

Zero Hunger – A work in progress

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Global Food and Nutrition Security

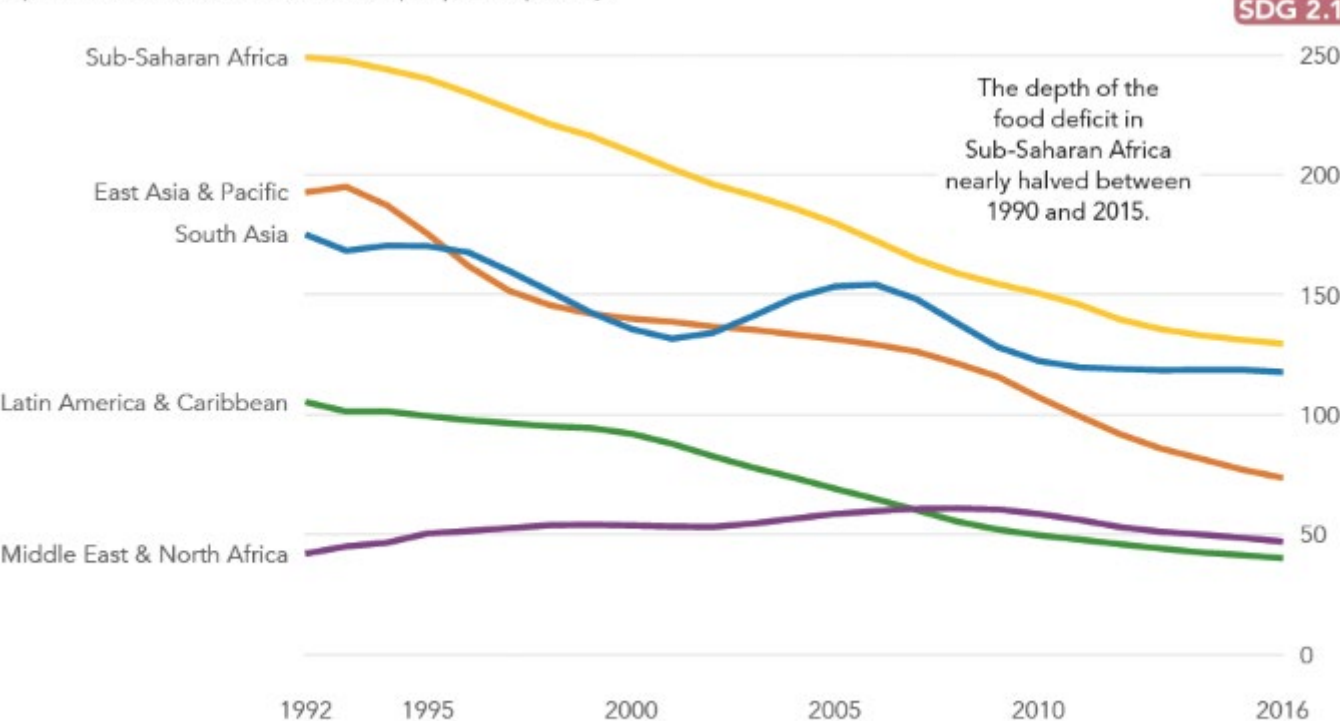
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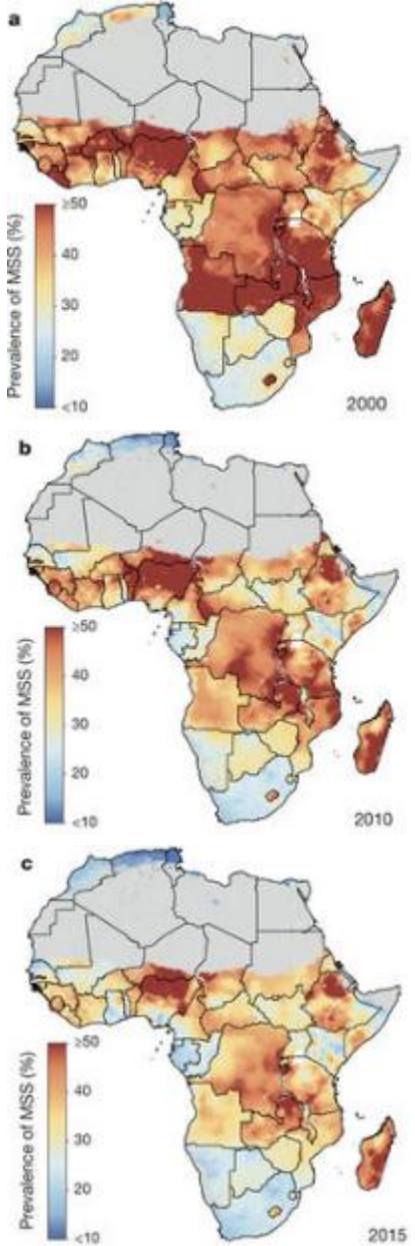


