



Repositioning agriculture to achieve human nutrition and planetary health

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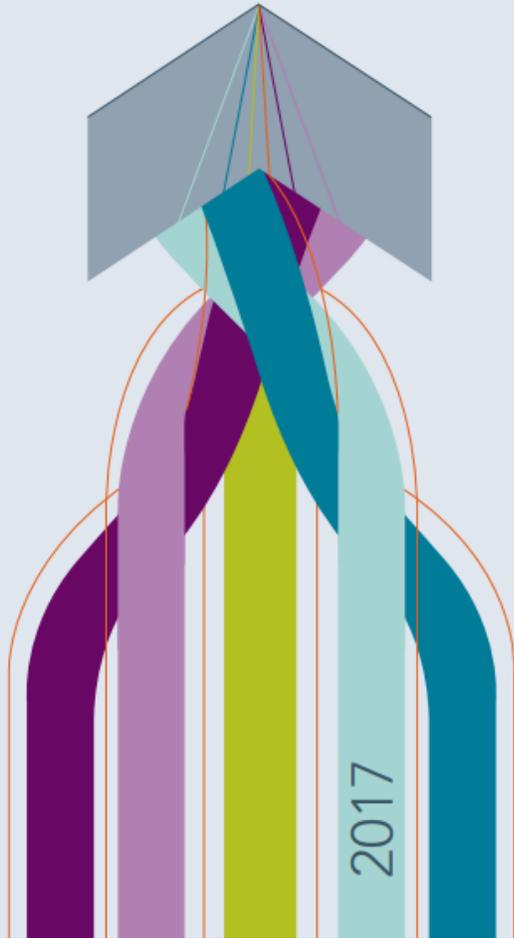
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Key Messages

- 1 The world faces multiple burdens of malnutrition and environmental challenges
- 2 Agriculture must be repositioned for human nutrition and planetary health
- 3 Policies are critical in repositioning agriculture for broad development outcomes



Nourishing the SDGs



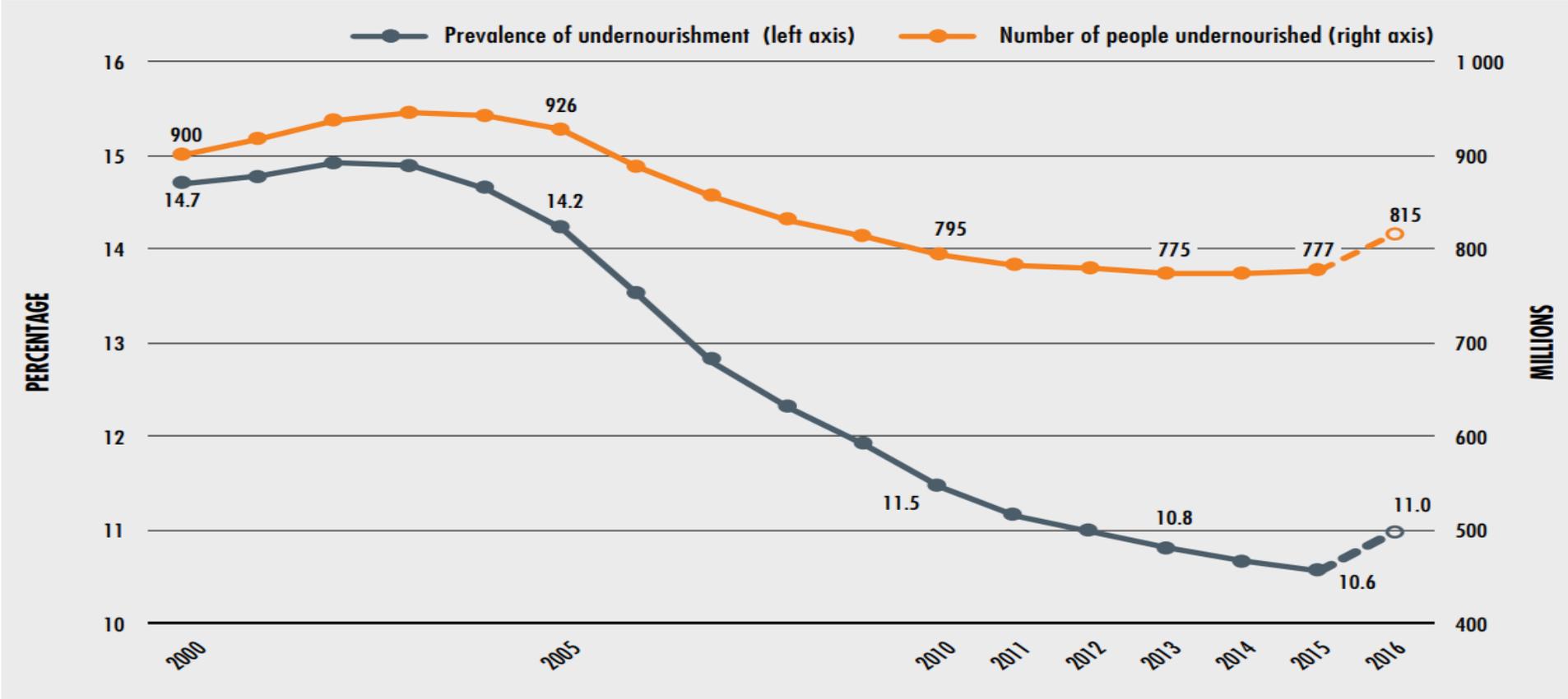
Key messages from the Global Nutrition Report 2017

