

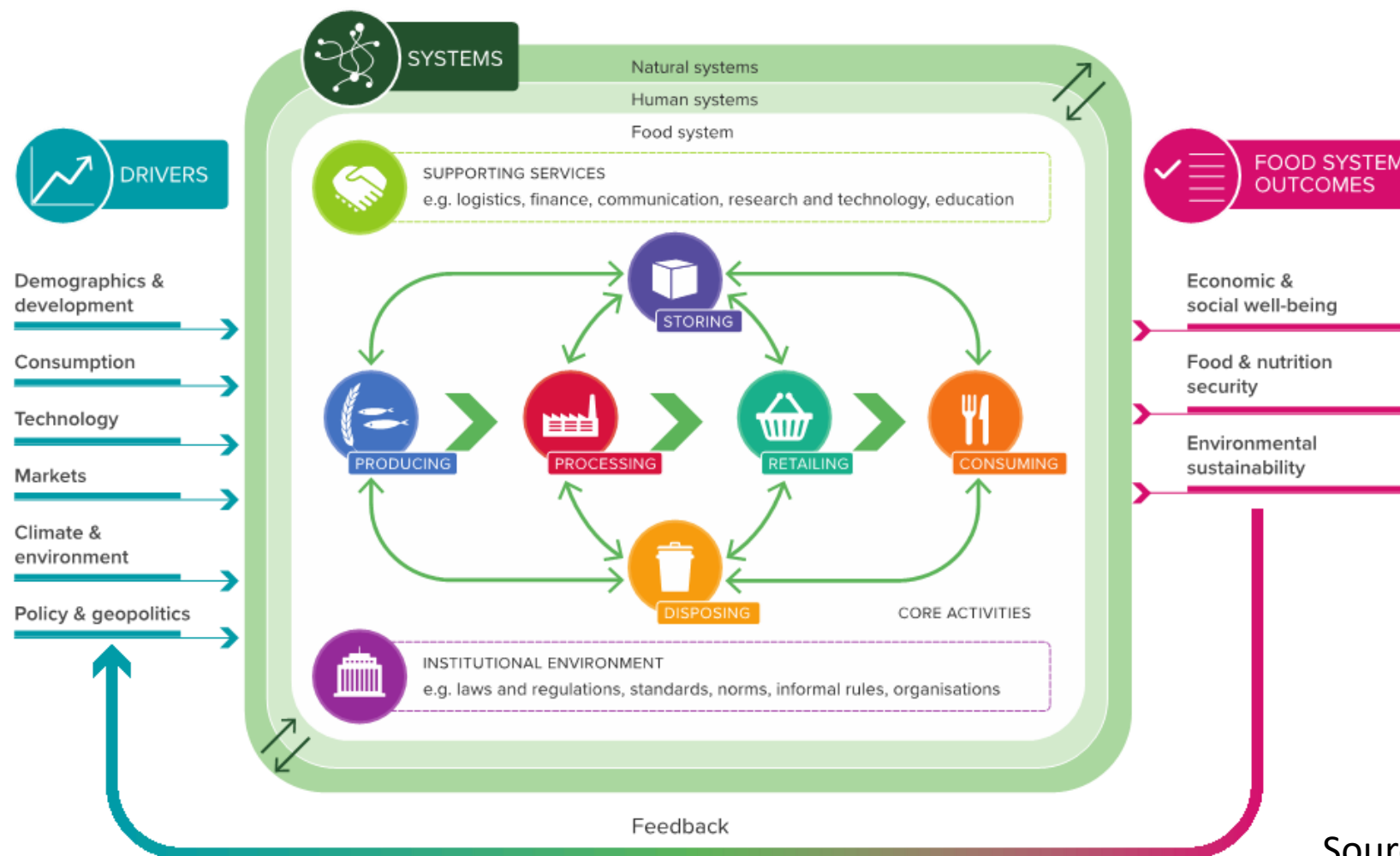
The futures of food systems: recent trends and game changers

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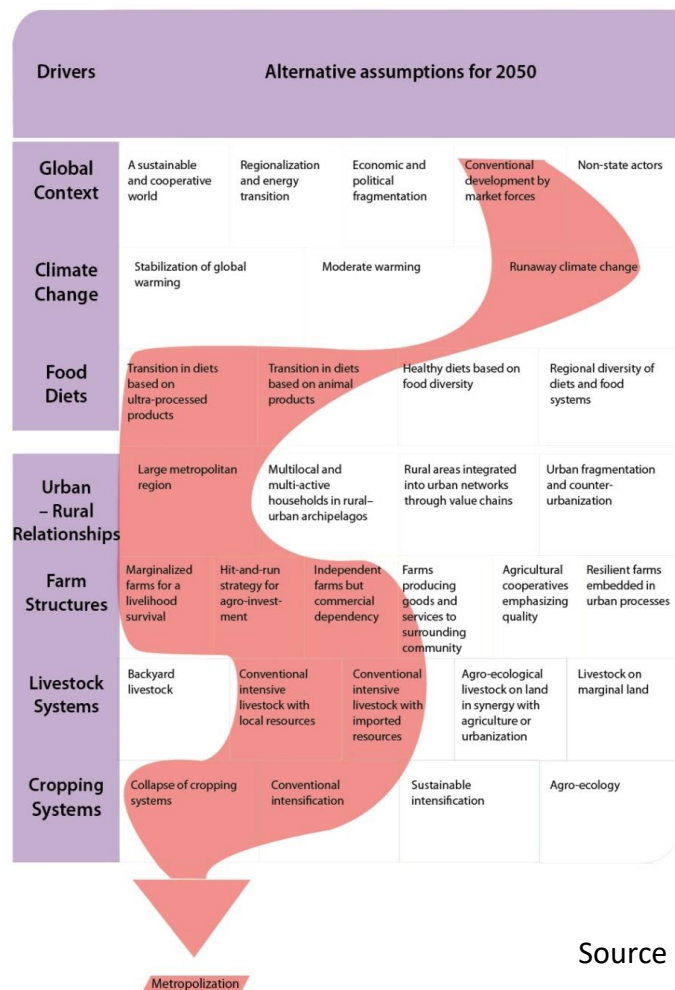
Patrick Caron (MUSE – Montpellier Université d'Excellence et CIRAD – UMR ART-DEV)

Bernard Hubert (INRAE et EHESS)

Food Systems are complex and at risk



2018 – Agrimonde-Terra: 5 scenarios of land use and food security



Land use (and food systems) driven by Metropolization

Land use for regional food systems

Land as commons for rural communities in a fragmented world

Land use (and food systems) for multi-active and mobile households

Land use (and food systems) for food quality and healthy nutrition

Global context & European context

Recent trends and game changers (2018-2022)

Covid sanitary crisis : 2020 – 2022 (?)



Growing :

- Difficulties in food access
- e-commerce

Need to pay attention to:

- Interconnections human – animals – planet health
- Food sovereignty
- Organisation of value chains
- Wastes

Wars, conflicts, tensions



→ **Regional influence and economic wars, for example over:**

- Digital & components
- Taiwan & South China Sea
- +++
- + Food systems

- A People's Summit Focused on Solutions for People, Planet and Prosperity
- **Food systems must adapt to realize SDGs: contribute to people's nutrition, health and well-being, restore and protect nature, be climate neutral, adapt to local circumstances and provide decent jobs and inclusive economies.**
- **Need for engagement and support**

and

NGO and social organisations protest

Boycott by some scientists



and



and

Coalition on Sustainable Productivity Growth for Food Security and Resource Conservation (SPG)

and



Coalitions of Action for Achieving Zero Hunger + Food is Never Waste
+++++



A worldwide strategy for expanding interdisciplinary collaborations and communications in all aspects of health care for humans, animals and the environment.