Significant Progress on Ending Hunger

Depth of the food deficit (kilocalories per person per day)

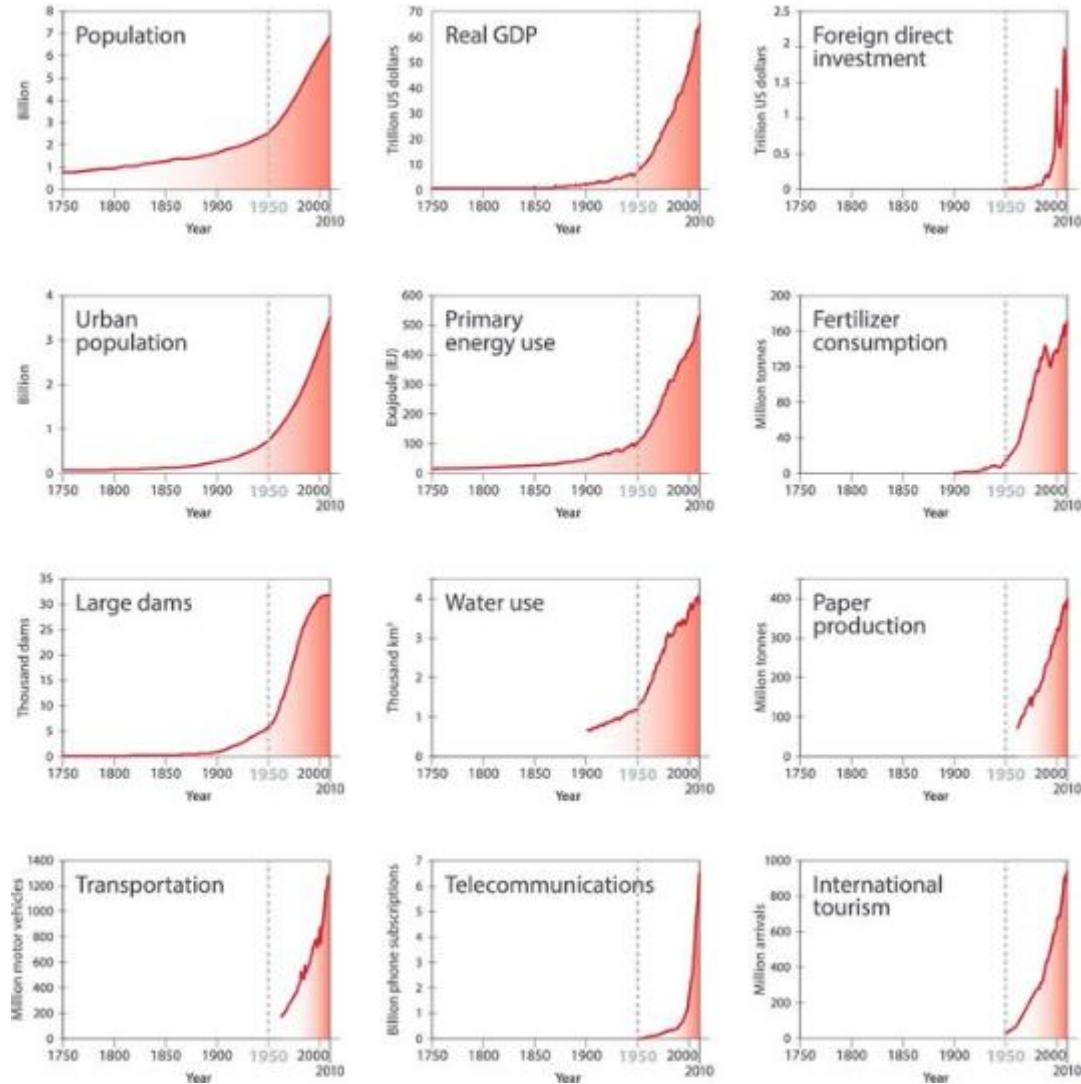


Source: Food and Agriculture Organization, World Development Indicators (SN.ITK.DFCT).

