Research Institute of Organic Agriculture FiBL
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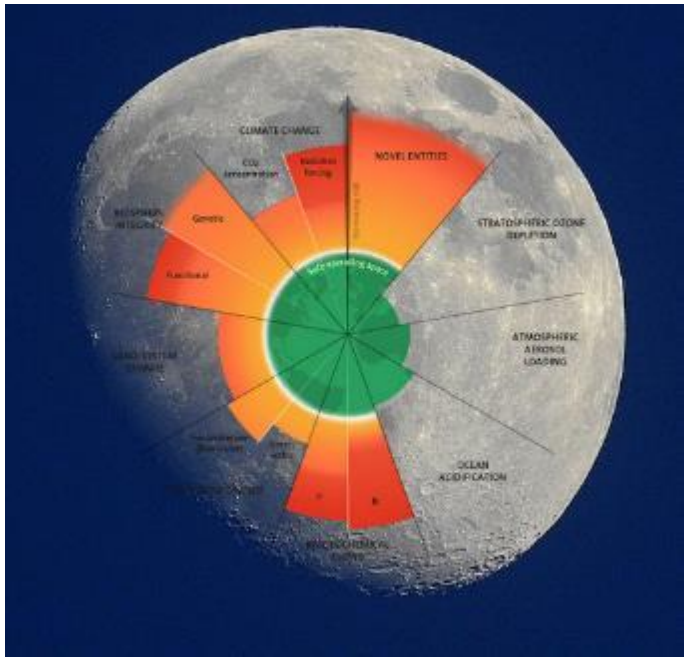
Evidence for Narratives

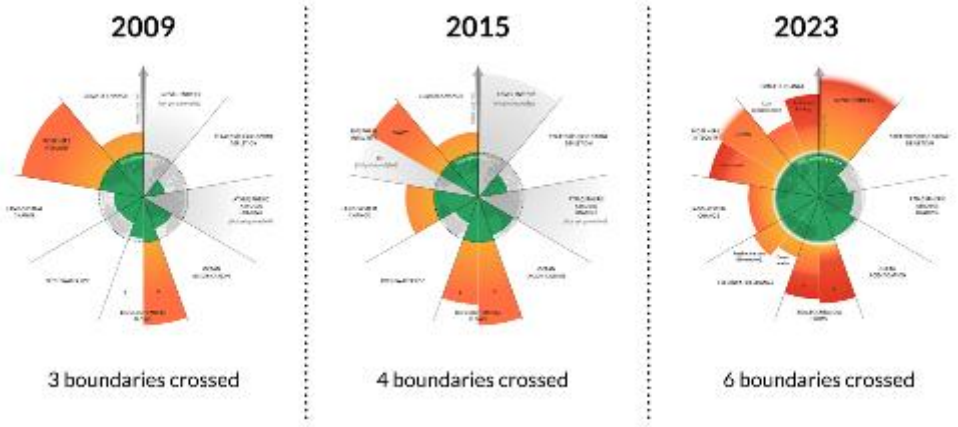
and other contributions of Research for Agroecology and Organic development in Africa

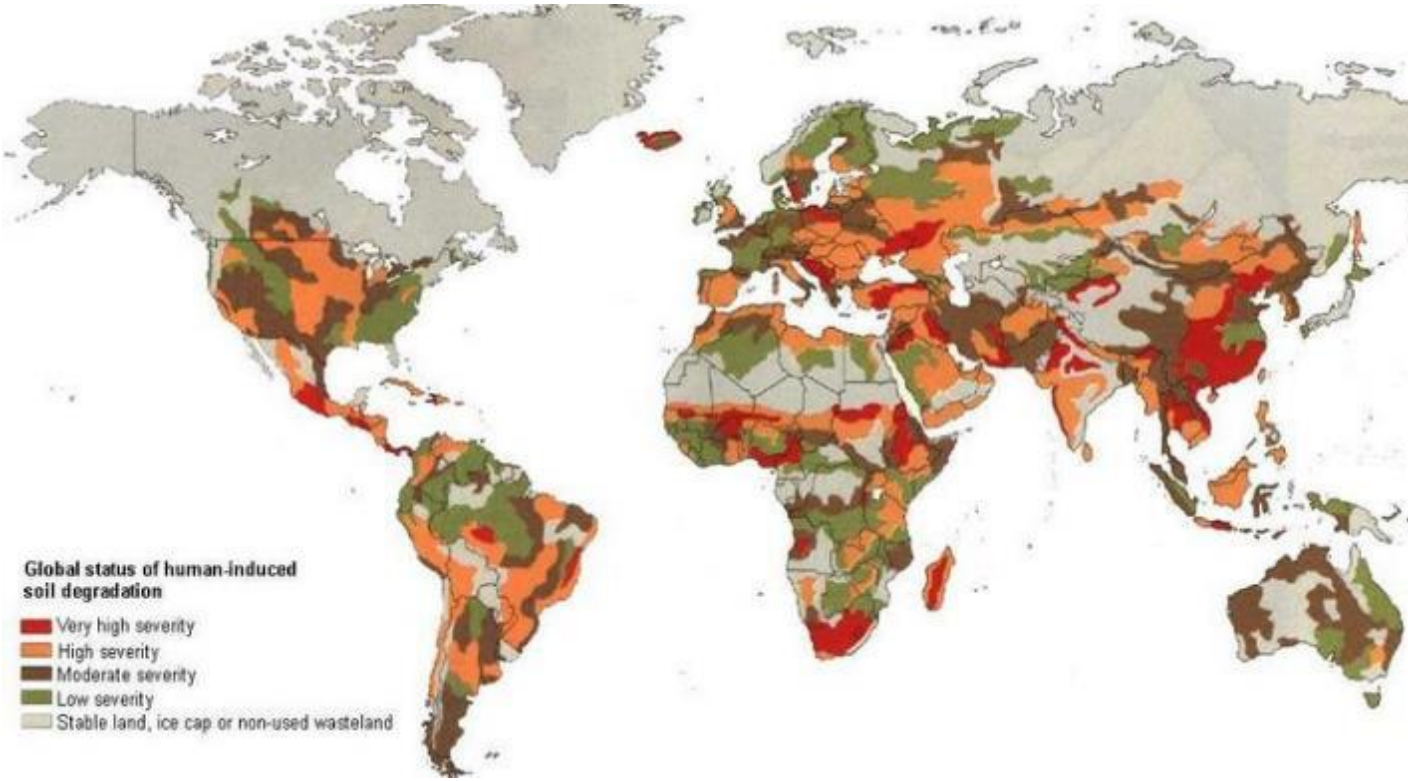
Markus Arbenz

Senior Consultant FiBL Switzerland, owner of Organics4Development and Ambassador of IFOAM Organics International

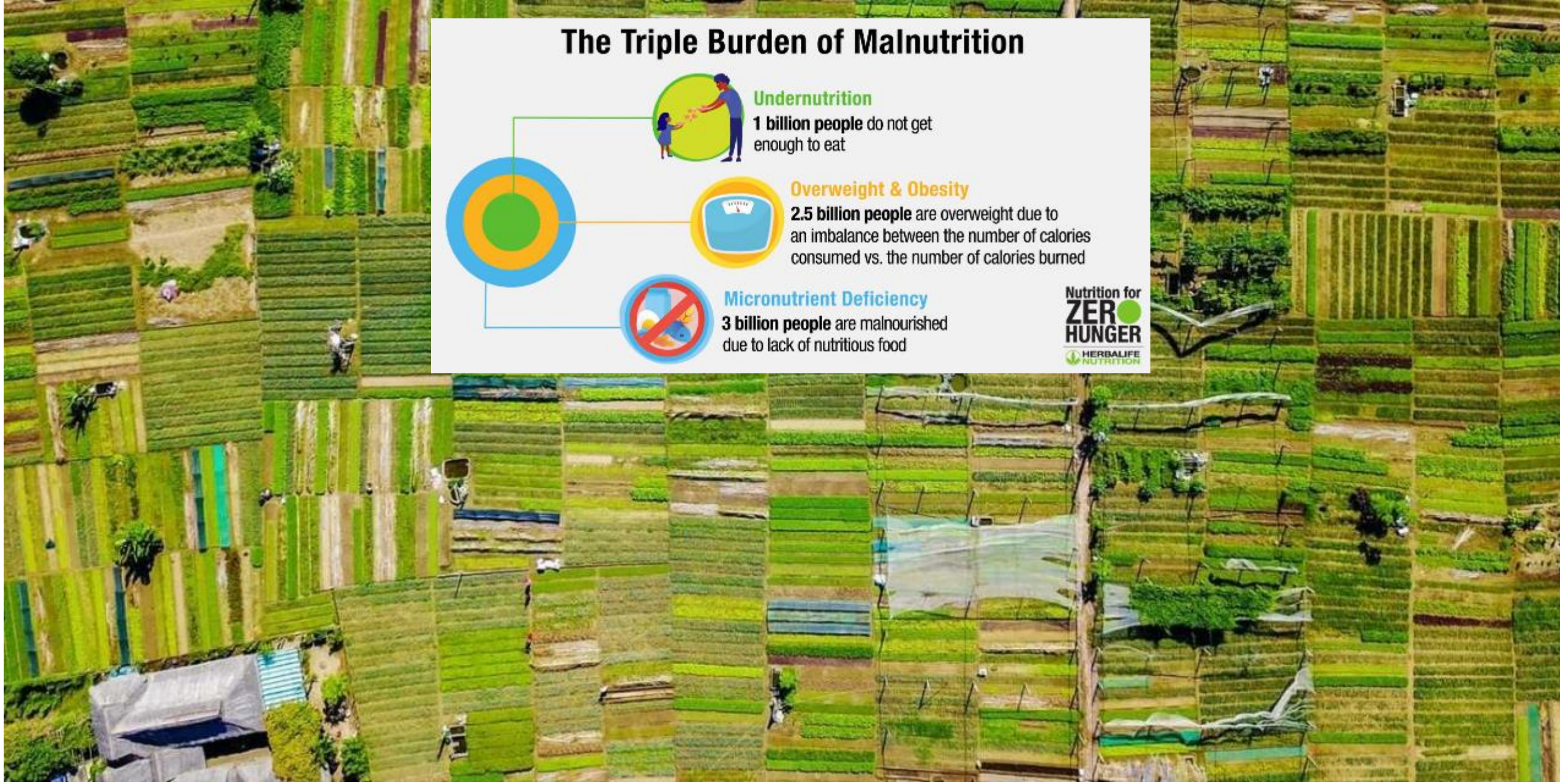
The Food System is challenged: Climate, Biodiversity, Natural Resources



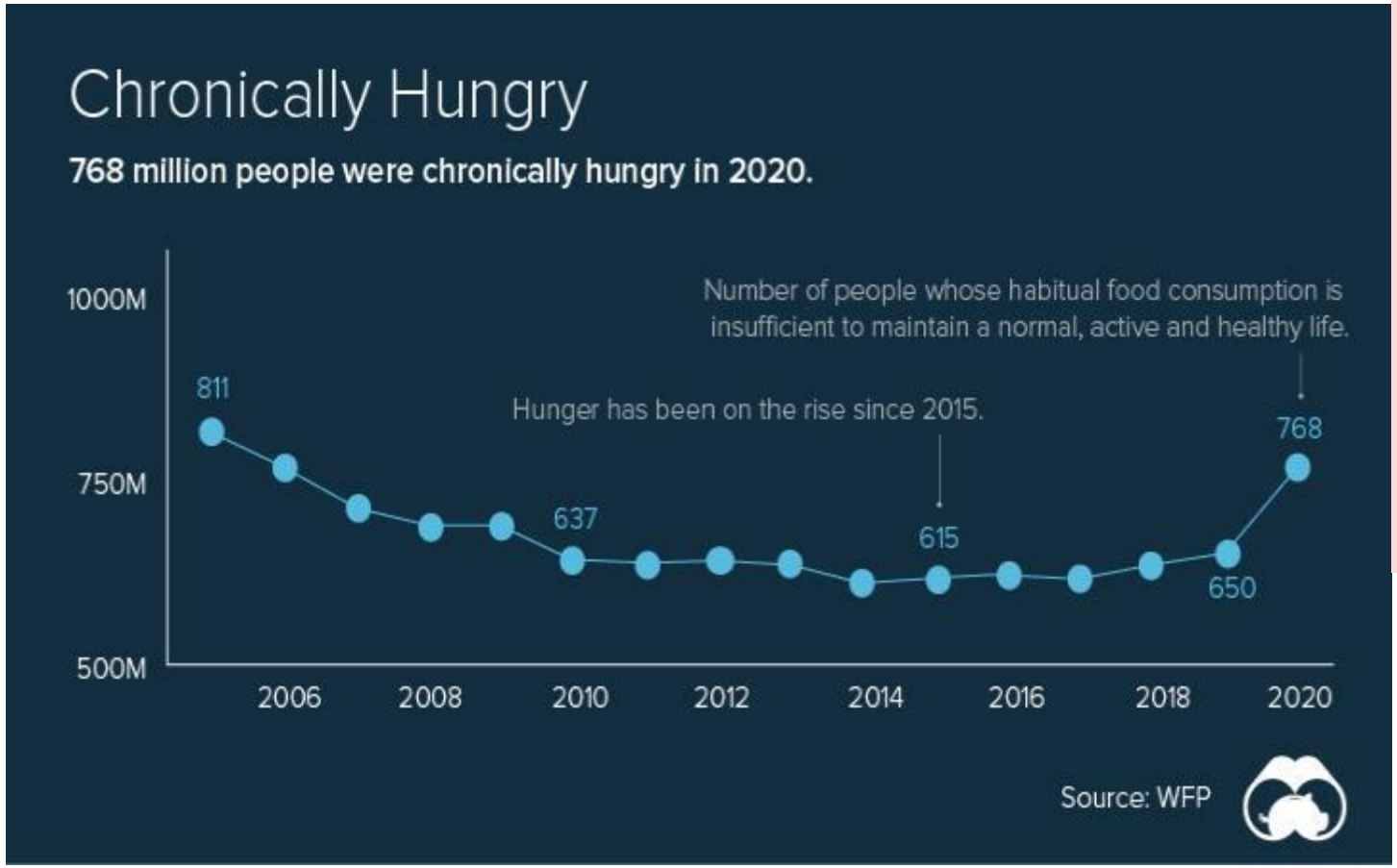




[8] In Agriculture and Consumer Protection Department – Food and Agricultural Organization of the United Nations (FAO), 'Dimensions of need: An atlas of food and agriculture', *FAO Corporate Document Repository* <http://www.fao.org/docrep/u8480e/U8480E0D.HTM> [accessed March 2012]


The Triple Burden of Malnutrition
Undernutrition
1 billion people do not get enough to eat
Overweight & Obesity
2.5 billion people are overweight due to an imbalance between the number of calories consumed vs. the number of calories burned
Micronutrient Deficiency
3 billion people are malnourished due to lack of nutritious food
Nutrition for ZERO HUNGER
HERBALIFE NUTRITION

Social and Economic challenges



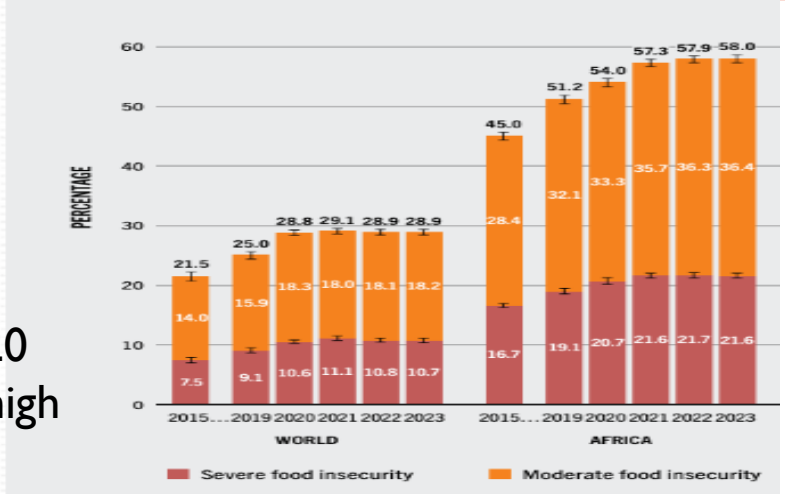
Food scarcity is largely a result of climate change, civil unrest and declining food production.

