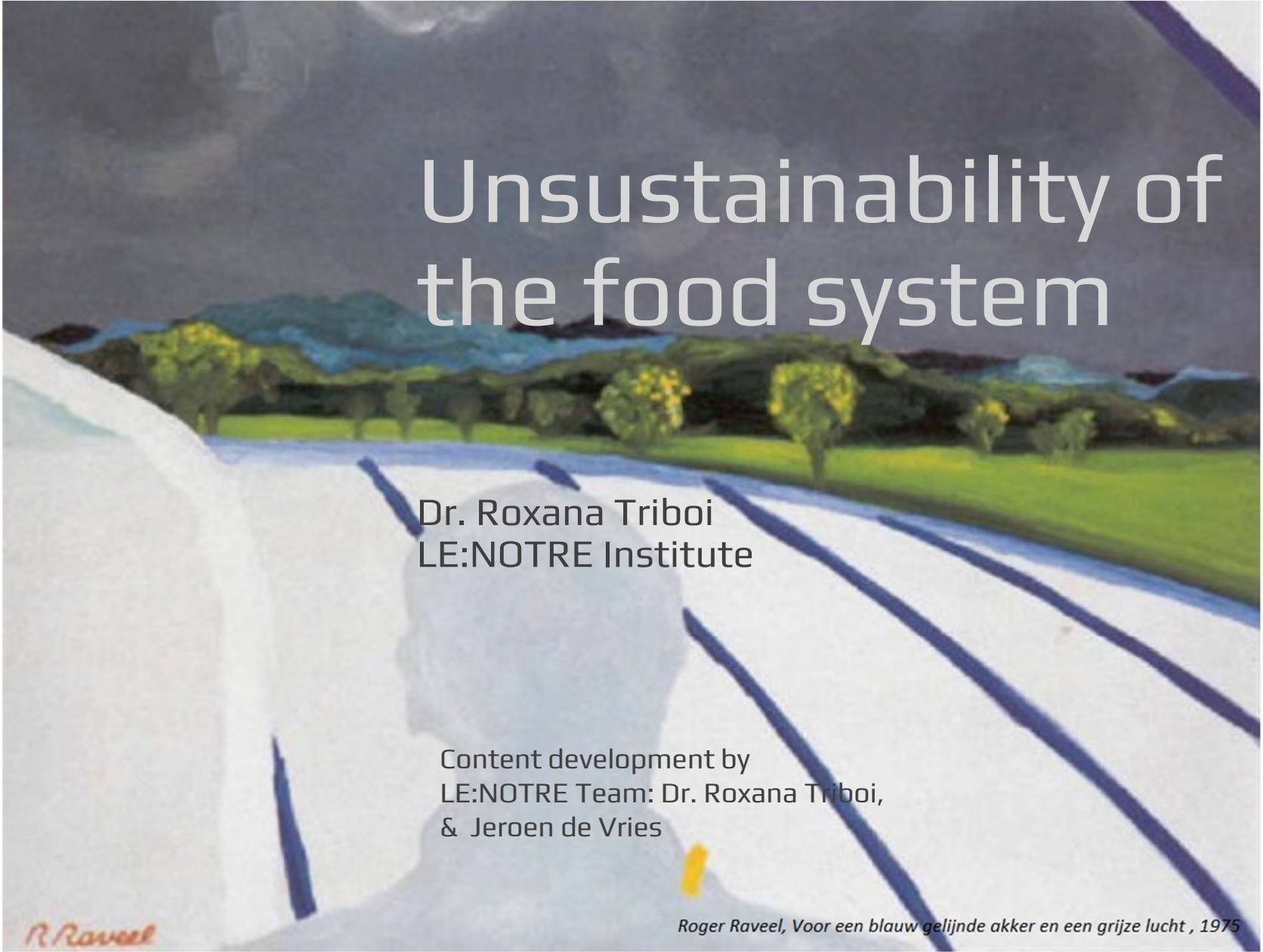




# Unsustainability of the food system

## ***Lecture 5.2***

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MLA Vilnius Tech

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

# From Unsustainable Food Systems to Just Transitions *Insights from Recent Global Reports*

**Key findings** on the current unsustainability of food systems:

- Food systems are major drivers of **climate change**, **biodiversity loss**, and **social inequality**.
- Unhealthy diets are now the **leading global cause of premature death**.
- Transformation must address **ecological limits** and **social justice** together.

**Reports on:**

- Ultra-processed foods and health
- EAT–Lancet and planetary boundaries
- Doughnut Economics framework
- Corporate power in food systems
- FAO's integrated systems approach
- IPES–Food on fossil fuel dependency

# From Unsustainable Food Systems to Just Transitions: Insights from Recent Global Reports

- **Ultra-Processed Foods (UPFs):** Industrial products dominate diets and worsen health inequalities.
- **EAT–Lancet Commission (2025):** Defines the Planetary Health Diet; shows food systems breaching planetary limits and deepening inequality.
- **Doughnut Economics (Raworth):** Links social needs and ecological boundaries; exposes the global imbalance between North and South.
- **Titans of Agriculture (Clapp):** Reveals corporate concentration across seeds, trade, and retail, undermining food sovereignty.
- **FAO 2025 –Systems Integrated Approach:** Advocates integrated, inclusive, and resilient food systems through multi-level governance.
- **IPES–Food – Fossil Fuel Addiction:** Shows food's deep fossil dependence; urges decarbonisation via agroecology and just transitions.