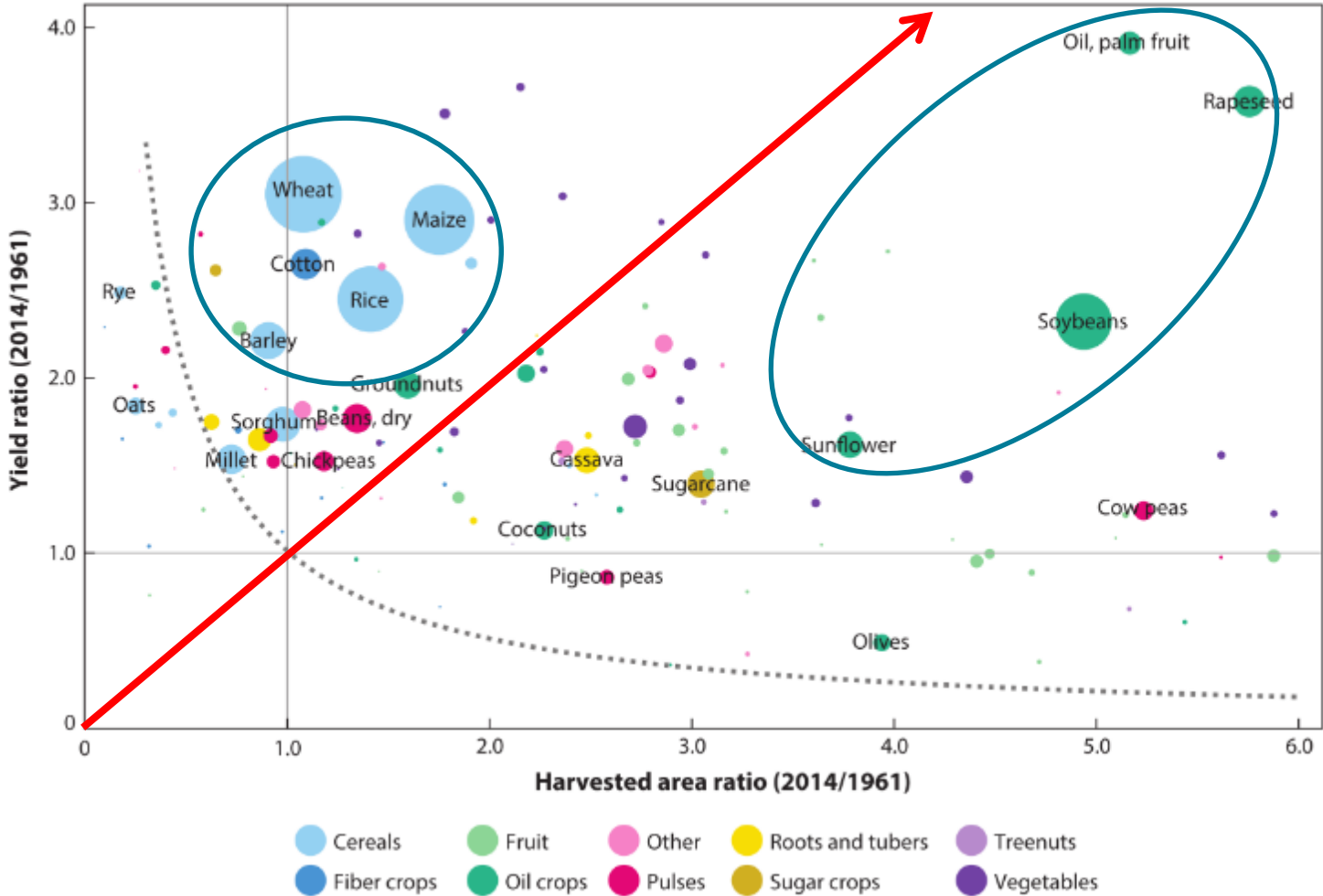


Moving into the Anthropocene

- Global food production has continued to grow allowing us to meet global demand
- But it has come at an environmental cost
- Sustaining progress towards hunger reduction will require sustainable intensification