Public investment in agriculture is also declining..

In 2019, nearly one in ten people in the world did not have regular access to safe, nutritious, and sufficient food.

Source UN Association of USA

After 2020 remains high



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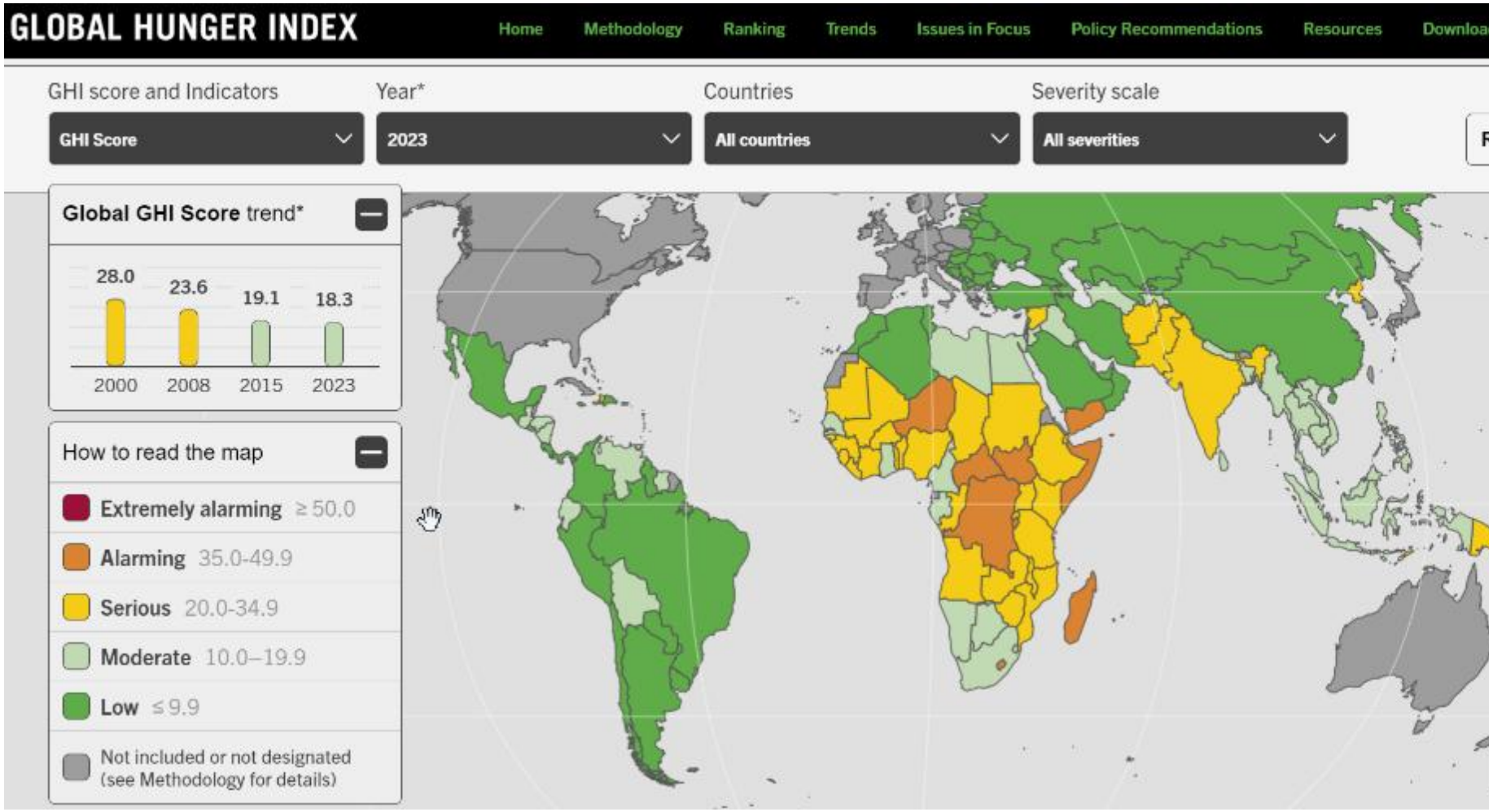
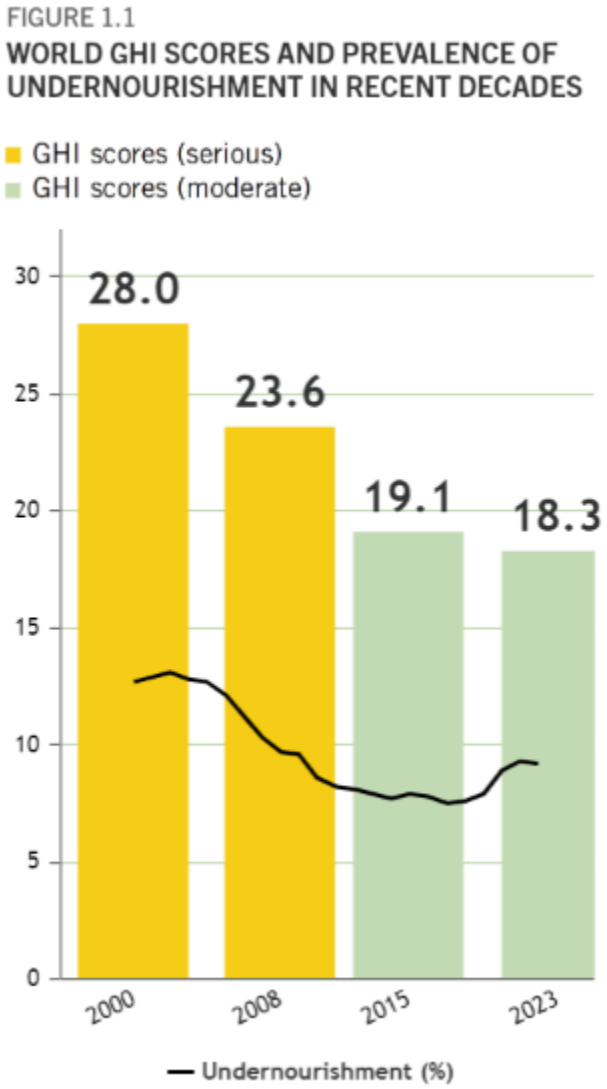
GDP 2 End Hunger by 20230 is not on track





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The Global Food System is challenged including in Africa

Food systems: the risks are increasingly urgent, serious, and combined (CIRAD)

As things currently stand, food systems are under several simultaneous threats, which suggests food crises could become increasingly common.

- **Galloping population growth**
- **Dietary changes**
- **Job creation**.
- **Environmental degradation is gaining speed**
- **Global markets**
- **Natural disasters and conflicts**

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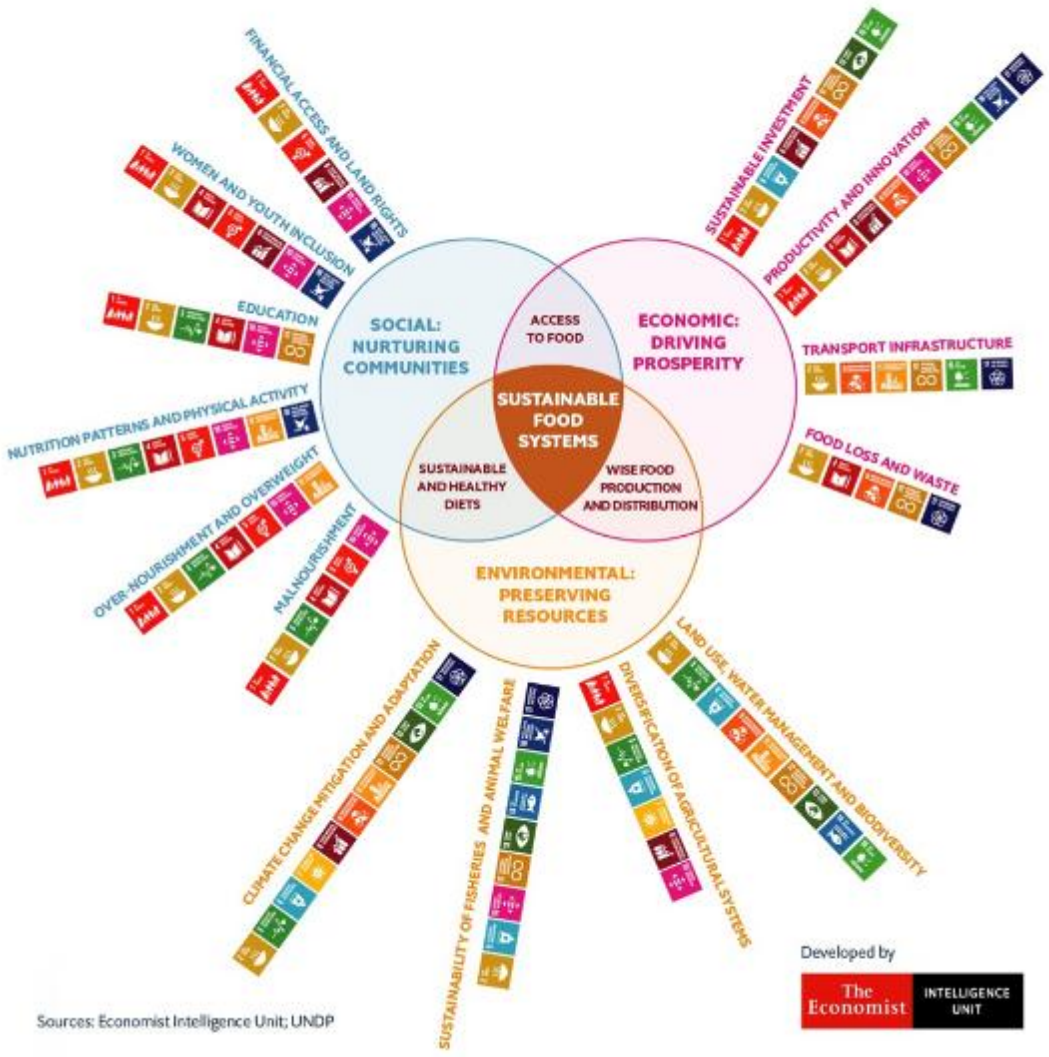
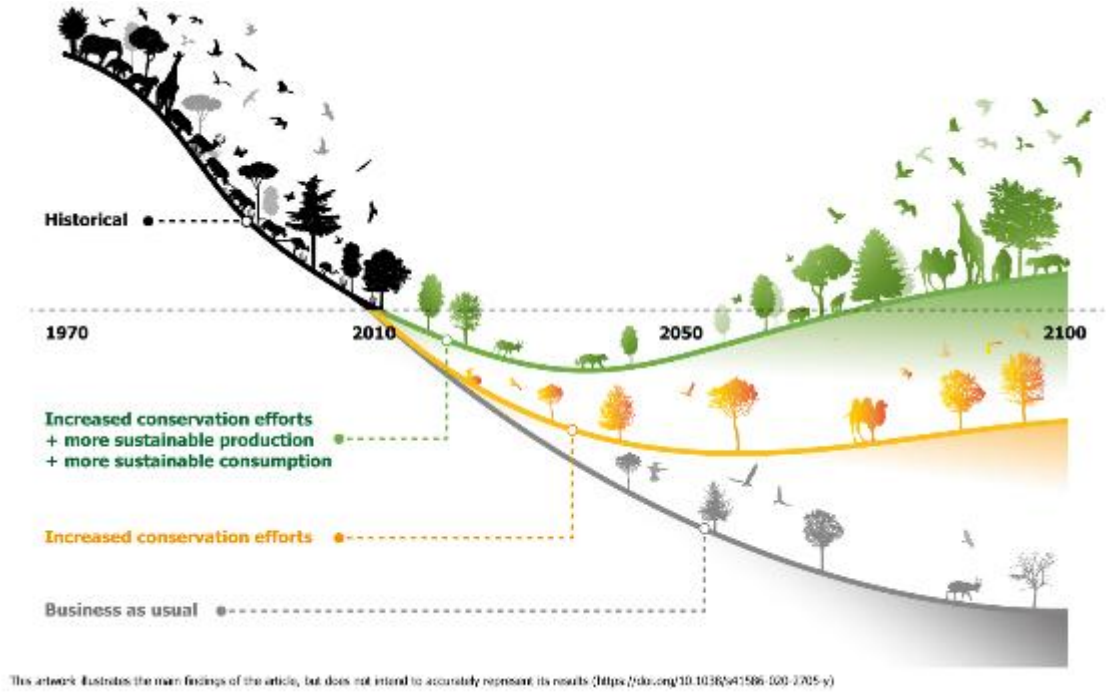
Solutions are proposed: Agreement on SDG, and Sustainability and Resilience





Credit: Adam Islaam | IIASA

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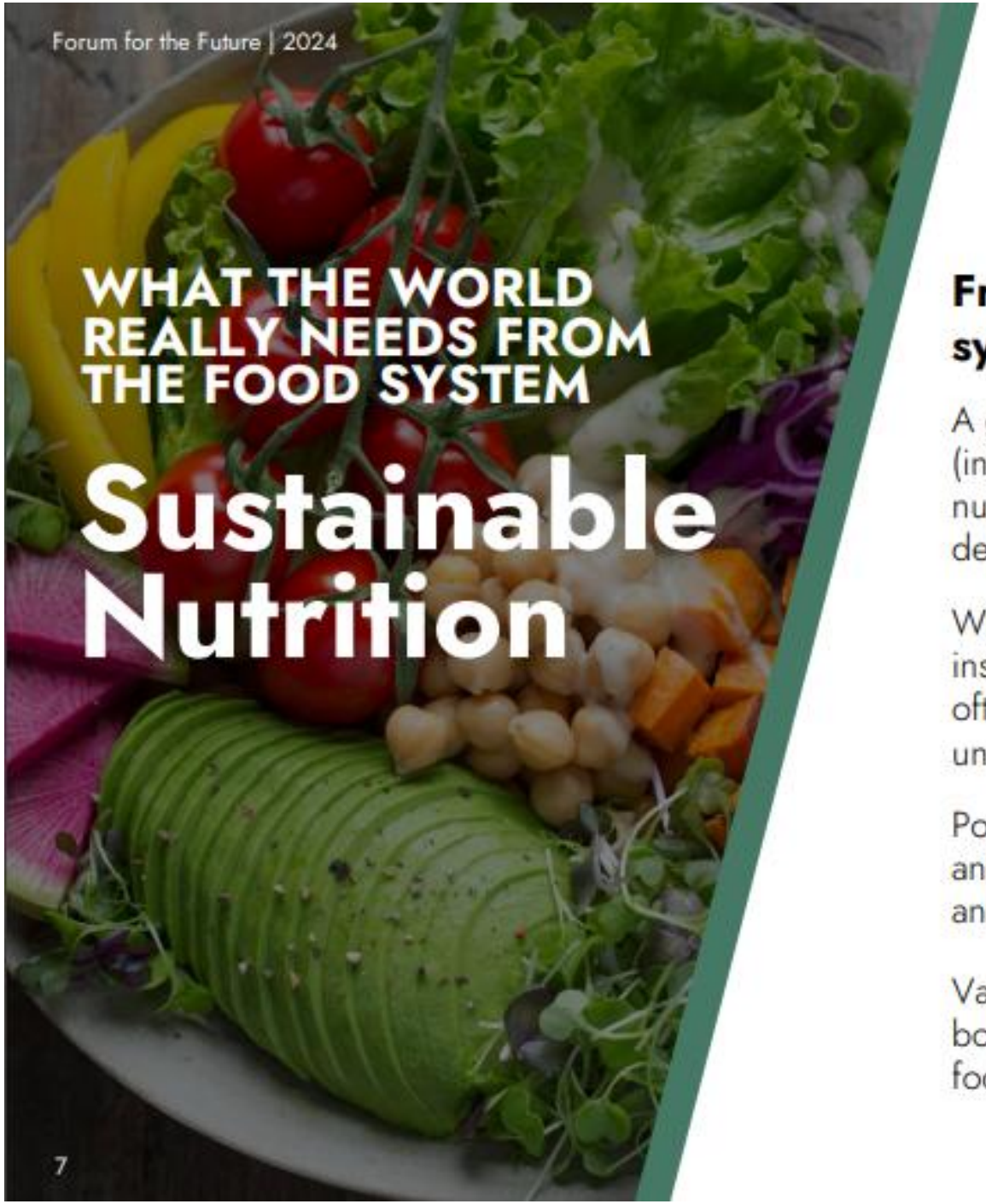

