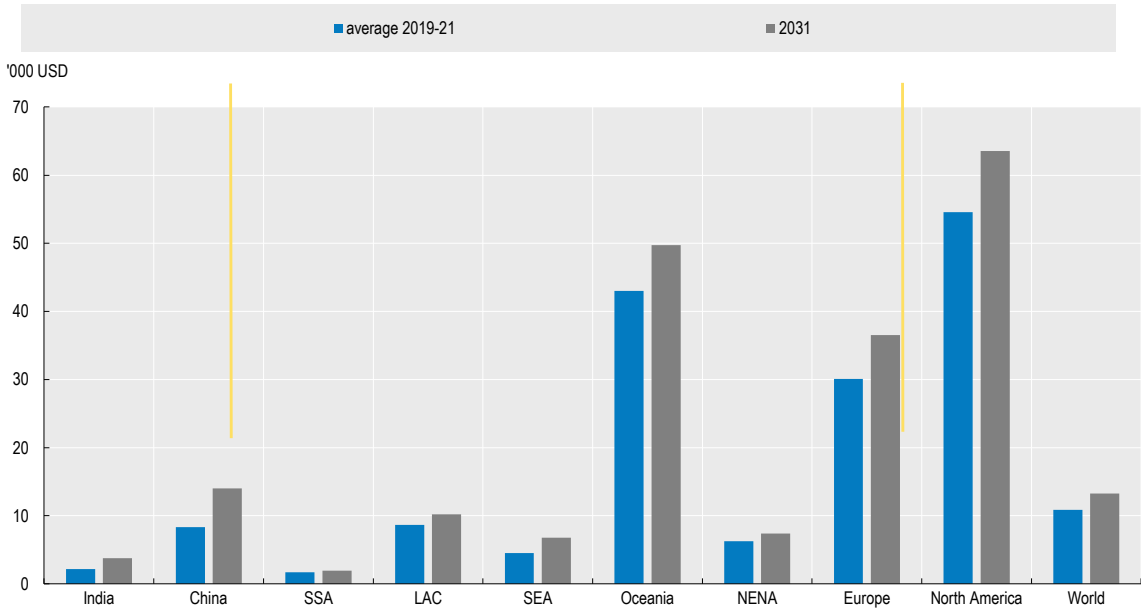
Per capita income (1000 USD)



	average 2019-21	2031
India	2,16	3,76
China	8,34	14,03
SSA	1,72	1,92
LAC	8,66	10,19
SEA	4,52	6,77
Oceania	43,02	49,74
NENA	6,27	7,36
Europe	30,09	36,55
North America	54,59	63,54
World	10,88	13,26

Note: SSA is Sub-Saharan Africa; LAC is Latin America and Caribbean; SEA is Southeast Asia; NENA stands for Near East and North Africa, and is defined as in Chapter 2. The graph shows per capita GDP in constant 2010 US dollars.

Source: "OECD-FAO Agricultural Outlook", OECD Agriculture statistics

2. Past and Present Trends and Impacts of Agriculture

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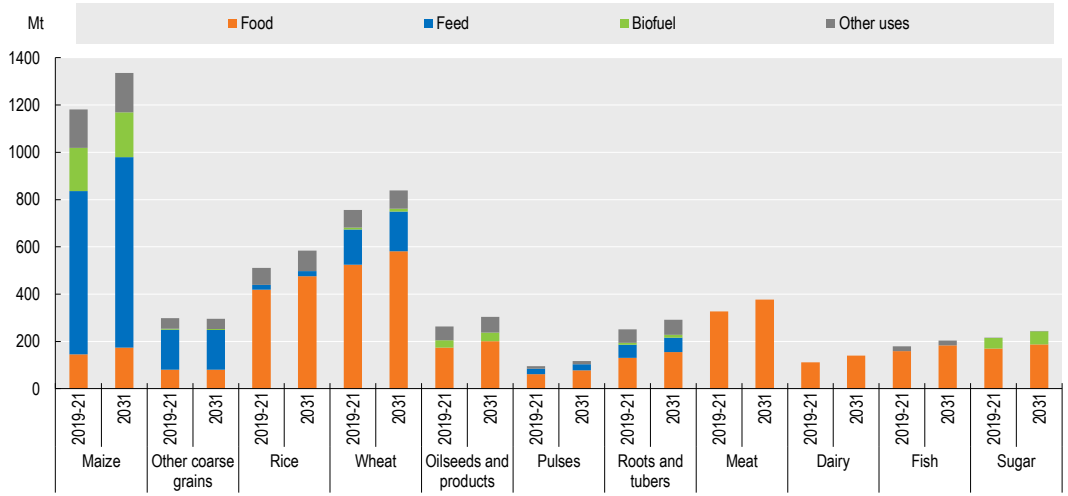
Global use of major commodities (Mt)



Product	Period	Food	Feed	Biofuel	Other uses
Maize	2019-21	146 299	690 227	182 827	162 379
	2031	173 745	806 294	188 847	167 226
Other coarse grains	2019-21	80 287	169 553	4 816	44 493
	2031	80 596	167 704	4 989	42 218
Rice	2019-21	419 679	19 782		71 828
	2031	475 715	22 179		85 822
Wheat	2019-21	524 843	148 665	8 706	74 434
	2031	581 412	168 525	12 008	76 721
Oilseeds and products	2019-21	173 576		32 071	57 854
	2031	201 066		36 424	66 092
Pulses	2019-21	61 523	22 587		10 977
	2031	77 463	26 681		12 691
Roots and tubers	2019-21	130 708	55 989	8 397	55 998
	2031	154 668	61 693	12 535	63 274
Meat	2019-21	327 683			
	2031	377 206			
Dairy	2019-21	112 277			
	2031	139 603			
Fish	2019-21	158 897			20 829
	2031	183 136			20 271
Sugar	2019-21	169 506		44 707	332
	2031	187 470		55 922	288

Source: "OECD-FAO Agricultural Outlook", OECD Agriculture statistics

2. Past and Present Trends and Impacts of Agriculture

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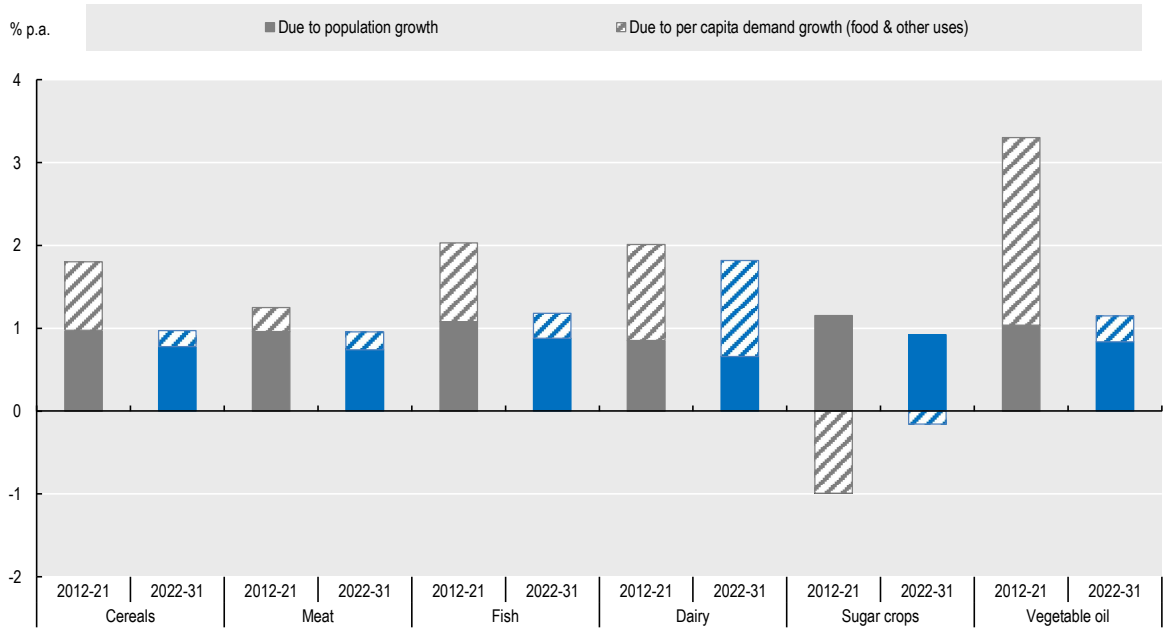
Annual growth in demand for key commodity groups(%)



	Period	Due to population growth	Due to per capita demand growth (food & other uses)
Cereals	2012-21	0,98	0,83
	2022-31	0,78	0,19
Meat	2012-21	0,96	0,29
	2022-31	0,74	0,21
Fish	2012-21	1,08	0,95
	2022-31	0,88	0,30
Dairy	2012-21	0,85	1,16
	2022-31	0,66	1,16
Sugar crops	2012-21	1,15	(0,99)
	2022-31	0,92	(0,16)
Vegetable oil	2012-21	1,04	2,27
	2022-31	0,83	0,31