- The world faces a grave nutrition challenge
- Improving nutrition can catalyze achievement of the SDGs
 - Achieving other SDGs will help end malnutrition
- Data gaps hinder accountability
- Political commitment is essential to the SDGs
- There are opportunities to end malnutrition and achieve multiple development goals

Agriculture will play a critical role

After years of progress, hunger is on the rise

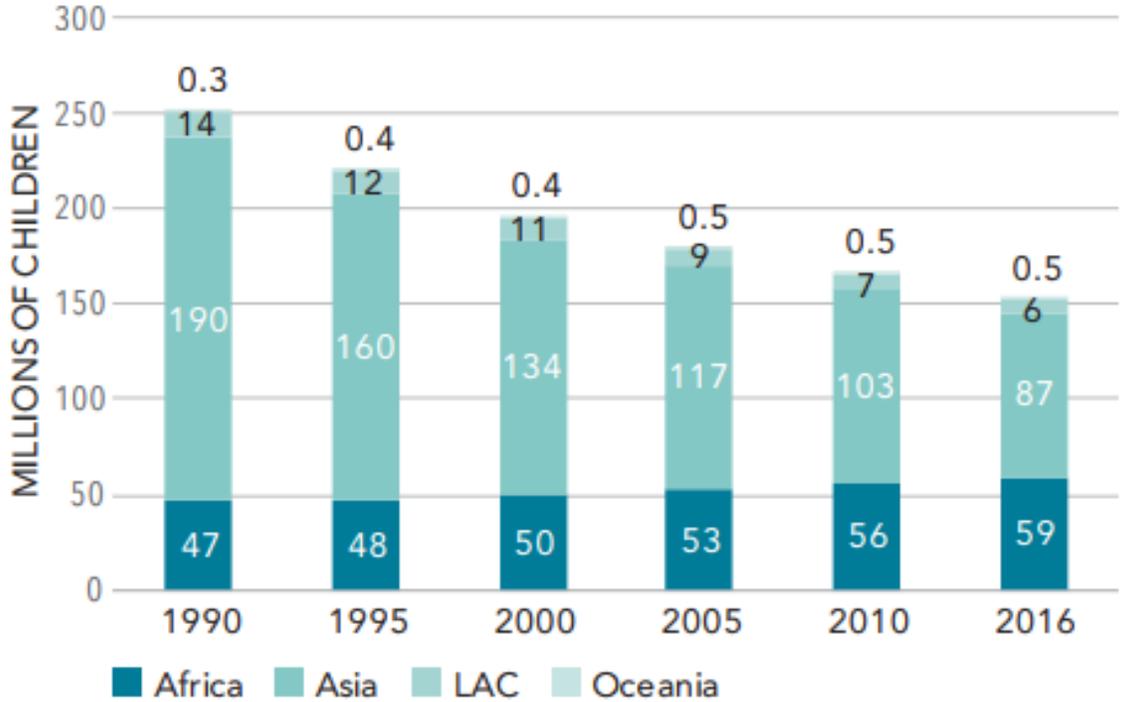
Prevalence and number of undernourished worldwide



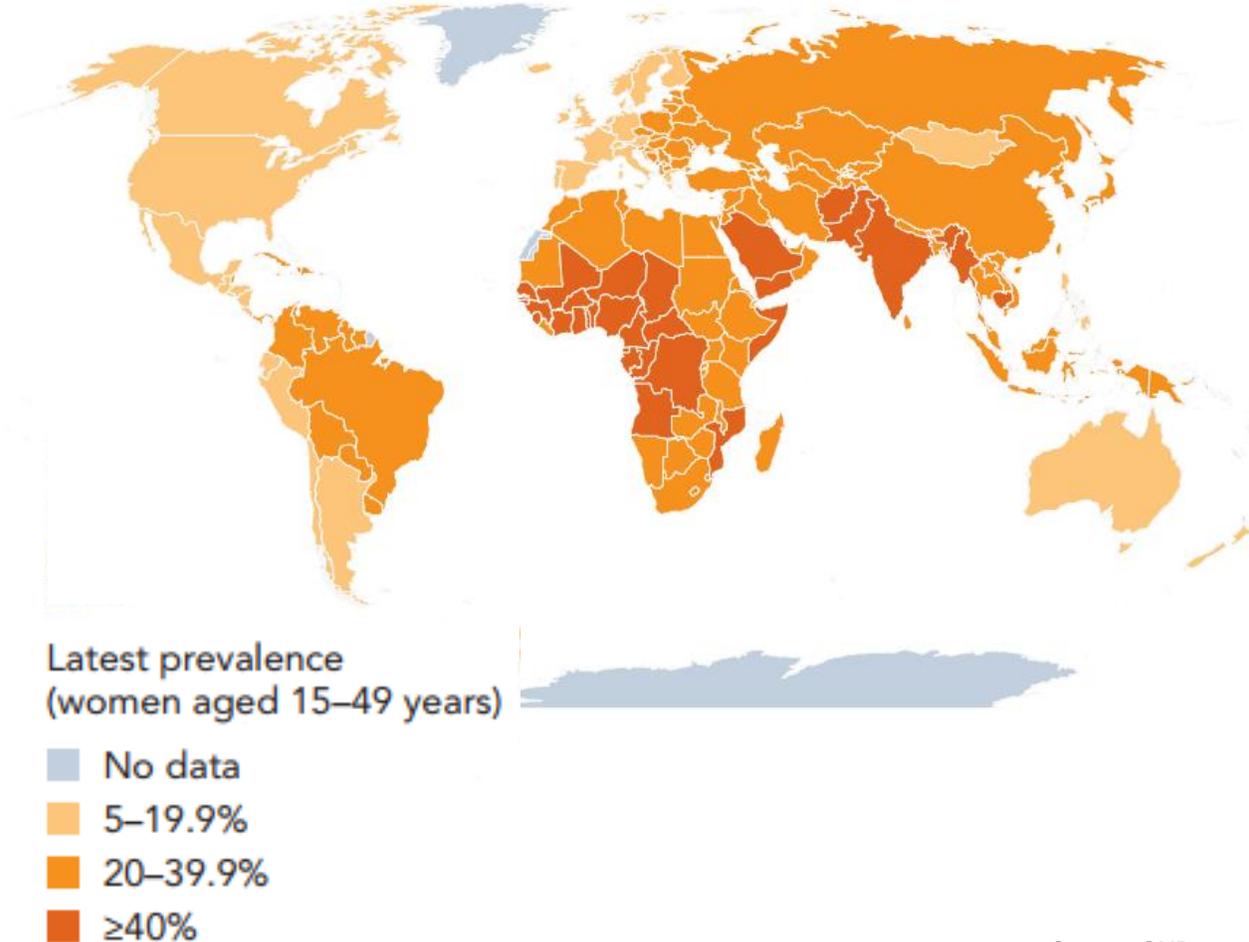
38 million face food insecurity in four conflict-afflicted countries: Nigeria, Somalia, South Sudan, and Yemen