WHAT THE WORLD REALLY NEEDS FROM THE FOOD SYSTEM

Sustainable Nutrition

From a global food system that's driving...		To a global food system that guarantees...
A global malnutrition epidemic (including over- and under-nutrition and nutritional deficiencies).	→	Healthy, nutritious diets as the norm.
Widespread food poverty and insecurity, where good food is often unaffordable and/or unavailable.	→	Good food that is affordable and accessible for everyone.
Poor pay, working conditions and prospects for many farmers and food workers.	→	Decent food livelihoods and a healthy food economy.
Vast environmental damage, both driven by and undermining food production.	→	A safe and stable climate alongside thriving, restored nature.

Our GOAL: by 2030
But how exactly?

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Source: Alan Warner, Edith Callaghan & Cate de Vreede (2013) Promoting sustainable food and food citizenship through an adult education leisure experience

What is a Narrative?

A narrative is a structured **form of storytelling** that conveys a **sequence of events**, typically with a beginning, middle, and end. It aims to engage the audience by invoking emotions, sharing experiences, or imparting lessons through characters and plots.

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8 Narratives on how to feed the world

1. Agroecological and Regenerative Agriculture Approach
2. High-Tech, Precision Agriculture & Biotechnology
3. Plant-Based & Alternative Protein Transition
4. Sustainable Intensification
5. Circular Food Systems & Food Sovereignty
6. Ocean and Blue Food Solutions
7. Policy and Behavioural Shifts (Taxation, Subsidies, and Education)
8. Ethical and Justice-Oriented Food Systems

Each of these narratives has supporters and detractors, and they are not mutually exclusive—many food systems experts advocate for integrating elements from multiple approaches.

1. **Agroecological, Regenerative, and Ecological Organic Agriculture Approach:** Transform agriculture to work with nature rather than against it by promoting soil health, biodiversity, and traditional farming practices.

Key Points:

- Reducing dependence on synthetic fertilizers and pesticides
- Increasing crop diversity and agroforestry
- Enhancing local food systems and smallholder farmer support
- Supporting organic and low-input farming

Criticism: Some argue it may not produce enough food at scale without significant shifts in diets and consumption patterns.

2. **High-Tech, Precision Agriculture & Biotechnology:** Utilize advanced technology to optimize agricultural efficiency and reduce environmental impact.

Key Points:

- Genetic modification (GMOs, CRISPR) to improve crop yields and resilience
- Precision farming using AI, robotics, and IoT to minimize waste
- Vertical farming and hydroponics in urban areas
- Lab-grown meat and alternative proteins (e.g., cultivated meat, insect protein)

Criticism: Concerns about corporate control of food systems, ethical issues with genetic modification, and the energy-intensive nature of some technologies.

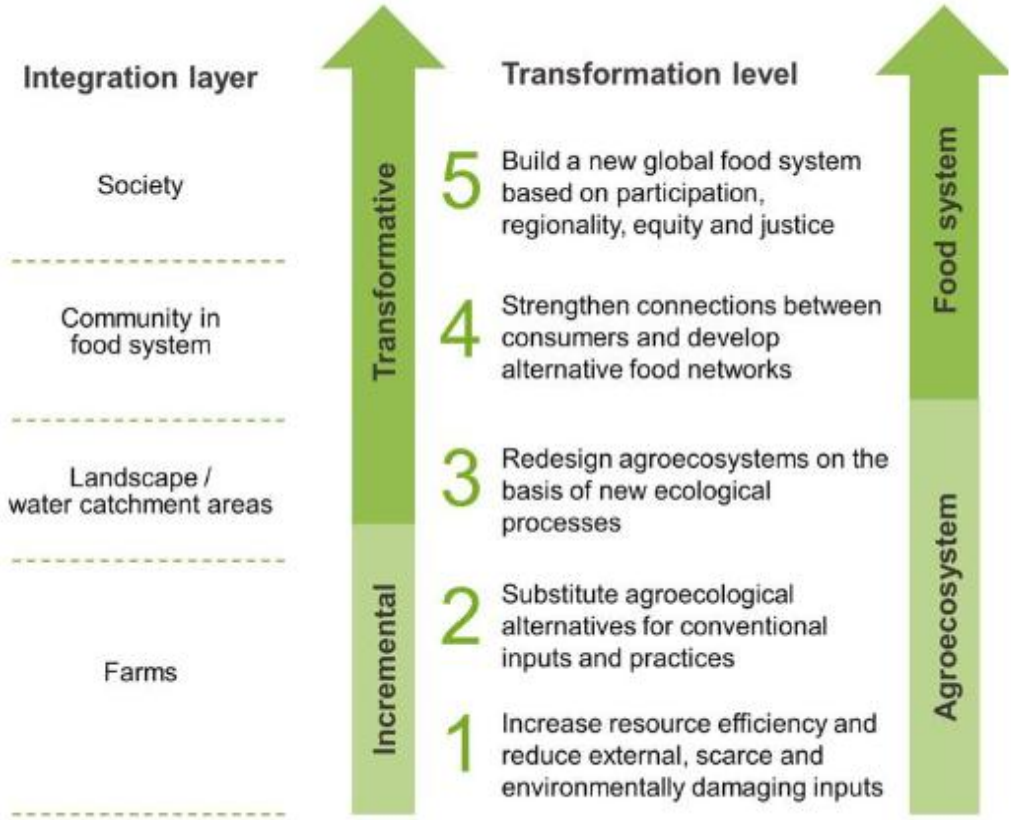
4. Sustainable Intensification: Increase food production on existing farmland using sustainable practices rather than expanding agriculture into natural ecosystems.

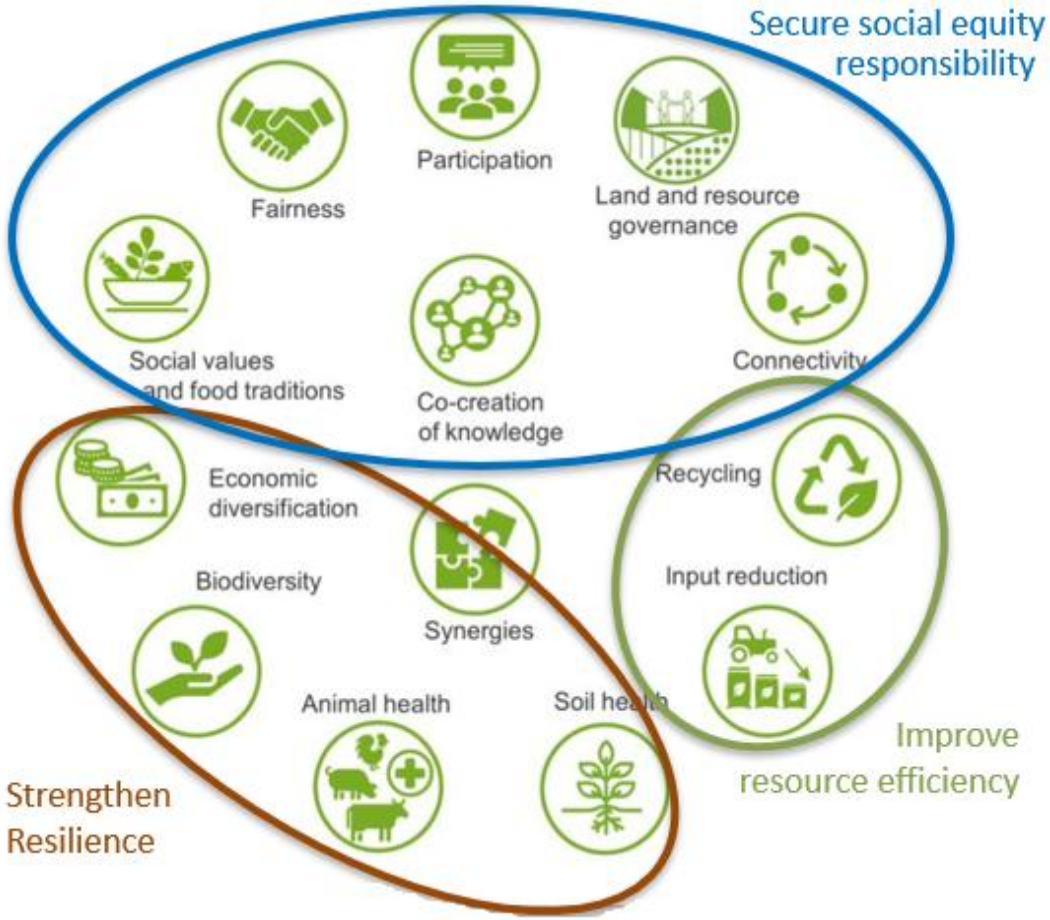
Key Points:

- Using climate-resilient crops and improved irrigation techniques
- Enhancing soil carbon sequestration
- Improving livestock management to reduce emissions
- Reducing food loss and waste

Criticism: Some claim it still relies heavily on industrial farming and doesn't challenge current consumption patterns enough.

Agroecology through its 13 principles (HLPE, 2019), layers and levels of transformation (Gliessman, 2016)





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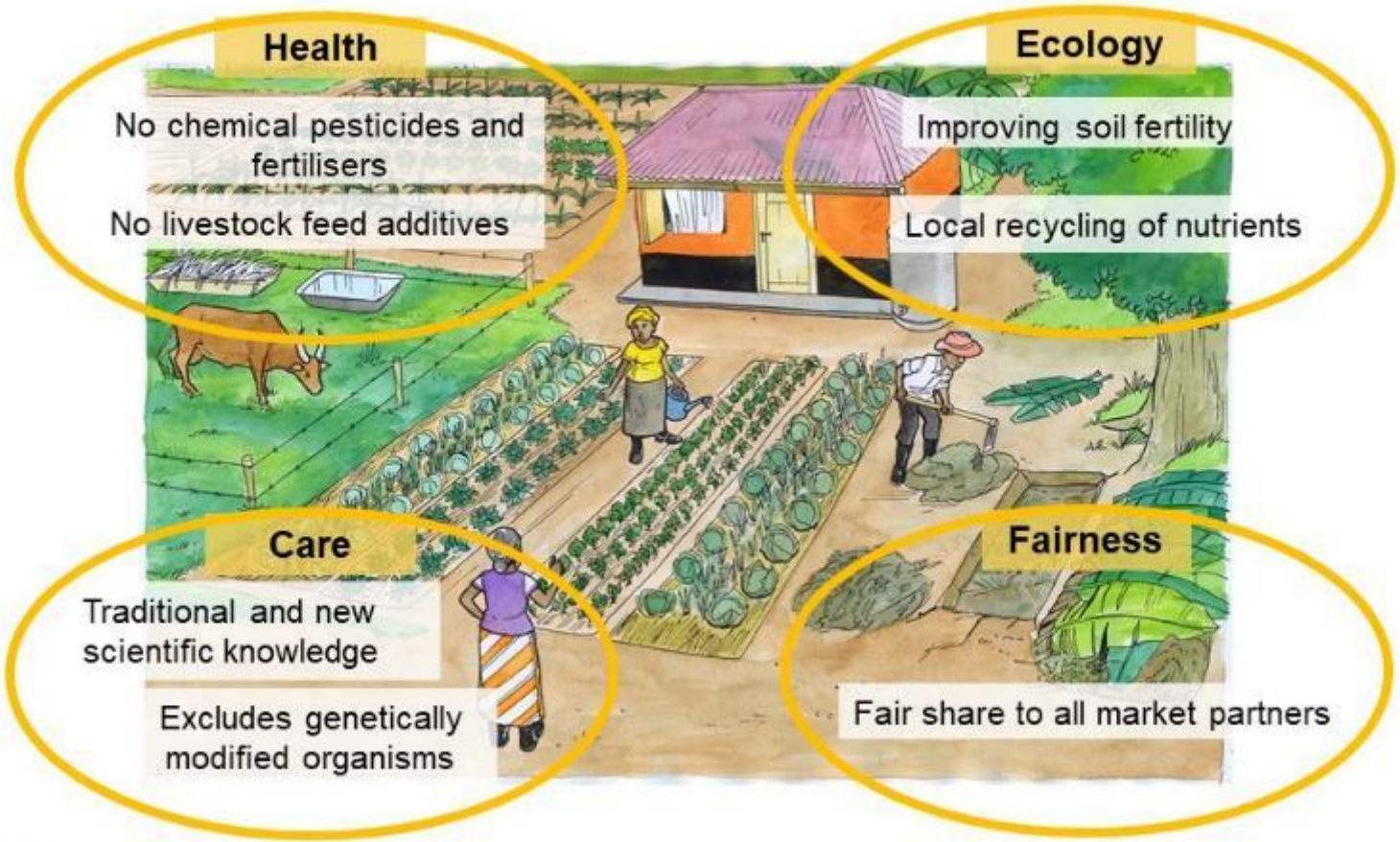
Principles of organic agriculture



ORGANICAFRICA

Free manuals, posters, factsheets, and presentations on organic farming for trainers and practitioners.