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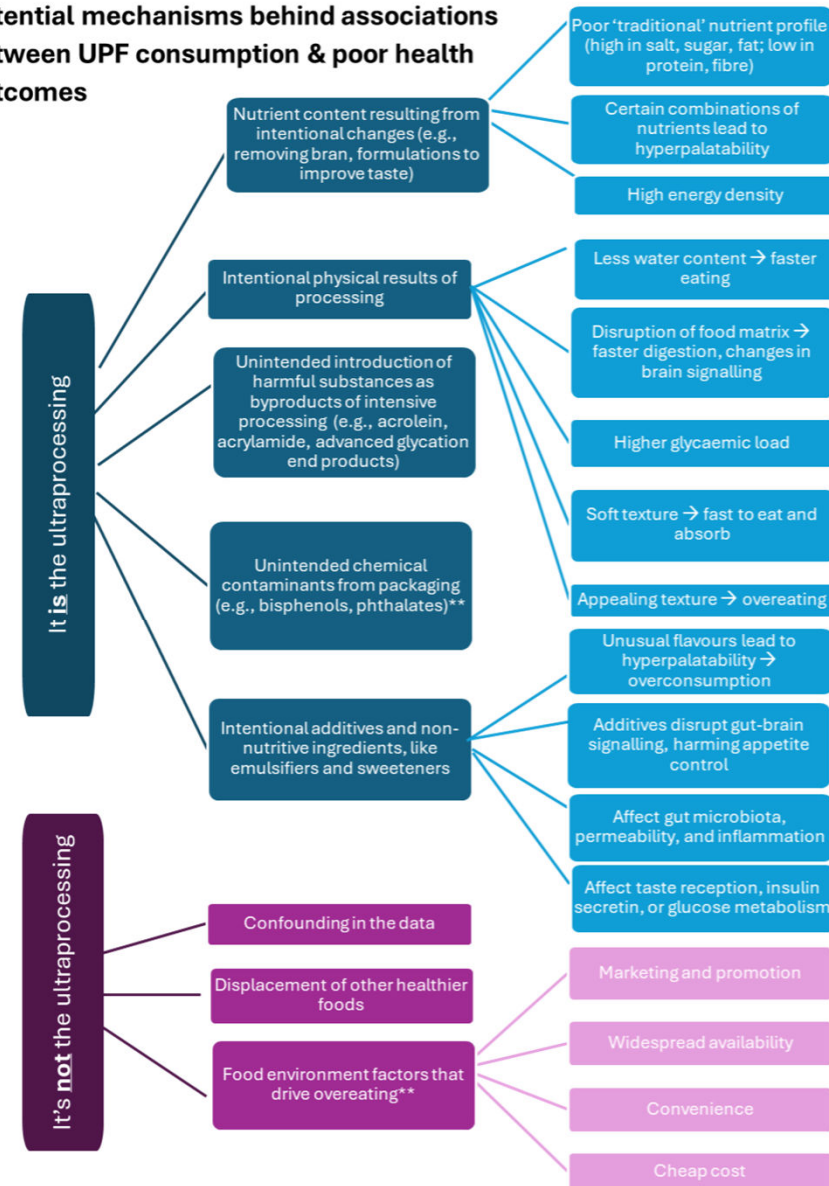
# Ultra-Processed Foods

- Ultra-processed foods (UPFs) = industrial formulations rarely made in home cooking.
- They represent over half of daily calories in some countries, especially among youth.
- Linked to health risks (diabetes, heart disease, depression), but not all UPFs are equal.
- The category is too broad – includes both harmful (soft drinks, processed meats) and acceptable (whole-grain breads, dairy) foods.
- Debate complicated by industry influence and research limitations.

**Stella Nordhagen**  
Senior Technical Specialist



## Potential mechanisms behind associations between UPF consumption & poor health outcomes



\*\* Whether these two are intrinsic to the processing is debatable

# Towards a More Nuanced Food Planning Approach

- UPFs raise questions not only about **nutrition**, but about **how food systems are designed**.
- Some UPFs contribute to **accessibility, food safety, and sustainability** (e.g. plant-based analogues, shelf-stable foods).
- Need to **differentiate subcategories**, understand mechanisms, and move **beyond “good vs bad” labels**.
- For food planners: focus on
  - **food environments**,
  - **production and processing systems**,
  - and **policies** that promote **healthy, just, and sustainable diets**.

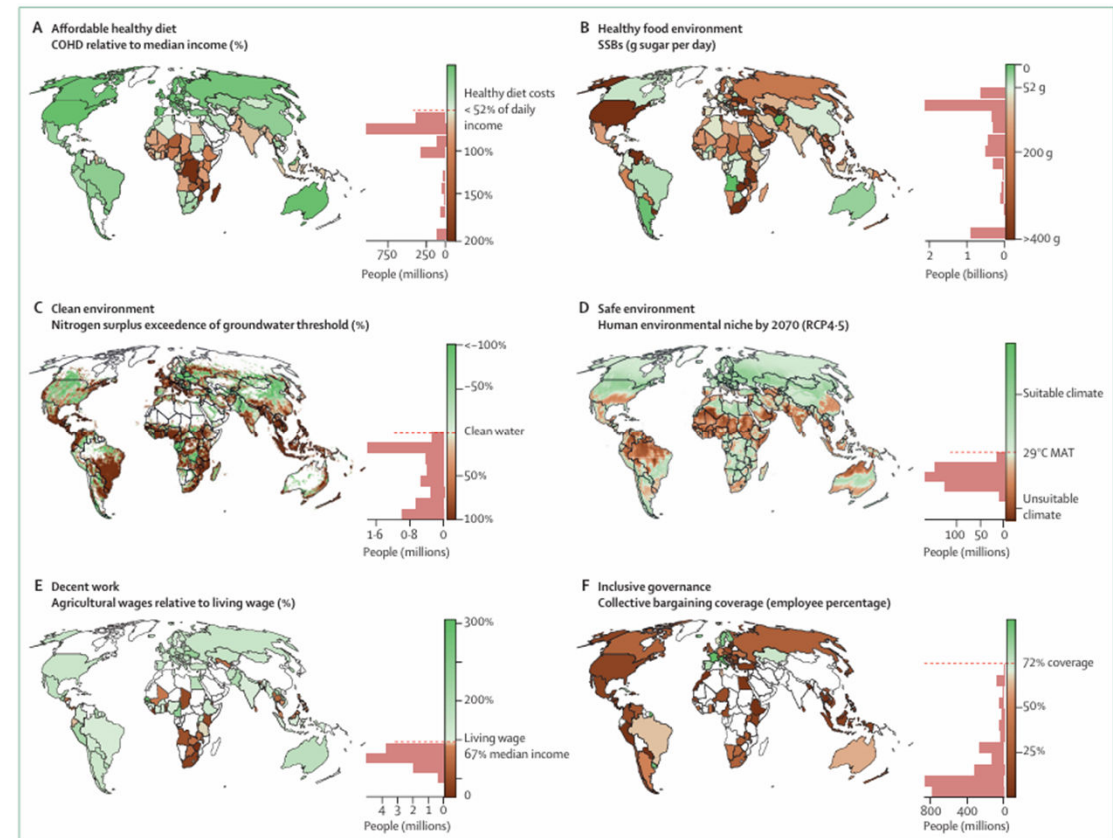
# What Is the EAT–Lancet Commission?

