How do we reconcile a long-term climate goal and sustainable development?

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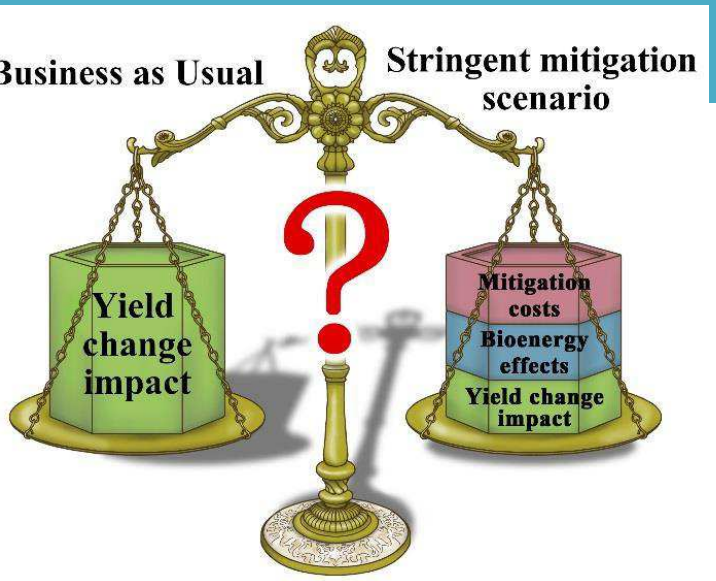
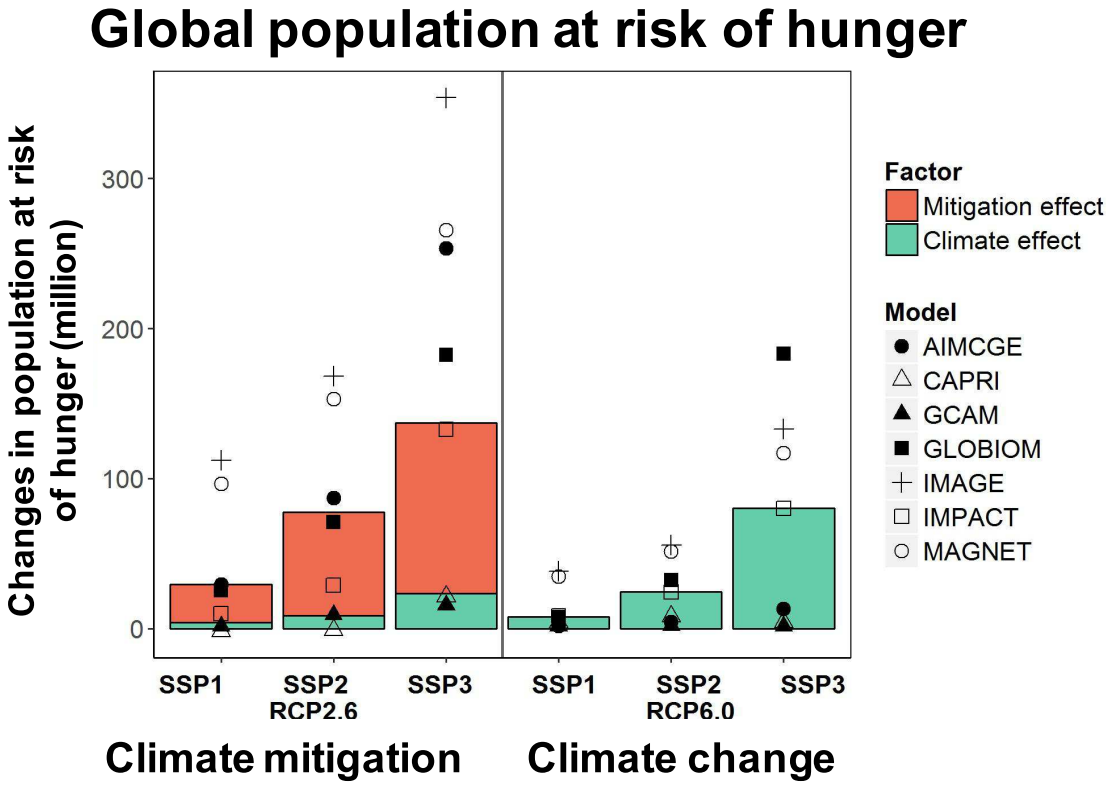
Impacts of climate change and mitigation on food security

- Trade-offs between climate change mitigation and food security
- Economy-wide and uniform stringent climate mitigation would negatively affect food security.
- Necessary to consider the adverse impacts and implement complementary measures to reduce them.