www.organic-africa.net

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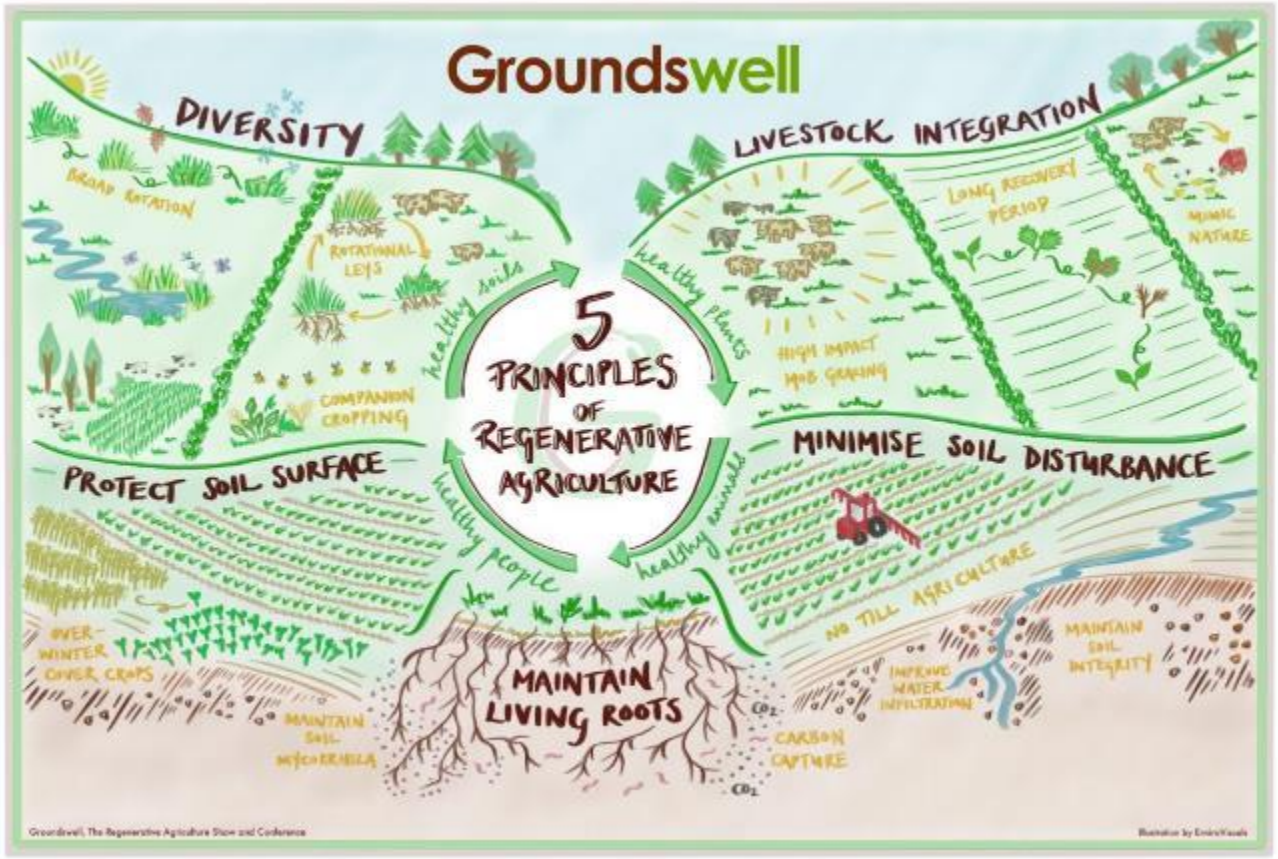
Regenerative (Organic) Agriculture



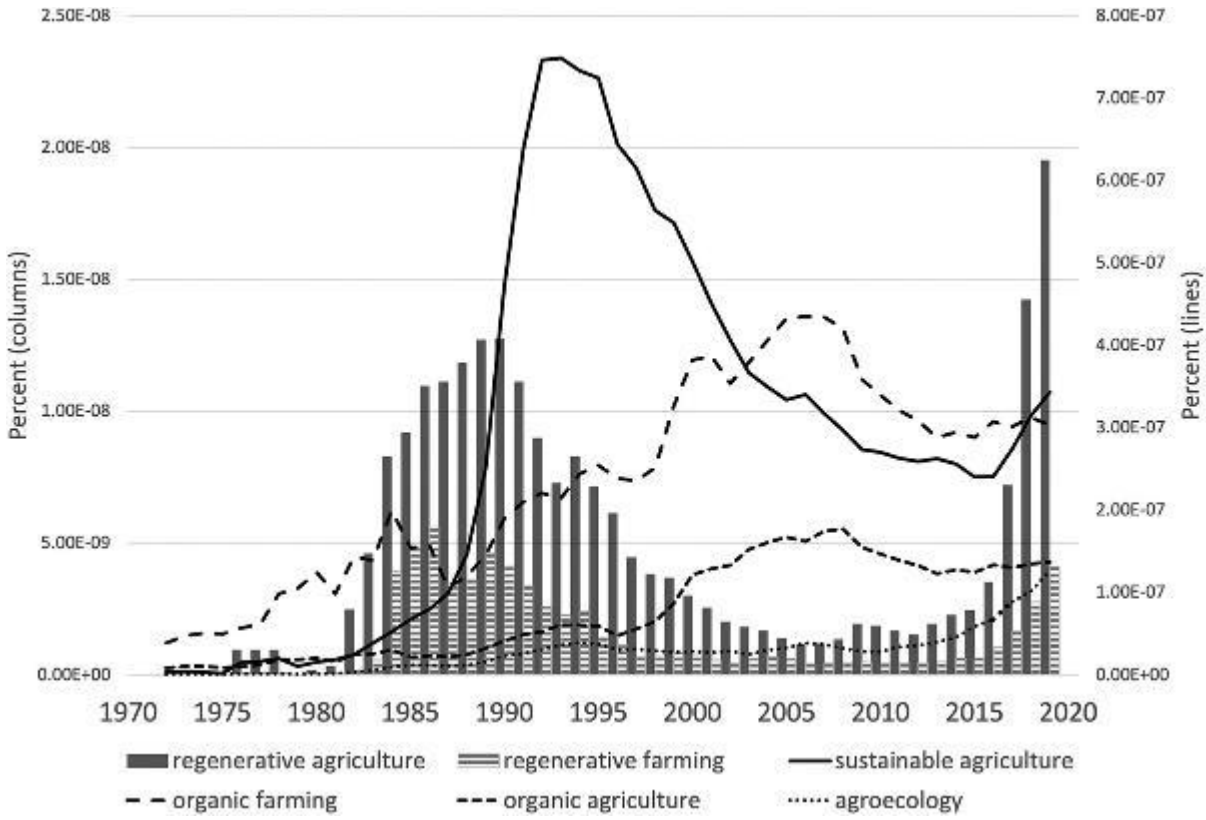


Figure 2. The frequency of key terms in books (3-year rolling averages). Source: Google NGram Viewer, Corpus 'English 2019' which includes books predominantly in the English language published in any country.

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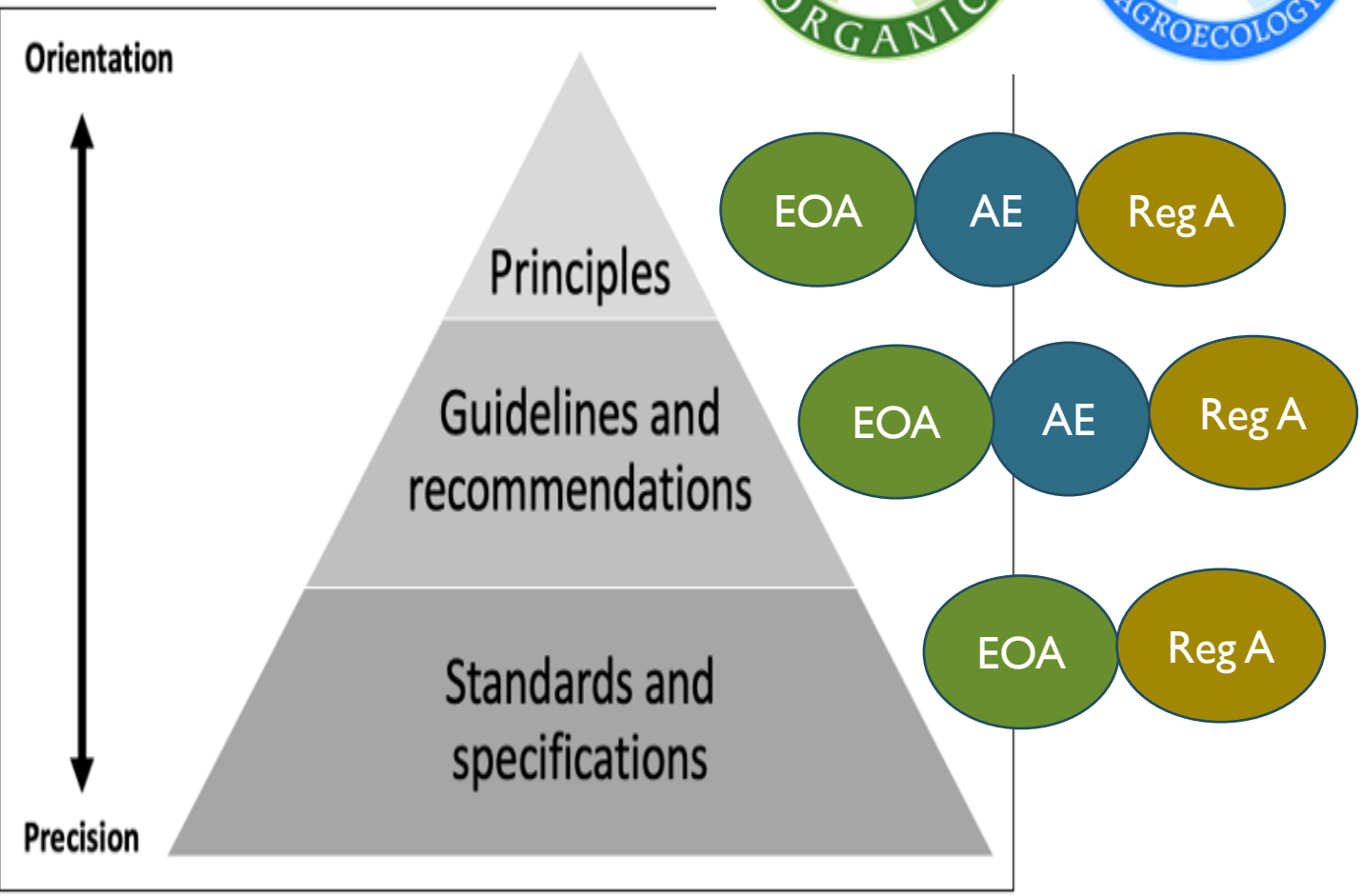

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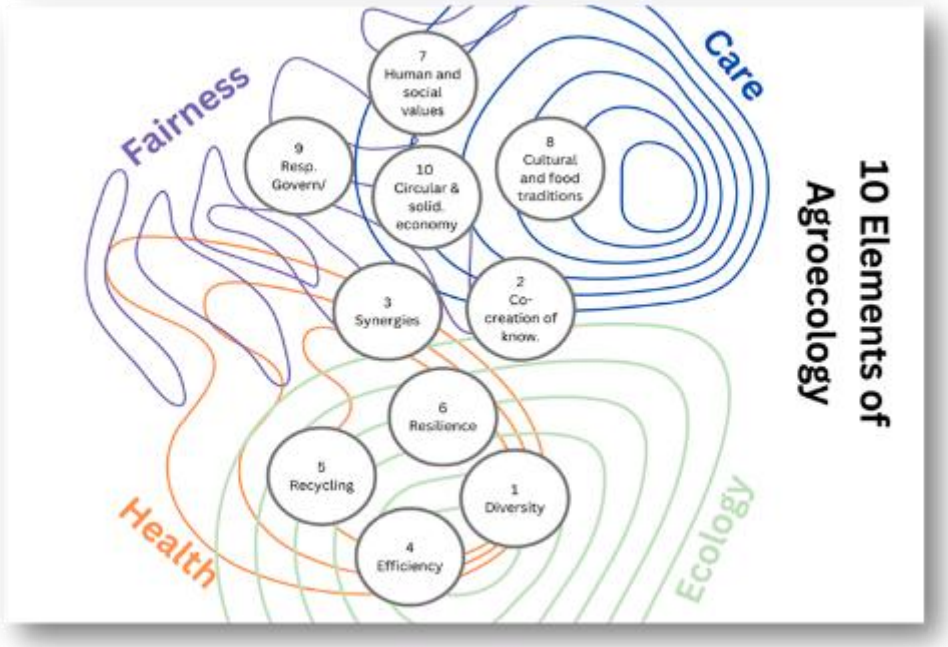

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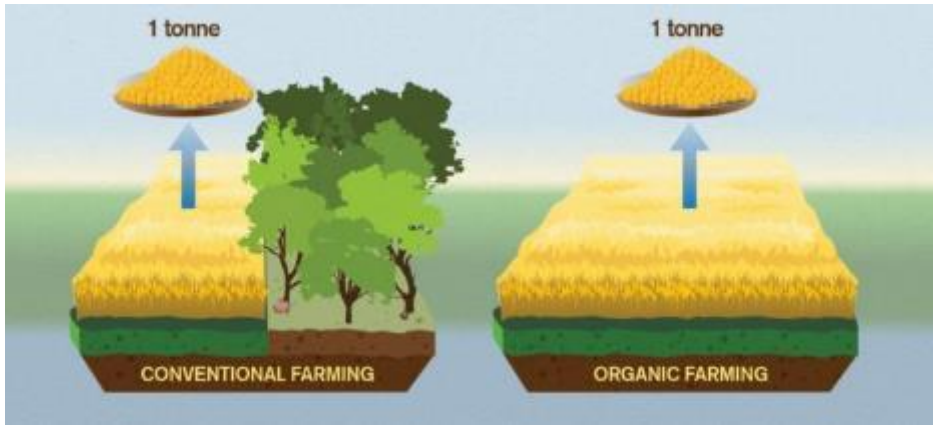

Is Organic Food Really More Expensive?

Agroecology and organic farming in the tropics

... can they feed a growing population?

... are they profitable and affordable?

... are they scalable?