Sources of past increases in agricultural production



Source: Ramankutty et al. (2018) *Annual Review of Plant Biology*

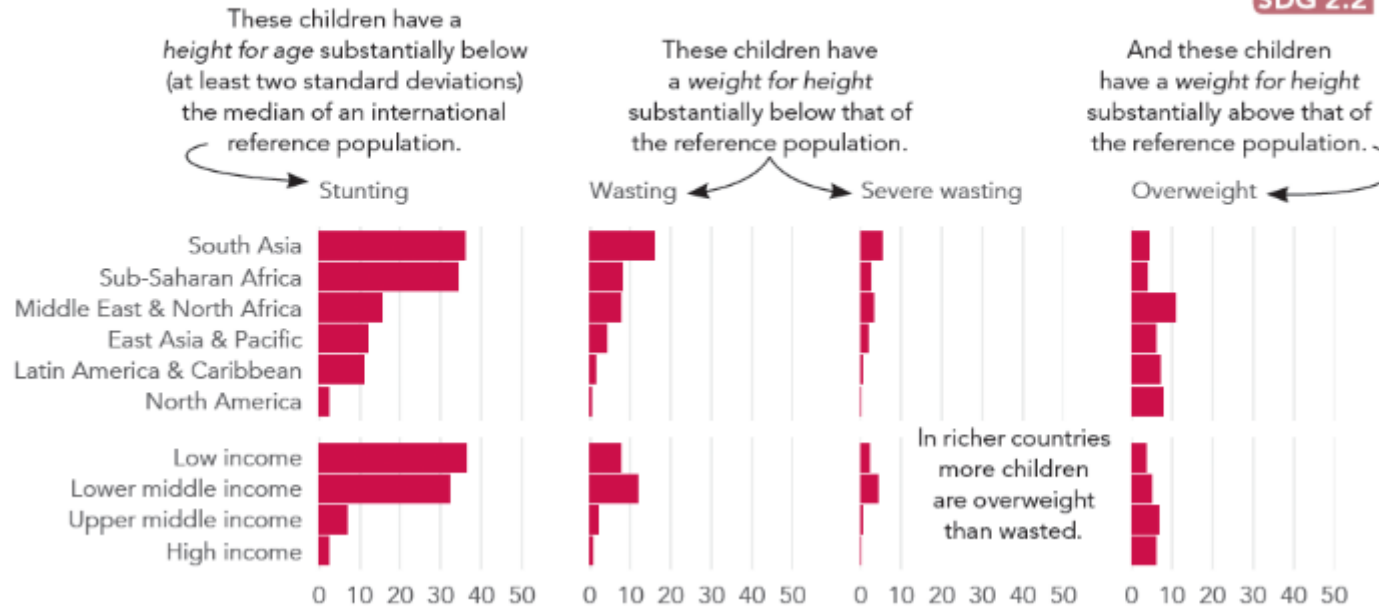


Progress is complicated - the Double Burden Looms

Malnutrition is manifested in multiple ways. In lower-middle-income countries 12 percent of children suffer from wasting, while 5 percent are overweight.

Prevalence of different types of malnutrition, children under age 5, 2016 (%)

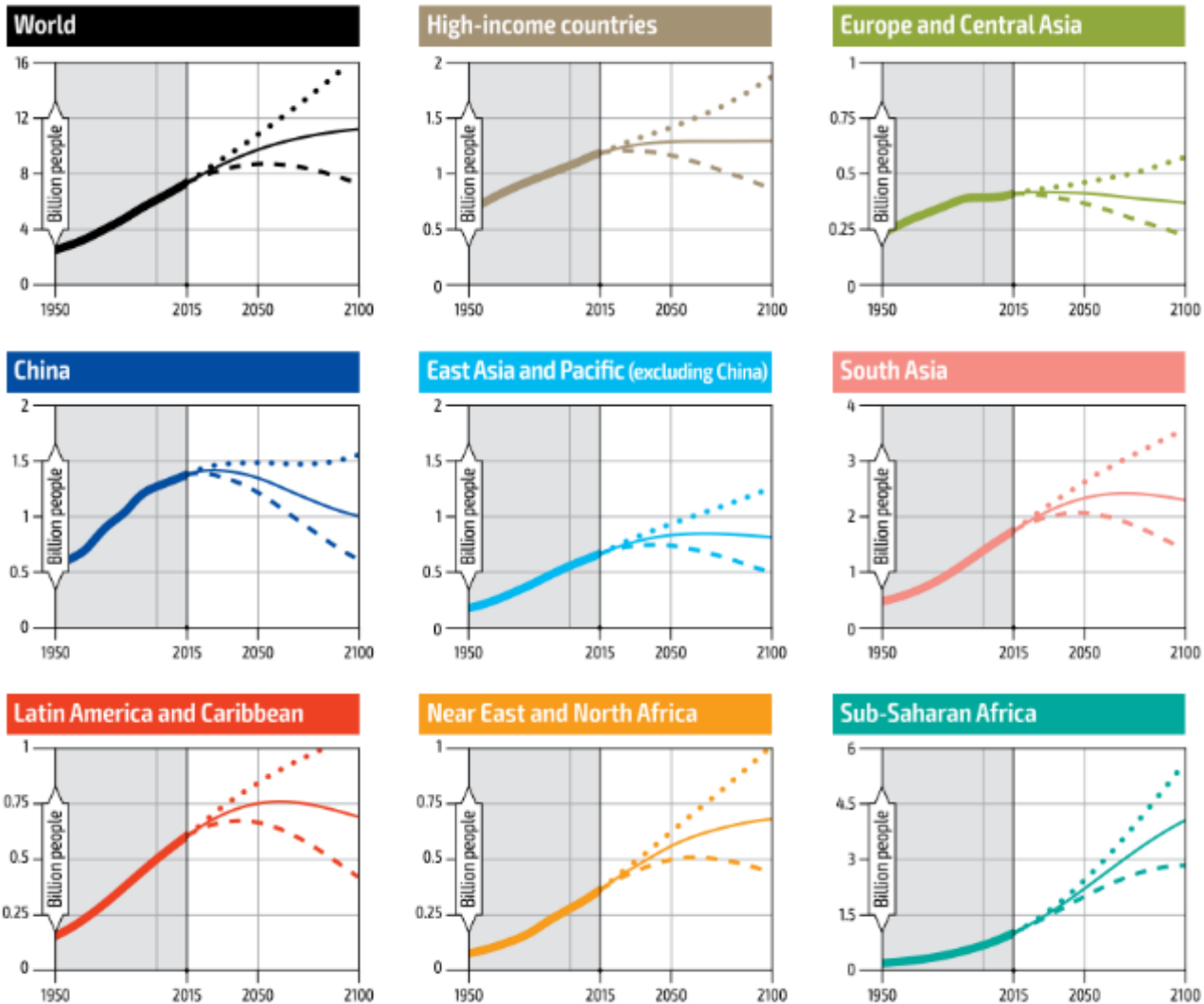
SDG 2.2



More people + More Wealth = ?

