FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

Climate Change and Variability: What are the Risks for Nutrition, Diets and Food Systems?

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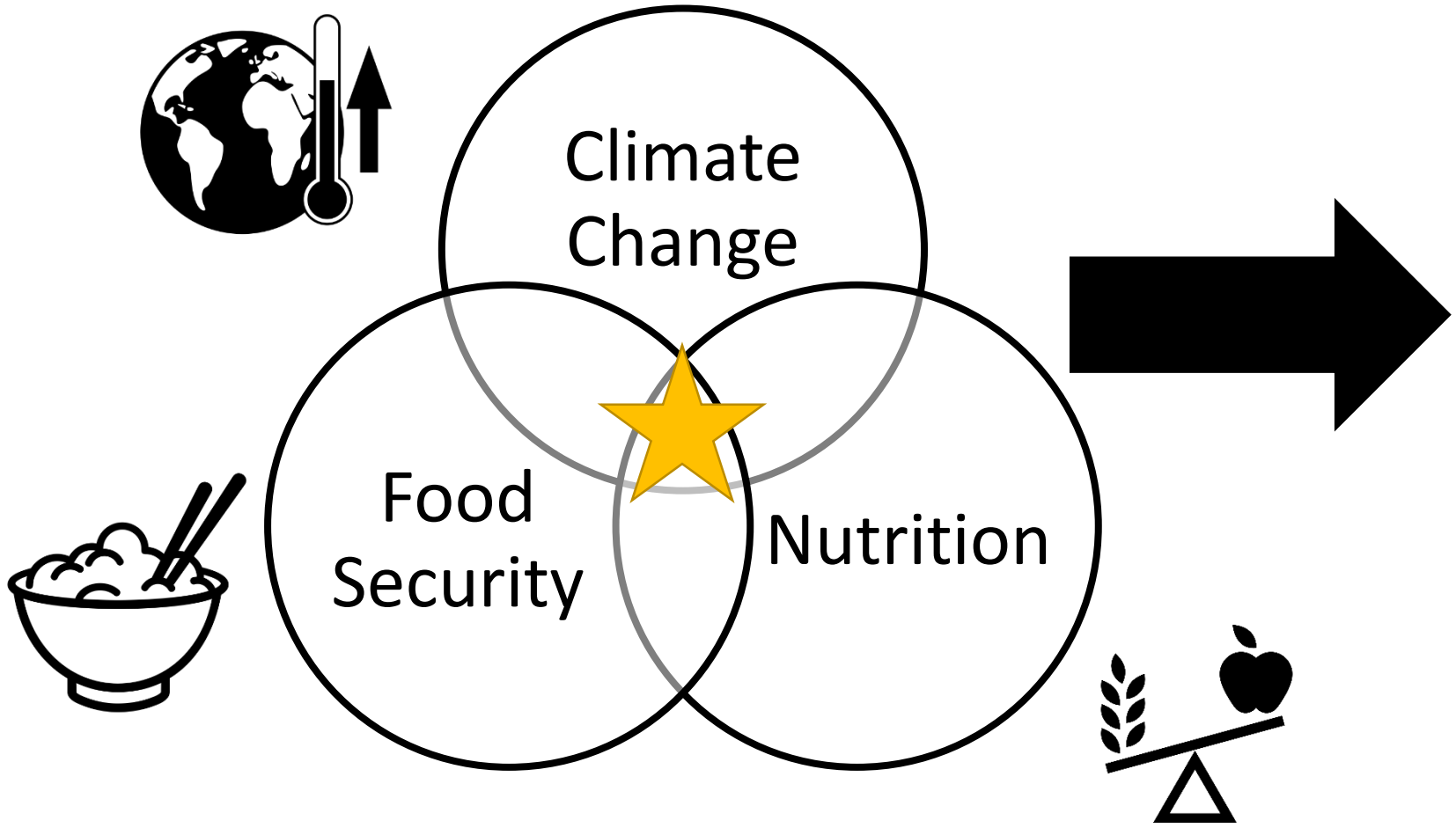
USAID
FROM THE AMERICAN PEOPLE

CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security
CCAFS

IFPRI
INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

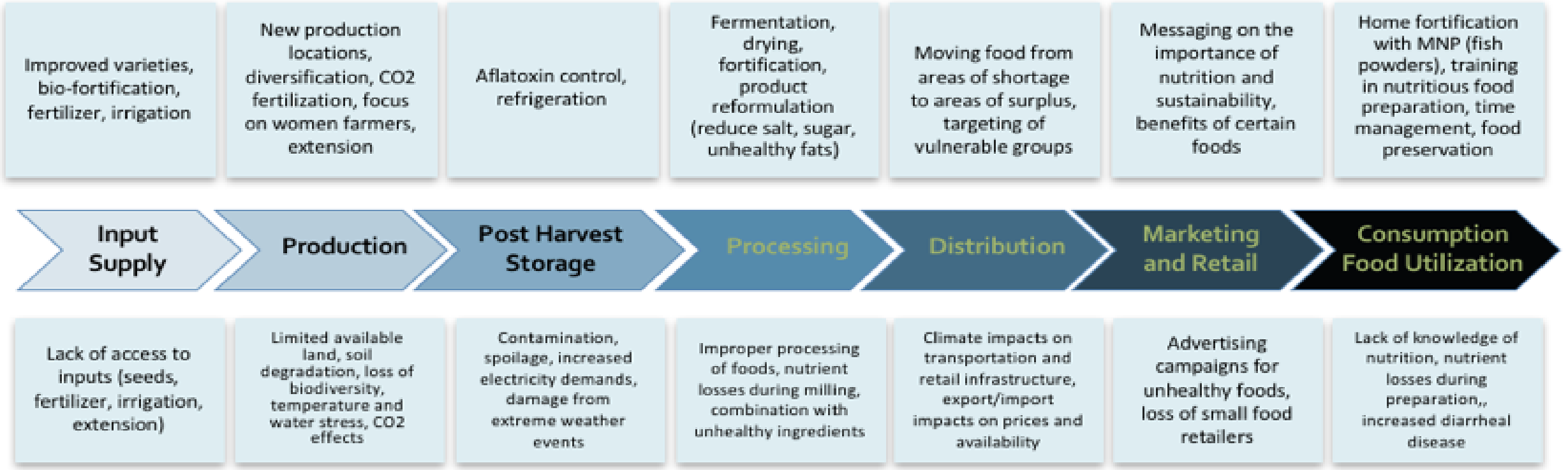
Aims



Recommend Effective Interventions
To Ensure Access to Sufficient Nutritious Food

Conceptual Framework

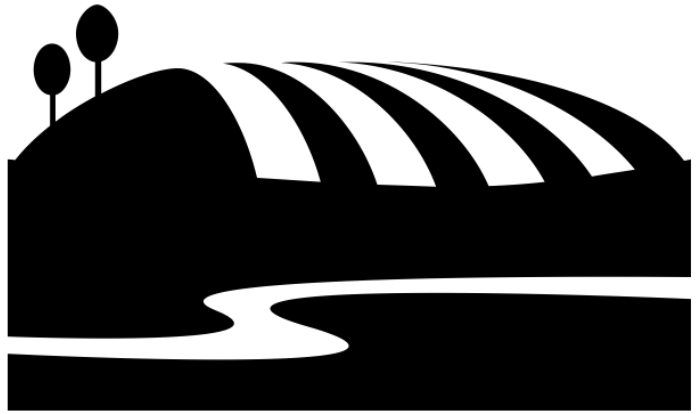
Maximize nutrition **"entering"** the food value chain