Source: "OECD-FAO Agricultural Outlook", OECD Agriculture statistics

2. Past and Present Trends and Impacts of Agriculture

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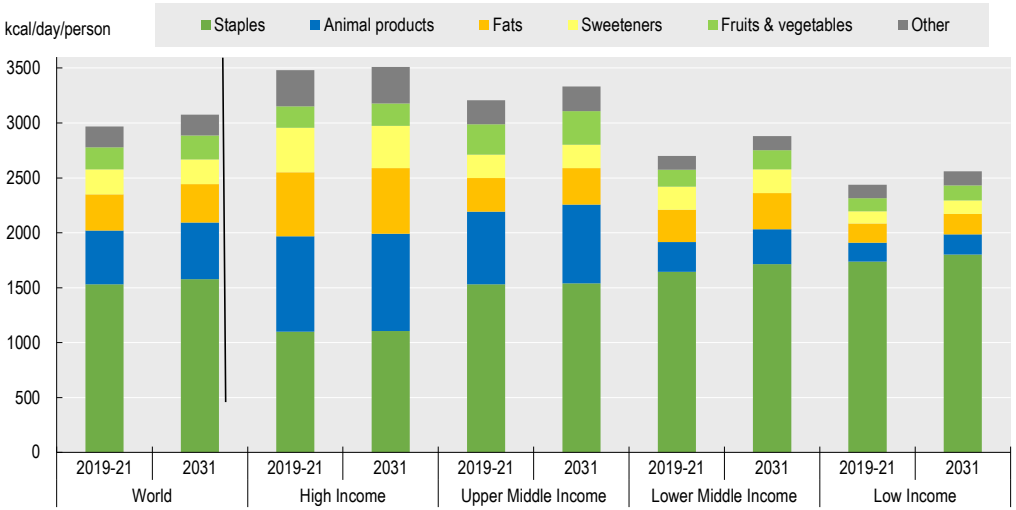
Per capita calorie availability of the main food groups, by country income group (kcal/day/person)



		Staples	Animal products	Fats	Sweeteners	Fruits & vegetables	Other
World	2019-21	1.530,70	490,51	329,12	228,70	200,09	189,26
	2031	1.579,03	516,48	347,11	226,33	218,43	190
High Income	2019-21	1.098,8	870,6	583,2	403,4	195,25	331,17
	2031	1.104,4	887,2	596,8	386,8	202,66	333
Upper Middle Income	2019-21	1.532,21	660,74	305,64	212,32	278,04	217,70
	2031	1.539,04	718,76	330,99	212,59	308,34	223
Lower Middle Income	2019-21	1.645	270,71	295,14	210,51	154,62	123,01
	2031	1714	320	327	216	176	127
Low Income	2019-21	1.737	171,84	176,01	109,62	120,18	121,92
	2031	1803	183	187	123	136	128

Source: "OECD-FAO Agricultural Outlook", OECD Agriculture statistics

2. Past and Present Trends and Impacts of Agriculture

Agriculture

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Today, there are two divisions of agriculture, **subsistence** and **commercial**, which roughly correspond to the less developed and more developed regions.

2.1. Subsistence Agriculture

Growing crops and rearing animals for the sole purpose of feeding the farmer and his family is known as subsistence farming.

Basic characteristics:

- Basic farm equipment use (Insufficient mechanization and capital)
- Family labor intensive production
- Insufficient education
- Small plots of land and small family farming
- Lack of irrigation infrastructure
- Insufficient and low quality input use
- Low soil fertility
- Dependency to climate
- Low level of farmer organization

- Low productivity
- Low income
- Limited marketable products
- Poverty
- Less polluting, nature friendly production

2. Past and Present Trends and Impacts of Agriculture

Agriculture

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2.2. Commercial Agriculture

More developed nations tend to have commercial agriculture with a goal to produce food for sale in the global marketplace called agribusiness.

Basic characteristics:

- ❖ Mechanized and capital intensive
- ❖ Hired labor use
- ❖ Good knowledge base
- ❖ Big farm land, benefit from economies of scale
- ❖ Sufficient and high quality input use
- ❖ Good soil fertility
- ❖ Nature friendly farming possible
- ❖ High level of farmer organizations
- ❖ Access to finance
- ❖ Appropriate supporting system

- ➢ High yield
- ➢ Quality products
- ➢ A fair price
- ➢ Sufficient productivity
- ➢ Market integration
- ➢ High income
- ➢ Wealth

2. Past and Present Trends and Impacts of Agriculture

Agriculture

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2.2. Commercial Agriculture - Industrial Agriculture

Industrial agriculture is the large-scale, intensive production of crops and animals, often involving chemical fertilizers on crops or the routine, harmful use of antibiotics in animals

Specifications:

- Capital and technology intensive farming
- Involves genetically modified crops
- Intensive use of chemicals (pesticides and fertilizer)
- Deplete the land
- Mistreat animals
- Increase various forms of pollution
- Vertical integration
- Domination of international companies
- Prevention of competition

2. Past and Present Trends and Impacts of Agriculture

2.2. Commercial Agriculture - Industrial Agriculture

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Soilless agriculture:

It can be defined as an advanced production technique in which plants are grown by using different solid or liquid media other than soil, in the root zone of plant nutrients and water required for the development of plants. With the soilless production model, it is aimed to provide the most appropriate air, water and nutrient balance in the root zone, in addition to physical support to the plants in an artificial environment.

Hydroponics has been recognized as a viable method of producing vegetables (tomatoes, lettuce, cucumbers and peppers) as well as ornamental crops such as herbs, roses, freesia and foliage plants. Due to the ban on methyl bromide in soil culture, the demand for hydroponically grown produce has rapidly increased in the last few years (Shrestha and Dunn, 2022. Hydroponics, at: http://osufacts.okstate.edu.

2. Past and Present Trends and Impacts of Agriculture

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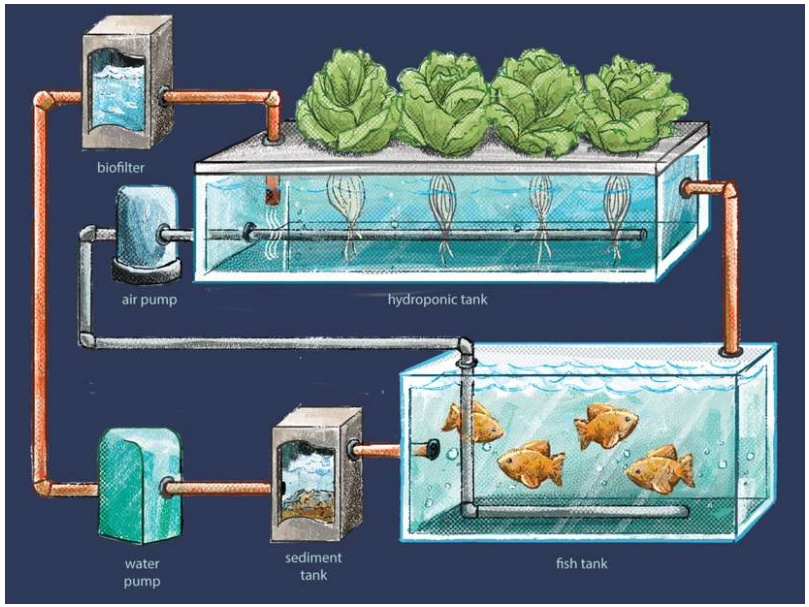
Aquaculture and Aquaponics

"Aquaponics is an integrated production operation that encompasses recirculating aquaculture systems and hydroponics to produce fish and plants in a closed-loop system. Simply said, the fish produce nutrient-rich effluent that fertilizes the plants, and the plants filter the water for the fish. The synergistic relationship of the fish and plants has created a popular perception of sustainability around aquaponics by the general public (Pattillo, 2022.)

Advantages of this closed-loop system over conventional crop production methods include:

- reduced land area requirements,
- reduced water consumption,
- accelerated plant growth rates,
- year-round production in controlled environments,
- operational efficiency with shared equipment,
- reduced or eliminated effluents, and
- multiple crops produced simultaneously



2. Past and Present Trends and Impacts of Agriculture

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2.3. Sustainability in Agriculture

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Sustainable development was defined in the 1987 Brundtland Report as "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (Velten at all. 2015).

In this context, sustainable agriculture is an “integrated system of plant and animal production practices having a site specific application that will, over the long term:

(a) satisfy human food and fiber needs;

(b) enhance environmental quality;

(c) make efficient use of non-renewable resources and on-farm resources and integrate appropriate natural biological cycles and controls;

(d) sustain the economic viability of farm operations; and

(e) enhance the quality of life for farmers and society as a whole” (1990 U.S. Farm Bill).

