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# **Sustainable Food Security**

## ***“Complexities, Challenges and Solutions”***

***“What’s coming down the track?”***

**John Ingram**  
**Food Systems Programme Leader**  
*Environmental Change Institute*  
*University of Oxford*

Environmental Change Institute

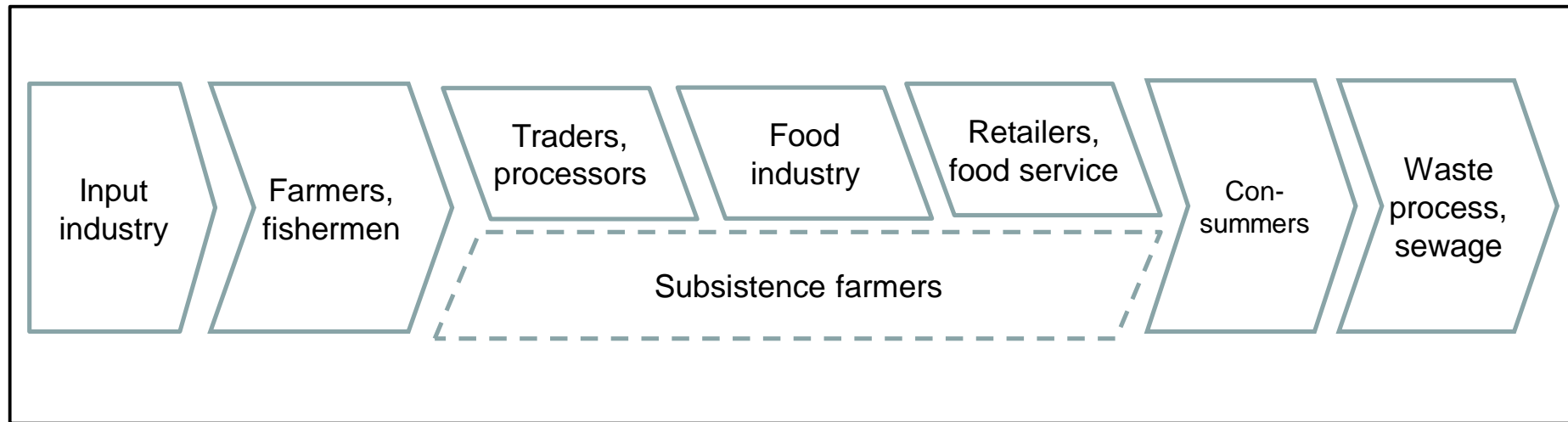


# Food Systems include a set of 'Activities' ...



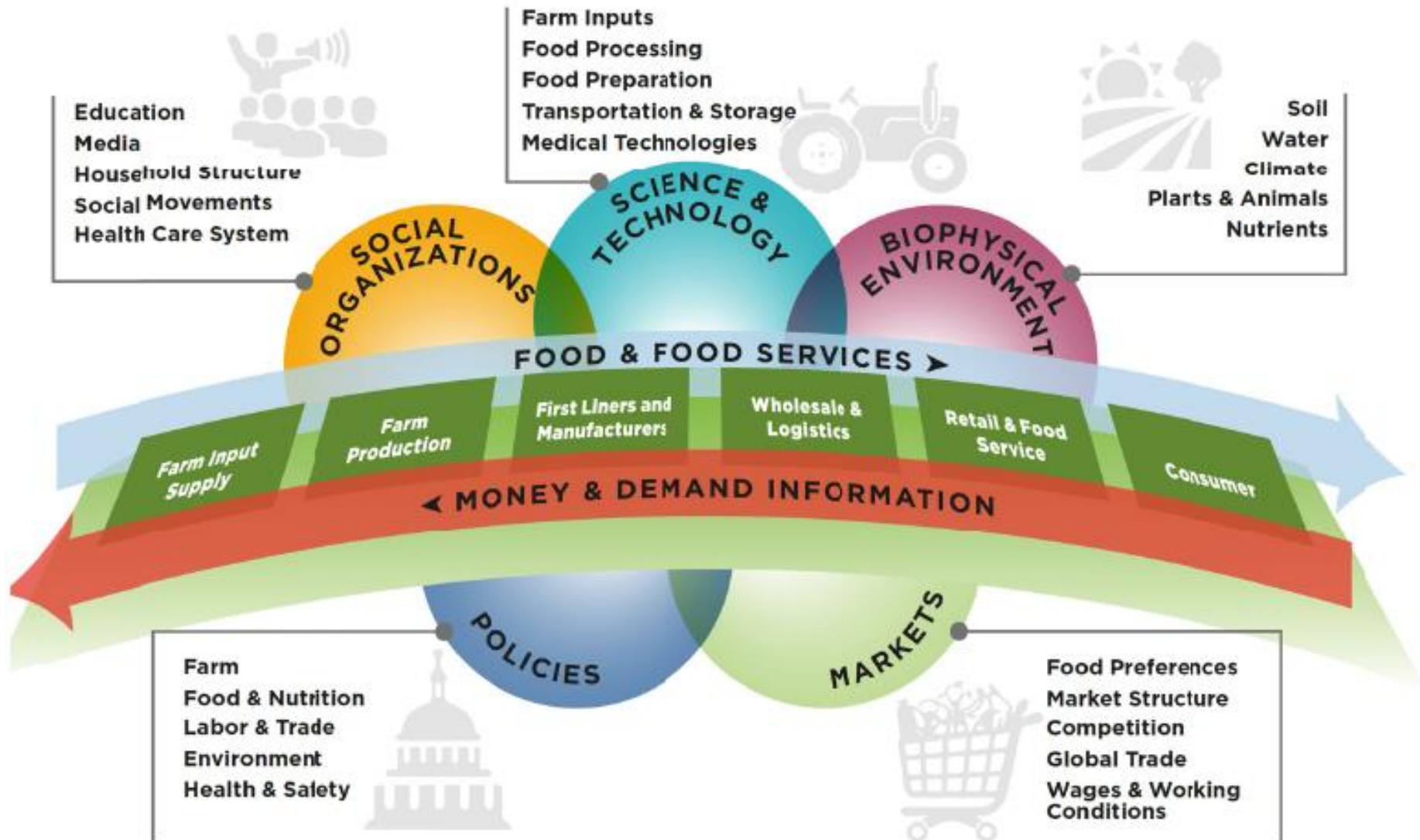
**... all of which have a wide range of Actors ...**

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**... all of whom have a range of motives ...**