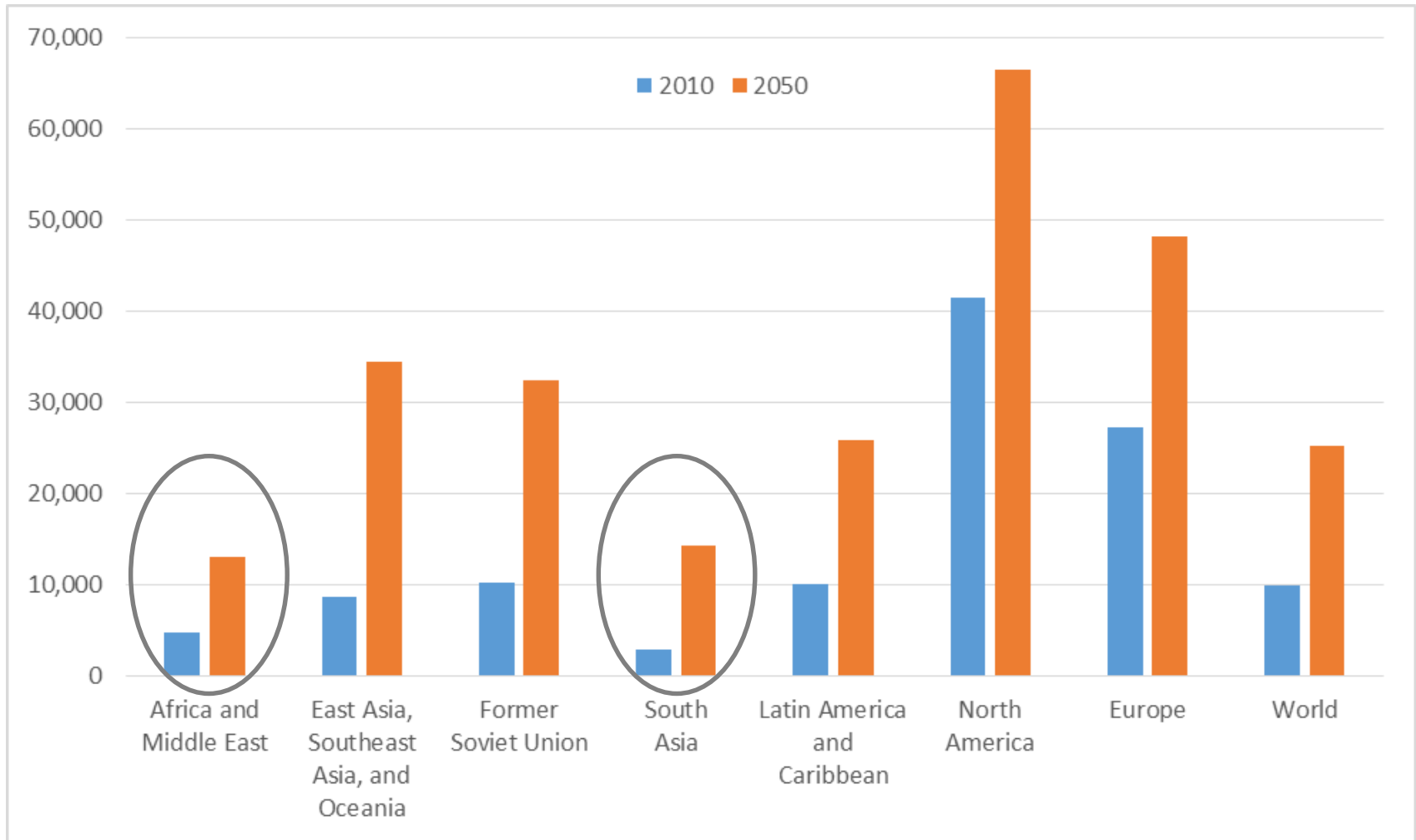


Population growth will slow, but not peak



FAO (2018) The future of food and agriculture: Alternative pathways to 2050