The **EAT–Lancet Commission on Food, Planet, Health** is a collaboration between the medical journal *The Lancet* and the non-profit organisation **EAT**.

- It brings together **37 leading scientists** from **16 countries**, working across health, nutrition, agriculture, environmental science, and policy.

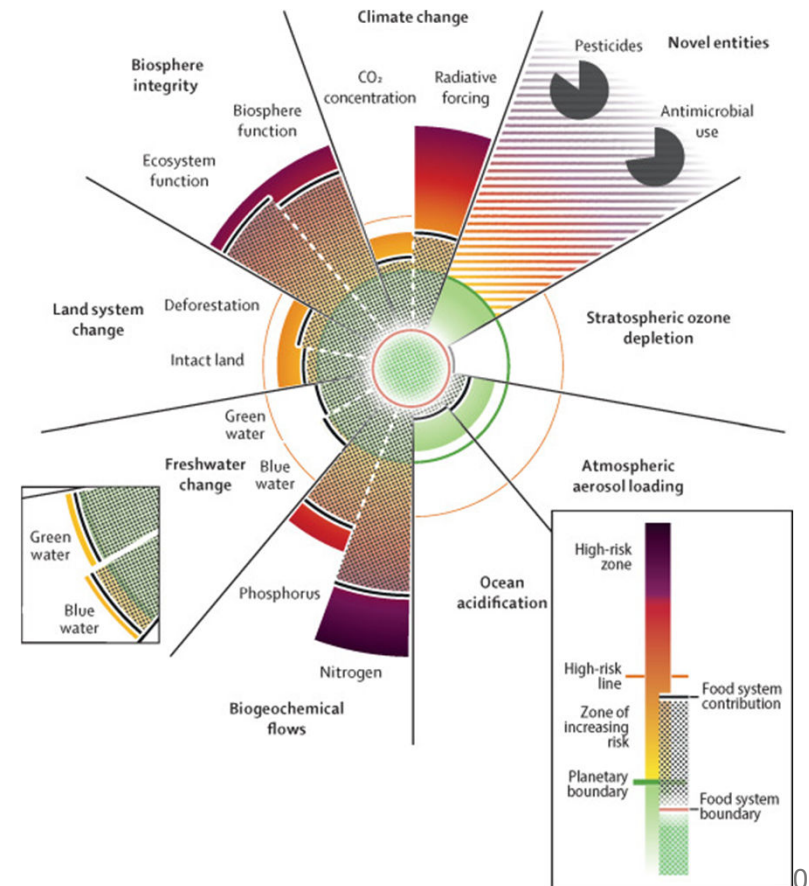
**Purpose:** to define a “**Planetary Health Diet**” – one that ensures both **human health** and the **sustainability of the planet**.

- The first report (2019) and its update (EAT–Lancet 2.0, 2024) respond to a growing crisis:
  - unhealthy diets are now the **leading cause of disease and early death**,
  - while food production is a **major driver of climate change, biodiversity loss, and water pollution**.



# EAT Lancet 2.0 on health, sustainable and just food systems

- The **2025 EAT–Lancet Commission** presents the **most comprehensive scientific assessment of global food systems** to date.
- Food systems are now the *single largest contributor to the transgression of five planetary boundaries* (climate, biodiversity, land, freshwater, nutrient pollution) *of the six breached boundaries*.
- Even if fossil fuels were phased out entirely, **current food systems alone could still push global warming above 1.5°C**.
- Less than **1% of the world's population** currently lives in the “**safe and just space**” — where everyone's food needs and rights are met within planetary limits.
- **The richest 30% of the global population drive over 70% of food-related environmental impacts**.



# Key Findings

- **Dietary transformation** could prevent up to **15 million premature deaths per year**.
- Food systems contribute around **30% of global greenhouse gas emissions** — transformation could **cut this by half**.
- Around **32% of food system workers earn below a living wage**, showing that inequity is embedded across the system.
- Global diets still **lack fruits, vegetables, nuts, legumes, and whole grains**, while containing **too much meat, dairy, sugar, and ultra-processed food**.
- The updated **Planetary Health Diet** is **plant-rich, culturally adaptable**, and **emphasises equity and justice**, not only calories or nutrients.

# A Just and Sustainable Transformation

- Transformation must address both **planetary boundaries** and **social foundations** — ensuring that:
  - Everyone has the **right to food**,
  - Food system workers have **decent livelihoods**,
  - Environmental burdens are **shared fairly**.
- Even small dietary shifts combined with **better production, reduced waste, and fair labour practices** could yield an annual **return of \$5 trillion**, far exceeding the investment needed.
- Food is recognised as **central to human and planetary well-being**, not only as a commodity.

