



Living with the trouble: mapping sustainable food futures

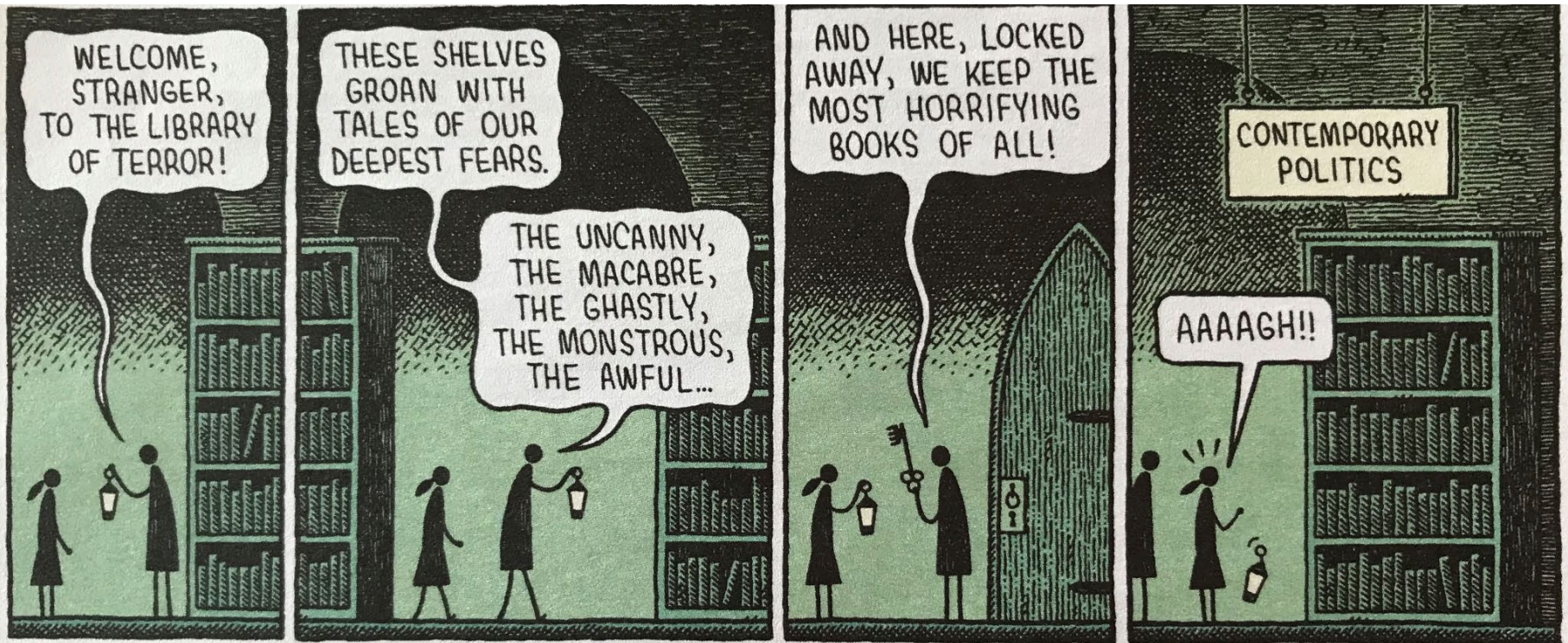
Professor Damian Maye

Inaugural Lecture, 15th May 2019

CCRI, University of Gloucestershire

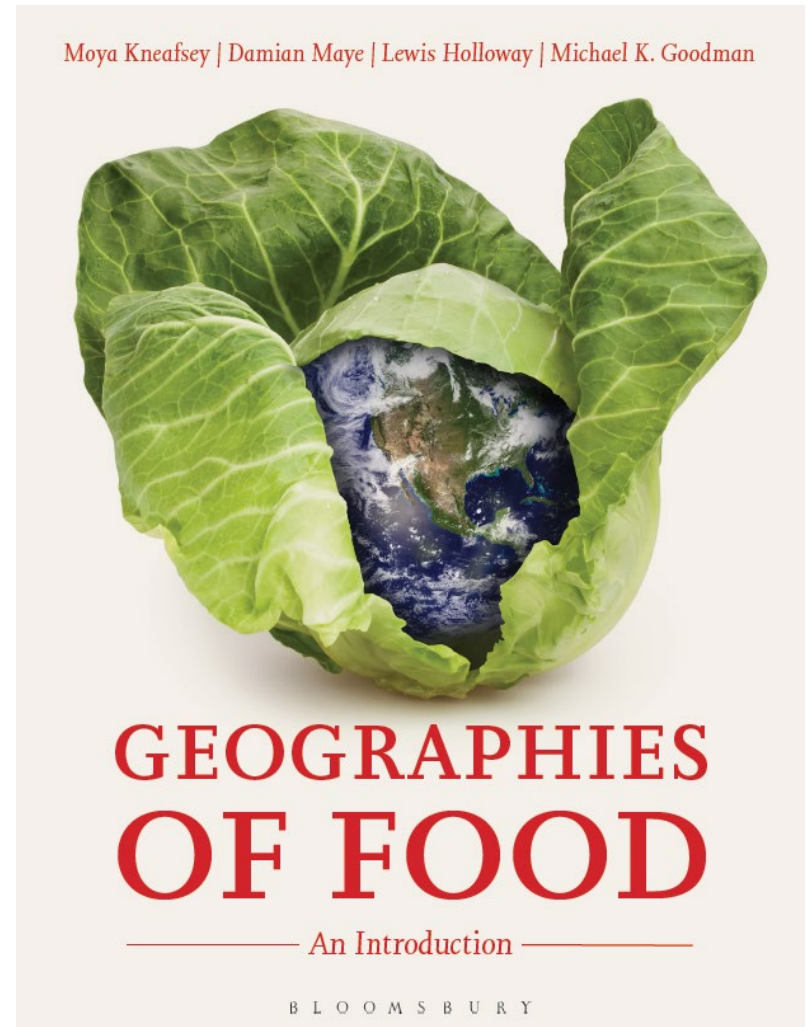
dmaye@glos.ac.uk; [@DamianMaye](https://twitter.com/DamianMaye)

Brexit and climate change



Food and farming-related troubles ...

- 815 million people are undernourished; rise of food poverty & food banks
- 30% of global food production is wasted along the food chain
- Food of poor nutritional quality & obesity
- Food is damaging the Earth's natural ecosystem
- Food is embedded with other systems (evident after the 2007-08 financial crisis)
- Environment-health-finance nexus of food & farming-related 'troubles'



