UK Climate Change Risk Assessment evidence on food security risk

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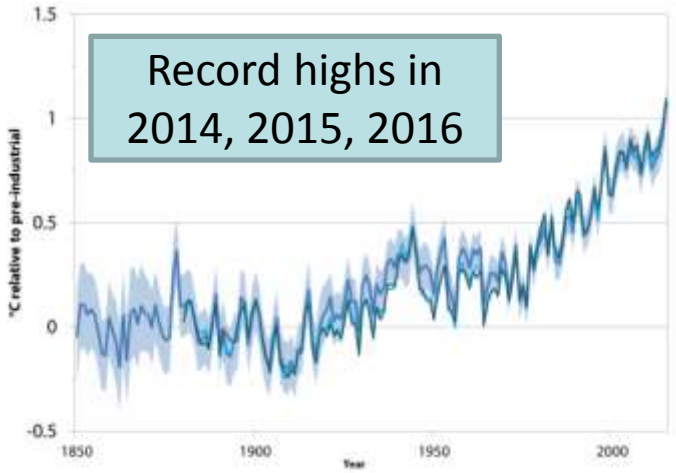
Adaptation Sub-Committee secretariat
Committee on Climate Change

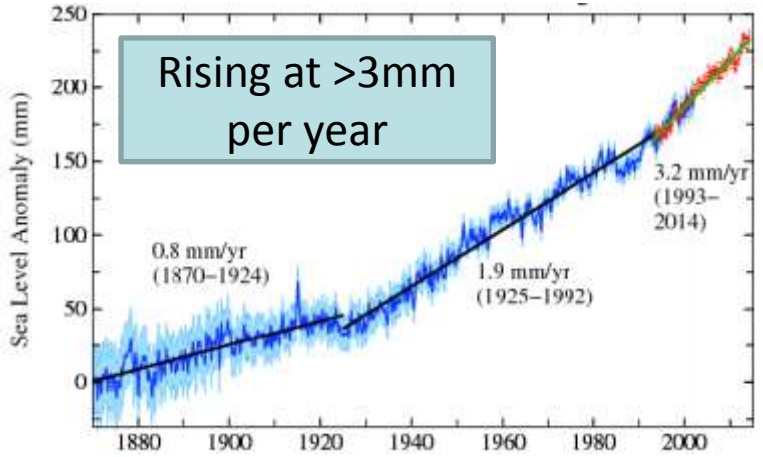
IPCC stated that warming is unequivocal (Observed changes since 1950s)

