Introduction to the IPCC Special Report on Climate Change and Land

Dr Eamon Haughey
Trinity College Dublin and IPCC WGIII TSU

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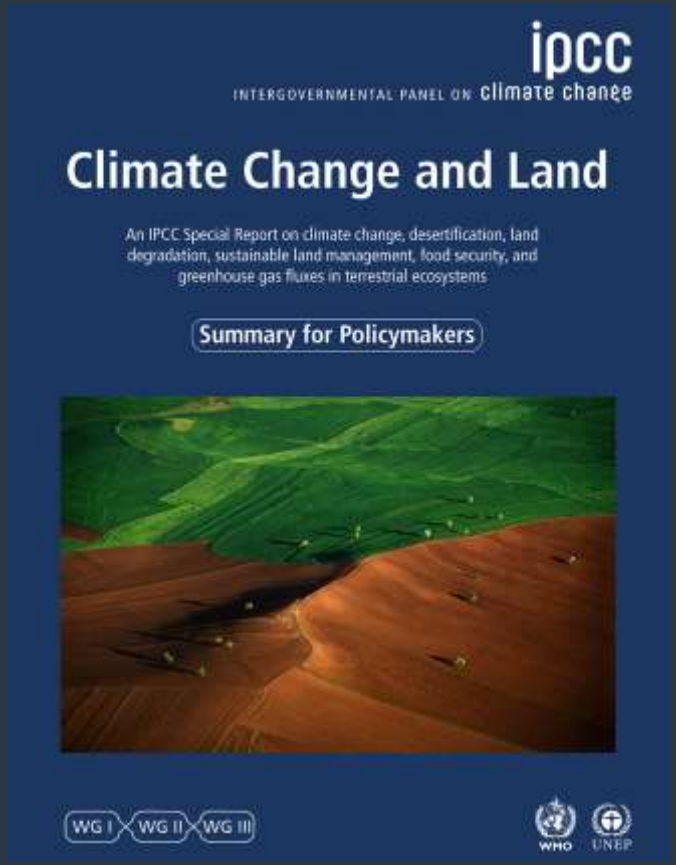

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1: Framing and Context

2: Land-Climate Interactions

3: Desertification

4: Land Degradation

5: Food Security

6: Interlinkages between desertification, land degradation, food security and GHG fluxes: Synergies, trade-offs and Integrated Response Options