Hasegawa et al., 2018

How do we meet growing food needs while protecting the environment?

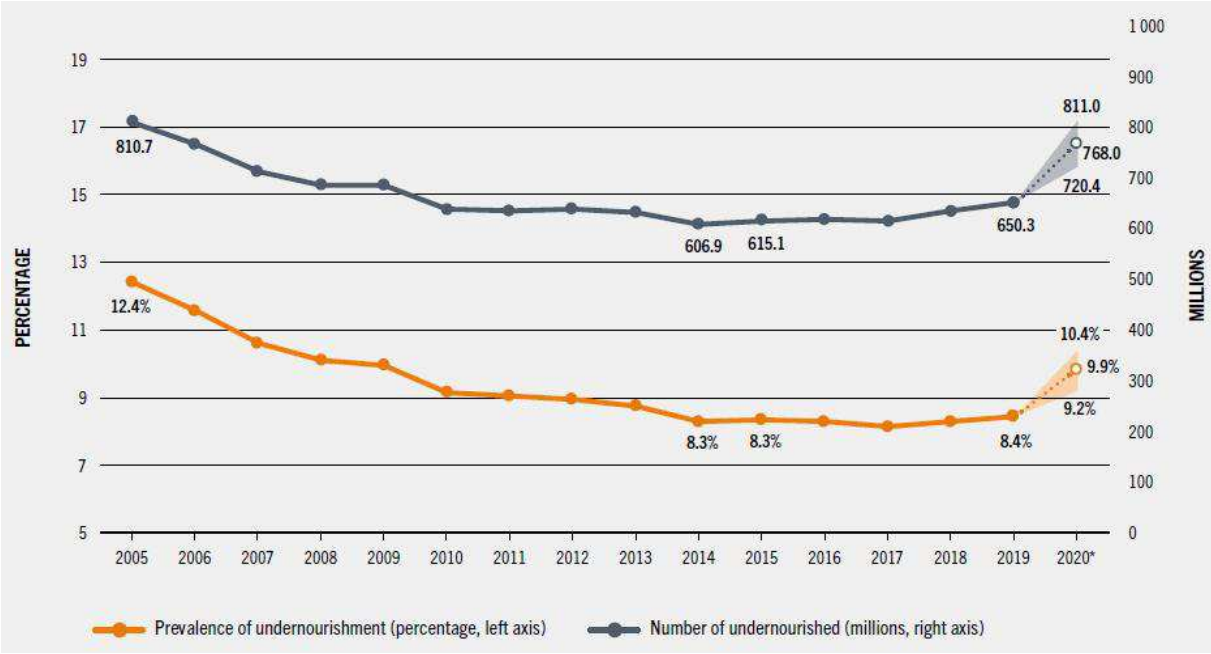
- The world trend is not on track to achieve the SDG Zero Hunger target.
- Increasing food production is a common approach but can pose environment risks.
- Scenarios to end hunger by 2030 combined with various food policies to reduce negative environmental impacts

