

Transformations within reach: Resilient food systems

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Food systems at the heart of the sustainability challenge



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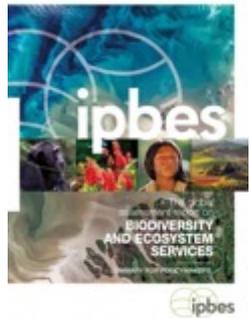
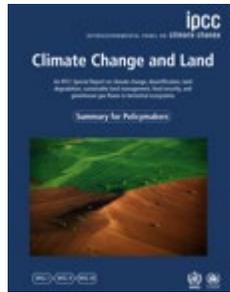
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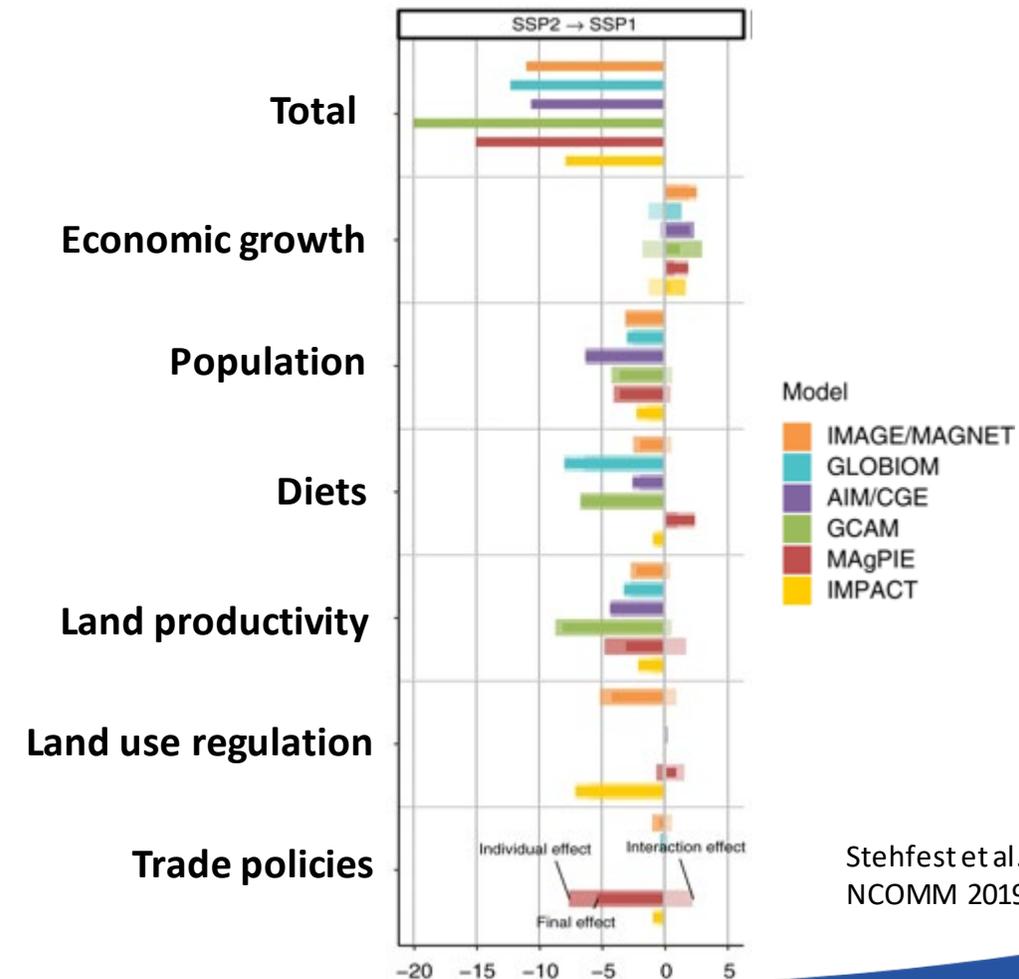
Long-term scenarios: Shared Socio-economic Pathways