# 8 Pathways for Action

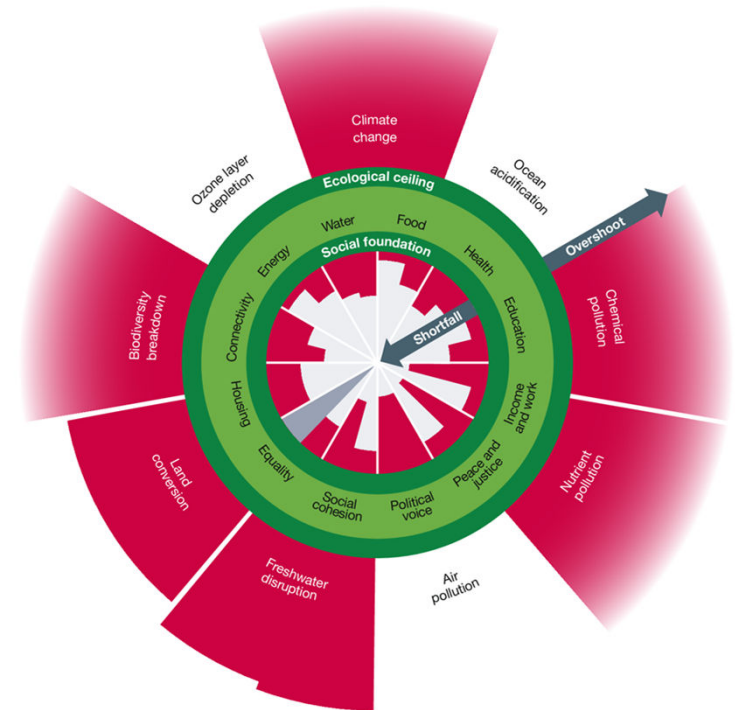
- 1. Protect and promote traditional healthy diets.**
- 2. Create accessible and affordable food environments** that encourage healthy eating.
- 3. Implement sustainable production practices** – carbon storage, biodiversity, and water protection.
- 4. Halt agricultural expansion** into intact ecosystems.
- 5. Reduce food loss and waste** at every stage.
- 6. Ensure decent working conditions** across the food chain.
- 7. Give voice and representation** to food system workers.
- 8. Recognise and protect marginalised groups.**

Each of these is supported by **policy, economic, and cultural levers**:

- Integrating traditional foods into dietary guidelines.
- Supporting **local seed systems and agroecological practices**.
- Redirecting **subsidies** to make healthy foods more affordable.
- Building **coalitions and financing mechanisms** for transformation.

# The Doughnut: A Compass for Human Prosperity

- Developed by **Kate Raworth**, the **Doughnut Economics framework** defines a **safe and just space for humanity**.
- It integrates **two concentric rings**:
  - **Inner ring** – the **social foundation**, below which people face deprivation (food, health, housing, equality, education).
  - **Outer ring** – the **planetary boundaries**, beyond which Earth's life-support systems are destabilised (climate, biodiversity, freshwater, pollution).
- Between these rings lies the “**safe and just space**” where **human well-being and ecological integrity** can coexist.
- The 2023 update by **Fanning & Raworth** provides the most detailed global monitoring of this balance.



# A World Out of Balance

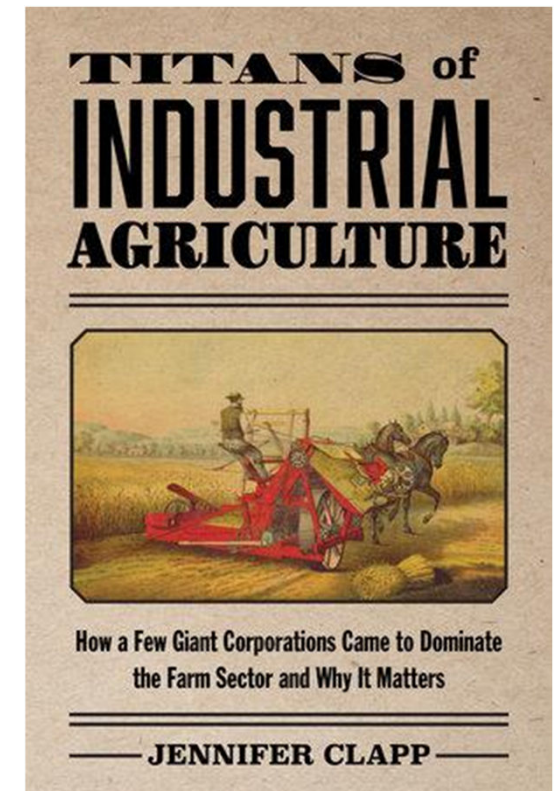
- Latest data shows:
  - **6 of 9 planetary boundaries exceeded** (climate, biodiversity, land use, water, nitrogen, phosphorus).
  - **No country** currently meets all social needs **within planetary limits**.
  - The **Global North** overshoots ecological limits, while the **Global South** remains below the social foundation.
- This reflects a **double injustice**:
  - ecological degradation driven by high-income consumption,
  - social deprivation persisting in low-income regions.
- The Doughnut reveals how **economic growth models** fuel both inequality and environmental overshoot.

# Implications for Food Planning and Policy

- Food systems sit **at the core of the Doughnut**, linking social and ecological domains.
- Applying the Doughnut lens means:  
Ensuring **food security and decent livelihoods** within local ecological boundaries.  
Reducing **agricultural emissions, waste, and land pressure**.  
Promoting **fair access to nutritious food** for all communities.  
Embedding **justice, regeneration, and circularity** in planning processes.
- For planners: the Doughnut as a **decision-making compass** to design **place-based food systems** that respect both **people's rights** and **planetary limits**.

# “Titans” of Global Agriculture

- **Jennifer Clapp** (University of Waterloo, Canada) is a leading scholar on **global food politics and power structures**.
- In *Titans in Agriculture* she describes how **a handful of powerful corporations** dominate every link in the global food chain:
  - Seeds and agrochemicals
  - Grain trading and processing
  - Retail and food delivery
  - Finance and digital platforms
- These “titans” control flows of **capital, data, and knowledge**, shaping what, how, and for whom food is produced.
- The result: **highly concentrated corporate power** that undermines food sovereignty and environmental sustainability.



