



JAMES MARTIN 21ST CENTURY SCHOOL

# Sustainable intensification: Framing & implementation

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**Charles Godfray**

Department of Zoology & Director, Oxford  
Martin Programme on the Future of Food





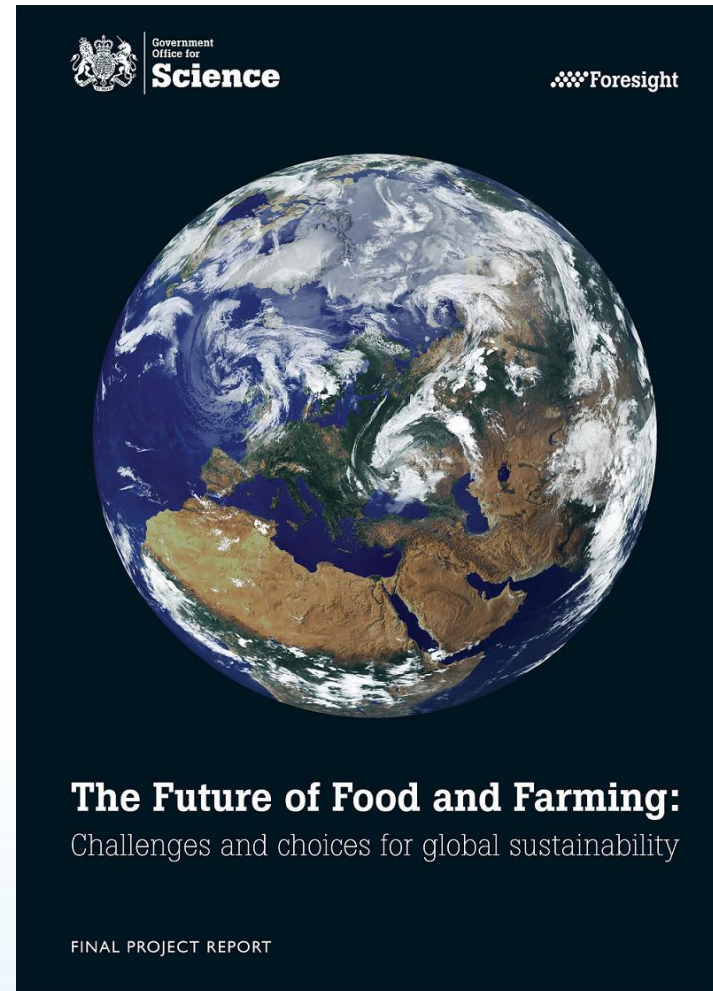
## Coming challenge

- Continuing demand growth
- Urbanisation & mega-cities
- Hunger & under-nutrition
- Obesity & over-nutrition
- Pressures on agriculture
  - Water scarcity
  - Competition for land and soil degradation
- Resilience to shocks
  - Climate change
  - Human



# What should we do?

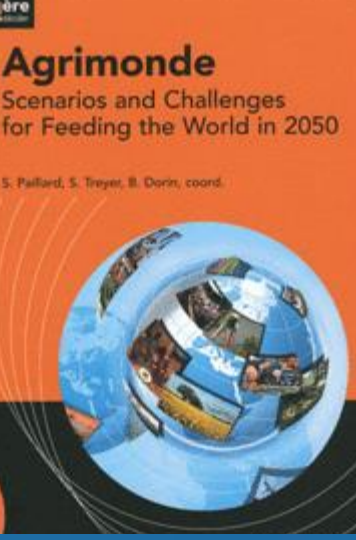
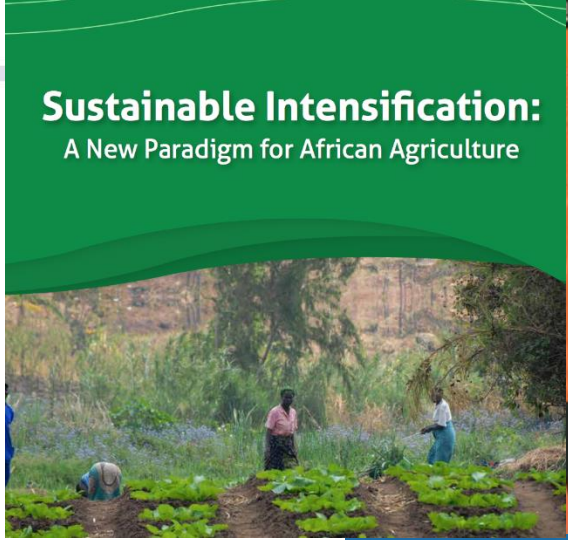
- The challenge
  - Global food dynamics
  - Ending hunger
  - Sustainable food systems
- Food system responses
- Market failures and policy interventions



