

Using DMDU methods to explore the lifestyle change uncertainty in integrated assessment models

Sibel Eker

Climate Interactive and IIASA

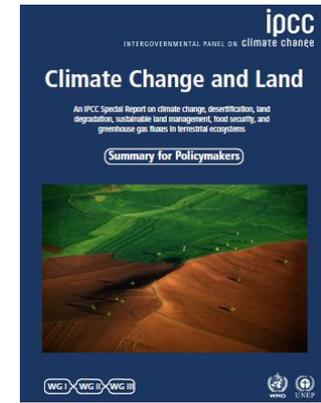
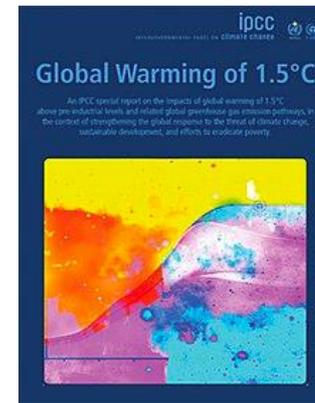
 eker@iiasa.ac.at
seker@climateinteractive.org
 [@sibel_eker_](https://twitter.com/sibel_eker_)

12 November 2020

Annual Meeting of the Society for Decision Making under Deep Uncertainty



Lifestyle change



[About us](#) | [WRF Events](#) | [Projects](#) | [Publications](#) | [News](#) | [Get Involved](#) | [Privacy Statement](#)

Lifestyles Need to Change Radically, WRF Conference Concludes

February 28, 2019 | [In Headline Event, WRF Events](#)



Analysis | Published: 04 June 2018

A low energy demand scenario for meeting the 1.5°C target and sustainable development goals without negative emission technologies

Amel Ghalib, Charlie Wilson, Nuno Bento, Benigna Boza-Kos, Volker Frey, David L. McCollum, Naveenita D. Rao, Keyvan Riahi, Joon Roggi, Simon De Sterck, Jonathan Collins, Stefan Frank, Oliver Fricko, Fei Guo, Matt Golden, Petr Havik, Daniel Huggemann, Gregg Kiewitewer, Peter Rafaj, Wolfgang Schoepf & Hugo Vallin

Nature Energy 3, 515–527 (2018) | [Download Citation](#)
3945 Accesses | 62 Citations | 501 Altmetric | [Metrics](#) »