Committee on Climate Change

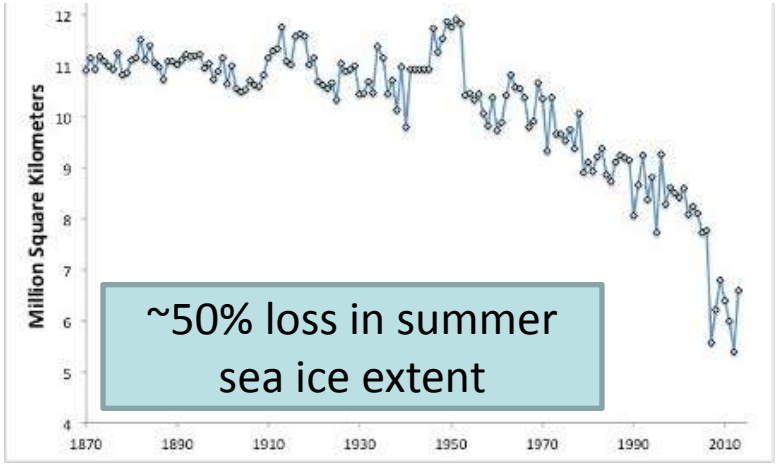
Global average temperature



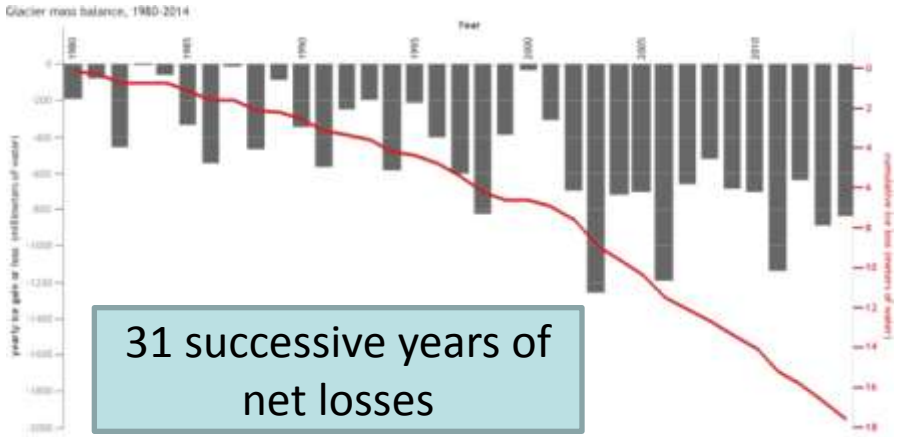
Global average sea level



Summer arctic sea ice extent



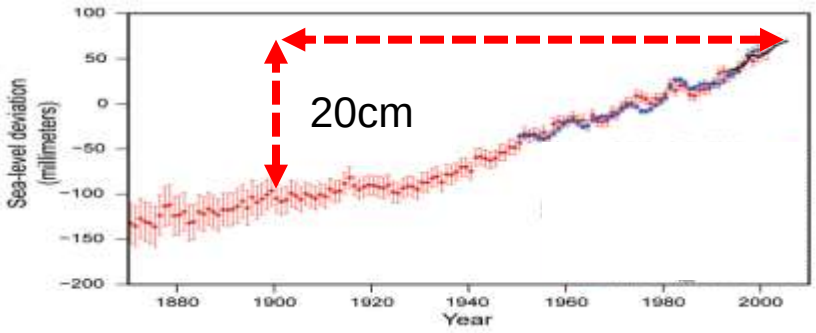
Glacier mass

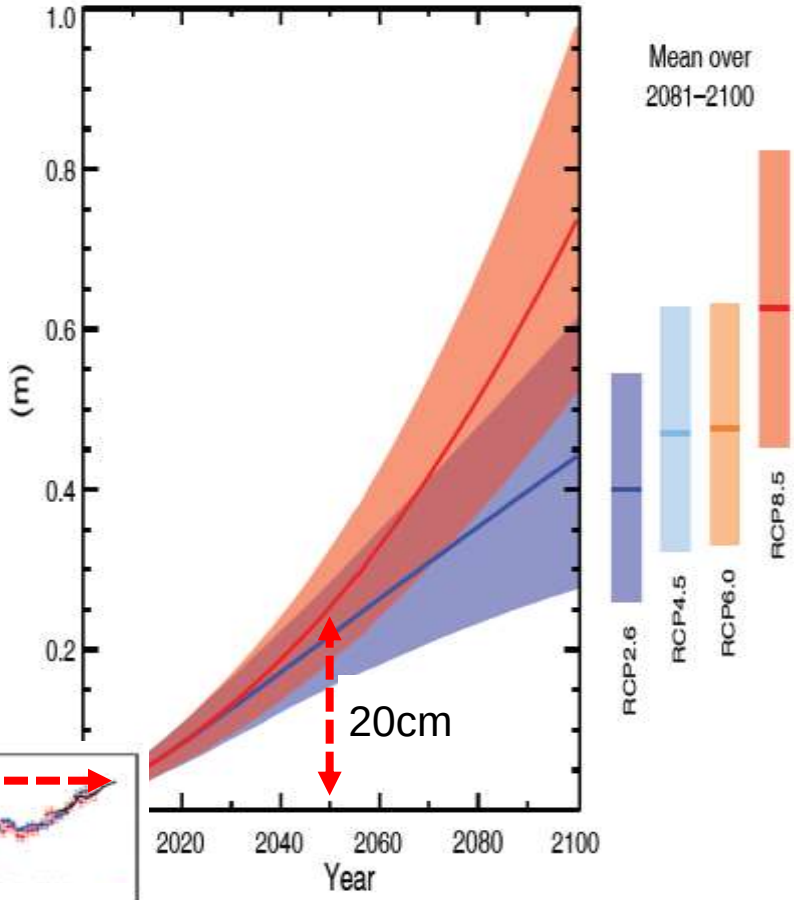


Source: NASA, NOAA Climate.gov, Met Office Hadley Centre

Lag in the Earth's climate system means further changes are inevitable

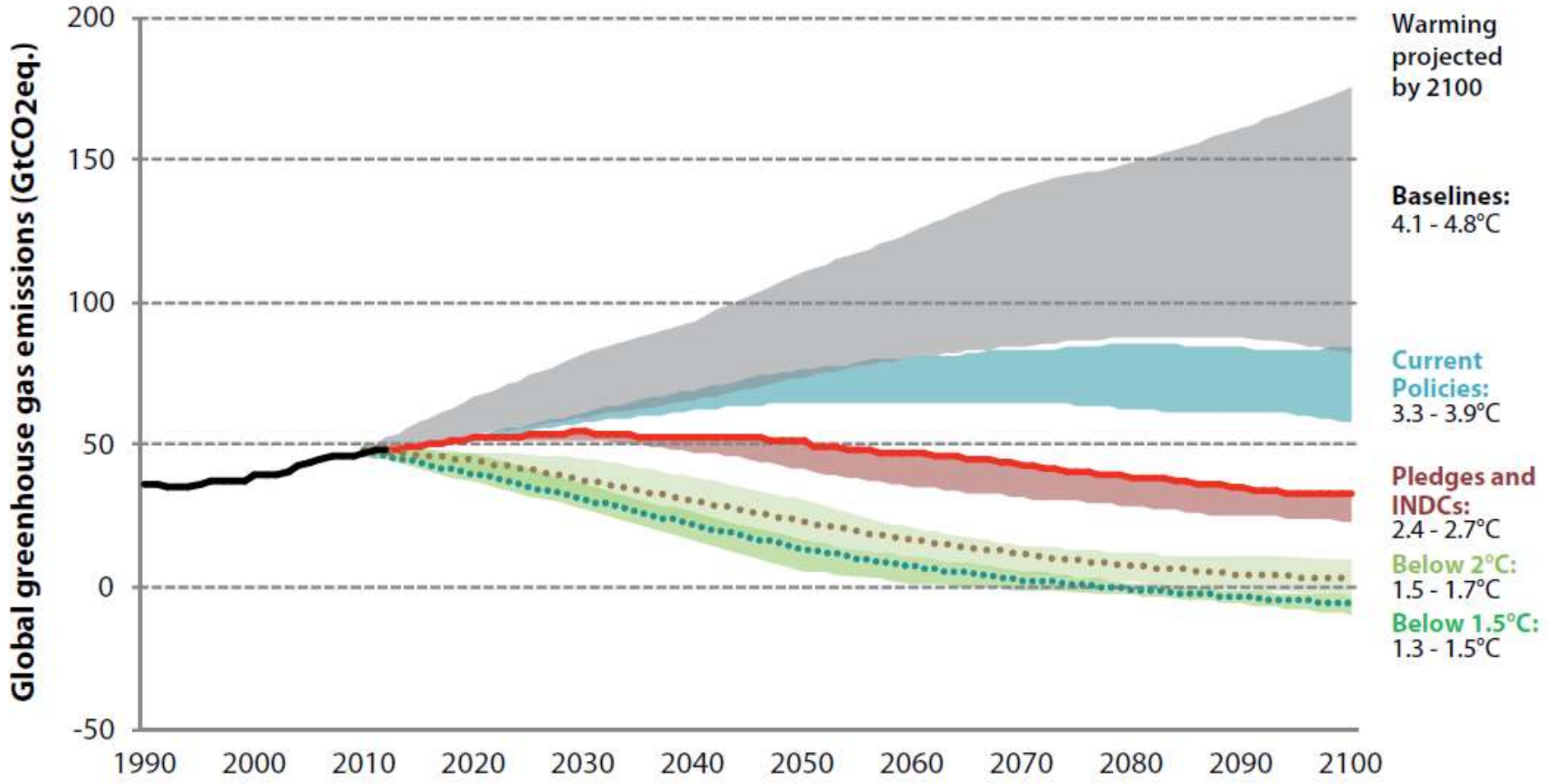
- Sea level rise during 20th century set to be repeated in the next 30-40 years
- Largely regardless of future greenhouse gas emissions
- Overall a meter of sea level rise by 2100 is plausible
- More depending on rate of Greenland and Antarctic ice sheet melt





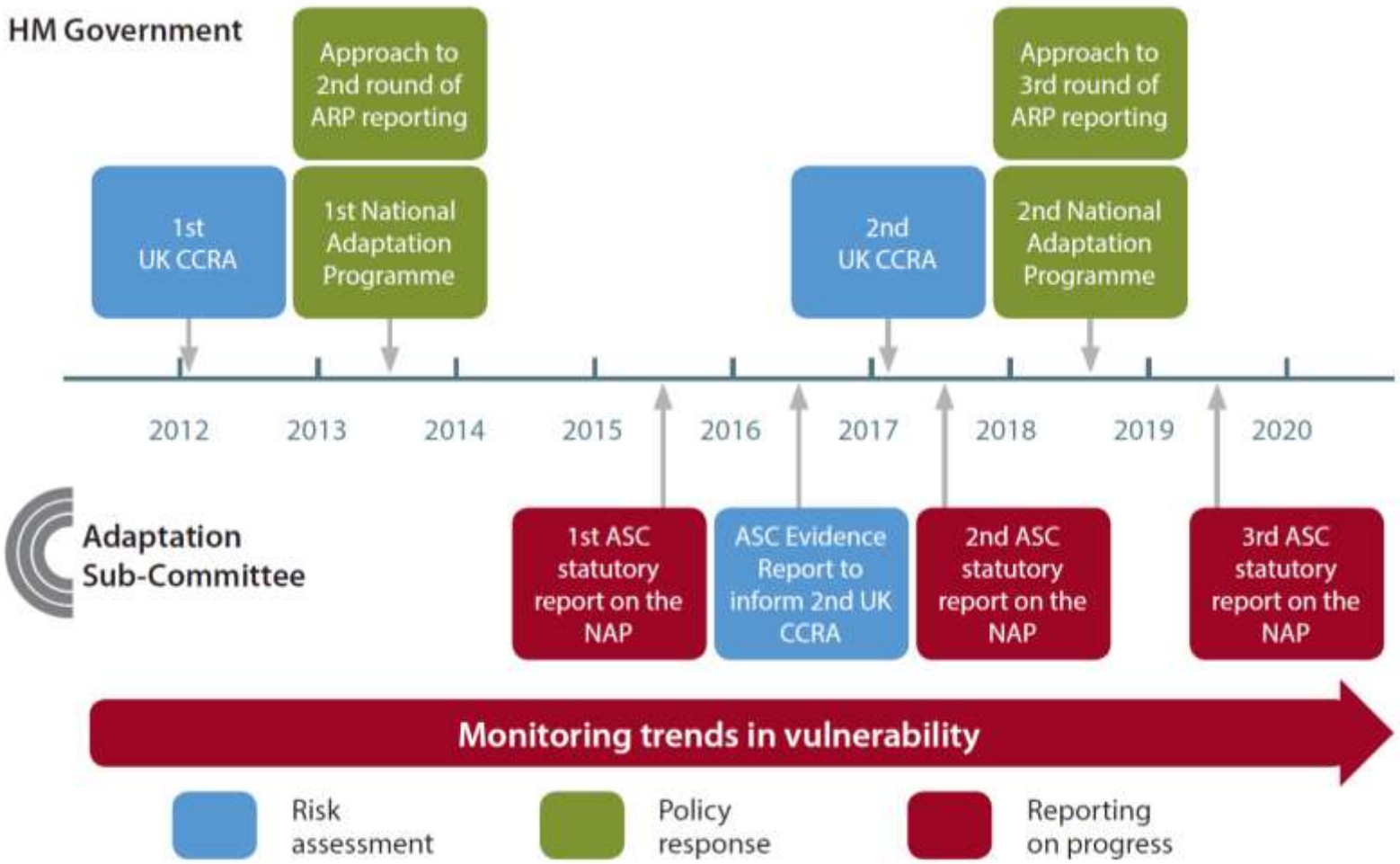
Source: (a) NOAA/NCDC, (b) IPCC Fifth Assessment Report (2014)