Undernutrition has reduced, but still persists

Prevalence of stunting in children under 5 (%)



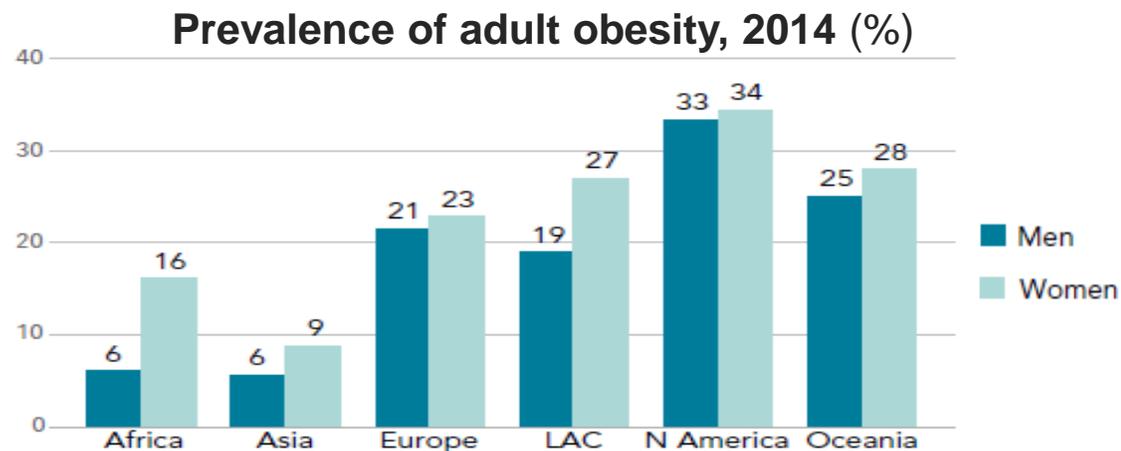
Prevalence of anemia among women aged 15-49, 2016



There is a growing crisis of overweight, obesity, and NCDs...

Globally,

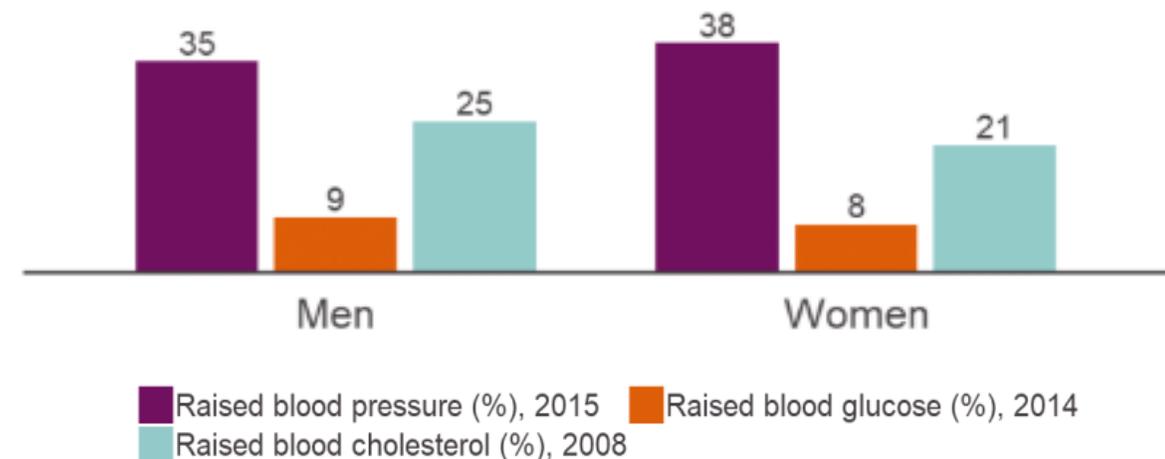
- **2.1 billion** are overweight/obese
 - 62% live in developing countries
- **3.4 mil. deaths** annually related to overweight and obesity