Article | Published: 10 October 2018

Options for keeping the food system within environmental limits

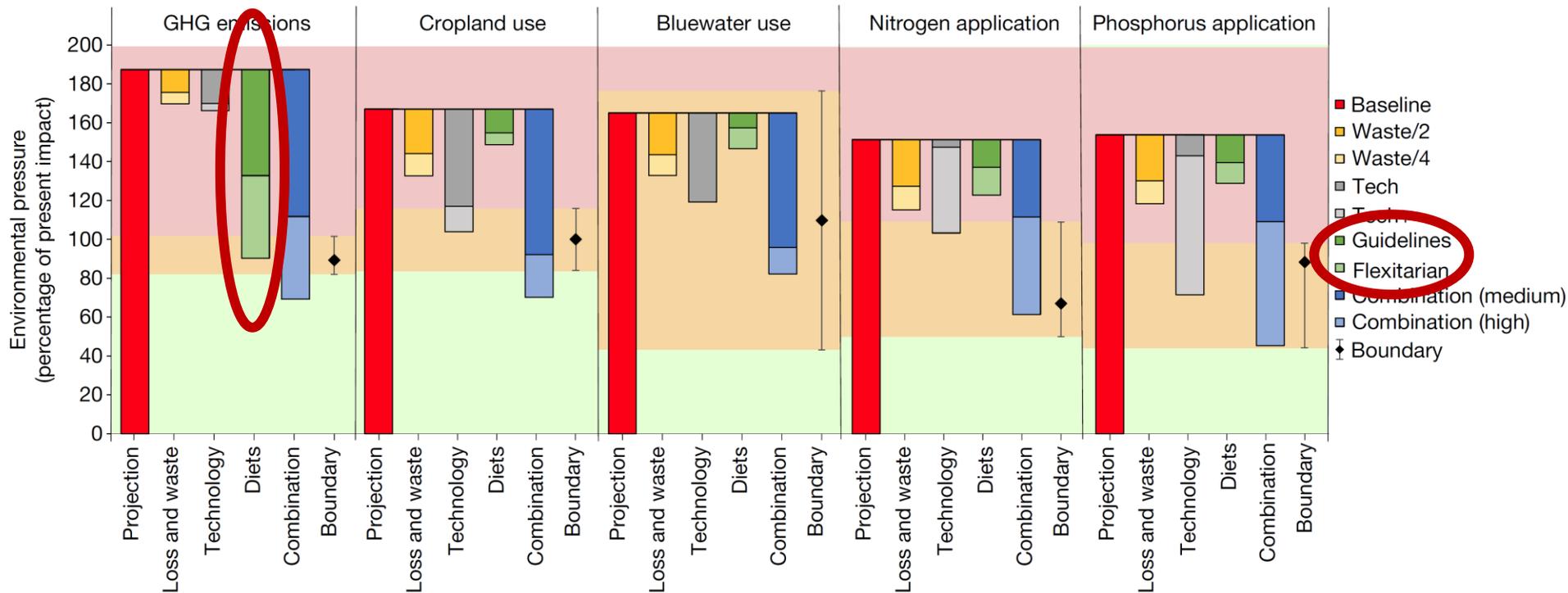
Marco Springmann, Michael Clark, Daniel Mason-D'Cruz, Keith Wiebe, Benjamin Leon Bodirsky, Luis Lassalle, Wim de Vries, Sonja J. Vermeulen, Mario Herrero, Kimberly M. Carlson, Malin Jonell, Max Troell, Fabrice DeClerck, Line J. Gordon, Rami Zurayk, Peter Scarborough, Mike Rayner, Brent Loken, Jess Fanzo, H. Charles J. Godfray, David Tilman, Johan Rockström & Walter Willet

Nature 562, 519–525 (2018) | [Download Citation](#)
79k Accesses | 122 Citations | 2265 Altmetric | [Metrics](#) »