Paris Agreement reduces the chance of 3-5°C warming but some risk remains

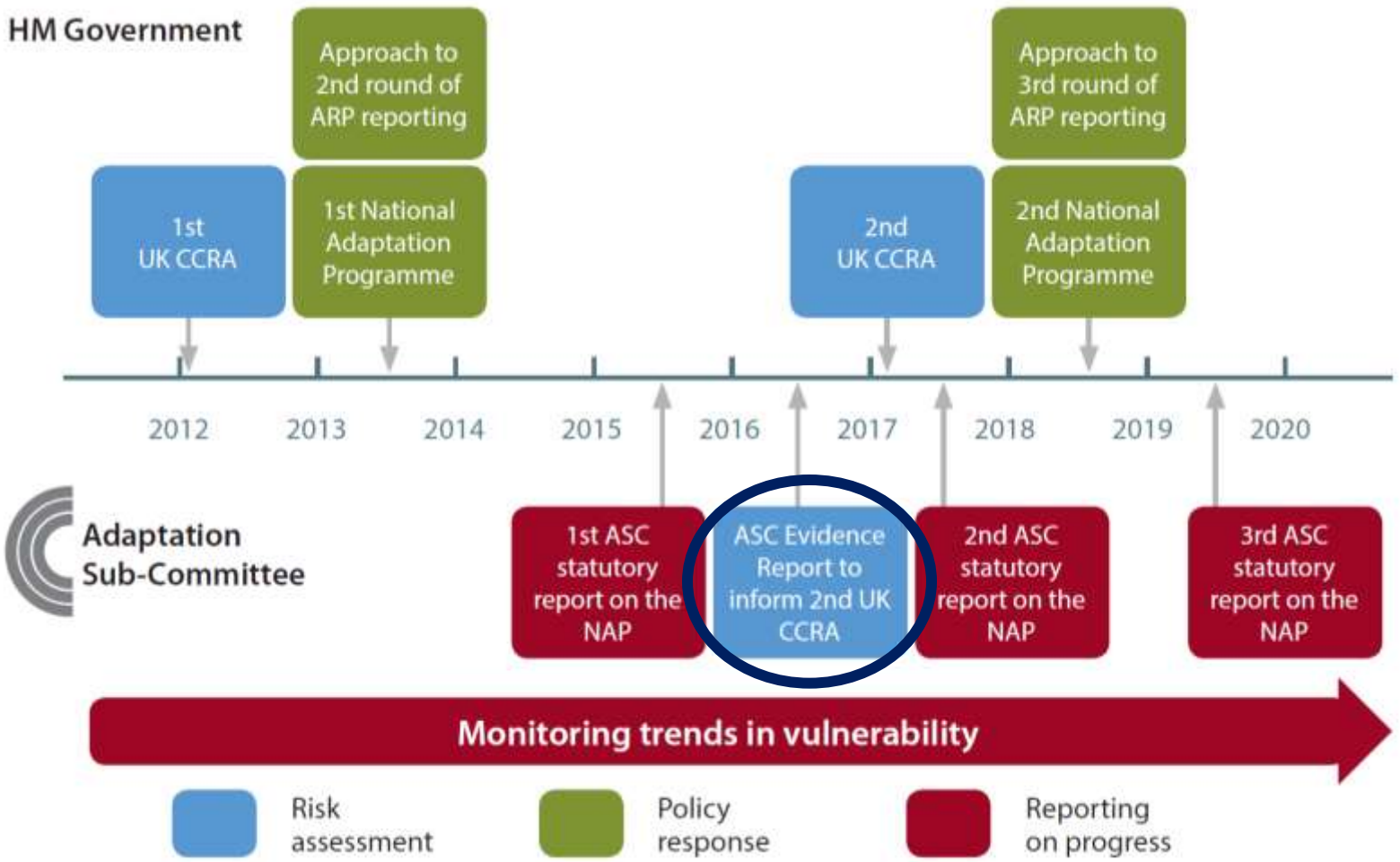


Source: Gütschow et al. (2015), Climate Action Tracker

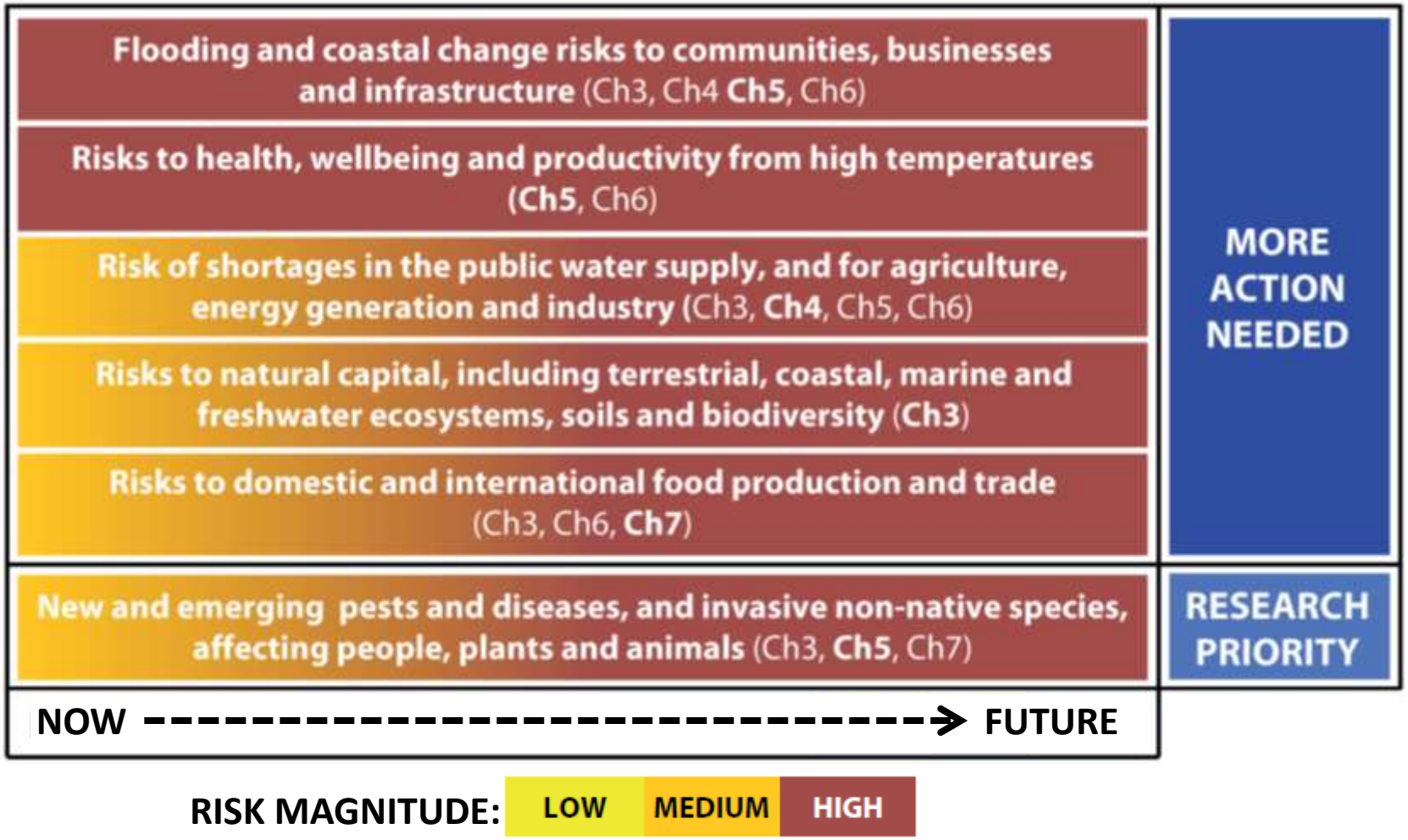
The Adaptation Sub-Committee advises on the possible impacts from climate change and scrutinises Government policies on adaptation



The Government asked the ASC to provide the evidence base for the UK Climate Change Risk Assessment 2017

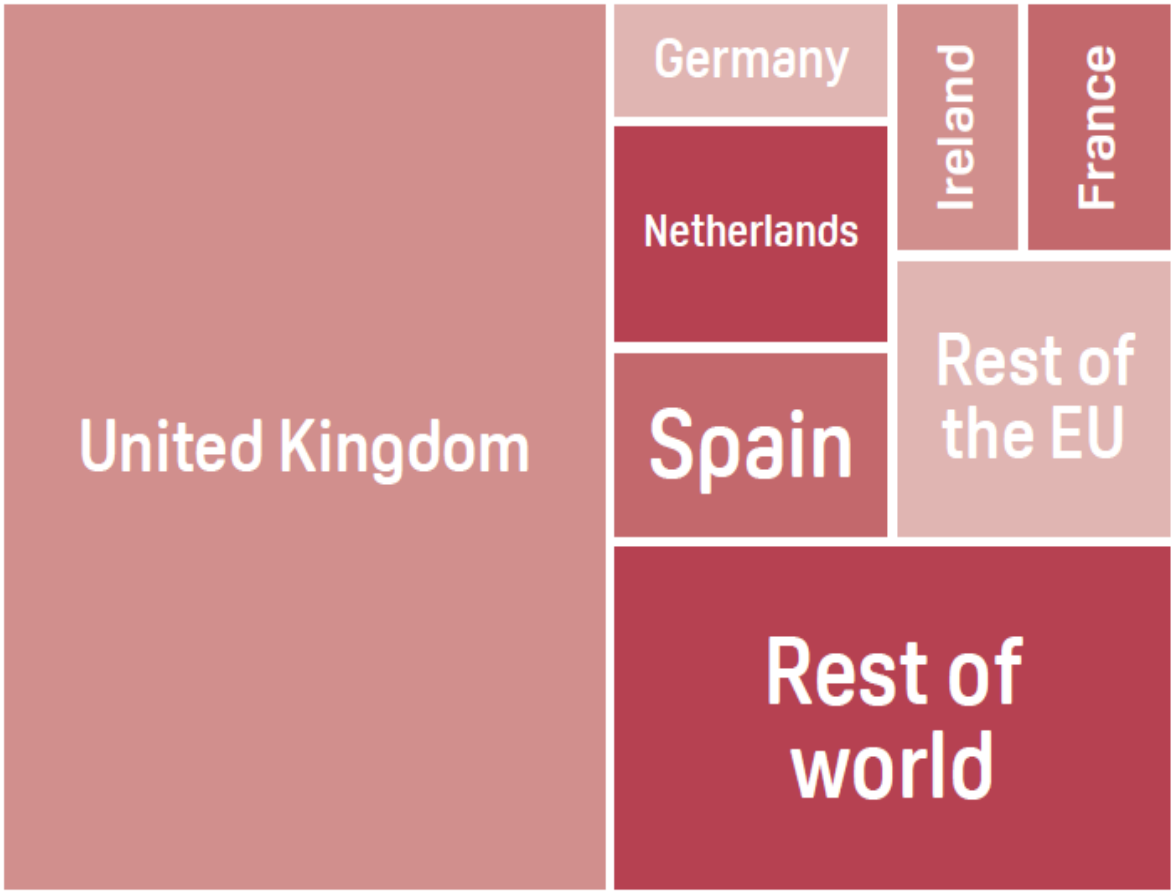


Risks to domestic and international food production and trade is one of six priority areas identified by the ASC



