

Changing farming for a changing climate

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WORLD BANK GROUP

Farmers of the 21st century must adopt 3 revenue streams

1

Environmental services

- Carbon sinks
- Set asides
- Biosecurity

2

Agriculture

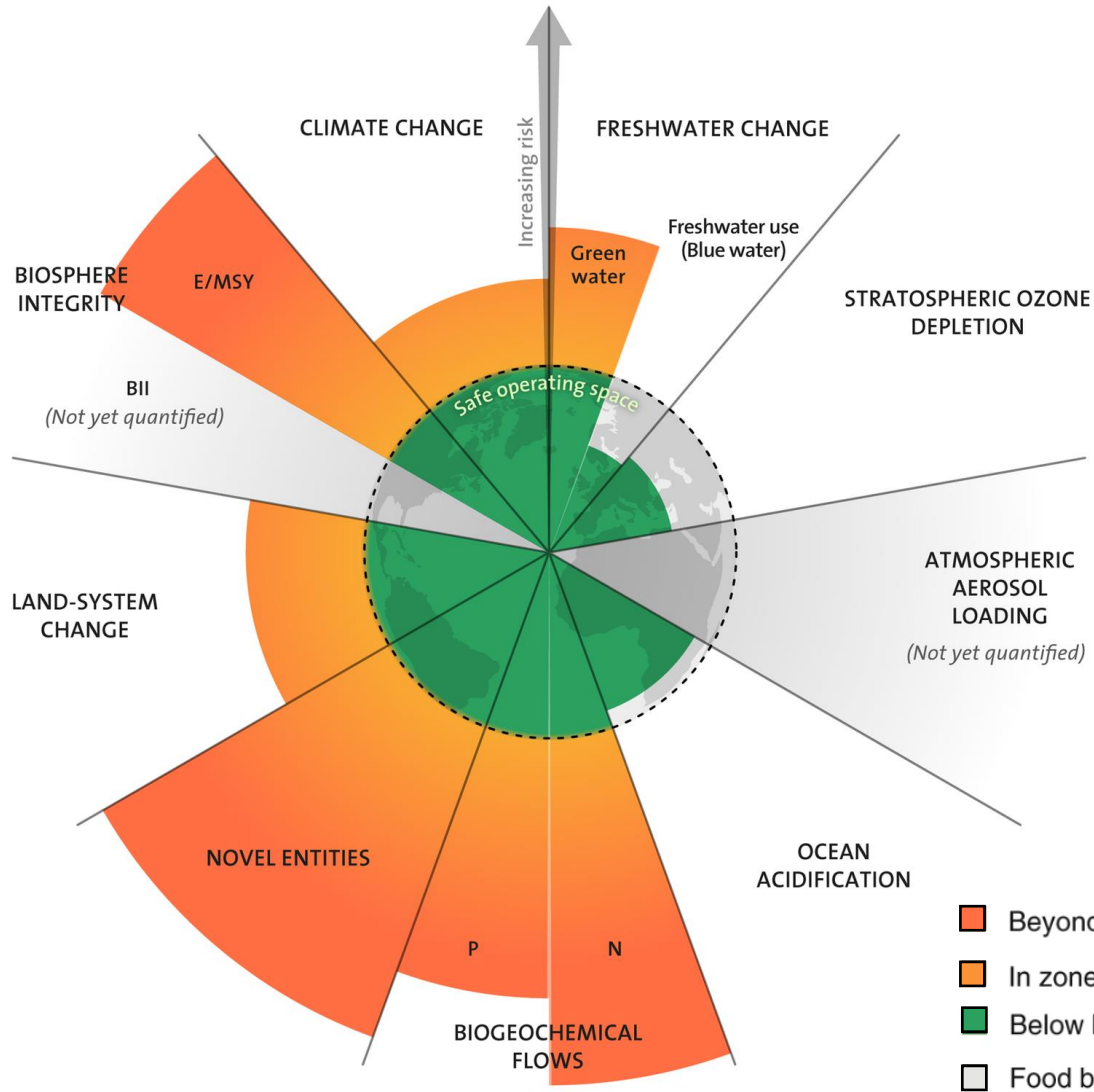
- Climate smart
- New foods
- Healthy diets

3

Renewables

- Energy
- Irrigation
- Recycling

We are abusing the planet...