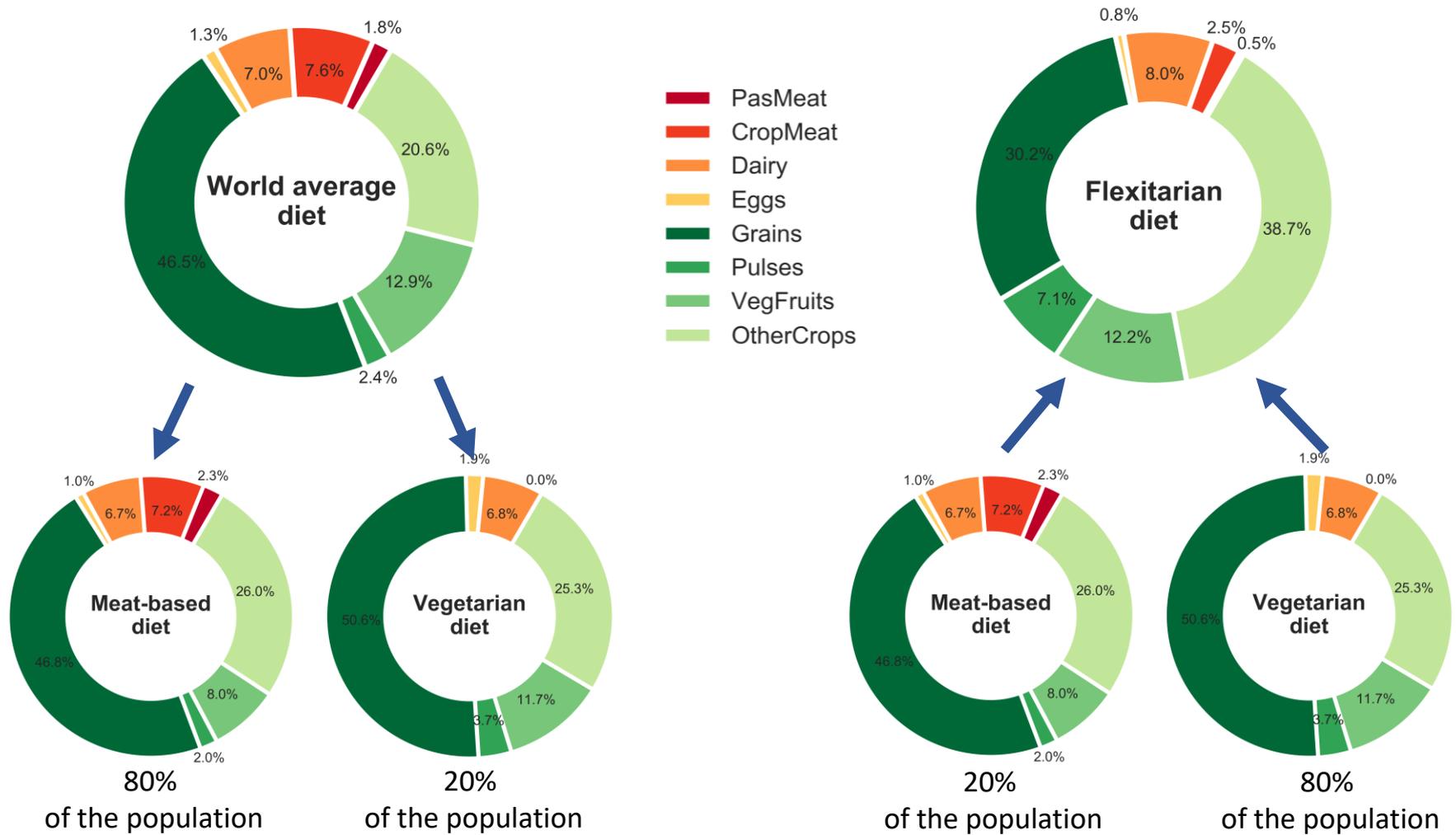


Sustainable diets

Impacts of reductions in food loss and waste, technological change, and dietary changes on global environmental pressures in 2050

