

Food system transformation is not just a science problem:

Rethinking knowledge across different actors of the food supply chain

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We know more than ever. So why is transformation towards sustainability so difficult?

- **Environmental impacts of food systems are (fairly) well documented.**
- **Food waste measurements are being taken more and more often.**
- **The implications of (un)sustainable diets are increasingly understood.**
- **Unsustainable food production and consumption practices persist.**
- **Food waste remains high or even growing.**
- **Behavioural change is uneven.**

Environmental Impacts of Food Production

What are the environmental impacts of food production? How do we reduce the impacts of agriculture on the environment?

By [Hannah Ritchie](#), [Pablo Rosado](#), and [Max Roser](#)

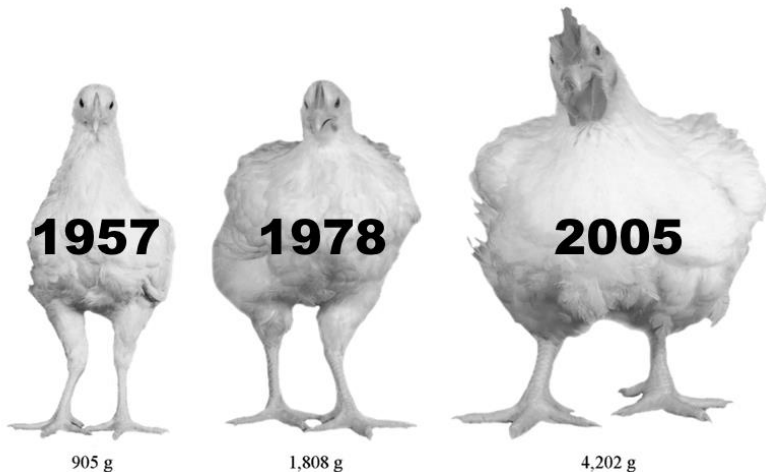
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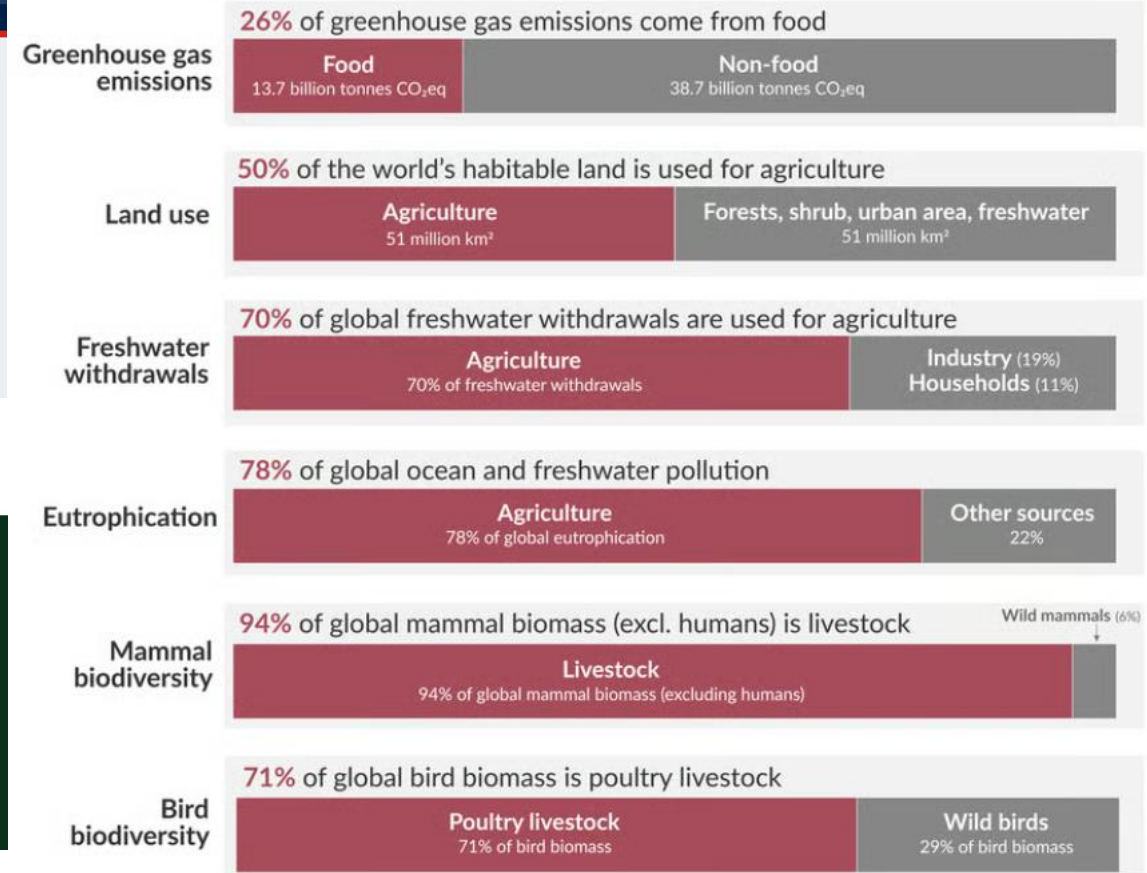
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REDUCING FOOD WASTE