7: Risk management and decision making in relation to sustainable development

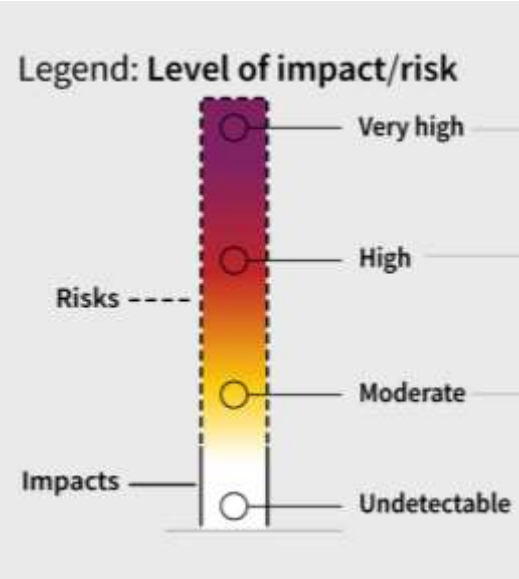
Report Structure

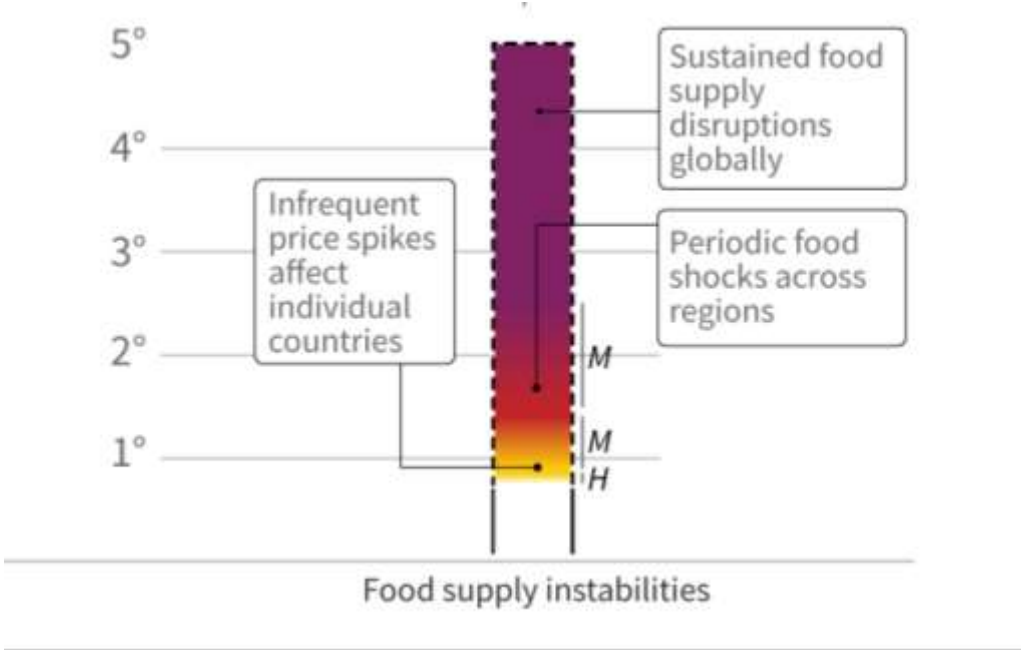
“Land is a critical resource – we rely on it for food, water, health and wellbeing – but it is already under growing human pressure. Climate change is adding to these pressures

Climate change - making a challenging situation worse

- The temperature over the land surface has already increased almost twice the global average
- Climate zones are shifting. Many extreme events have become more frequent and intense
- Future climate change will cause reduced crop yields and increased food prices
- Land degradation occurs over ¼ of the Earth's ice-free land area – driven primarily by unsustainable land management
- Climate change exacerbates the rate and magnitude of land degradation processes
- **In a warmer climate the capacity of land to store carbon can be reduced**