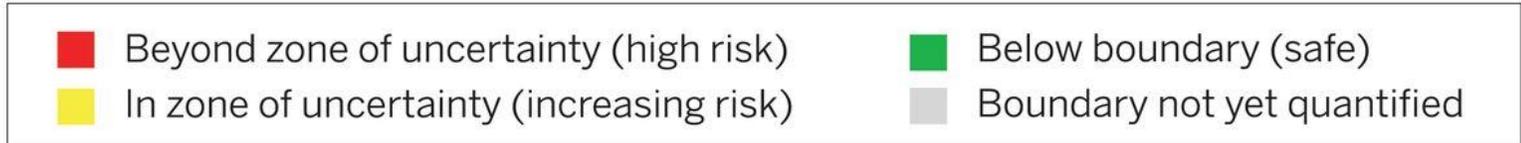
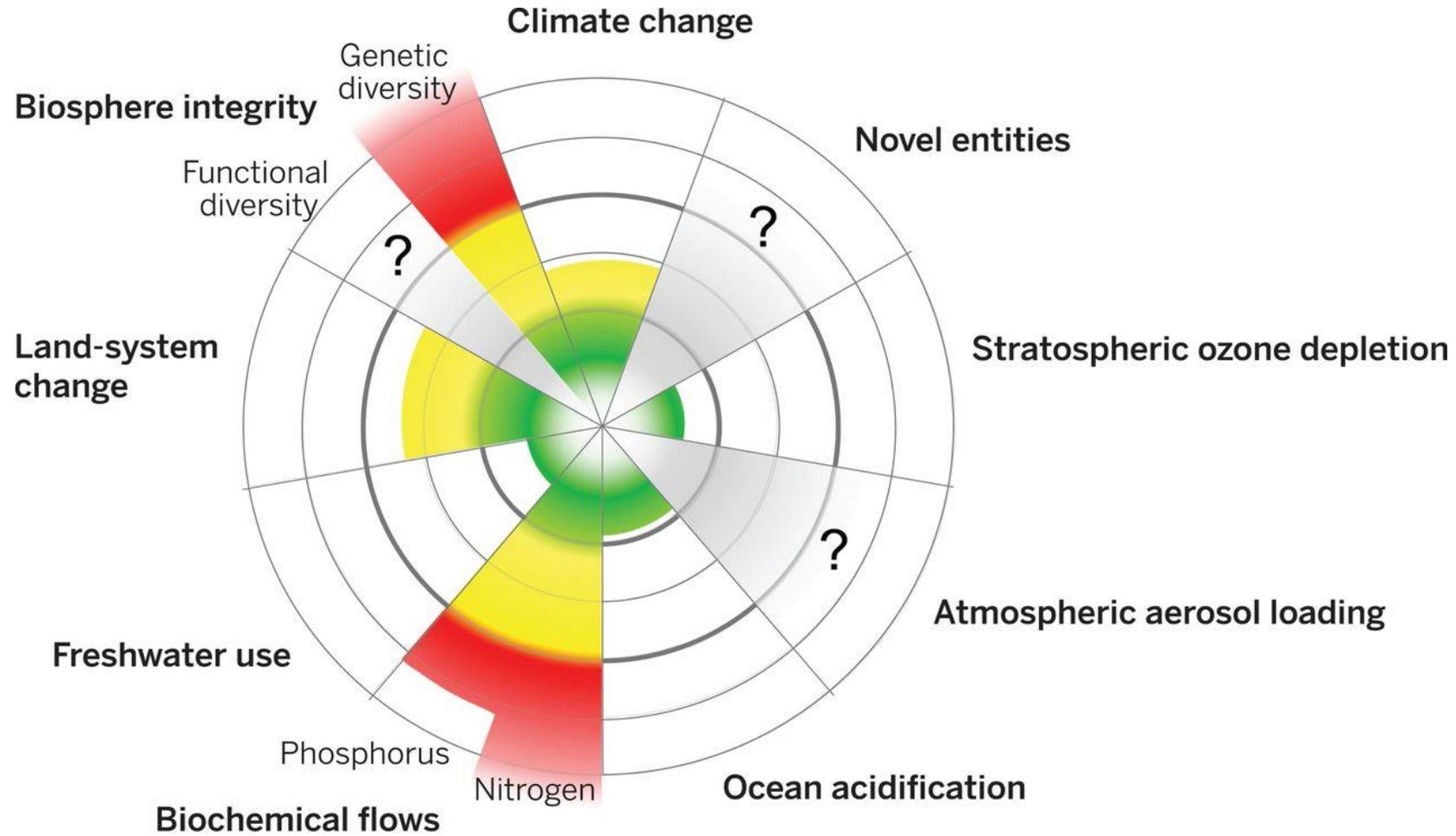
Unhealthy diets contribute to obesity and NCDs, including diabetes, heart disease, stroke, and cancer

Source: WHO 2015

Metabolic risk factors for diet-related NCDs globally (%)



...AND the world is reaching planetary boundaries



**Agriculture plays
key roles for
human nutrition
and planetary
health**



Agriculture is critical for nutrition

Agriculture-Nutrition pathways

1. Agriculture as a source of food (own production)
2. Agriculture as a source of income
3. Agricultural policy and food prices affecting purchasing power and consumption patterns
4. Agriculture income's effect on spending patterns

Gender dimensions (rural women)

5. Women's status and intra-household decisions and resource allocation
6. Women's ability to care for young children
7. Women's own nutritional status



Agriculture and food affect health

Producers

- **Increased productivity & production of nutritious & healthy food**
 - Impact health of smallholders & subsistence farmers
- **Agriculture-related, water-borne, zoonotic diseases**
- **Overuse of pesticides, growth hormones, antibiotics (AMR)**
- **Agriculture takes up women's time & takes time away from providing child healthcare**
 - Time-saving technologies can help

Consumers

- **Agricultural productivity → reduce food prices, esp. for healthy food**
 - Nutritious food improves health
 - BUT unhealthy food & overconsumption can lead to overweight & obesity
- **Overuse of pesticides, growth hormones, antibiotics (AMR)**