Minimize nutrition **"exiting"** the value chain

Vulnerability from Climate Change

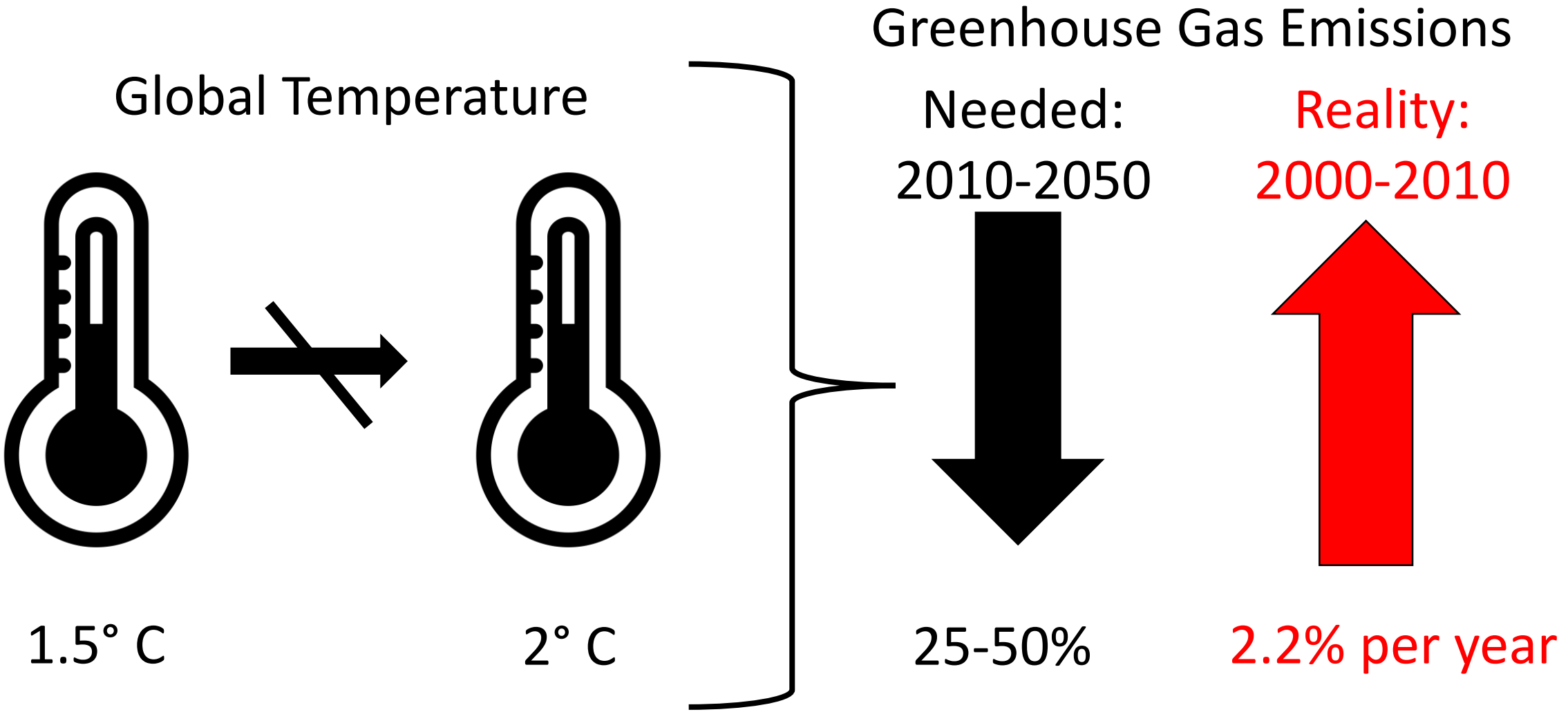
Global South =
Most vulnerable
to effects of climate change



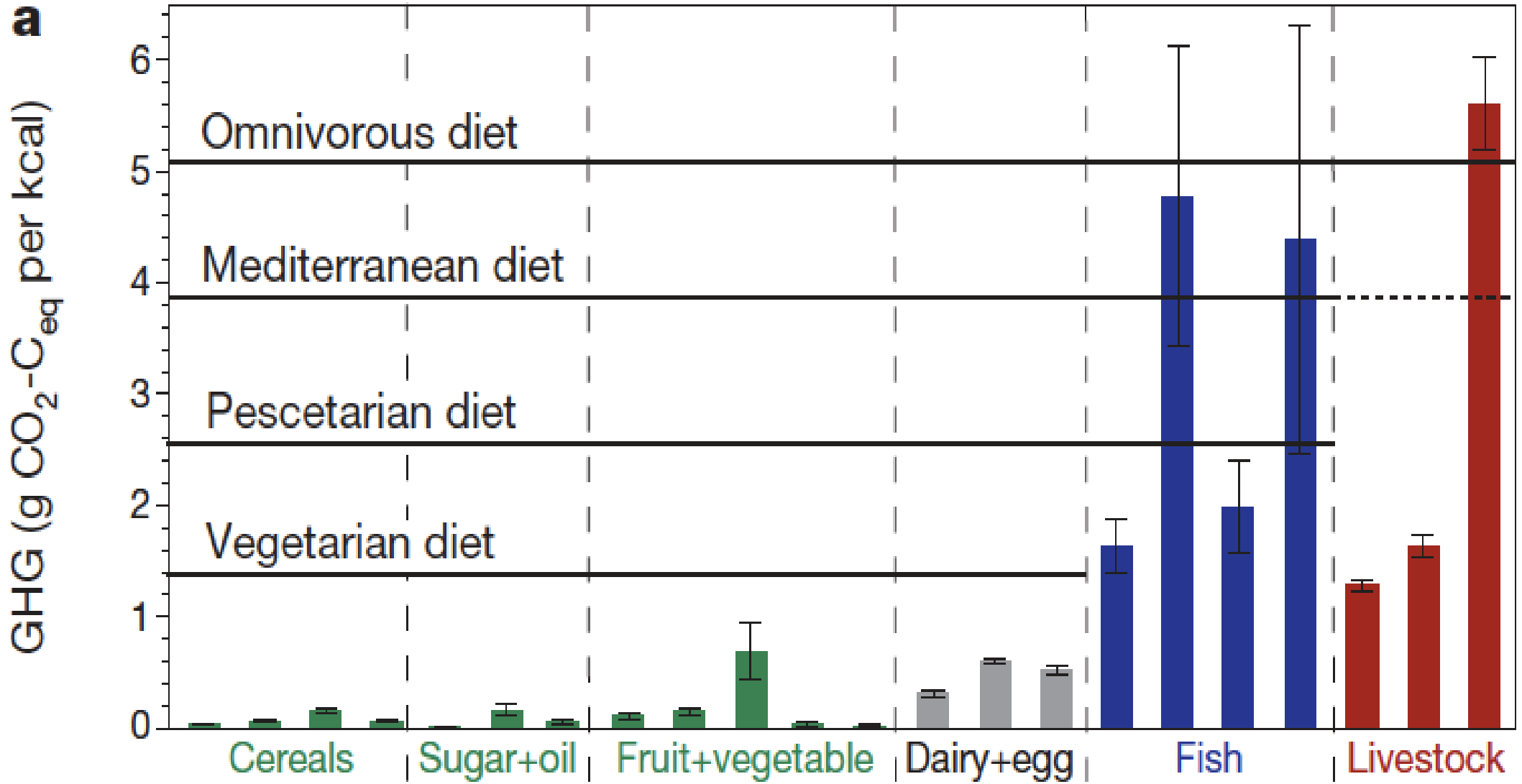
Rural poor =
Least able
to adapt


WE NEED….
Climate-smart & nutrition-sensitive food system

Climate Change and Variability:

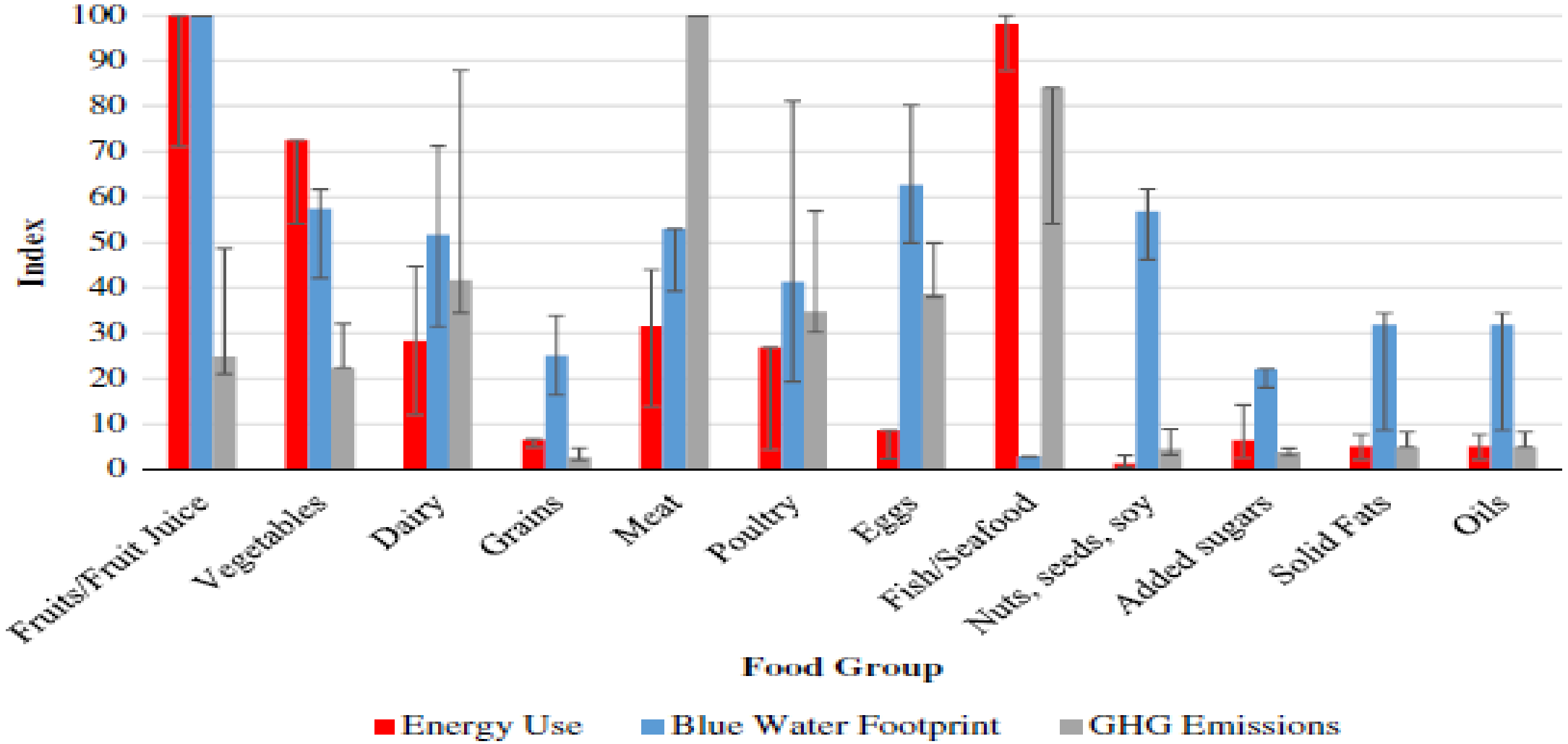


Greenhouse Gas Emissions of Different Diet Types



- Tilman and Clark 2014

Energy, Water, and Greenhouse Gas Emissions for Different Food Groups

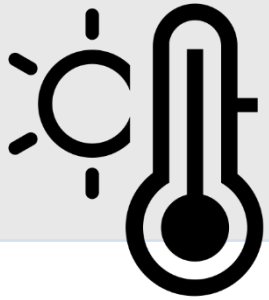


- Tom et al. 2015

Climate Change and Human Health

Direct

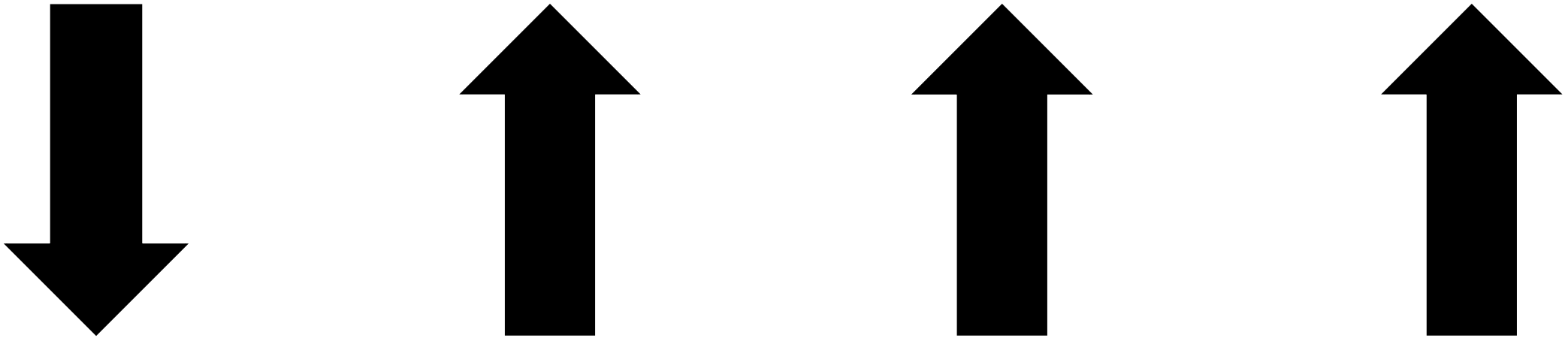
- Extreme weather events



Indirect

- Water & food
- Healthcare
- Incomes

Effects of Climate Change



Food & Water Availability

Malnutrition

Infectious Disease

Air Pollution

CC caused 160,000 deaths in 2000

Additional 250,000 deaths likely each year between 2030 - 2050

- WHO 2016

Climate Change and Nutrition

How CC Exacerbates Undernutrition: Major Pathways		
Household food security	Child feeding and care practices	Environmental health and access to health services