Assessment of risk – example: food supply instabilities





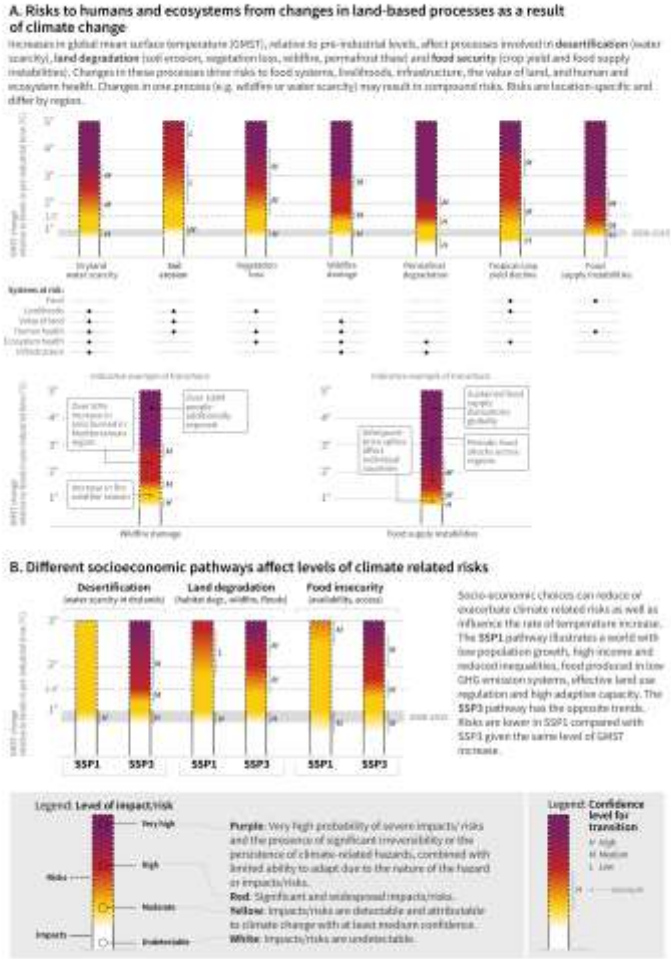


Figure SPM.2

- Current levels of global warming are associated with **moderate risks** for soil erosion, vegetation loss, costal degradation and tropical crop yield decline
- At around 2.0°C of global warming risks from permafrost degradation, and food supply instabilities are projected to be **very high**
- Socioeconomic pathways also affect levels of risk associated with different temperature levels

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Agriculture, food production, and deforestation are major drivers of climate change.

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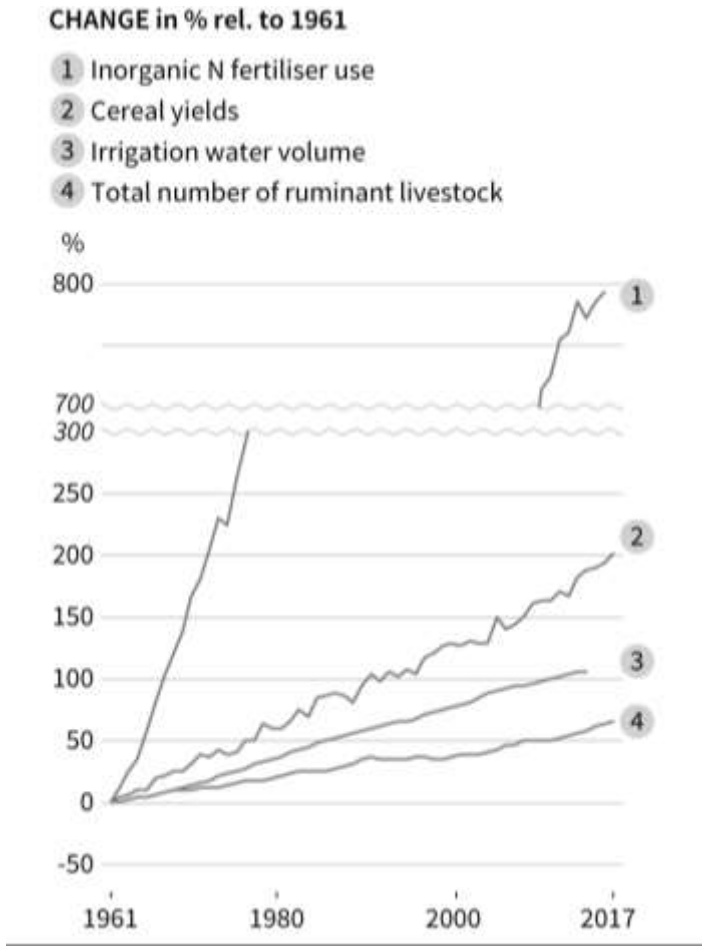
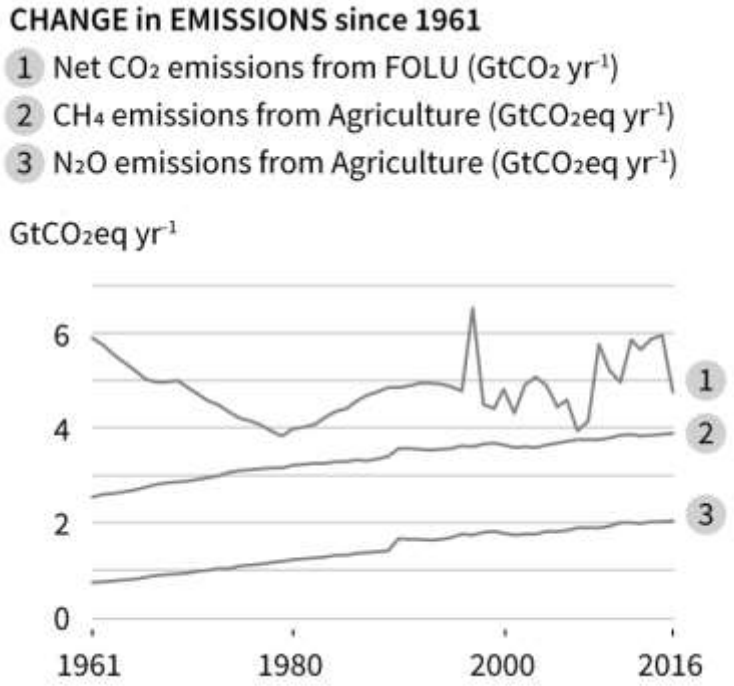
Intensification – consumption and production