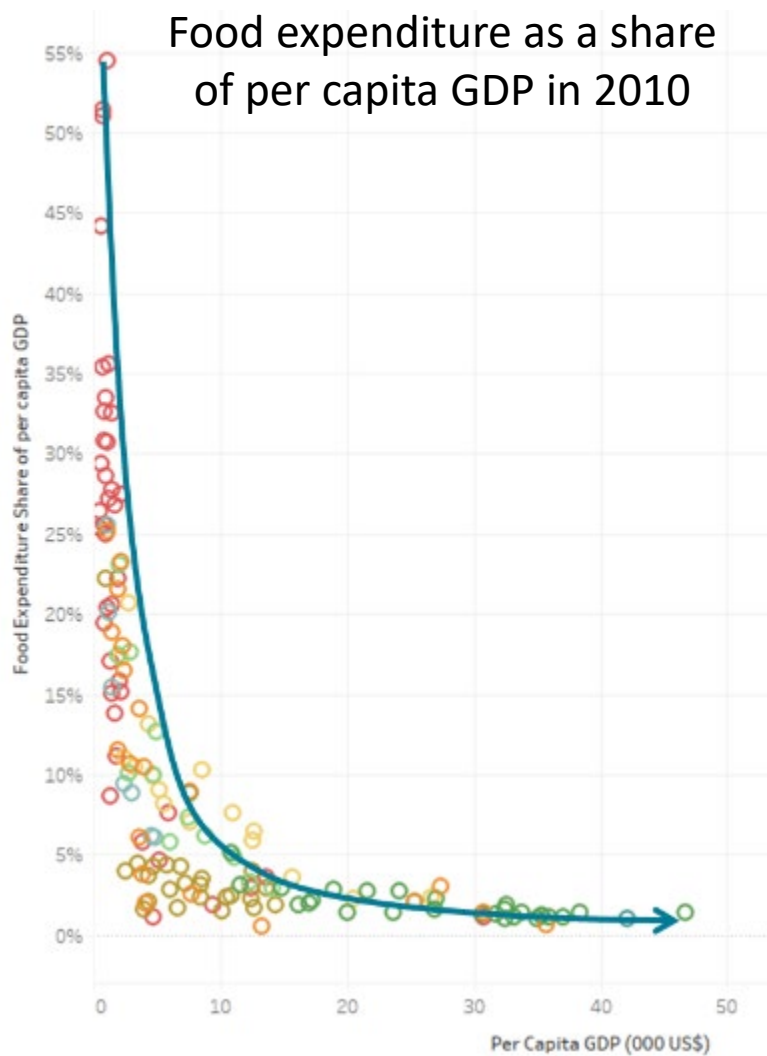
Poorest regions will see fastest growth



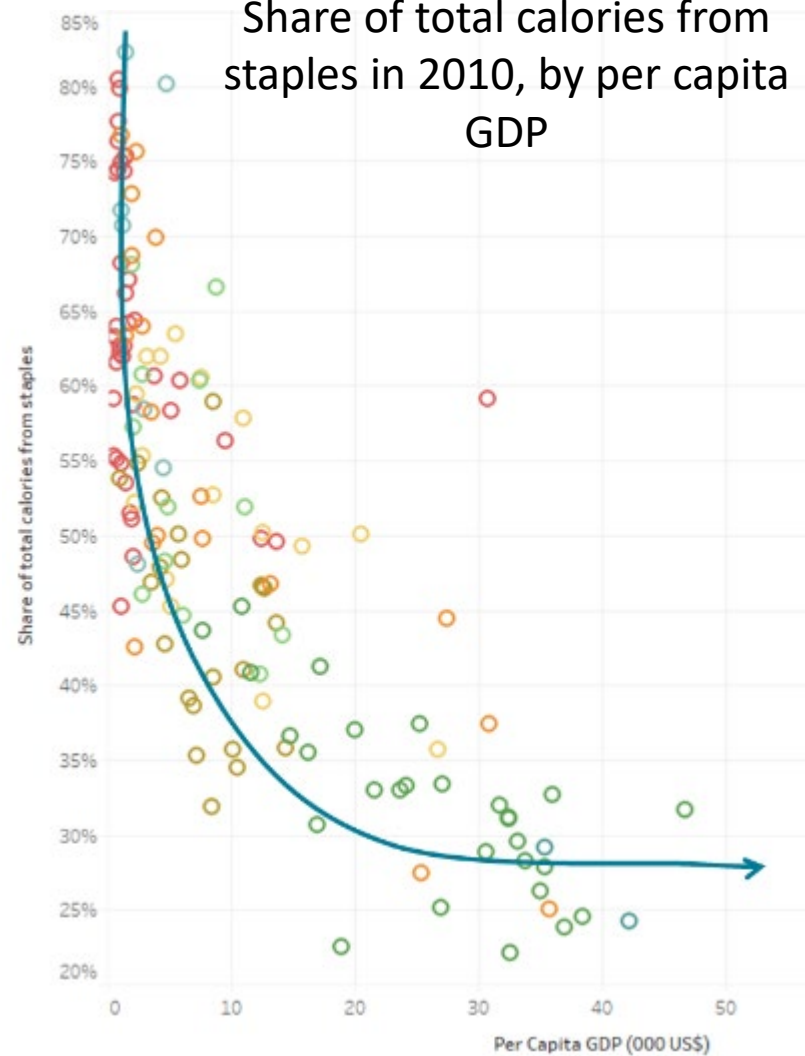
Source: Mason-D'Croz, Cenacchi, Dunston, Sulser, et al. (in draft)