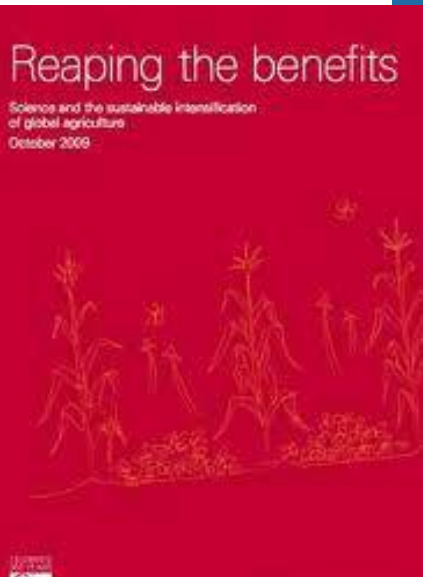


# Production side response

- **Sustainable Intensification (SI)**
  - Higher yields, less env. impact
- Incorporated into policy (government, private sector, NGOs)
- Reaction



food sovereignty



## A Wolf in Sheep's Clothing?

An analysis of the 'sustainable intensification' of agriculture

October 2012

## Sustainable intensification - an oxymoron



Bringing plant-potential to life

# 1. Action needed on all fronts

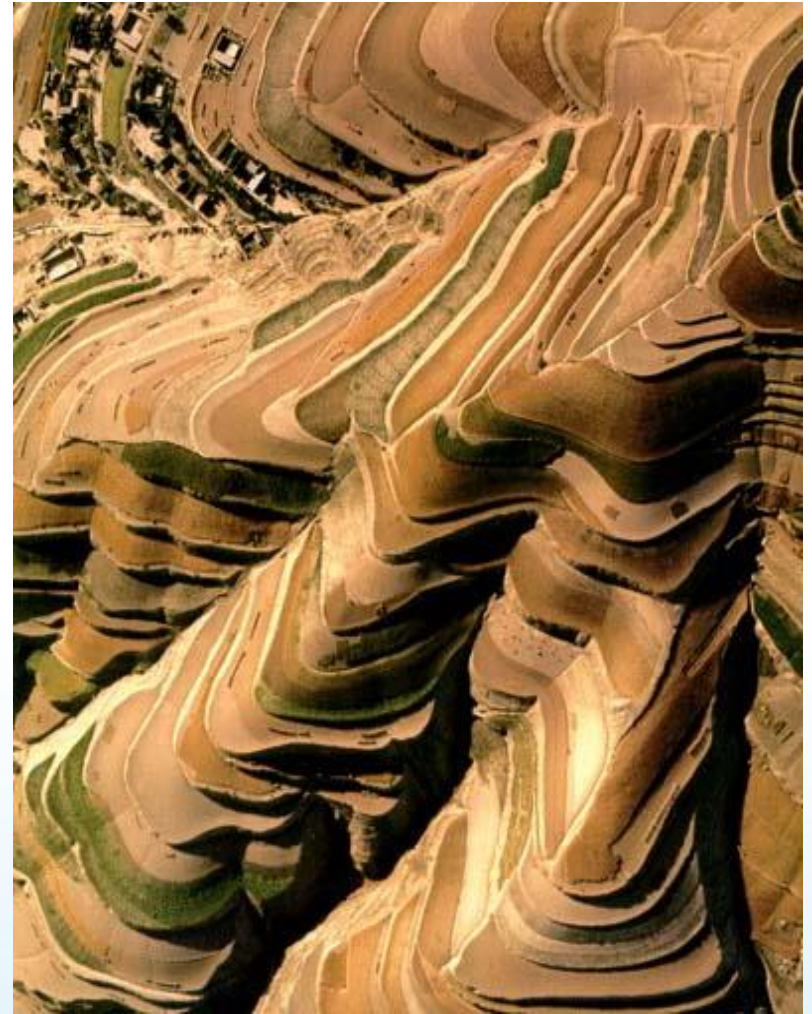
- Moderate demand, reduce waste, improve governance ...
- ... but also produce more food
- SI is neither a “productionist silver bullet” nor special pleading by the agricultural sector
- Facilitate sustainable response to price signals





## 2. Very limited new land

- Major environmental costs to land conversion – GHG emissions & biodiversity
  - Restoration of agricultural lands a priority
- Pressure from other land uses
  - Biofuels daftness



### 3. It's not Sustainable Intensification

- Don't mistake SI as business-as-usual with marginal improvements in environmental impact
- Genuinely radical if taken seriously
- Overall yield growth but
  - Some local reductions
  - Some land sparing