- Population growth and changes in the consumption of food, feed, fiber, timber and energy have driven land use intensification
- Since 1961 cereal crop yields have increased by over 200%
- Over the same period there has been around an **800% increase** in the rate of nitrogen fertilizer used
- There has also been a marked increase in **ruminant livestock** numbers and the amount of **water used for irrigation**
- At the same time **25-30%** of food produced globally is lost or wasted

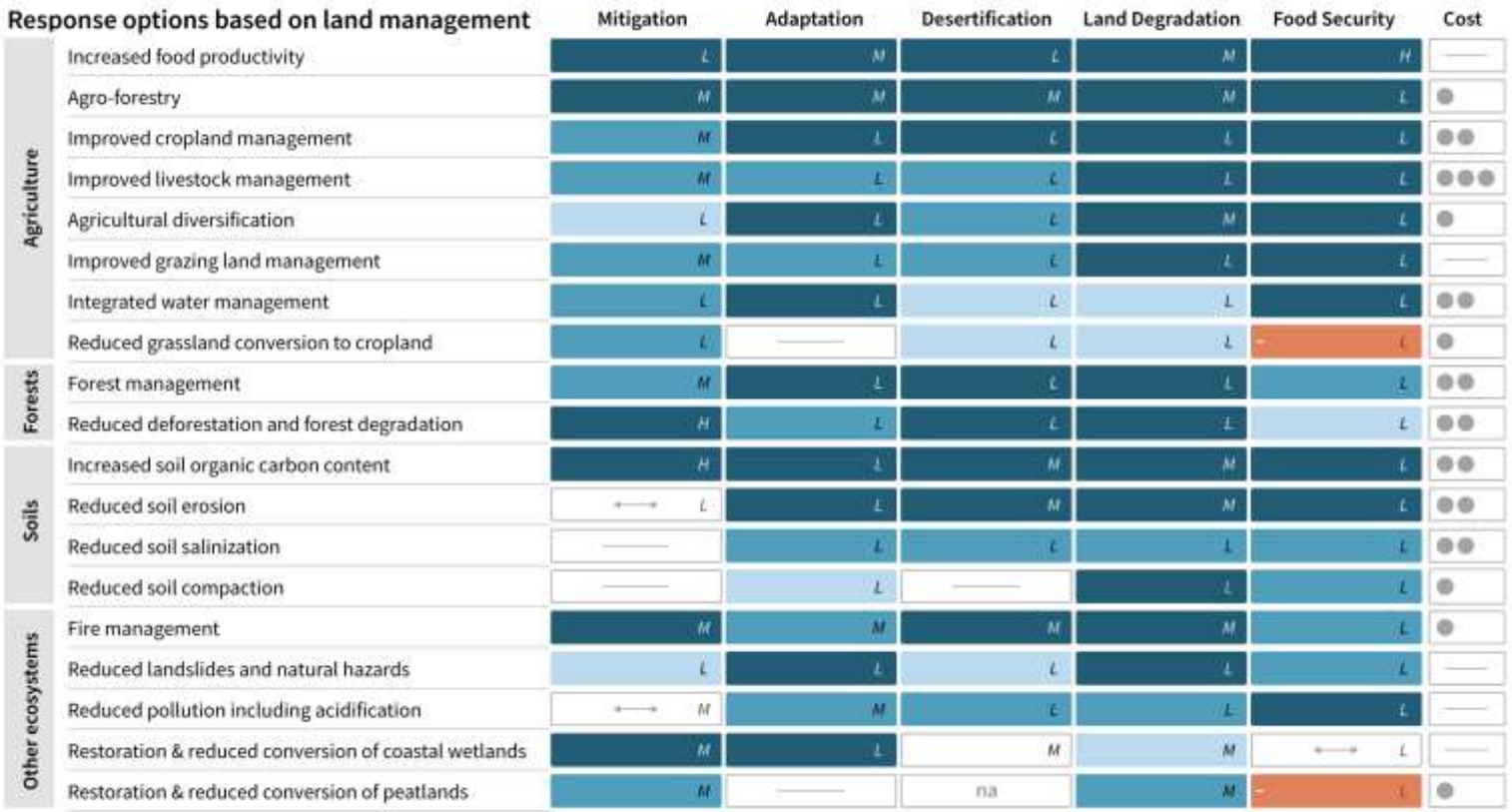


Trends in global GHG emissions

- Agriculture, forestry and other types of land use account for 23% of human GHG emissions
- Since 1961 steady increase in CH_4 and N_2O from agriculture
- This has been driven by changes in the scale and intensity of land use
- At the same time **land is also a major carbon sink** – absorbing an equivalent of almost a third of CO_2 emissions from fossil fuels and industry