Is it possible to measure the level of sustainability in an agricultural business?

https://www.nal.usda.gov/farms-and-agricultural-production-systems/sustainable-agriculture

2. Past and Present Trends and Impacts of Agriculture

2.3. Sustainability in Agriculture

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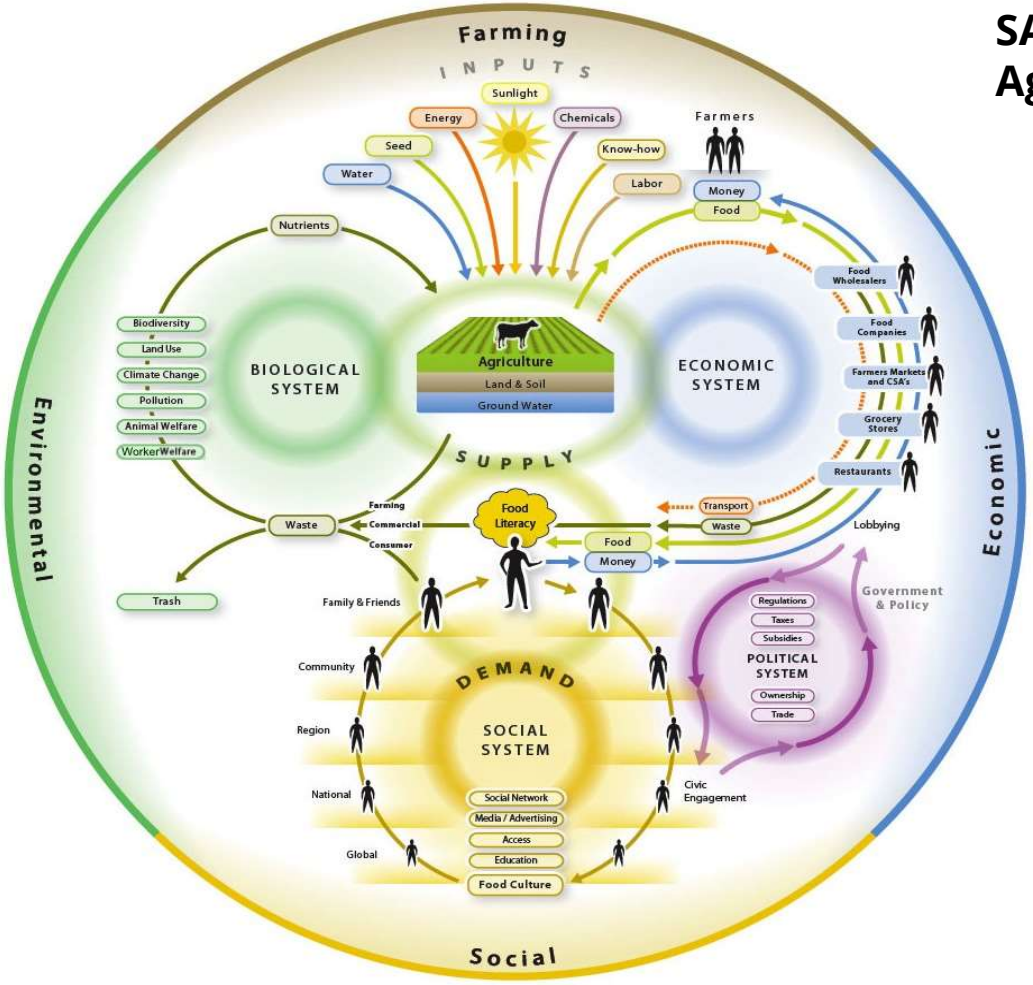
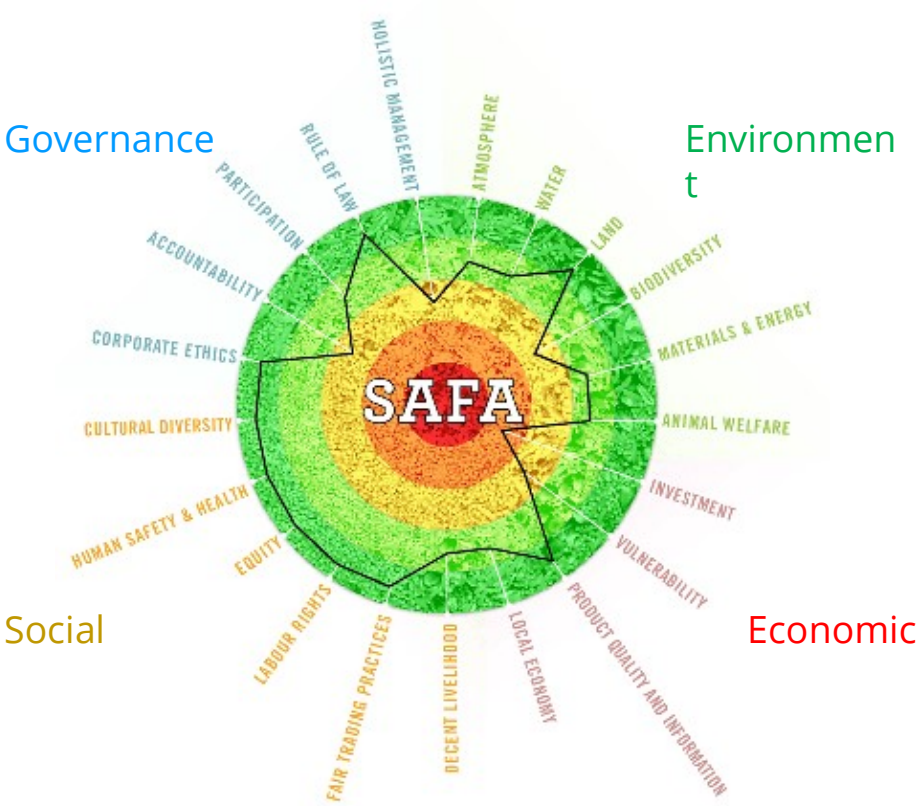


SAFA - Sustainability Assessment of Food and Agriculture Systems (FAO)



https://www.fao.org/nr/sustainability/sustainability-assessments-safa/en/

2.4. Agriculture and Environment

AGRICULTURE

1. Impact:
Land transformation (Due to use of land to yield goods and services)

Causes:
- ❖Deforesttation to create agricultural land
- ❖Drainage of wetlands to field cropping
- ❖Landscape degradation trough infrastructure activities (road etc.)
- ❖Urbanization (Transformation of agricultural lands into urban lands)

2. Impact:
Land degradation (The long-term decline in ecosystem function and productivity)

Causes:
- ❖Soil erosion
- ❖Soil salinisation
- ❖Overgrazing
- ❖Freguent burning
- ❖Loss of soil biodiversity due to use of agrochemicals

3. Impact:
Water pollution

Causes:
- ❖Soil erosion
- ❖Excessive and incorrect use of chemicals (fertilisers and pesticides)
- ❖Effluents from food processing factories
- ❖Soil from infrastructure development

2.4. Agriculture and Environment

AGRICULTURE

4. Impact:
Loss of biodiversity

Causes:
- ❖Cutting and burning
- ❖Agrochemicals usage
- ❖Monoculture cropping
- ❖Water eutrophication from agricultural fertilisers
- ❖Genetic engineering

5. Impact:
Atmospheric pollution

Causes:
- ❖Burning (bush and garden clearance)
- ❖Use of fertilizers-produces GHG (Greenhouse gases)
- ❖Rice growing
- ❖Livestoc activities

6. Impact:
Marginalisation of small-scale farmers

Causes:
- ❖Liberalization of agricultural trade under WTO
- ❖Legalizing the use of export subsidies
- ❖Use of agricultural subsidies for inputs by developed countries

2.4. Agriculture and Environment

AGRICULTURE

Global GHG Emissions by Sector

2016 global emissions of greenhouse gases
(fuel combustion emissions attributed to energy consumers)

- **Energy industry own use** (4.4%)
- **Manufacturing and construction** (24.3%)
- **Transport (Road)** (12.1%)
- **Transport (Int. Shipping)** (1.4%)
- **Transport (Int. Aviation)** (1.1%)
- **Transport (Other)** (1.9%)
- **Residential** (11.0%)
- **Commercial** (6.7%)
- **Unallocated Combustion** (3.6%)
- **Agriculture** (11.9%)
- **Land Use Change and Forestry** (6.6%)
- **Waste** (3.2%)
- **Industrial Processes** (5.7%)
- **Fugitive Emissions** (5.9%)