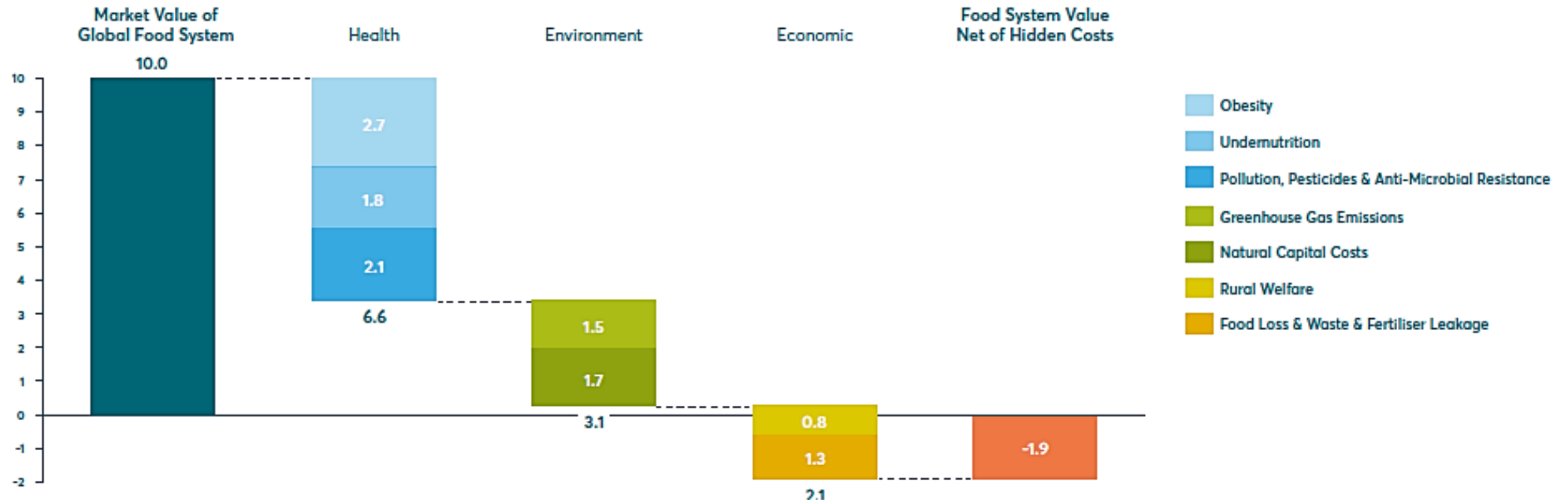


- **34%** GHG emissions from global food system (IPCC 2019)
- Majority of global working poor in agriculture (WB, 2016)
- **690 million** undernourished 2019 (FAO et al. 2020)
- **>10 million** lives lost annually due to unhealthy diets (GBD, 2019)

...and food systems are one of the offenders

Social costs outweigh market value of food systems

Trillions USD, 2018 prices



Unhealthy People...



828 million
hungry



2.3 billion
food insecure

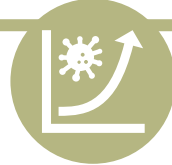


1 billion
obese or overweight

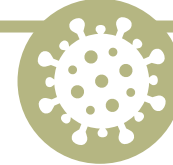
Cardio-vascular
disease
leading deaths



600 million
foodborne illnesses



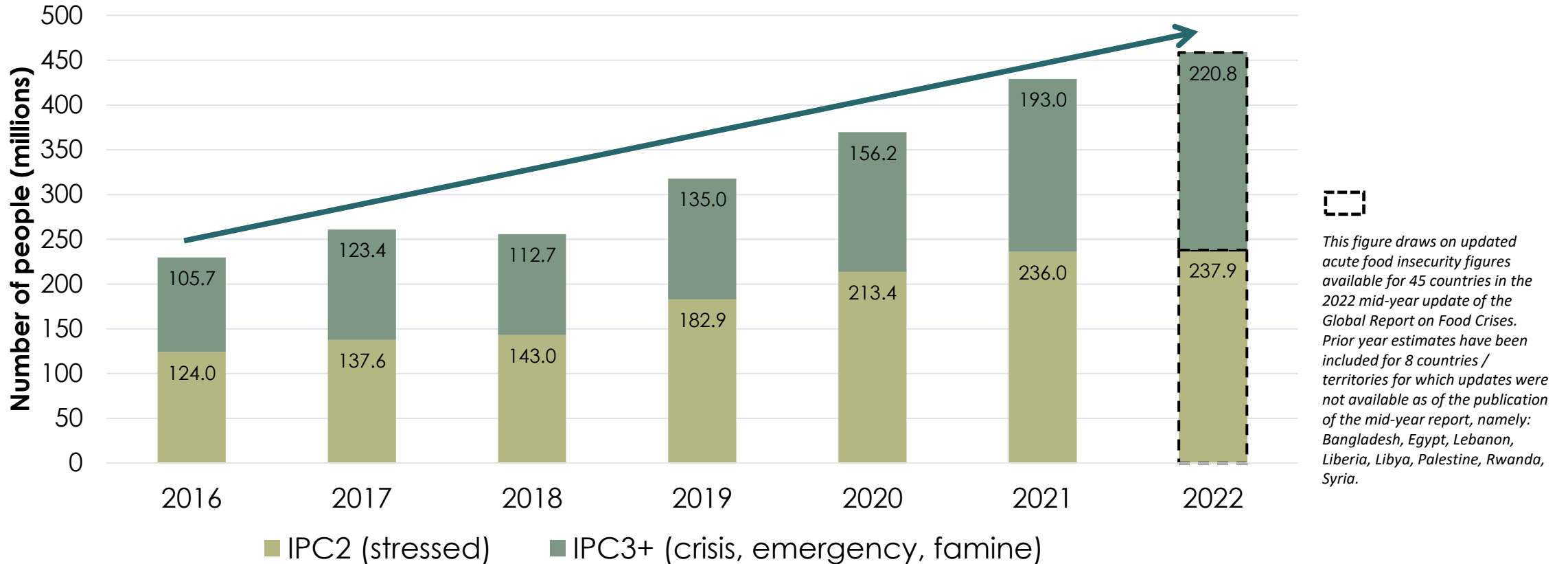
75% of emerging
infectious diseases
are zoonosis



Sources: FAO SOFI 2022, UN 2022, WHO 2022, IHME 2019, WHO 2015

Food insecurity reached new highs in 2022, and could worsen through 2027

Global acute food insecurity has reached new highs in 2022¹



¹ Adapted from the Global Network Against Food Crises. <http://www.fightfoodcrises.net/>.

² Andree, Bo Pieter Johannes. Machine Learning Guided Outlook of Global Food Insecurity Consistent with Macroeconomic Forecasts (English). Policy Research working paper; no. WPS 10202 Washington, D.C.: World Bank Group.

<http://documents.worldbank.org/curated/en/099224110112215850/IDU0e396273b08036047c8082f8086f52e55c9ac>.

