

# Food security – challenges and opportunities for evidence

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# What do we mean by food security?

While the world *can* produce enough food for its current population, it has not ensured that

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

**>1 billion people undernourished in 2009**



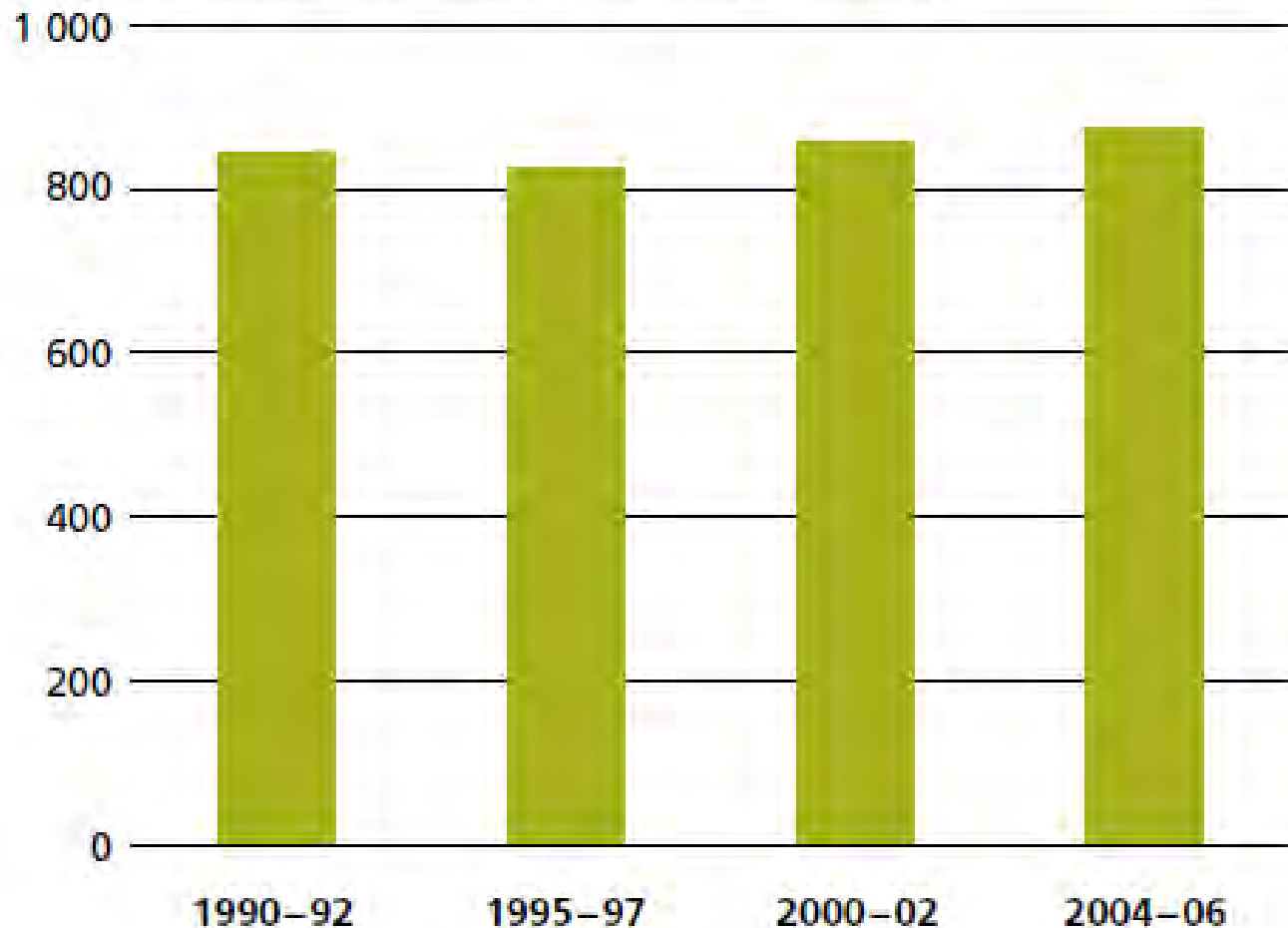
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0000 réfugiés de guerre soudanais vivent dans les camps de l'Onu. Chacun a droit à 2100

**FIGURE 1**

Chronic hunger has been increasing since 1995-97

Number of undernourished in the world (millions)



Source: FAO.