Changing generations

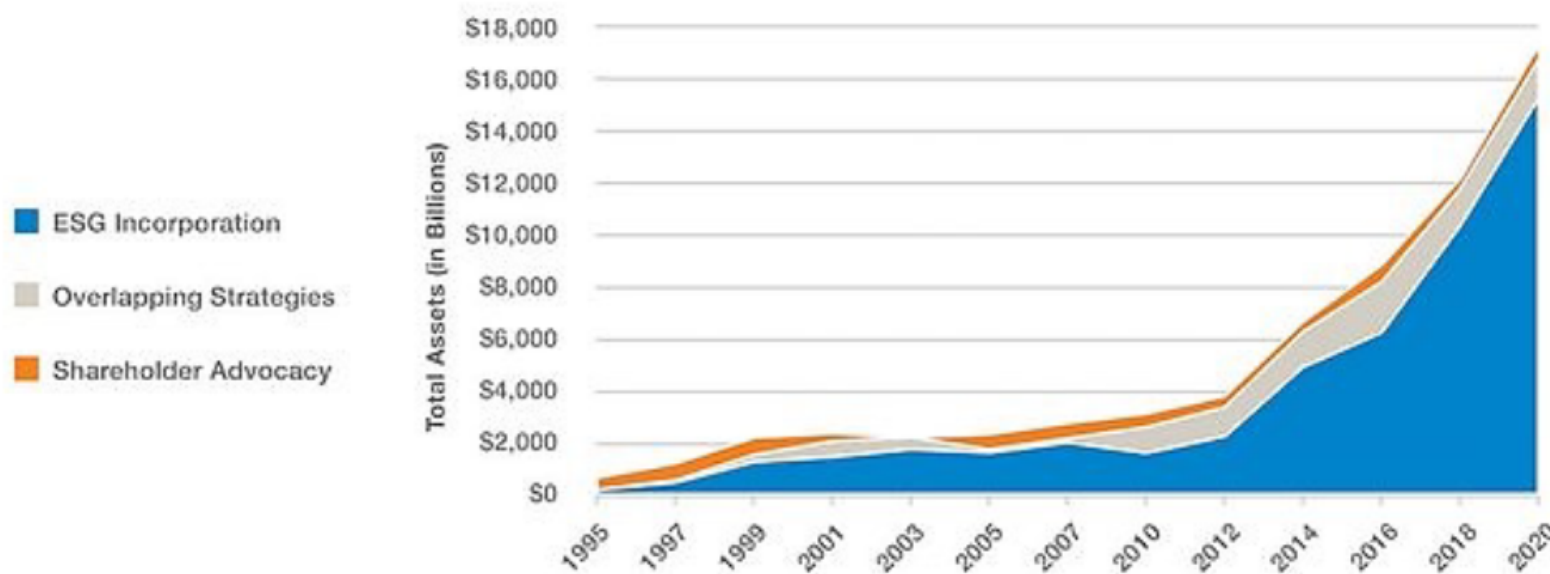
Net zero target evaluations

- A new generation is taking over the top positions. Baby-boomers leaders are being replaced by 45-year-old CEOs who are hiring 25-year-olds, with new concerns.
- Development of local initiatives, public and private poles, private initiatives

Rating the comprehensiveness of national net zero target design		Net zero target design elements								
Sept 2022 Update		1	2	3	4	5	6	7	8	9
Country		Target year	Emissions coverage	International aviation and shipping	Reductions or removals outside of own border	Legal status	Separate reduction & removal targets	Review process	Carbon dioxide removal	Comprehensive planning
Chile	ACCEPTABLE	2050	✓	✗	✓	✗	✓	✗	✓	✗
Colombia	ACCEPTABLE	2050	✓	✗	✓	✓	✓	✓	✗	✓
Costa Rica	ACCEPTABLE	2050	✓	✗	✓	✗	✓	✗	✓	✗
European Union	ACCEPTABLE	2050	✓	✗	✓	✓	✗	✓	✓	✗
United Kingdom	ACCEPTABLE	2050	✓	✓	✗	✓	✗	✓	✓	✗
Viet Nam	ACCEPTABLE	2050	✓	✗	✗	✓	✓	✓	✗	✓
Canada	AVERAGE	2050	✓	✗	✓	✓	✗	✓	✗	✗
Germany	AVERAGE	2045	✓	✗	✗	✓	✓	✓	✗	✗
Nigeria	AVERAGE	2050-2070	✗	✗	✓	✗	✗	✓	✗	✗
South Korea	AVERAGE	2050	✗	✗	✓	✓	✓	✗	✓	✓
Switzerland	AVERAGE	2050	✓	✓	✗	✗	✓	✗	✗	✗
Thailand	AVERAGE	2065	✗	✗	✓	✗	✓	✗	✗	✓
United States	AVERAGE	2050	✓	✗	✗	✗	✗	✗	✓	✗
Australia	POOR	2050	✓	✗	✗	✗	✗	✗	✗	✗
China	POOR	2060	✗	✗	✗	✗	✗	✗	✗	✗
Japan	POOR	2050	✓	✗	✗	✓	✗	✓	✗	✗
Kazakhstan	POOR	2060	✓	✗	✗	✗	✗	✗	✗	✓
New Zealand	POOR	2050	✗	✗	✗	✓	✗	✓	✗	✗
Russian Federation	POOR	2060	✓	✗	✗	✓	✗	✗	✗	✗

Investments are shifting towards more sustainable strategies

Assets managed under sustainable investment strategies 1995–2020



Note: Definition of ESG varies between sources

Goldman Sachs: \$750 billion for 'large opportunities' in sustainable finance by 2030

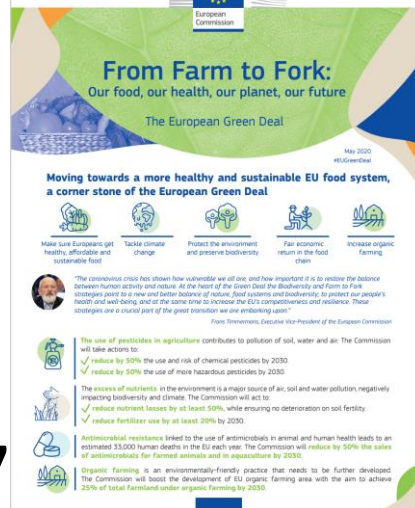
Blackrock sustainable funds: from \$90bn in AUM to \$1 trillion in the next decade

One in three European funds to be focused on ESG investing by 2030

Europe: strategic orientations but also complex arrangement of public laws and private food standards



New CAP 2023-2027

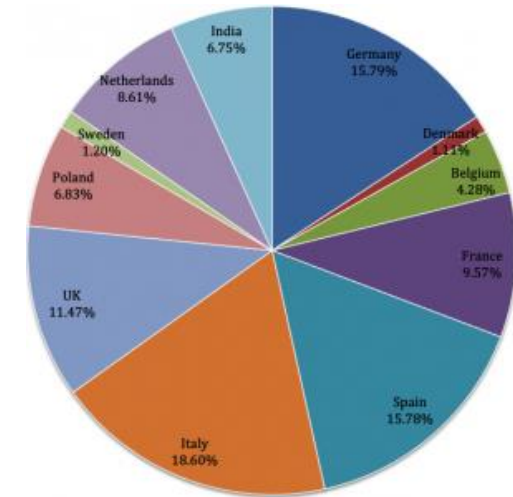


Food safety :

BRC standard

FSSC 22000 .