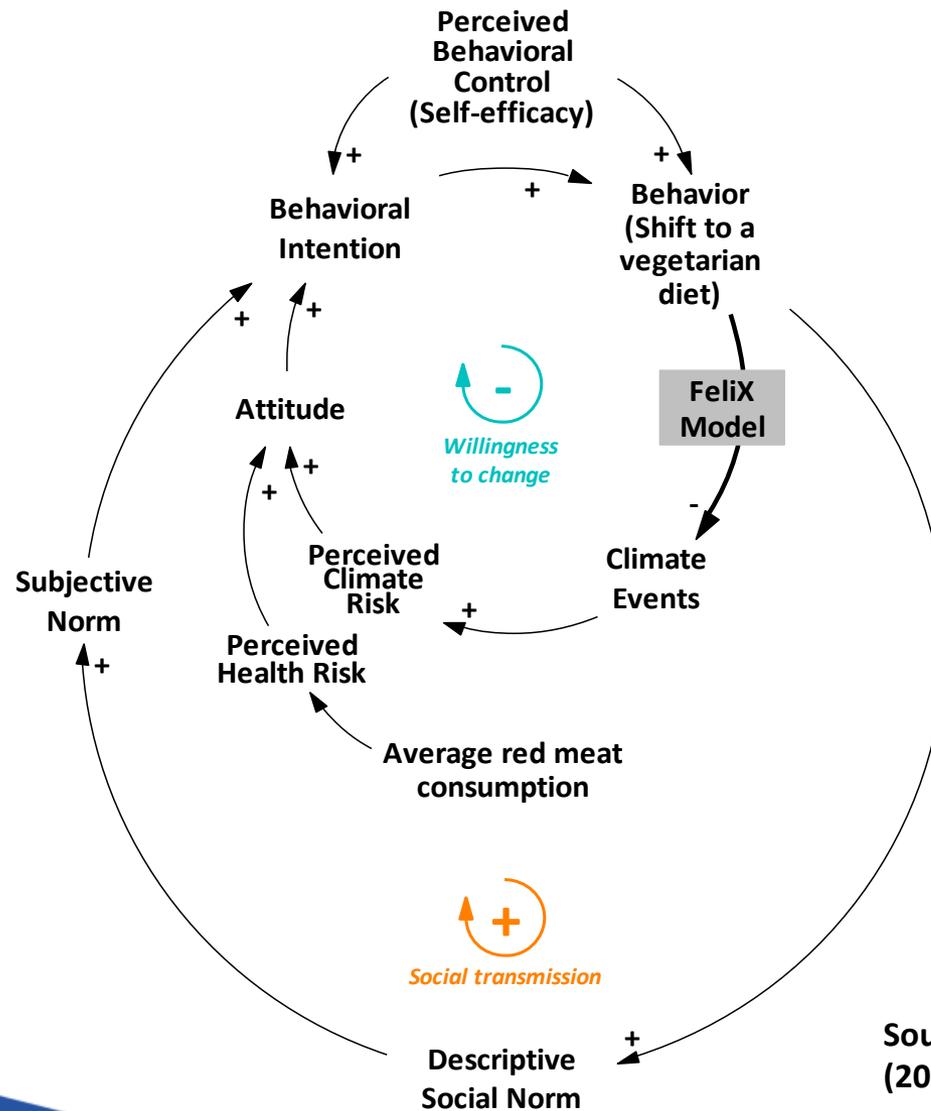


How many people does it take...?



*...integrated assessment models should
include social and behavioral
uncertainty for feasible scenarios!*

Modelling behavioral drivers

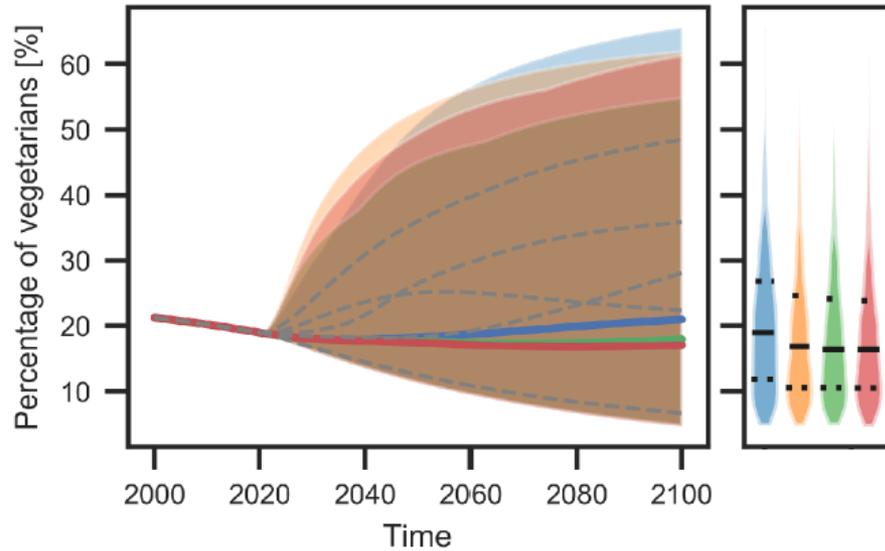


Source: Eker S, Reese G, Obersteiner M. (2019) *Nature Sustainability*.