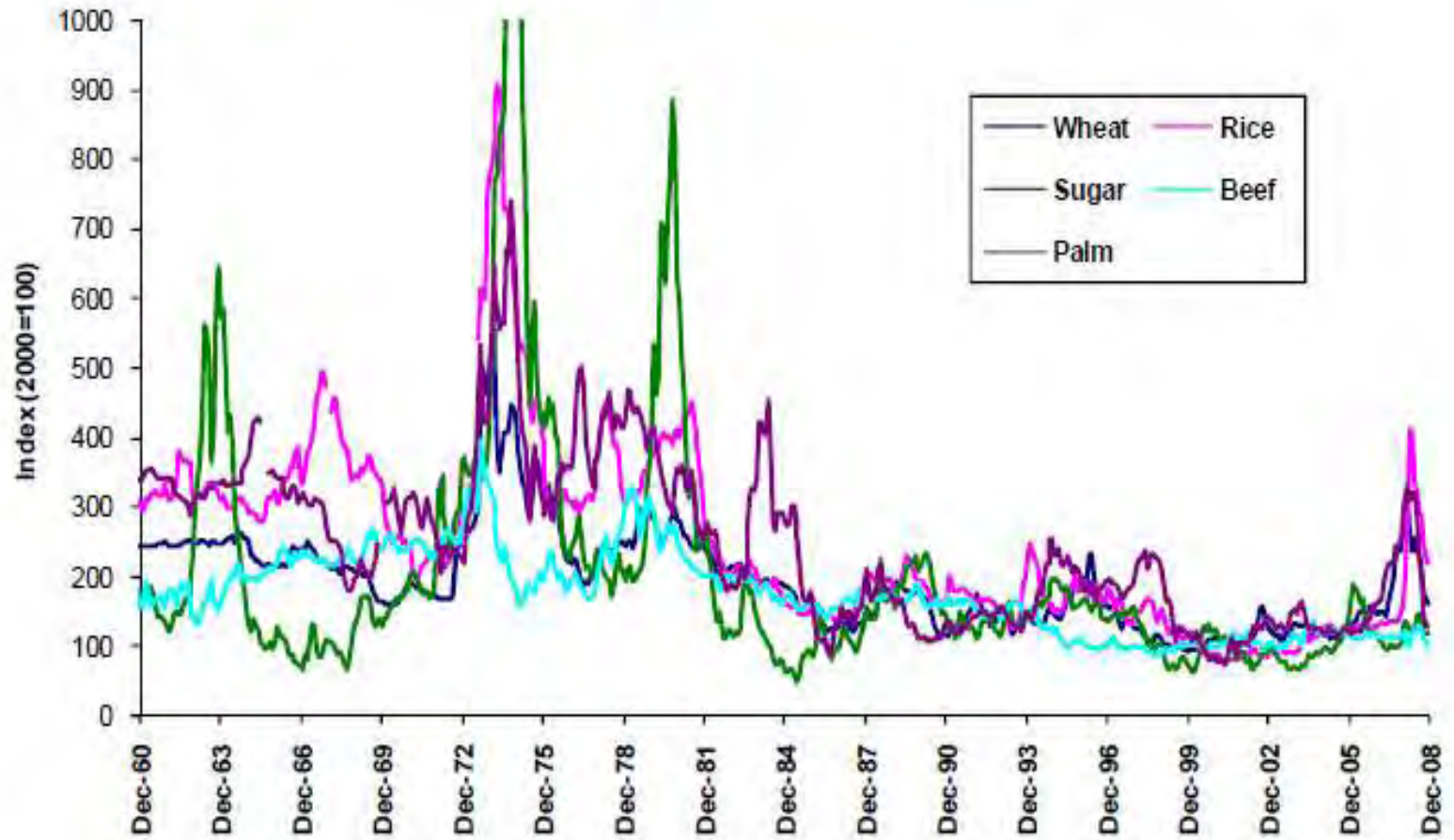
# Why?