Fighting food waste on a global scale.



The environmental impacts of food and agriculture



Data sources: Poore & Nemecek (2018); UN FAO; UN AQUASTAT; Bar-On et al. (2018).

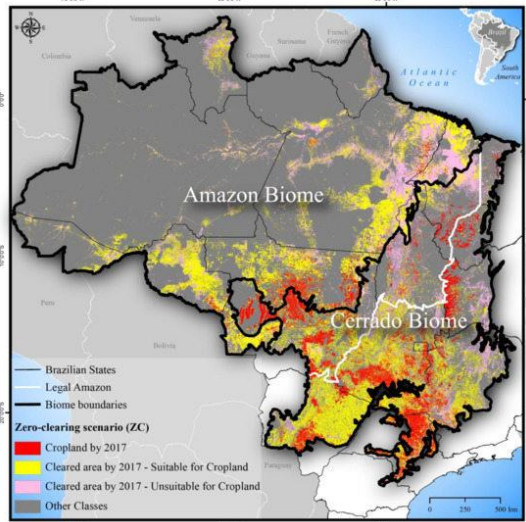
Licensed under CC-BY by the author Hannah Ritchie.

What if the challenge is not insufficient knowledge, but how knowledge travels across the food system?

The potential knowledge deficit model...

- **Science → Evidence → Awareness / Understanding → Policy / Practice → Transformation (?)**
- Many transformation efforts implicitly assume that more (scientific) knowledge leads to better decisions.
- But food systems are populated by very different actors with very different priorities and very different attitudes.
- Organisational / Occupational / National culture also play a role

Some examples



The food system as multiple knowledge worlds / domains

Every actor already possesses expertise. The issue is that expertise takes different forms.

Actor	Main knowledge orientation
Farmers	Ecological and experiential <u>e.g., best yield</u>
Manufacturers	Technical and process-based <u>e.g., UPFs</u>
Retailers	Logistical and behavioural <u>e.g., marketing</u>
Chefs	Experimental and aesthetic <u>e.g., fine dining</u>
Consumers	Practical and affective <u>e.g., quick and tasteful</u>

What kind of science does each actor actually need?

Actor	Sustainability science that resonates
Farmers	Soil health, resilience
Manufacturers	Process efficiency
Retailers	Spoilage prediction
Chefs	Creative valorisation
Consumers	Practical heuristics e.g. repurposing recipes