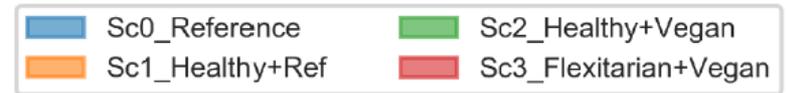
Scenario exploration



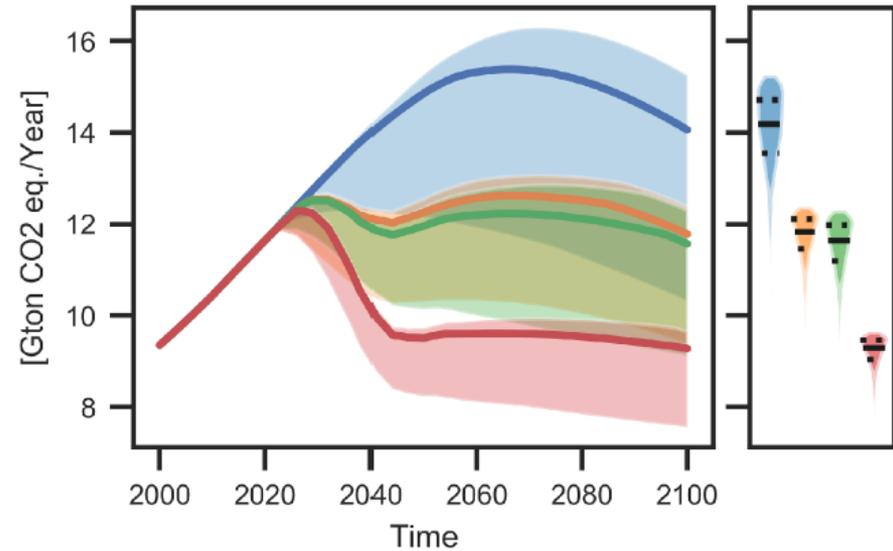
Percentage of vegetarian diet followers



(a)