- Scenario framework adopted by IPCC and IPBES



O'Neill et al. GEC 2019

% change in global cropland



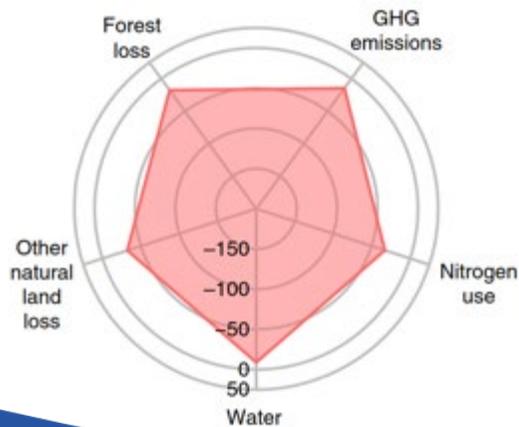
Stehfest et al. NCOMM 2019

Heterogeneity of consumers matters

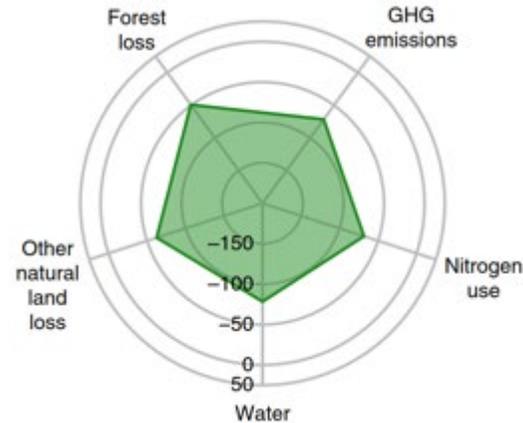
Ending hunger

- Ignoring the heterogeneity
→ 20% more food production
- Focusing on undernourished
→ 3% more food

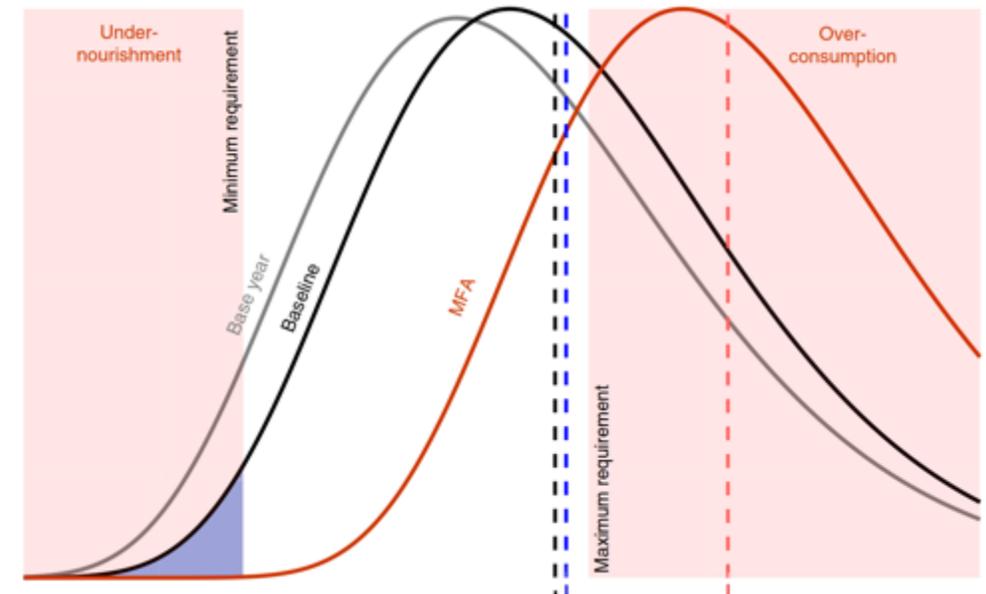
“More Food for All”



“Food for Poor & No Overconsumption”