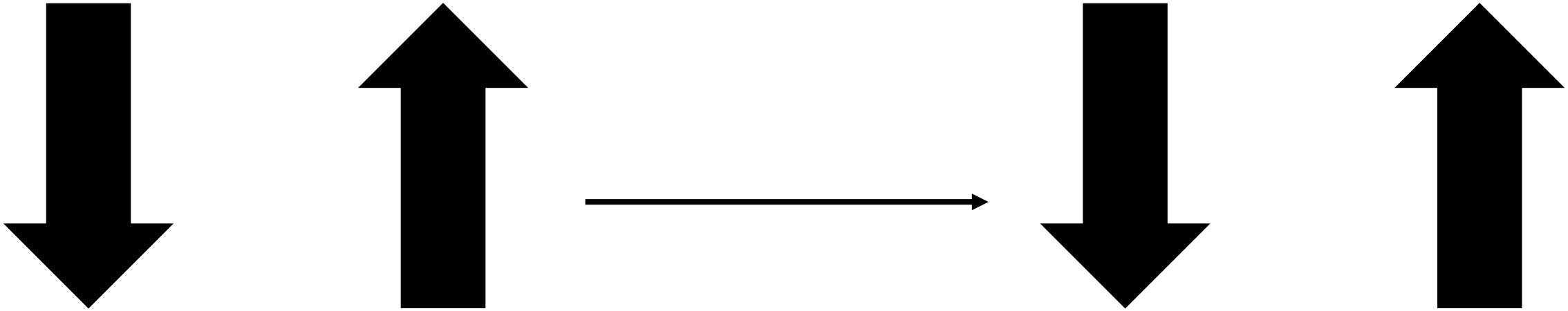
Climate Change and Nutrition

- Seasonal variation in food availability → hunger seasons
- Areas with highly variable rainfall that rely on rain-fed agriculture