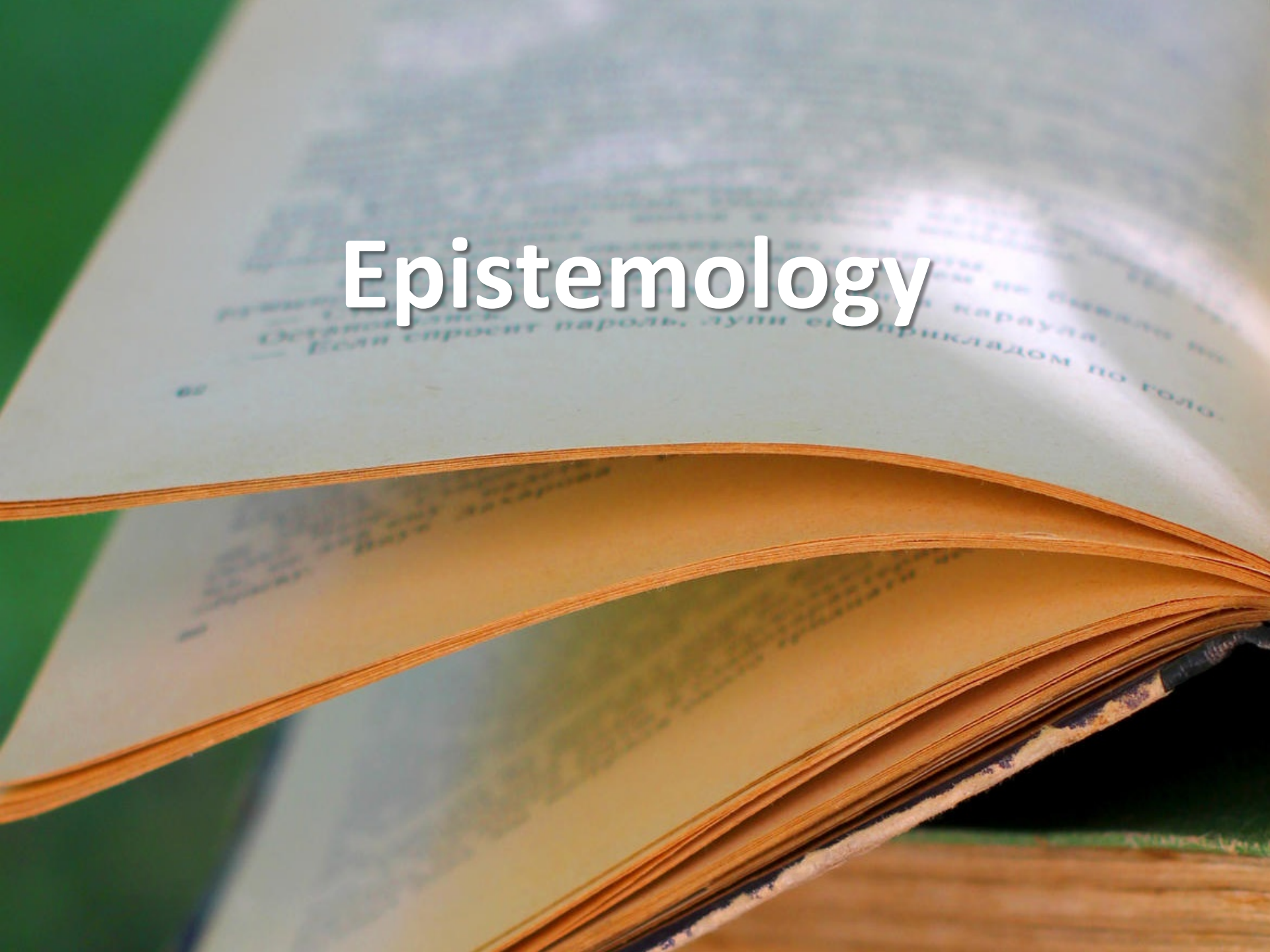
Food in the Anthropocene

- Trouble: “to stir up”, “to make cloudy”, “to disturb” (Haraway, 2016: 1)
- IPCC 1.5°C report (2018); IPBES report (2019); EAT-Lancet (2019)
- Climate now actively threatens our existential status at a species level (Head, 2016)
- Links agri-food scholarship to **the Anthropocene** (the first geological epoch shaped by human activity)

Living with the trouble

- Anxious, pessimistic politics of the Anthropocene (Haraway, 2016: 3); neither despair or hope is sensible re. futurism
- Need to foster positive paths *in the present*
- Four themes/paths:
 - Agri-food epistemology;
 - Agri-food ethics;
 - Agri-food economies;
 - Agri-food experimentation.

Epistemology

An open book is shown from a top-down perspective, slightly angled. The pages are a light cream or off-white color, and the binding is a warm, brownish-orange hue. The text on the pages is in a Cyrillic script, appearing as a blurred background. The word 'Epistemology' is superimposed in the center of the image in a large, white, sans-serif font with a subtle drop shadow, making it stand out against the book's pages.

The meat debate: framing food futures

a) *Plant-based food future*

The Lancet Commissions

ARTICLE

<https://doi.org/10.1038/s41586-018-0594-0>

Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems



Walter Willett, Johan Rockström, Brent Loken, Marco Springmann, Tim Lang, Sonja Vermeulen, Tara Garnett, David Tilman, Fabrice DeClerck, Amanda Wood, Malin Jonell, Michael Clark, Line J Gordon, Jessica Fanzo, Corinna Hawkes, Rami Zurayk, Juan A Rivera, Wim De Vries, Lindiwe Majele Sibanda, Ashkan Afshin, Abhishek Chaudhary, Mario Herrera, Rina Agustina, Francesco Branca, Anna Lartey, Shenggen Fan, Beatrice Grona, Elizabeth Fox, Victoria Bignet, Max Troell, Therese Lindahl, Sudhvir Singh, Sarah E Cornell, K Srinath Reddy, Sunita Narain, Sania Nishtar, Christopher J L Murray

Options for keeping the food system within environmental limits







Marco Springmann^{1,2*}, Michael Clark³, Daniel Mason-D'Croz^{4,5}, Keith Wiebe⁴, Benjamin Leon Bodirsky⁶, Luis Lassaletta⁷, Wim de Vries⁸, Sonja J. Vermeulen^{9,10}, Mario Herrero⁵, Kimberly M. Carlson¹¹, Malin Jonell¹², Max Troell^{12,13}, Fabrice DeClerck^{14,15}, Line J. Gordon¹², Rami Zurayk¹⁶, Peter Scarborough², Mike Rayner², Brent Loken^{12,14}, Jess Fanzo^{17,18}, H. Charles J. Godfray^{1,19}, David Tilman^{20,21}, Johan Rockström^{6,12} & Walter Willett²²



Target 1: Healthy Diet



Target 2: Sustainable Food Production

Earth system process	Control variable	Boundary (Uncertainty range)
Climate change	 GHG emissions	5 Gt CO ₂ -eq yr ⁻¹ (4.7 – 5.4 Gt CO ₂ -eq yr ⁻¹)
Land-system change	 Cropland use	13 M km ² (11–15 M km ²)
Freshwater use	 Water use	2,500 km ³ yr ⁻¹ (1000–4000 km ³ yr ⁻¹)
Nitrogen cycling	 N application	90 Tg N yr ⁻¹ (65–90 Tg N yr ⁻¹) * (90–130 Tg N yr ⁻¹)**
Phosphorus cycling	 P application	8 Tg P yr ⁻¹ (6–12 Tg P yr ⁻¹) * (8–16 Tg P yr ⁻¹)**
Biodiversity loss	 Extinction rate	10 E/MSY (1–80 E/MSY)

*Lower boundary range if improved production practices and redistribution are not adopted.

**Upper boundary range if improved production practices and redistribution are adopted and 50% of applied phosphorus is recycled.

- *To stay within the safe operating space for food systems it will require “substantial shifts toward mostly plant-based dietary patterns, dramatic reductions in food losses and waste, and major improvements in food production practices” (EAT-Lancet Commission Summary Report, 2019: p. 16)*
- Sustainable intensification is the favoured approach re. production practices