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R4D ▶ Reference Model for Our Systems Research: **Evidence for Narratives**

Dynamic Agroforestry

Climate Adaptation

Seed systems for underutilized crops

Nutrition & Health

Soil fertility enhancement

Biodiversity & CO2 mitigation

System Relevance, Sustainability & Resilience

Policy & Sector Development

Diversification of production

Smallholder empowerment

Innovative Cropping Technologies

Market Access & Income

Capacity building smallholders

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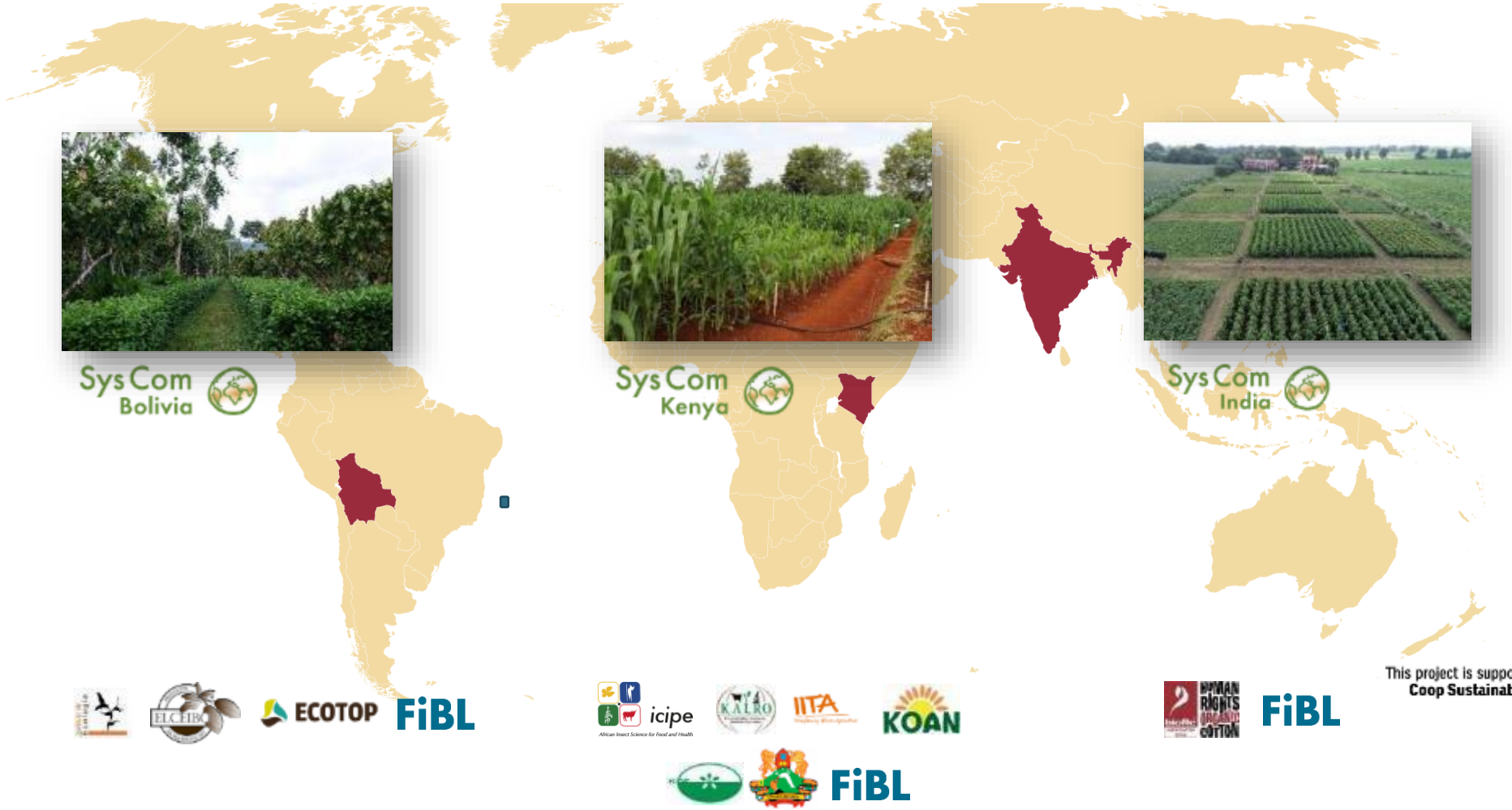
Resilient Farming Systems:
SysCom - Farming Systems Comparison in the Tropics



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SysCom Project in Kenya

Maize/ Babycorn

Cabbage

Spinach

Kale

French/ Common bean

Potato

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Agroecology and organic farming in the tropics

... can they feed a growing population?

... are they profitable and affordable?

... are they scalable?

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Diverse cacao agroforestry systems in Bolivia

Higher total system productivity and resilience

- Up to 2 times higher yields in diversified systems
- Improve household food security

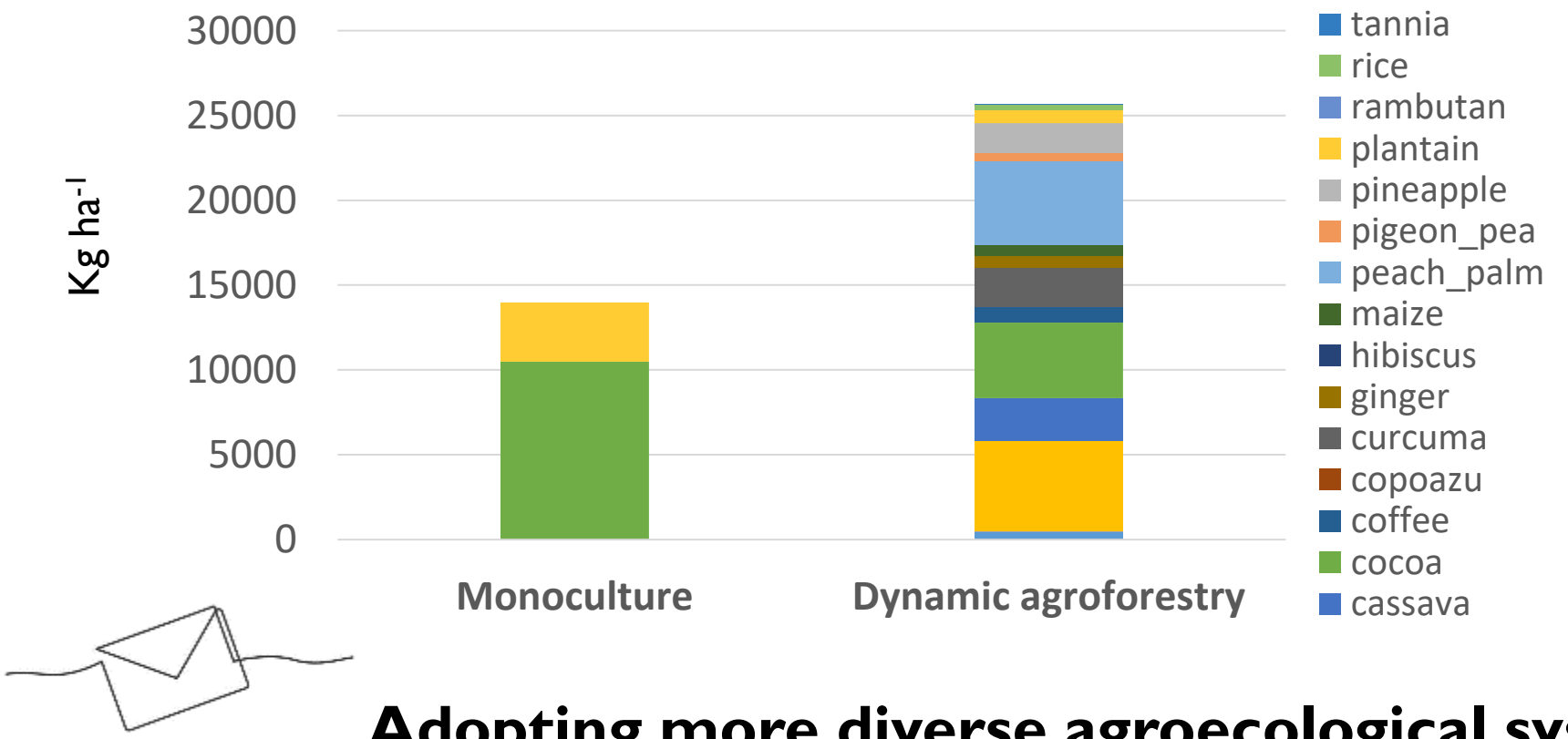
Cocoa monoculture yield

Diverse agroforestry yield

Other fruit trees
Peach palm
Maize
Ginger
Curcuma
Coffee
Cocoa
Banana

Average yields from 2013-2022 (FiBL, 2023 & Sekaran et al. 2021, SysCom Bolivia project data)

Total system yields of a dynamic agroforestry system



Adopting more diverse agroecological systems results in improved household food security and dietary diversity

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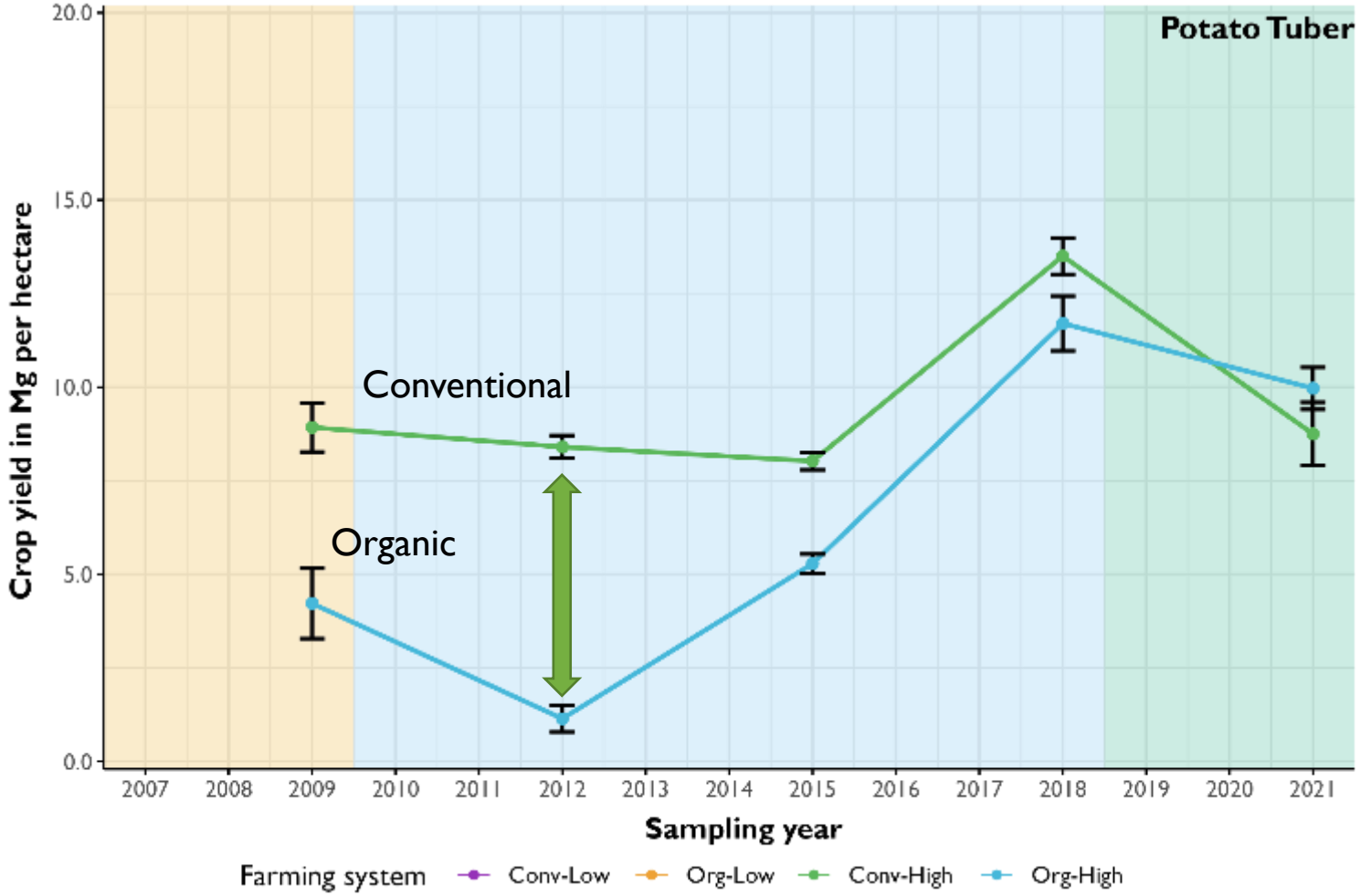
Potato cultivation in Kenya

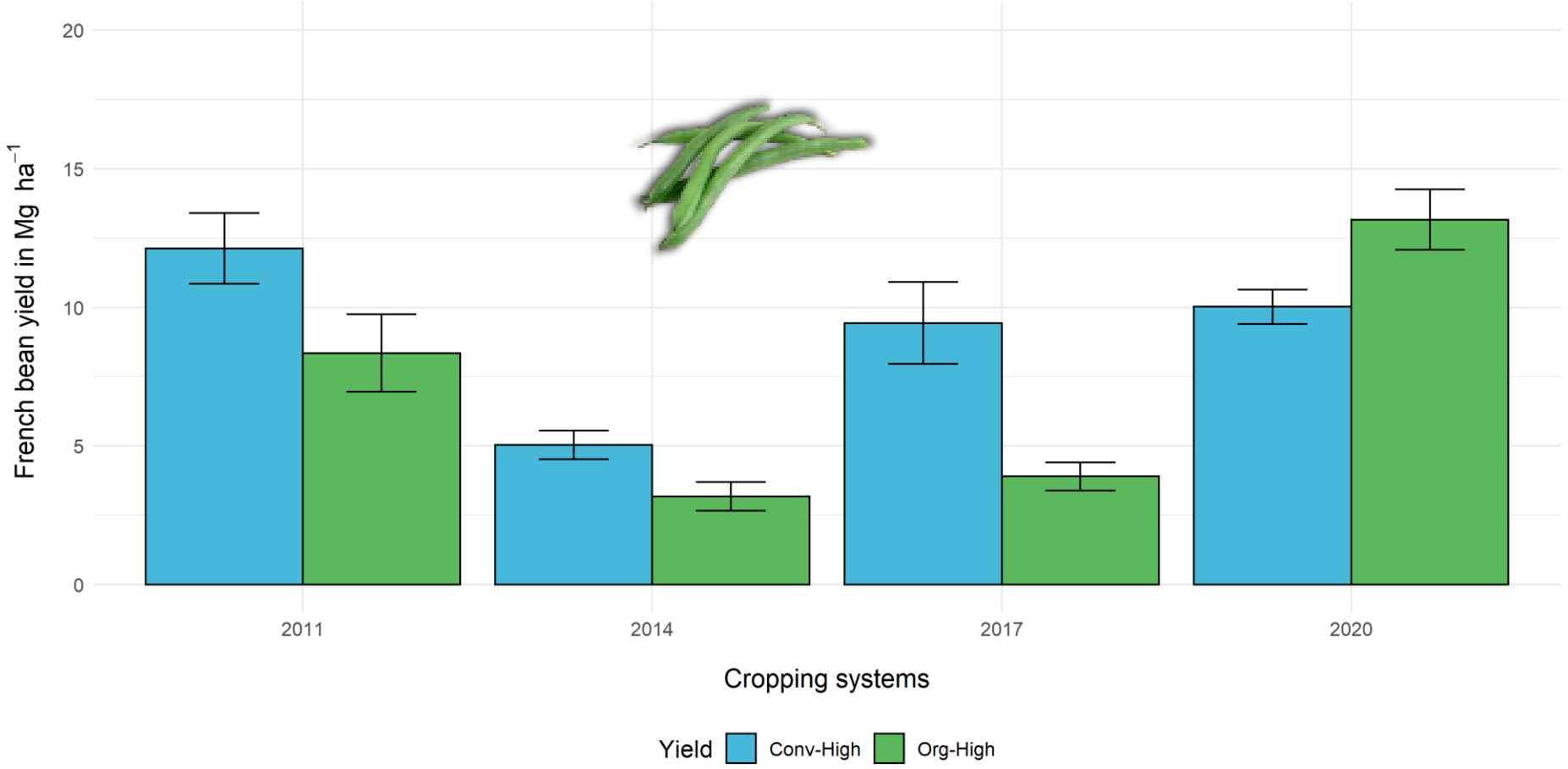
Increased organic yield development by shifting to a best-practice systems

- Enhanced pest & disease management
- Push-pull: +dolichos/ desmodium
- Improved compost management