Let's look closer at farmers, chefs and consumers



- Soil
- Weather
- Crop cycles



- Sensory judgement
- Reconstruction of existing recipes
- Experimentation

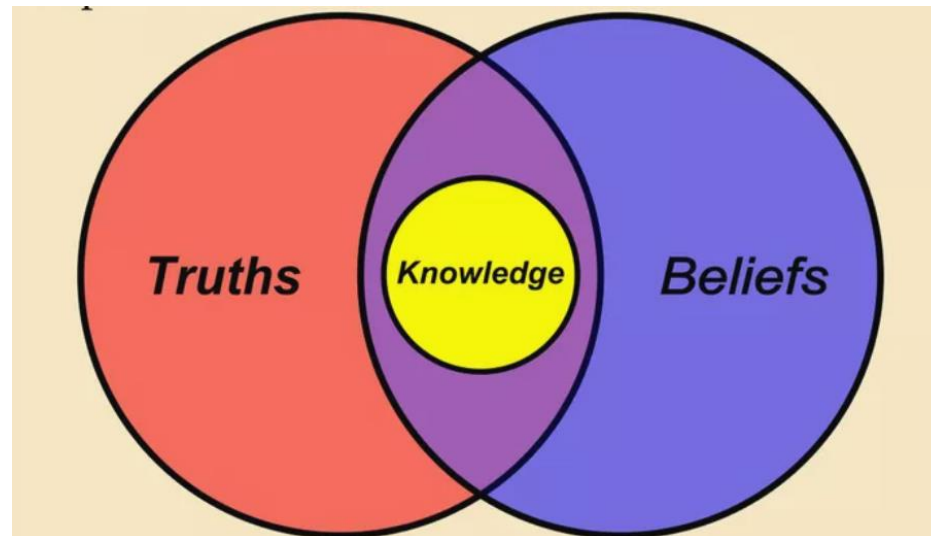


- Habits
- Emotions
- Social norms

These actors are not waiting to be filled with scientific knowledge.

They already operate through rich knowledge systems (often transferred through generations).

- **Epistemic misalignment may occur when sustainability knowledge is produced in forms that do not align with how actors understand, experience, and act in the food system.**
- Epistemology is the philosophical study of knowledge.
- Its core purpose is to answer two fundamental questions: "***What do we know?***" and "***How do we know it?***" It examines the difference between justified belief and actual truth and asks how we can trust our senses and reasoning.



Examples

- Scientific metrics vs consumer habits **e.g., the growth of food deliveries.**
- Food cost calculations vs chef creativity **e.g., gazpacho.**
- Global models vs farmer experience **e.g., Subak in Bali.**

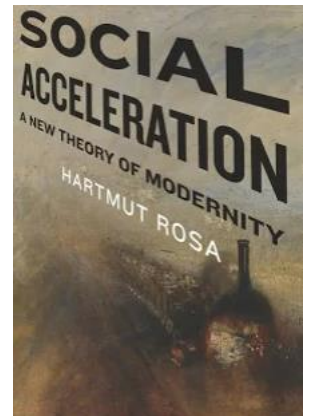
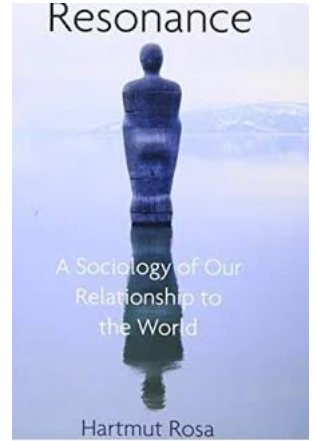


'Lazy but convenient' - a quarter of young adults have two or more takeaways a week



Why knowledge fails to travel across the food system?

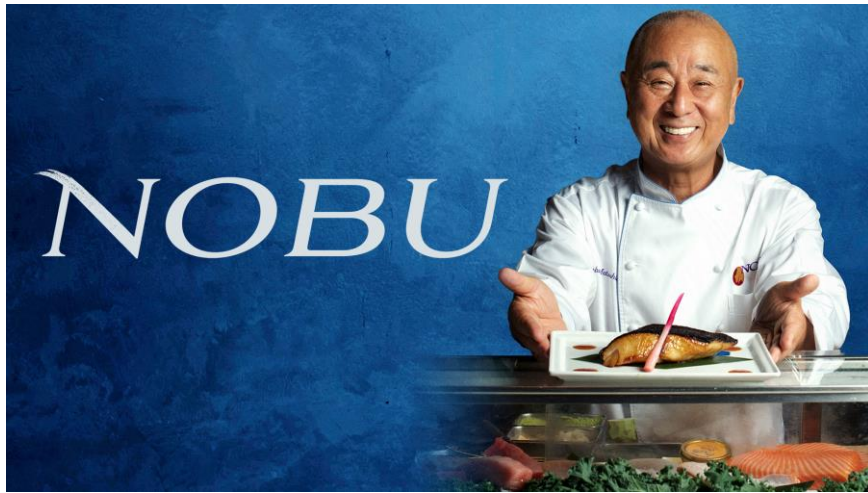
- From knowledge to **resonance**
- Knowledge must resonate before it can transform behaviour.
- Many sustainability messages remain cognitively understood but experientially distant.
- Knowledge $\neq$ Resonance $\neq$ Action
- **Data / Information is not the same as connection.**



Re-establishing resonance: potential role of arts

- From knowledge to **resonance**

Science	Culture	Arts
kg of...	Deeply embedded values	Storytelling
calories...		Film
m3 of...		Theatre
liters of...		Culinary arts
kWt of...		Food aesthetics