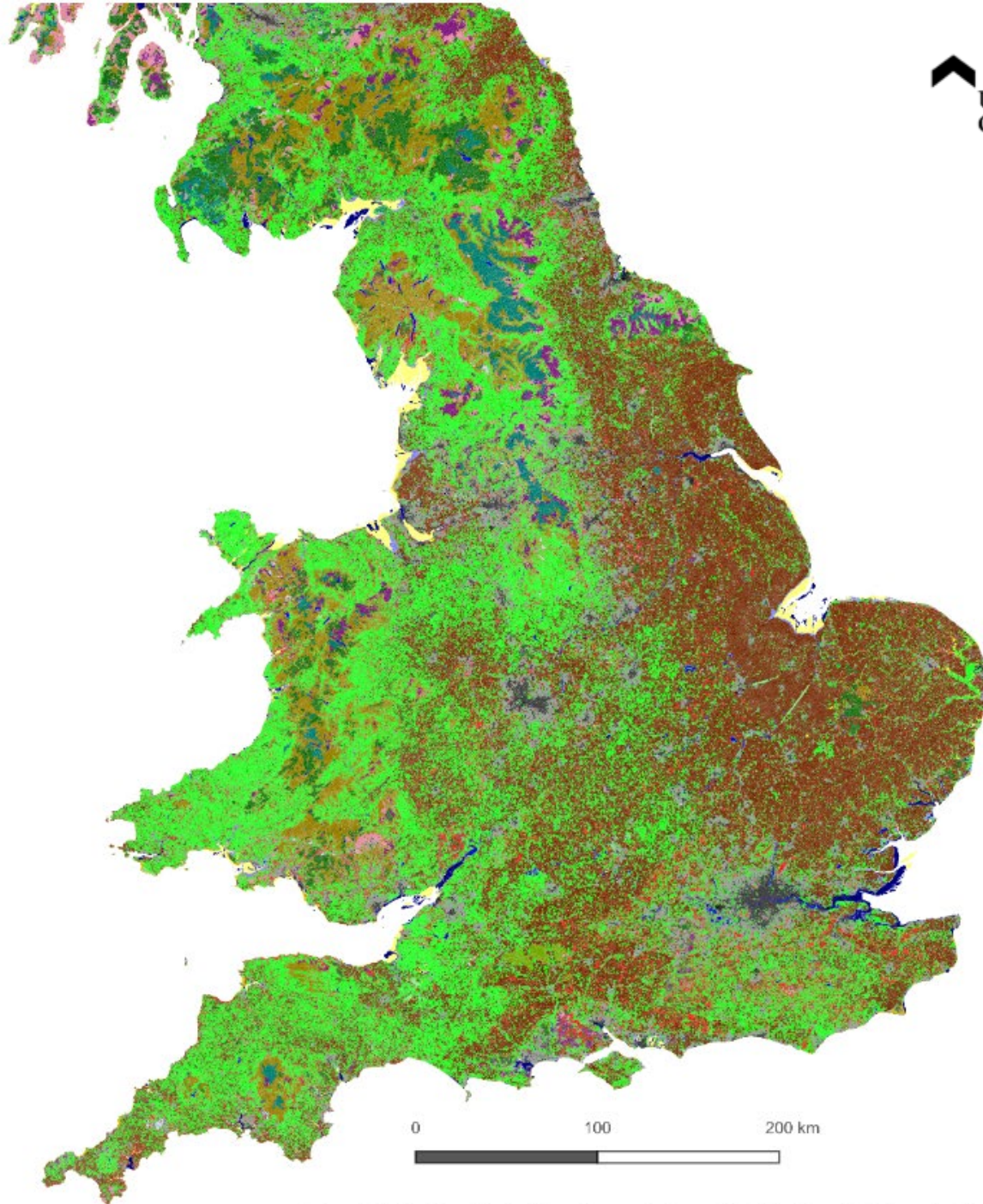
b) Agro-ecological food future

Grass-fed livestock

- Sustainable Food Trust/Patrick Holden
- Pasture-fed Livestock Association

Contest EAT-Lancet recommendations. E.g.:

- We should not reduce beef and lamb consumption over poultry;
- In the UK a high % of farmland only suitable for growing grass; grass & grazing should be reintroduced in all-arable crop rotations.



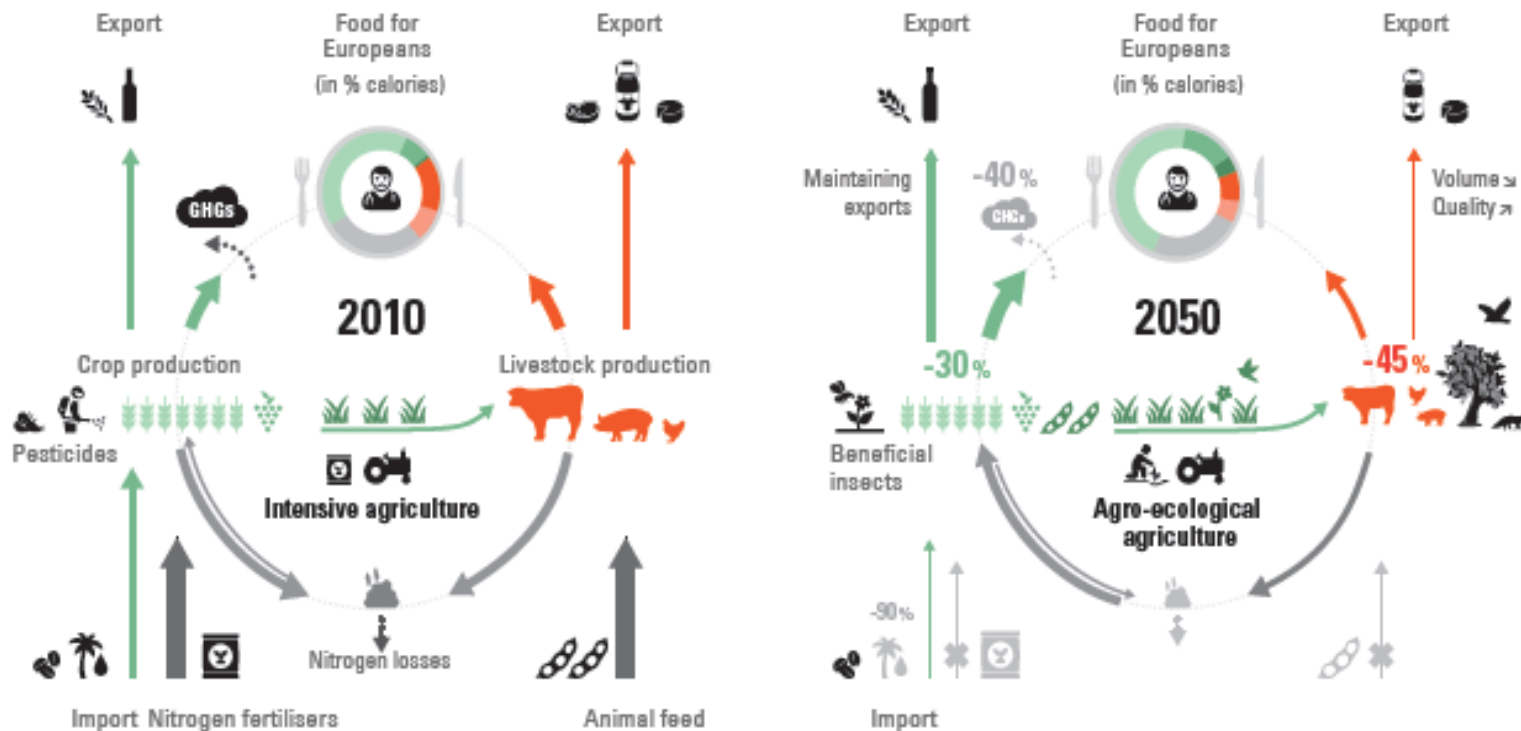
Land cover type

- Broadleaved woodland
- Coniferous woodland
- Arable and horticulture
- Improved grassland
- Neutral grassland
- Calcareous grassland
- Acid grassland
- Fen, Marsh and Swamp
- Heather
- Heather grassland
- Bog
- Inland rock
- Saltwater
- Freshwater
- Supra-littoral Rock
- Supra-littoral Sediment
- Littoral Rock
- Littoral sediment
- Saltmarsh
- Urban
- Suburban

Data sources:

1) Land Cover Map 2015 [FileGeoDatabase geospatial data].
Scale 1:2500. Tiles: GB. Updated: 25 May 2017. CEH. Using
EDINA Environment Digimap Service. <<https://digimap.edina.ac.uk/>>. Downloaded: 2019-04-01
15:45:25.212

2) Ordnance Survey Boundary-Line. Contains OS data ©
Crown copyright and database right 2019.