Diets will shift with growing incomes

Food expenditure as a share of per capita GDP in 2010



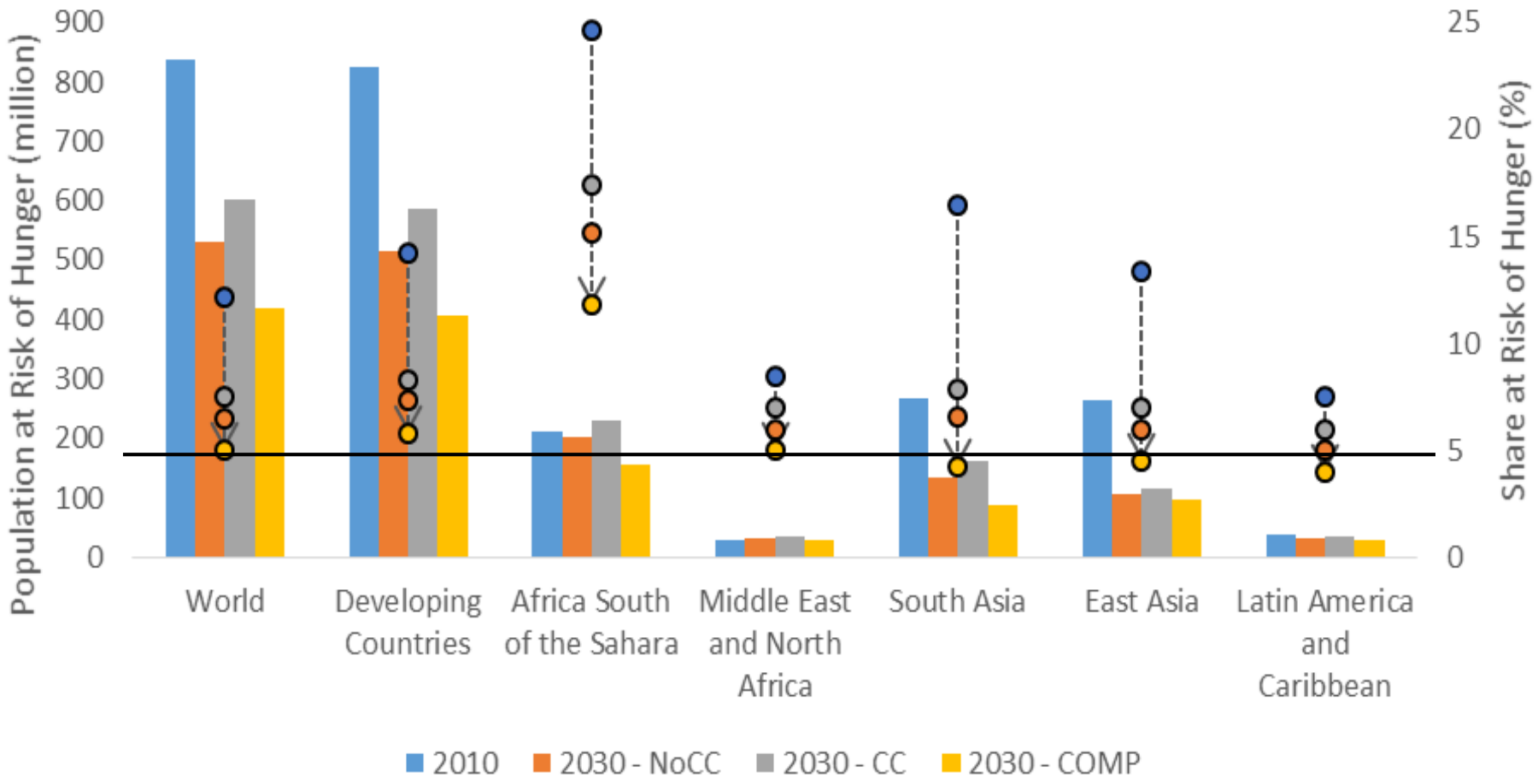
Share of total calories from staples in 2010, by per capita GDP



Source: Mason-D'Croz, Cenacchi, Dunston, Sulser, et al. (in draft)

Still progress is likely to be too slow

Additional investments in agriculture are needed



Income growth important but alone will not ensure food security or healthy diets

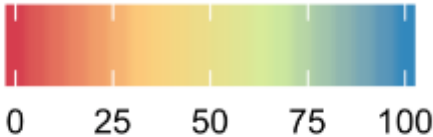
Zinc

Iron

Vitamin A



Income growth effect on adequacy, 2010-2050, (percent)