# The Architecture of Power

**4 interlocking dimensions of power** in food systems:

**1. Structural power** – corporations set the terms of trade, finance, and technology.

**2. Instrumental power** – direct political influence through lobbying and partnerships.

**3. Discursive power** – shaping narratives about “innovation”, “efficiency”, and “feeding the world”.

**4. Material power** – control of land, inputs, logistics, and digital infrastructure.

• These powers reinforce one another, creating **path dependency** and **corporate capture** of sustainability agendas.

# Rethinking Food System Transformation

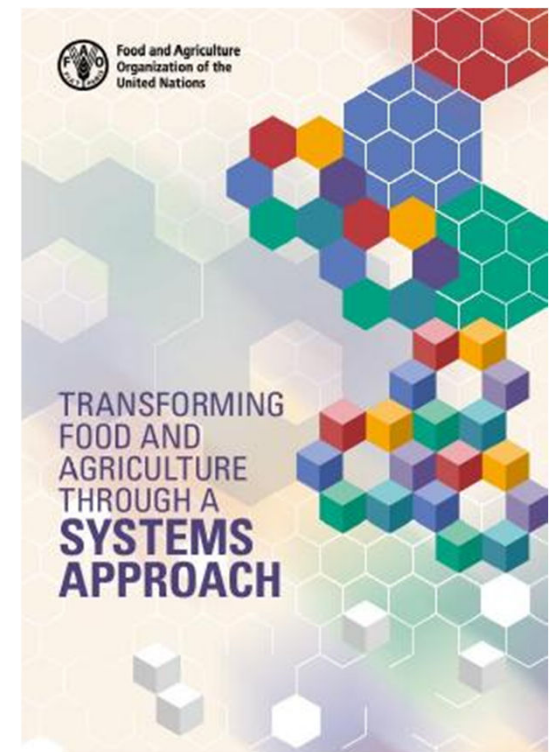
Clapp warns that current transitions — “green”, “digital”, or “climate-smart” — risk **deepening concentration** rather than challenging it.

Real transformation requires:

- **Democratising governance** of food and agriculture.
- Supporting **diverse, territorial food systems** and **public goods**, not private monopolies.
- Re-embedding food in **social, ecological, and local economies**.
- **Accountability** for corporations profiting from environmental and social harm.
- For food planners: examine **who holds power, whose knowledge counts, and whose interests shape policy**.

# FAO 2025- Why a Systems Approach to Food Systems?

- The **Agrifood Systems Integrated Approach (AIIC)** by FAO promotes **systemic transformation** to achieve the SDGs.
- Recognises food systems as **interconnected networks** of production, distribution, consumption, and governance.
- Core challenges:
  - Persistent **hunger and malnutrition**.
  - **Climate and biodiversity crises**.
  - **Inequalities** in access, income, and power.
- Vision: **healthy, inclusive, and sustainable agrifood systems** that work for both people and planet.



# Core Principles of the AIIC Systems Approach

- **Integration across sectors** – linking agriculture, health, environment, and social equity.
- **Multi-level governance** – from local communities to global institutions.
- **Inclusivity and participation** – empowering farmers, women, youth, and indigenous peoples.
- **Resilience and circularity** – reducing waste, improving soil, water, and biodiversity.
- **Evidence-based policy** – using data and foresight to guide transitions.
- The approach moves from *sectoral interventions* to **coordinated, system-level change**.

# Pathways for Action

- **Transforming production:** promote agroecology, sustainable intensification, and climate-smart practices
- **Transforming consumption:** support healthy diets, reduce food loss and waste.
- **Transforming governance:** create inclusive platforms, align financial and policy incentives.
- **Transforming resilience:** strengthen rural livelihoods crisis response, and local innovation.
- For food planners:
  - Apply **systems thinking** to link food, land, water, and health.
  - Design **territorial and participatory food policies**.
  - Build bridges between **science, governance, and citizens** for just transitions.

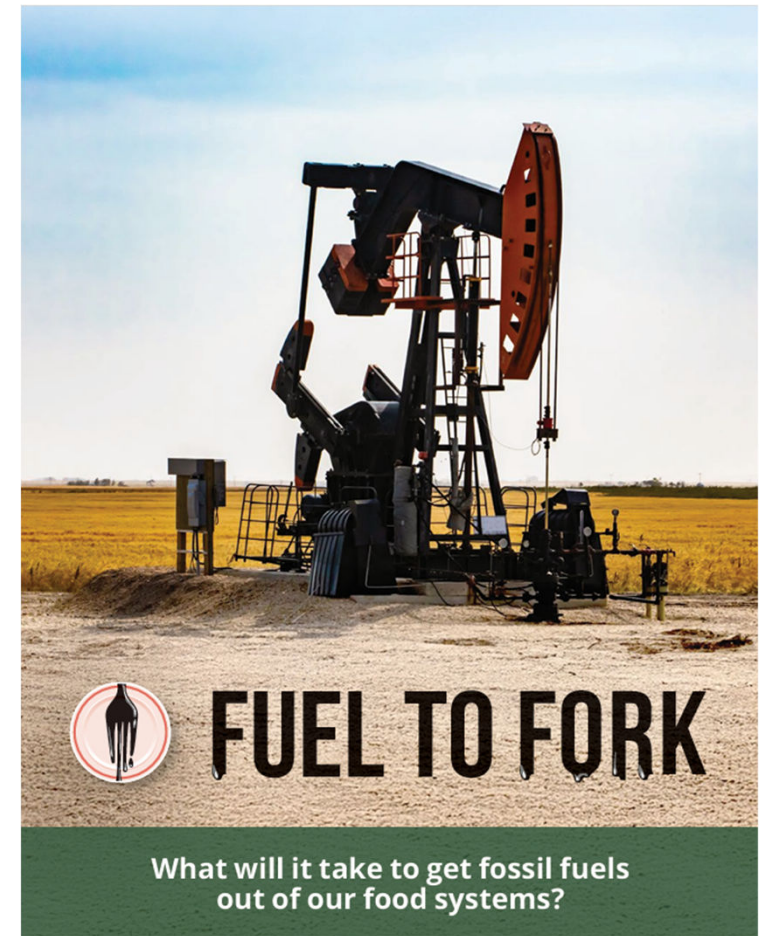
## OVERVIEW: EXAMPLES OF PRACTICAL ACTIONS IN COUNTRIES