Food policies

Food support targeted to the poor

Reduced food waste and over-consumption

Crop yield improvement



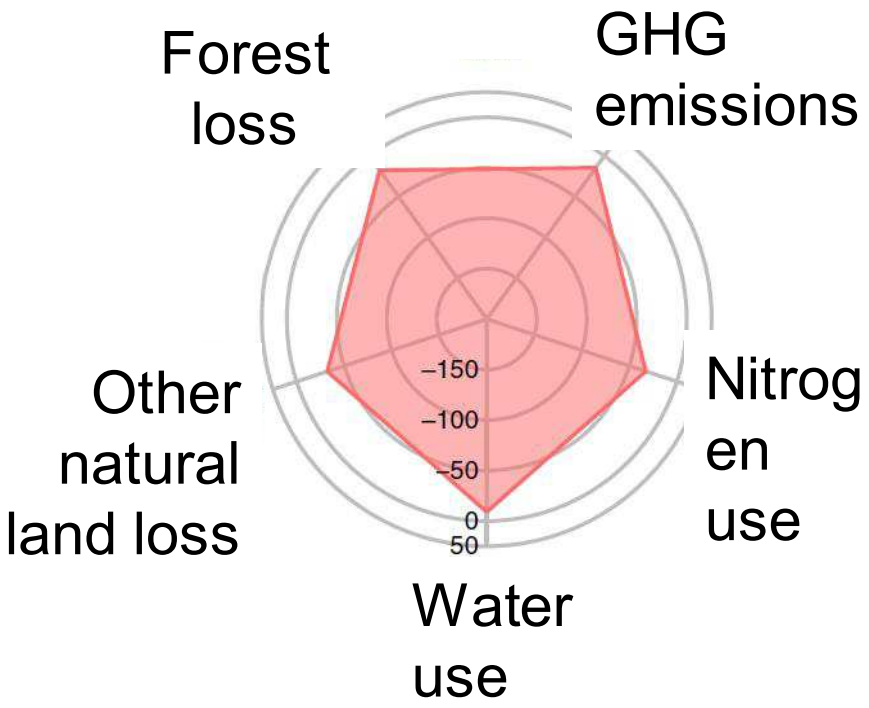
Impacts of food needs to end hunger on the environment