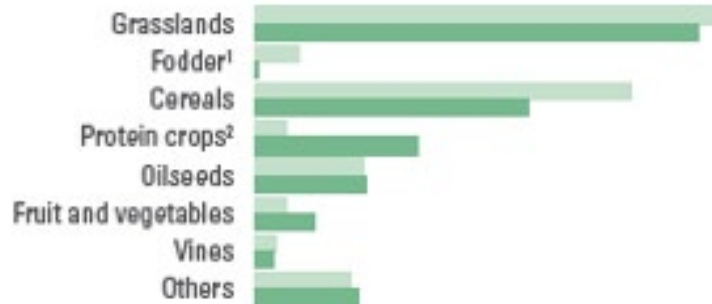


Productions

- Cereals and starchy foods
- Fruit and vegetables
- Protein crops (peas, lentils, etc.)
- Meat, eggs and fish
- Dairy products
- Others



Land use ● 2010 ● 2050



1: non protein; 2: grain and fodder

STUDY

N°09/18 SEPTEMBER 2018

An agroecological Europe in 2050: multifunctional agriculture for healthy eating

Findings from the Ten Years For Agroecology (TYFA) modelling exercise

Xavier Poux (AScA, IDDRI), Pierre-Marie Aubert (IDDRI)

With contributions from Jonathan Saulnier, Sarah Lumbroso (AScA), Sébastien Treyer, William Loveluck, Elisabeth Hege, Marie-Hélène Schwoob (IDDRI)



Grasslands

c) *Lab-based food future*

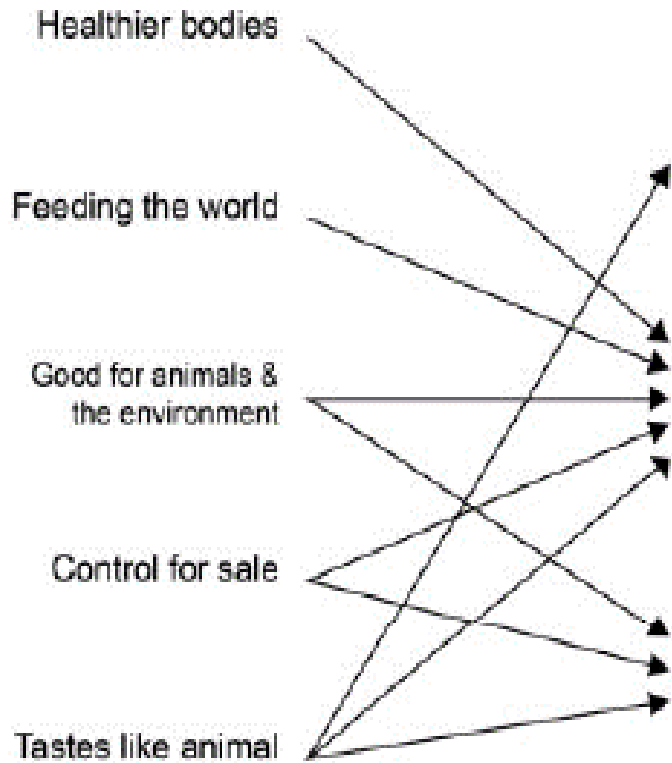
- Plant-based proteins, edible insect products and ‘cellular agriculture’ as ‘the future of protein’ (Froggatt and Wellesley, 2019)
- Cellular agriculture: use cell science techniques to grow animal-derived foods outside the animal body (i.e. ‘in vitro’)
- *Promissory narratives* (Sexton et al., 2019)

**THE
IMPOSSIBLE
BURGER**

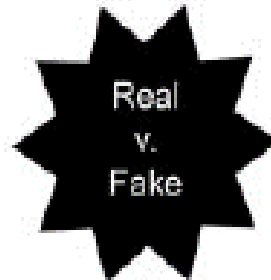
It's here. A delicious burger made entirely from plants for people who love meat. No more compromises. Ready for an introduction?



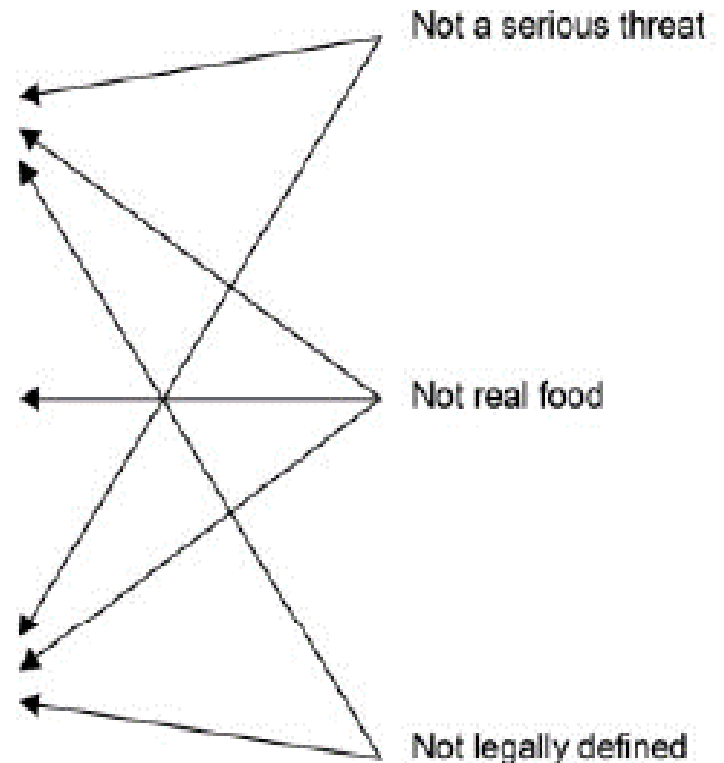
The promises of alternative proteins



FLASHPOINT



Counter-narratives of the livestock industry



Promissory narratives, counter-narratives & flashpoints (Sexton et al., 2019: 16)

Particular 'food futures' are imagined ...

- Eat less meat/sustainable diet; agroecology; alternative proteins

Reflects wider long-running 'battles' over agri-food production 'futures' (Kneafsey et al., 2020):

- **Technocentric:** food technology, digital and precision agriculture, vertical farming, the 'smart food city' (Maye, 2019);
- **Ecocentric:** agroecology, ecological sustainability and resilience, grass-fed/agroforestry, etc., the multifunctionality of farming.

New geographies of food (rural and urban) and different knowledge systems

Values in an era of post-truth politics

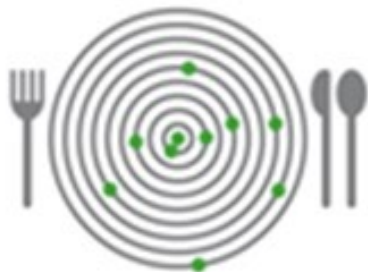
- The meat debate is polarised (Sexton et al., 2019)
- Cultural, social and contextual challenges around transitioning from meat to plant-based diets (Garnett, 2014; ‘cultural capital’ of meat eating— Bourdieu, 1979; local agro-ecologies, etc.)
- Science suggests we know the solutions, but *we don’t know about the future* – much more uncertain than it appears (DuPuis, 2019)
- Consensus we need to act but issues are “as much about values as ‘science’” (Garnett, 2014: 31); i.e. shared values, social practices, less normative

Ethics



Multiple perspectives & agri-food ethics

- **Post-normal science** (Funtowicz and Ravetz, 1993); legitimise multiple perspectives
- Examined actors' perceptions of food chain performance in 12 countries, across four **spheres** of debate (public, market, scientific and policy) and five **dimensions** (economic, social, environment, health and ethics)
- See Brunori et al., 2016, Kirwan et al., 2017a/b, Maye et al., 2016/2019



GLAMUR
Global and local food assessment:
a MULTIdimensional performance-based approach

Multi-Criteria Performance Matrix (Kirwan et al 2017a/b)