Source: ASC (2016) *UK CCRA 2017 – Synthesis Report*

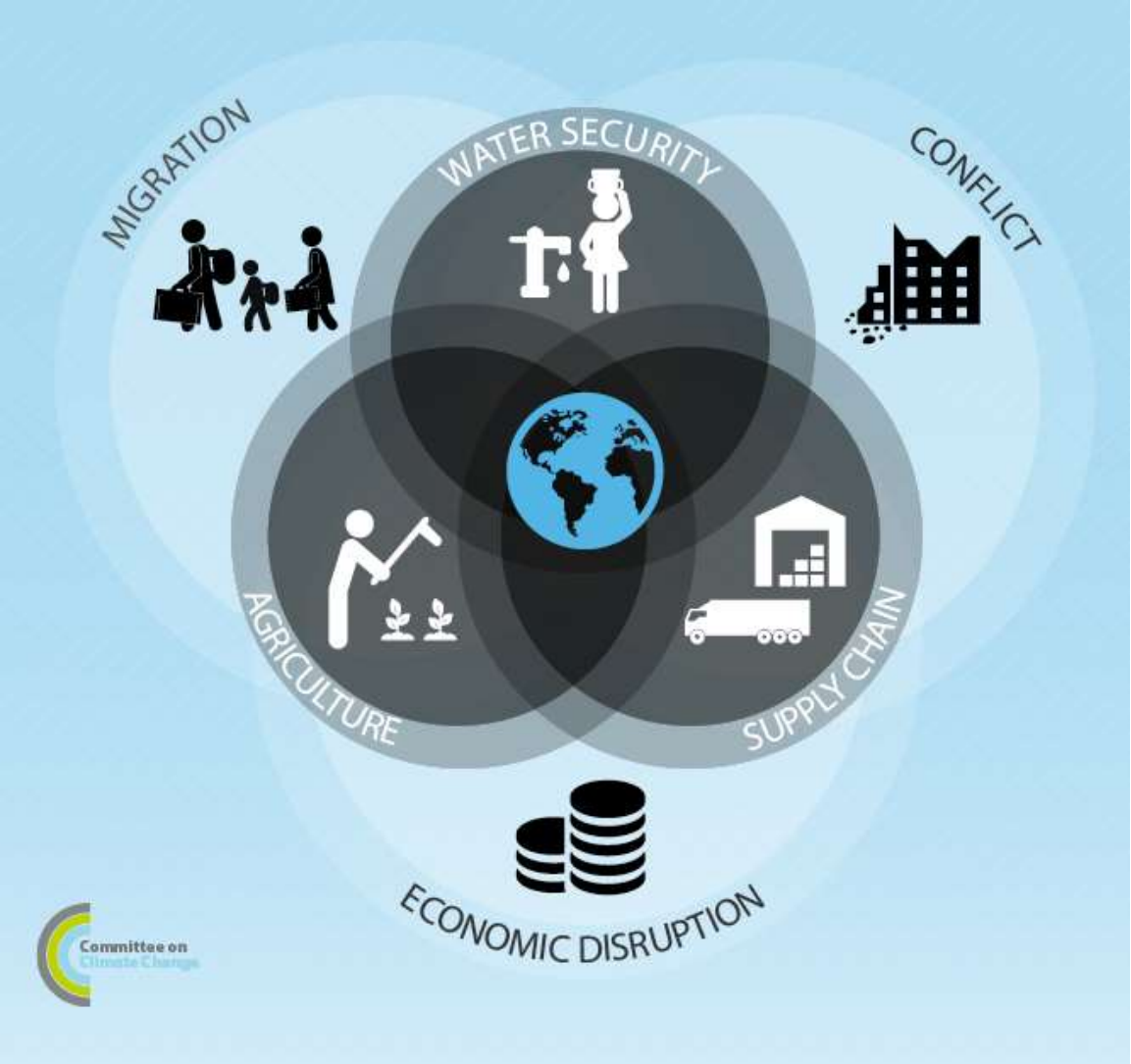
The CCRA Evidence Report looked at the domestic and international components of the UK food system



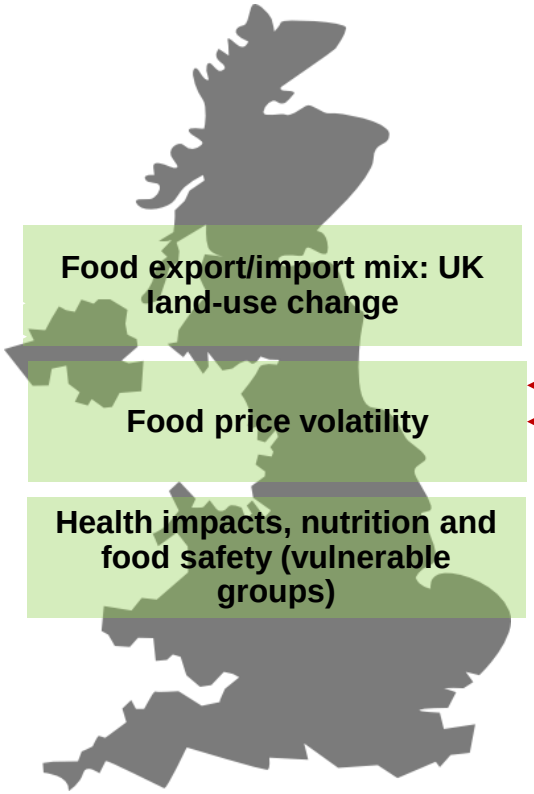
- About half of the half the farm-gate value of unprocessed food in the UK is imported.
- This is a positive aspect of the UK food system as diversification of sources increases resilience.
- Climate change can impact to both domestic and international food production and trade.
- Consuming food from a single source would make the system more vulnerable.

Source: Origins of food chart from Food Standards Agency (2016) Food crime, annual strategic assessment

On the international side, climate change is disrupting water resources, agriculture and infrastructure around the world. These international impacts indirectly affect the UK.



For example, extreme events can disrupt supply chain and overseas food production, with impacts on UK prices



Impacts to the UK

- Food export/import mix: UK land-use change
- Food price volatility
- Health impacts, nutrition and food safety (vulnerable groups)

Short-term shocks

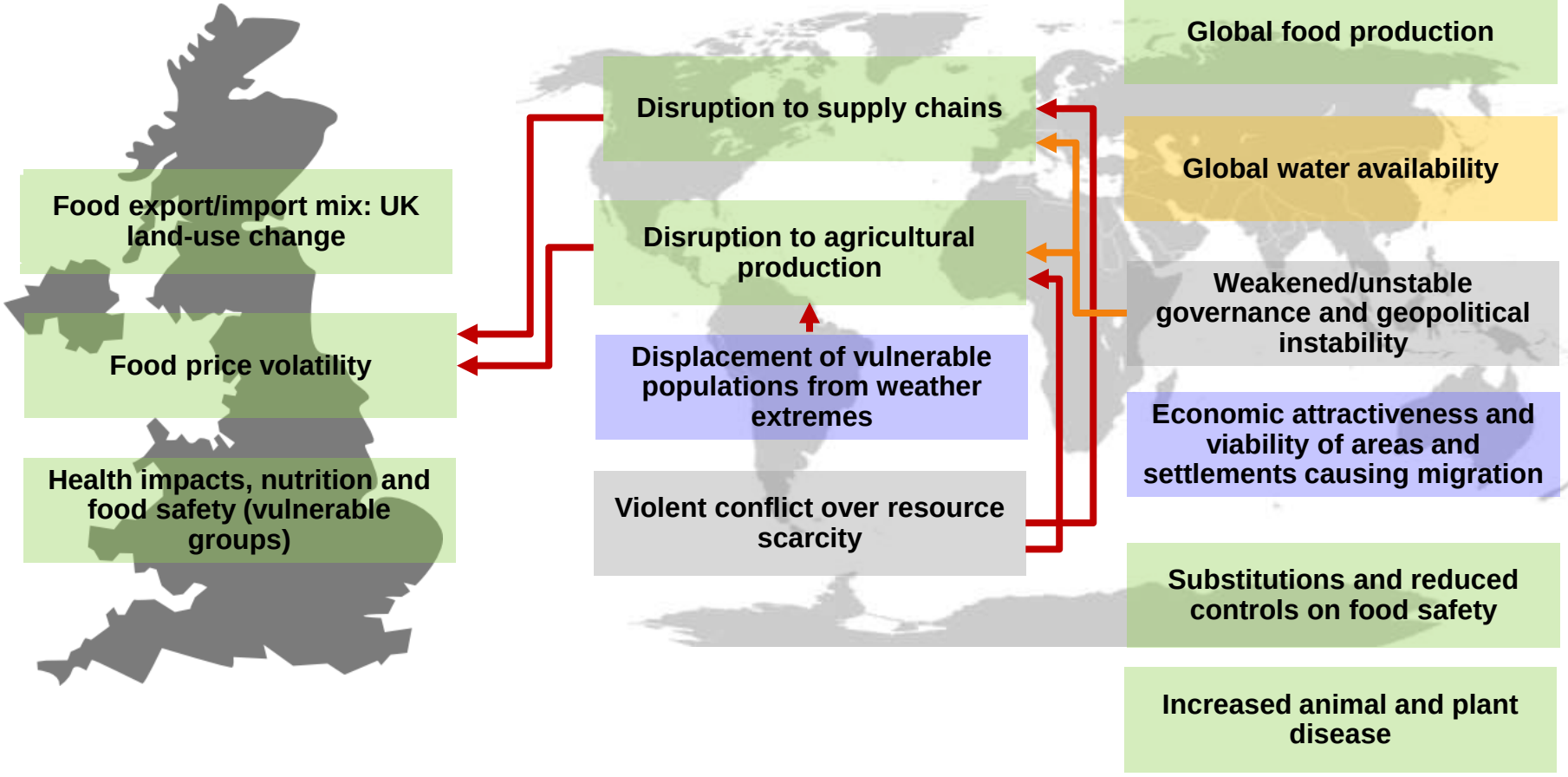
- Disruption to supply chains
- Disruption to agricultural production
- Displacement of vulnerable populations from weather extremes
- Violent conflict over resource scarcity