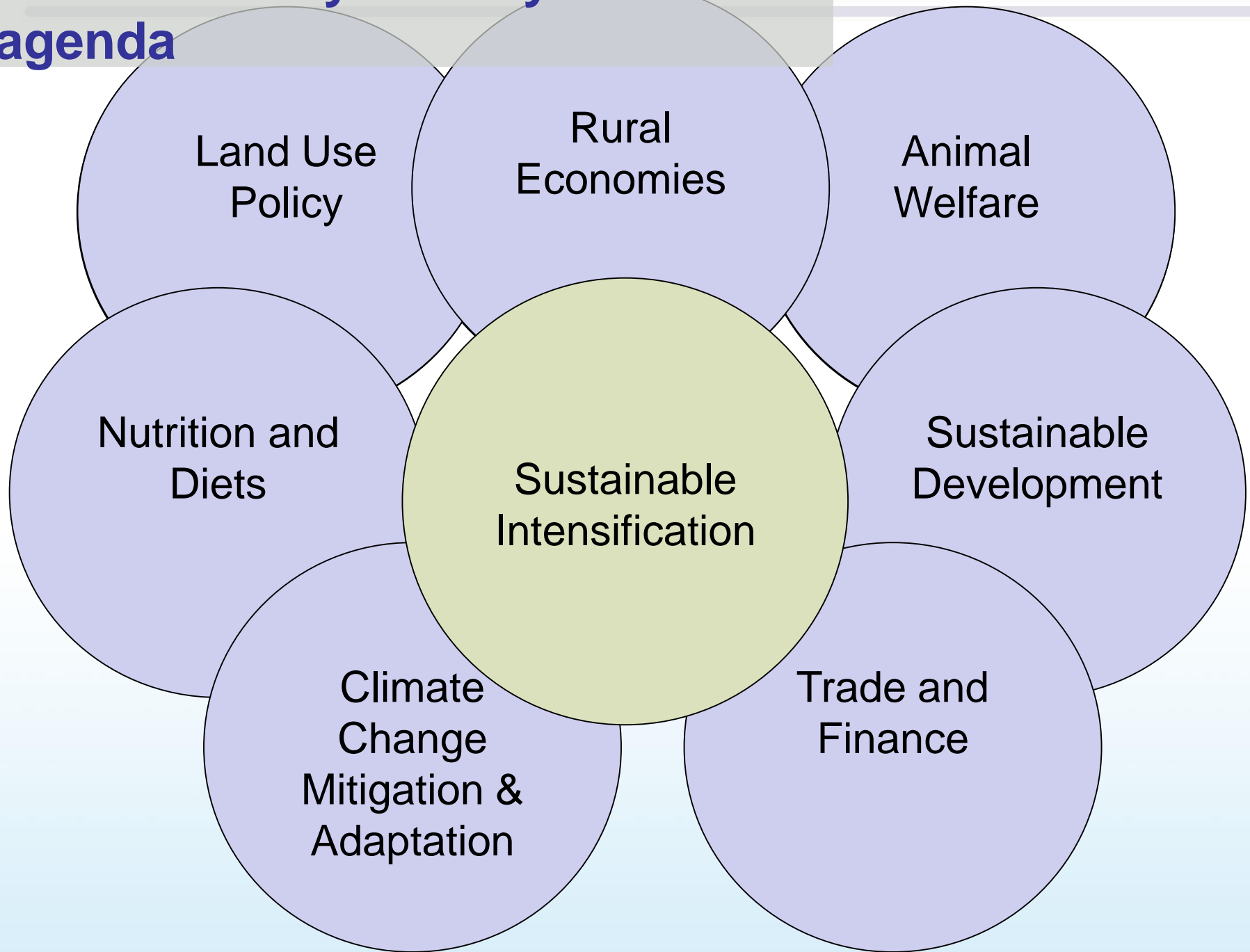
## 4. A goal not a trajectory

- Evidence based and context specific
- What should the permissible strategy set be?
- My view: pick the best from conventional, “high-tech”, agro-ecological, organic
- The politicisation of science and the “scientificisation” of politics





# 5. Not the only food system agenda



Garnett *et al.* 2013, *Science* **341**, 33-34.  
Godfray 2015, *Food Security* **7**, 199-208

POLICYFORUM

AGRICULTURE

## Sustainable Intensification in Agriculture: Premises and Policies

Clearer understanding is needed of the premises underlying SI and how it relates to food-system priorities.

T. Garnett,<sup>1</sup> M. C. Appleby,<sup>2</sup> A. Balmford,<sup>3</sup> I. J. Bateman,<sup>4</sup> T. G. Benton,<sup>5</sup> P. Bloomer,<sup>6</sup> B. Burlingame,<sup>7</sup> M. Dawkins,<sup>1</sup> L. Dolan,<sup>1</sup> D. Fraser,<sup>8</sup> M. Herrero,<sup>9</sup> I. Hoffmann,<sup>7</sup> P. Smith,<sup>10</sup> P. K. Thornton,<sup>11</sup> C. Toulmin,<sup>12</sup> S. J. Vermeulen,<sup>11</sup> H. C. J. Godfray<sup>1\*</sup>

Food security is high on the global policy agenda. Demand for food is increasing as populations grow and gain wealth to purchase more varied and resource-intensive diets. There is increased competition for land, water, energy, and other inputs into food production. Climate change poses challenges to

how SI interfaces with other major food-system goals and show how they may guide

ity as to raising productivity. SI does not mean business-as-usual food production moder-