Dimension / Sphere	Economic	Social	Environmental	Health	Ethical
Public	<ul style="list-style-type: none"> •Affordability •Creation & distribution of added value •Contribution to economic development 	<ul style="list-style-type: none"> •Information & communication •Food security 	<ul style="list-style-type: none"> •Resource Use •Pollution 	<ul style="list-style-type: none"> •Nutrition •Food safety •Traceability 	<ul style="list-style-type: none"> •Animal Welfare •Responsibility •Labour relations •Fair Trade
Scientific	<ul style="list-style-type: none"> •Contribution to economic development •Technological innovation •Governance 	<ul style="list-style-type: none"> •Consumer behaviour •Territoriality 	<ul style="list-style-type: none"> •Resource Use •Biodiversity •Efficiency •Technological innovation •Food waste 	<ul style="list-style-type: none"> •Nutrition •Food safety 	<ul style="list-style-type: none"> •Fair Trade •Animal welfare
Market	<ul style="list-style-type: none"> •Efficiency •Profitability / competitiveness •Connection •Technological innovation •Resilience 	<ul style="list-style-type: none"> •Information & communication •Territoriality •Connection 	<ul style="list-style-type: none"> •Efficiency 	<ul style="list-style-type: none"> •Traceability •Food safety 	<ul style="list-style-type: none"> •Fair Trade •Territoriality
Policy	<ul style="list-style-type: none"> •Creation & distribution of added value •Contribution to economic development •Efficiency •Resilience •Food waste 	<ul style="list-style-type: none"> •Consumer behaviour •Labour relations 	<ul style="list-style-type: none"> •Food Waste •Pollution 	<ul style="list-style-type: none"> •Traceability •Nutrition •Food Safety 	<ul style="list-style-type: none"> •Food Security •Governance



Ethics and responsabilisation in agri-food governance: the single-use plastics debate and strategies to introduce reusable coffee cups in UK retail chains

Damian Maye¹  · James Kirwan² · Gianluca Brunori³

Takeaway coffee cups - context

- Plastic – versatile material but made with fossil fuels and difficult to dispose
- Takeaway coffee cups
- The coffee industry in the UK
- Consumers assume takeaway coffee cups are recyclable but not the case (less than 0.25% are actually recycled)

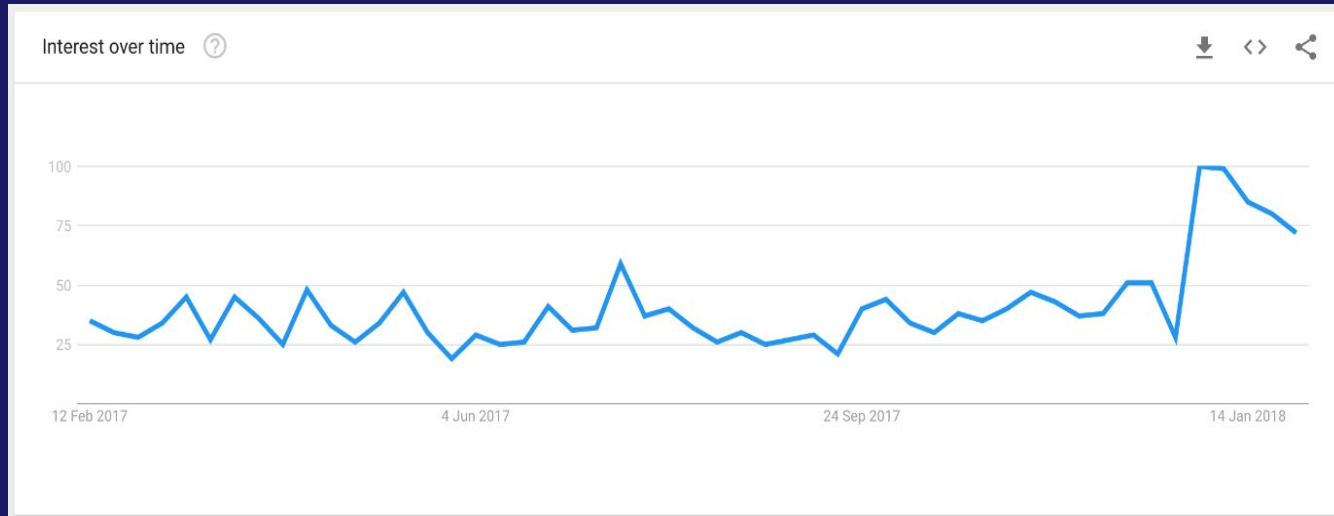


Phase 1: Hugh's 'War on Waste' and the Ellen MacArthur Foundation (circular economy)

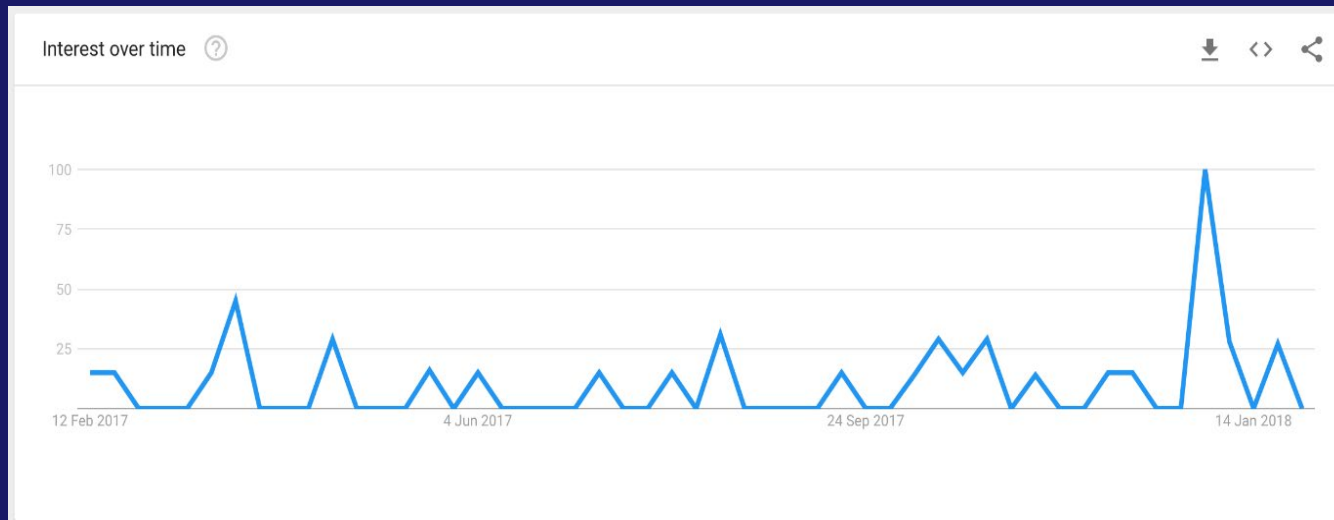


Phase 2: Blue Planet II

Recycling plastic (in the UK):



