CONSUMER LEVEL FOOD WASTE AND CORRESPONDING GREENHOUSE GAS EMISSIONS

Reducing food waste would offer the chance to ensure food security, which is well known. Yet at the same time it could help mitigate dangerous climate change.

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INTRODUCTION

- reduce food loss and waste can be a solution to decelerate increase in food demand
- food loss and waste occurs at across various stages of the food supply chain
- a challenge is to estimate food loss and waste consistently across the globe

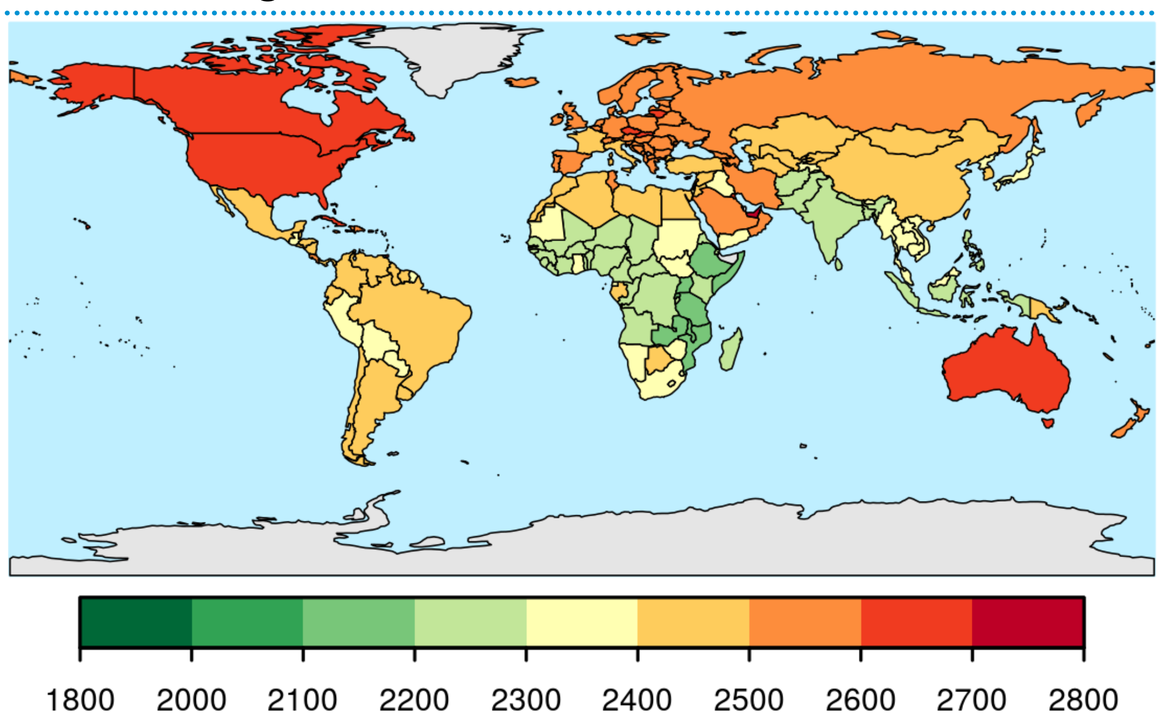

Fig. 1 *The average food energy required per person on a country scale for 2010 in kcal/cap/day. Low requirements prevail in developing and least develop countries while higher requirements are common in transition and developed countries.*

METHOD AND DATA

Human energy requirements

- food energy requirements is a function of basal metabolic rate (BMR) & physical activity level (PAL)
- BMR – minimum energy required for life functioning depending on body weight (BW), age and sex
- PAL value bases on lifestyles

Food surplus and deficit

- differences between estimated food requirements and food availability from Food Balance Sheets
- positive differences result in food waste and negative differences are considered as food deficit