When underlying trend in food prices has been a slow decline since 1870s

Only 3 major spikes in food prices in last 100 years:

- After World War II
- 1970s
- This decade

Figure 2: Real price indices January 1960 – December 2008



source: Defra

Figure 3: Real food prices in the UK (month by month changes Jan 1987 – Oct 2009 – 1987=100)



Source: Defra

# Responses to the first 2 spikes

- Policies – e.g. Common Agricultural Policy
- Setting up of UN Food and Agriculture Organisation
- Green Revolution including investment in international agricultural research centres
- In UK investment in public sector agricultural research

# Response to 3<sup>rd</sup> spike

- UN High Level Task Force
- Governance Reform e.g. Food and Agriculture Organisation, Consultative Group of International Agricultural Research
- World Food Summits, G20 agreements, Foresight project, national meetings.....

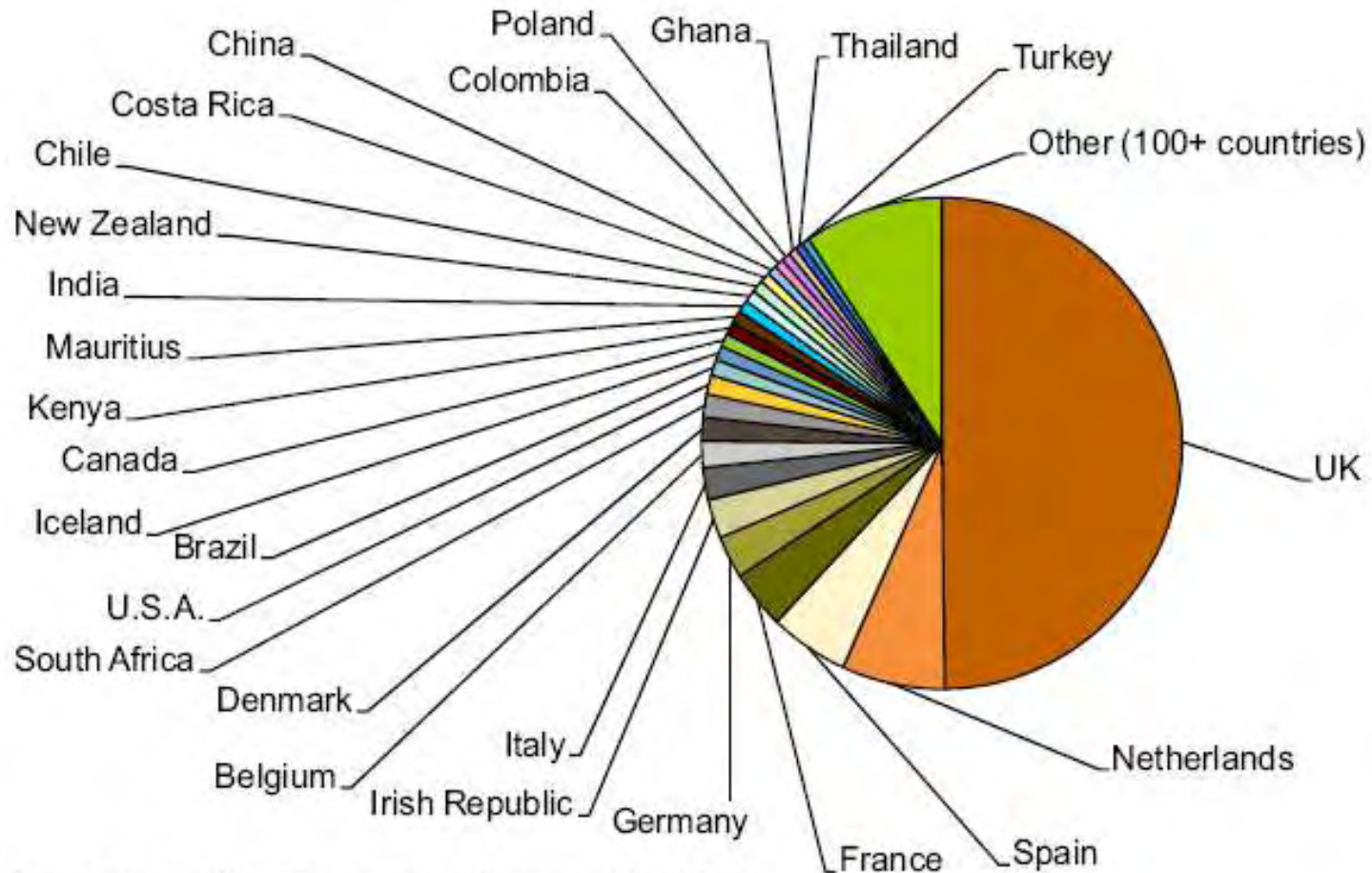
# UK Food security – open system

## Issues

- 2008: 60% Self sufficient in all foods, 73% in those grown in UK

Future drivers: economics, climate change policy, trade agreements, CAP reform, migration, in longer term climate change

# Origins of food consumed in the UK by unprocessed value, 2007



Based on the farm-gate value of unprocessed food



Source: © 2005 PETER MENZEL  
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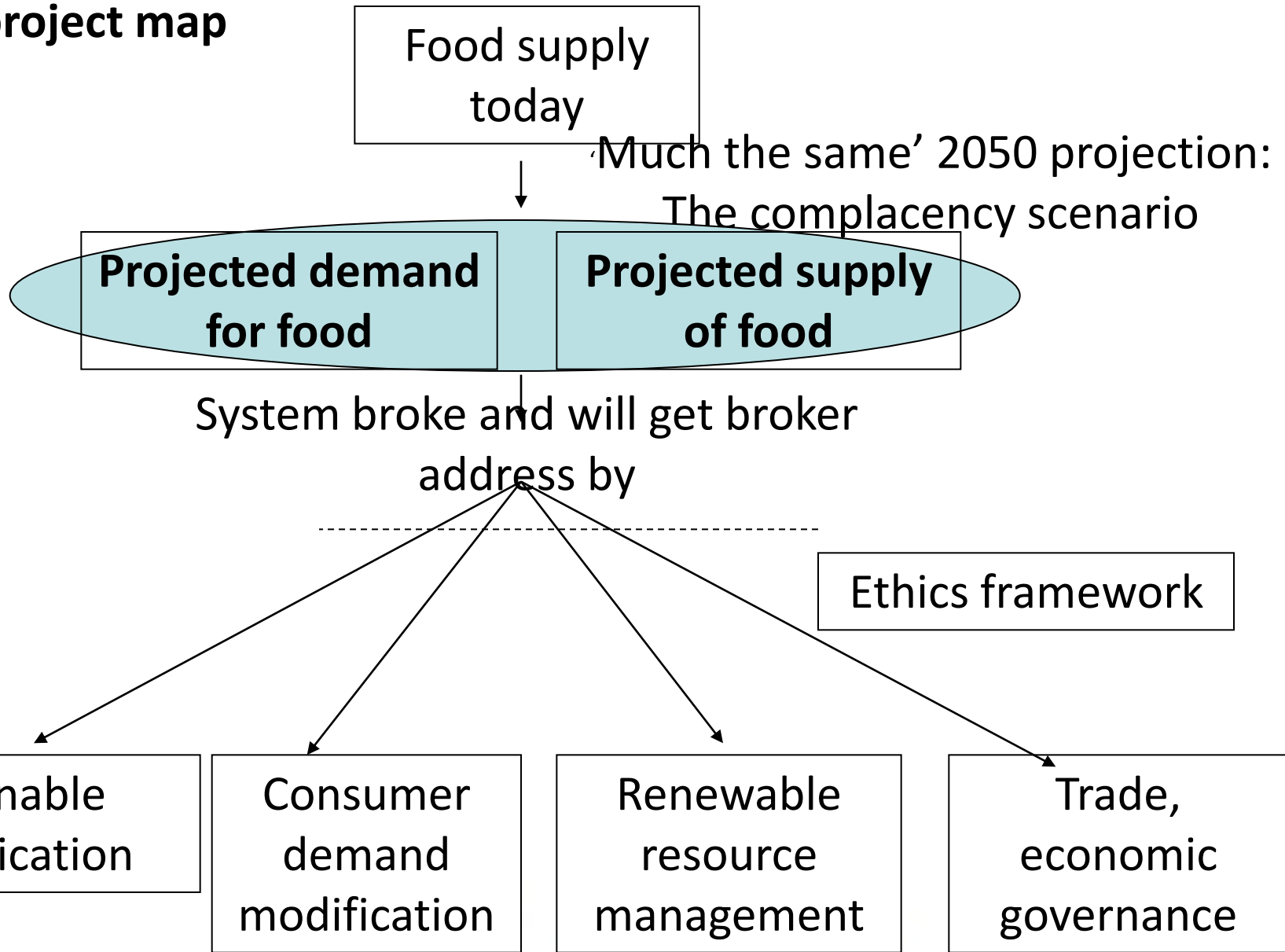
avalés chaque année... Plus de la moitié des Allemands sont en surpoids ou obèses.

