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A Visionary Perspective on the Future of Food

Professor Guy Poppy CB FMedSci

Interim Executive Chair
Biotechnology & Biological Sciences Research Council
UK Research and Innovation

Conflicts of interest disclosure

- Former Chief Scientific Adviser to UK Government Department (Food Standards Agency, 2014-2020)
- Director of Red Tractor, the UK's biggest farm and food assurance scheme
- Evaluation Expert for the Consultative Group on International Agricultural Research (CGAIR)
- Scientific Trustee/Director at Fera Science Ltd
- Owner of Guy Poppy and Associates Consulting Ltd

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We are the **largest public funder** of research and innovation in the UK – working with the government to invest **over £8 billion a year** - bringing together 9 councils covering all sectors and disciplines.

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- Economic and Social Research Council
- Research England
- Natural Environment Research Council
- Innovate UK
- Medical Research Council

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Food - our current system

‘The food we eat and the way we produce it is doing **terrible damage** to **our planet** and **our health***’

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*National Food Strategy

Health impact

Poor diet - leading driver of non-communicable diseases across the globe

Malnutrition

>820 million people are undernourished around the world, with ~2 billion people facing moderate or severe food insecurity

Obesity

~2 billion adults and 380 million children are obese or overweight – increasing across the globe

Increased risk of type 2 diabetes, cardiovascular disease and cancer

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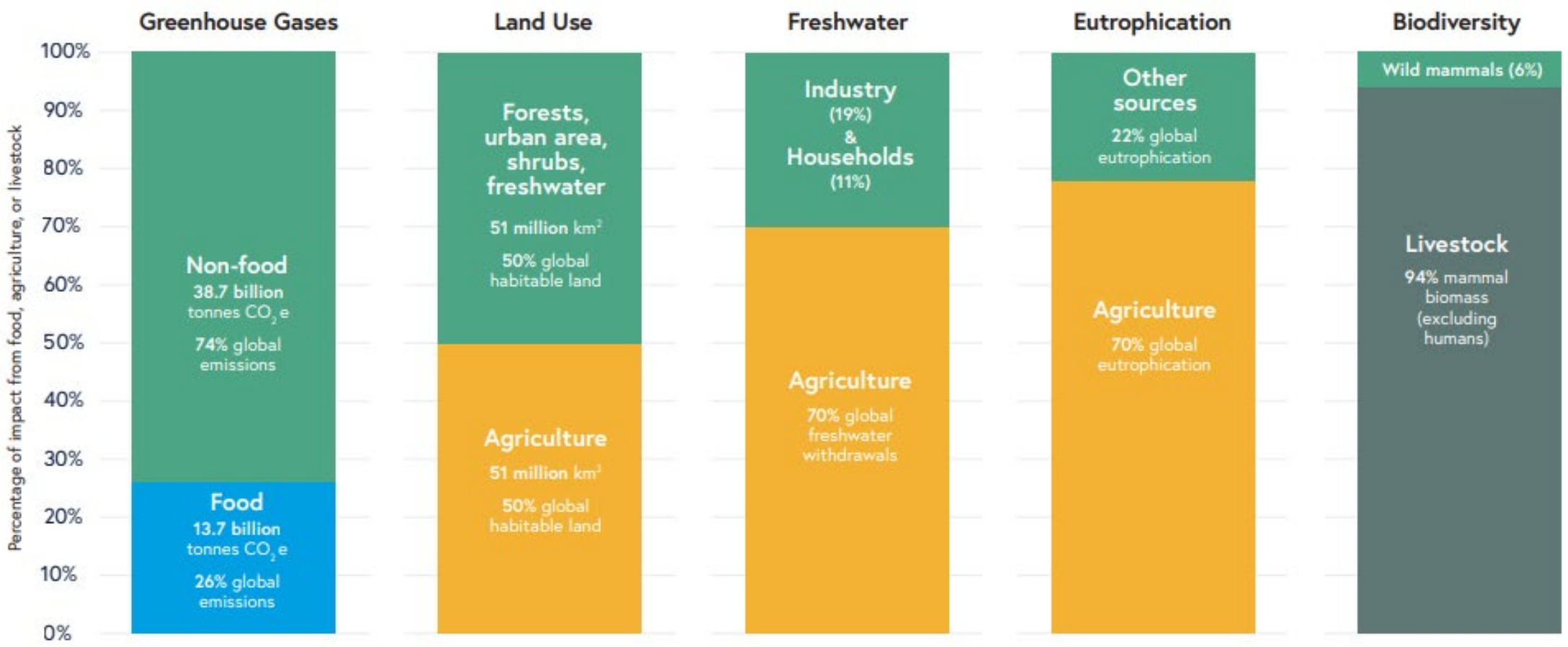
Environmental impact