More food for all people

+ 20% Food production ↑

+ 48Mha Agricultural land ↑

+ 550 MtCO2eq GHG emissions ↑

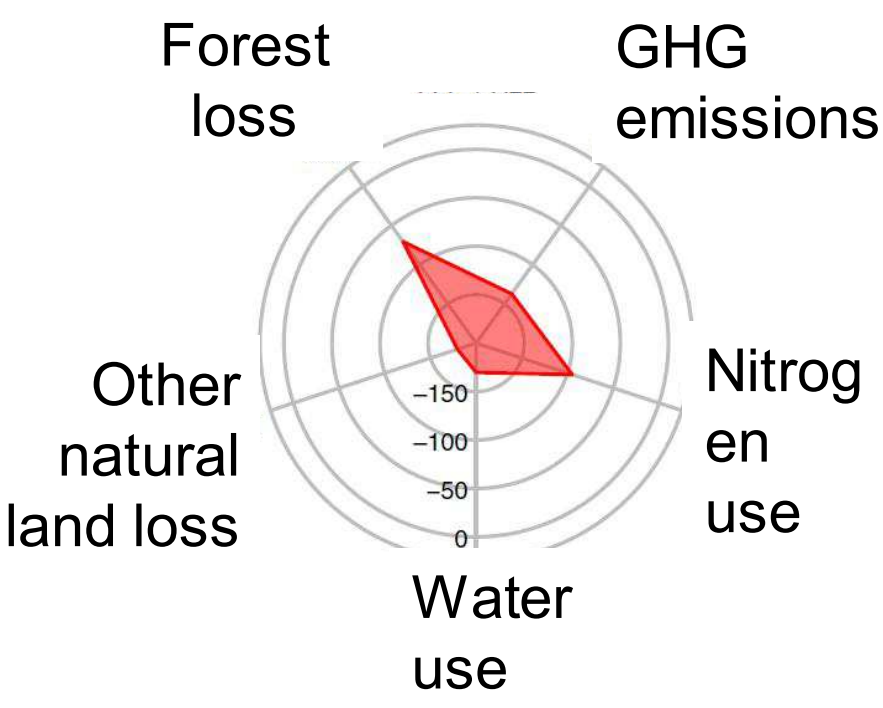


Food for poor + all food policies

- 9% food production ↓

- 230 Mha agricultural land ↓

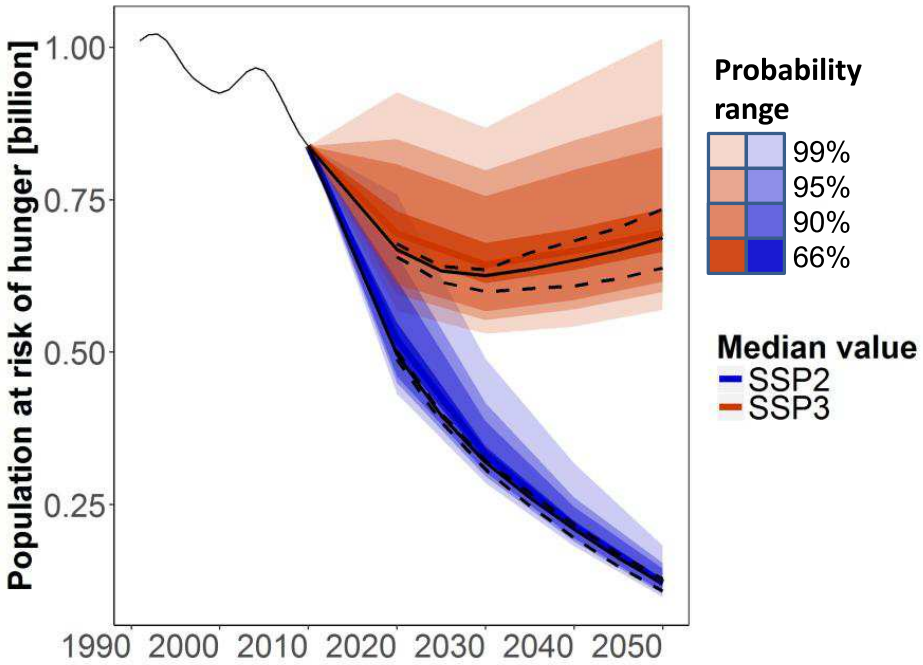
- 1360 MtCO2eq GHG emissions ↓

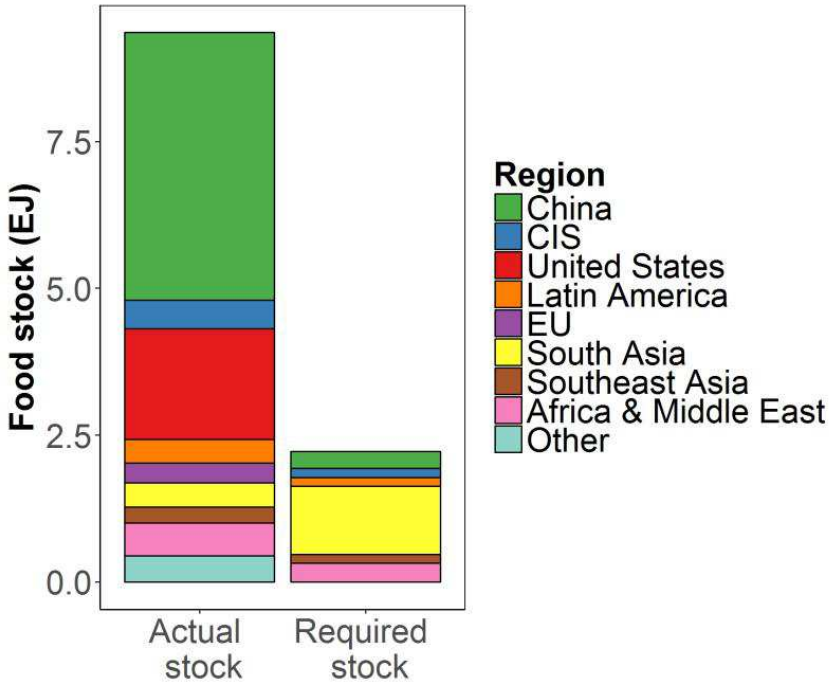


Hasegawa et al., 2019

Extreme climate event increases risk of global food insecurity and adaptation needs

- Climate change can increase the frequency and intensity of extreme climate event.
- + 11–36% of the world population may face hunger by 2050 under a once-per-100-year extremely climate.
- Globally the current total reserve is quantitatively sufficient, even in the worst case.
- However, in some affected regions e.g., South Asia, the amount of food requirement to offset such an effect is triple the region's current food reserve.





Thank you for listening

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