Food availability distribution across the individuals in the population

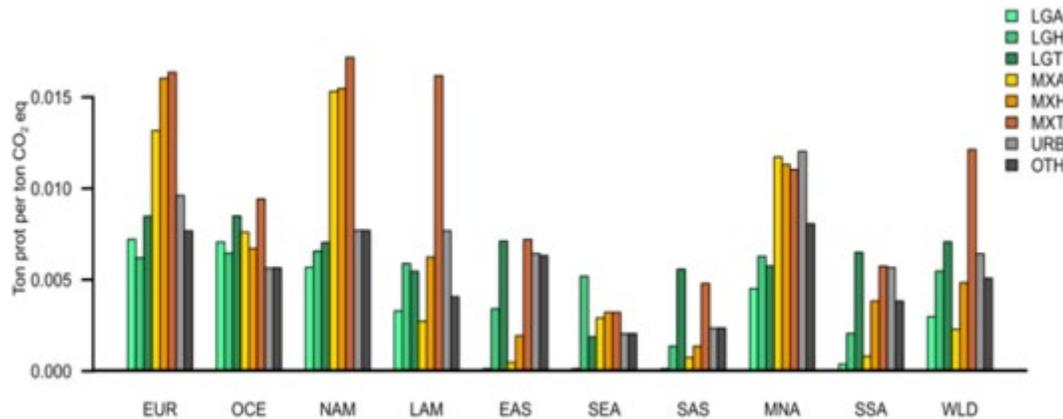


Hasegawa et al. NSUST 2019

Heterogeneity of farm systems matters

Large efficiency gaps prevail between production systems and regions

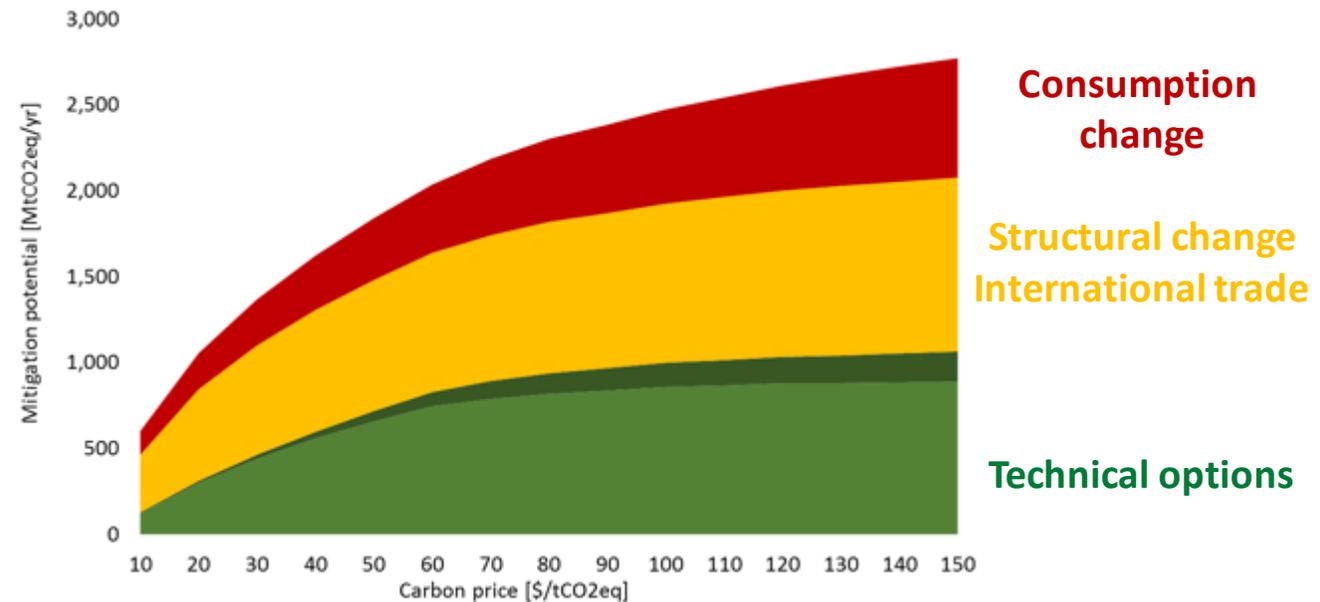
GHG efficiency of beef production by system and regions