# Global Food and Farming Futures Foresight project

“How can a global population of 9 billion people all be fed healthily and sustainably?”

The project will take a global view of the food system and look out to 2050; considering issues of demand, production and supply as well as broader environmental issues.

# Simple project map



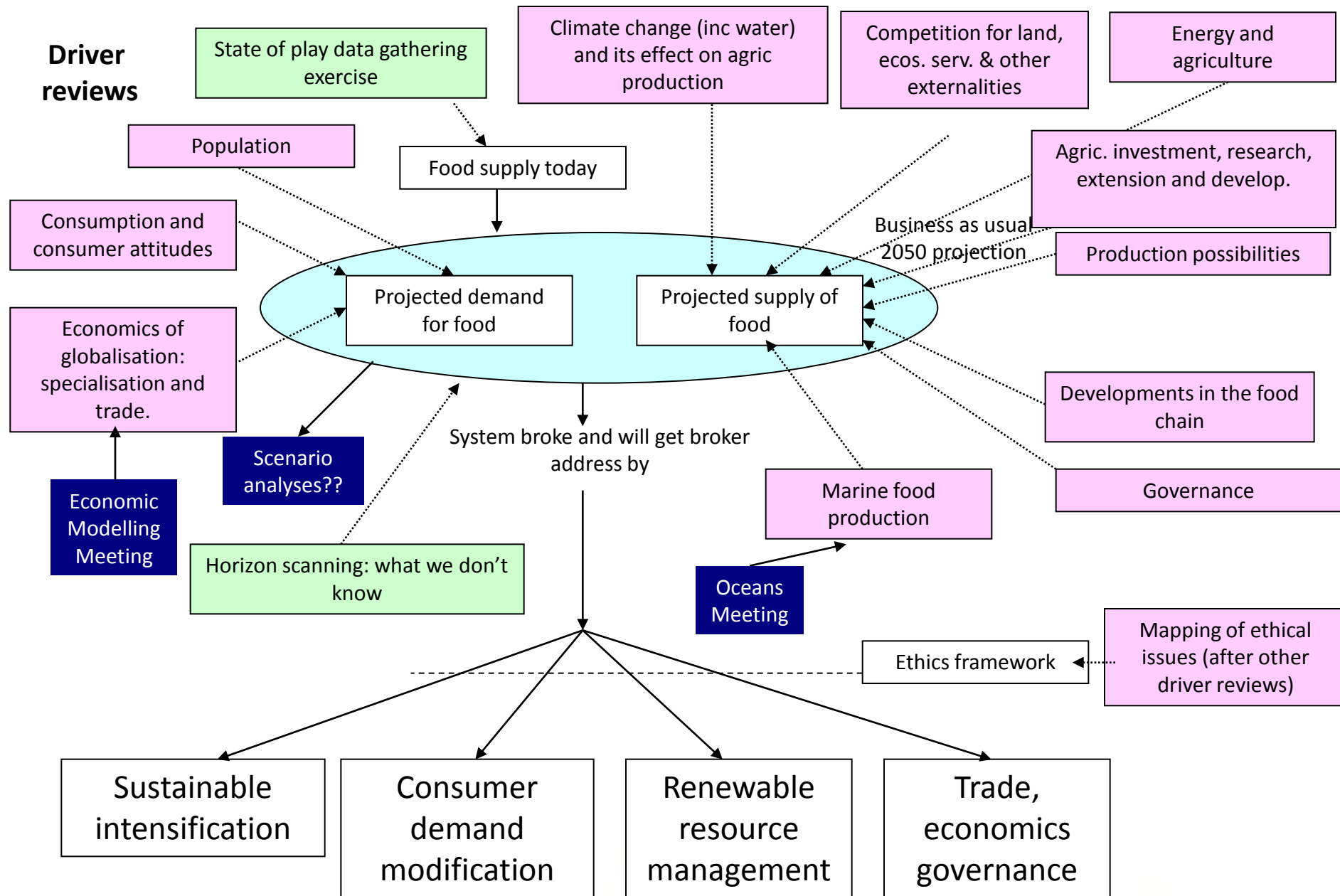
# Project development:

## Phase 1

1. Examine the **complete food system**, including production, demand and supply and broader environmental impacts; strengthen understanding of the global uncertainties and interdependencies.
2. Consider different **spatial scales** – global, regional, country, local.
3. The role of **land, oceans, seas and lakes** in food production.
4. Extensive use of **economic analysis** and **modelling**.