Long-term impacts

- Global food production
- Global water availability
- Weakened/unstable governance and geopolitical instability
- Economic attractiveness and viability of areas and settlements causing migration
- Substitutions and reduced controls on food safety
- Increased animal and plant disease

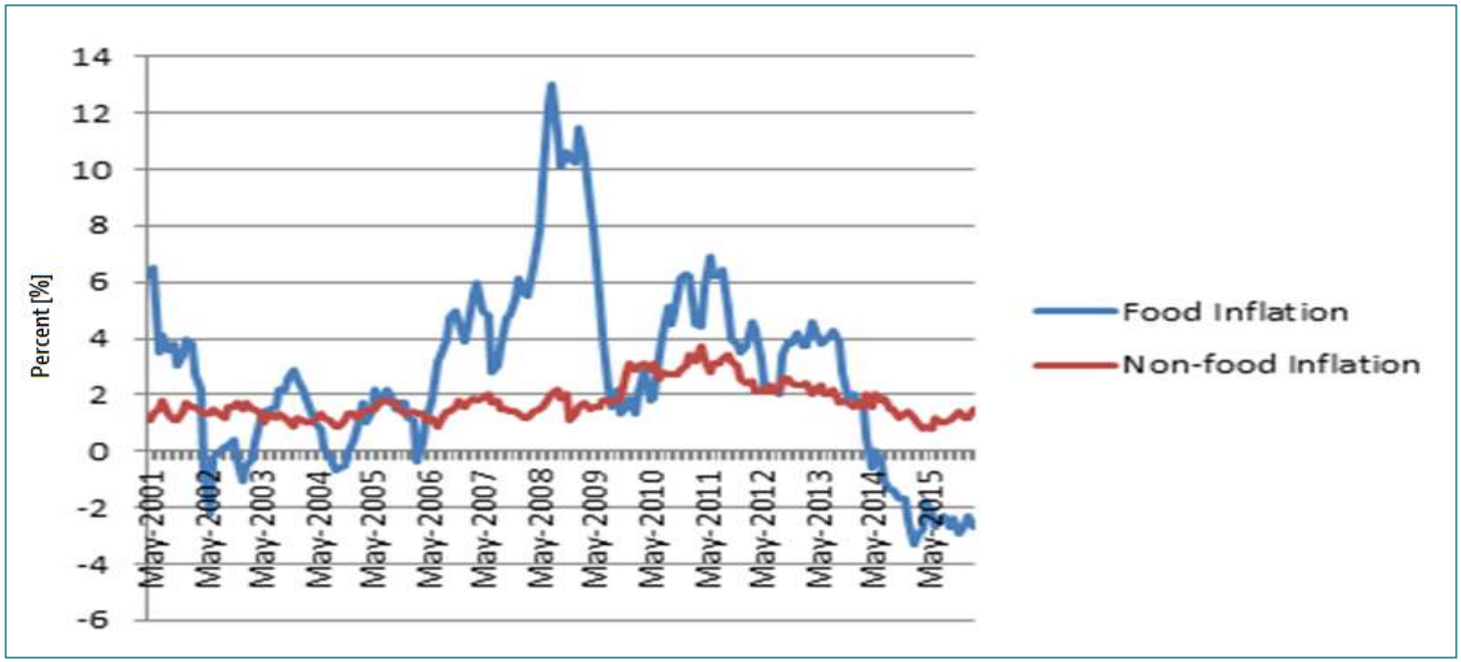
Source: UK CCRA 2017 Evidence Report – Chapter 7: international dimensions

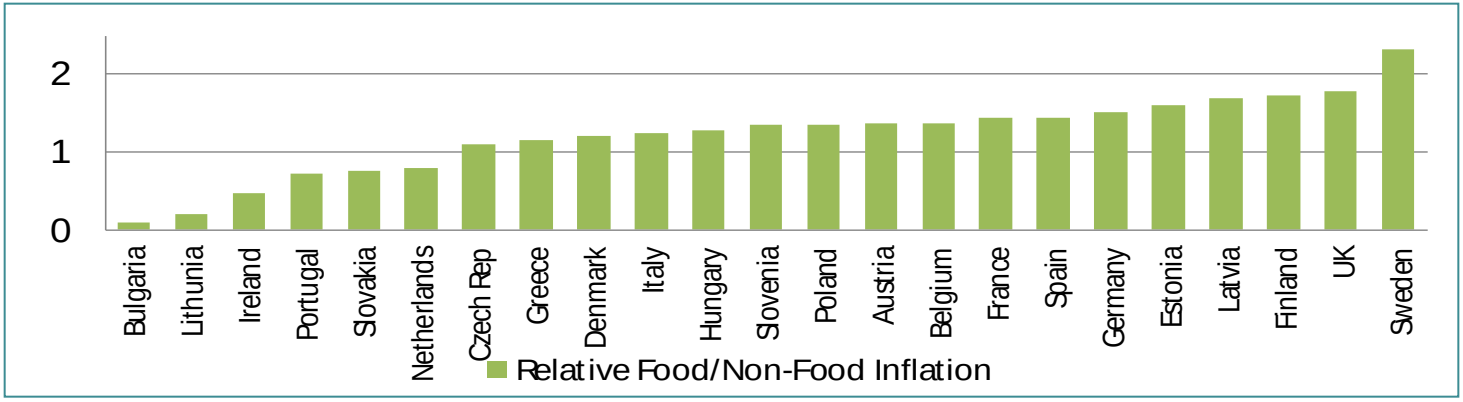
Trade disruptions can also be a secondary consequence of displacements, conflicts and political instability



Source: UK CCRA 2017 Evidence Report – Chapter 7: international dimensions

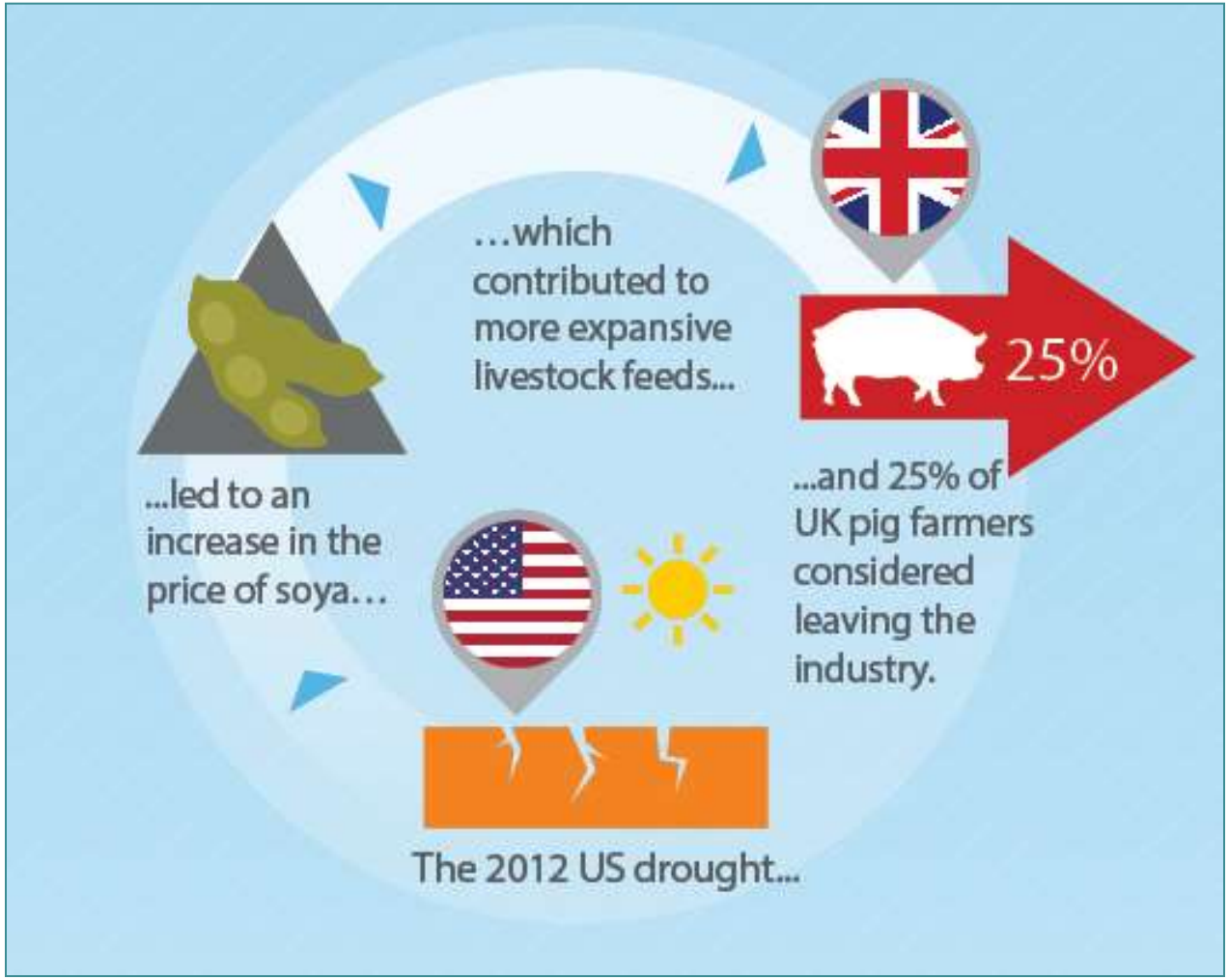
UK food prices are particularly sensitive to shocks, more than most European countries