SOURCE: Ritchie, H. (2019). Our World In Data; online

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The need for change

Global Challenges facing our food system

Climate change	Transition to net zero	Land use	Food security	Health
Weather Disease Pests	Need for more sustainable food production	Biodiversity loss Soil health	Increasing population Shocks to food supply	Nutrition Food safety Social inequalities

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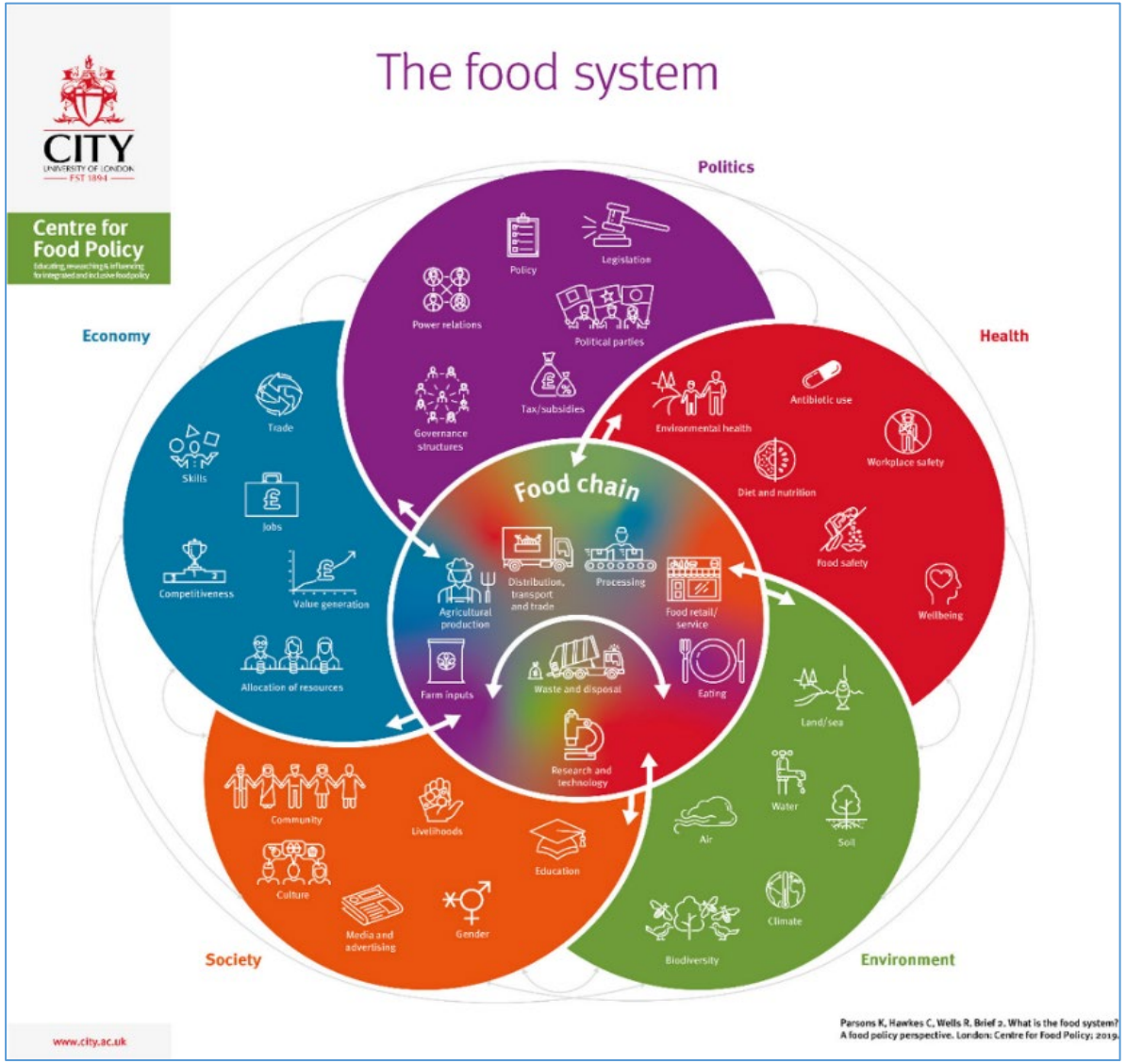
Requires a food systems approach