# ... and who all operate within a diversity of 'environments'.



Source: The Institute of Medicine & The National Research Council of the National Academies, 2015

# 'Outcomes'

## of the Actors' Activities underpin food security ...

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# ... but have other food system Outcomes.



# We know that current Food System Activities will continue to impact natural resources

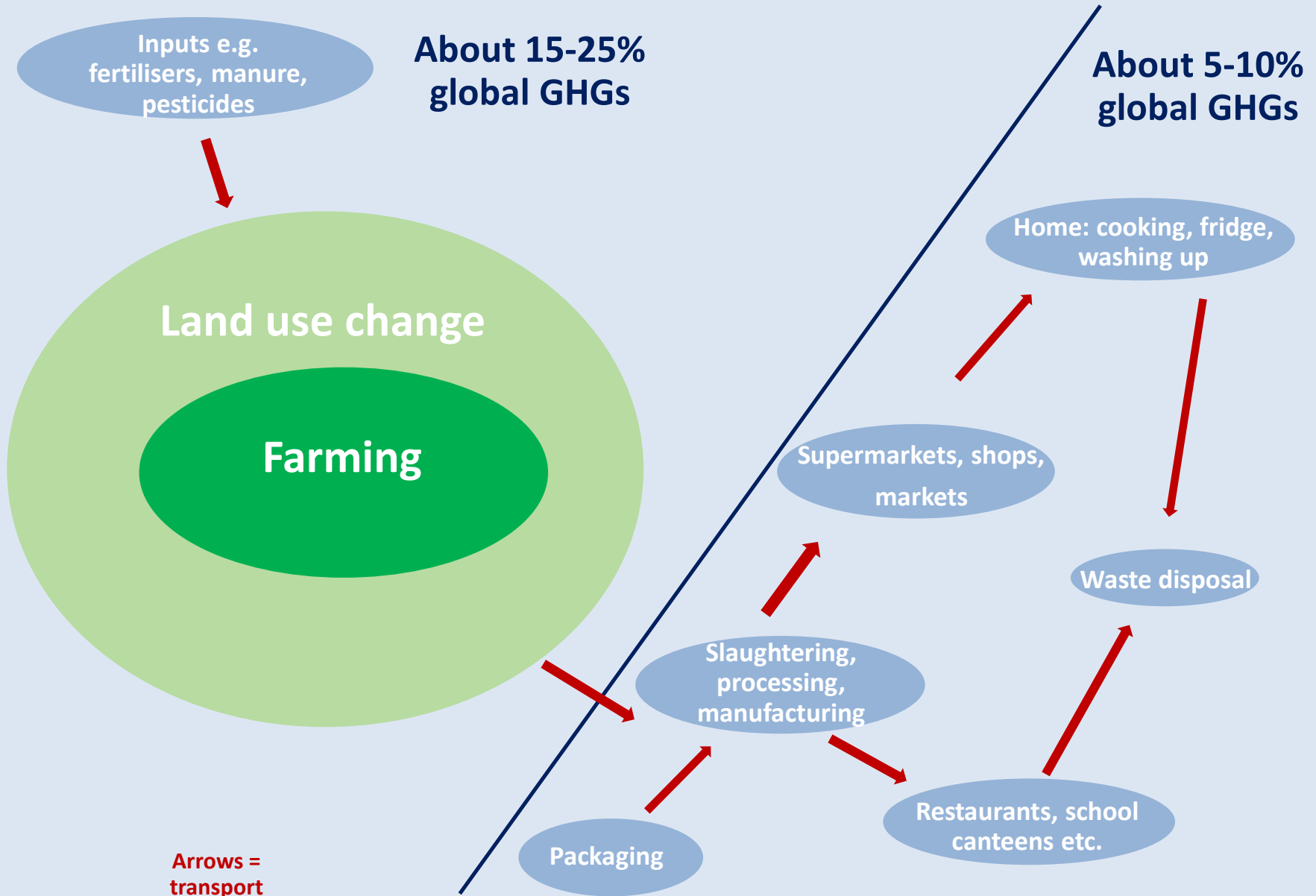
Agriculture has already led to:

- Soil 33% degraded
- Fresh water 20% aquifers overexploited
- Biodiversity 60% of loss
- Minerals >80% losses farm-to-fork





# But food systems are more than “agriculture”





# Food Systems and Paris targets

**2010  
GHG baseline**

Annual global GHG emissions

Food-related = 30%

# Overall food security 'situation'

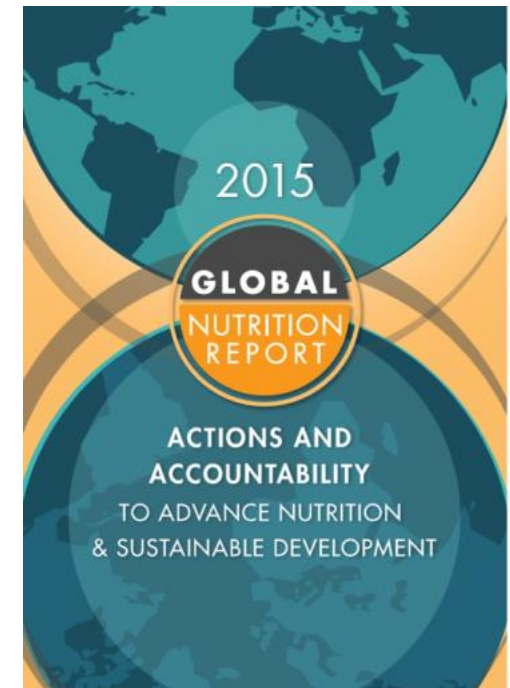
**Insufficient cals  
Insufficient nutrs**  
*currently ~ 1 billion*

**Sufficient cals  
Insufficient nutrs**  
*currently ~ 2 billion*

**Sufficient cals  
Sufficient nutrs**  
*currently ~ 3 billion*

**Excess cals (incl. some  
with insufficient nutrs)**  
*currently >2.5 billion*

- Different, overlapping forms of malnutrition the 'new normal' (IFPRI 2015)



## Overall Food Security Situation

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### CONSUMERS

Constraints on dietary choice and diversity  
*affordability, preference, allocation, cooking skill, convenience, cultural norms, ...*  
**=> Consumption by Sub-populations**

### FOOD CHAIN ACTORS

'Post-farm gate' Food System Activities  
*processing, packaging, trading, shipping, storing, advertising, retailing, ...*  
**=> Final Cals/Nutrient Quantity and Price at shop**