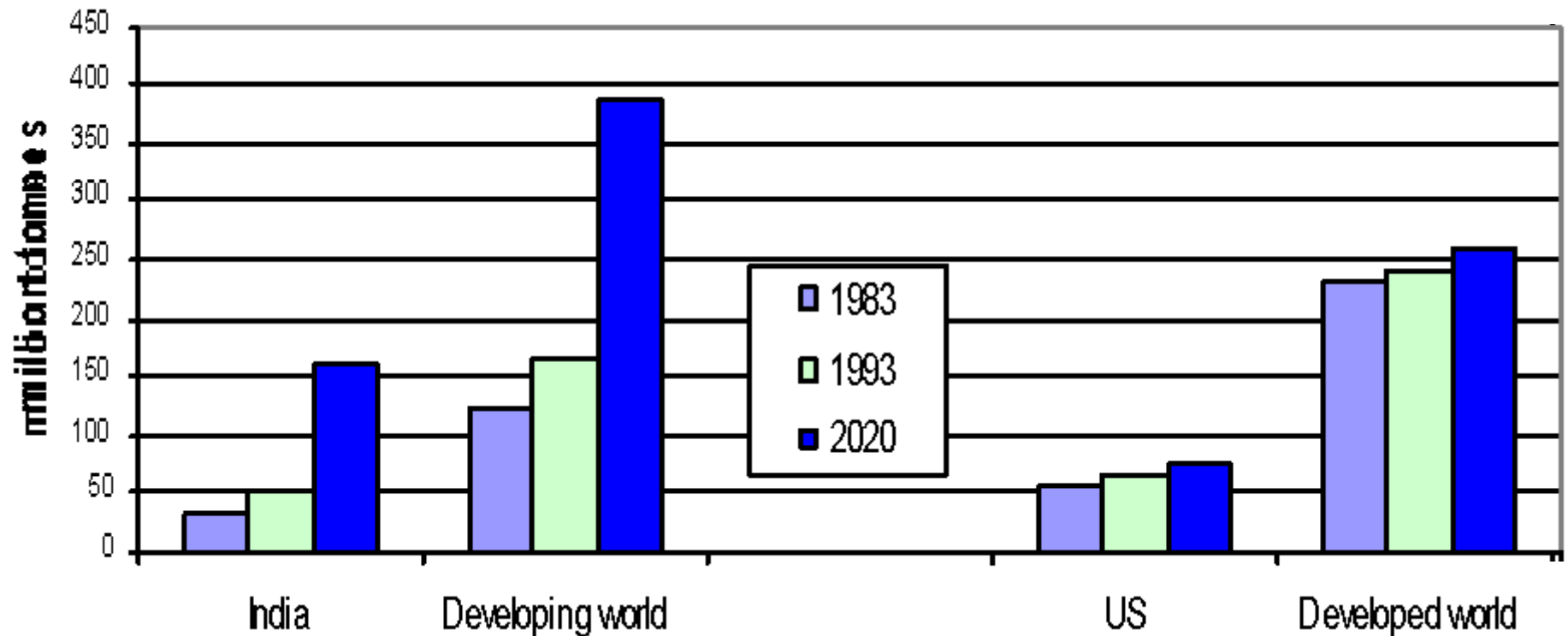
## Phase 2

Underway – integration, scenario development;