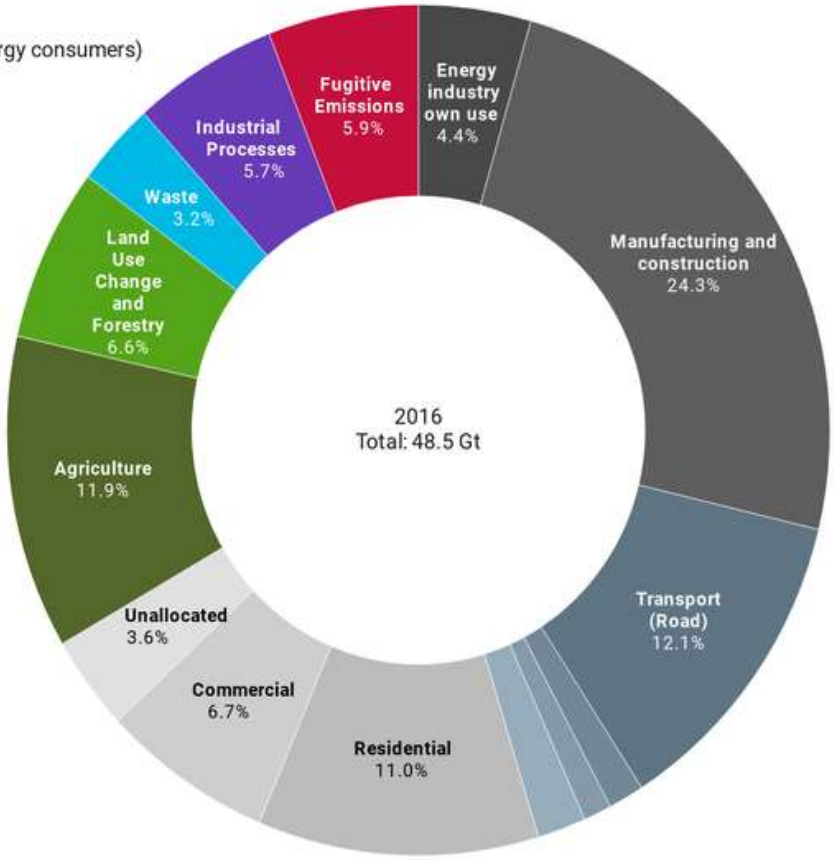


Chart: EarthCharts.org • Source: See website • Created with Datawrapper

3. Stakeholders of Actions on Agriculture (Suply Chain)

Agriculture

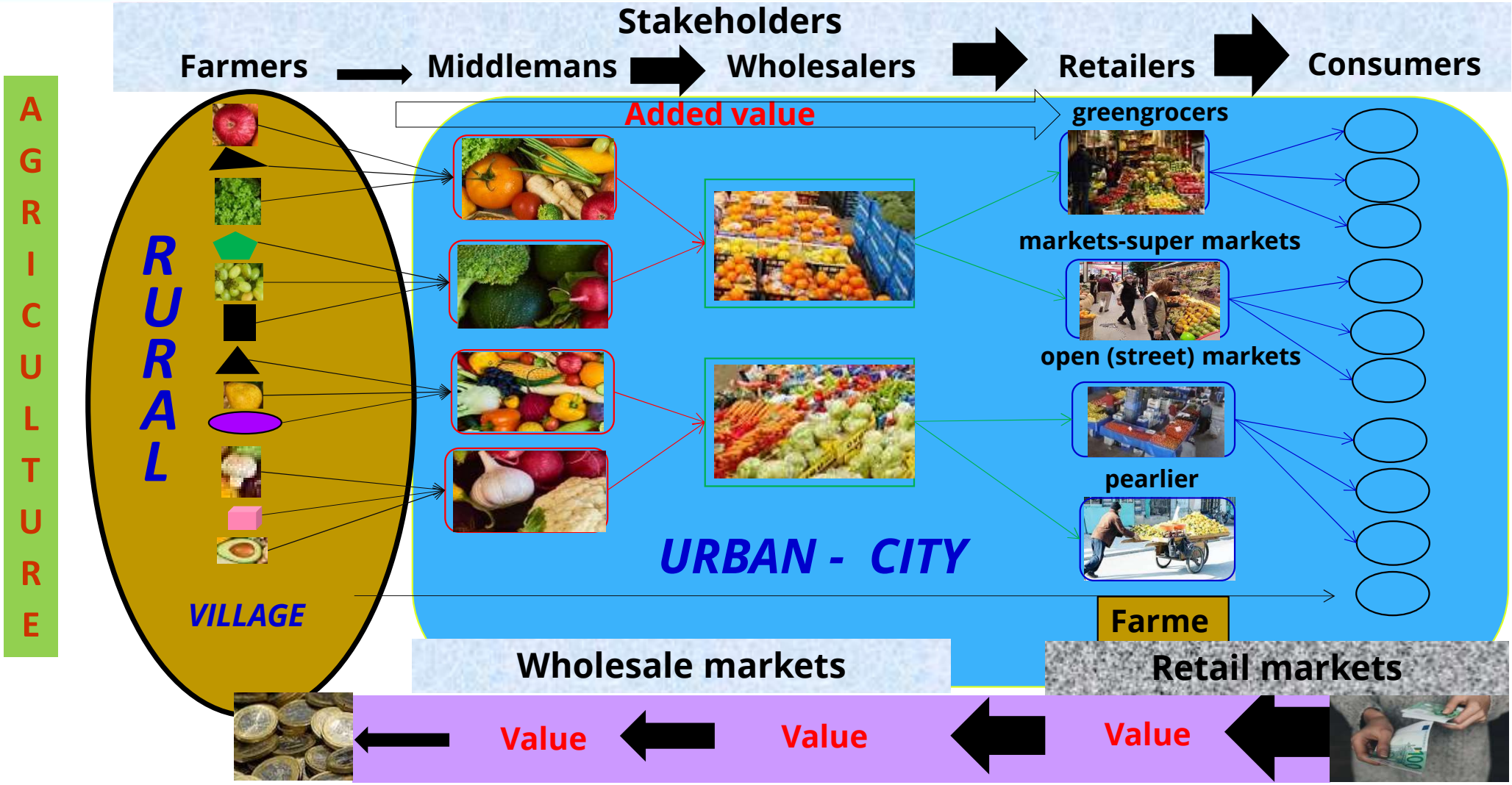
AGRICULTURE

Agricultural marketing is a process which starts with a decision to produce a saleable farm commodity. It involves all the aspects of market structure or system, both financial and institutional, based on technical and economic considerations, and includes pre- and post-harvest operations, assembling, grading, storage, processing, transportation and distribution.

Agricultural marketing brings producers and consumers together through a series of activities and thus becomes an essential element of the economy. The scope of agricultural marketing is not only limited with the final agricultural produce. It also focuses supply of agricultural inputs (factors) to the farmers.

3. Stakeholders of Actions on Agriculture (Suply Chain)

Marketing Channels of agricultural products



3. Stakeholders of Actions on Agriculture (Supply Chain)

Antalya wholesale market

AGRICULTURE

In Antalya Metropolitan Municipality Wholesale Market, which is the biggest producer in Turkey, 5-6 million kilograms of fresh fruit and vegetables are sent to domestic and foreign markets daily. Hal, which has been serving for 22 years, is also the livelihood of approximately 5,500 people. Life begins at night in the Wholesale Market. The product that the producer collects from the fields and greenhouses during the day reaches the state in the evening.

3. Stakeholders of Actions on Agriculture (Supply Chain)

AGRICULTURE

3. Stakeholders of Actions on Agriculture (Supply Chain)

AGRICULTURE

Antalya fisherman's shelter

Fish wholesale market

Auction

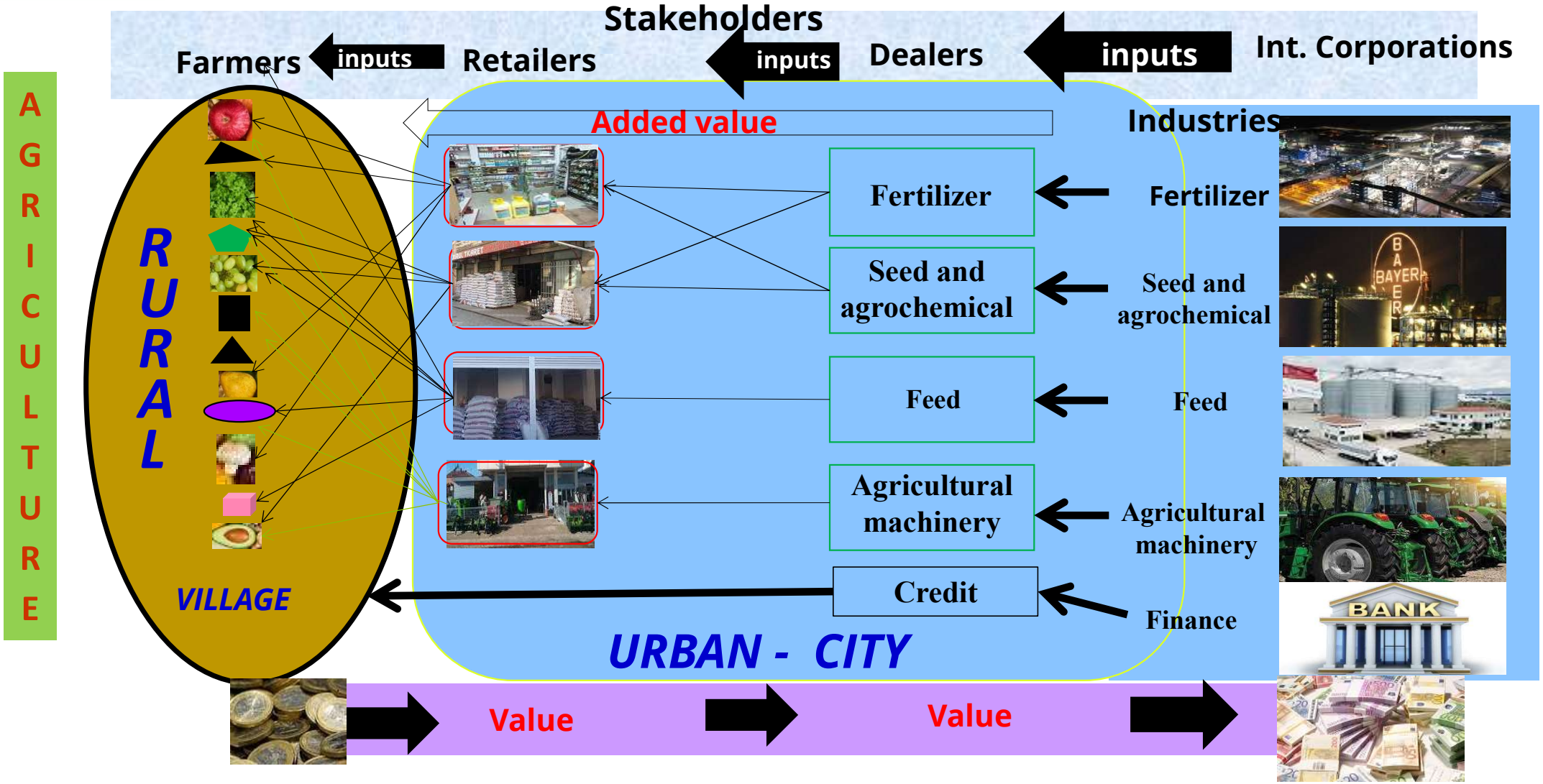
Processing

www.antalyabalik.com.tr

Retailing

3. Stakeholders of Actions on Agriculture (Supply Chain)

Marketing Channels of agricultural inputs



3. Stakeholders of Actions on Agriculture (Supply Chain)

Marketing Channels of agricultural inputs

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2017 Sales of Leading Seed Companies