Food Sec. (2015) 7:199–208  
DOI 10.1007/s12571-015-0424-2

ORIGINAL PAPER

## The debate over sustainable intensification

H. Charles J. Godfray

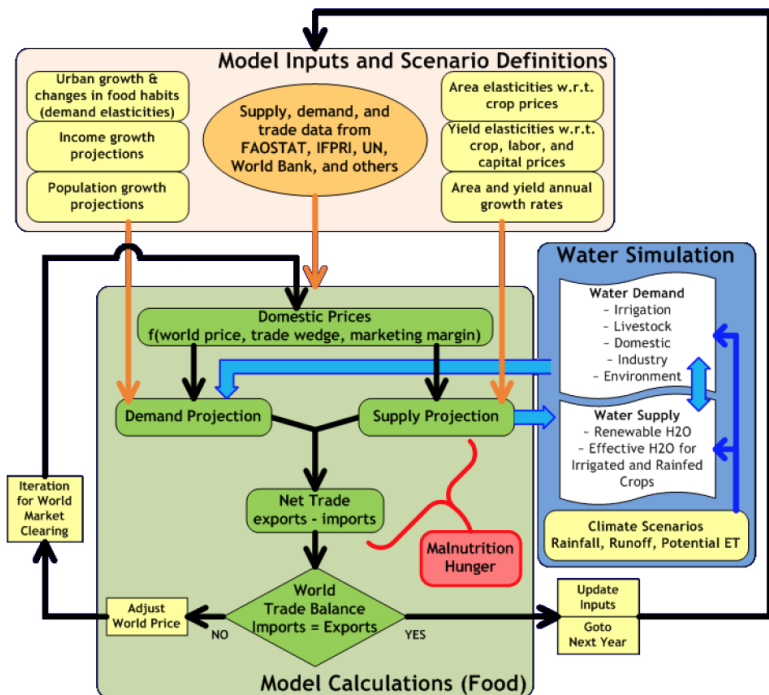


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# Food and environment in the new UK

- Narratives on food
  - Self sufficiency
  - Feeding the world
  - Free markets v UK CAP
- Narratives on the environment
  - CAP environment: Pillar two
  - Rewilding
  - Public money for public good
  - A more granular rural policy