Overall

- **Agricultural practices & investments → growth in agricultural sector, nonfarm sector → increase income & improve health**
- **Climate change: carbon & methane emission, increased temperature, diseases**

Agriculture can do more to save water, land and energy

Hydroponic, vertical or indoor farming

- Estimated US\$750 million in North American private investment in vertical farming (through Q3 2017)
- Economically viable and sustainable

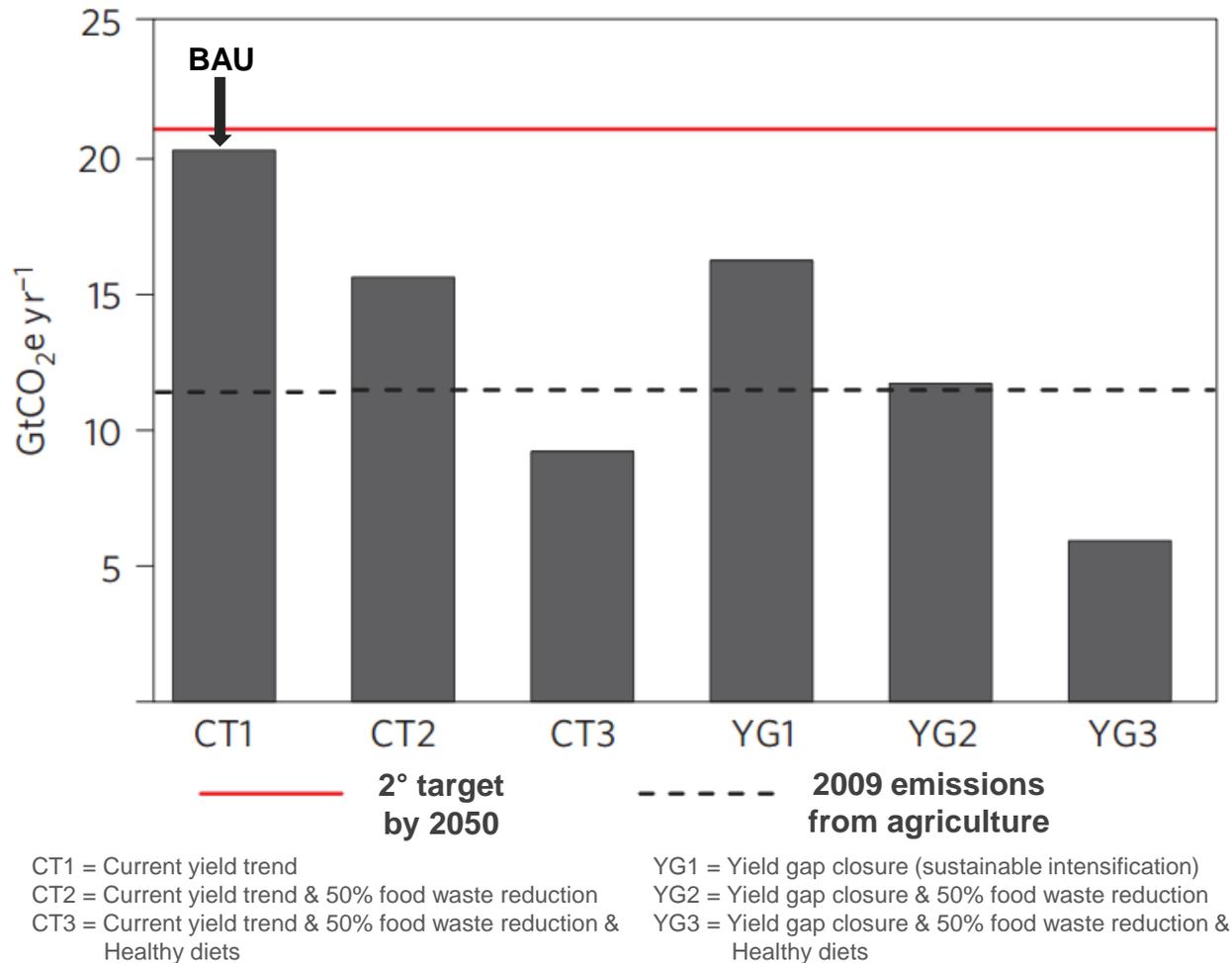
Biotechnology

- ‘Cultured’ meat (e.g. Memphis Meats, Hampton Creek, Impossible Foods)
 - Production involves **78-96% lower GHG emissions, 99% lower land use, 82-96% lower water use** depending on conventional meat product compared