Food Intake

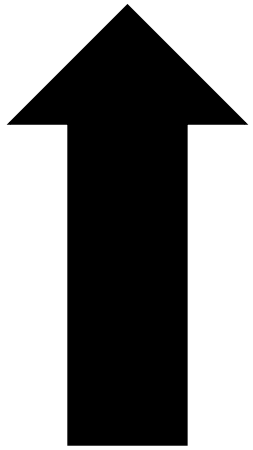
Malnutrition

Mothers and Children

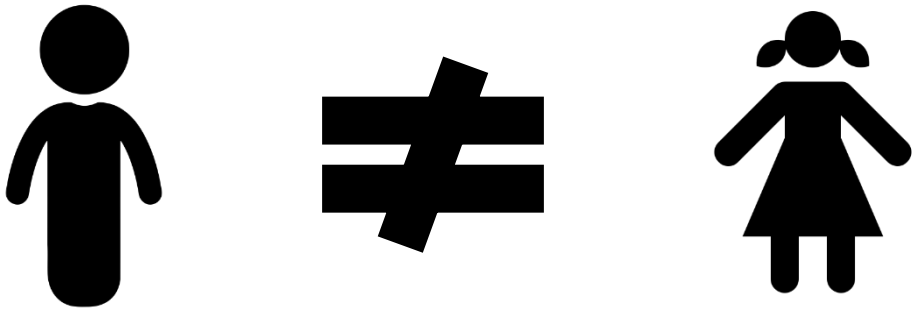


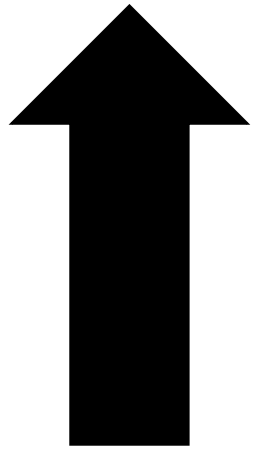
Children

By 2050:
An additional
4.8 million
undernourished children
under five years old



Wasting



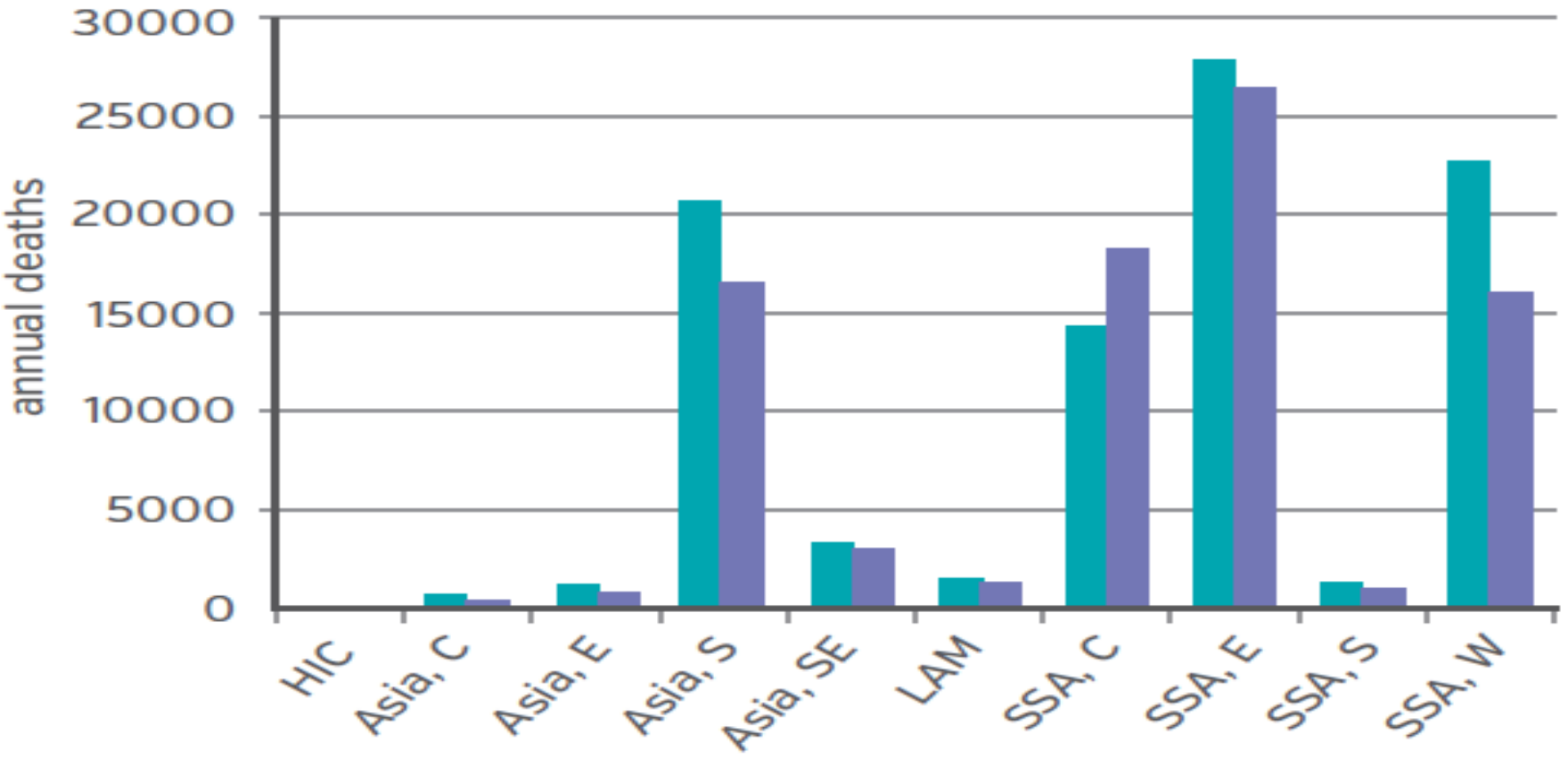


Stunting

	No. of undernourished children under age 5, in millions			
		2050		Additional no. of children undernourished because of climate change 2010-2050
Region	2010, base climate	Without climate change	With climate change	
Sub-Saharan Africa	40.9	37.0	39.3	2.4
South Asia	77.1	50.4	51.9	1.4
East Asia/Pacific	21.9	7.8	8.2	0.4
Latin America & Caribbean	4.3	1.5	1.8	0.3
Middle East/North Africa	4.0	1.7	1.9	0.2
Europe and FSU (former Soviet Union)	1.8	1.5	1.6	0.1
WORLD	150.0	99.9	104.8	4.8

Number (in millions) of undernourished children under age 5 years in 2000 and 2050 from extended results of the IMPACT model published in the Global Food Policy Report February 2017

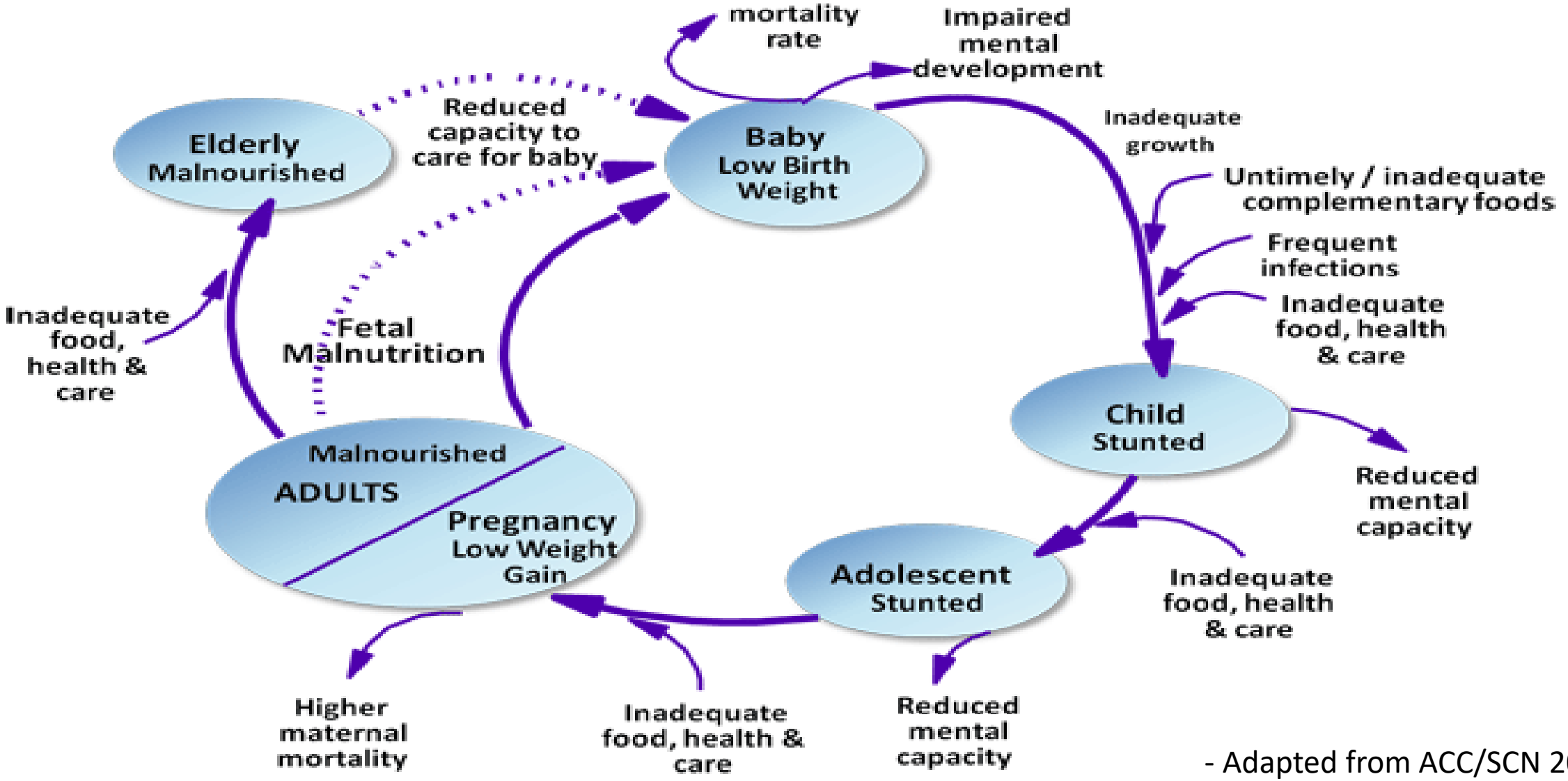
Undernutrition mortality of children under five years of age due to climate change



Estimated future mortality due to climate change in 2030 (light blue bars) and 2050 (purple bars)