Herrero et al. PNAS 2013

Reallocation of production across systems and regions would reduce GHG emissions, nitrogen pollution, and water scarcity

Annual non-CO₂ abatement potential by 2050 Water & nitrogen

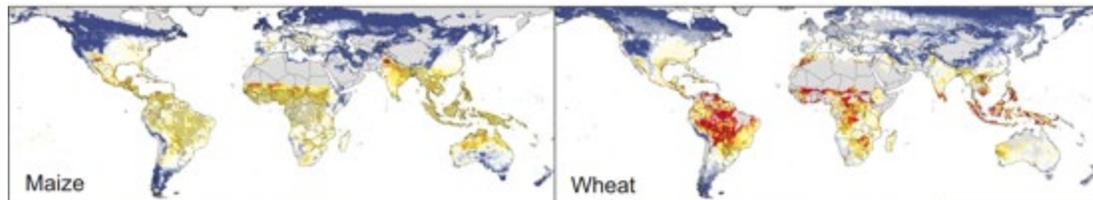


Frank et al. NCOMM 2018

Smart multilateral trade system

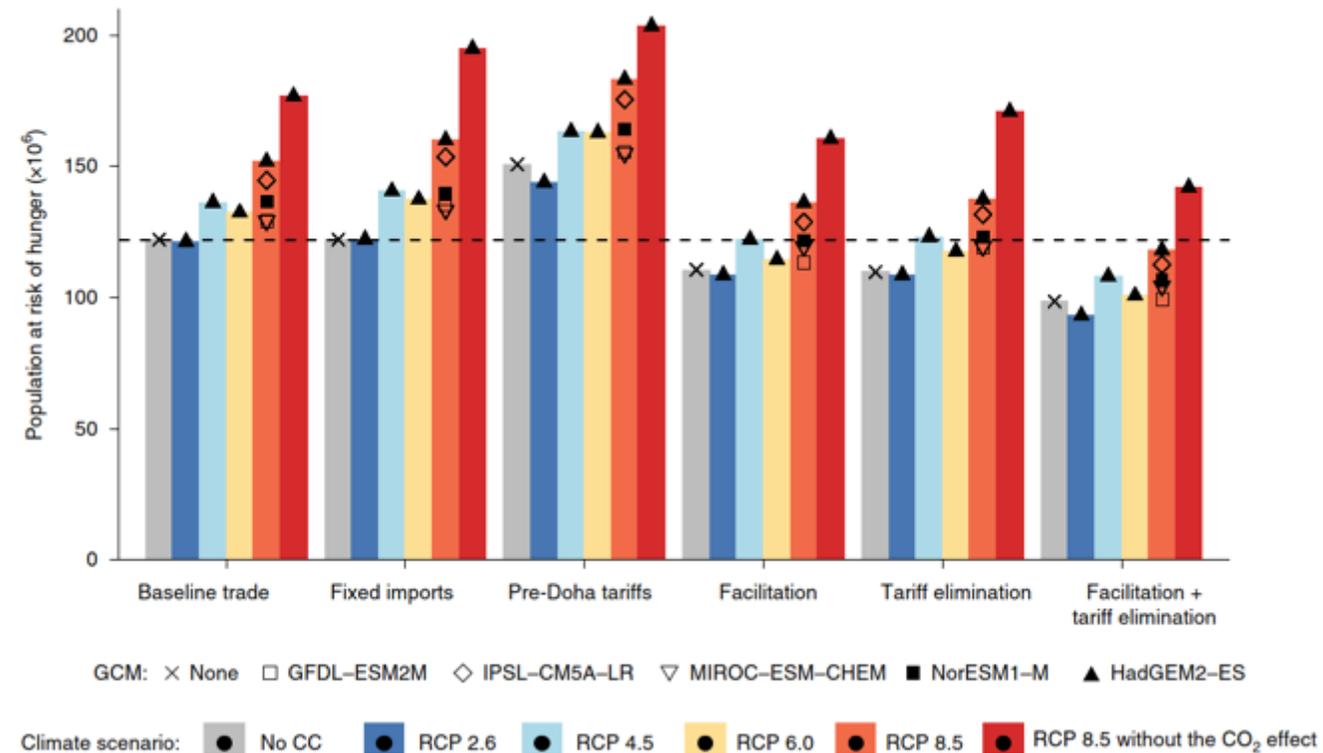
Climate change impacts increasing the differences across regions