Rank	Company	Sales (million $)	Market share (%)
1.	Monsanto+Bayer	10,913 + 1,769 = 12,682	33.0
2.	DowDuPont	8,200	21.3
3.	Syngenta	2,826	7.3
4.	Limagrain (Vilmorin)	1,842	4.8
4 big sum		25,550	66.4
Global seed sales		38,429	100.0

2017 Sales of Leading Agrochemical Companies

Rank	Company	Sales (million $)	Market share (%)
1.	Syngenta + ChemChina	9,244 + 3,523 = 12,767	23.5
2.	Bayer Crop Science + Monsanto	8,713 + 3,727= 12,440	23.0
3.	BASF	6,704	12.3
4.	Dow + DuPont*	6,100	11.2
4 big sum		38,011	70.0
Global agrochemical sales		54,219	100.0

Source: Yücel D., 2021

3. Stakeholders of Actions on Agriculture (Suply Chain)

Marketing Channels of agricultural products

Agriculture

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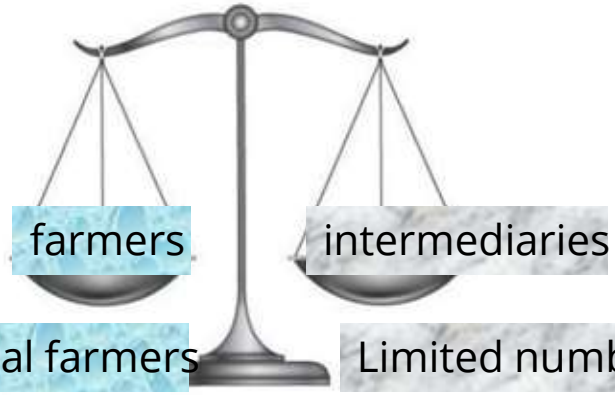
1. In wholesale markets;
which part has more bargaining power?



Plenty of individual farmers

Limited numbers intermediary

Pure competitive market structure

Oligopsony market structure

2. How can we increase the bargaining power of farmers in wholesale markets?

3. Stakeholders of Actions on Agriculture (Suply Chain)

Marketing Channels of agricultural products

Agriculture

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Farmer-Producer Organizations

Farmers' and producers' organizations are important institutions that deliver services to their members, facilitate their access to markets, and empower small farmers to engage in policy dialogue. They have a key role to play in ensuring inclusive and sustainable rural transformation at local, national and international levels (https://www.ifad.org/en/producer-organizations).

Many farmer work on relatively small family farms (95.2 % in the EU) which operate independently of each other. By contrast there is a far higher concentration amongst both processors and retailers. This asymmetry of bargaining power makes it difficult for farmers to defend their interests when negotiating with other actors in the supply chain.

To strengthen farmers' collective bargaining power, the EU supports farmers who wish to work together in producer organizations.

3. Stakeholders of Actions on Agriculture (Suply Chain)

Marketing Channels of agricultural products

Agriculture

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Farmer-Producer Organizations Types

1. **Economic organizations (Producer organizations, Cooperatives (POs))**
2. **Vocational organizations**
3. **Social organizations**

1. Economic organizations (Producer organizations, Cooperatives)

Producer organizations strengthen the collective bargaining power of farmers by:

- concentrating supply
- improving marketing
- providing technical and logistical assistance to their members
- helping with quality management
- transferring knowledge.

POs can take different legal forms in the EU, including agricultural cooperatives.

3. Stakeholders of Actions on Agriculture (Suply Chain)

Marketing Channels of agricultural products

Agriculture

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Farmer-Producer Organizations Types

1. Economic organizations (Producer organizations, Cooperatives)

There are around 3,638 recognised POs in the EU (as of 2017). They mainly operate in three sectors:

Distribution of recognized POs between sub sectors

Category	Share (%)
Fruit and vegetables	52.00
Others	39.00
Milk and dairy products	9.00

Number of recognized POs by EU country

No	Category	N. of POs	No	Category	N. of POs	No	Category	N. of POs
1	FR	724	11	BE	21	21	LV	4
2	DE	692	12	RO	19	22	DK	2
3	IT	583	13	BG	17	23	IE	2
4	ES	579	14	NL	14	24	MT	1
5	EL	466	15	HR	10	25	EE	0
6	PL	239	16	CY	9	26	LT	0
7	PT	119	17	SE	5	27	LU	0
8	HU	60	18	SI	5			
9	CZ	32	19	SK	5			
10	AT	26	20	FI	4			

Formation is possible;

- Multi-national producer organizations
- Interbranch organizations

Farmer-Producer Organizations Types

2. Vocational organizations

The chambers of agriculture, professional association of the farmers are in public qualification like other nongovernmental organizations.

Chambers of Agriculture mostly act to increase the technological knowledge of the farmers and to form public opinion in order to protect the interests of the farmers.

Functions of Farmers' Associations

The basic mission of farmers' associations is to represent farmers, in order to ensure their participation in the formulation and implementation of policies and agricultural development actions. The accomplishment of this mission is based on three principal functions:

- ❖ consultation
- ❖ information and training of farmers
- ❖ support for professional organization of farmers

Although recognized by law as the official interlocutors of the government, farmers associations do not have a monopoly of this function; other actors can carry out these functions. The role of farmers' associations in this case is to facilitate dialogue between all those who exercise these functions on behalf of farmers.

DPSIR Framework Agriculture & Forestry Development

Driving Forces	Trends	Pressures	State	Impacts
Economic	Globalization Market and price regulations Economies of scale	Revenues, costs, profits, assets values Land use change	Food identity oriented to export Fragile ecosystems	Rural economy, incomes and employment Loss of traditional culture Public health Creation of social disparities Degradation of ecosystem services Pressure over supply sustainability
Modernization	Mass production Intensive input usage New technology Pollution	Concentration of power Water and soil pollution	Quantity and quality of food and agri-goods supply	
Urbanization	Unstructured urban growth along an urban-rural continuum	Growing demand and degradation on natural resources	Land fragmentation Higher land costs Lack of common good	
Climate Change	Water scarcity Rising average temperatures	Climate Risks	Water shortage Changing crop pattern	
S P E C T R U M O F R E S P O N S E S				
Safeguard measures ➢ **Resilience** ➢ **Democracy** **-Participation** **- Cooperation**	➢ Multi-stakeholder processs ➢ Payment for ecosystem services ➢ Monitoring and avaluation	Dynamic conservation approaches	➢ Eco-agricultural products ➢ Sustainable tourism ➢ Industrial integration ➢ System Strategies ➢ Circular economy	

4. Current developments, policies, strategies for agriculture and food

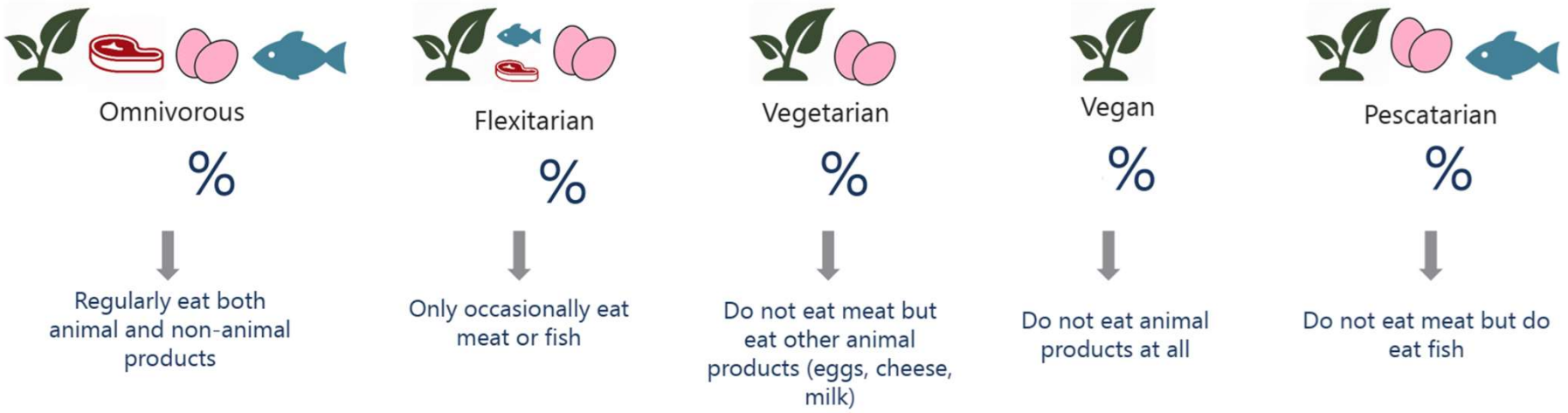
AGRICULTURE

Agriculture

- European union new CAP, green deal
- Trade offs / impacts of the current agribusiness system
- Responses by FAO / IPES / Milano urban food policy pact
- KPIs: Examples of the indicators of MUFPP and FAO / CRFS indicators, a selection that relate to the landscape aspects
- Main questions for TELOS learners
- References

poll 1: How would you consider your own diet? Select the one that is most appropriate.