Credit: The Centre for Food Policy, City University of London

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UK National Food Strategy

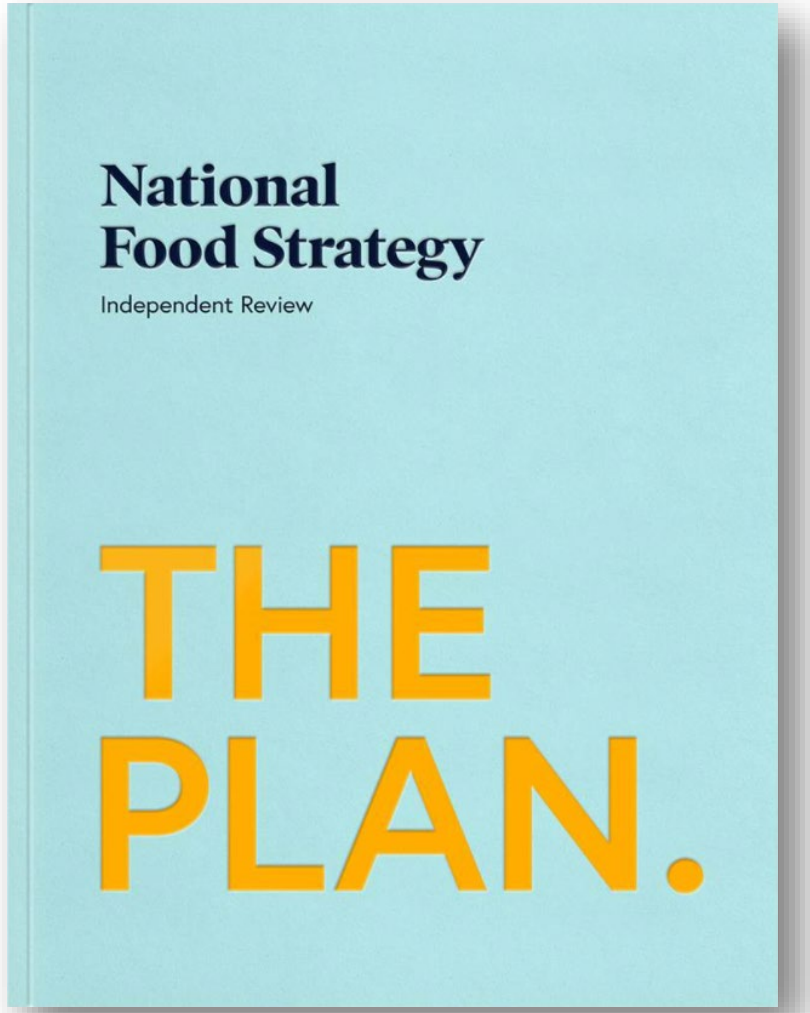
2021 – publication of the first independent review of England's food system in 75 years

Commissioned by the Department for Environment, Food and Rural Affairs (**Defra**), and led by **Henry Dimbleby**, co-founder of Leon Restaurants

Looked at the entire system - from field to fork.

Engaged individuals from across the food system – both interested parties and those working within the sector.

Sets out a **vision** and a **plan** for a **better food system**



https://www.nationalfoodstrategy.org/

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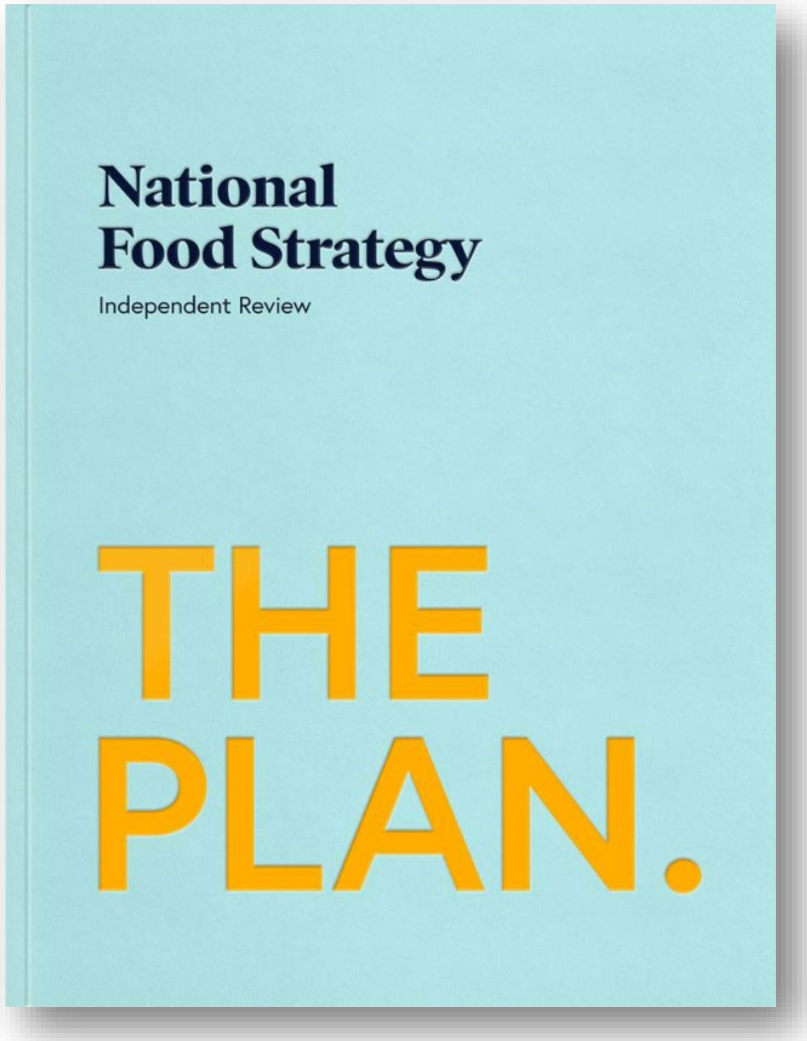
Four central themes