Coinciding with a growing trend of overweight and obesity

Undernourishment, overweight and obesity, 2000-2016



Unhealthy Planet



34%
of greenhouse gas
emissions



Greatest cause
of biodiversity loss



Nitrification
of oceans



70%
of fresh-water use



80%
of deforestation

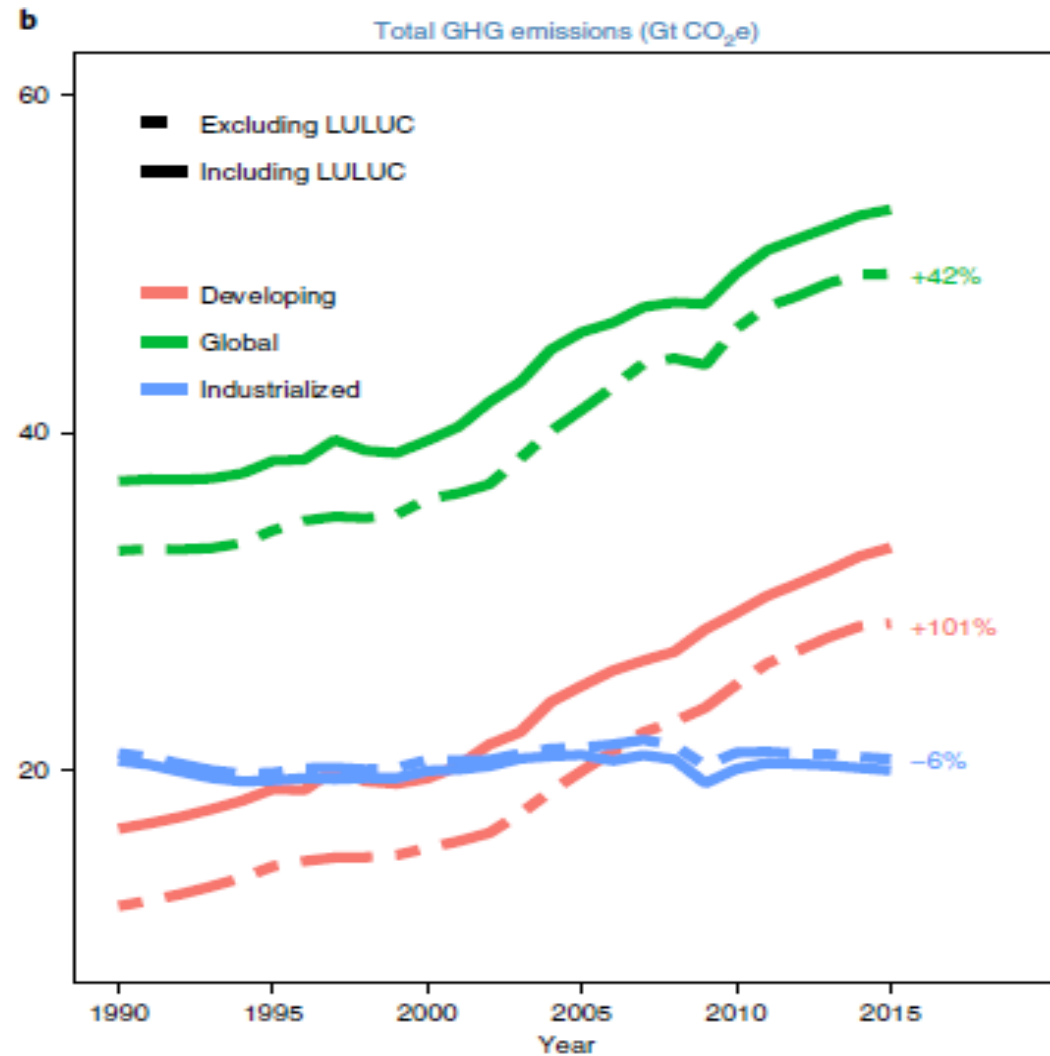


Oceans used as
landfills

Sources: UNCCD 2022

Agriculture is a main contributor of GHGs

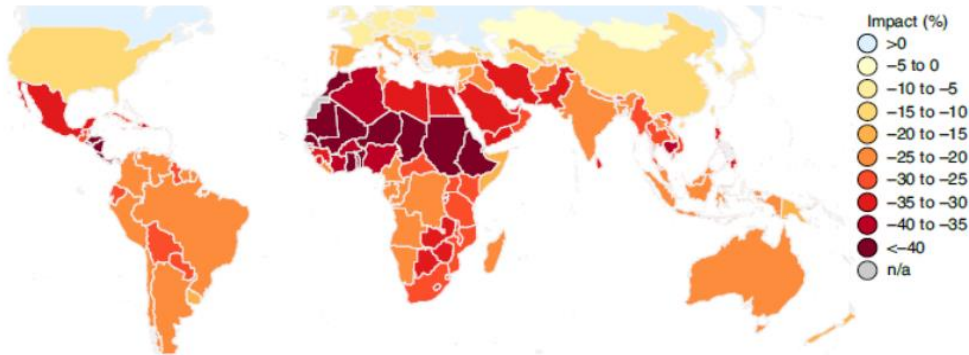
- Food systems generate **34%** of global emissions
- Agriculture is:
 - **#1** source of methane
 - **#1** source of biodiversity loss
 - User of **70%** of fresh water
 - If food waste were a country, it would be **3rd highest** emitter
- Emissions from agriculture are **increasing** in developing countries



And, enormously vulnerable

Climate change

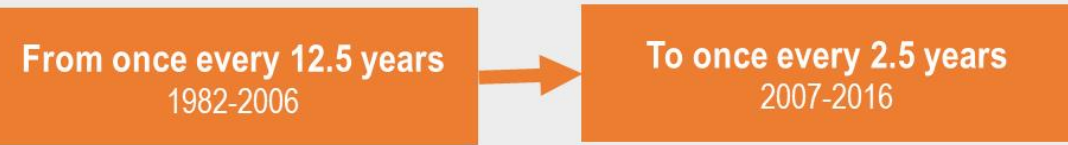
Estimated agricultural total factor productivity loss due to climate change since 1961



Source: Ortiz-Bobea et al. (2021) Anthropogenic climate change has slowed global agricultural productivity growth. *Nature Climate Change*. 11:306-312

The frequency of severe droughts and floods has increased

Climate-related per capita food production declines of greater than 2.5 percent per year in Sub-Saharan Africa has increased:



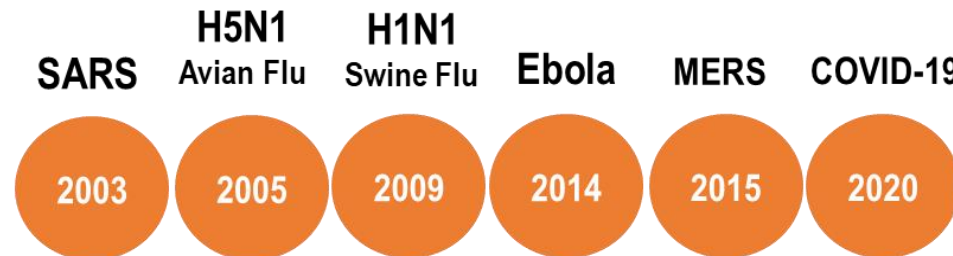
3.2 billion people live in agricultural areas experiencing high levels of water stress or high drought frequency

Source: FAO (2020) *State of Food and Agriculture*

Pest and diseases

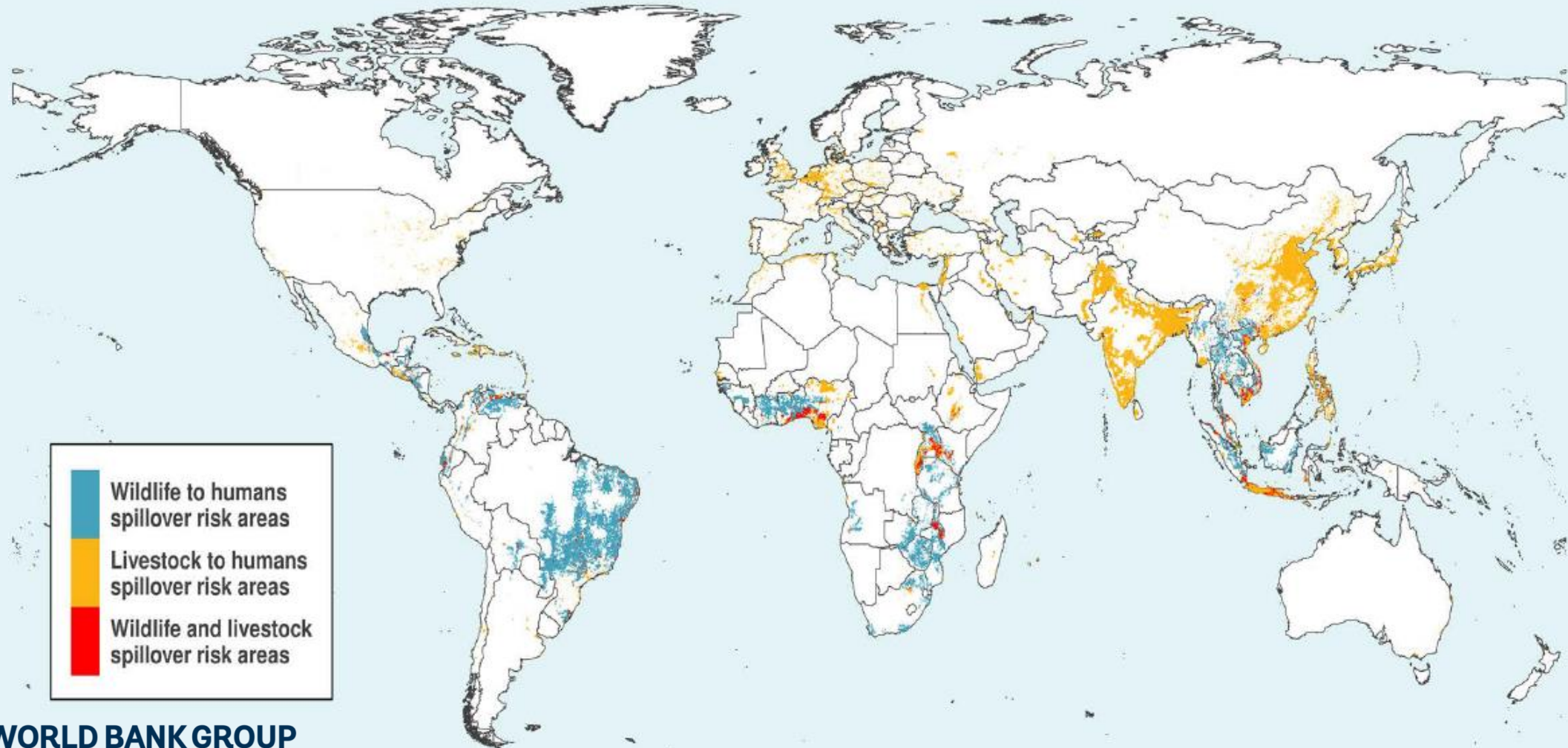


Zoonotic diseases: increased frequency and impact over past two decades



Infectious diseases and pandemics originate in farms and nearby wildlands

Map for active interfaces between wildlife, livestock and humans (hotspots of zoonotic diseases)