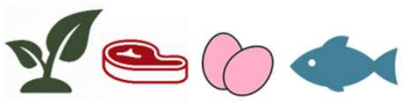
AGRICULTURE



Source: Ipsos MORI Global Advisor Survey. N=20313 28 countries

poll 1: compared to the world diets

AGRICULTURE



Omnivorous

73%

Regularly eat both animal and non-animal products

Flexitarian

14%

Only occasionally eat meat or fish

Vegetarian

5%

Do not eat meat but eat other animal products (eggs, cheese, milk)

Vegan

3%

Do not eat animal products at all

Pescatarian

3%

Do not eat meat but do eat fish

4.1. CAP and the EU

Agriculture

AGRICULTURE

OBJECTIVES OLD CAP

- ✓ Increasing agricultural productivity
- ✓ Ensuring a fair standard of living for farmers
- ✓ Guaranteeing the availability of supplies
- ✓ Stabilising the markets
- ✓ Establishing a secure supply chain with reasonable prices
- ✓ Harmonising competition rules across all countries

- ❖ Price & market supports
- ❖ Tariffs on imports
- ❖ Price intervention to disable falling market prices
- ❖ Farmer support respecting amount of production

See for the historic development of the Common Agriculture policy of the EU with data the wiki:

https://telos.hfwu.de/index.php?title=Landscape_Economy_Readings_and_Resources#Session_4.1:_Agriculture

GREEN DEAL

AGRICULTURE

- The Union should become **climate neutral** – **2050** – engage all citizens into Climate action
- **Biodiversity and its sustainability** – **2030** –bring nature back to centre and suburbs
- Secure environment and favourable livelihoods in rural and urban
- Zero pollution for water/air/soil and steady reduction in pollution
- **Landscape management and protection**

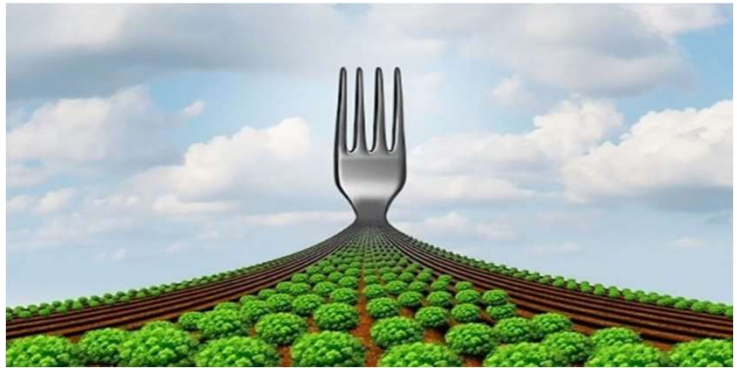
4.3. CAP AND THE GREEN DEAL

Agriculture

GREEN DEAL

AGRICULTURE

- Sustainable production schemes with **minimum input use**
- **Natural production** as possible for regeneration
- **Monitoring food** industries
- **Horizontal and vertical integration** for efficiency
- Sustainable **consultancy** services
- Direct supports to **environment-friendly production**



- **CAP** almost disregarded food and nutrition for **60 years**.
- **Green Deal** suggests assuring **sustainability in food and nutrition** and developed plans and strategies.

Agriculture

AGRICULTURE

NEW CAP (2023:2027)

December 2021

✓ Fairer, greener and more performance-based CAP.

✓ Application of clean/safe **circular economy** approach

✓ **European Green Deal**

✓ **Farm to Fork Strategy**

✓ **EU Soil Strategy for 2030**

4.5. CAP AND THE GREEN DEAL

Agriculture

FARM TO FORK STRATEGY – F2FS

AGRICULTURE

- ✓ Ensure sustainable food production
- ✓ Ensure food security
- ✓ Stimulate sustainable food processing, retail, hospitality and food services' practices
- ✓ Promote sustainable food consumption, and facilitate the shift towards healthy, sustainable diets
- ✓ Reduce food loss and waste
- ✓ Combat food fraud along the food chain

Enhanced conditionality

Eco-schemes

Farm Advisory Service

Agri-environment-climate measures and investments

4.6. CAP AND THE GREEN DEAL

Agriculture

AGRICULTURE

FARM TO FORK STRATEGY – F2FS

2030 Targets for sustainable food production

PESTICIDES	NUTRIENT LOSSES	ANTIMICROBIALS	ORGANIC FARMING
50%	50%	50%	25%
Reduce the overall use and risk of chemical and hazardous pesticides	Reduce nutrient losses by 50% whilst retaining soil fertility, resulting in 20% less fertilisers	Reduce sales of antimicrobials for farmed animals and aquaculture	Increase the percentage of organically farmed land in the EU

#EUFarm2Fork #EUGreenDeal

European Commission

4.7 EU Framework for Sustainable Food System

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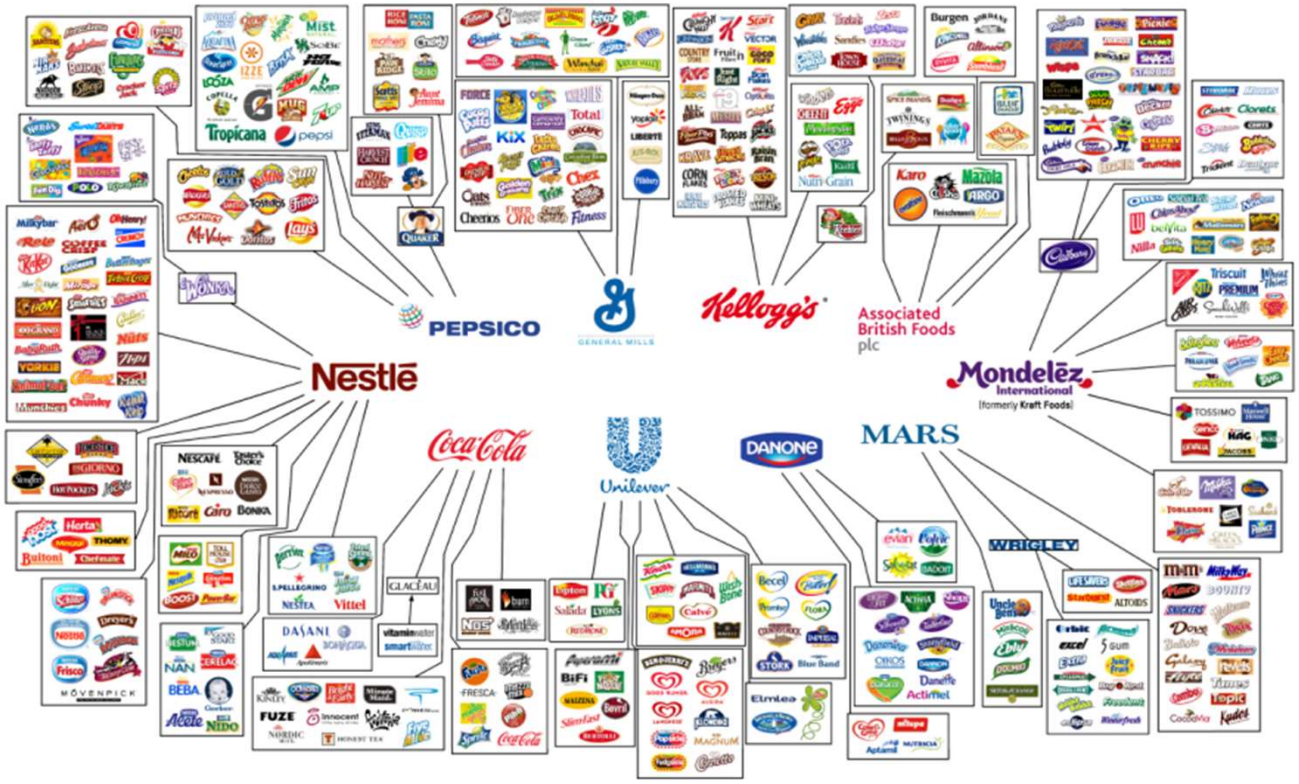
Agriculture

- Multi-departmental approach to address food system sustainability: DG SANTE, DG AGRI, DG ENV, and DG MARE
- Planned to be launched in the end of 2023.
- Aims to ensure coherent actions at both EU and member state levels.
- Focuses on key issues:
  - Incentives for sustainable food production.
  - Affordability of sustainable foods.
  - Food loss and waste reduction.
  - Cross-sector responsibilities for sustainability.