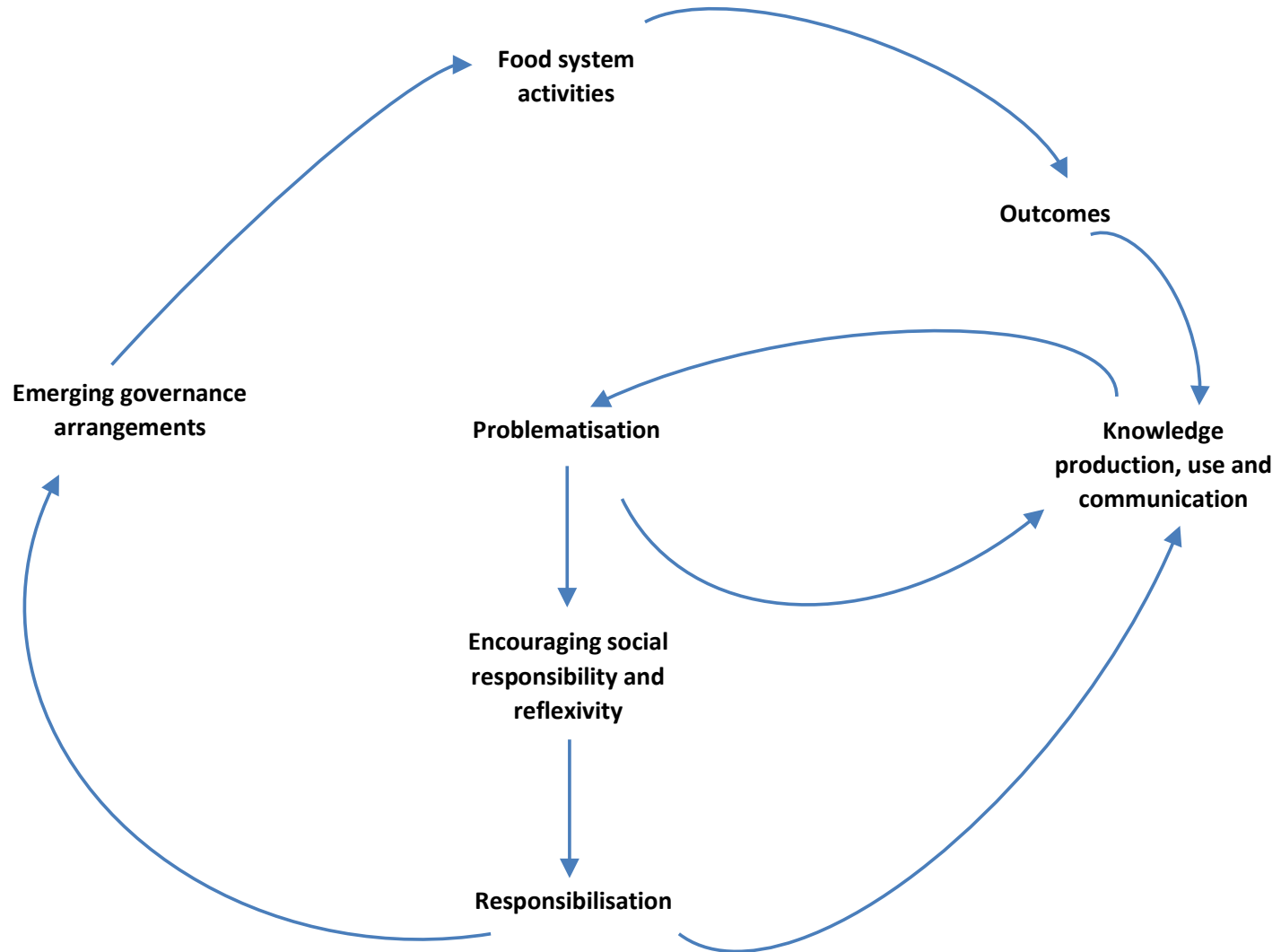
Recycling coffee cups (in the UK):



Strategies of responsabilisation

- Producer Responsibility Scheme
- UK Gov's (Defra 2018) 25 Year Environment Plan
- Collaborative action critical re plastic waste
- EAC (2018) report (*Disposable Packaging; Coffee Cups*):
 - Polluter pays principle and Waste Hierarchy rule;
 - 25p 'latte levy';
 - By 2023 all coffee cups should be recycled/recyclable;
 - Companies pay for disposal;
 - Labelling for consumers.
- Business examples: National Trust, Waitrose, Starbucks, Pret A Manger, Costa Coffee

Strategies of responsabilisation in agri-food governance (Maye et al., 2019: 5)



Economies

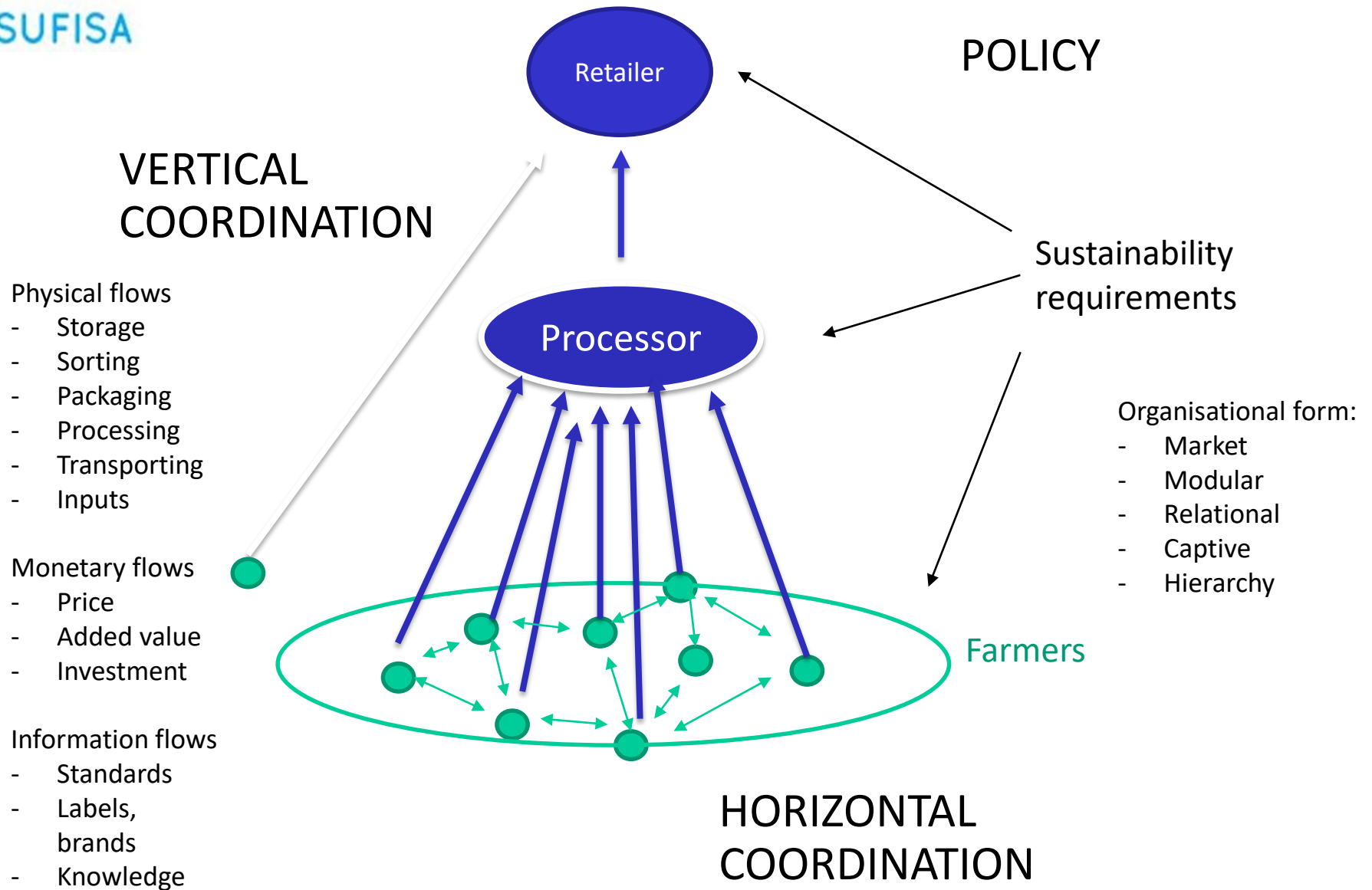


Market-orientated ag. policy

- Milk Package, 2012: need for a ‘contractual economy’ (Derville and Allaire, 2014; Maye et al., 2018/2019)
- Agricultural Markets Taskforce (2016):
 - Ag policy now more market-orientated;
 - Exposure to market instability;
 - Information asymmetry;
 - Market-orientated policy instruments.
- CAP reform post-2020 (Matthews, 2018) & Post-Brexit Ag. policy (Defra, 2018): manage risk & volatility
- Directive on Unfair Trading Practices in the agricultural & food supply chain (EC, 2019)