Agriculture is key for climate mitigation

GHG emissions from agriculture and LUC

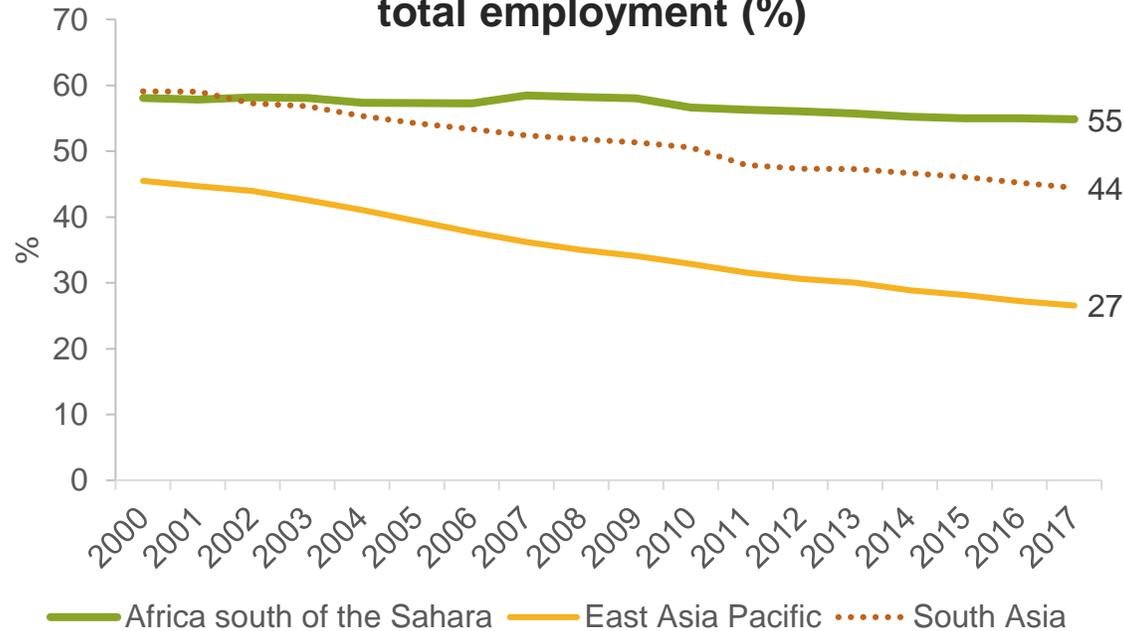


Without drastic changes to agri-food systems, we will not be able to meet the 2°C target

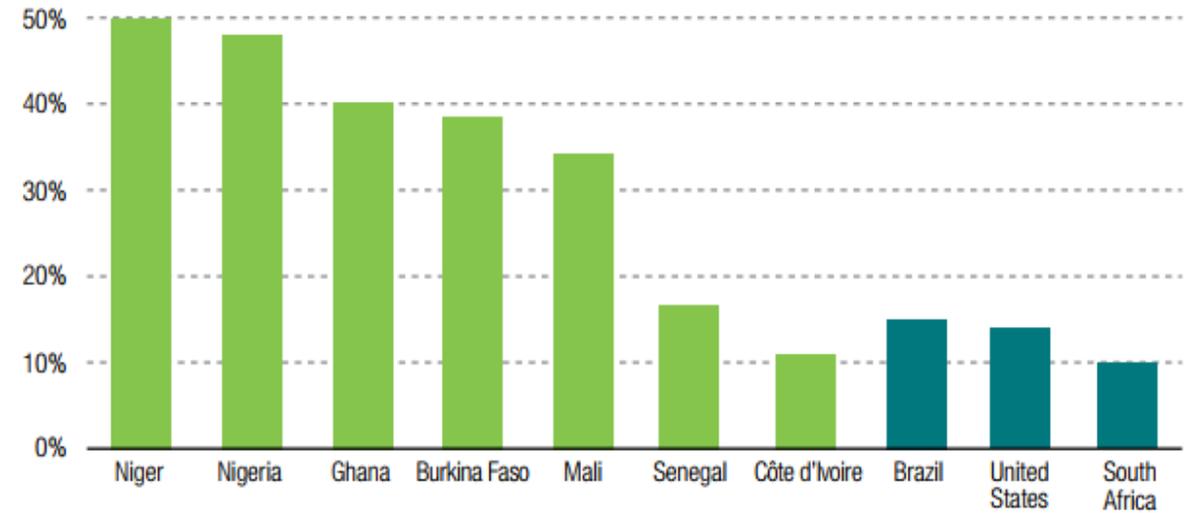
- Under BAU, agriculture will emit 20.2 GtCO₂e/yr, almost reaching 2°C target emission allowance for all sectors in 2050 (~21 GtCO₂e yr⁻¹)
- Food system transformation will be key for sufficient mitigation, e.g. yield gap closure, food waste reduction, and healthy diets (YG3 scenario)

Agriculture and non-farm food employment is critical, especially in Africa

Share of employment in agriculture in total employment (%)



Share of food processing employment in total manufacturing employment



Across the whole food system, 22% of total food economy jobs are in off-farm activities in West Africa

Future jobs in food systems will require higher knowledge due to technological innovations

Agriculture is critical to address inequalities

Women face constraints in agriculture

- Productive asset ownership
e.g. land and livestock
- Control of productive inputs
e.g. access to credit, insurance, technology
- Systemic gender differences
e.g. base education levels; natural resource knowledge

Women produce less not because of inefficiency or inability—they lack equal access to resources

Barriers limit smallholders' profitability

- Limited farm size
- Limited access to finance and capital
- Inadequate access to modern markets
- Food price increases and volatility
- Rising agricultural-related risks to health

Smallholders provide up to 80% of food in Asia and Africa south of the Sahara yet make up the majority of poor and hungry

Agriculture is central to the bioeconomy

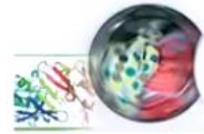
Bioeconomy: Sustainably provides products and services with biological resources

- Comes from plants, microbes, animals, biodiversity, biotechnology, carbon, biological knowledge
- Involves agriculture, forestry, fisheries, textiles—and beyond

Examples of consumer bio-products



Biomaterials in car industry



Enzymes lowering effective washing temperature



Bioplastics



Implants made from spider fibers



Biobased building materials



New sugar substitutes



Biopharmaceuticals based on proteins



Biofuels based on forest residues, straw etc.