Unhealthy Economy



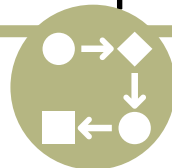
79%
of world's poor live
in rural areas

Poverty lines far
below the cost
of a healthy diet



Majority
of world's hungry
are farmers

Global supply chains
vulnerable
to disruptions



1/3
of all food produced
is lost or wasted

US\$690
billion/year
on farm subsidies

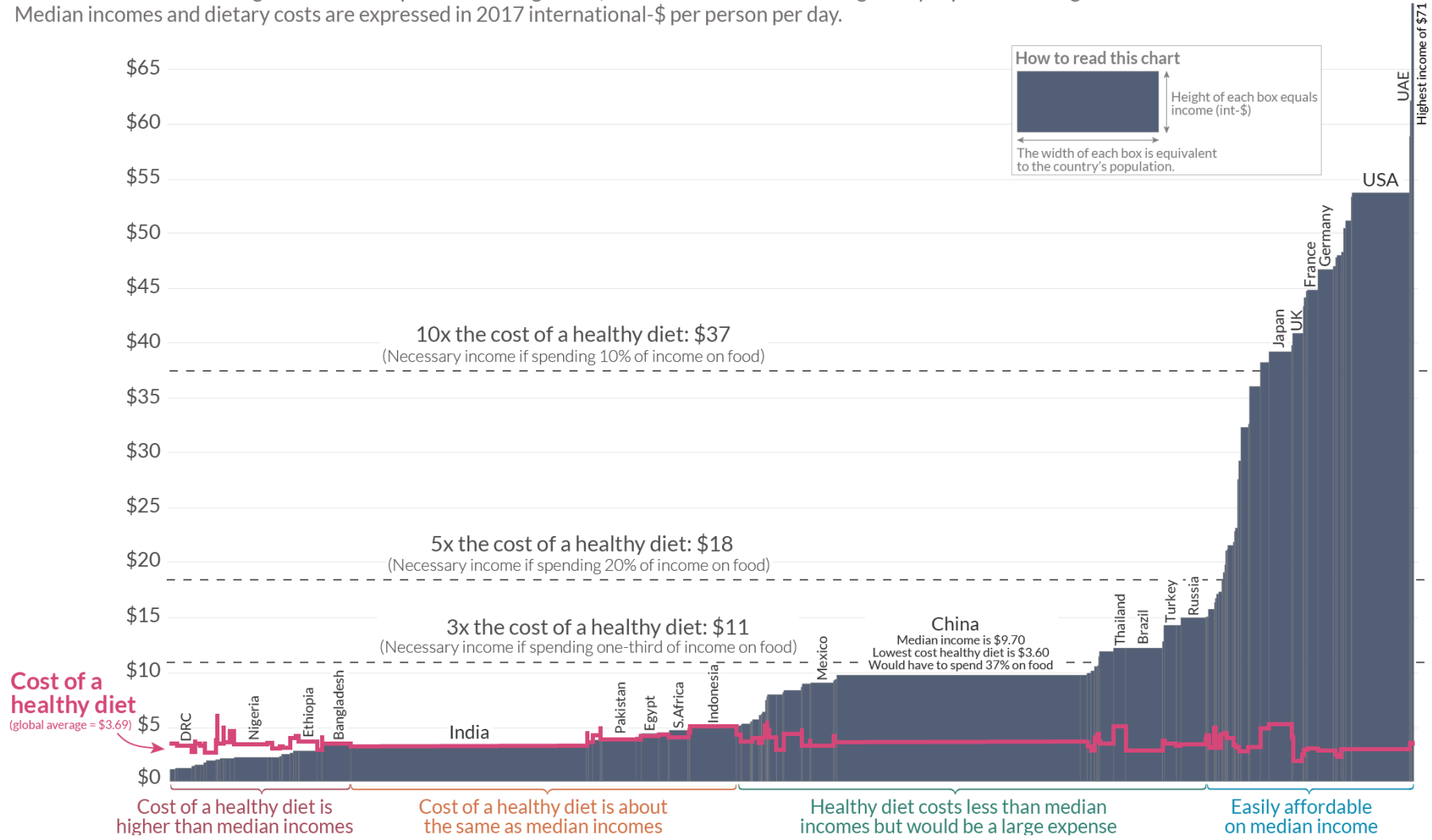


Sources: IFAD 2019, FAO 2021

Low incomes make healthy diets unaffordable

How does the cost of a healthy diet compare to daily median incomes?

The cost of a healthy diet is the lowest cost set of items that would meet requirements for food-based dietary guidelines. These come from national governments or public health agencies, and are defined based on regionally representative guidelines. Median incomes and dietary costs are expressed in 2017 international-\$ per person per day.



**Food is cheap
 (prices do not
 reflect hidden-
 costs)
 and non-
 affordable**



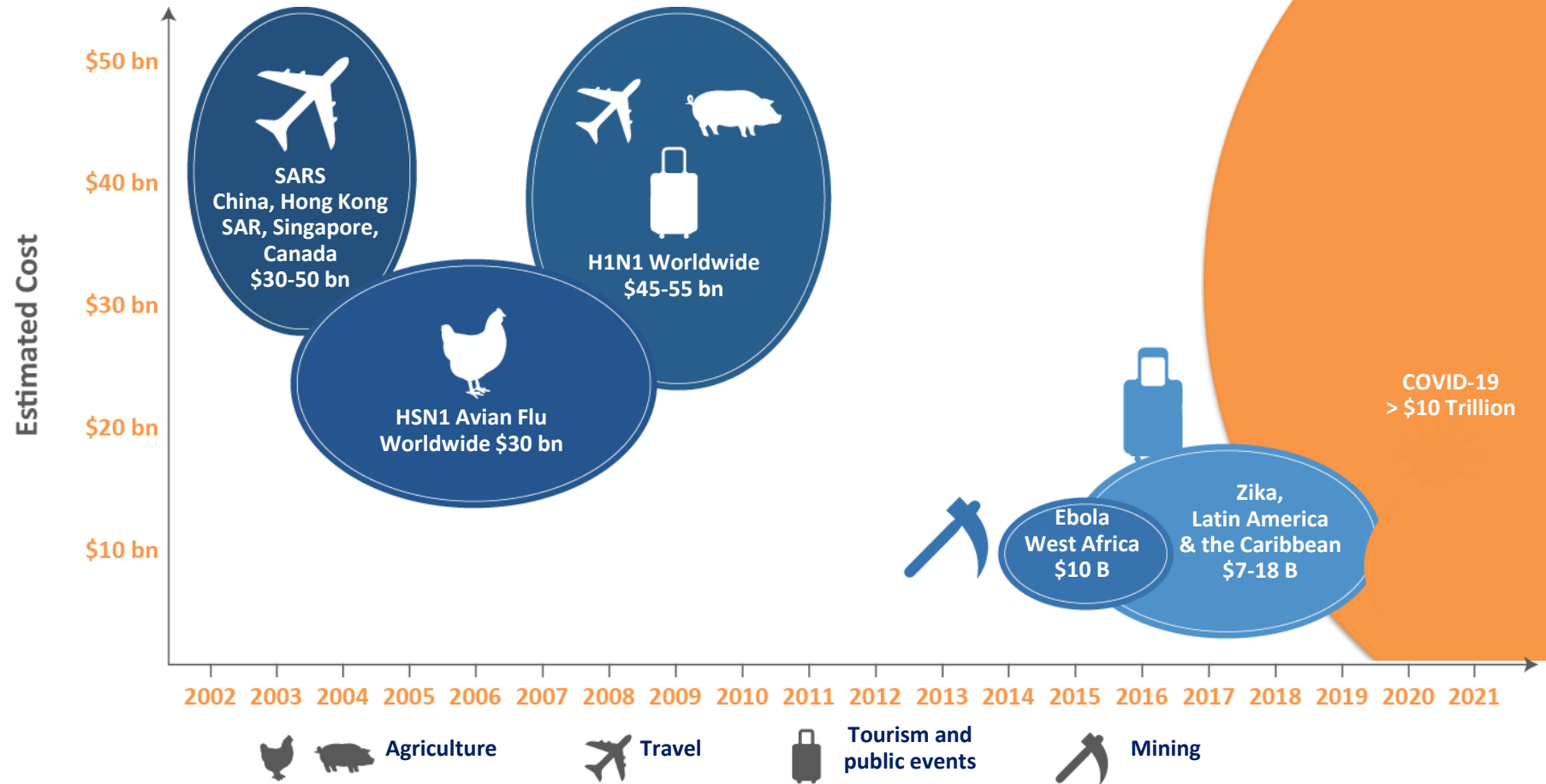
Source: Herforth et al. (2020). Cost and affordability of healthy diets across and within countries. Background study for UN FAO. World BANK (PovcalNet) 2-17 data