### PRODUCERS

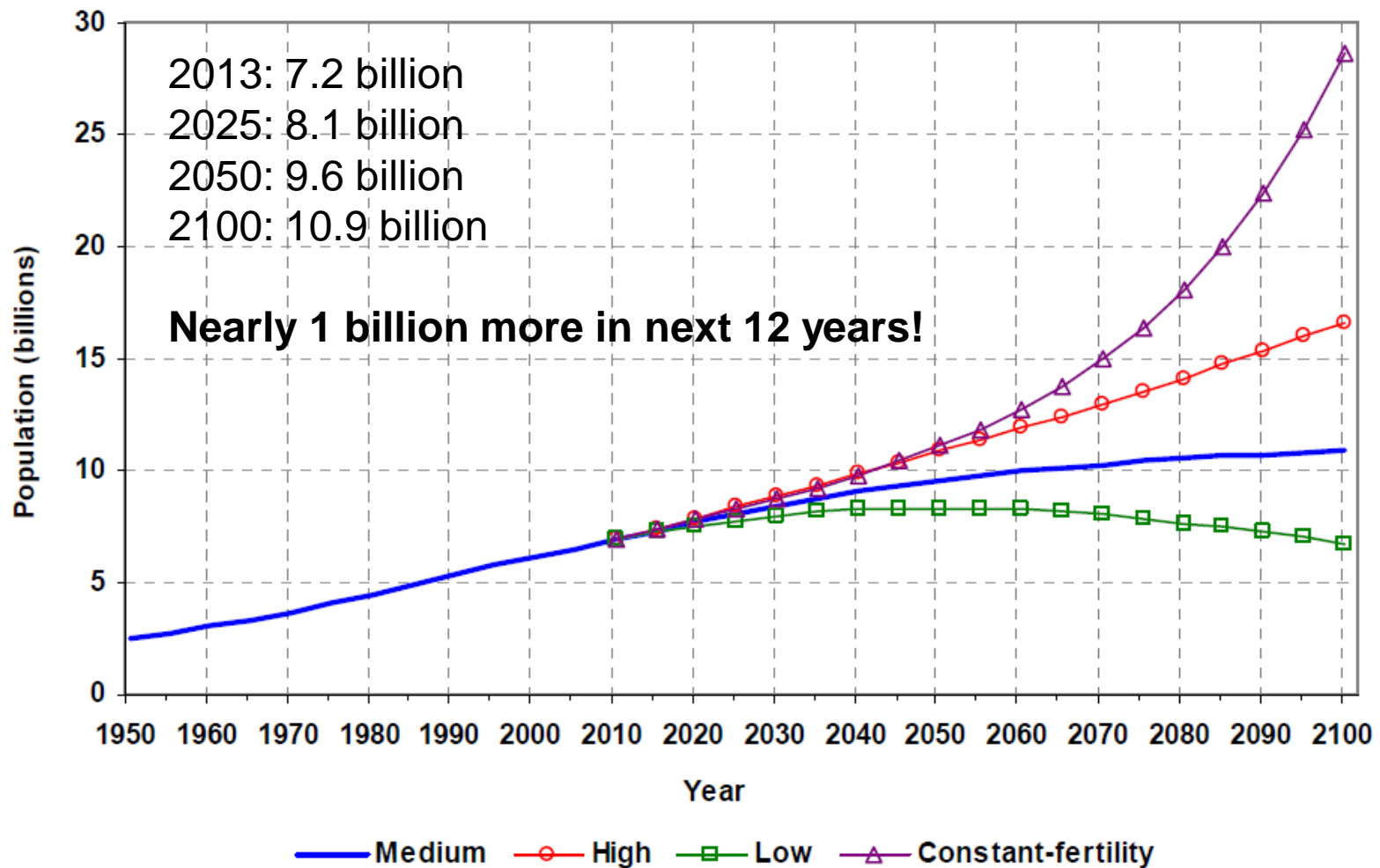
Local, Regional & Global Production Activities  
*farming, horticulture, livestock raising, aquaculture, fishing, ...*  
**=> Basic Cals/Nutrient Quantity and Price at farm**