Institutional arrangements



Institutional arrangements for milk

1. Collective organisational sales:

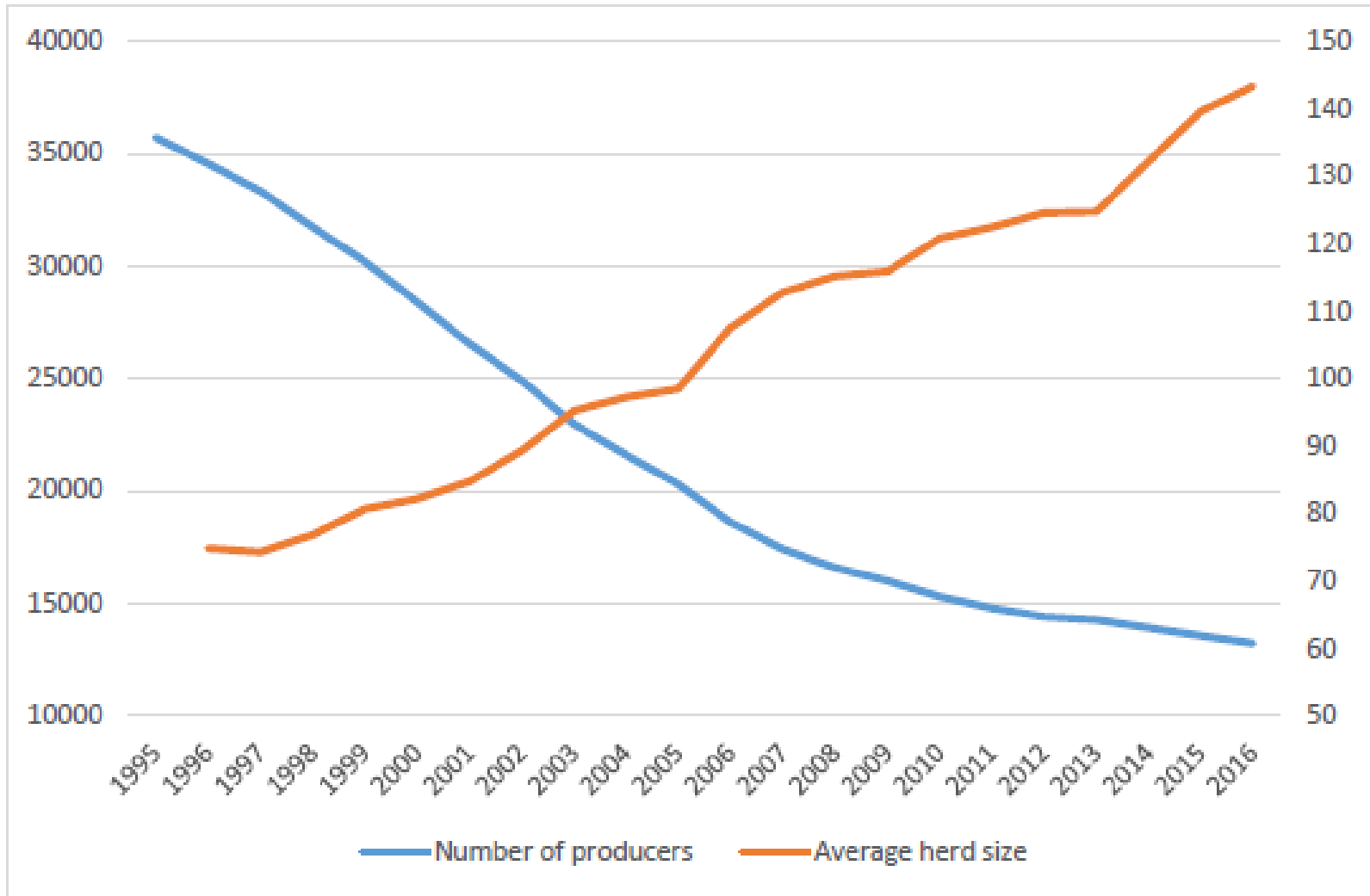
- Co-operatives (Arla, First Milk, OMSCO)
- DPO (Dairy Crest Direct)
- Free Range Dairy Network (grass-fed)



2. Individual sales:

- Supermarket-aligned contracts (e.g. TSDG)
- Direct to processor/milk buyer (Muller [non-aligned], Credition, Barber's, Wykes...)
- Informal arrangements (e.g. direct to consumer)

Dairy farm restructuring in the UK



(Source: AHDB, 2017)

Capitalocene and future 'lock-in'?

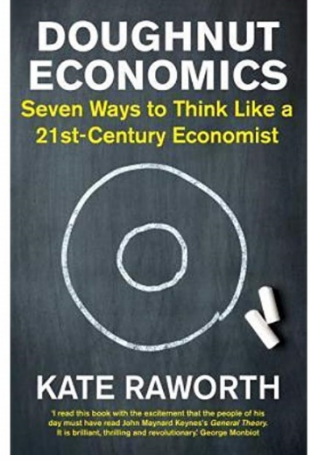
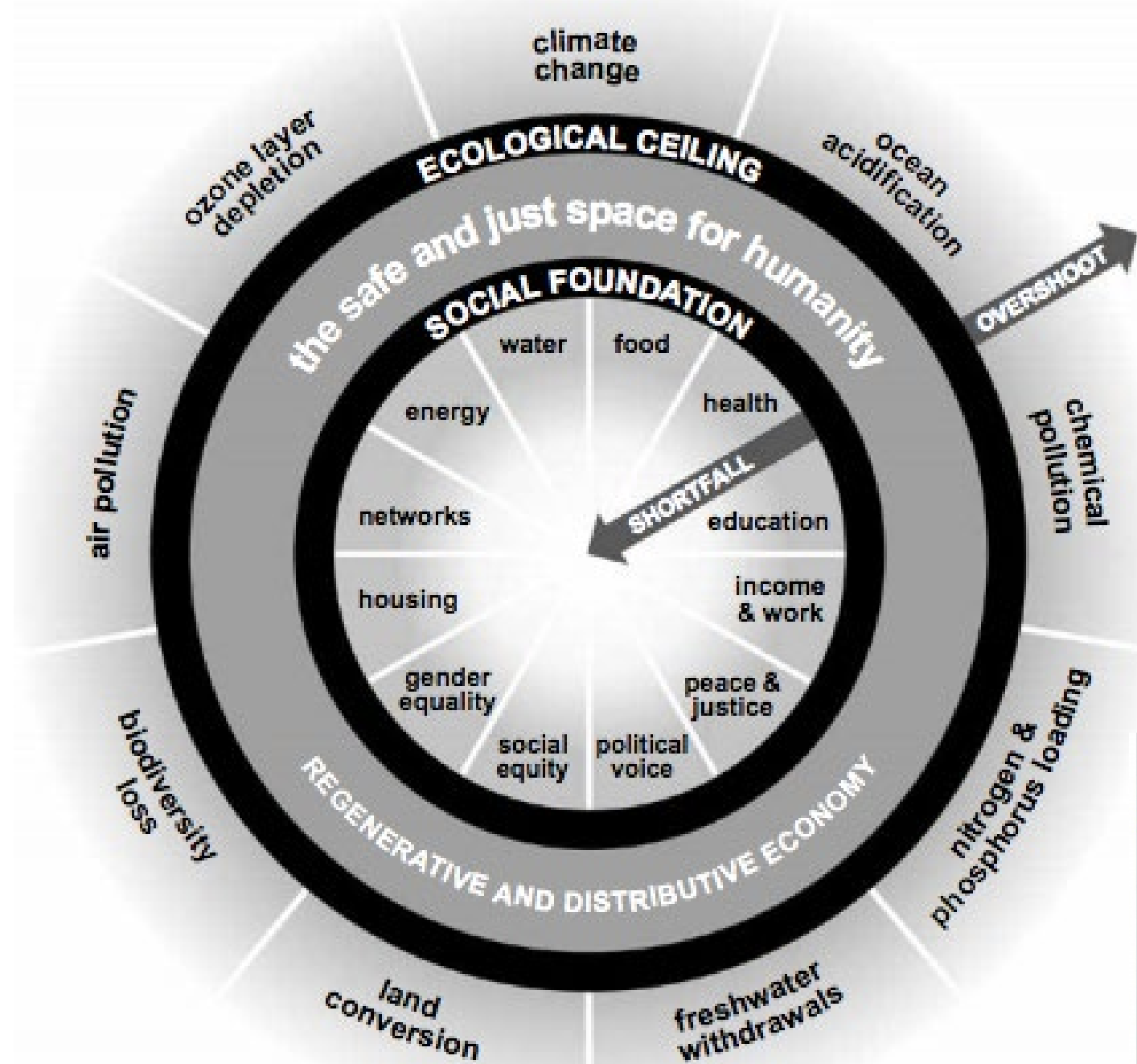
Financialisation

- Growth in financial speculation (Clapp, 2014)
- Two key processes (Marsden et al., 2018):
 - Cost-price squeeze volatilities;
 - Stranded assets in the post-carbon economy.