There are **actions available** to us that can simultaneously **improve land, enhance food security and improve nutrition.**



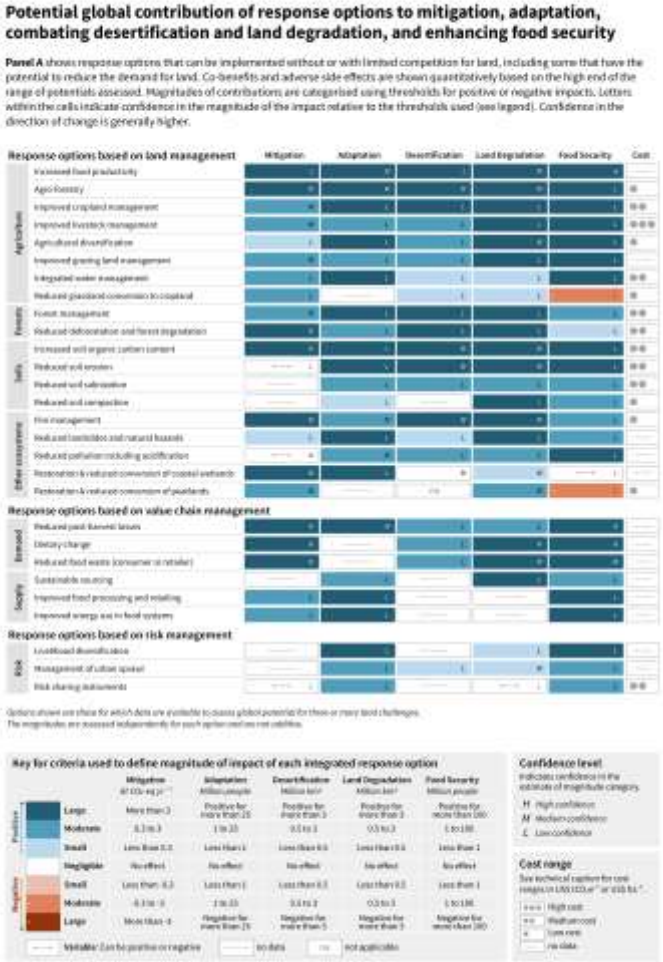


Figure SPM.3

- Global assessment – land-based options are not additive
- Many of these response options can be of benefit across multiple challenges, are at an advanced technology level and many are relatively low cost
- However, report found that the scale of deployment of some response options is a cause of concern
- Specifically, the deployment of **bioenergy**, **reforestation**, **afforestation** and **biochar** needs to be implemented carefully to avoid negative effects on food security and biodiversity

The **way we produce our food matters**; dietary choices can help reduce emissions and pressure on land.