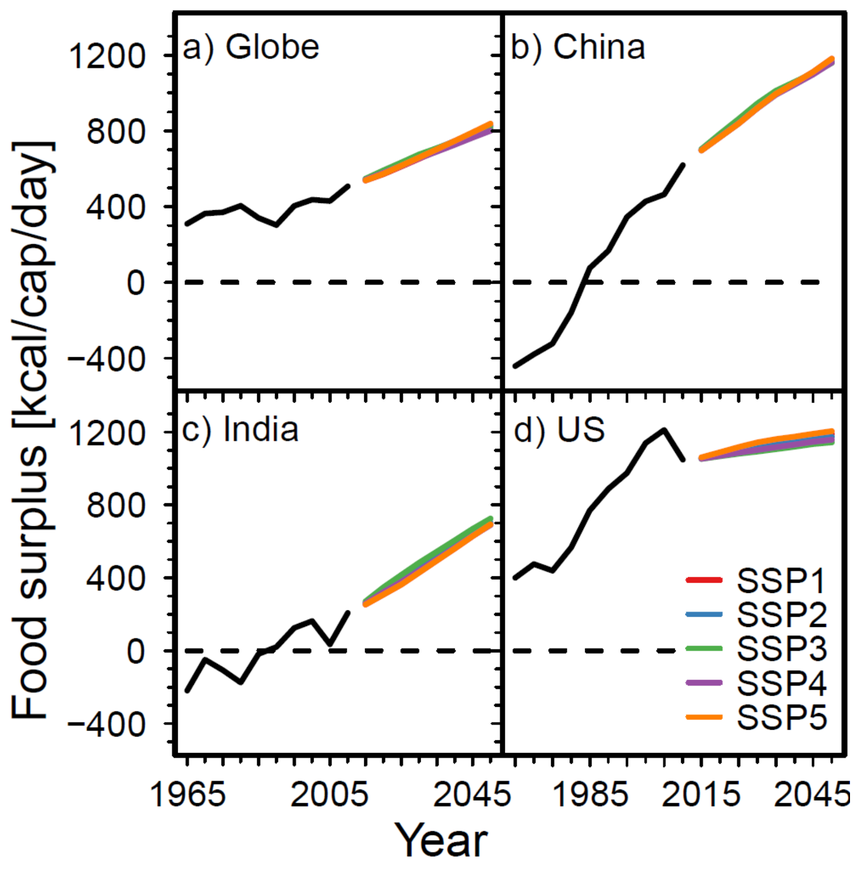

Fig. 2 *Estimated food surplus per person between 1965 and 2050. Food surplus is increasing on global and national scales, mainly due to growing food availability. In the future, food surplus will further increase globally, considering the food demand and demographic projections.*

RESULTS

- the average food required per person has almost remain constant in the past and may not change in the future
- in contrast, food waste had been increasing and may grow further under business as usual scenario
- greenhouse gas emissions associated with food waste has been increasing over-proportionally during the last decades

Fig. 3 *Interrelation between country scale food availability and requirement ratio as a function of Human Development Index (HDI) for the year 2010. The ratio below 1 represents food deficit. In general, the ratio increases with growing HDI.*