Productivity

Diversity & Quality

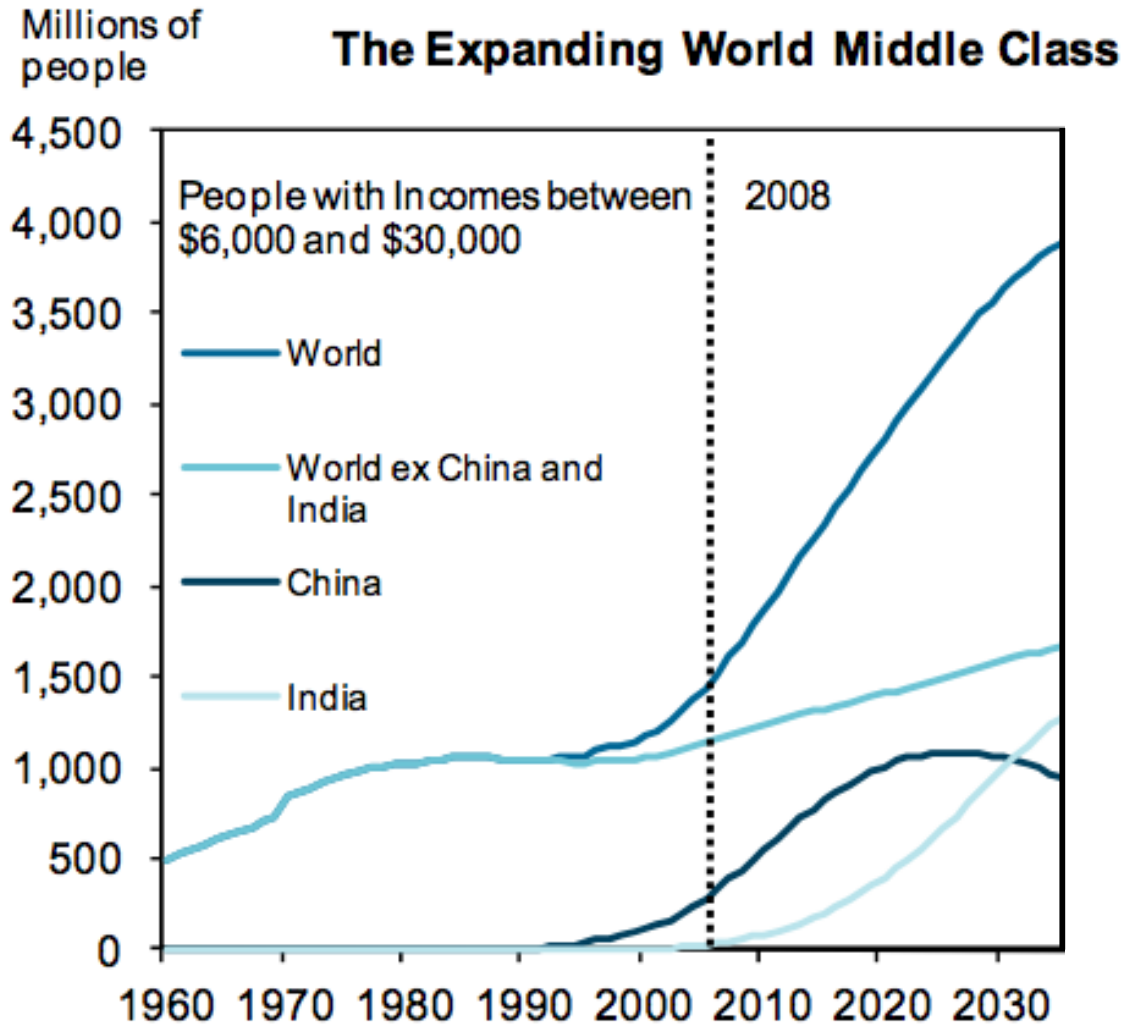
Social, Political, Policy, Business & Biophysical Environments