Agriculture can help maintain culture and tradition

- Many traditional farmers provide environmental services—e.g. watershed conservation, biodiversity protection and carbon storage—and cultural services
- **Globally Important Agriculturally Heritage Systems (GIAHS)** opens opportunities for jobs and markets through the “cultural economy”
- Agro- or eco-tourism can compensate farmers’ conservation measures
- Farmers organizations will play a big role



The global agri-food system must be repositioned to achieve the SDGs

New agri-food system

Nutrition- & health-driven

Productive & efficient

Environmentally sustainable & climate-smart

Inclusive

Business friendly



Over half of SDGs relate to food security and nutrition

**Policies are critical in
repositioning
agriculture for broad
development
outcomes**



Advance nutrition-driven agricultural technologies

- Invest in agricultural R&D to produce more with less
- Support technologies that promote diversification of food production (e.g. vegetables, pulses, fruits)
 - E.g. Nepal prioritizes crop production diversity, which is linked to diet diversity and improved child nutrition outcomes (UNSCN 2013, Shively and Sununtnasuk 2015)
- Advance frontiers for nutrition-driven technologies, e.g. biofortification
 - Increasing nutrient density through plant breeding, agronomic practices



Iron beans



Zinc rice

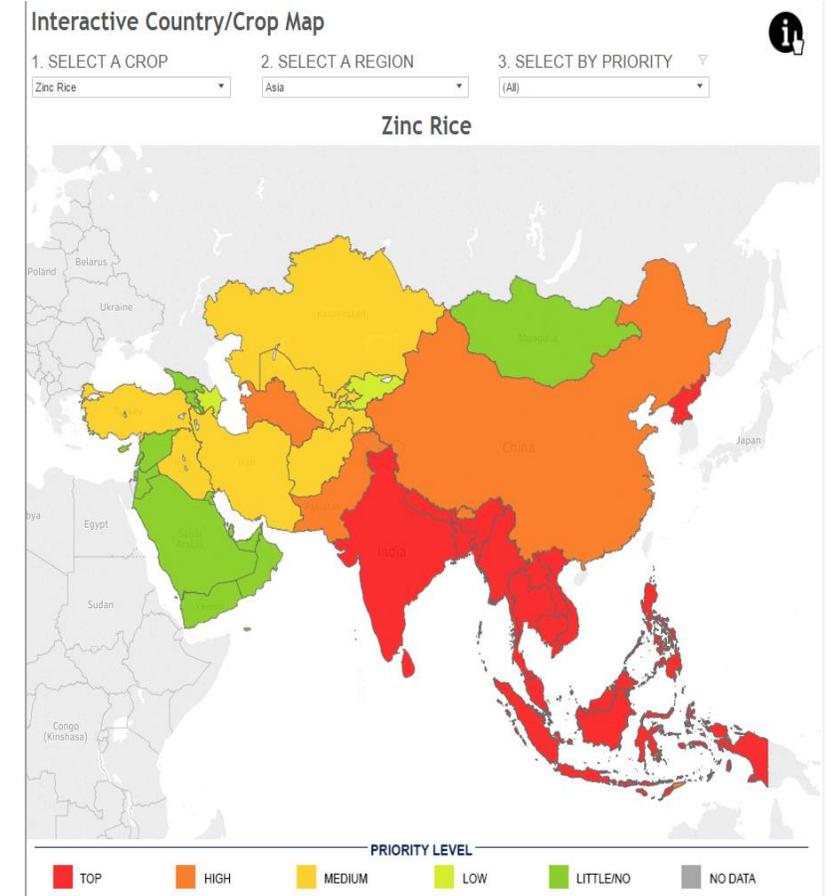


Iron pearl millet



Zinc wheat

Biofortification Priority Index



Use ICTs to improve food safety and market access

Smallholders can benefit from urban markets, but can also be excluded due to strict food safety requirements

- **Improve surveillance, e.g.**
 - Mobile phones, internet tracking for better accuracy, comprehensiveness
- **Promote e-commerce, e.g. G20 initiative in China**
 - Connects rural farmers with supply and demand information on agricultural produce and materials, and consumer products



Reduce food loss and waste

33% of all food is lost or wasted—primarily fruits, veg., roots, tubers

Invest in post-harvest technologies and infrastructure

- Improving roads, rail, electricity to address post-harvest losses can reduce hunger and child malnutrition of 4m children in 15 years (Rosegrant et al 2015)
- E.g. Zero energy cool chambers (ZECC) in India increase shelf-life, reduce weight loss for fruits and veggies (WRI 2013)

Use ICTs to distribute soon-to-expire foods

- Mobile apps can help businesses donate surplus food (e.g. Zero Percent), match excess food with hungry people (e.g. MyFoody, Waste No Food)

Promote policies to curb retail food waste

- E.g. France's ban on supermarkets throwing away quality food before best-before date

Invest in productive safety nets

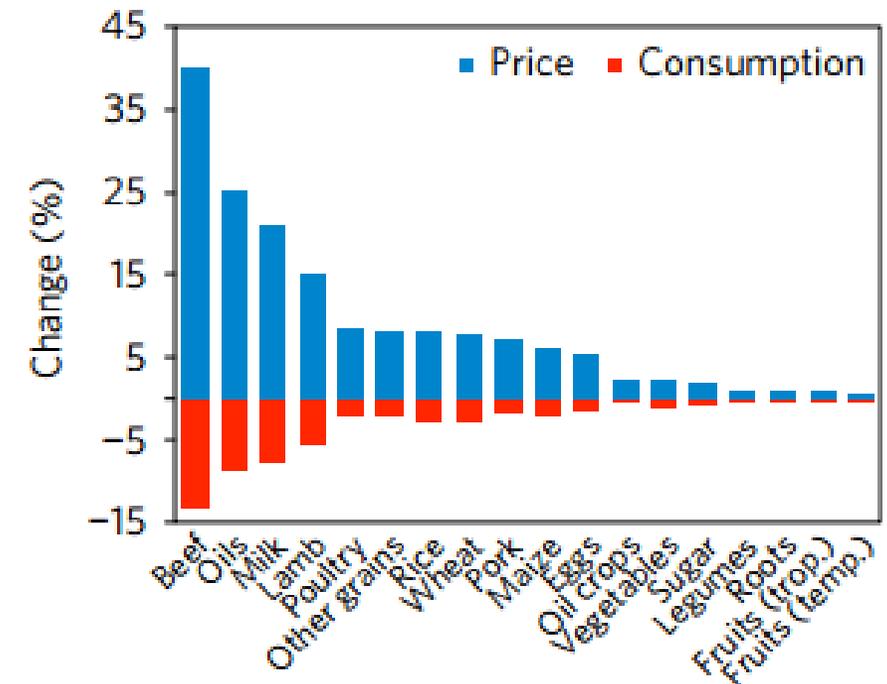
Social protection can secure basic livelihoods, protect from risk and vulnerability, and stimulate growth