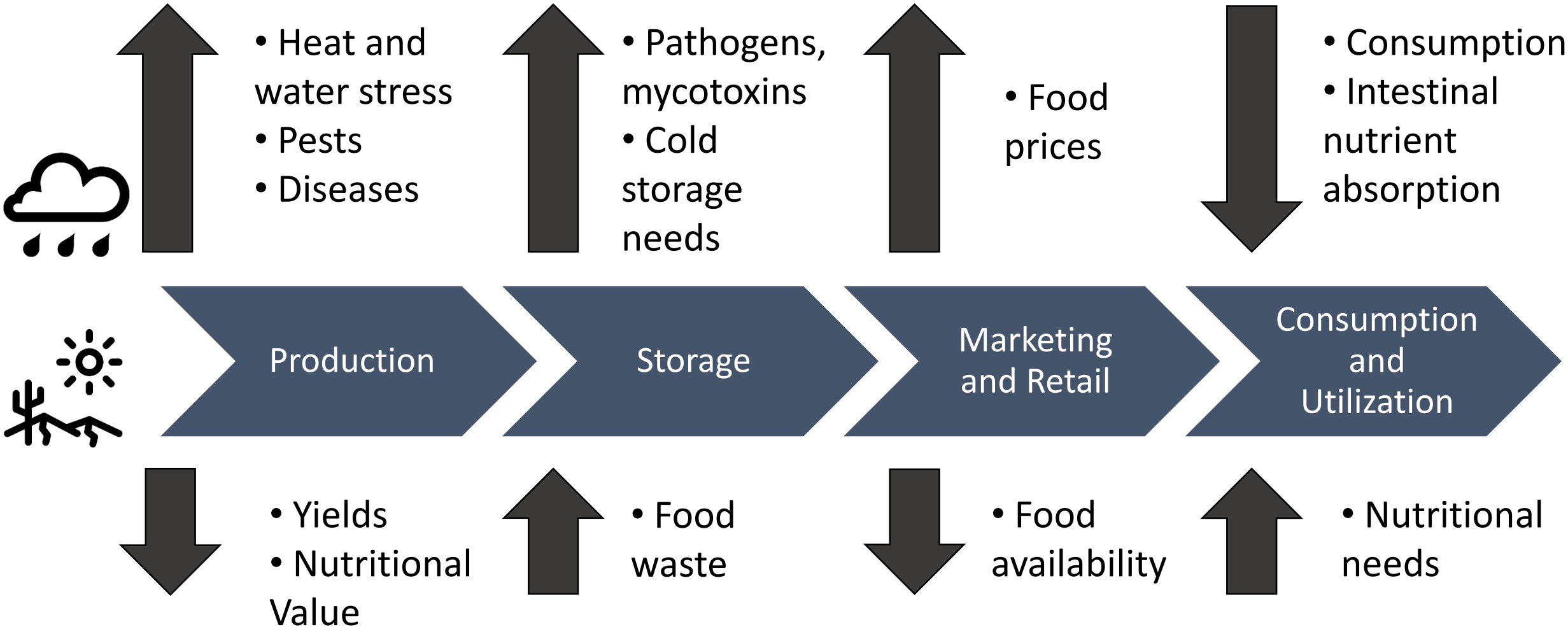
-WHO 2015

Undernutrition throughout the Life Cycle

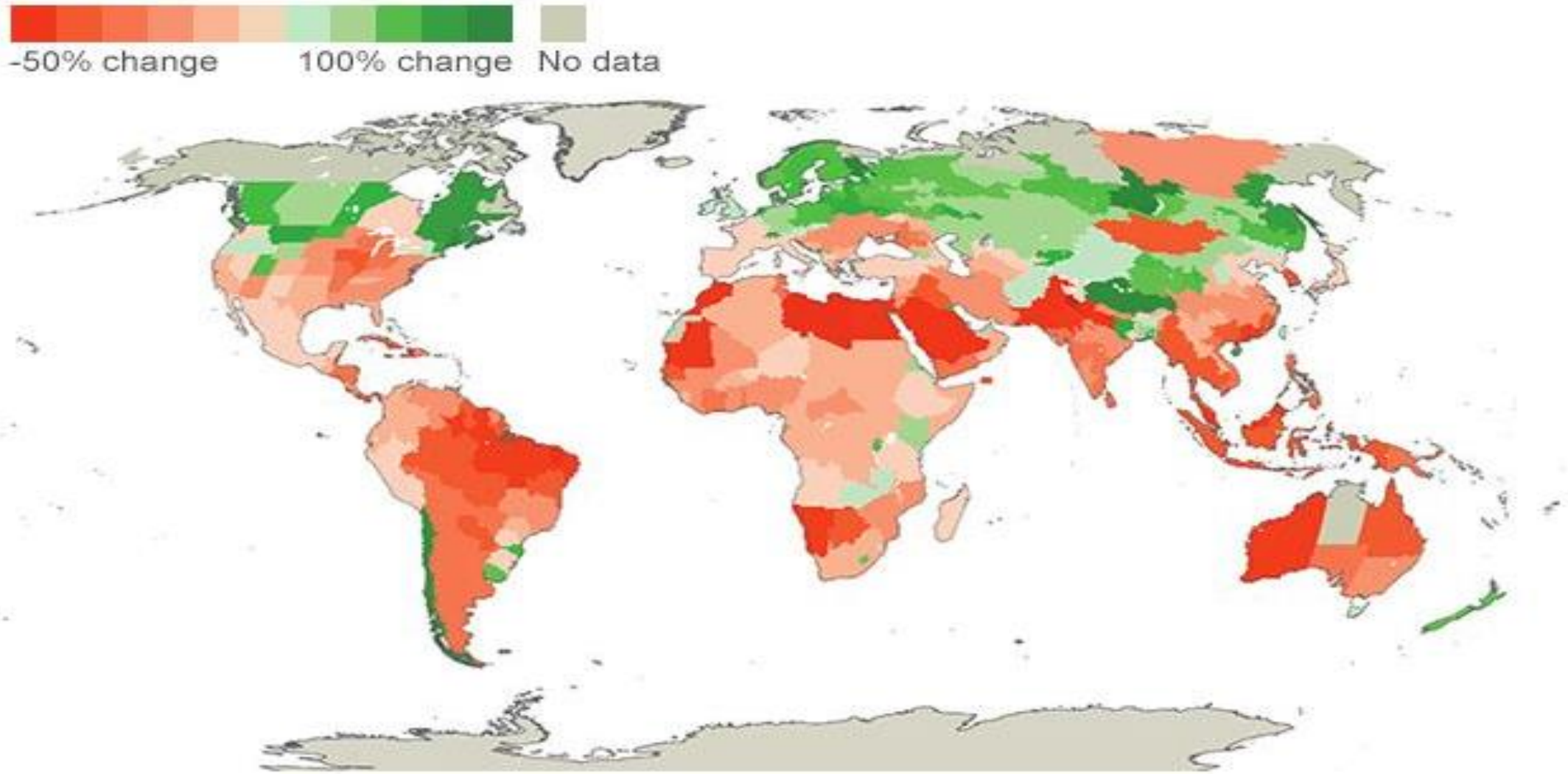


- Adapted from ACC/SCN 2000

Disruptions to Food System, Food Environments and Diets



Estimated impact of +3 degrees C change on crop yields by 2050



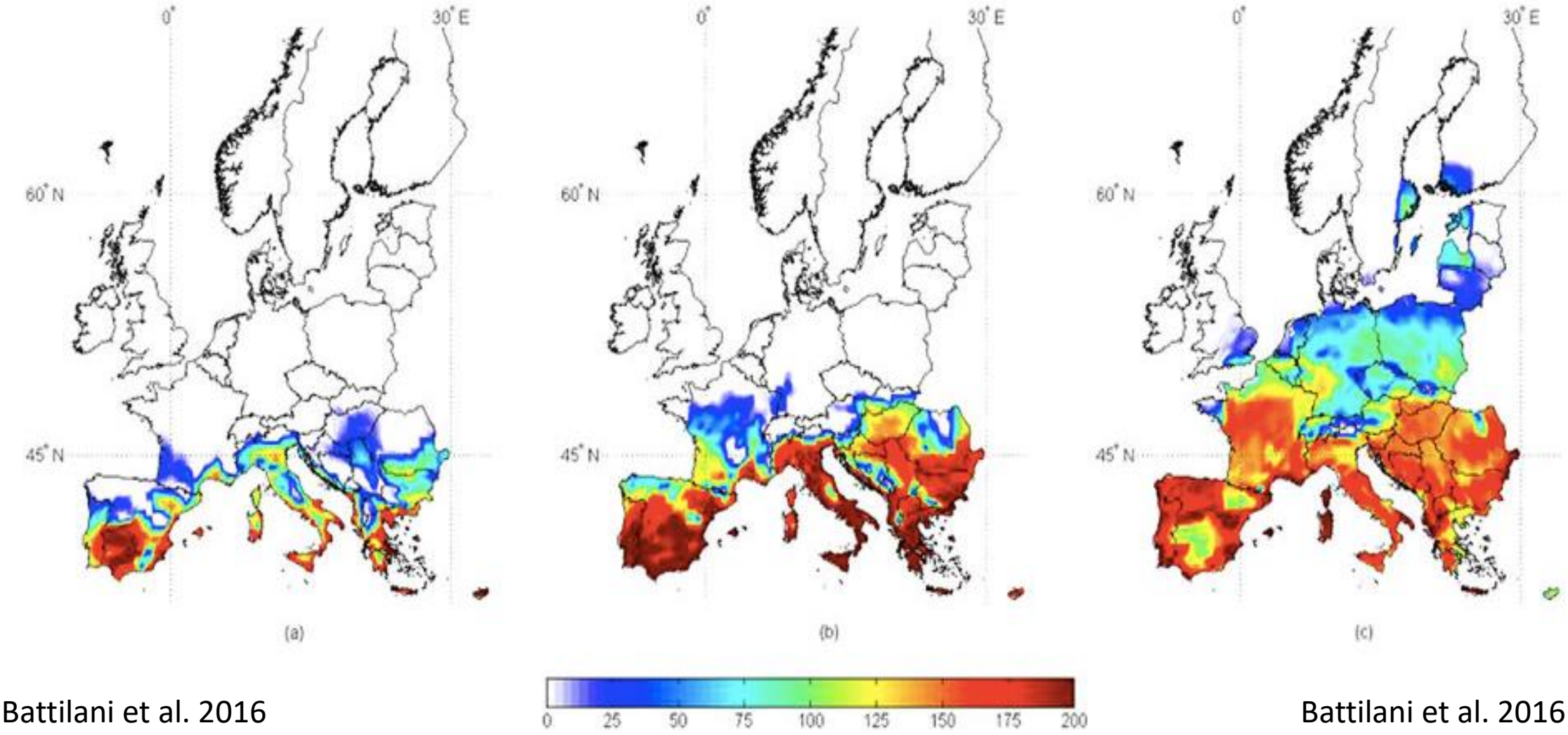
- Ranganathan 2016

Increased aflatoxin with climate change in maize

NOW

+ 2 DEGREES C

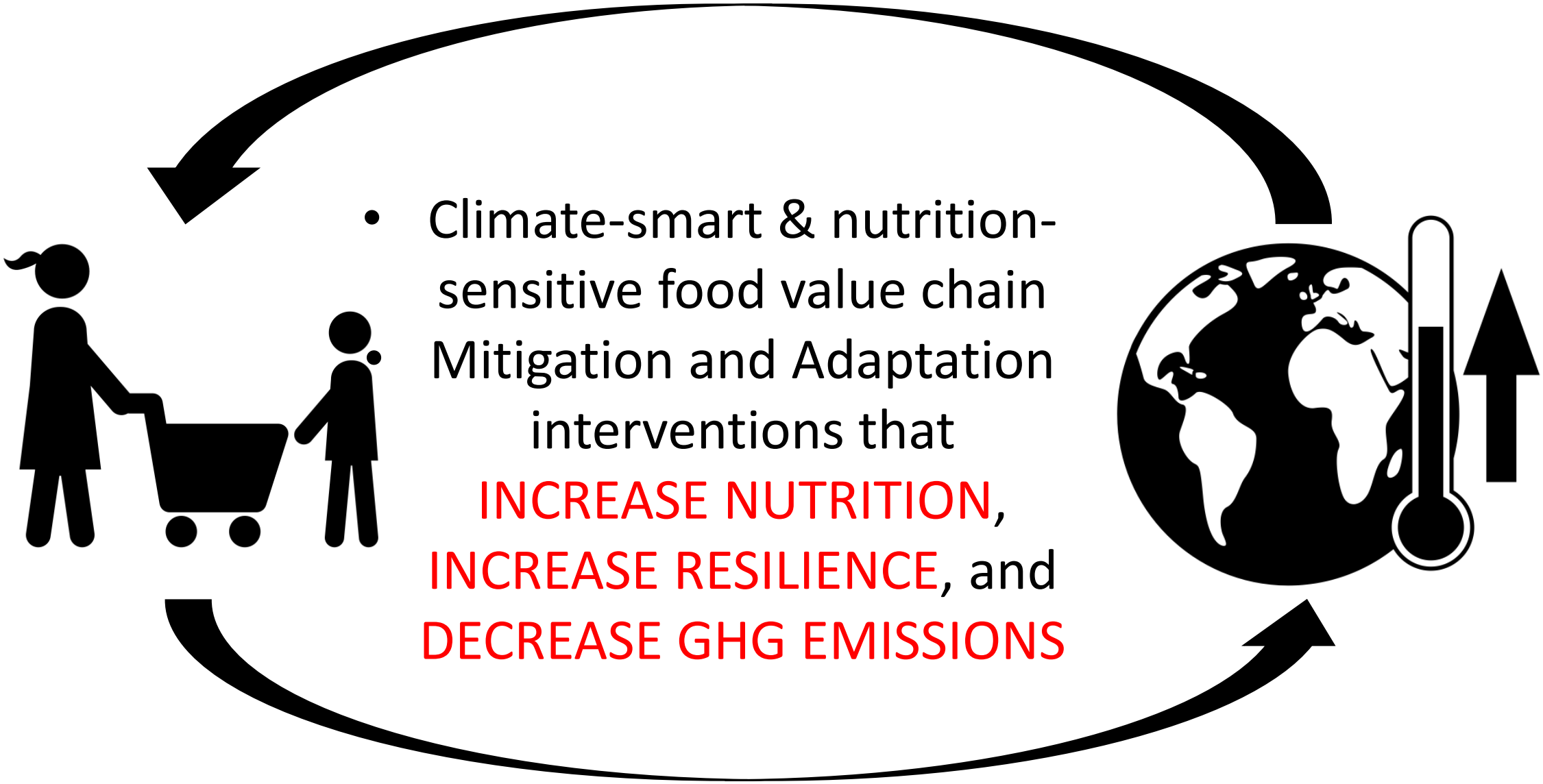
+ 5 DEGREES C



- Battilani et al. 2016

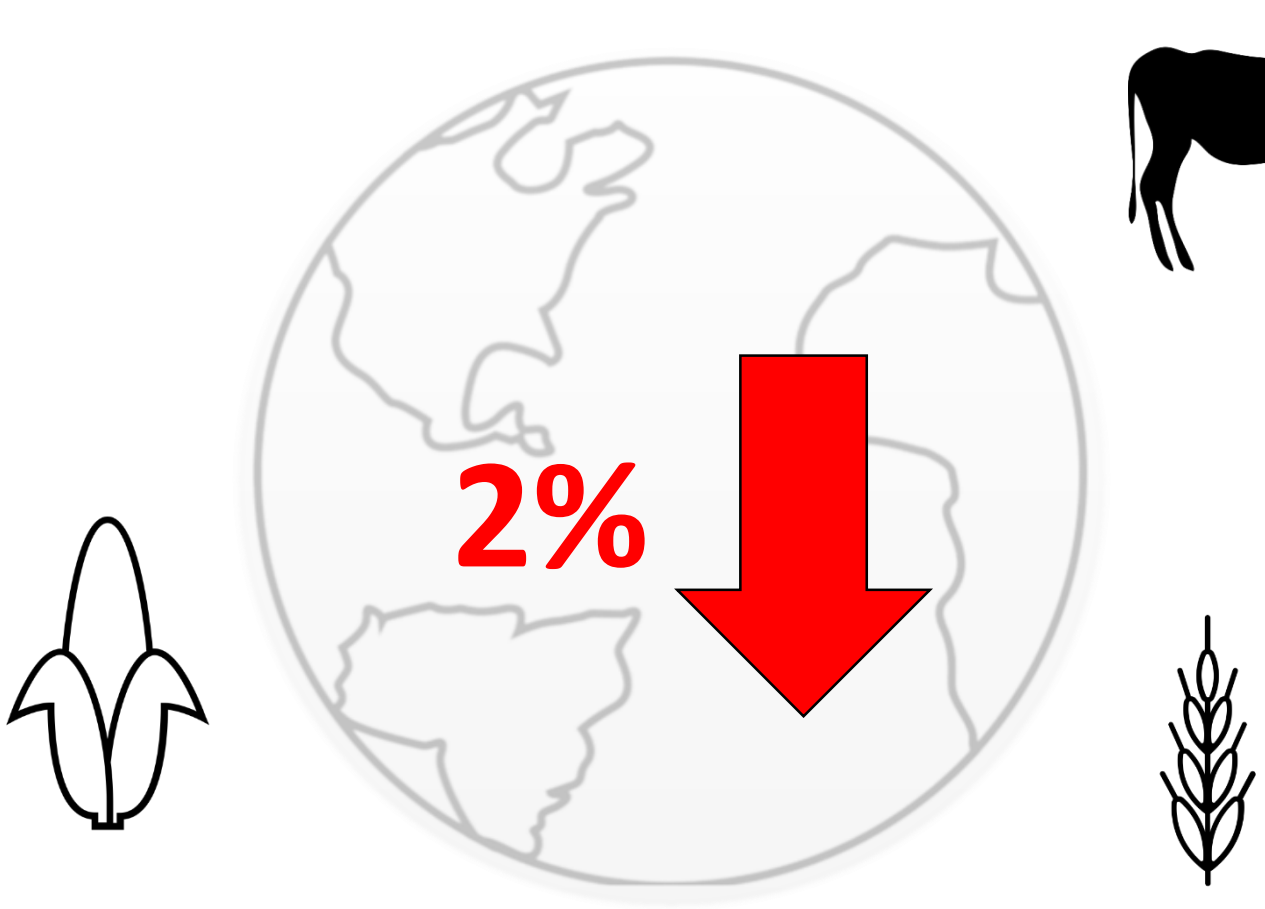
Battilani et al. 2016

Mitigation and Adaptation