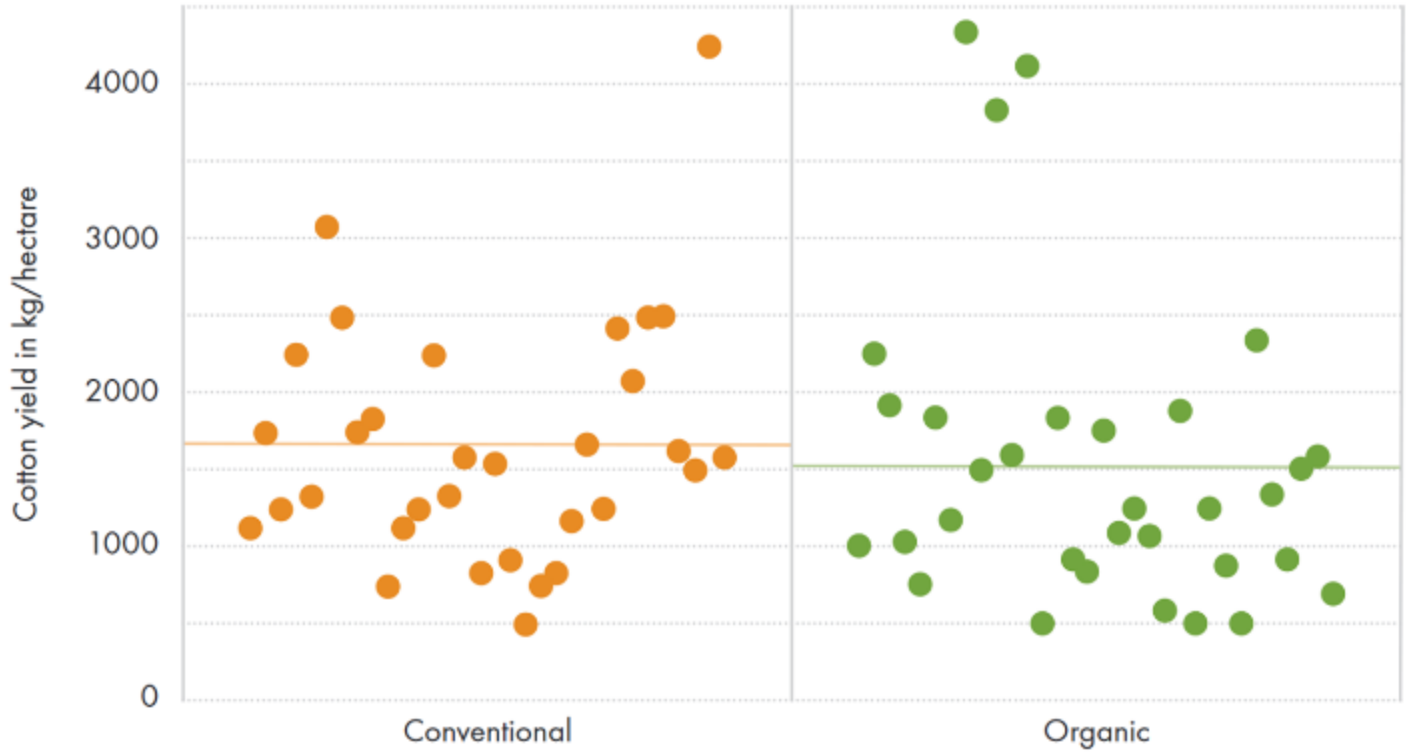
Bautze et al. (submitted)

French green bean yields in Kenya



The yield gap between conventional and organic high input systems reduced from 30% to 2.8%.

Cotton yield on organic and conventional farms



Increasing productivity needs improved capacities among farmers and farmer organizations.

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Feeding a growing population
Yield and beyond

- Active farm management / holistic approach to farming helps to overcome the biggest challenges
- Organic can have a positive impact on yields
- Diversified cropping systems can achieve higher overall yields than monocultures
- Diversified systems can alleviate food insecurity and hidden hunger and improve food availability during lean periods
- More diverse food available leads to a consumption of a larger variety of food groups and positive nutritional outcomes

Agroecology and organic farming in the tropics

... can they feed a growing population?

... are they profitable and affordable?

... are they scalable?

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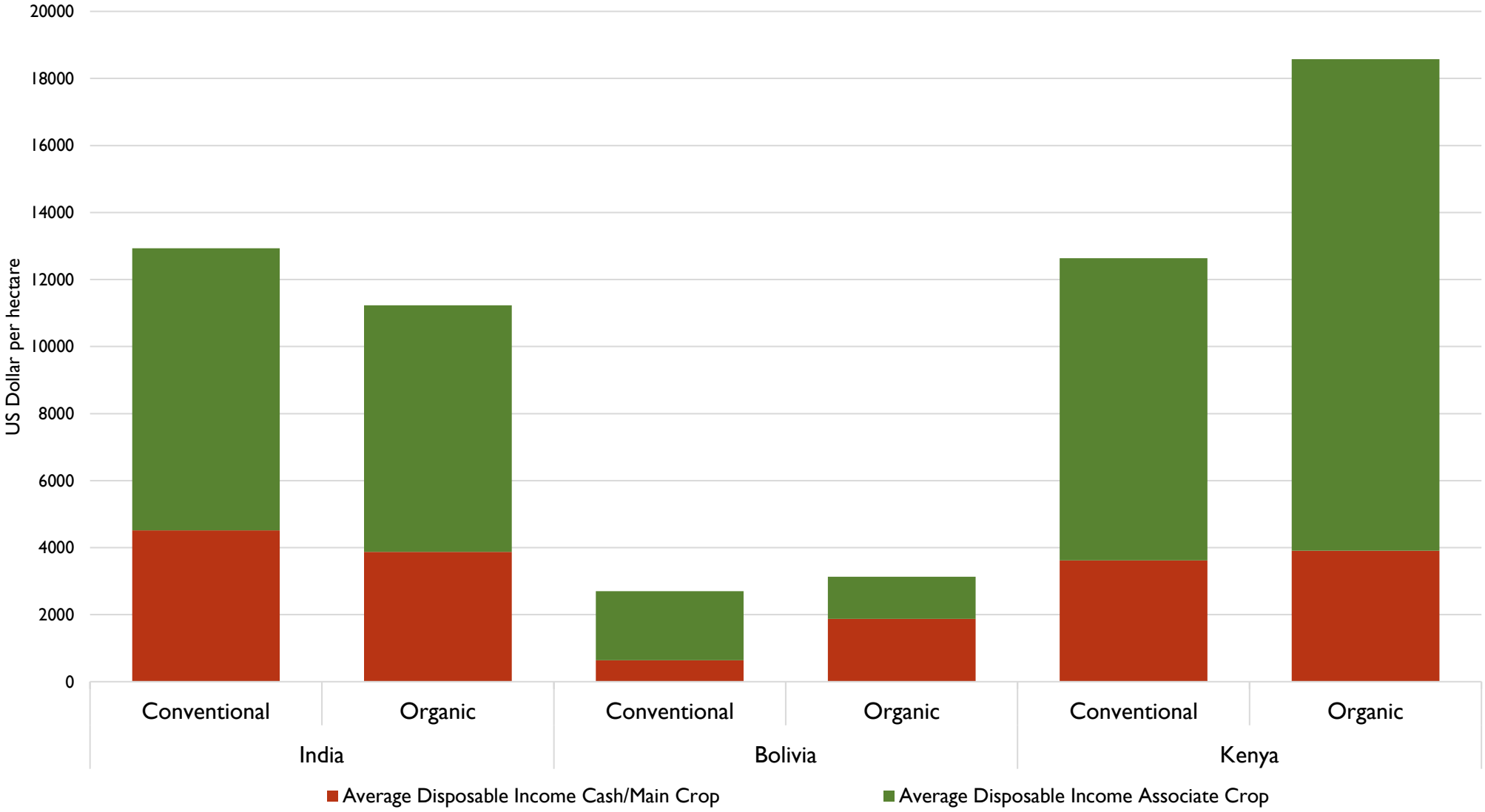


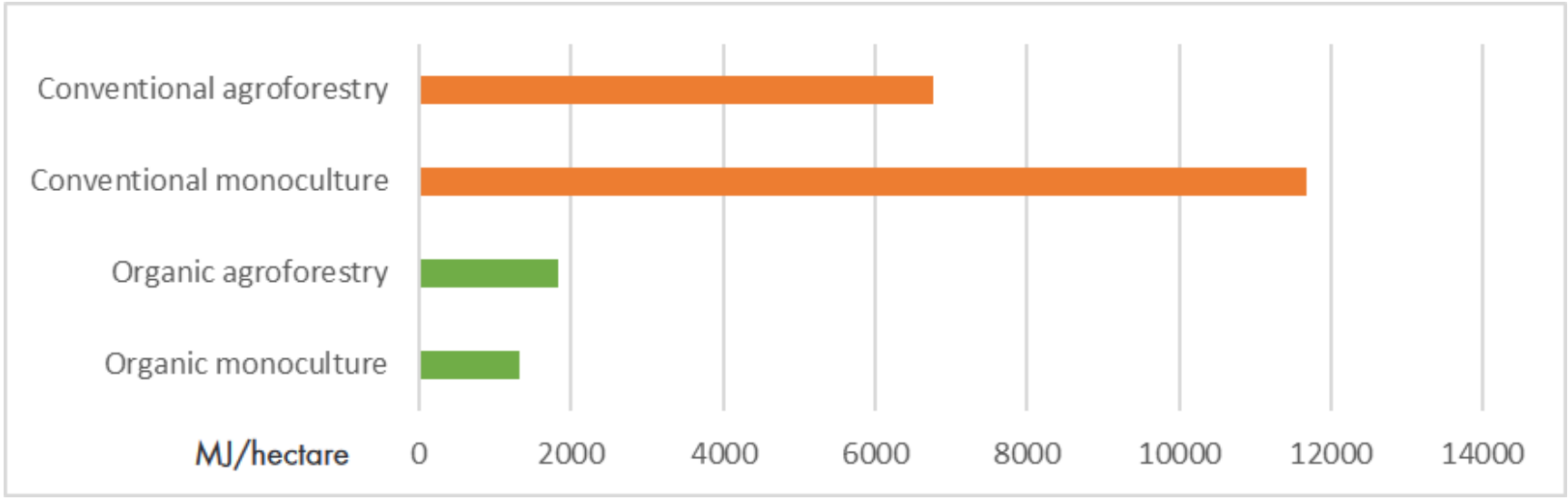
- Organic and convential agriculture can be equally profitable
- Diversification enables higher rentability compare to cash-crop based systems

Riar et al. (2024)

Organic agriculture in the tropics is profitable

Systems comparison in the tropics; annual profitability over 12 years

Cumulative demand for non-renewable energy in Conventional and Organic Systems



Higher potential for climate change mitigation due to smaller carbon footprints

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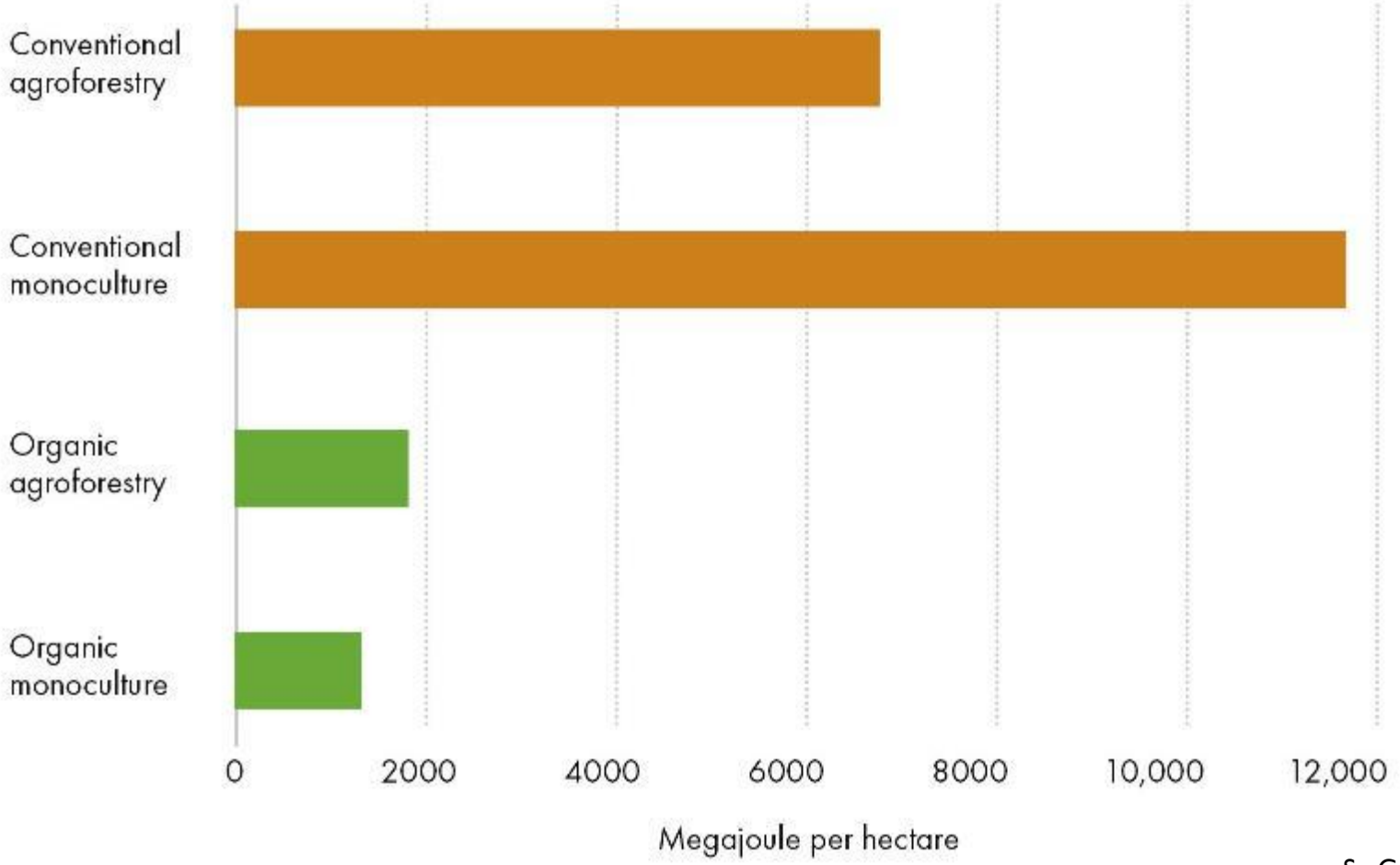
Energy use