# Looking ahead: Increasing population ...



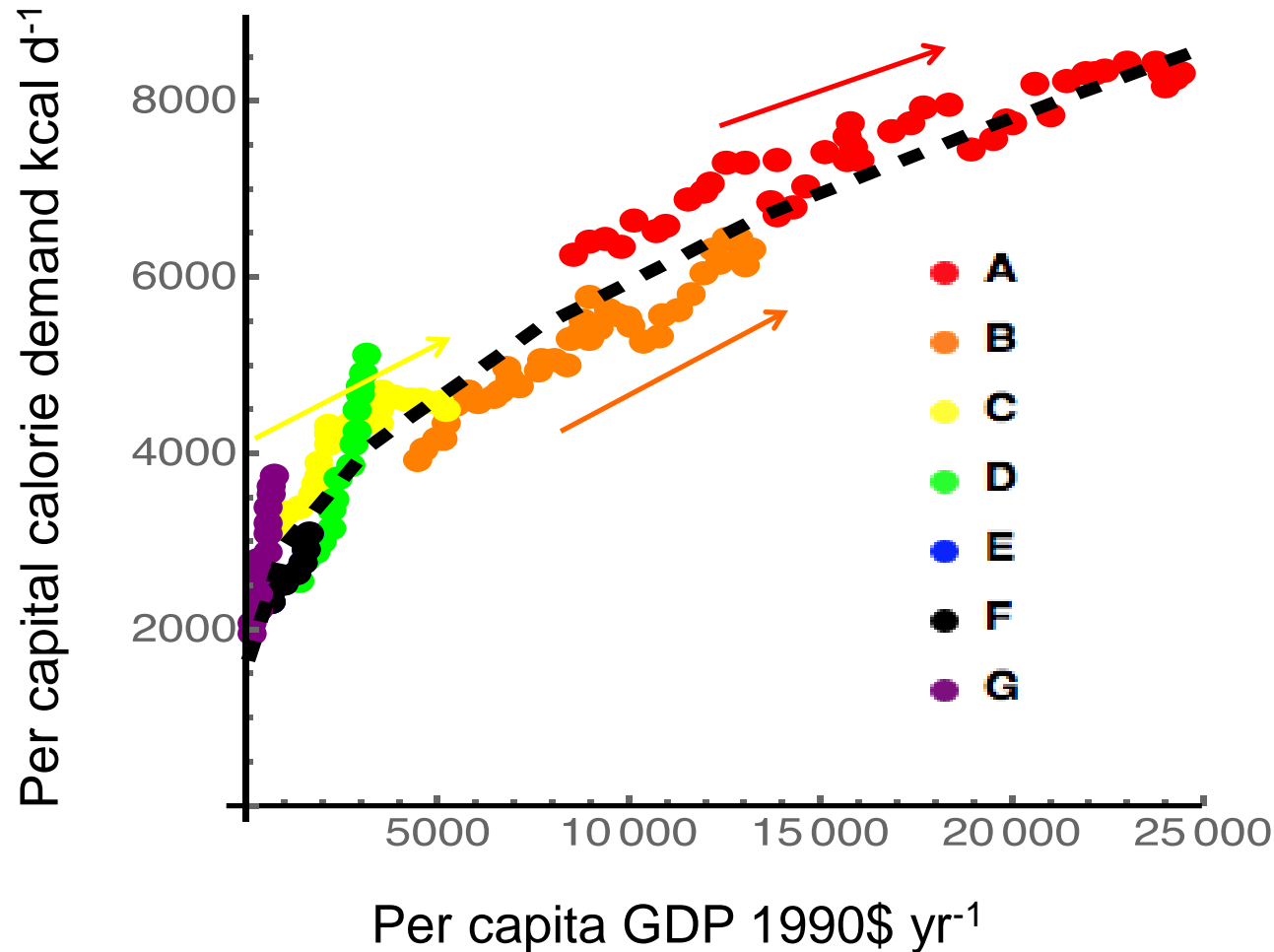
# ... is coupled with rising wealth ...

*\$6,000 – \$30,000*



Source: Goldman Sachs

... and we know that overall calorie demand increases with income.



*Tilman et al. 2011 PNAS*

# Looking ahead ...

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November 20, 2014 12:02 am

## Fat places \$2tn burden on world economy, says McKinsey report

Scheherazade Daneshkhu, Consumer Industries Editor



**F**at is becoming a weighty economic issue. Almost a third of the world's population is overweight or obese, levying an economic cost that rivals that of armed conflict or smoking, according to research by McKinsey consultants.

The strain on healthcare budgets is set to mount because unless current trends are curbed, half the global adult population will be overweight in 15 years' time. In a 150-page report, published on Thursday, the consultants put the global annual cost of obesity at \$2tn – equivalent to 2.8 per cent of the world's economic output.