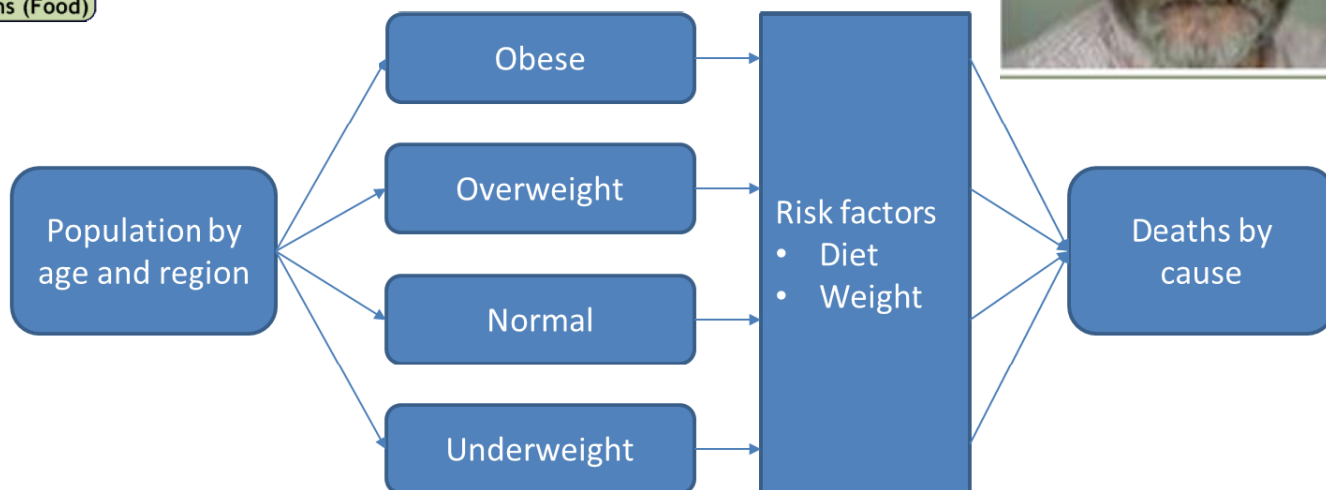
# Diet-related health & climate change



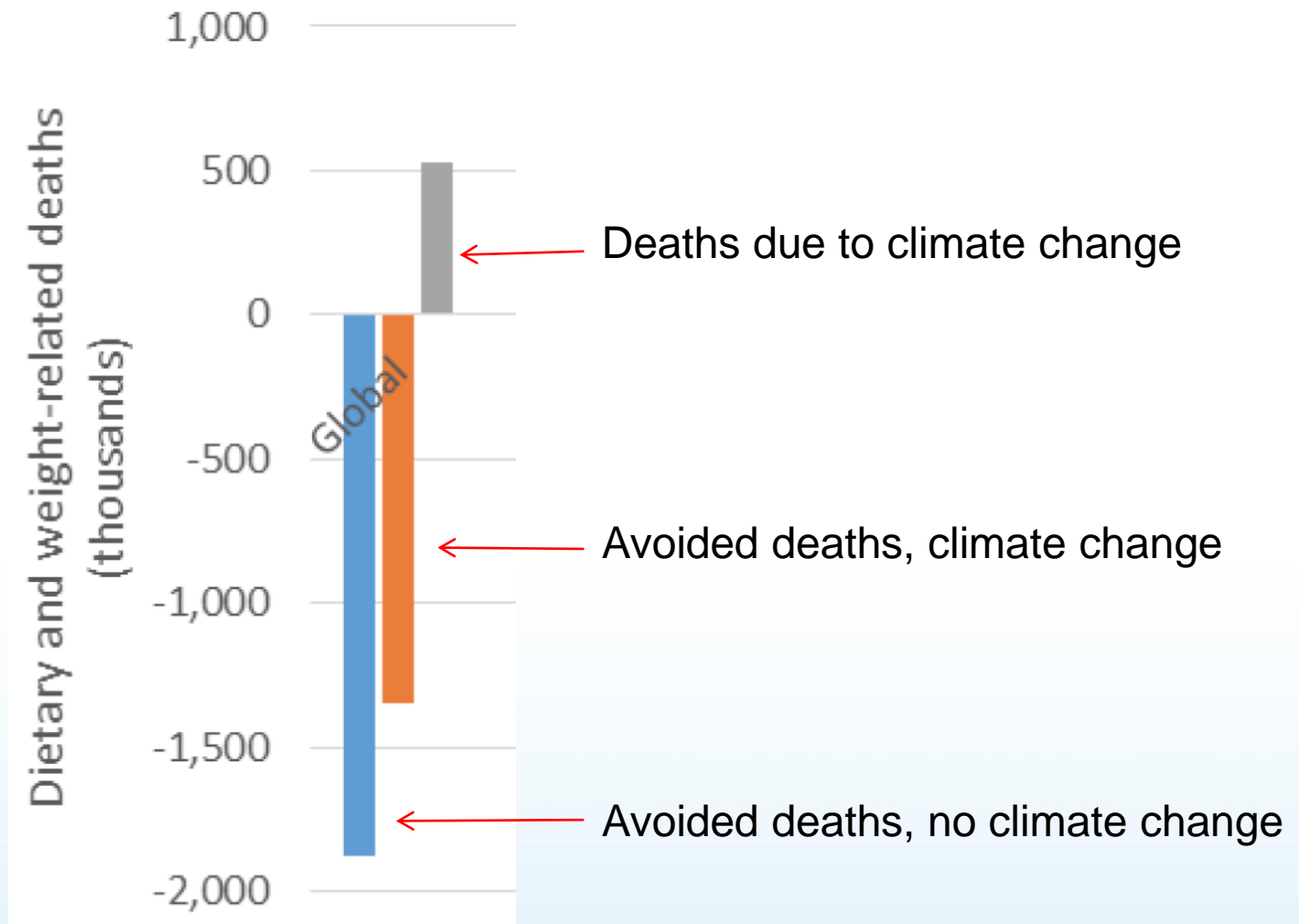
Team led by  
 Marco Springmann  
 Pete Scarborough  
 & Mike Rayner  
 From DPH, Oxford



Couple a global health model to a food economic model (IMPACT), itself driven by climate and crop Models.