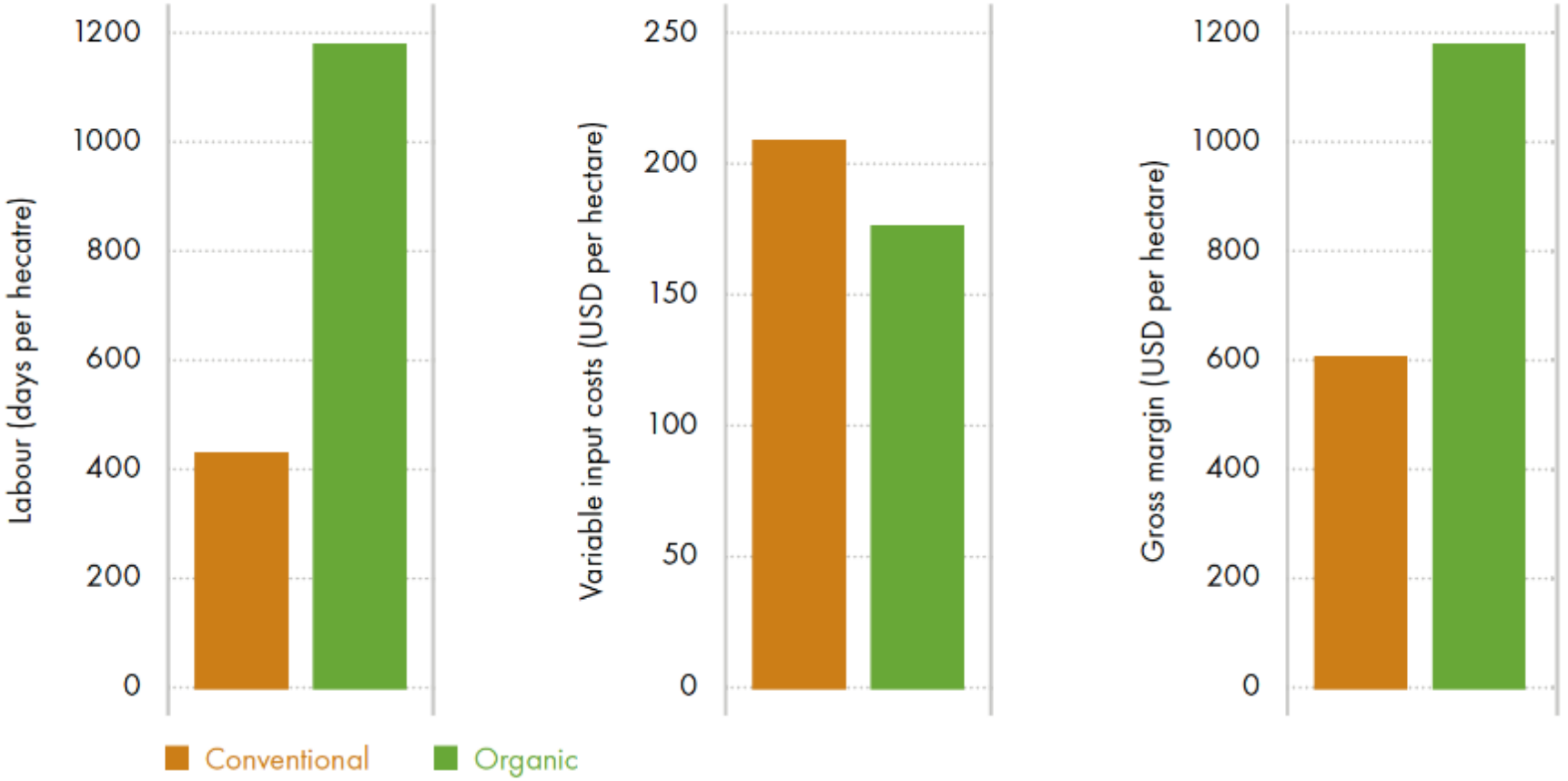
SysCom (2023)

Cumulative demand for non-renewable energy:

Example of cacao in Bolivia

Balancing labour, inputs and societal costs in Vietnam

- High labour requirements tend to be offset by low input costs compared to conventional
- Driving profitability: Access to stable markets, certification, and fair prices



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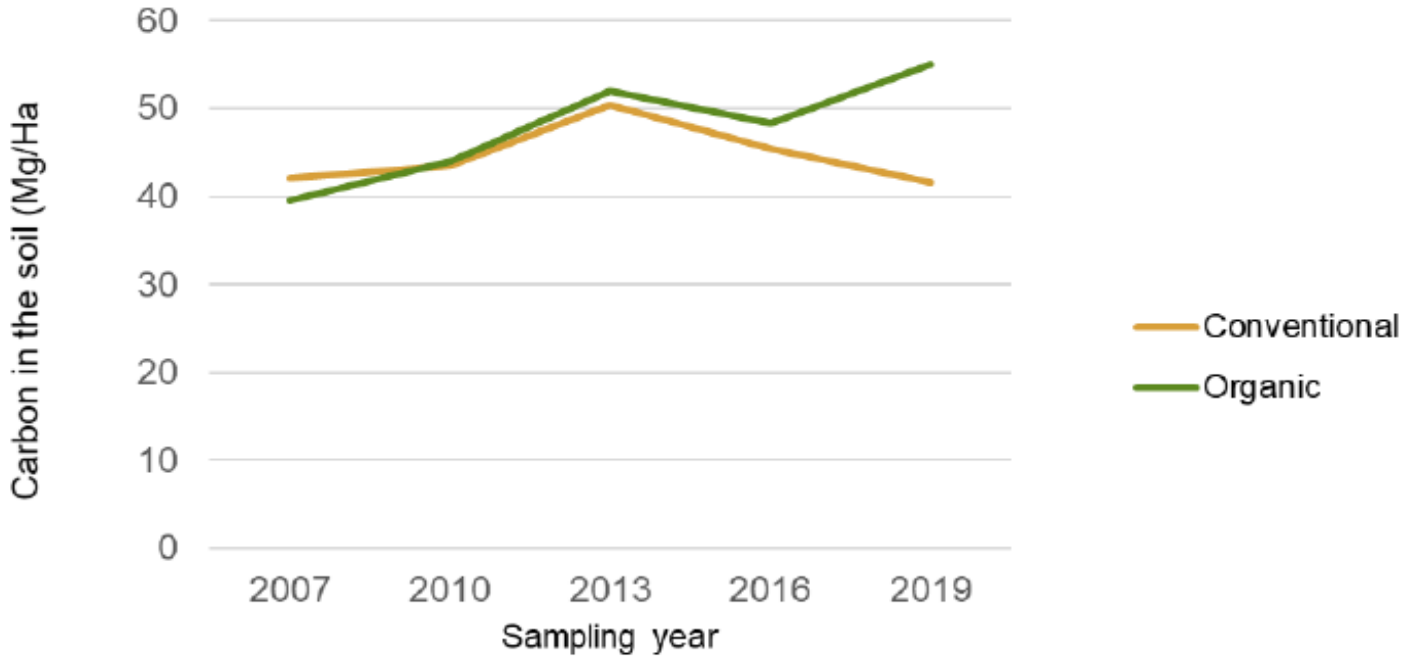
Grovermann et al. (2024)

OA and AE systems build up soil organic carbon



Soil Carbon after 12 years in Kenya

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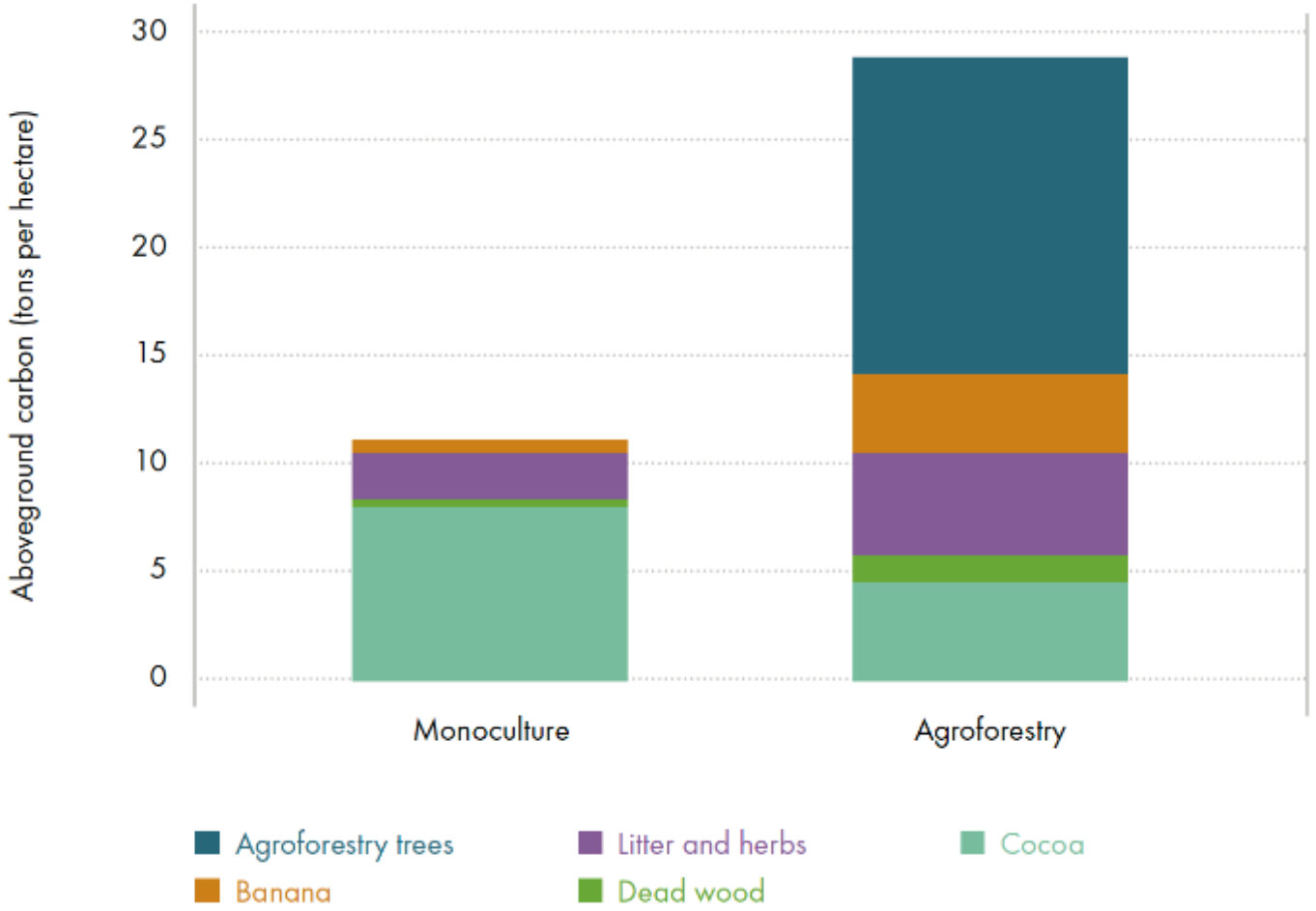
Soil and climate



FiBL (2023)

Increased carbon stocks above- and below-ground

Example from Bolivia

Boosting livelihoods with diversification

- A study across eight tropical countries revealed that household income rose with the number of crops grown
- Advances in income can contribute to more resilient livelihoods, by:
  - Reducing risk across space and time - act as “safety net”
  - Improving income stability, resource efficiency, and market opportunities

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Agroecology and organic farming in the tropics

... can they feed a growing population?

... are they profitable and affordable?

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Opportunities to facilitate organic and agroecology

Economic

- True-cost accounting
- Long-term-funding
- Value chain and market development to support fair pricing

Knowledge

- Bolster knowledge and capacity development, i.e. strengthen farmer organisations and extension services
- Support education, research, knowledge co-creation and exchange

Social

- Improve consumer food literacy
- Empower farmers and supply-chain actors through knowledge and resources

Resources

- Discontinue financial support and subsidies for harmful agricultural practices
- Support for appropriate mechanisation and digitalisation
- Land tenure reform

Governance

- Smart policies to incentivise and support transition to agroecology and organic

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Levers for Development:
A) Policy improvements for a conducive environment and frame conditions

Agroecology and organic agriculture have the potential to facilitate the transition toward inclusive, healthy, and sustainable food systems

Sources:
88 peer-reviewed publications and 61 publications and international studies, e.g. FAO, CFS-HLPE, IFAD IPES-Food

Project Partners:

SysCom

KCOA Knowledge Centre for Organic Agriculture and Agroecology in Africa

Funding Partners:

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Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
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This project is supported by the **Coop Sustainability Fund.**

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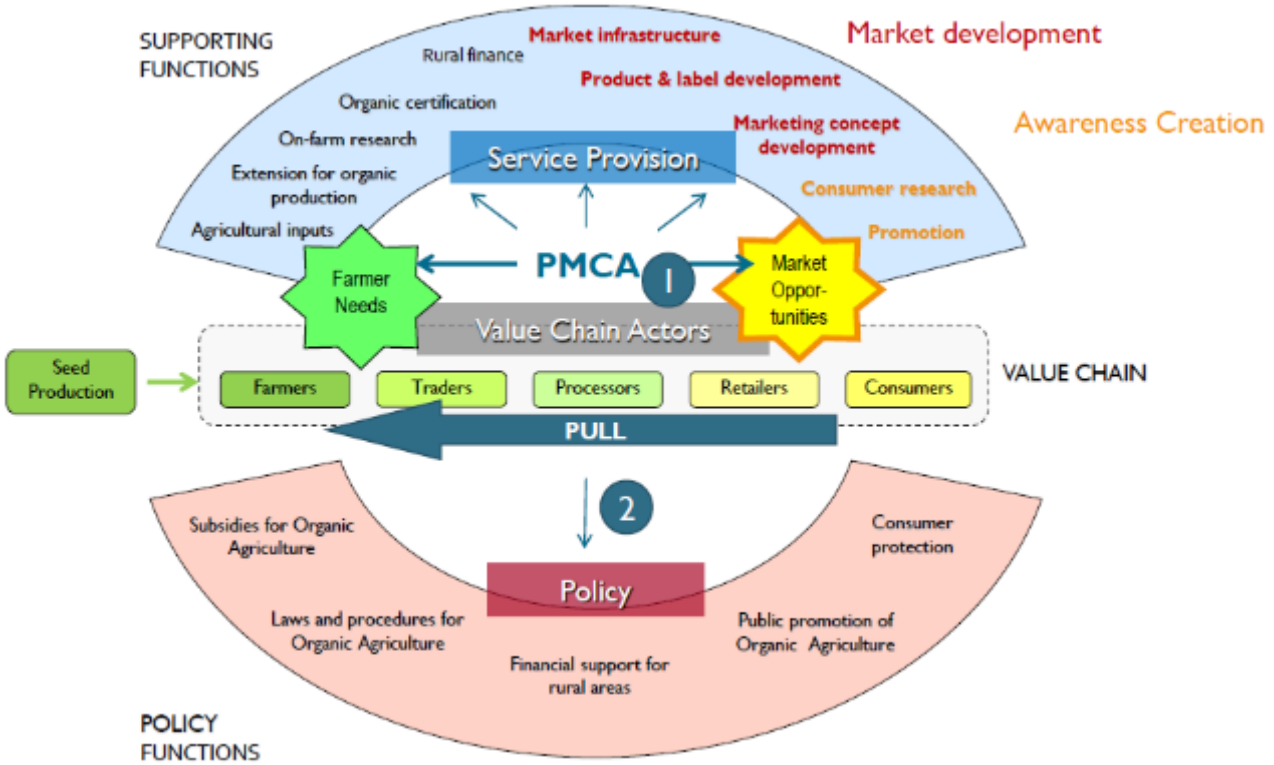
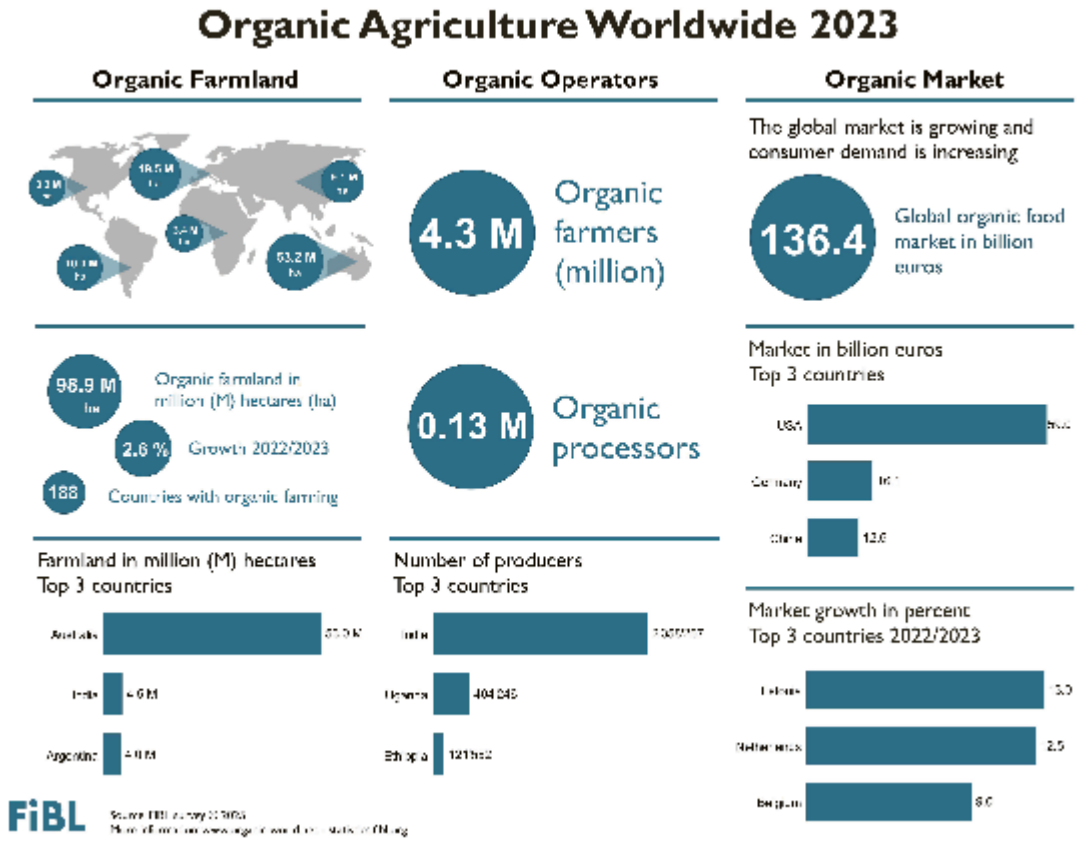
Implemented by giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