- Promote better-targeted, productive, cross-sectoral safety nets e.g.
 - **Ethiopia's Productive Safety Net Program**
Access to safety nets and ag. support improves food security
 - **Bangladesh's Vulnerable Group Development Program**
Food security, nutrition interventions + income-generating activities
AND adding **behavior change communication** can boost nutritional impacts of interventions
- Promote social protection for urban poor & hungry
 - By 2020, 85% of poor in Latin America, 40-45% in Africa and Asia will live in cities or towns
 - E.g. Public works, conditional or unconditional cash transfers

Use taxes for sustainable, nutritious, and healthy diets

- **Tax nutrient-poor foods and subsidize nutrient-rich foods**
 - Eliminate subsidies of nutrient-poor foods (US \$500+ billion/year) and convert to investments for more nutritious crops (e.g. vegetables) (Tiffin and Arnoult 2010)
- **Taxing emissions-intensive foods (e.g. meat and dairy) could avoid more than 100,000 deaths in 2020** (Springmann et al. 2016)
 - Two-thirds due to changes in **dietary risk factors**
 - One-third due to changes in **weight-related risk factors**

Changes in prices and consumption by food commodity (%)



Fix the fundamentals

- **Develop rural infrastructure**

- Investments in rural roads shown to have large impact on agricultural growth and poverty reduction (Fan 2007)
- Access to WASH is strongly linked to child stunting reduction (Smith & Haddad 2014)

- **Strengthen institutional and regulatory frameworks**

- Promote land rights and efficient land markets
- Improve food safety monitoring with capacity strengthening along the value chain and more resources for monitoring agencies

- **Promote open, transparent, and fair trade**

- Eliminate distortionary trade policies
- Fill domestic gaps with appropriate imports



Close gender gap in agriculture

- **Improve mother's health and nutrition**
 - **Burkina Faso:** Enhanced Homestead Food Production (E-HFP) showed decrease in prevalence of maternal underweight and enhanced empowerment (Olney et al. 2016)
- **Reform institutions to strengthen resource rights**
 - **Vietnam:** Land titling for women improved reallocation of household expenditures toward food, among others (Menon et al. 2014)
- **Improve access to inputs and credit**
 - **Ghana:** Women's ability to make credit decisions significantly improved dietary diversity for women and girls (Malapit and Quisumbing 2015)
- **Provide agric. training and information**
 - **Bangladesh:** Livelihood assistance and training increased savings for productive assets (Meinzen-Dick and Quisumbing 2012)

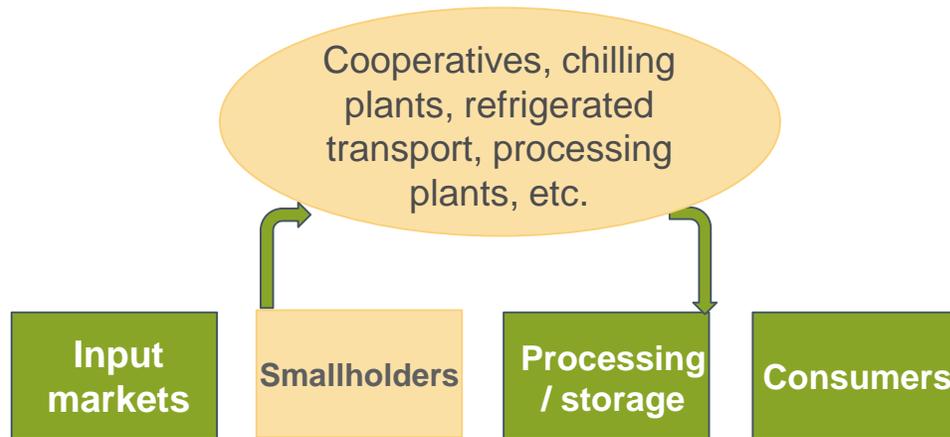


Support smallholders and develop youth

Support inclusive marketing in food value chains

- Link smallholders to modern agrifood value chains

India's improved dairy chain



- 4.5% increase in production / yr (1970-2001)
- Consumers gained more, better-quality milk

Develop young farmers

- Land, capital, and skill-building are crucial to develop next generation of farmers
- Improve rural infrastructure to increase access to services, goods, jobs, and leisure
- Young people + opportunity = “Youth dividend”

Working together to accelerate progress

What Compact2025 does

Assists countries to refine and implement their road maps for action toward ending hunger and undernutrition by 2025

How?

By developing national and subnational networks of researchers and policymakers who identify evidence tool gaps

Special focus

Enhancing implementation and capacity at national and subnational levels



Upcoming global gathering in Bangkok, Thailand (late 2018)

Accelerating progress through multisector food system transformation