“unless trends are curbed, half the global adult population will be overweight in 15 years time”





# Food security...

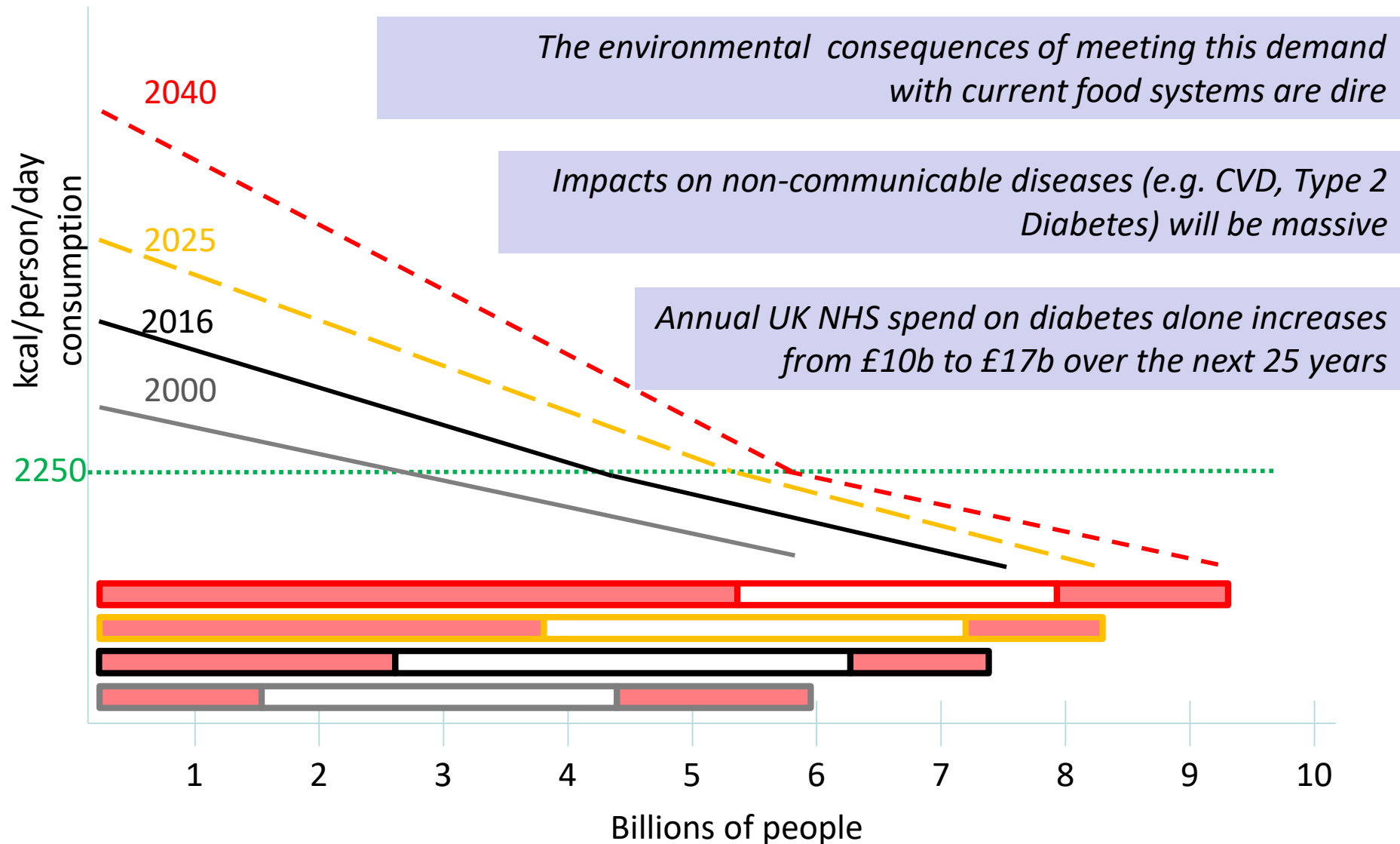
... exists when all people, at all times, have physical, economic and social access to **sufficient**, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

“enough for a particular purpose; as much as you need”

... OED

# Calorie consumption trend: dietary changes

*(indicative; not to scale)*



# We need to get a grip on consumption patterns ...

## US obesity rates 'rising for first time since 2004'

12 Nov

“zero chance that the world can meet the target set by the UN for halting the climbing obesity rate by 2025”  
... *Lancet*, 2016

Obesity rates are rising again among American adults despite national efforts to promote healthy lifestyles.

Rates of obesity had been climbing dramatically since the 1980s but started levelling off in about 2004.

This latest study means they are rising again - to nearly 38% in 2013-14, about 32% a decade ago.