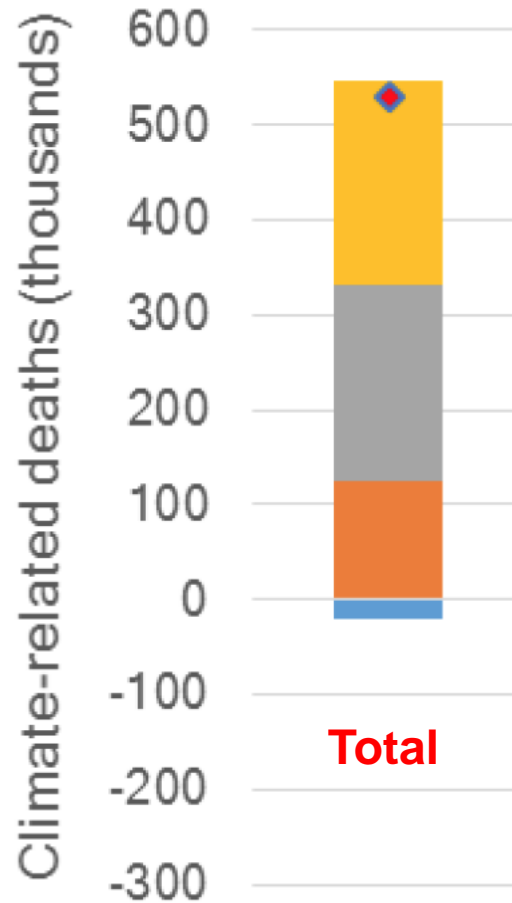






# Causes of death

■ CHD ■ Stroke ■ Cancer ■ Other ◆ All causes



# Risk categories

Fruit & veg

Underweight

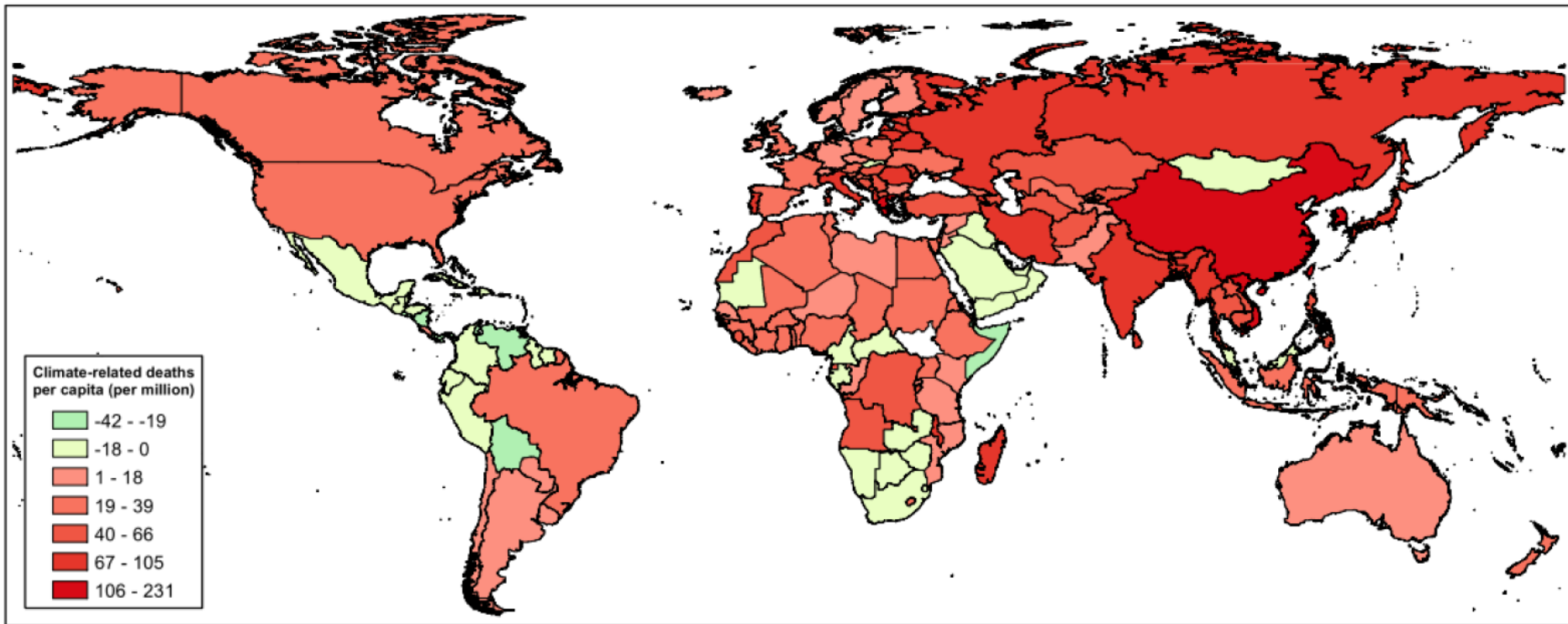
Obese

Meat

Overweight

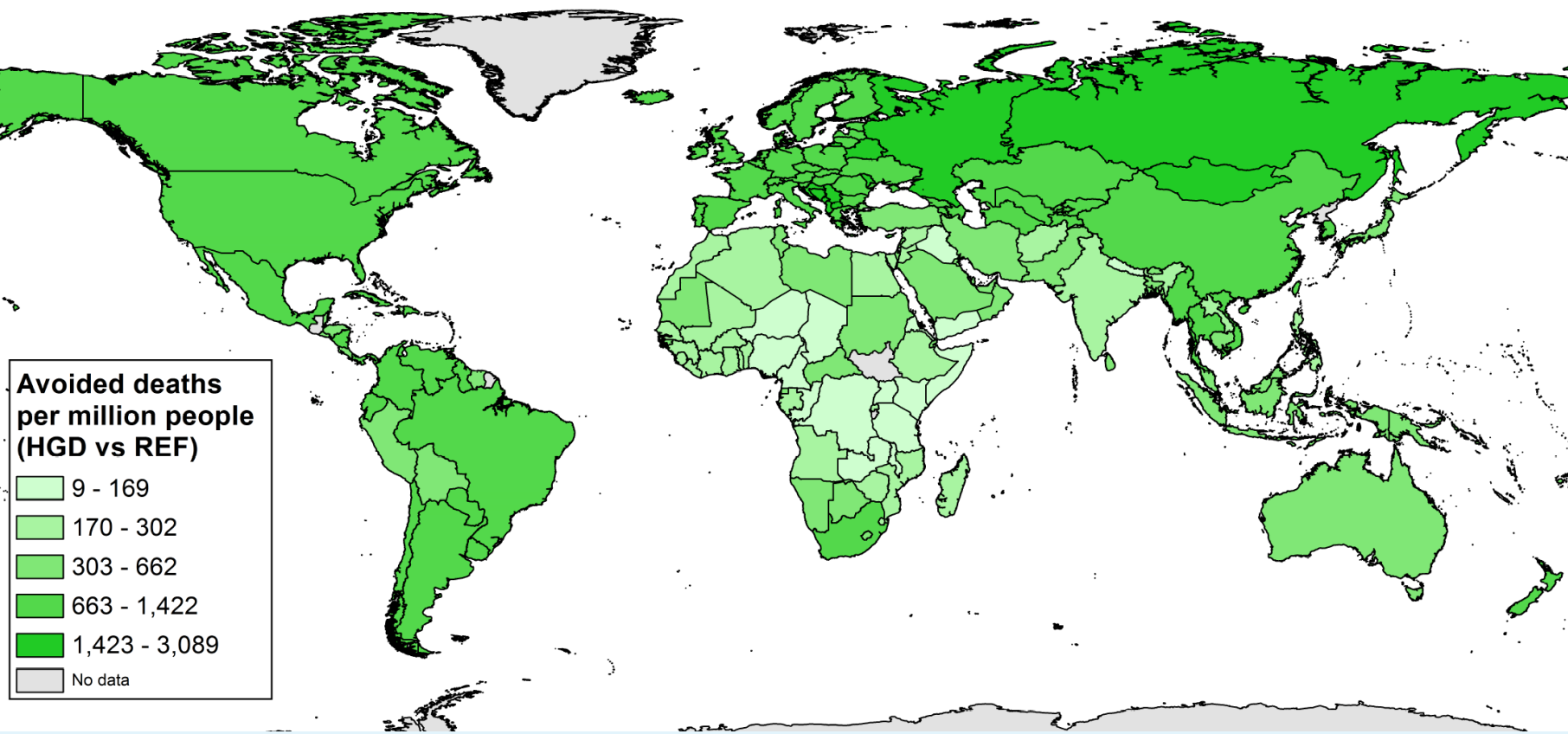