SQF code



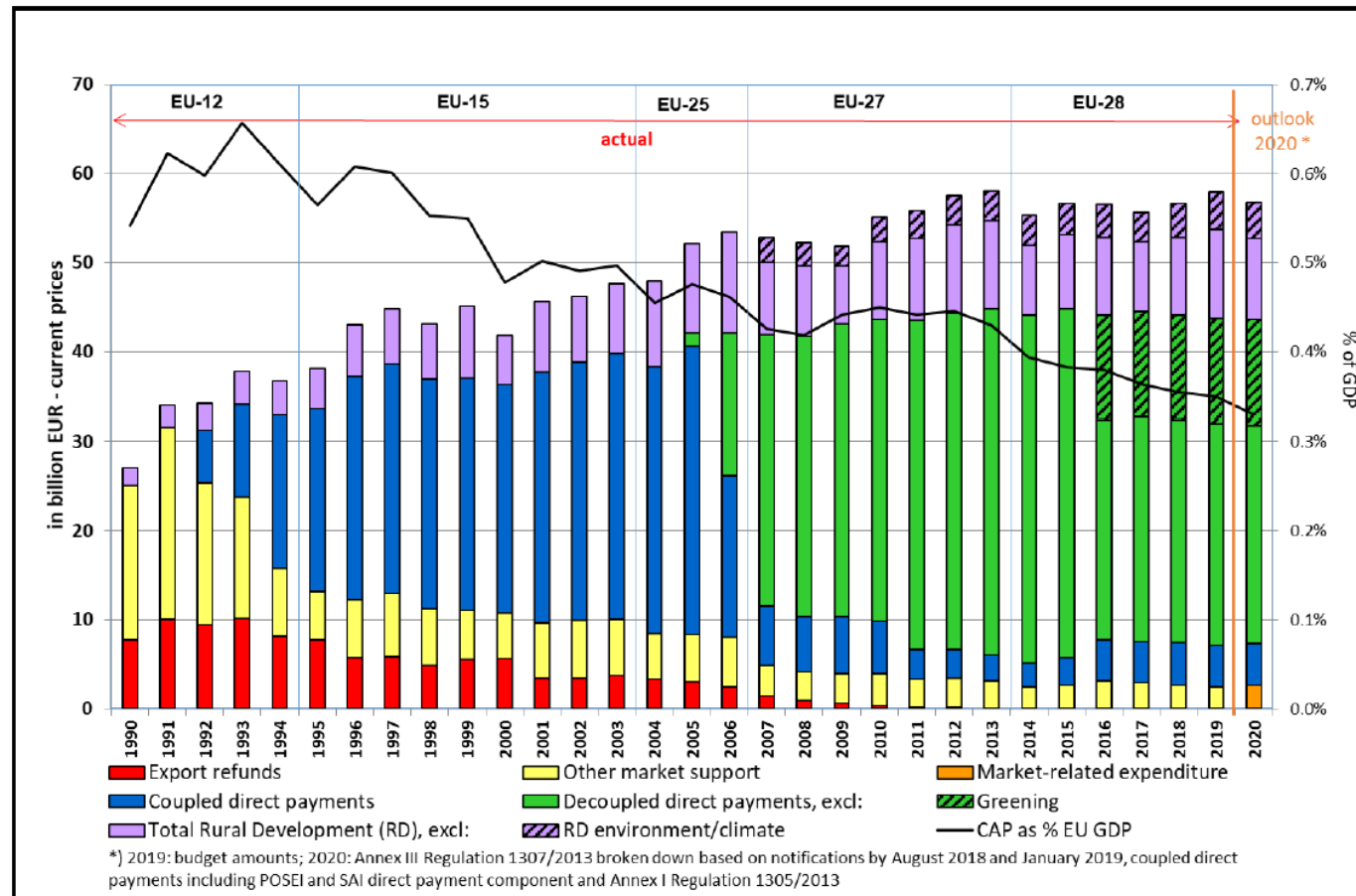
Bio production



etc.

European Union: major changes in policy instruments

Figure 2. Historical evolution of CAP expenditure by type of policy instruments (1980-2020)



Climate change

Recent trends and game changers (2018-2022)

Climatic events



Food systems responsible for up to 1/3 GHG emissions and are impacted by emissions.

Deforestation contributes to GHG emissions.

Cropping & livestock systems

Recent trends and game changers (2018-2022)

Global growth of production & stocks for cereal grain and rice

CEREAL GRAIN PRODUCTION, UTILIZATION AND STOCKS



RICE PRODUCTION, UTILIZATION AND STOCKS

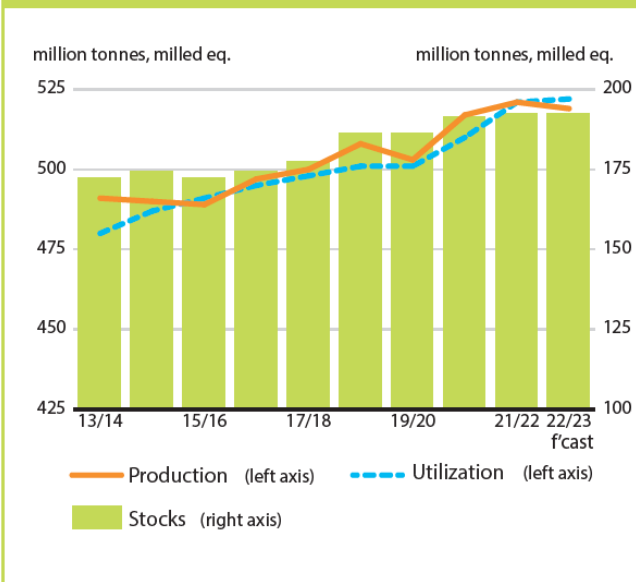
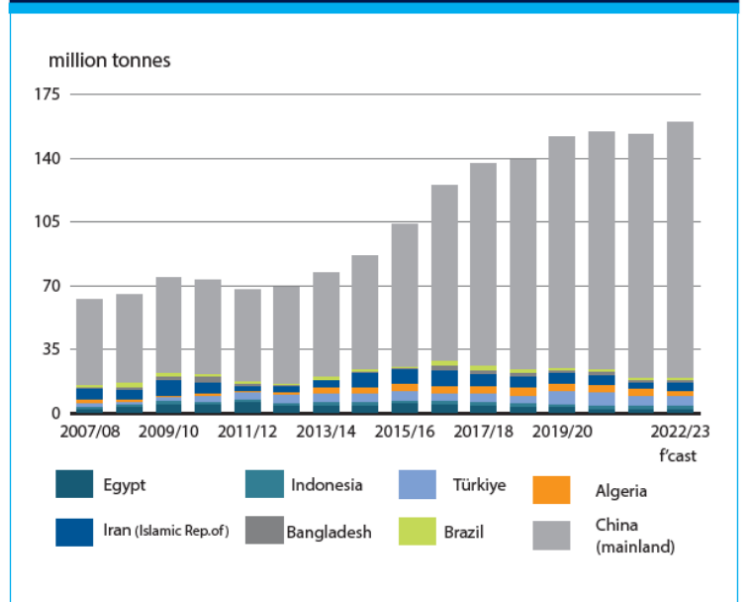


Figure 9. Wheat stocks of top importers



Cereals : Growth of barley and sorghum
 Huge stocks in China ?
 Stocks by MNC and impacts on prices ?