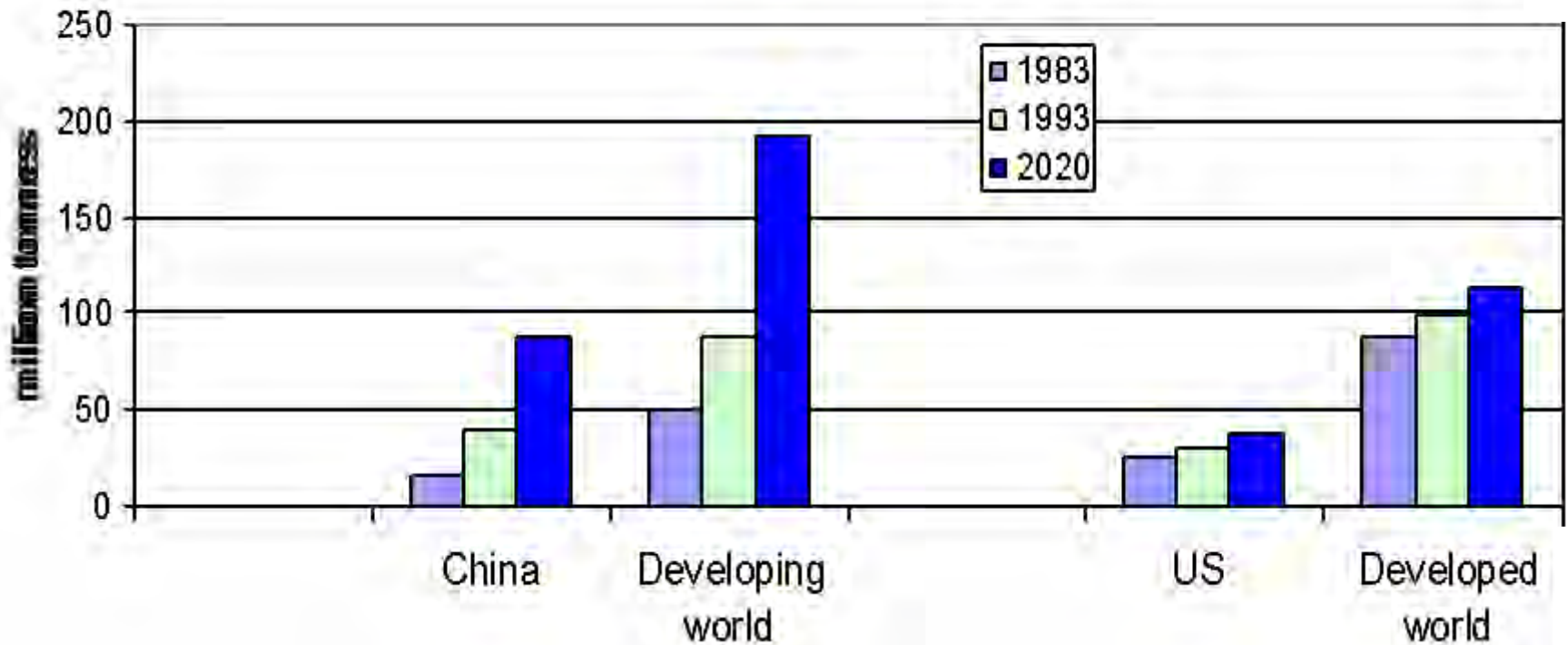


Aggregated list of drivers  
 These reviews will concentrate on business as usual projections

# Trends in milk consumption (*million tonnes*)



# Trends in meat consumption *(million tonnes)*



# The role of land, oceans, seas and lakes in food production

- Key aim to integrate perspectives across land and water; output, location, quality and value;
- Important contribution of aquatic resources; marine, inland fisheries, aquaculture, post-harvest/markets
- Interactions – inland waters/catchments, coastal areas, enrichment (agric and urban);
- Climate change mitigation and adaptation issues – including ‘Blue Carbon’ – aquatic/oceanic processes; payment for ecosystem services
- Wide range of science interactions – methodologies, impacts; also social acceptance issues (eg GM)

# Economic analysis

## Economics Advisory Group

10-15 leading economists from government, international organisations meet at three or four key times during the course of the Project.

Offers advice on the economic analysis that should be performed, and ensures the highest possible quality of the work.

# Modelling

## **Global Food Modelling Workshop: March 2009**

Top modellers from around the world to discuss existing models and:

1. See how well models might work out to 2050
2. Discuss how they can be linked to/integrated with climate models
3. Discuss how these models need to be extended and/or adapted to analyse alternative scenarios of interest to the Foresight project.

# The aquatic perspective

- Major changes expected – marine and inland fisheries resources; aquaculture growth; changing global patterns, trade, markets;
- Significant role in future supply - + 60-70%? Implications for feed supply, water, spatial choices, environmental loading, safety and quality, investment and business structure;
- Key roles of science, management, governance – aim to identify where these are most critical, what can be done/by whom
- Partnerships in scientific and capacity-building processes – R&D investments and returns, closing knowledge/application gaps;

# UK level initiatives on food

- Global Food and Farming Foresight project
- UK CSA-led Food Research Group developed UK Food Research Strategy
- UK CSA-led Food Research Partnership
- Food Security programme involving Research Councils, Government Departments and DAs
- Royal Society Report – 'Reaping the benefits'

# Take Away Messages

- Alleviating food security at global level is not *just* about increasing supply
- Immediate need is to decrease greenhouse gas emissions associated with food production
- Longer-term need sustainable intensification of crop production globally
- Should not take linear demand trends as a 'given'

# Opportunities in Scotland

- To reconnect demand and supply in innovative ways – robust science to promote paradigm shifts?
- To use multiple science (natural and social) disciplines to develop innovative, sustainable food systems
- To use government scientists and analysts to link research to policy