5.6 **Where does** the food **come from? What is the social and environmental impact?**

AGRICULTURE



Source: Joki Gauthier for Oxfam 2012. For more information on this figure, and to see it online, visit http://www.behindthebrands.org

Source: OXFAM, 2013

5.7 **Challenges: Environmental impacts**:

see also slide 2.4 of the first part of this lecture

Agriculture

AGRICULTURE

- Loss of soil and soil degradation, erosion
- Water shortages and flooding
- Pesticides and nitrogen fertilisers -> biodiversity loss, water pollution
- Loss of environmental services pollination
- Carbon and nitrogen emissions

Sources: IPES (2019,), OXFAM 2013,

5.8 Challenges: Health impacts

AGRICULTURE

- Hidden cost of cheap food
- Food as a commodity and speculation: 850 million undernourished
- Shift to processed foods (richer in salt, sugar and saturated fats) often less nutritious
- Impact of air pollution by ammonia emissions, surface and drinking water pollution by pesticides and fertilizers
- Antimicrobial resistance and exposure to endocrine disrupting chemicals via foods and food packaging.
- Change in diets by industrial processing and marketing result in overweight and obesity (1.5 billion, 300 million diabetes type 2), especially for the poorer population groups.

Sources: IPES (2019,), OXFAM 2013,

5.9 Challenges: Socio-economic impacts

AGRICULTURE

Agriculture

- Regional hyper-specialization – for export not for providing food for residents
- Giant agri-food corporations result in precarious working conditions and poor working conditions and livelihood pressures for farmers by power imbalances.
- Techno investments make farmers depending on banks and large companies
- Erosion of traditional food cultures and the emergence of urban lifestyles -> disconnecting people from how food is produced and from concepts such as the seasonality of fruits and vegetables

Sources: IPES (2019,), OXFAM 2013,

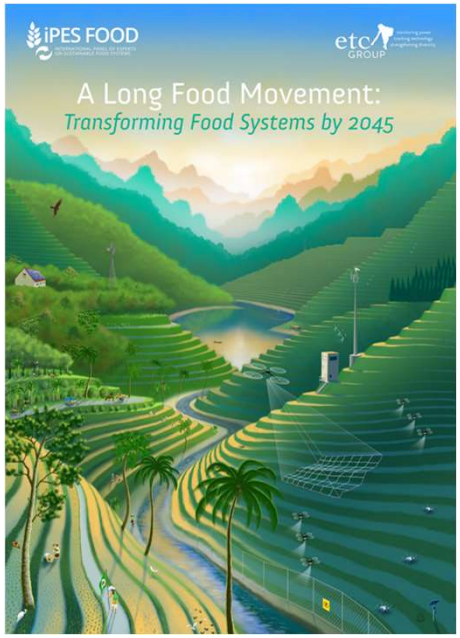
AGRICULTURE

Responses by / IPES / FAO / Milano Urban Food Policy Pact

6.1 Responses by IPES-Food on the system

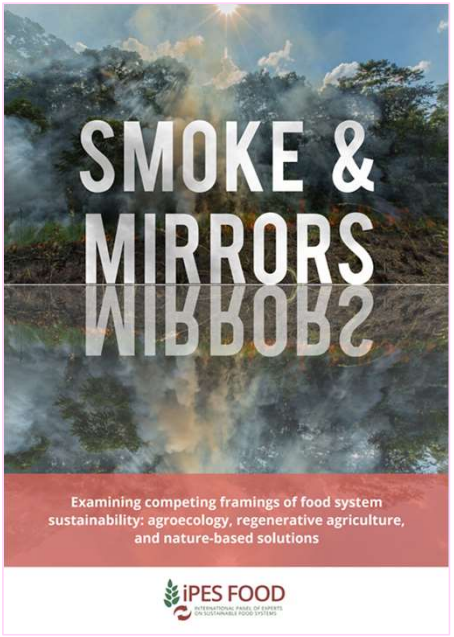
AGRICULTURE

Policy

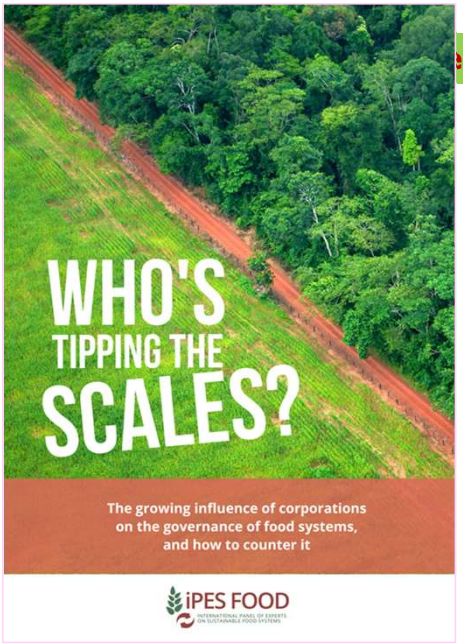


scenario / movement

http://www.ipes-food.org/pages/LongFoodMovement



framing



corporate power

4.8 Smoke an mirrors - IPES-FOOD
Agroecology, regenerative agriculture, NBS

The terms have common ground but also diverge in significant ways. A shared understanding is essential for effective policy and practice.

AGRICULTURE

Agroecology

- Embodies a holistic approach.
- Focuses on environmental restoration and sustainability.
- Emphasizes social and cultural well-being, equity, and justice.
- Values the plurality of knowledge.

Regenerative Agriculture

- Stresses the regeneration of natural resources.
- Linked with environmental dimensions.
- Less emphasis on socio-economic aspects.
- Historical roots in counterculture and environmental awareness.

Nature-Based Solutions (NBS)

- A newer term with diverse applications.
- Primarily used in climate change mitigation through carbon offsetting.
- Limited focus on social dimensions.
- Promoted by oil and gas corporations and conservation groups.

Concept Issue

While these terms share common themes, there are notable differences.

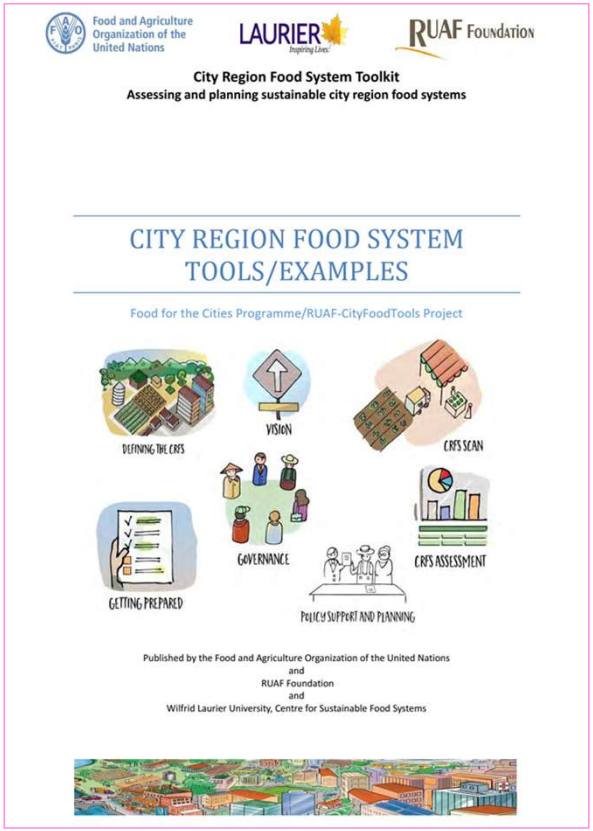
- **Agroecology**'s holistic approach includes socio-cultural dimensions and a plurality of knowledge.
- **Regenerative agriculture and NBS** are narrower, with limited emphasis on social aspects.
- Historical depth and institutionalization set agroecology apart.

The choice of terminology matters in shaping the future of food systems.

6.2 City – region policies and approaches – MUFPP and FAO City region food system

MILAN URBAN FOOD POLICY PACT

- 270 cities, 450 million inhabitants
- Voluntary commitments *"for the development of sustainable food systems and the promotion of healthy diets »*
- Adoption of a framework of recommended actions (governance, social and economic equity, support to production, local supplying...)
- Exchange of good practices



- City region approach focused on transforming food systems

6.3 Principles to guide the transition to Sustainable Food Systems 1

AGRICULTURE

Policies and regulation	National: Shift financial flows to support small farmers and producers, favour organic and local production, help to build capacity and healthy diets. Authorities should take control over access to land, grazing, water, seeds, livestock & fish populations and respecting the rights of local food producers.
Food security	Sustainable food systems must deliver diets that are nutritious, affordable and culturally acceptable , and must provide food security without compromising the ability of future generations to do so.
Food sovereignty	

Source: https://www.foodsovereignty.org/wp-content/uploads/2020/06/IPC_Handbook_EN.pdf

6.4 Principles to guide the transition to Sustainable Food Systems 2

AGRICULTURE

Food democracy	Decision-making in food systems must be democratized in ways that empower disadvantaged actors and help to realize the human rights of all, including the right to food. Food councils should be inclusive but also engage with the industry.
Focus on local	Localize food systems: food must be seen primarily as sustenance for the community and only secondarily as something to be traded, with fairer, shorter and cleaner supply chains
Focus on ecology	requires production and distribution systems that protect natural resources and reduce greenhouse gas emissions, avoiding energy-intensive industrial methods. Promote and support sustainable farming
Capacity building	Build knowledge and skills: technologies, such as genetic engineering, that undermine food providers' ability to develop and pass on knowledge and skills needed for localized food systems are rejected.