|                                                                                                                                                                    | ACTION                                                                                                | COUNTRY                                                                      | PAGE | * |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------|---|
|  <b>SYSTEMS THINKING:</b><br>MINDSETS THAT SEE SYSTEMS                          | Co-creating national visions guides new policy thinking                                               | ETHIOPIA                                                                     | 33   | ● |
|                                                                                                                                                                    | Identifying strategic entry points stimulates cross-sector governance                                 | ALBANIA                                                                      | 33   | ● |
|                                                                                                                                                                    | Convening spaces for systems thinking helps navigate tensions for shared solutions                    | CENTRAL HIGHLANDS, KENYA                                                     | 34   | ● |
|  <b>SYSTEMS KNOWLEDGE:</b><br>DATA AND EVIDENCE FOR SYSTEM CHANGE               | Modelling trade-offs and synergies across policy outcomes informs development planning                | INDONESIA                                                                    | 38   | ● |
|                                                                                                                                                                    | True cost accounting (TCA) creates transparency about costs across agrifood system outcomes           | SWITZERLAND                                                                  | 38   | ● |
|                                                                                                                                                                    | Cross-sectoral knowledge strengthens capacity to manage residues of veterinary drugs in foods         | PAKISTAN                                                                     | 39   | ● |
|                                                                                                                                                                    | Mapping food flows facilitates system thinking for urban-rural cross-sectoral planning                | COLOMBO, SRI LANKA                                                           | 39   | ● |
|  <b>SYSTEMS GOVERNANCE:</b><br>JOINED-UP EFFORTS ACROSS SECTORS                 | Distributing leadership involves establishing cross-sector leadership mechanisms for agrifood systems | BRAZIL, CAMBODIA, COSTA RICA, FRANCE, UNITED ARAB EMIRATES, UGANDA, VIET NAM | 43   | ● |
|                                                                                                                                                                    | Joint planning supports integration of nutrition and further outcomes into agrifood strategies        | RWANDA                                                                       | 44   | ● |
|                                                                                                                                                                    | Building coalitions rebalances power dynamics in developing a law on the right to food                | MEXICO                                                                       | 44   | ● |
|  <b>SYSTEMS DOING:</b><br>IMPLEMENTING ACTIONS THAT HARNESS INTERCONNECTIONS    | Addressing interconnected barriers in coffee agroforestry lays ground for longer-term resilience      | EL SALVADOR                                                                  | 47   | ● |
|                                                                                                                                                                    | Mutually reinforcing actions build bridges at the humanitarian-development nexus                      | AFGHANISTAN                                                                  | 47   | ● |
|                                                                                                                                                                    | Aligning food procurement budgets and processes delivers multiple co-benefits                         | NEW YORK CITY, UNITED STATES OF AMERICA                                      | 48   | ● |
|                                                                                                                                                                    | Balancing trade-offs in crop production supports more sustainable growth and investment               | SIERRA LEONE                                                                 | 48   | ● |
|                                                                                                                                                                    | Managing trade-offs builds trust in fisheries management                                              | UNITED REPUBLIC OF TANZANIA                                                  | 49   | ● |
|  <b>SYSTEMS INVESTMENT:</b><br>RESOURCES DIRECTED TO LONG-TERM TRANSFORMATION | Re-allocating investments across agrifood system portfolios fosters multiple policy objectives        | MOROCCO                                                                      | 53   | ● |
|  <b>SYSTEMS LEARNING:</b><br>CONTINUOUS LEARNING AND ADAPTATION               | System-based evaluation of agroecological transitions reveals benefits of interlinked actions         | ROSARIO, ARGENTINA                                                           | 56   | ● |
|                                                                                                                                                                    | Co-learning across cities facilitates the development of integrated food policies                     | BRAZIL                                                                       | 56   | ● |
|                                                                                                                                                                    | Expanding peer learning in farmer field schools enables collective action                             | BURUNDI                                                                      | 57   | ● |