- Escape the junk food cycle and protect the NHS
- Reduce diet-related inequality
- Make the best use of our land
- Create a long-term shift in our food culture



https://www.nationalfoodstrategy.org/

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Transforming UK Food Systems Programme (£47.5M)

Aiming to fundamentally transform the UK food system by placing **healthy people** and a **healthy natural environment** at the **centre**

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Office for Health Improvement & Disparities

Food Standards Agency
food.gov.uk

Department of Health & Social Care

Department for Environment Food & Rural Affairs

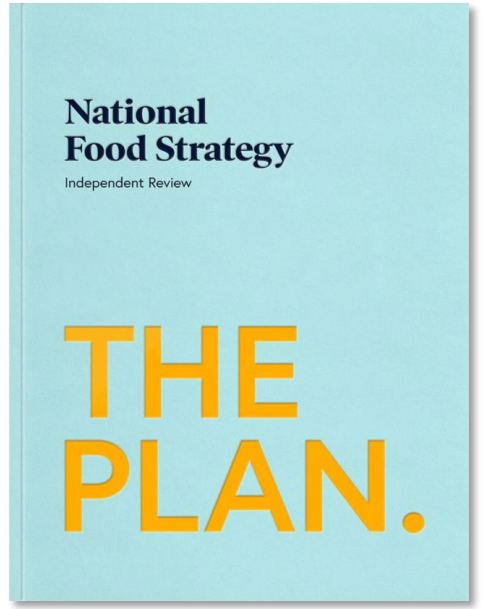
Global Food Security
Sustainable, healthy food for all

Transforming UK Food Systems Programme

Aims:

- Transform UK diets to be healthier and more sustainable
- Change the behaviour of actors across the food system
- Model the interdependencies across the UK food system
- Co-produce research between academia and stakeholders (UK government, business and civil society)
- Develop a pipeline of skilled people who can apply critical interdisciplinary systems thinking to the food system

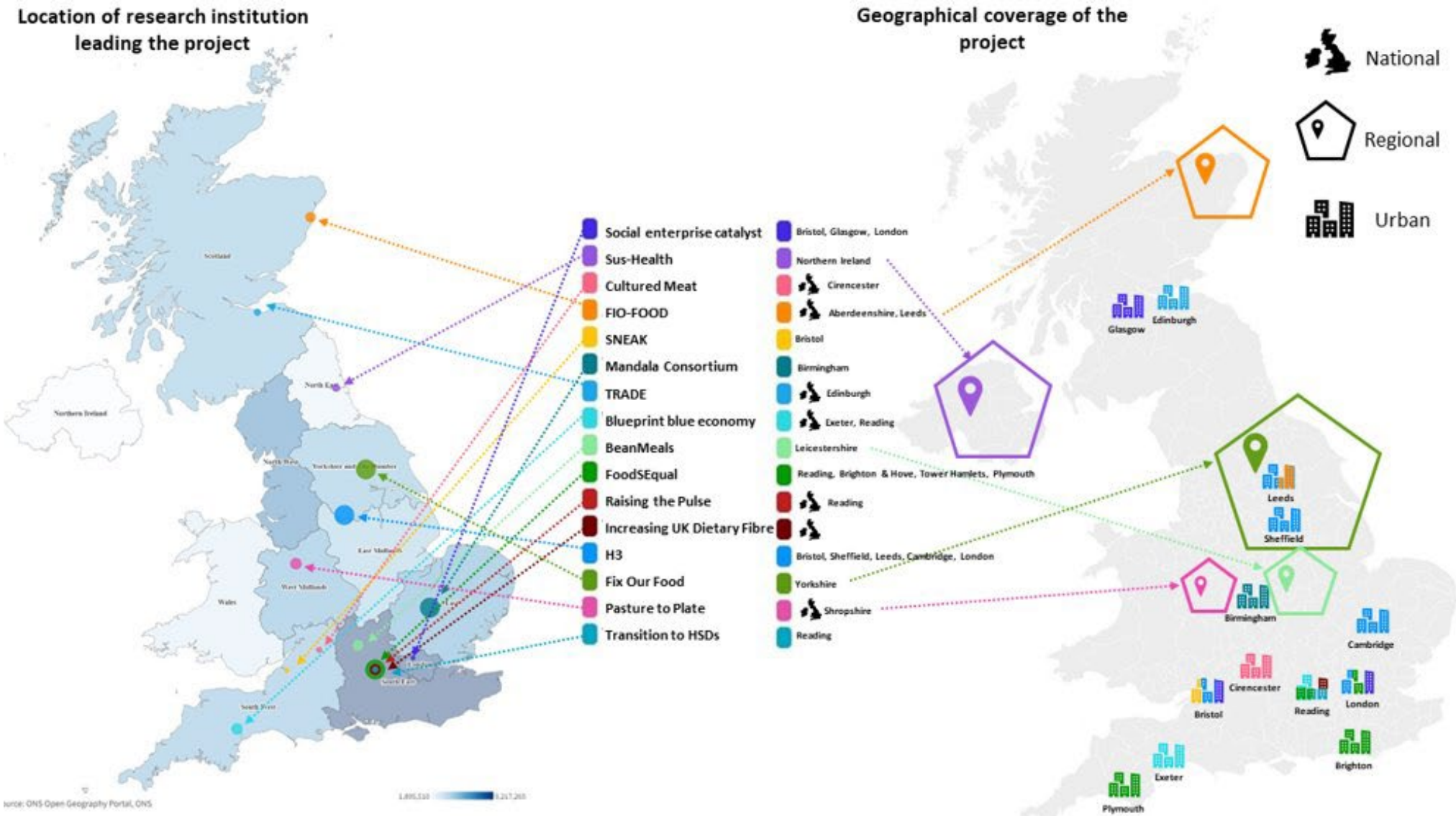
Mapped to themes within the National Food Strategy