Summary for policy makers: B.6.2

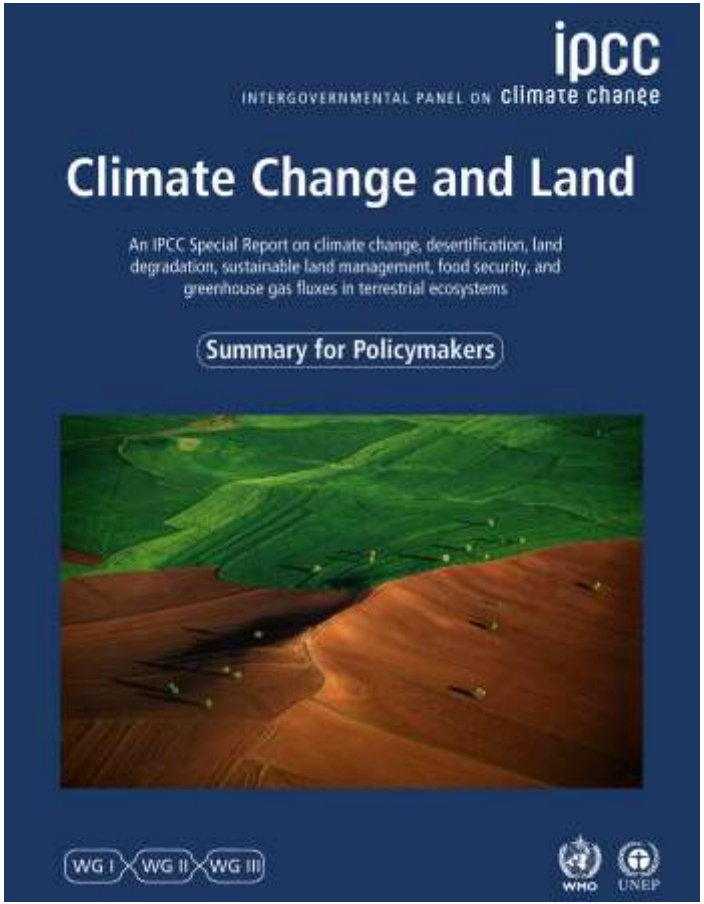
Diversification in the food system (e.g., implementation of integrated production systems, broad-based genetic resources, and diets) can reduce risks from climate change (medium confidence). ***Balanced diets, featuring plant-based foods, such as those based on coarse grains, legumes, fruits and vegetables, nuts and seeds, and animal-sourced food produced in resilient, sustainable and low-GHG emission systems, present major opportunities for adaptation and mitigation while generating significant co-benefits in terms of human health (high confidence).*** *By 2050, dietary changes could free several million km^2 (medium confidence) of land and provide a technical mitigation potential of 0.7 to 8.0 $GtCO_2$ eq yr^{-1}, relative to business as usual projections (high confidence). Transitions towards low-GHG emission diets may be influenced by local production practices, technical and financial barriers and associated livelihoods and cultural habits (high confidence). {5.3, 5.5.2, 5.5, 5.6}*

Response options – summary

- Protect current **carbon stocks** and restore degraded ecosystems (peatlands, forests)
- Increased bioenergy and forestry cover – sustainable implementation required
- **Food system – production**: improved livestock and pasture management, agricultural diversification, agroforestry, and increasing soil carbon
- **Food system – demand**: moving towards more plant-based diets and animal sourced food produced in sustainable and low-GHG emission systems
- Reducing **food loss and waste** (25-30% currently lost or wasted)

> **Better land management can play its part** in tackling climate change, but it can't do it all.

- Reducing greenhouse gas emissions from all sectors is essential if we want to keep below 2°C



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IPCC Secretariat: ipcc-sec@wmo.int
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