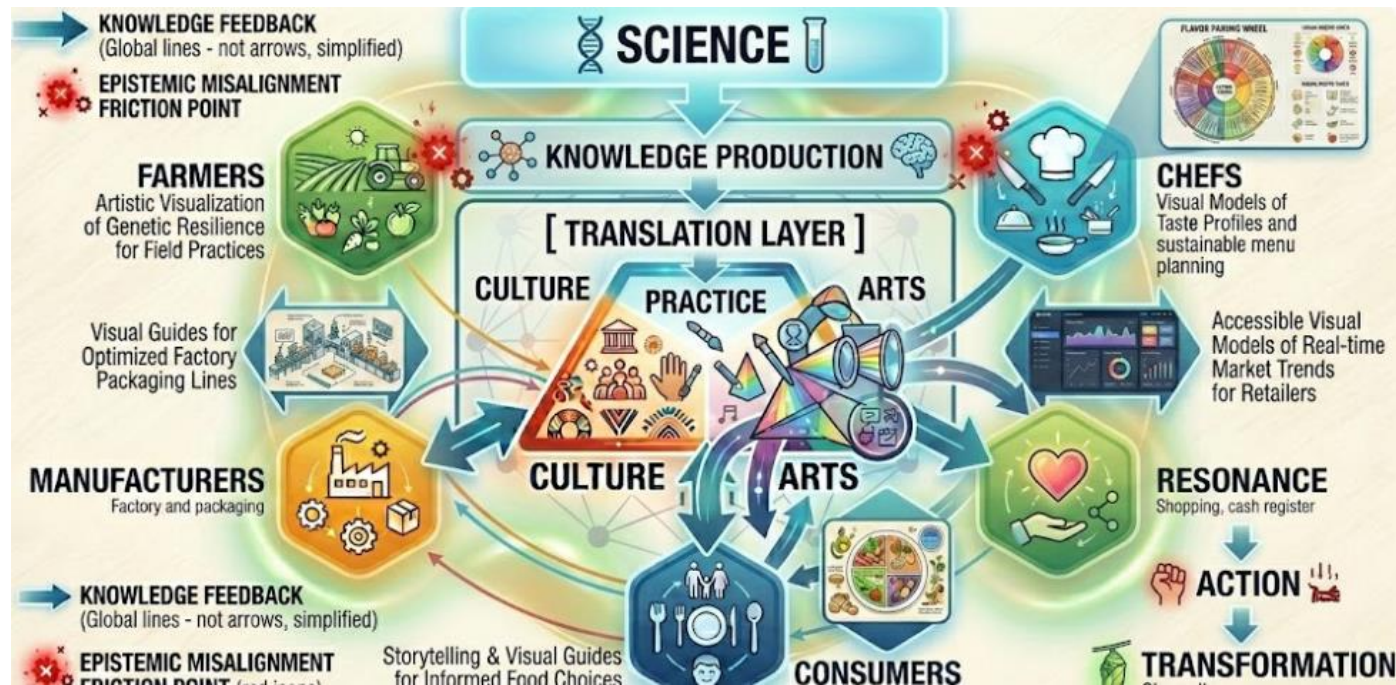




Object the abjection (Julia Kristeva)

Transformation through (better) epistemic alignment

- Arts do not replace science. They can help us translate science into lived experience, thus leading to better resonance as defined by Rosa.
- ...and the good news is that most people (up to 80% of adults globally) like arts although the level of their engagement and preferences varies



Implications

For academic research

- Move beyond knowledge production towards knowledge alignment.
 - **UK's REF exercise**

For policy-making

- Recognise actor-specific ways of knowing.
 - **EU Waste Framework Directive**, restaurants and food services are legally required to achieve a 30% per capita reduction in food waste by 2030 → especially encouraging food donation

For practice

- Integrate scientific, experiential, and artistic approaches.
 - <https://www.openkitchenmcr.co.uk/food-waste>



Conclusion

- Food system transformation is not only a scientific challenge.
- Different actors rely on different forms of knowledge. Knowing this knowledge can aid in developing better resonance with what science tells them/us
- The success of sustainable transformation may depend on achieving epistemic alignment and resonance across the food system.
- **If farmers, chefs, retailers and consumers all know sustainability differently, should food systems science focus only on producing knowledge or also on cultivating resonance?**