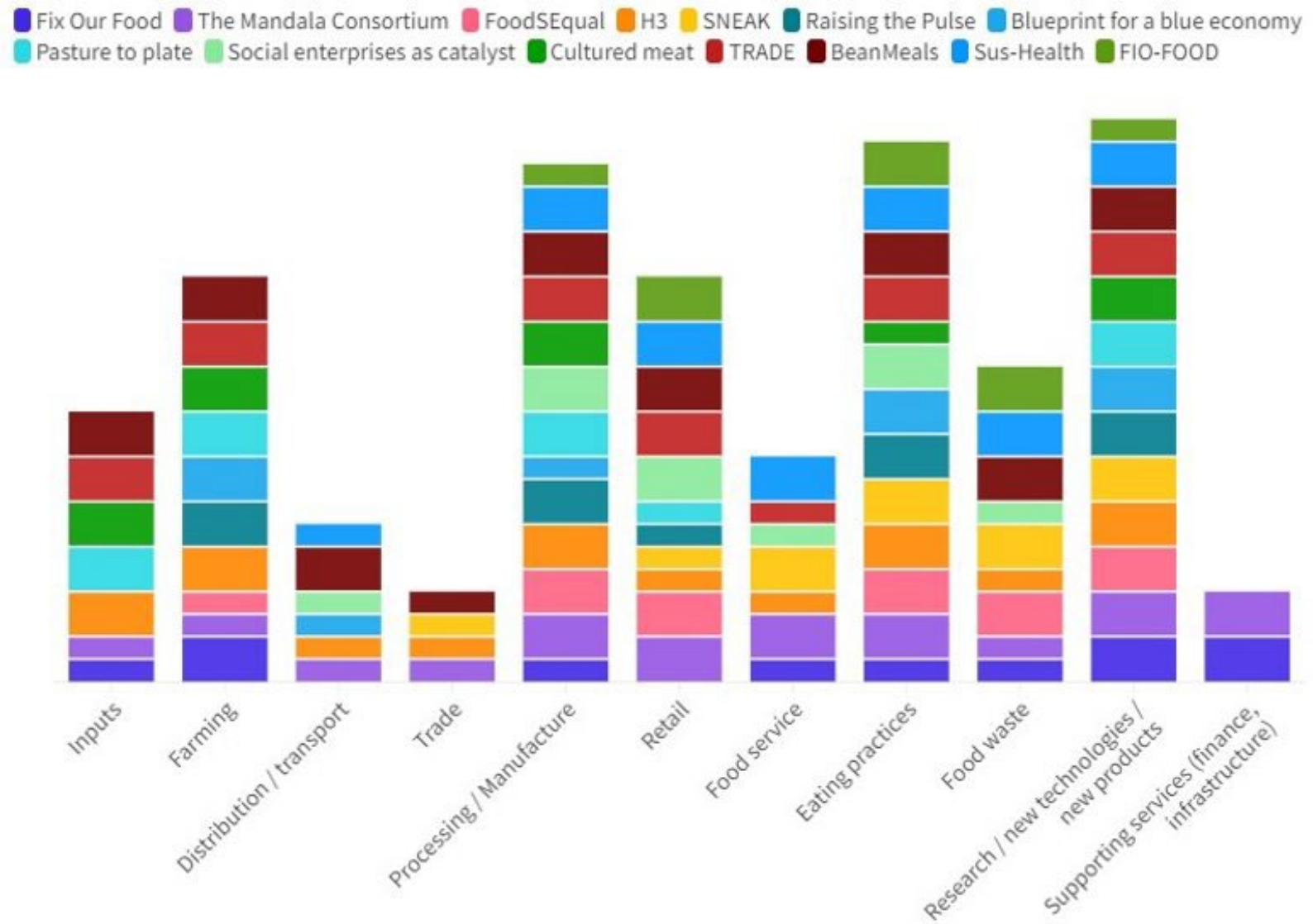
The programme so far

- Four large consortia (£6m, 5 year)
- 12 smaller 2-3 year research projects
- Centre for Doctoral Training
- A series of published reports
- Seminar Series
- Three Annual Grants Holders Meetings
- Knowledge Exchange Fellow