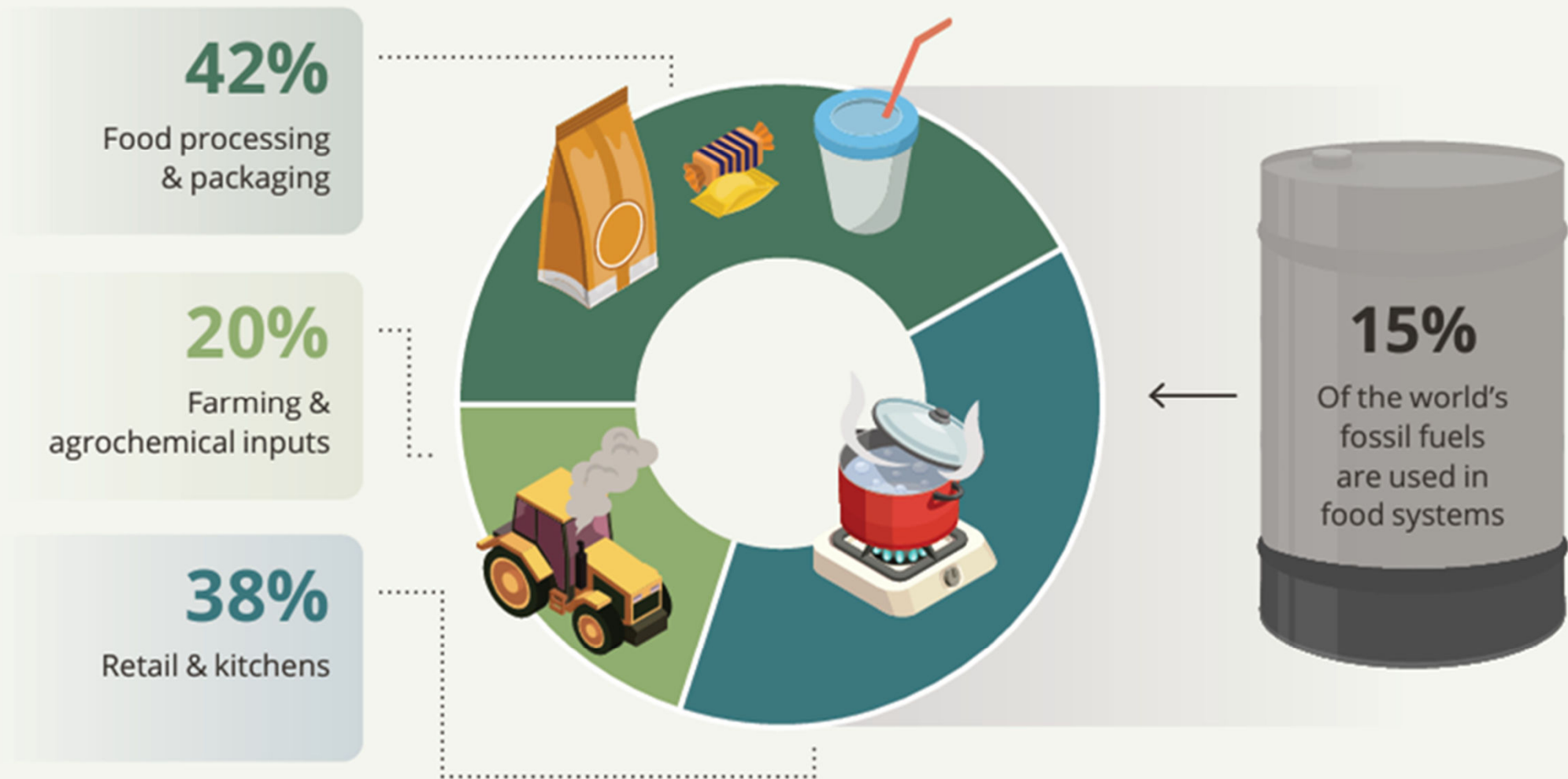
\* FURTHER FEATURED ELEMENTS: ● Systems thinking ● Systems knowledge ● Systems governance ● Systems doing ● Systems investment ● Systems learning

# IPES-food: The Fossil Fuel Addiction in Food Systems

- The industrial food system now **consumes ~40 % of petrochemicals** and **15 % of fossil fuels** globally.
  - Fossil fuels are embedded at every stage:
    - Fertilisers & pesticides (nearly all derived from oil/gas)
    - Plastic packaging, ultra-processed foods
    - Cold storage, transport, long supply chains
- This deep dependency locks food systems into **carbon-intensive, fragile, and inequitable pathways.**



## FOOD SYSTEMS CONSUME 15% OF GLOBAL FOSSIL FUELS



Source: Global Alliance for the Future of Food. (2023). [Power shift: Why we need to wean industrial food systems off fossil fuel.](#)