Oils & fats: stable production but decreasing stocks

Figure 5. Global production and utilization of oils/fats

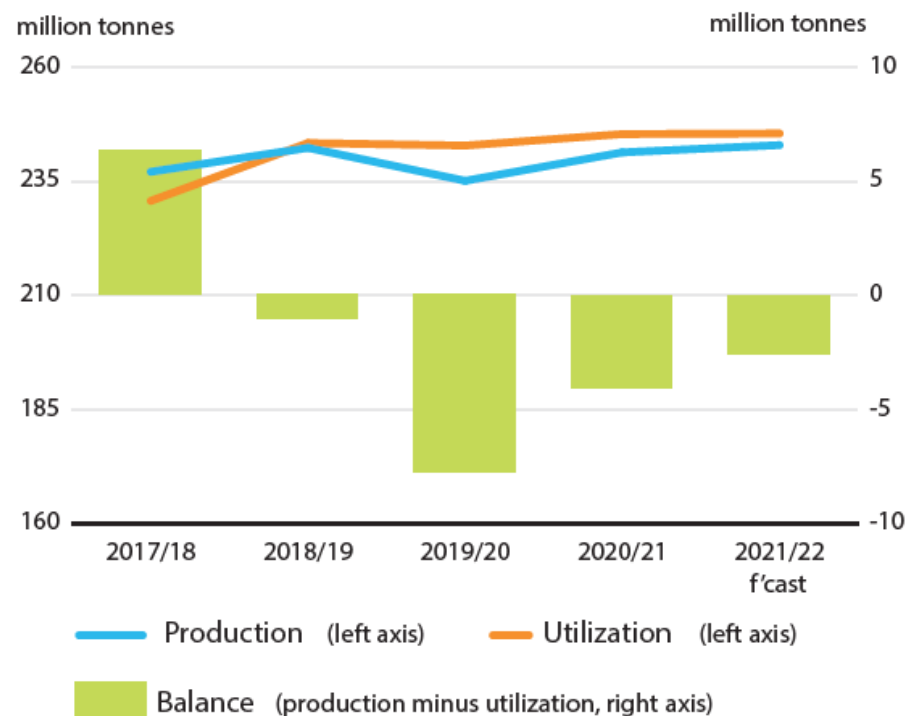
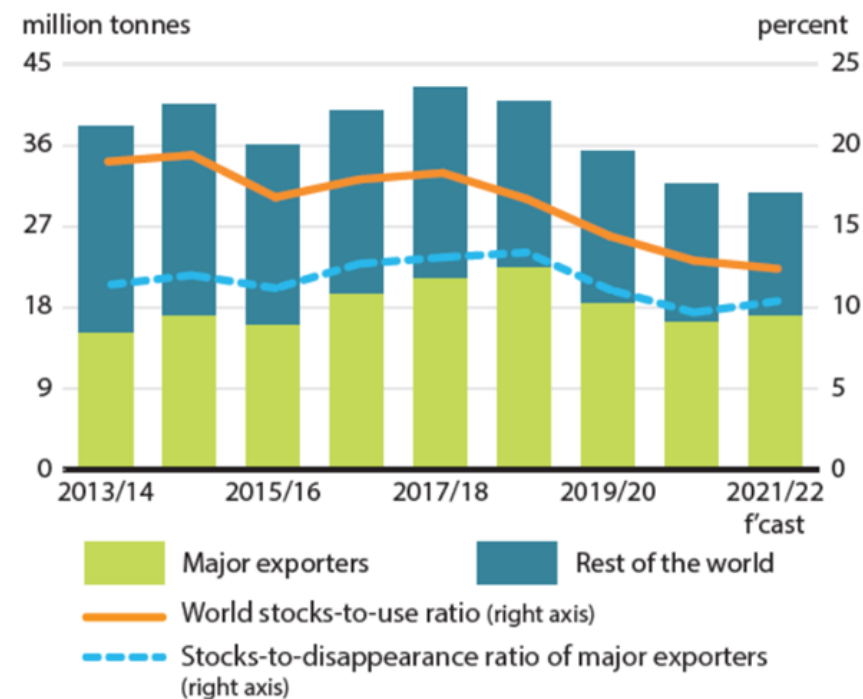
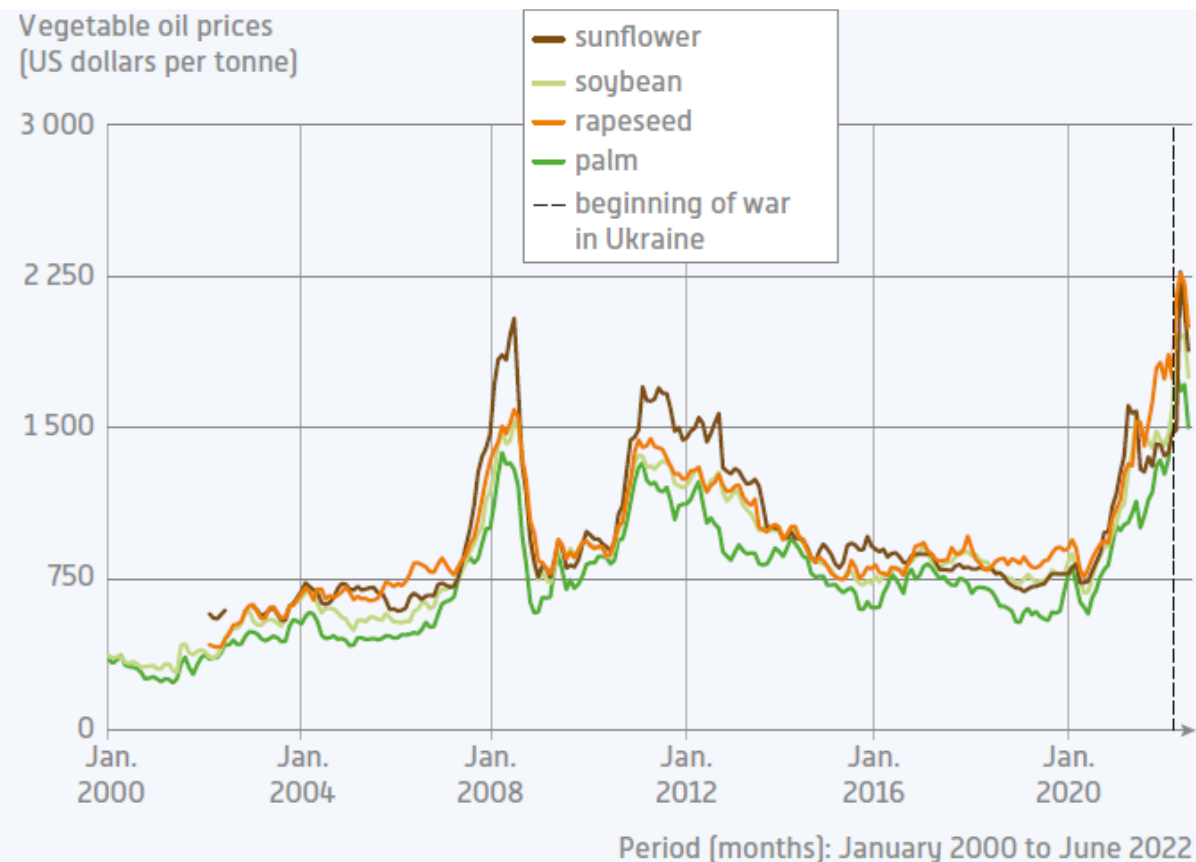
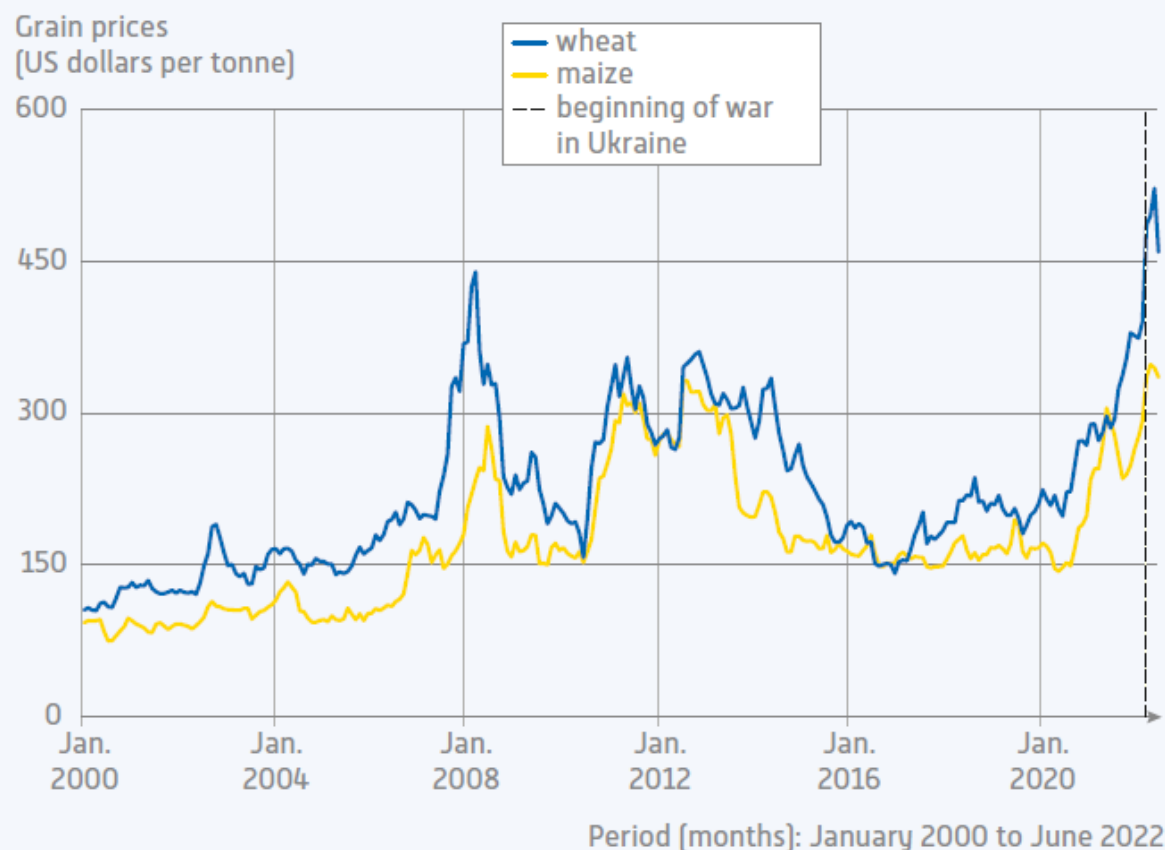