The funded projects are working across the UK



Projects work across the UK food system, tackling health, environmental and socio-economic challenges together



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TRANSFORMING UK FOOD SYSTEMS Strategic Priorities Fund

ICF

Recent activities and outputs

TRANSFORMING UK FOOD SYSTEMS
Strategic Priorities Fund

Escape the junk food cycle and protect the NHS

FoodSEqual Health
University of Reading

Reduce diet-related inequality

RaisingThePulse
University of Reading

Make the best use of our land

Lincolnshire beans could provide British solution to imports

Scientists have developed a haricot seed they hope will thrive in the UK after a 12-year project.

BeanMeals
University of Oxford

Create a long-term shift in our food culture

FixOurFood
University of York

Research and innovation – underpinning change

UKRI food-related portfolio - £1.3bn (2016/17 – 2020/21)

Spans activities across the food system

- Supporting research, innovation, talent, policy and national and global collaboration
- UKRI Executive Champion for Food

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UKRI investments – some examples

Strategically-supported institutes

National capabilities - supporting strategic research programmes and infrastructure

Host the UK Food Safety Network & Biofortification Hub

Biofortification Hub

Biotechnology and Biological Sciences Research Council

John Innes Centre

Quadram Institute

International Wheat Yield Partnership

Global partnership (public and private research organisations) to increase the genetic wheat potential by 50% by 2035

IWYP International Wheat Yield Partnership

Research to Deliver Wheat for the Future

Transforming Food Production

£90m investment – supporting businesses, researchers and industry to **transform food production** to meet the growing demand for food and move towards **net zero emissions** by 2040.

Additional investment - £270m Farming Innovation Programme (Defra, Innovate UK ISCF team).

INDUSTRIAL STRATEGY

Innovate UK

Biotechnology and Biological Sciences Research Council

Health

Providing solutions

Gene-edited tomatoes - new source of Vitamin D

John Innes Centre

Researchers have used gene editing to create tomato plants that lack a key enzyme in the conversion of provitamin 3 (7-DHC) to cholesterol.

7-DHC accumulates in leaves and fruit, which produce Vitamin D when exposed to UVB.

Builds on extensive work by the team to use plant metabolic engineering to nutritionally enhance foods – **purple tomatoes**

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DOI:10.1038/s41477-022-01154-6