Source: https://www.foodsovereignty.org/wp-content/uploads/2020/06/IPC_Handbook_EN.pdf

6.5 Example of the city of Ghent, Belgium

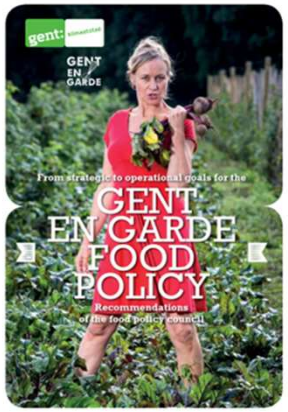
AGRICULTURE

“A liveable city has **greater food sovereignty**.. where more **locally oriented** professional agriculture and other forms of food supply in both the open and urban space contribute to a **sustainable relationship** between **city and countryside**

Not only through local sales of **healthy and fresh** products, but also through i**nnovative exchange of waste, energy and labour flows**. It is a city where f**armers help** to manage **nature and the landscape** and where **nature associations** help to protect **good agricultural land.”**
(Ruimte voor Gent)

- ★ Local food
- ★ Connection
- ★ Climate robust
- ★ Health
- ★ Waste
- ★ Water
- ★ Soil
- ★ Energy
- ★ Landscape Heritage
- ★ Jobs
- ★ Fair income
- ★ Inclusiveness

Agriculture



6.5 Example of the city of Ghent, Belgium

AGRICULTURE

culture

De Goedinge Agroecological land

Vanier short chain platform

Moestuinbegeleiding education growing food

Gratis fruit plukken Free fruit

Voortrekker eiwittransitie veggie day

Duurzame schoolmaaltijden school meals

foodsavers - food waste

restorestje - doggie bag

online support platform

Poll 2: your road to change

Agriculture

AGRICULTURE

How big is the role that agriculture and food plays in the planning or project area you work on?

Can you think of a transformative action that you as planner can initiate for the area to improve the sustainability of the landscape?

If you answered ‘yes’ before, can you name a type of action?

AGRICULTURE

KPIs: Examples of the indicators

further information on indicators of MUFPP and FAO / CRFS indicators

Sustainable Food System Assessment

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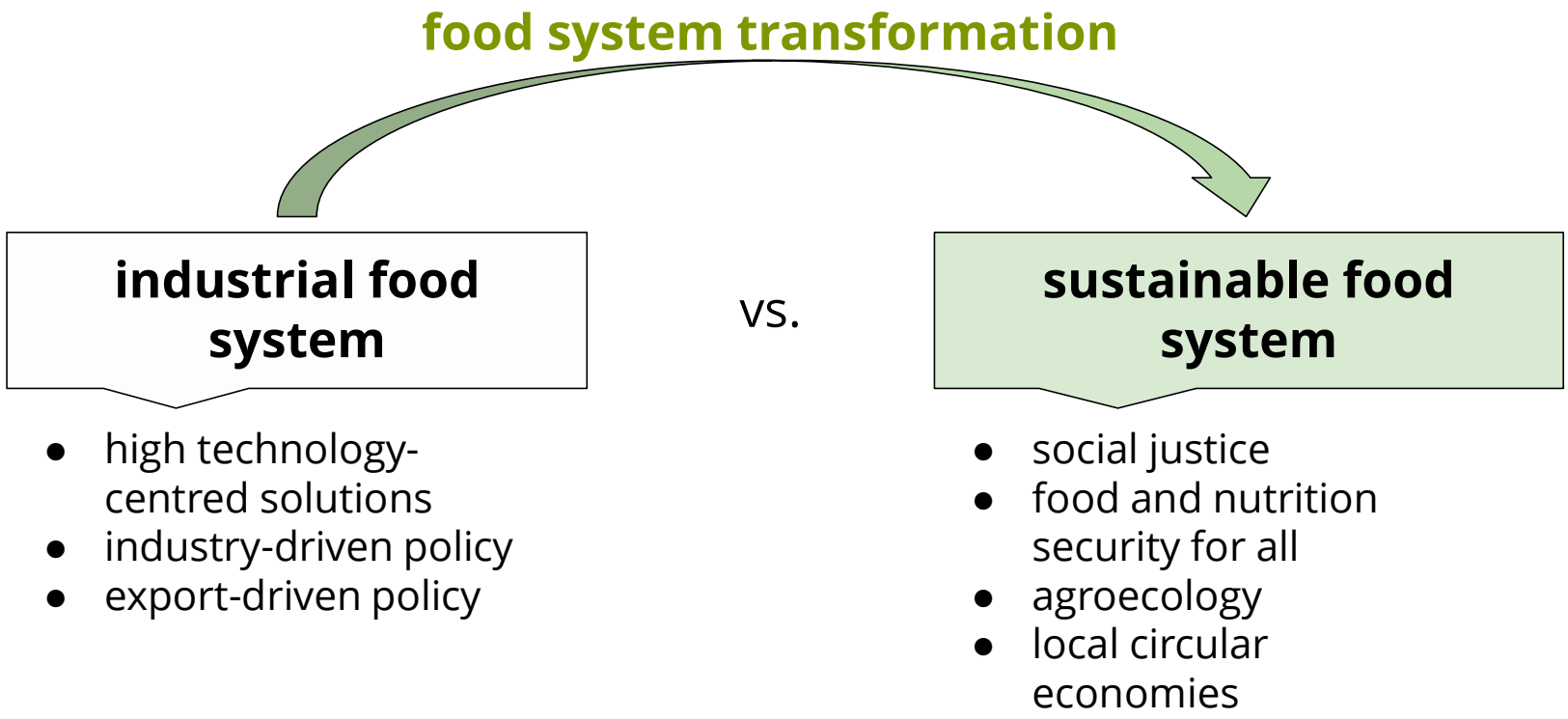

Source: Alison Blay- Palmer, Damien Conaré, Ken Meter, and Amanda Di Battista. (2019)The view from here A critical consideration of sustainable food system assessments, [in:] SUSTAINABLE FOOD SYSTEM ASSESSMENT. Lessons from global practice. pp. 234–251.

spatial, legal, economic, social, and environmental indicators

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SPATIAL: % of access to land for farmers, access to land for recreation, and connectivity of the land affected by communal regulations and use

LEGAL and POLICIES: Degree of implementation of the new goals of the CAP and the F2F strategy, regulations of land ownership and agricultural land reserve, establishment of a food strategy for city region.

ECONOMIC:

% of the farmers who receive a fair income,

% of land use by community supported agriculture (CSA), economic activity developed within communal structures (social economy, cooperatives, etcetera) and value of the products that are regulated and managed in a communal way

% of food for the city region produced locally

spatial, legal, economic, social, and environmental indicators

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SOCIAL:

% people benefiting or participating in social aspects of food production (urban agriculture, community gardens, care farms, allotment gardens),

% of people who have access to healthy food (not living in food deserts)

ENVIRONMENTAL:

Contribution of agriculture and the farmers to the preservation and improvement of environmental values and assets (carbon sequestration, water retention, ecological connectivity, biodiversity, etcetera,

% of land use surface for organic farming, % of land use by circular or nature inclusive farming.

Two sources where you could retrieve indicators from City region Food System (CRFS) and MUFPP

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City Region Food System Toolkit

Assessing and planning sustainable city region food systems

Food and Agriculture Organization of the United Nations

RUAF Foundation

LAURIER Inspiring Lives.

- The MUFPP indicator framework is a short version of CRFS.
- Focused on the city and the urban food system
- Tailored to align with local government urban policy priorities and data availability.

Source:https://archive.ruaf.org/news/city-region-food-system-indicators/

https://ruaf.org/assets/2019/12/FAO-MUFPP-Indicator-framework-Tel-Aviv.pdf

https://www.milanurbanfoodpolicypact.org/the-milan-pact/#6categories

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Main questions for learners

Some questions for you on agriculture and food

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- Which role plays food in your study/project area or in your study or work?
- Are there already transformative initiatives existing or would you like to propose some?
- Who could be the participants / actors in the development?
- Who would benefit, who should contribute, who should regulate?
- How would you measure the change: which key performance indicator to use?

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references

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FAO, RUAF, MUFPP. 2021. The Milan Urban Food Policy Pact Monitoring Framework - A practical handbook for implementation. Rome: https://www.fao.org/documents/card/en/c/cb4181en

https://www.fao.org/in-action/food-for-cities-programme/overview/crfs/en/

Background information

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https://archive.ruaf.org/news/city-region-food-system-indicators/

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https://environment.ec.europa.eu/topics/soil-and-land/soil-strategy_en