Figure 6. World stocks and ratios of oils/fats (including the oil contained in seeds stored)

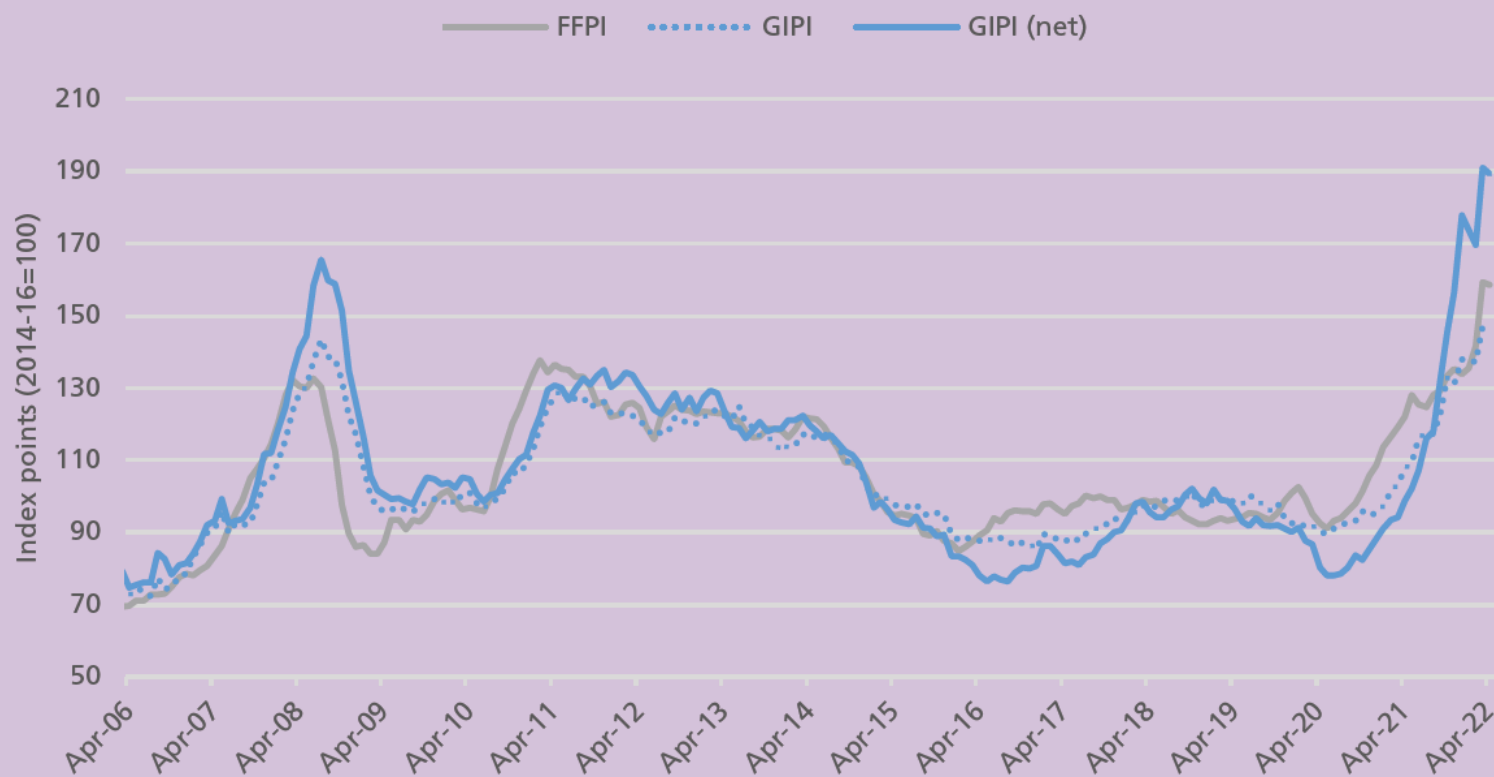


Food prices growth and volatility since 2000



Prices of food and inputs are closely linked

Box Figure 1. Comparing trends in the FFPI, GIPI and GIPI (net), 2014-2016 = 100

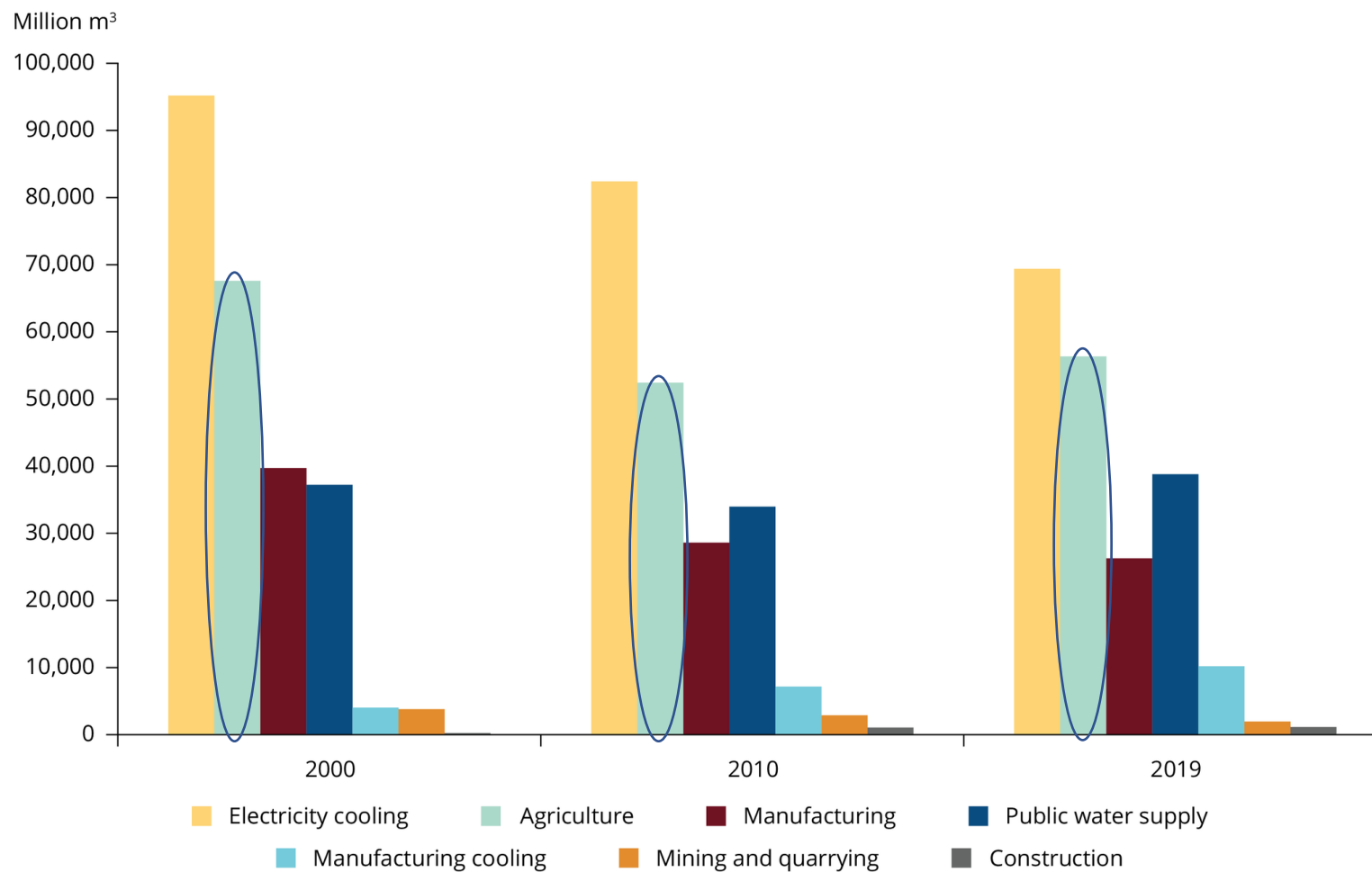


Source: FAO (EST) and Trade Data Monitor (TDM), authors' calculations.

Global and Europe: multiple modes of production and lack of norms

	Conventional intensive agriculture	Low input agriculture	Redesign of agriculture