Health

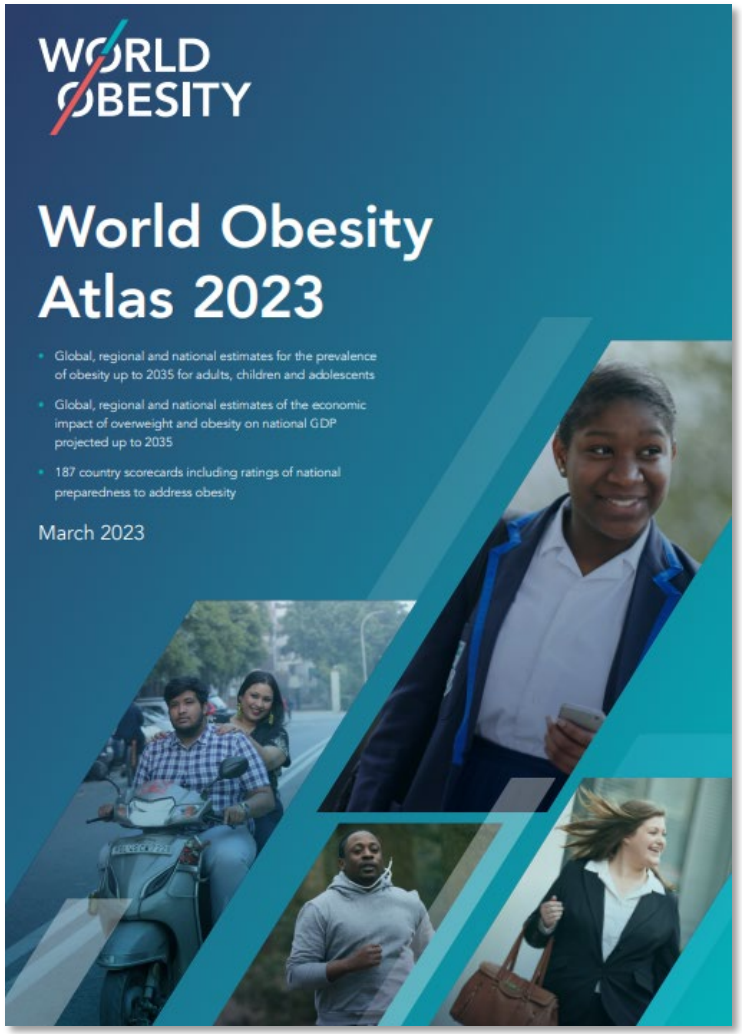
Tackling the obesity crisis

Economic impact of overweight and obesity to surpass **$4 trillion** by **2035** – comparable to the impact of COVID19 in 2020.

Current trends suggest **51%** of **the global population** will be overweight or obese. **1 in 4 people** (~2 billion) will have **obesity.**

Childhood obesity could **more than double** by 2035 – rising more rapidly than adults.

Lower income countries facing **rapid increases in obesity** prevalence.



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Ultra-processed foods

Health

CNN health Life, But Better Fitness Food Sleep Mindfulness Relationships

Study finds growing evidence of link between ultraprocessed food and cancer

By Sandee LaMotte, CNN

5 minute read · Updated 3:59 PM EST, Wed November 22, 2023

INDEPENDENT

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Lifestyle > Health & Families

Study links ultra-processed food and drink to risk of depression in women

Commonly consumed edibles are often high in salt, sugar, hydrogenated fats and other additives

Faiza Saqib • Friday 22 September 2023 16:28 BST • Comments

How should we produce/reformulate food in the future?

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Health

Some ultra-processed foods are good for your health, WHO-backed study finds

Bread and cereals - which are heavily processed - reduce risk of multimorbidity due to fibre content

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Environment

Providing solutions

From carbon capture to fertiliser

CCm Technologies uses captured carbon to convert materials from waste streams (agricultural and industrial) into value-added materials.

Using this technology, they have generated **new low carbon fertilisers** - shown to be effective in a range of farming environments.

Offers huge potential for low-emissions farming and improving the circular economy.

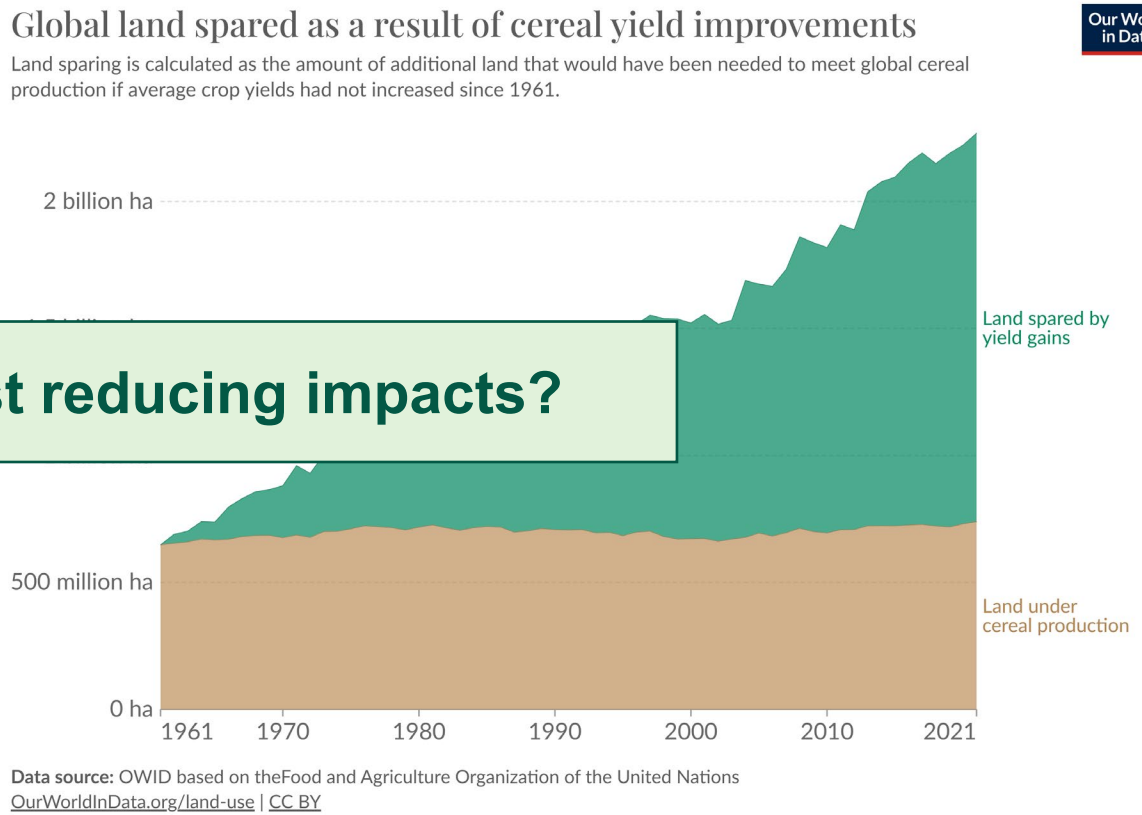
Environment

Managing our land

Green Revolution - we can now produce **~3x more** cereal from our land

How do we maintain yields whilst reducing impacts?