# Distribution of climate-change related deaths

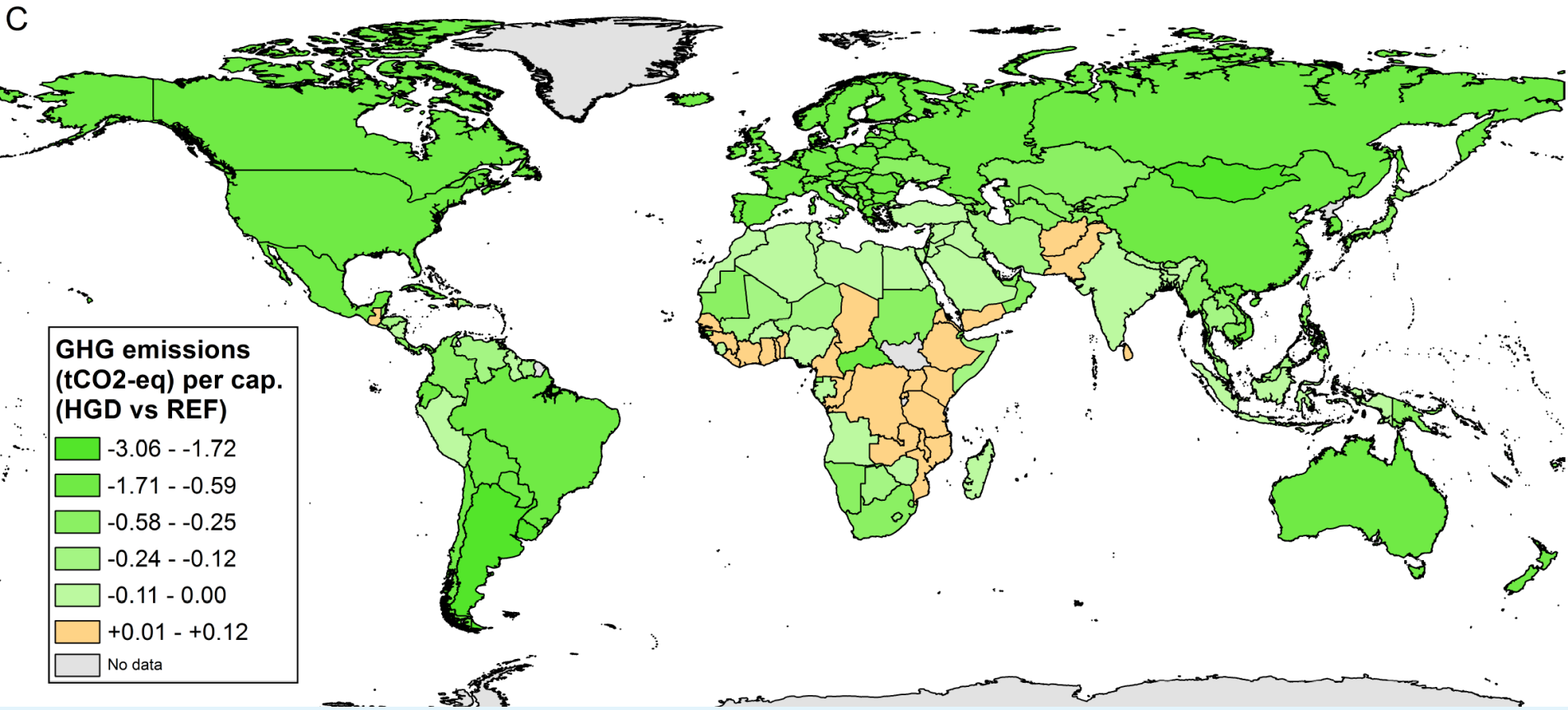


Compared to FAO diet predictions, adoption of a diet meeting nutritional guidelines would in 2050 result in 5.1M avoided deaths per year