Disease brewed through food systems can create havoc in the global economy

The global economy contracted by **4.3% in 2020** due to COVID-19, or about **\$3.6 trillion** worth of goods, services and other output lost.

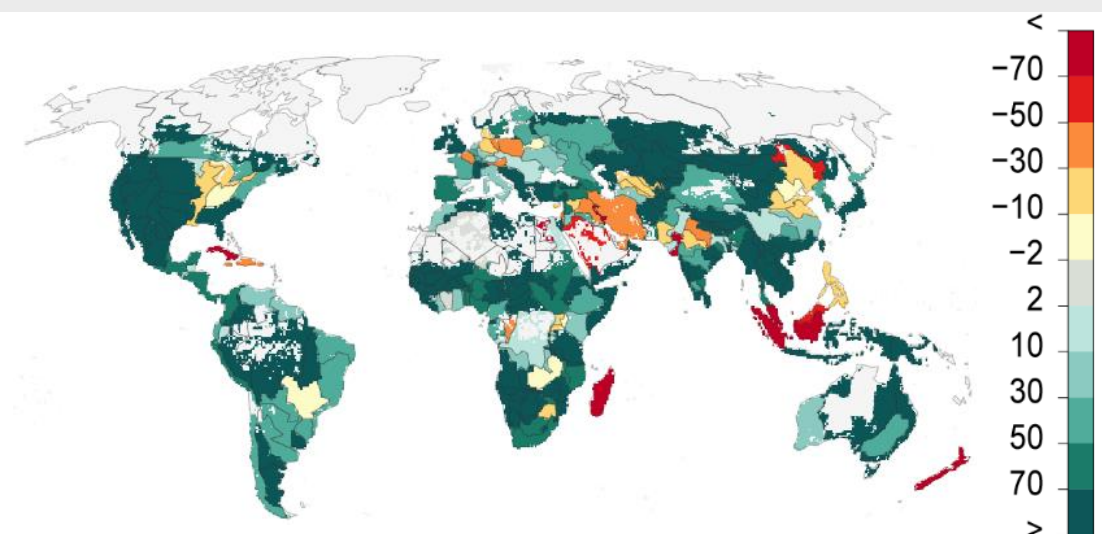
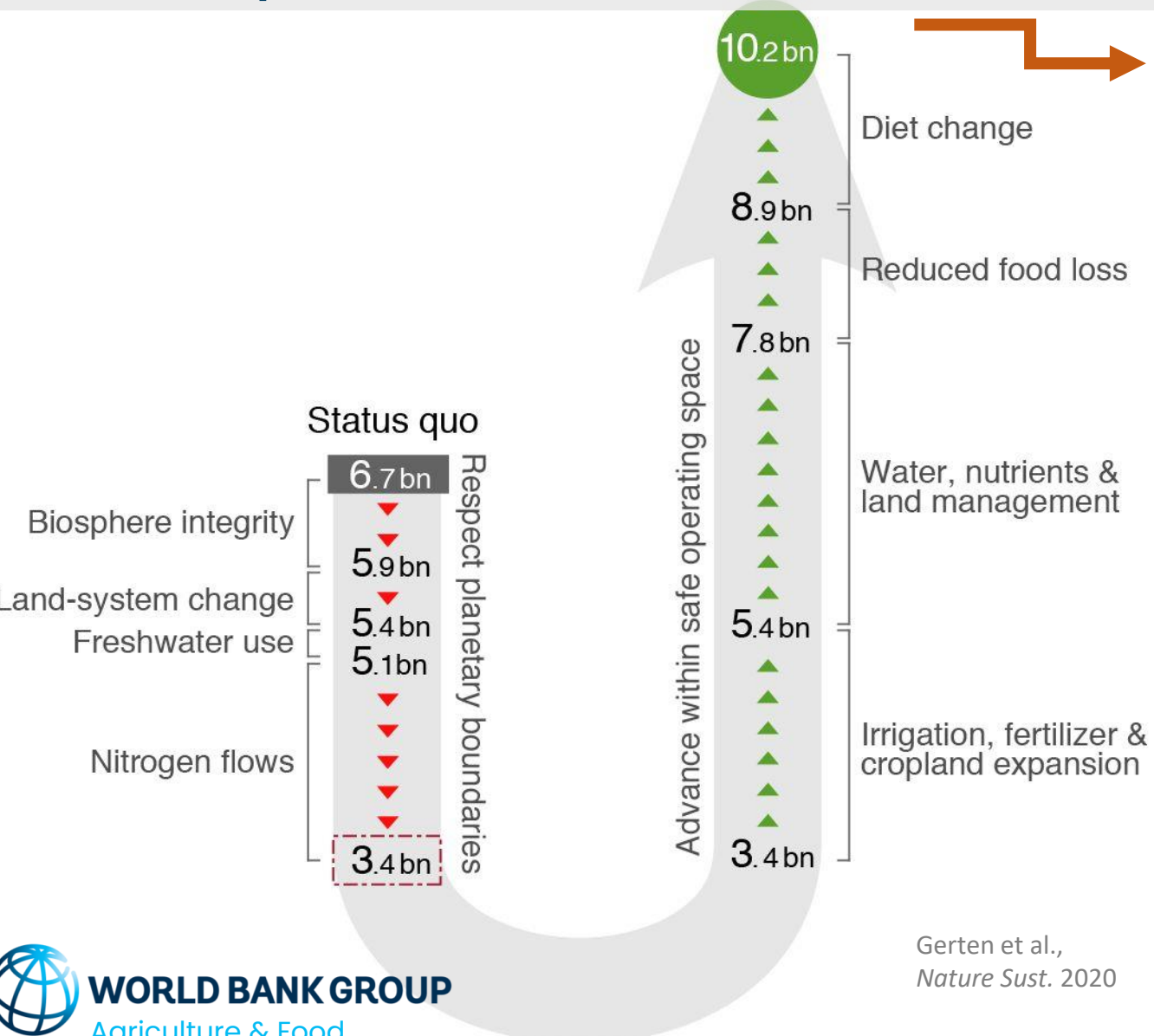
Projected cumulative output loss due to the pandemic (2020 to 2025) ~ \$22 Trillion.