Practices	High use of water, energy, fertilizers, pesticides, etc. Use of genetically modified crops	(1) Input substitution <u>Biological production</u> <u>Permaculture</u> <u>Organic ag.</u> (2) <u>Lack of access</u>	<u>Regenerative agriculture</u> <u>Precision ag.</u> <u>Reasoned ag.</u> <u>Integrated ag.</u> <u>Sustainable intensification</u> <u>Agroecology</u>
Actors & connections	Large role of MNC	Small farms	SME
Policies & Norms	In silos	EU regulations but also national regulations	Lack of norms

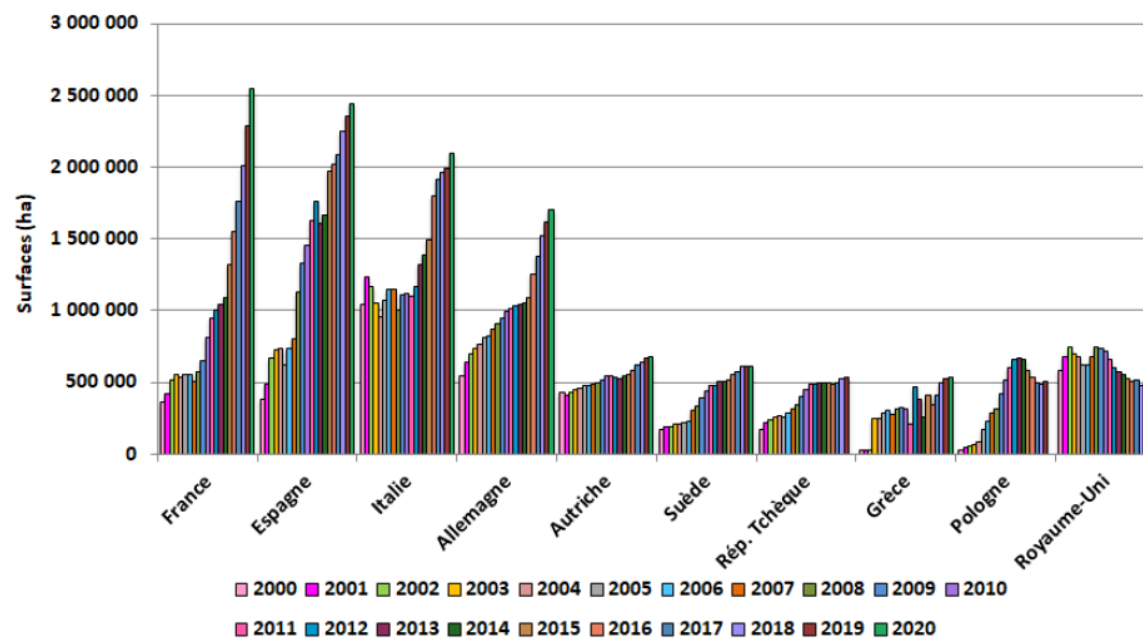
Europe: major use of water in agriculture and re-increasing



Source : [Water abstraction by source and economic sector in Europe \(europa.eu\)](http://europa.eu)