## One fifth of adults worldwide will be obese by 2025, predicts study

UK is on track to have the highest obesity levels in Europe, while a fifth of world's obese adults live in six high-income English-speaking countries



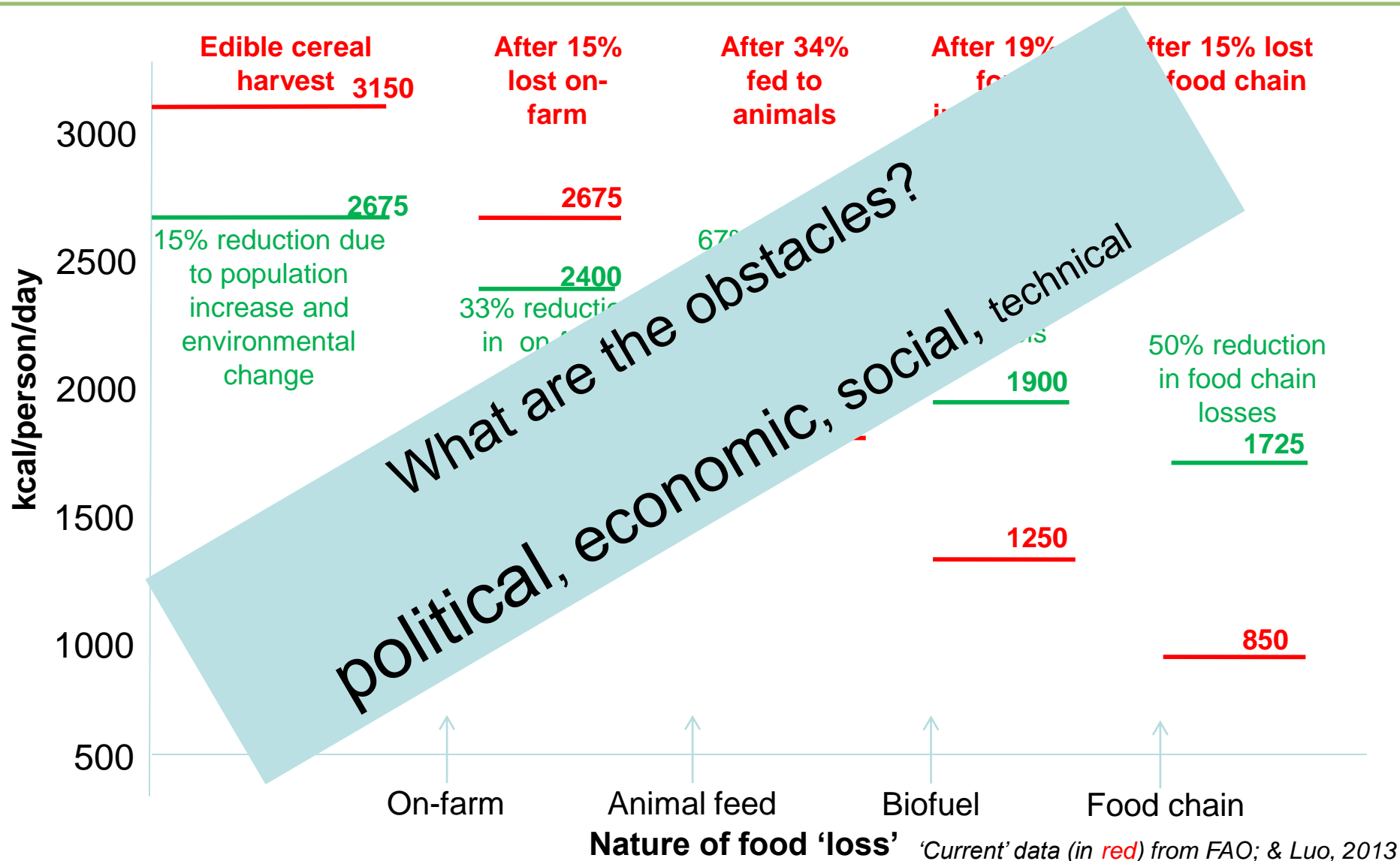
By 2025, the UK will have the highest obesity among both men and women in Europe, at 38%, say the researchers Photograph: Dominic Lipinski/PA

About a fifth of all adults around the world and a third of those in the UK will be obese by 2025, with potentially disastrous consequences for their health, according to a study.

The research published by the *Lancet medical journal* says there is zero chance that the world can meet the target set by the UN for halting the climbing obesity rate by 2025.

# ... and make more sustainable use of our harvest.

*50% more cereal cals/person/day, despite harvesting 15% less/person*



# So to what does 'sustainable' refer?