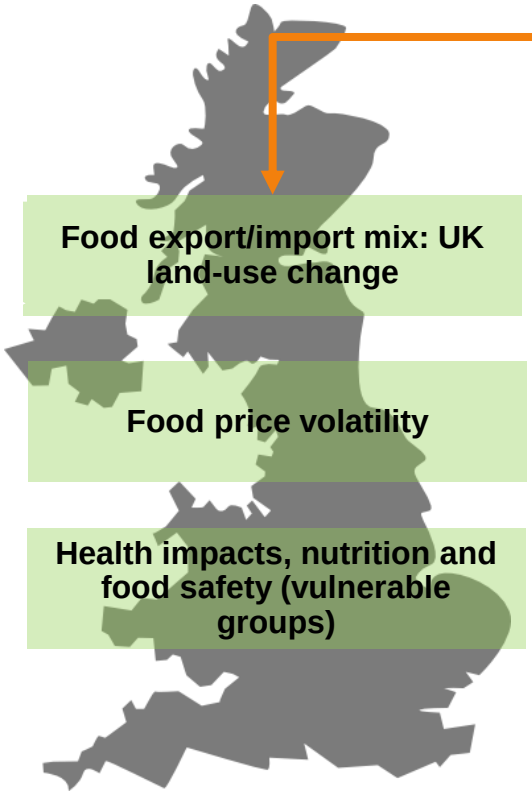
Source: Lloyd et al. (2015) see UK CCRA 2017 Evidence Report – Chapter 7: international dimensions

Price spikes can also impact prices of feed, with effects on farmers



Source: Benton, T. (2012) Severe weather and UK food chain resilience

Global changes in food production and local climate changes in the UK can also drive land use changes within the UK



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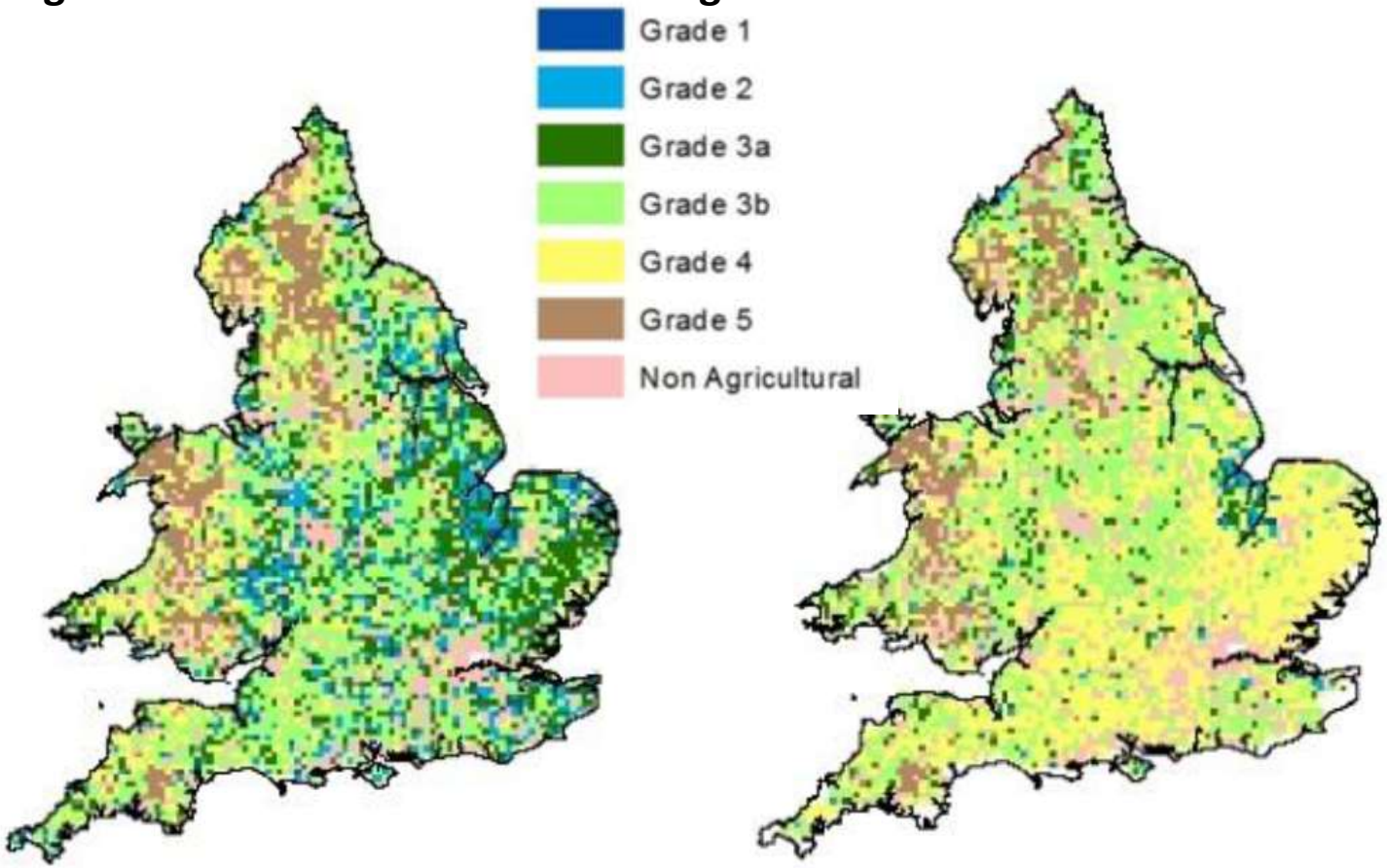
Source: UK CCRA 2017 Evidence Report – Chapter 7: international dimensions

Domestically, food production depends on the condition of soils…

Agricultural land classification in England and Wales



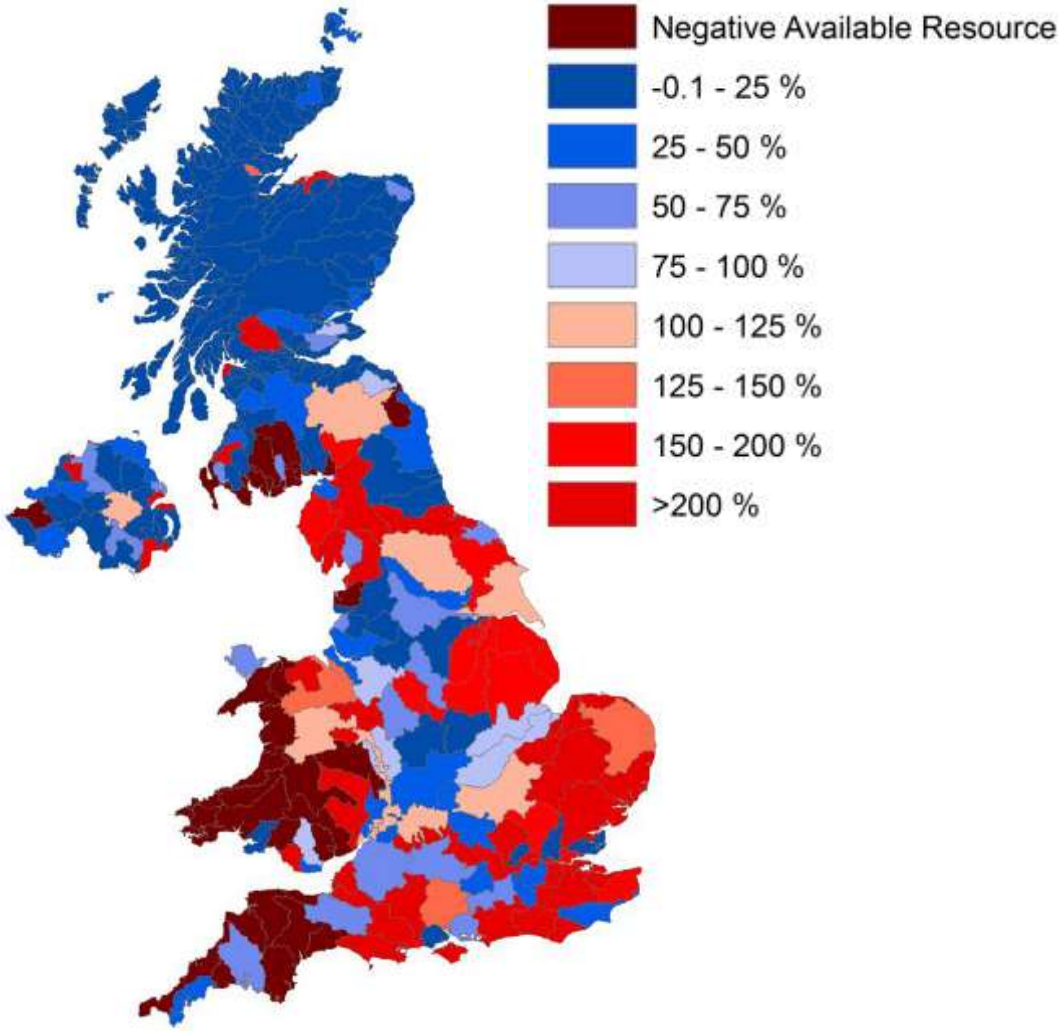
Baseline (1961-91)