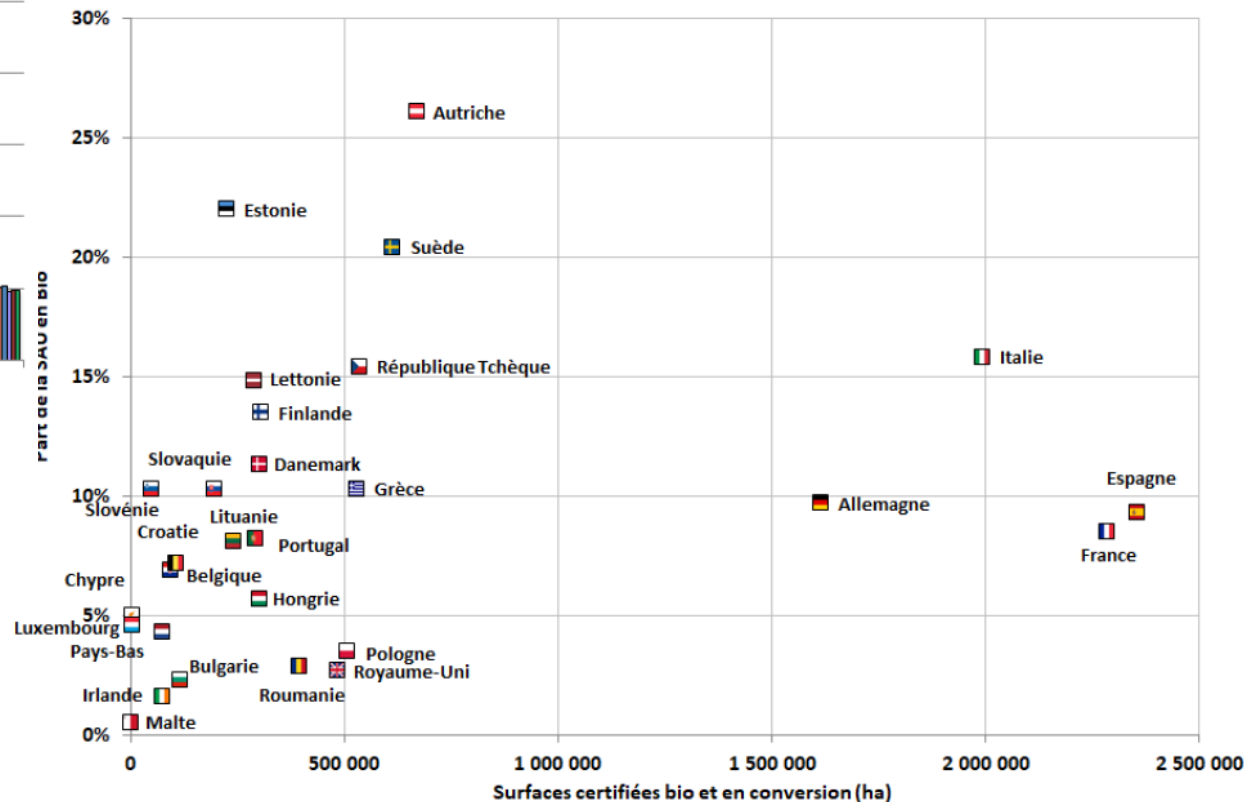
Bio production areas: 25% in Austria, 10% in Slovakia, 8% in France

Evolution des surfaces certifiées bio et en conversion dans les 10 premiers pays producteurs de l'Union européenne depuis 2000



Source : Agence BIO d'après différentes sources européennes

Surfaces cultivées en bio et part dans le territoire agricole dans chaque pays de l'UE en 2019

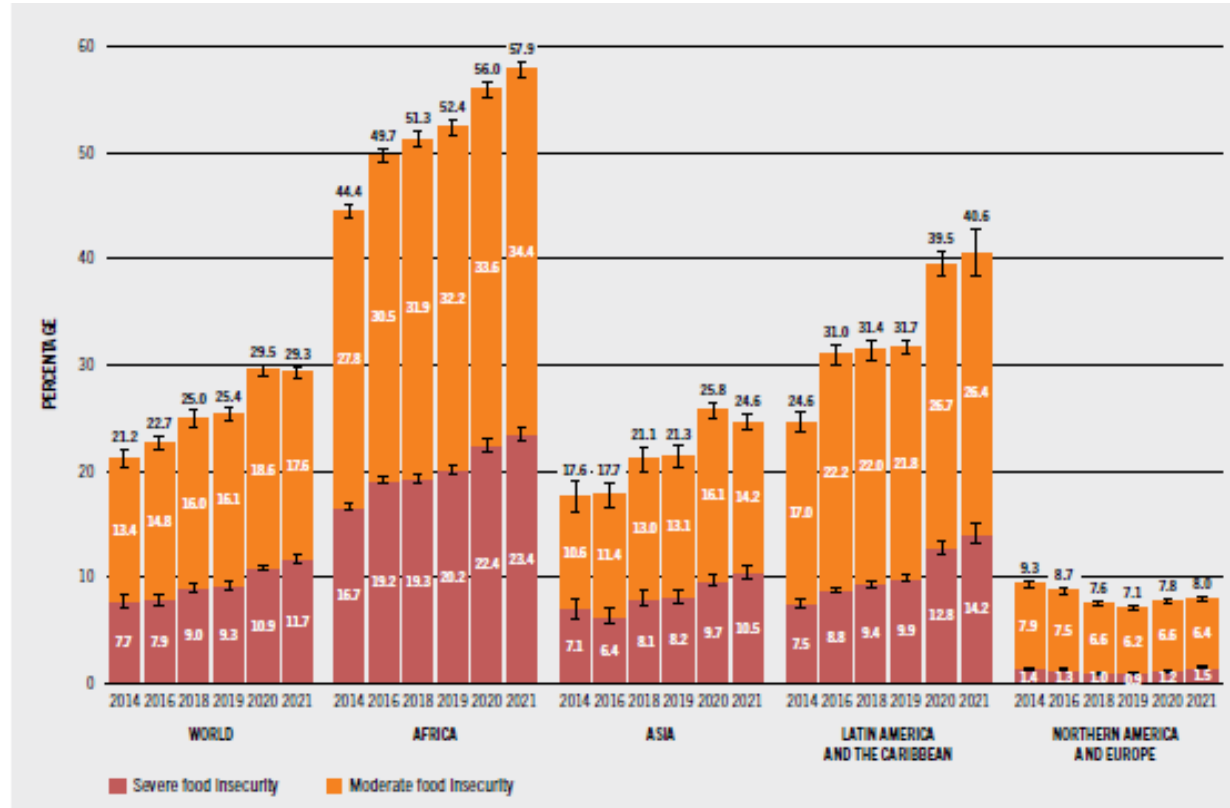


Source : Agence BIO d'après différentes sources européennes

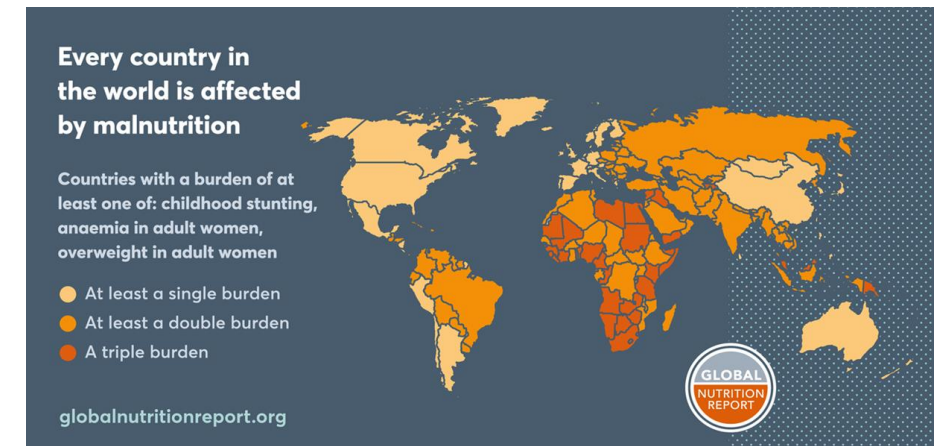
Food diets, processing, retailing, consuming