This does not include the different ways people suffered the downturn through death, illness, loss of livelihood or disruption of schooling, for example.



Source: Adapted from the World Bank Operational Framework For One Health, 2018

But feeding 10 billion people within planetary boundaries is possible... **climate smart and nutrition smart**



% increase in kcal supply (above today) through sustainable transformations

- Half of current food production depends on planetary boundary transgressions
- A **u-turn** towards sustainable food production and consumption would enable enough food for ~10 bn people – within the boundaries
- However this requires radical co-transformations across sectors

Gerten et al.,
Nature Sust. 2020

Farmers of the 21st century...

... need to be resilient and climate smart through 3 revenue streams:

1 FIRST REVENUE STREAM

• Payment for Environmental Services

- Carbon sinks – forests, soils
- Biodiversity set-asides
- Pollutant recycling
- Biosecurity

2 SECOND REVENUE STREAM

• More healthy Food from More Productivity

- Climate smart agriculture
- Diet oriented production – vegetables and proteins versus carbs and fats
- Less food loss and waste
- Better market access from remote areas
- Buffering global supply disruptions

3 THIRD REVENUE STREAM

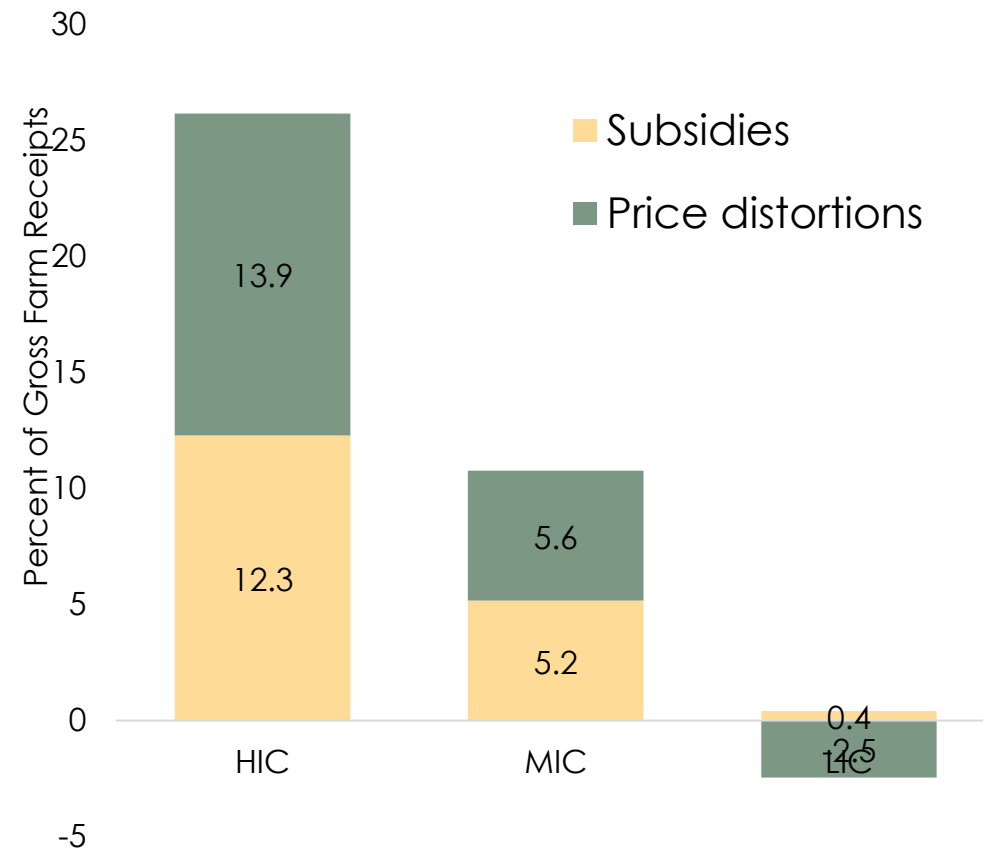
• Renewables and sustainability

- Renewable energy for own use and grid – solar, wind, micro-hydro
- Nutrient recycling – composting, organic matter recovery, efficient chemicals
- Irrigation – water productivity, lower withdrawals