2050s (high emissions scenario)

- 'Best and Most Versatile' land in England now and in 2050s
- Projected to decrease from 38% to 9% by 2050s
- This is due to projected increases in soil aridity

Source: from Defra (2015), see UK CCRA 2017 Evidence Report – Chapter 3: Natural environment

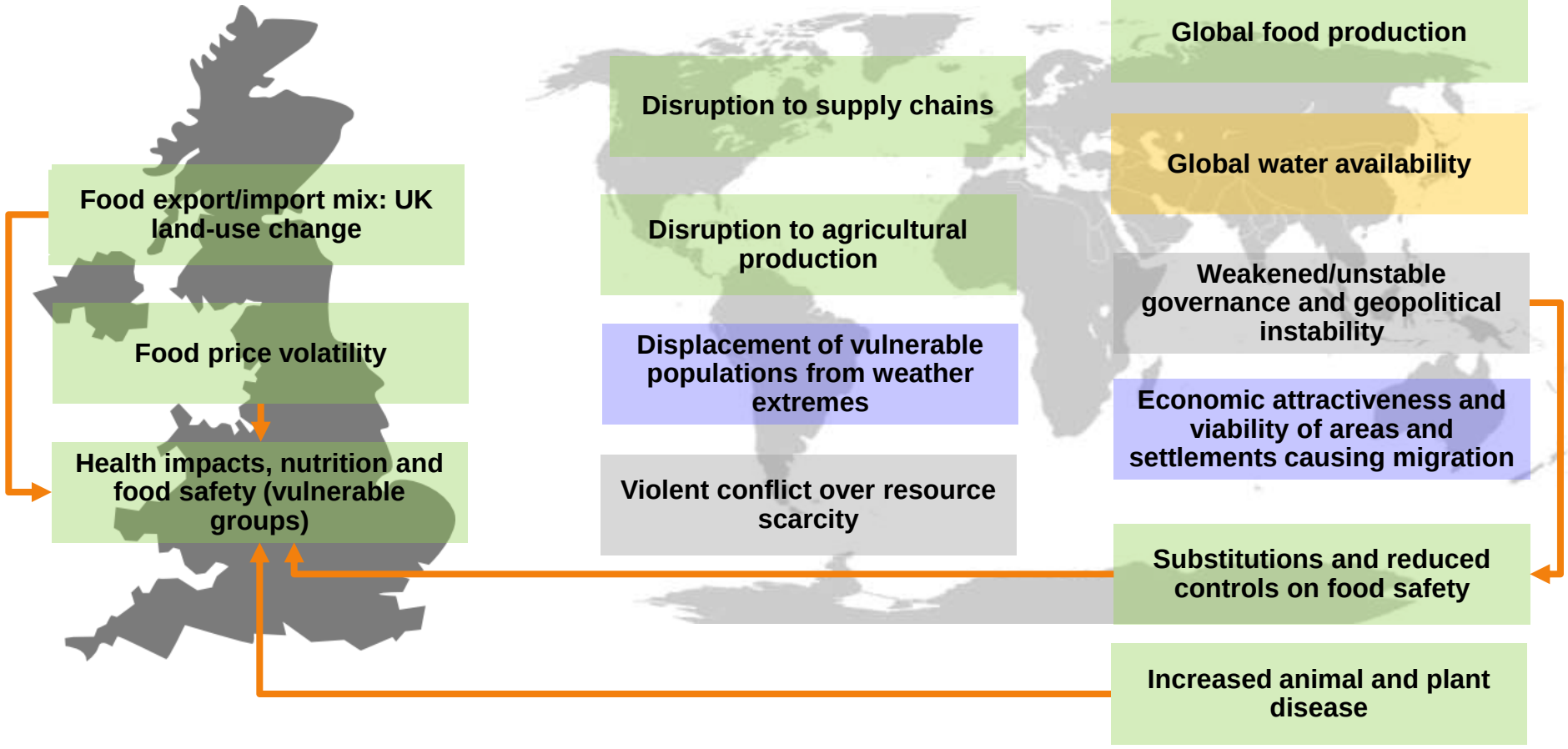
…and availability of water



- Map showing water availability in the 2080s under a 3.5oC, low population growth and high adaptation scenario
- Great Britain overall projected to be in deficit by 800 to 3,000 Ml/d by the 2050s

Source: HR Wallingford (2015) for the ASC- *Updated projections of water availability in the UK*

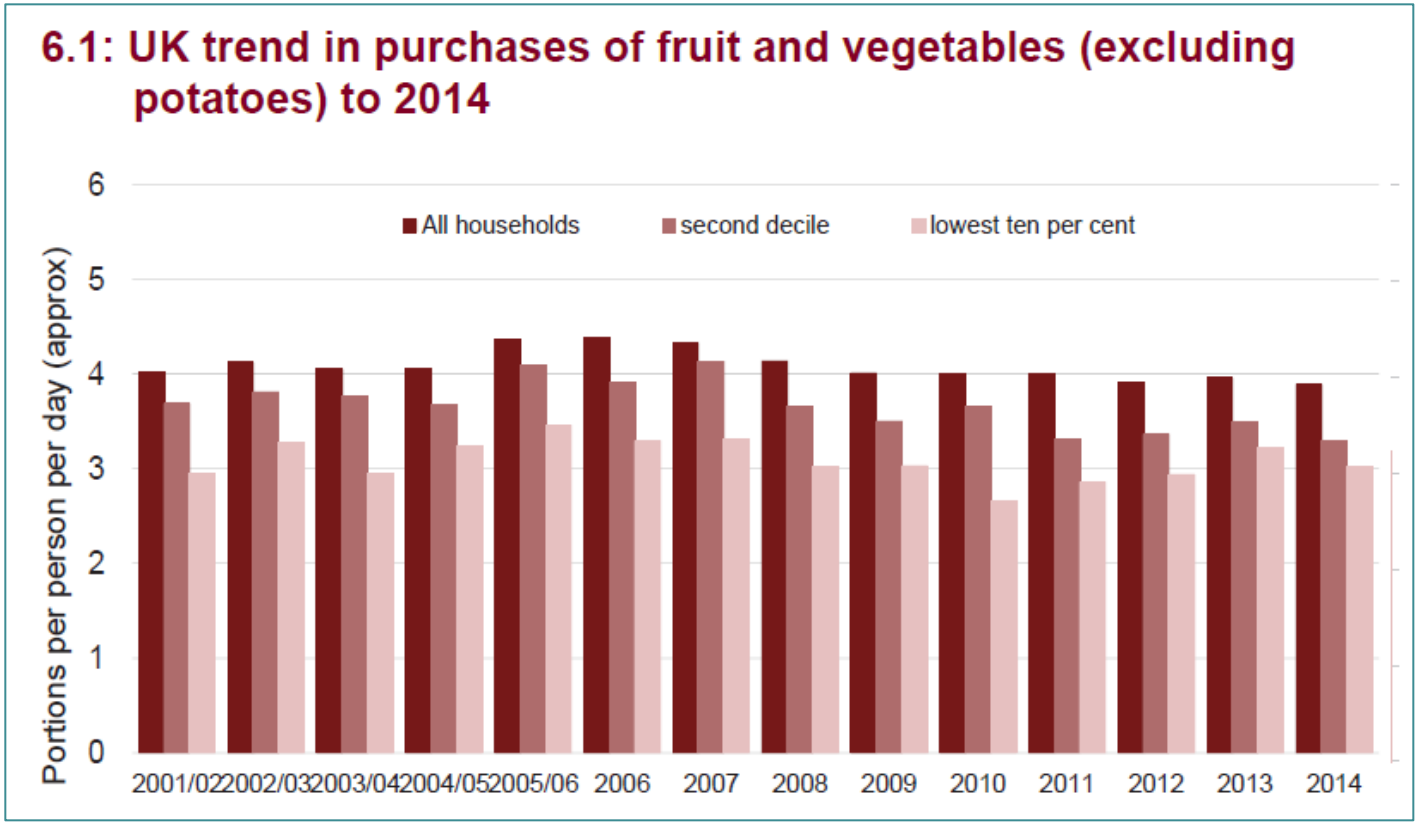
Price and production changes, as well as emerging disease and reduced control overseas, might impact access to safe and nutritious food



Source: UK CCRA 2017 Evidence Report – Chapter 7: international dimensions

Higher food prices affect access by vulnerable groups to nutritious food

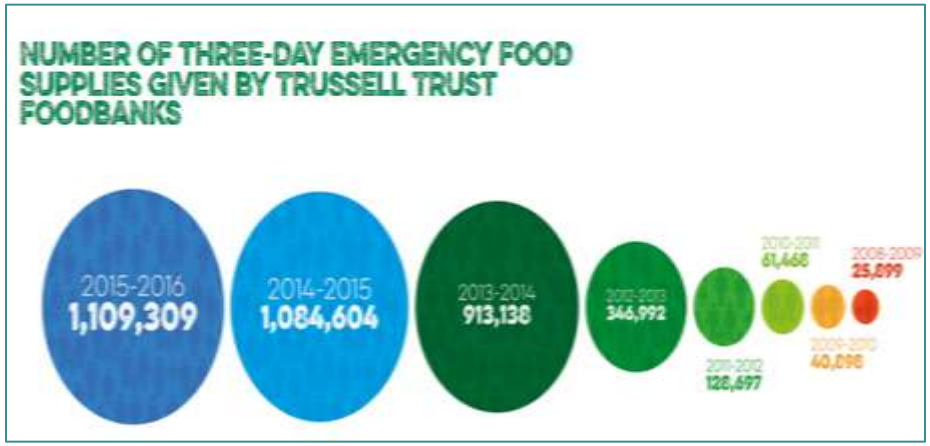
- An estimated 4 million people in the UK struggle to access a healthy diet
- Lower income groups already purchase less fruit and vegetables.
- Lower income groups also spend a greater proportion of their income on food, thus price spikes can also affect their capability to buy other goods.