C

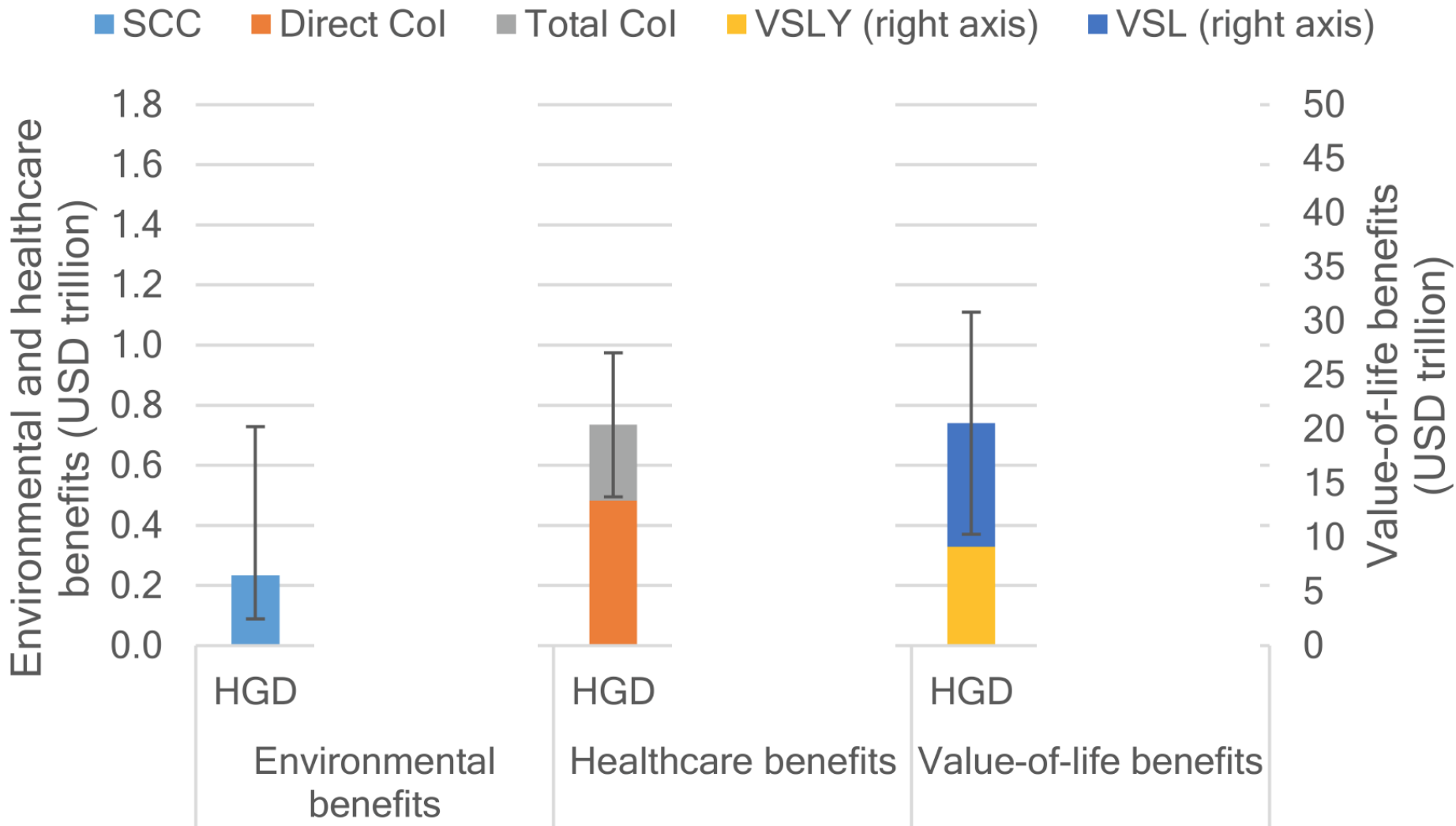


Adoption of a diet meeting nutritional guidelines would in 2050  
would reduce the increase food-system associated GHG emissions  
from 51% to 7%





## There are also very substantial, but hard to quantify, economic benefits of changing diets



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## Caveats

- 500m death high emission scenario
- Uncertainties in agricultural models; especially over extreme events
- Assumptions in economic models
- Simplifications in health models (results robust in sensitivity analysis)

## Conclusions

- Modest reductions in consumption but 28% drop in avoided deaths
- Diets matter and food system approach needed
- Recent WHO estimates of disease burden of climate change too low
- Further argument for mitigation
- Adopt broad-focus on weight-related risk factor
- Greater research focus on fruit and vegetable production and levers of diet change

# Conclusions

- Food system entering uncharted waters
- Action needed on all fronts; no silver bullets
- Sustainable intensification (even if you call it something else) essential
- We fail on food we fail on everything