Regenerative agriculture – preserving our land



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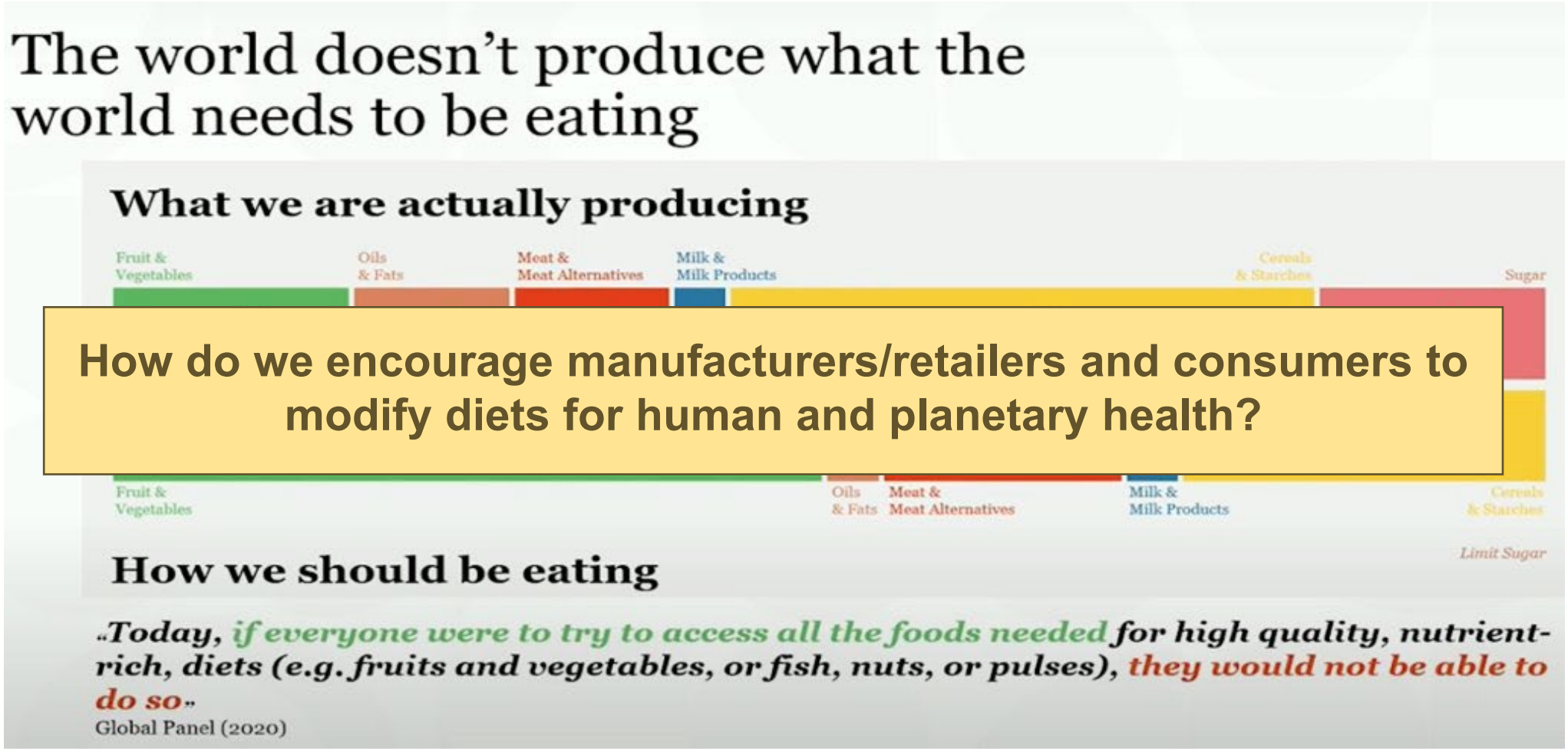
Socio-economics

Changing our diet



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Socio-economics

Changing our diet

“Every year, governments around the world provide $800 billion in food production incentives, leading to negative climate and environmental outcomes”

Dr Juergen Voegele, Vice President for Sustainable Development at the World Bank

How do we change subsidies to incentivise a new food system for human and planetary health?

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The future of food

Other sectors (energy/car etc) have a **shared vision** and **plan for delivery**

We **need a shared vision for food**

Until agreed, plans for delivery will be difficult

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Thank you

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