Digitalisation

- Big Data (D. Goodman in Kneafsey et al., 2020):
 - Big Data are a resource and strategic asset;
 - John Deere's 'intelligent tractors'.





Moving towards the Doughnut in food systems thinking?

- Ethics and ‘the right to food’ (de Shutter, 2011)
- *“Designing governance that is suited to the challenges we face raises deep political issues that confront the longstanding interests and expectations of countries, corporations and communities alike”* (Raworth, 2017: 59)
- Holistic, system-based: e.g. Canada’s National Food Policy; European Common Food Policy?; Food Policy Councils
- A range of design, technology & socio-ecological approaches for food transition e.g. circular economy; agroecology; sustainable diet; sus. intensification



Experimentation

Agri-food experimentation

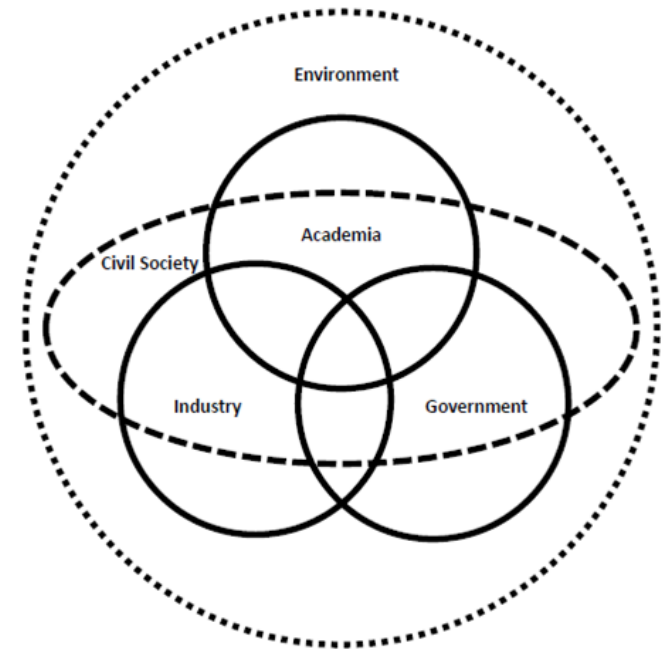
- Climate change ‘experiments’ e.g. Greenovation
- Enables reflexive learning, visioning of future systems and brings different actors together



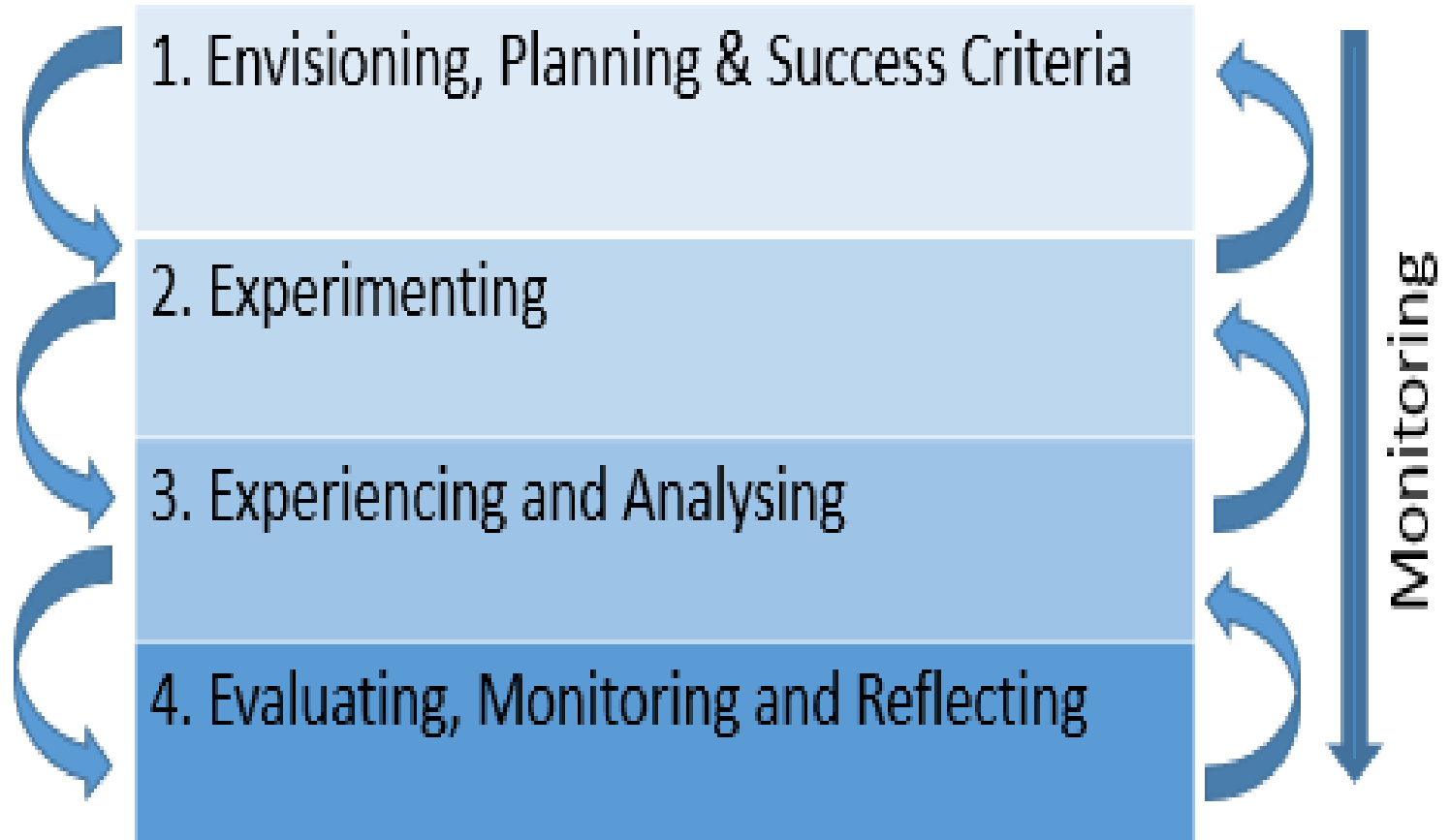
- H2020 ROBUST project:
 - Applying the **‘living lab’ approach** (co-innovation to develop & experiment with governance solutions in place);
 - Aim: to improve rural-urban linkages / governance;
 - UoG and Gloucestershire County Council;
 - Themes: Sustainable Food Systems; Ecosystem Services; New Business Models and Labour Markets.

Living labs: key characteristics

- Geographical embeddedness
- Experimentation and learning
- Participation and user involvement
- Leadership and ownership
- Evaluation and refinement
(Voytenko et al., 2016)
- Quadruple helix model of innovation



Living lab stages



Gloucestershire's 'food lab'

- UoG and Gloucestershire County Council
- New food strategy for Glos (led by RAU)
- Other policy links: Gloucestershire 2050, Local Industrial Strategy, 25 Yr. Enviro Plan, etc.
- Co-innovation but tangible outcomes

Areas of experimentation:

- School food contracts (sustainable diet; Defra's 2014 balanced scorecard criteria);
- New business models (circular, smart, public, PESS).
- Please get involved!

Living with the trouble: closing remarks

- ‘Fractured consensus’ (Maye and Kirwan, 2013) re. the need for (radical) food system change
- Techno-science is important & not the enemy, but the future is uncertain (DuPuis, 2019)
- Four paths / future research themes:
 - Agri-food epistemology;
 - Agri-food ethics;
 - Agri-food economies;
 - Agri-food experimentation.



Thank you for your attention
&
Thank you to all my family,
friends & colleagues!

www.ccri.ac.uk