- Without adaptation through trade
+73 million people undernourished
- **Smart liberalization and infrastructure development to** offset negative climate change impacts



Rosenzweig et al. PNAS 2020

Population at risk of hunger (million)

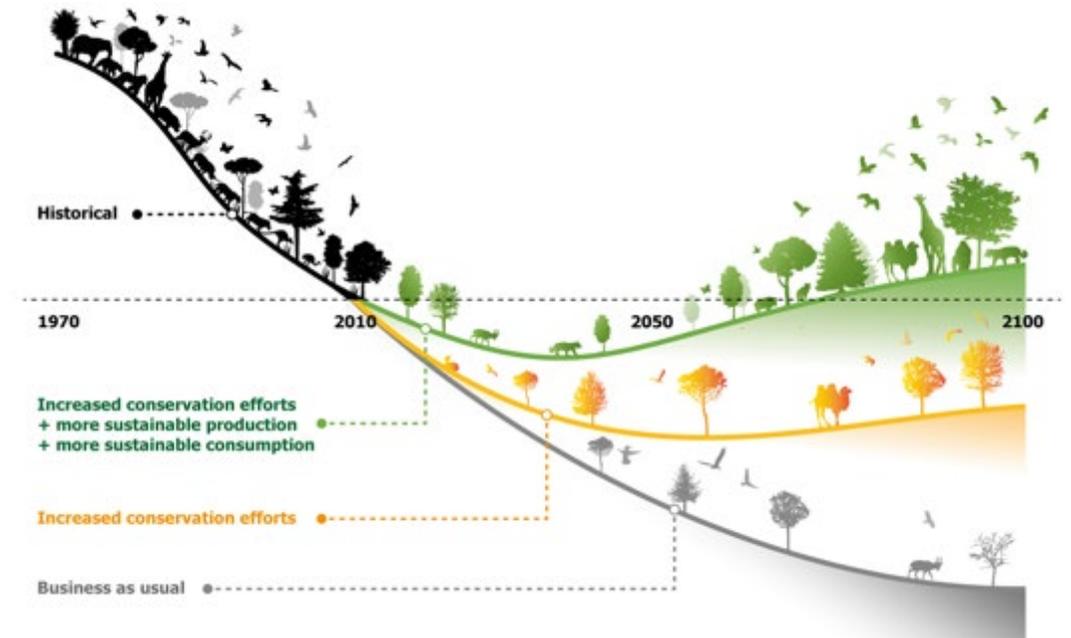


Janssens et al. NCC 2020

No silver bullet – but context specific bundles of all available options supported by smart policies

Bending the curve by 2050 might be feasible only if

- transforming our food systems from farm to fork
- adopting an ambitious conservation & restoration plan
- addressing other threats to biodiversity (climate change, biological invasion, ...)



Additional efforts to reverse trends in biodiversity					
Supply side		Demand side		Increased conservation	
Sustainably increased crop yields	Increased trade of agricultural goods	Reduced waste of agricultural goods from field to fork	Diet shift to a lower share of animal calories	Increased extent and management of protected areas	Increased restoration and landscape-level conservation planning

Thank you very much

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