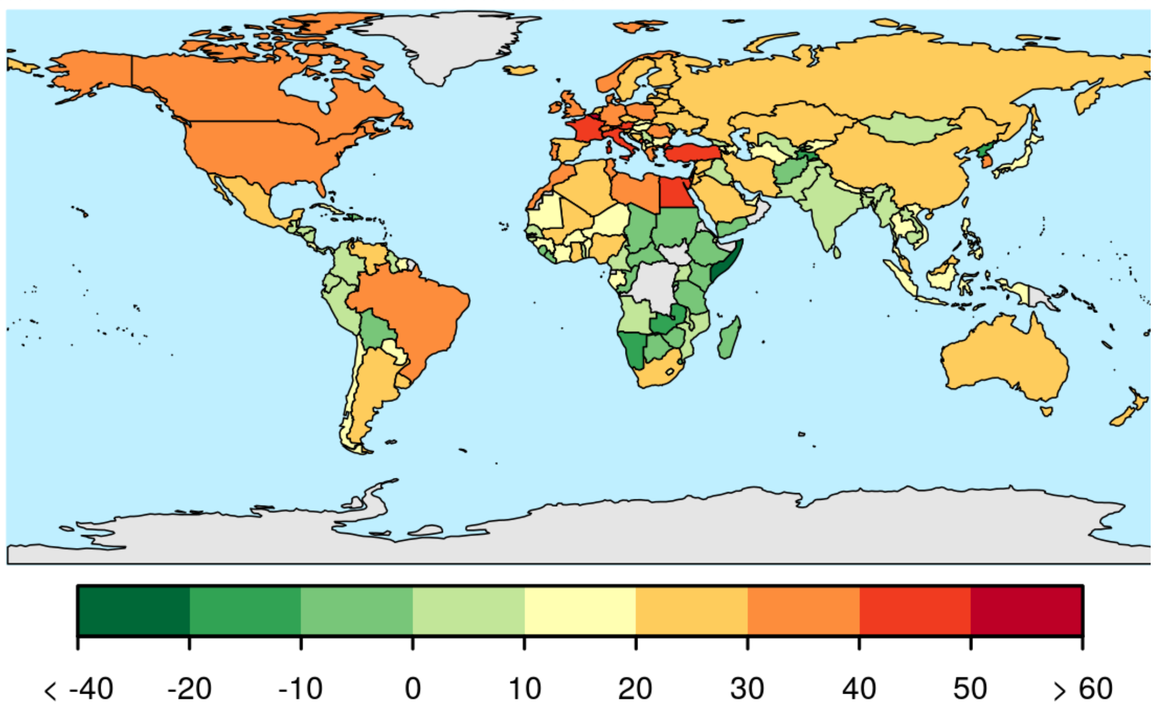

Fig. 4 *Share of food surplus/deficit on a country scale compared to food requirement for 2010 in percentage. The negative values represent food deficits while the positive values express food surplus. Food surplus is common in countries in the North, while food deficits are prevailing in the South.*

DISCUSSION

- food availability has increased and current projections show that food demand will further grow in the future
- most of the growing food demand is related to increasing food waste
- currently, many countries have more food than needed while still few countries do not have enough food
- food waste is related to excess resources used in and avoidable environmental burdens from agriculture
- are we facing more food and less food situation? is this a demand side or supply side problem?

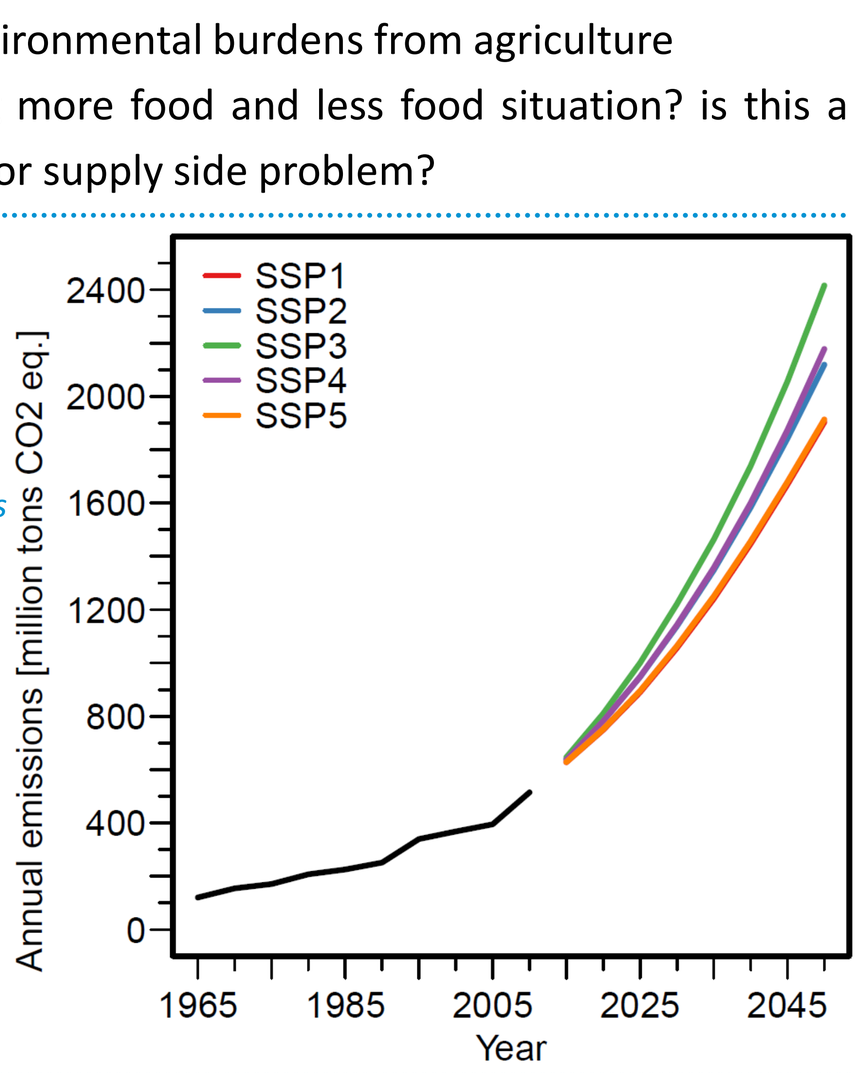

Fig. 5 *Interrelation between country scale food availability and requirement ratio as a function of Human Development Index (HDI) for the year 2010. The ratio below 1 represents food deficit. In general, the ratio increases with growing HDI.*

REFERENCE

Hiç, C., Pradhan, P., Rybski, D., & Kropp, J. P. (2016). Food Surplus and Its Climate Burdens. Environmental science & technology, 50(8), 4269-4277.