First, incentives need to be realigned in support of climate smart and nutrition smart outcomes

- **\$568 billion** per year supports agricultural producers in 79 countries
- **65%** of support distorts producer incentives (market price support, input and output subsidies)
- Large protection by high-income countries, continued net taxation by low-income countries
- Agriculture and food sector is lagging adoption of ESG standards

Agricultural Producer Support as Share of Gross Farm Receipts (Percent, 2016-18)



HIC = High income countries,
MIC = Middle income countries,
LIC = Low-income countries

Second, financing: Five financing imperatives

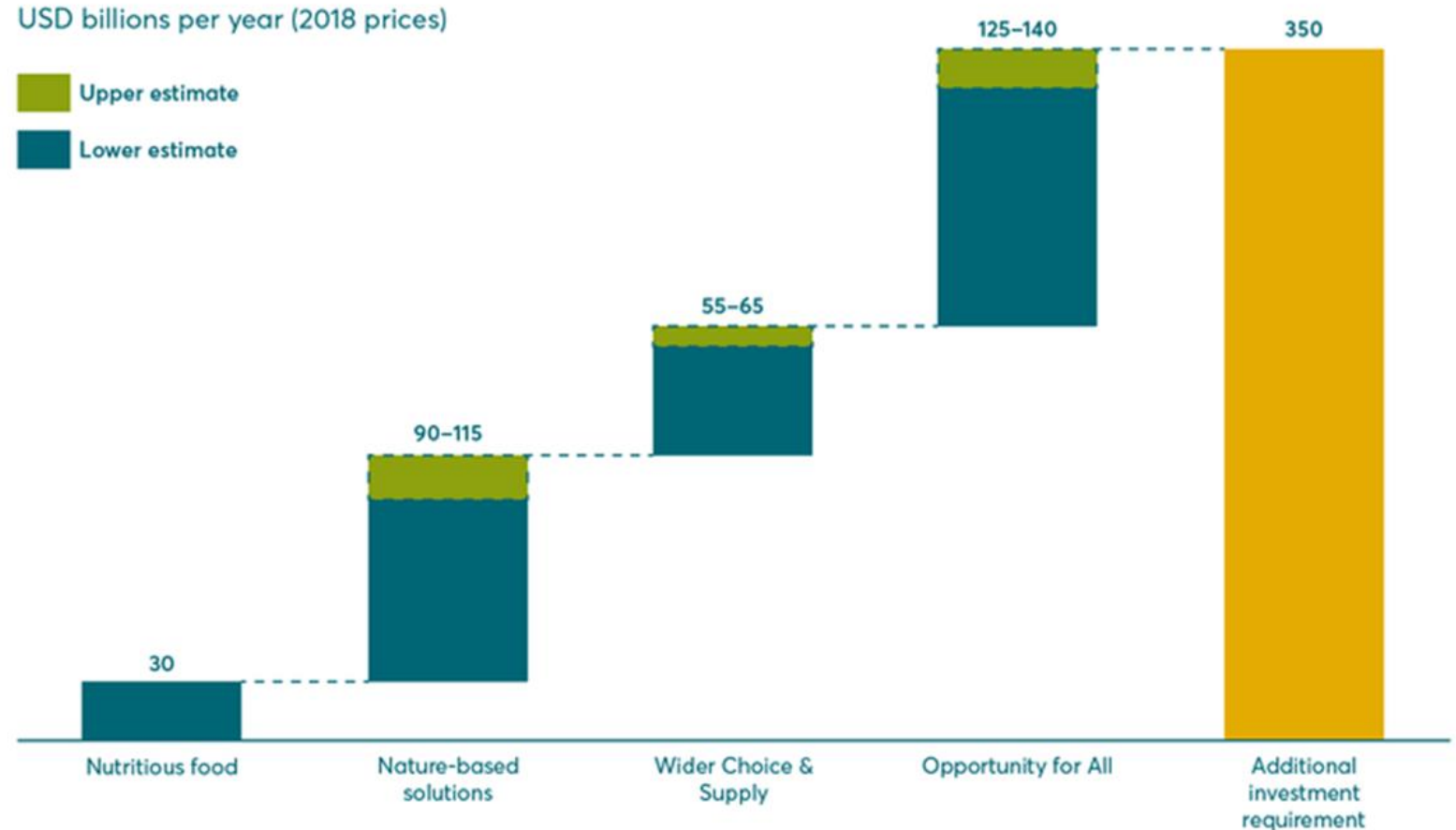
1. Reshape public support and incentives
2. Integrate health, environmental and social risks into financial decision-making
3. Scale fit-for-purpose financial products and business models
4. Secure equitable food systems
5. Strengthen food governance and stability

FOOD FINANCE ARCHITECTURE HELPS OPTIMISE PUBLIC CAPITAL AND MOBILISE PRIVATE CAPITAL THROUGH FIVE CORE IMPERATIVE



How much would need to be invested?

- The additional annual investment requirements associated with the ten critical transitions are between **\$300 and \$350 billion** (2018-2030)
- This is less than **0.5% of GDP**, a **return ratio of more than 15:1** based on the economic prize.



The case for action: policies are at country level, but international coordination is vital for global success

Climate change and environmental sustainability are global challenges

- Global concerted action needed to build momentum
- Need to think global, **BUT** policies are national – need to act local

Options need careful evaluation of impacts in each context

- Understand the problem: scale, nature and impact of policies and support
- Identify feasible options to repurpose and associated tradeoffs

Even the best-designed policy reforms face political hurdles

- **Delicate balancing act:** careful political economy analysis
- Dialogue with key stakeholders for feasible strategies for smart repurposing



Thank you

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