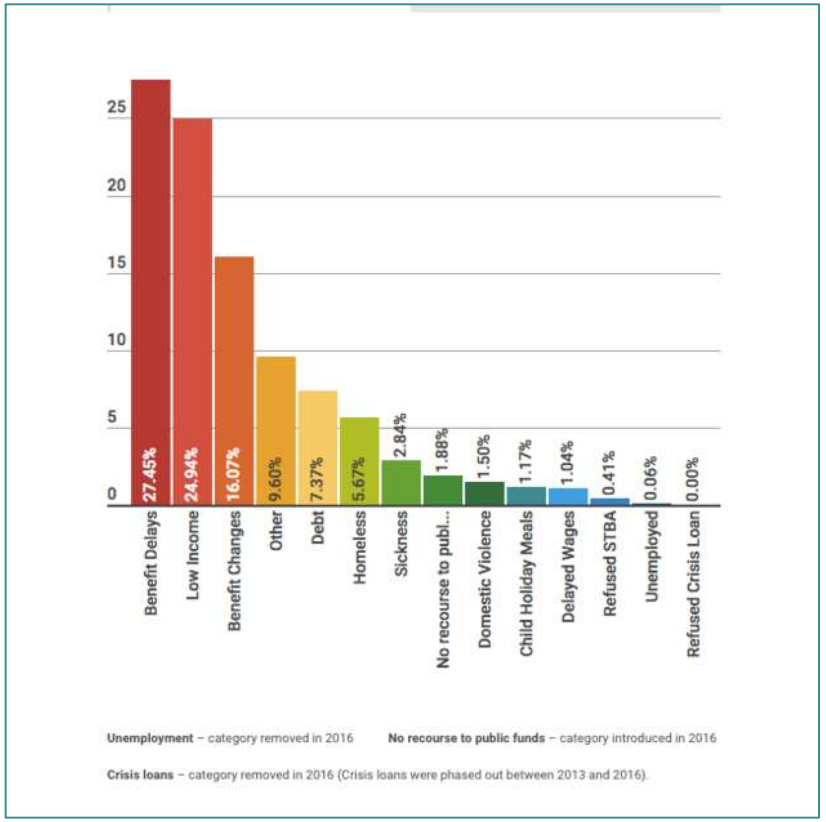


Source: Defra (2015) food statistics pocketbook

Higher food prices affect access by vulnerable groups to nutritious food

- Reliance on food aid has steadily increased over the past decade, although reasons for this are still under debate and might not be related to access to food.
  (To note: most of the food provided by food banks is processed food)





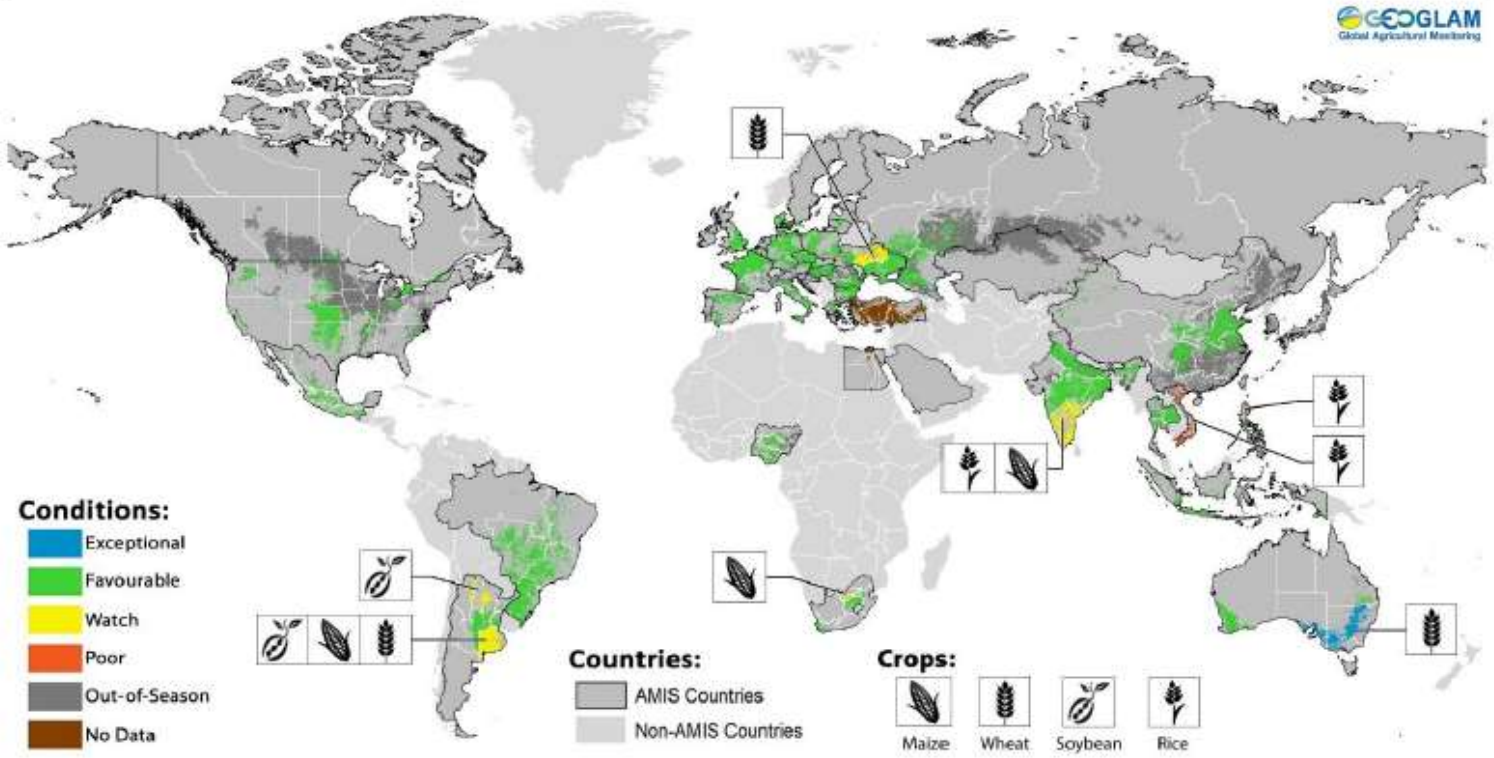
Sources: Cooper N, and Dumpleton S (2013) Walking the Breadline: The scandal of food poverty in 21st-century Britain
ww.trusselltrust.org

The Government is part of the AMIS system that monitors prices and crop conditions. Dialogue is initiated if abnormal market conditions are observed

Committee on Climate Change

Crop monitor

Crop conditions in AMIS countries (as of 28 November)



Crop condition map synthesizing information for all four AMIS crops as of 28 November. Crop conditions over the main growing areas for wheat, maize, rice, and soybean are based on a combination of national and regional crop analyst inputs along with earth observation data. ***Only crops that are in other-than-favourable conditions are displayed on the map with their crop symbol.***

The UK Food Security Assessment is a set of indicators of production, trade and market conditions

- The UK Food Security Assessment was produced in 2010 and last updated in 2012.
- It concluded that the UK has a strong food security, based on:
  - A strong UK food production base
  - Access to EU markets and
  - An open, rule-base international trading system
- Importance of 25 year plans for the environment, and food and farming…
- …but domestic production is only one part of the story

The CCRA Evidence Report concluded that more action is needed to improve the resilience of the UK food system

Current Government actions focus on monitoring and responding to price shocks	• AMIS system and the UK Food Security Indicators measures the "here and now", rather than looking at possible changes in the near future. • There are no actions lined up to reduce the risk.
A national, strategic approach is needed to identify appropriate actions	• Support sustainable and climate resilient agriculture in the UK and abroad • Build strategic trading partnerships • Improve the resilience of supply chains.
Actions can also be taken at local level	• Raise awareness on demand-side measures that reduce waste and greenhouse gas emissions • Ensure access to healthy and nutritious food for the most vulnerable • Improve resilience of infrastructure and business

Next steps

- **Updated adaptation programmes:**
  - UK (England): summer 2018
  - Scotland, Northern Ireland: 2019
  - Wales: as part of Wellbeing Act
- **Next ASC statutory progress reports:**
  - UK (England): June 2017

Further references

- https://www.theccc.org.uk/uk-climate-change-risk-assessment-2017/ccra-chapters/international-dimensions/
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