B) Market development:
Market System Development (MSD) as a lever





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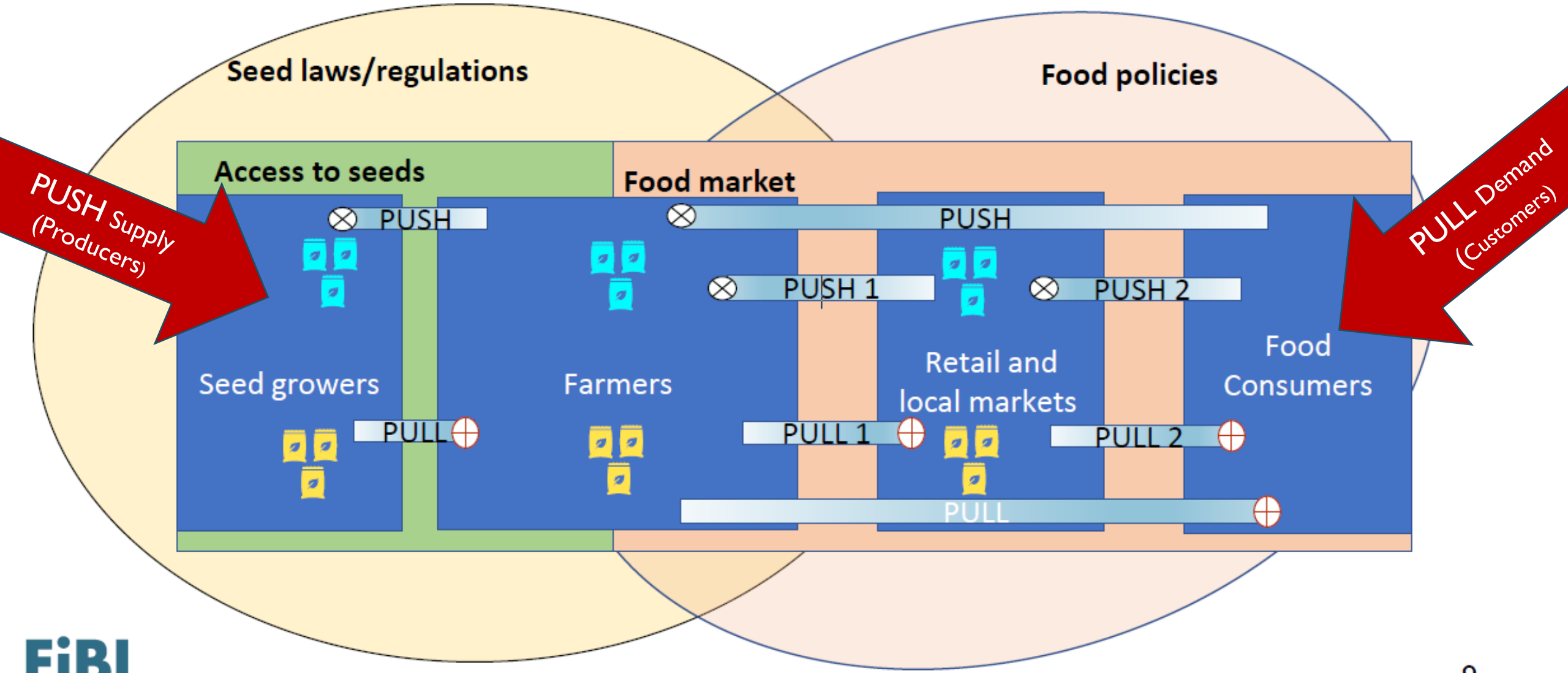
Framework for achieving Transformative Sustainable Agriculture and Food Systems



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Example of products developed to diversifying Diets

Ungalishe

Ingredients: Finger millet, Bambara groundnut, rice and pumpkin seeds

Bambara bean Flour

Ingredients: Bambara groundnut and Maize

The successful integration of producers, processors, and retailers leads to rapid product development.

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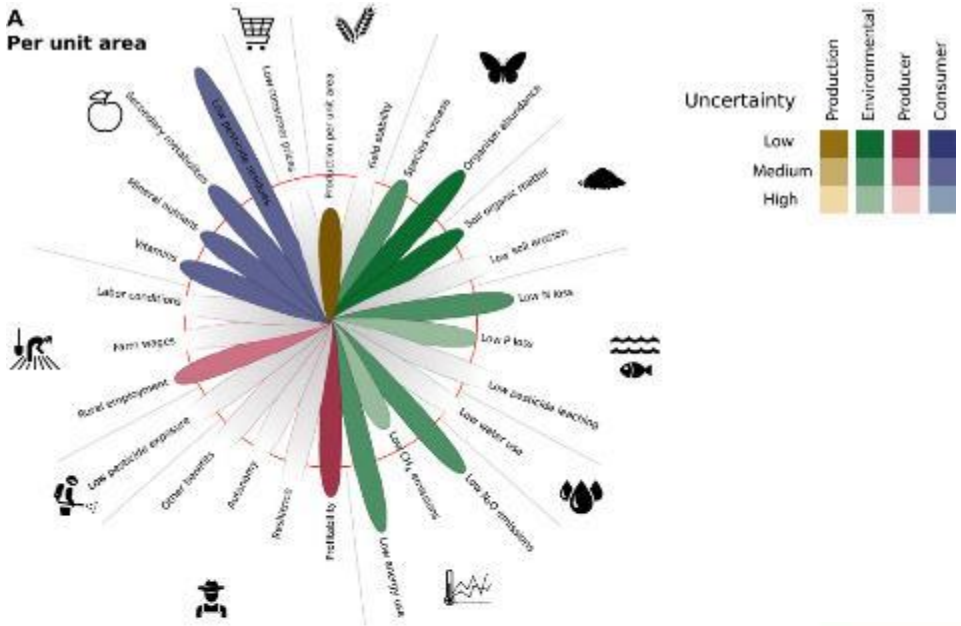
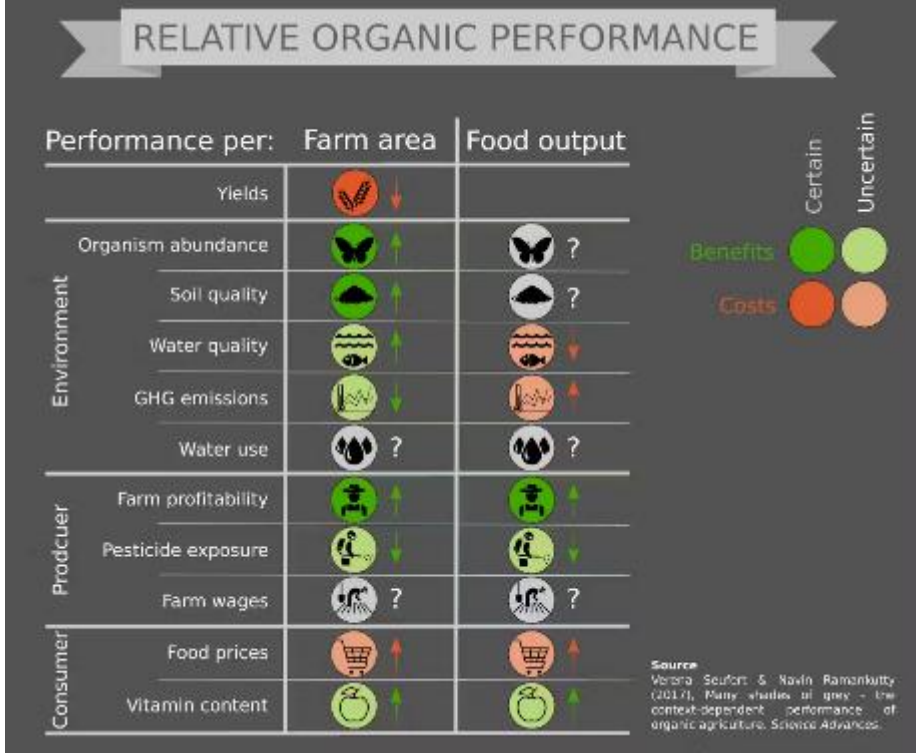
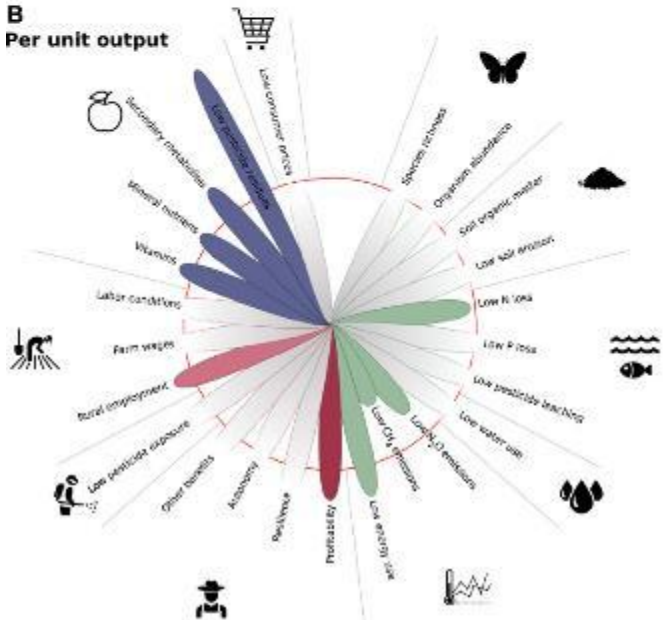
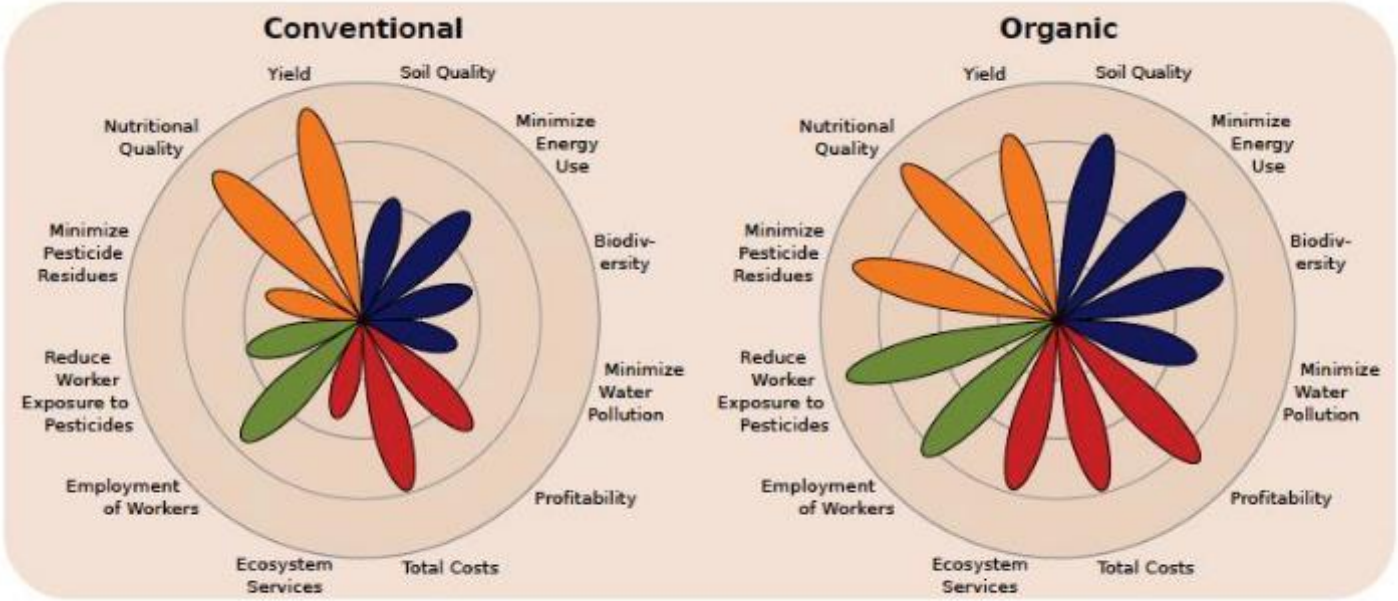
Other evidence





Seufert, V. 2017, Many shades of grey, the performance of Organic Agriculture





New Narrative in EU: Organic positioning

Summary from recommendations of Andy Battentier – December 2024 based on interviews with 35 persons on behalf of IFOAM Organics Europe

1. **The foundation of Europe's agroecological transition**, making conventional farming the exception.
2. **A system that goes beyond certification**, integrating sustainability principles into all agrifood policies.
3. **A credible leader in sustainability**, addressing contradictions (e.g., pesticides, meat consumption) head-on.
4. **An inclusive and innovative movement**, breaking the niche perception and engaging diverse stakeholders.

1. **« Stop Harm »:** a campaign assertive on pesticides. Call to stop to fuel a toxic dynamic of harm to ourselves

2. **« Organic delivers »:** a series of three videos framing organic practices as
   - **technological innovation**,
   - **tool for adaptation to climate change**, and
   - **a way to improve the lives of rural communities** (Biodistricts)

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Final Reflection

Agroecology and organic farming...

- contribute to better adaptation to climate change by emphasising diversity, the use of locally adapted varieties and breeds, and long-term sustainable productivity
- can have lower greenhouse gas emissions, be more energy efficient and use fewer non-renewable resources than conventional farms.
- improve soil organic carbon (SOC) content over time.
- have the potential to sequester more carbon in soils, plants and trees.
- with preventive pest control improve yields and reduce the need for synthetic pesticides.
- reduce pesticide pollution and thus contribute to better health, water and soil quality.

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