Recent trends and game changers (2018-2022)

Growing food insecurity & malnutrition



The State of Food Security and Nutrition in the World 2022



- **Changes in the composition – and for some commodities, the level – of demand → shift from producing bulk items for food service to smaller packages for home use.**
- **Delivery through different channels → changes for producers.**
- **Continued growth of fastfood, snacking et catering**

Global food-miles account for 19 % of total food-systems emissions



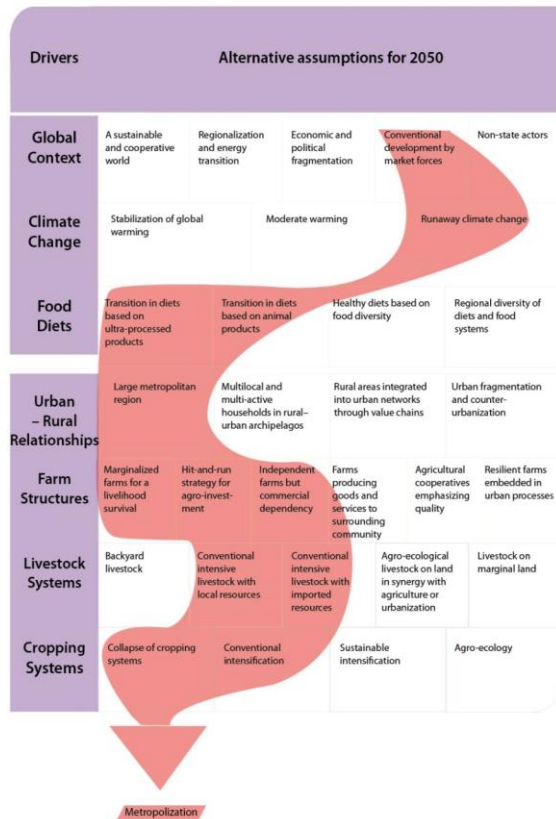
In Europe, GHG emissions due to transport are twice those linked to production

Source : Li, M., Jia, N., Lenzen, M. *et al.* Global food-miles account for nearly 20% of total food-systems emissions. *Nat Food* **3**, 445–453 (2022).
<https://doi.org/10.1038/s43016-022-00531-w>

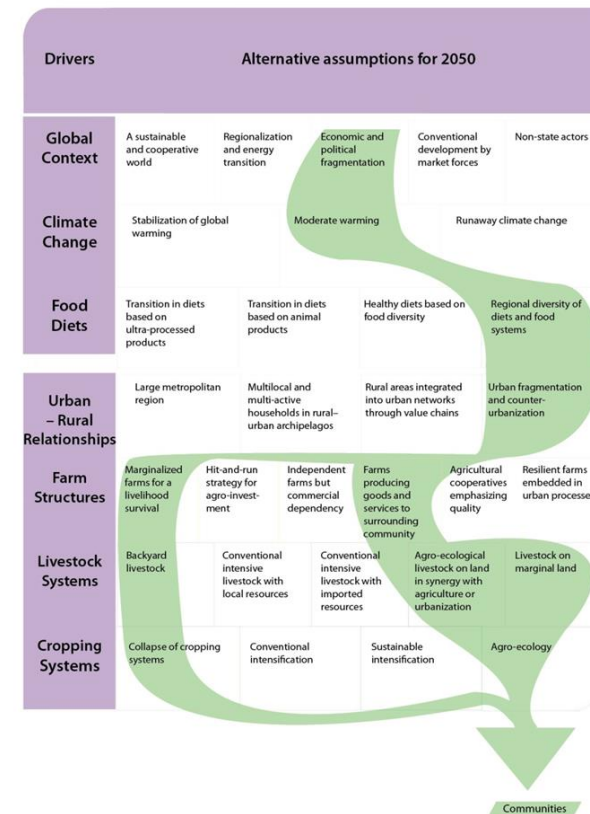
Conclusion

Dramatic on-going trends

Metropolization and Communities scenarios

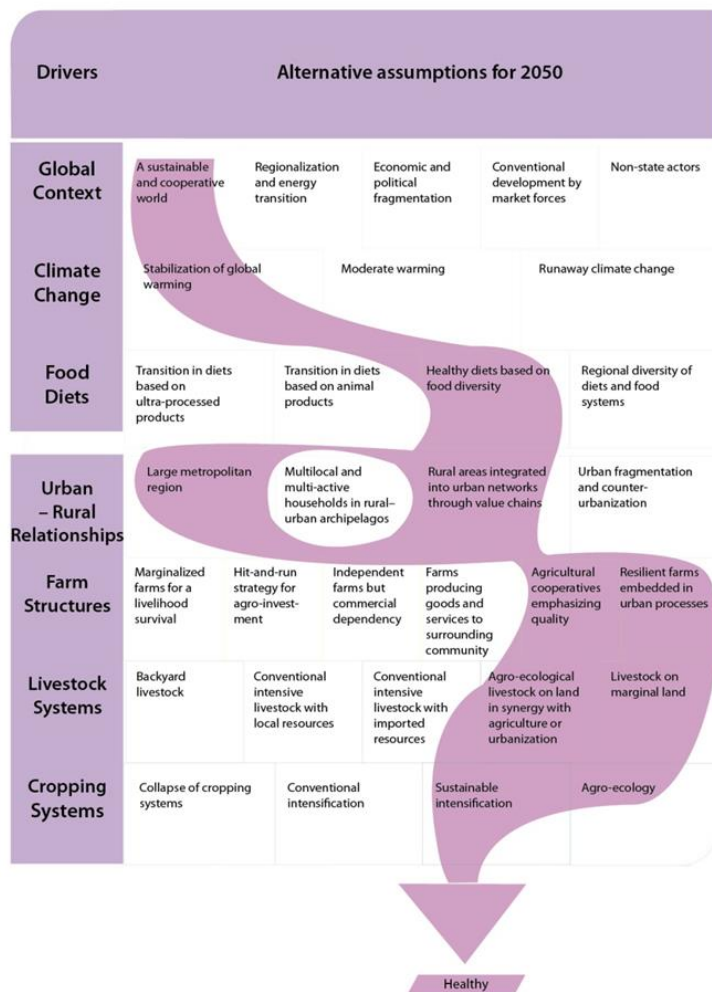


Land use (and food systems) driven by Metropolization



Land as commons for rural communities in a fragmented world

And positive game-changers
towards « Healthy » scenario



Land use (and food systems) for
food quality and healthy nutrition

→ Europe needs to be proactive

→ Europe needs to change in order
to contribute to a global
evolution

Levers of change for European food systems

- **Transcend on-going paradigm and have a holistic and systemic vision**
Sustainability in all dimensions
Diversity, multi-functionality and resilience
Green Deal +++ adopted by all European countries.
- **Give new objectives to food systems:** economic and social well-being (incl. health & employment), food and nutrition security, environmental sustainability.
- **Critically engage producer organizations, retailers and other actors in food chains.** Be socially & technologically innovative
- **Adopt common - European, public & private - norms and standards.**
Pursue development of new financial incentives.
- **Develop information and transparency** and new indicators of progress.