FIGURE 2

# FOOD SYSTEMS EAT UP 40% OF GLOBAL PETROCHEMICALS

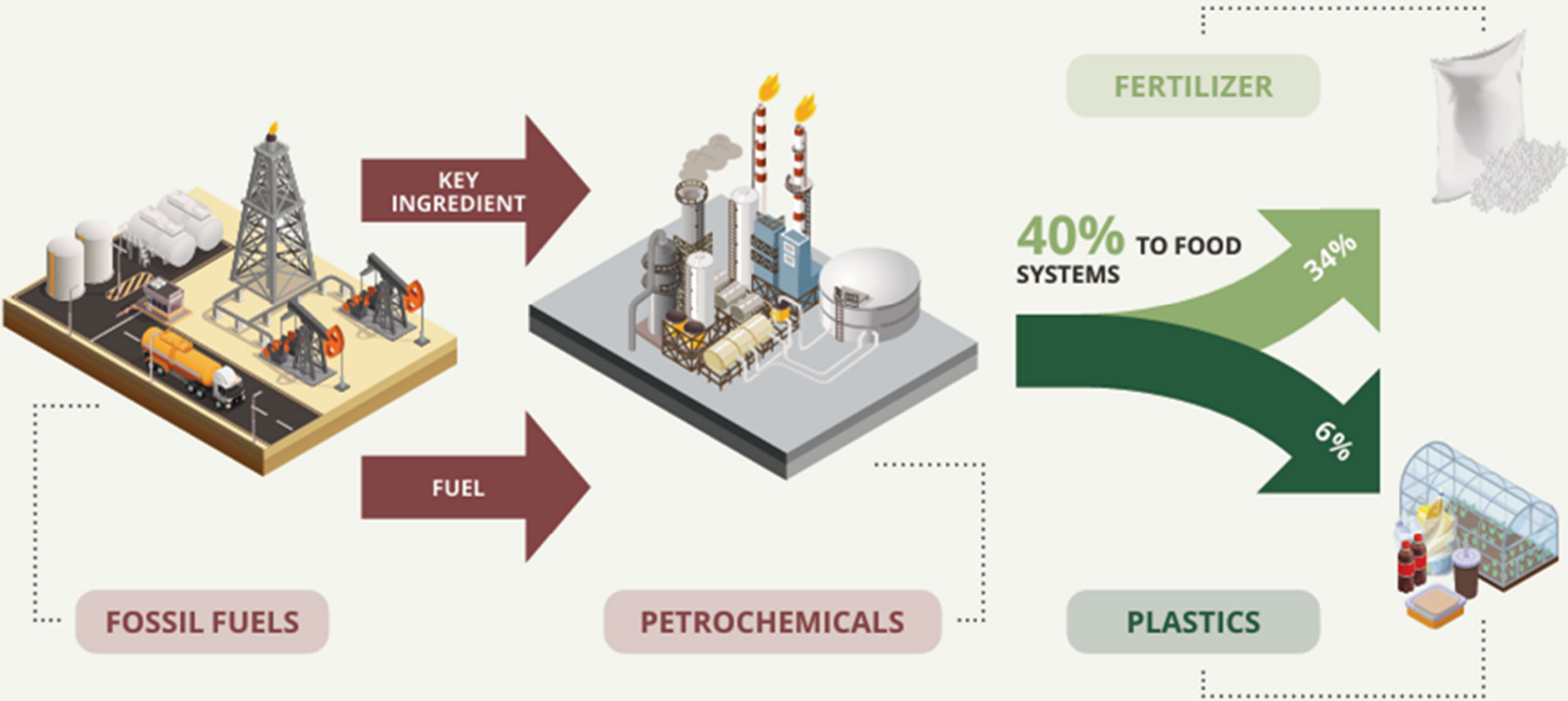
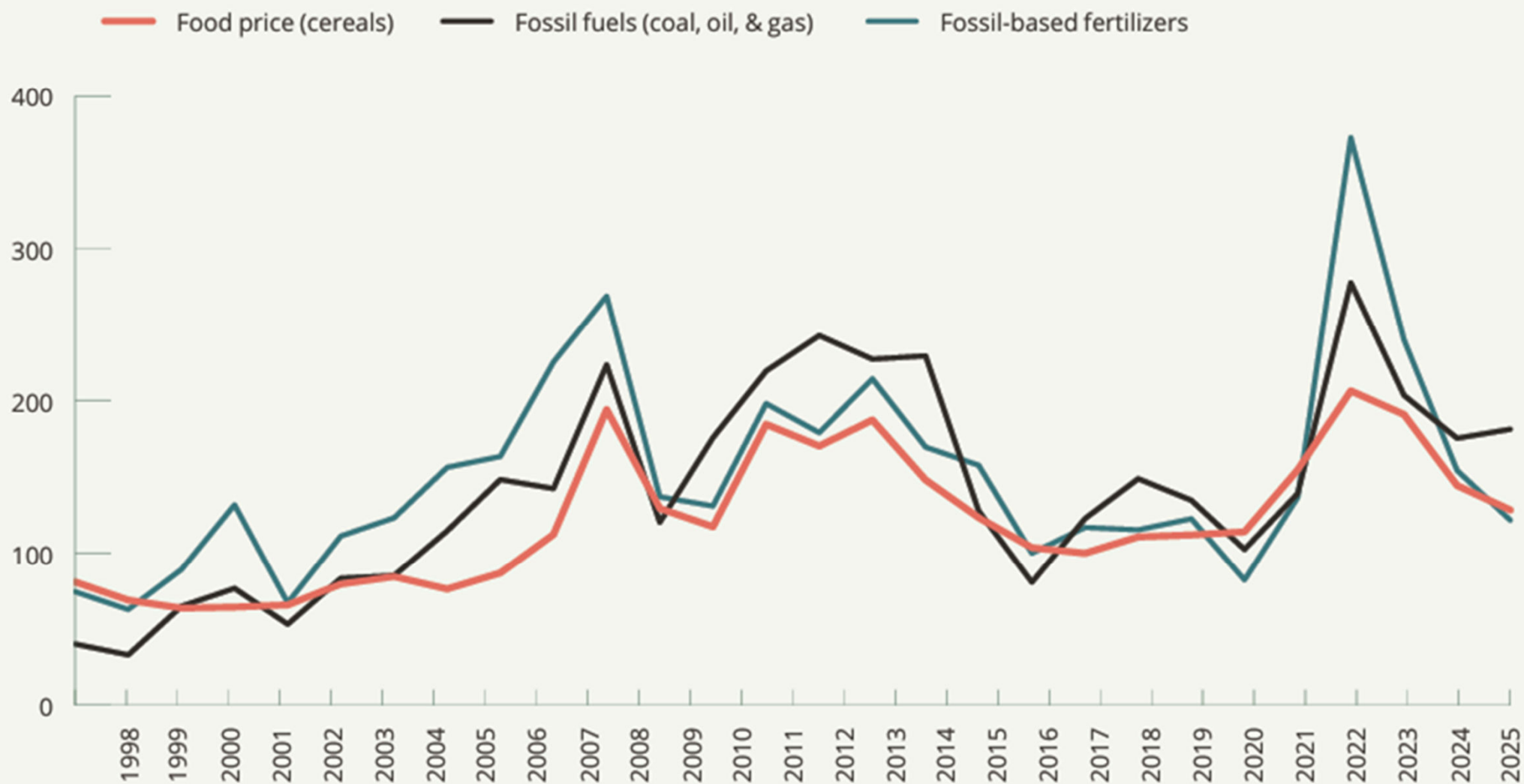


FIGURE 3

## FOOD, FERTILIZER, AND FOSSIL ENERGY PRICES ARE DEEPLY INTERLINKED



# Pathways to Decarbonise Food Systems

- **Reject false fixes** – e.g. “blue ammonia”, digital intensification, or carbon capture schemes that deepen fossil reliance.
- **Promote agroecology and regenerative farming** – rebuild biological cycles, reduce synthetic inputs.
- **Shorten supply chains and relocalise** – support territorial food systems to cut transport emissions and dependence.
- **Reform policy and economics:**
  - Phase out fossil fuel subsidies in agriculture.
  - Regulate plastics, packaging, and fossil-based inputs.
  - Support just transitions for farmers and food workers.
- **Vision:** a food system where **production, diets, and governance** are decoupled from fossil fuels — **sustainable, equitable, and resilient.**