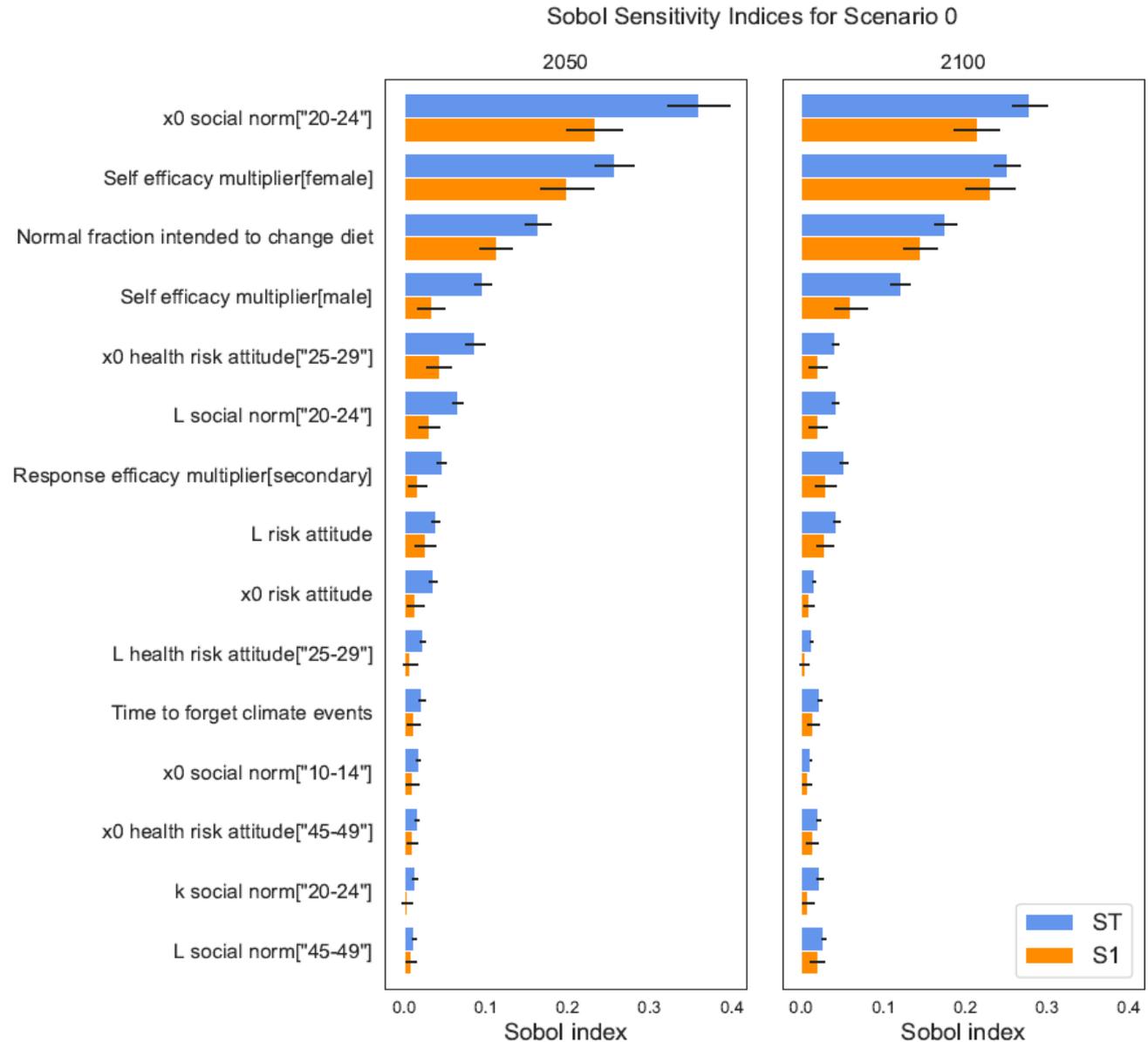
Total Agr. and Land Use Emissions



(b)

Global Sensitivity Analysis and Sobol Indices

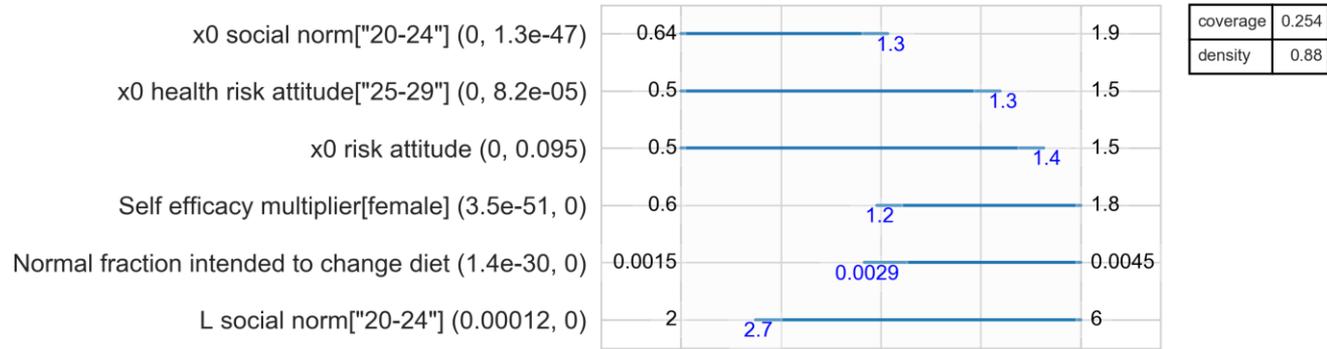
Which behavioural factors cause the highest sensitivity?



Scenario discovery using PRIM

Which factors are associated with a wide spread of vegetarians in the global population?

Scenario discovery results for scenario 0 and time 2050



Scenario discovery results for scenario 0 and time 2050

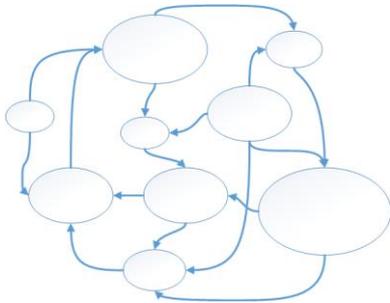


Conclusions



Social norms and self-efficacy (identity) are the most prominent drivers, not the climate or health risk.

The groups who already have a high tendency, e.g. young and female, are the low-hanging fruits.



The modelling framework is generalizable and transferrable.

DMDU methods help to enhance the feasibility of mitigation scenarios, and set research priorities for uncertainties!