Unbalanced diets - insufficient fruits & vegetables

| | Fruit & Vegetable Supply (g/capita/day) | | | Ratio of Supply to Recommended Consumption | | | | | | | | |
|--------|--|------|------|--|------|------|------------------|------|------|------------------|------|------|
| | 2010 | 2030 | 2050 | No Waste | | | 15 percent waste | | | 33 percent waste | | |
| Region | 2010 | 2030 | 2050 | 2010 | 2030 | 2050 | 2010 | 2030 | 2050 | 2010 | 2030 | 2050 |
| EAP | 789 | 959 | 959 | 1.40 | 1.68 | 1.66 | 1.19 | 1.43 | 1.42 | 0.94 | 1.12 | 1.12 |
| EUR | 612 | 643 | 666 | 1.07 | 1.12 | 1.16 | 0.91 | 0.95 | 0.99 | 0.72 | 0.75 | 0.78 |
| FSU | 498 | 611 | 656 | 0.88 | 1.07 | 1.15 | 0.75 | 0.91 | 0.97 | 0.59 | 0.72 | 0.77 |
| LAC | 437 | 501 | 556 | 0.79 | 0.89 | 0.98 | 0.67 | 0.76 | 0.83 | 0.53 | 0.60 | 0.65 |
| MEN | 740 | 779 | 796 | 1.35 | 1.39 | 1.41 | 1.15 | 1.18 | 1.19 | 0.91 | 0.93 | 0.94 |
| NAM | 640 | 719 | 728 | 1.13 | 1.27 | 1.28 | 0.96 | 1.08 | 1.09 | 0.76 | 0.85 | 0.86 |
| SAS | 287 | 542 | 1005 | 0.53 | 0.97 | 1.78 | 0.45 | 0.83 | 1.51 | 0.35 | 0.65 | 1.19 |
| SSA | 261 | 328 | 411 | 0.50 | 0.61 | 0.75 | 0.42 | 0.52 | 0.64 | 0.33 | 0.41 | 0.50 |
| DVG | 524 | 657 | 796 | 0.95 | 1.17 | 1.41 | 0.81 | 1.00 | 1.20 | 0.64 | 0.79 | 0.94 |
| DVD | 610 | 661 | 681 | 1.07 | 1.16 | 1.19 | 0.91 | 0.98 | 1.01 | 0.72 | 0.78 | 0.80 |
| WLD | 538 | 658 | 780 | 0.97 | 1.17 | 1.38 | 0.83 | 1.00 | 1.17 | 0.65 | 0.79 | 0.92 |

Source: Mason-D’Croz, Cenacchi, Dunston, Sulser, et al. (in draft)

Food waste a challenge, household waste tends to increase with income

| Region | Fruit & Vegetable Supply (g/capita/day) | | | Ratio of Supply to Recommended Consumption | | | | | | | | |
|--------|--|------|------|--|------|------|------------------|------|------|------------------|------|------|
| | 2010 | 2030 | 2050 | No Waste | | | 15 percent waste | | | 33 percent waste | | |
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Source: Mason-D’Croz, Cenacchi, Dunston, Sulser, et al. (in draft)

Thank you

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References

- Development Initiatives, 2017. Global Nutrition Report 2017: Nourishing the SDGs. Bristol, UK: Development Initiatives.
- Mason-D’Croze, D., N. Cenacchi, S. Dunston, ... K. Wiebe (in draft). *2050 Climate Change Monograph*. Washington, DC: IFPRI
- Mason-D’Croze, D., T.B. Sulser, K. Wiebe, ... R. Robertson (submitted) Agricultural investments and ending hunger in Africa; Modeling potential contributions to SDG 2. *World Development*
- Nelson, G., J. Bogard, K. Lividini, ... M.W. Rosegrant. (2018). Income Growth and Climate Change Effects on Global Nutrition Security to Mid-Century. *Nature Sustainability*, 1(12). DOI: [10.1038/s41893-018-0192-z](https://doi.org/10.1038/s41893-018-0192-z)
- Osgood-Zimmerman, A., A.I. Milller, R.W. Stubbs, ... Hay, S. I. (2018). Mapping child growth failure in Africa between 2000 and 2015. *Nature*, 555(7694), 41–47. DOI: [10.1038/nature25760](https://doi.org/10.1038/nature25760)
- Ramankutty, N., Z. Mehrabi, K. Waha, ... L.H. Rieseberg. (2018). Trends in Global Agricultural Land Use: Implications for Environmental Health and Food Security. *Annual Review of Plant Biology*, 69(1), annurev-arplant-042817-040256. DOI: [10.1146/annurev-arplant-042817-040256](https://doi.org/10.1146/annurev-arplant-042817-040256)
- Steffen, W., W. Broadgate, L. Deutsch, O. Gaffney, & C. Ludwig. (2015). The trajectory of the Anthropocene: the great acceleration. *The Anthropocene Review*, 2(1), 81-98. DOI: [10.1177/2053019614564785](https://doi.org/10.1177/2053019614564785)
- World Bank (2018) 2018 Sustainable Development Goal (SDG) Atlas. <http://datatopics.worldbank.org/sdgatlas/index.html>