- Climate-smart & nutrition-sensitive food value chain Mitigation and Adaptation interventions that INCREASE NUTRITION, INCREASE RESILIENCE, and DECREASE GHG EMISSIONS

Without Action?



In Food Production
Every Decade

After 2050?

Recommendations: Inputs and Production

- Increase crop and livestock diversity → increases resilience to weather, pests, and disease
- Soil quality: promote cover crops, crop rotations, organic fertilizers & manure
- Increase irrigation and water access

- Promote mixed crop and livestock systems and integrated land-use policies
- Services and support for farmers: risk management tools, insurance, and loans

Input Supply → **Production**

Recommendations: Storage and Processing

- Promote strategies that prevent food safety concerns (aflatoxin), minimize need for cold storage and preserve nutritional value of foods → also decreases food waste in LMIC
- Improve infrastructure: roads, warehouses, and processing plants

Post-Harvest Storage and Processing

Recommendations: Distribution, Marketing, and Retail

- Improve retailer access to water, electricity, and cold storage
- Develop networks between food producers to increase market access and help limit food waste
- Improve transportation infrastructure

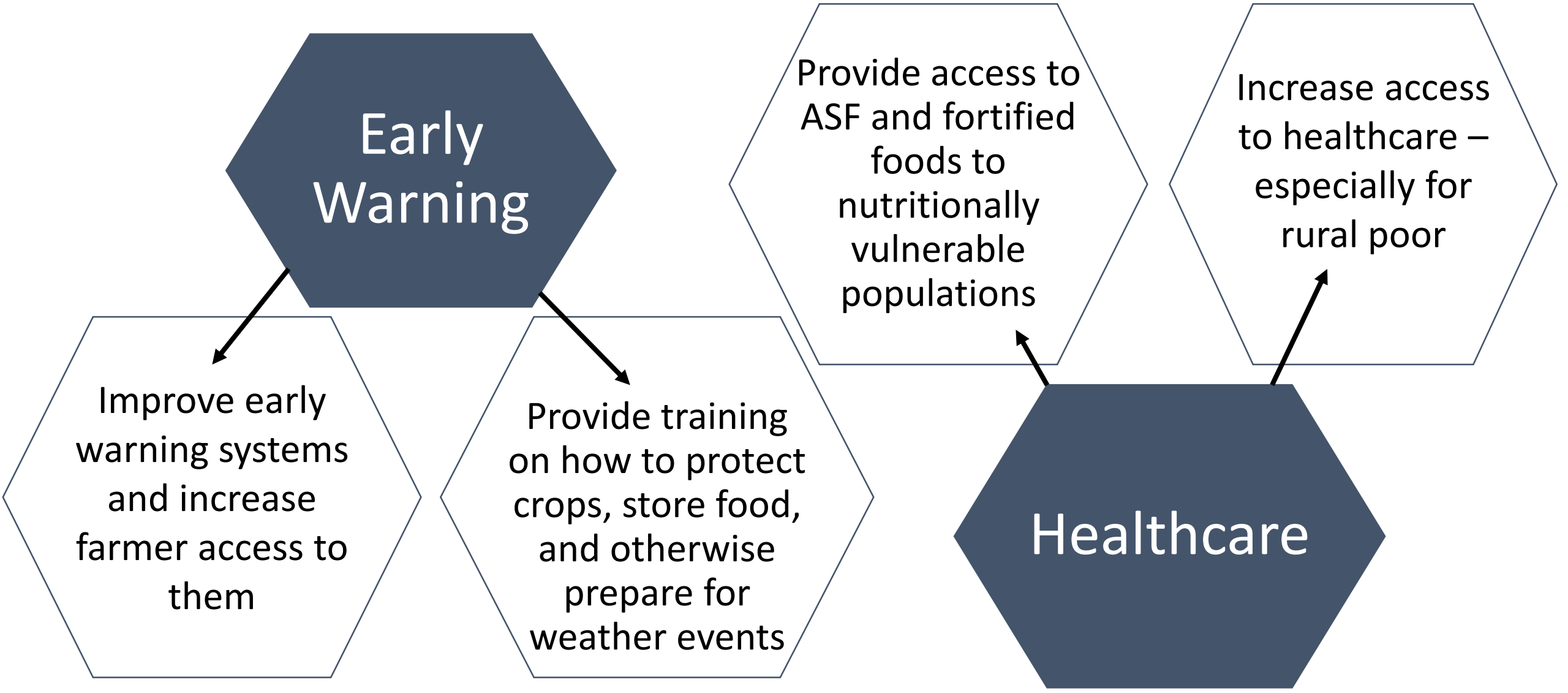
Distribution, Marketing, and Retail

Recommendations: Consumption & Utilization

- Social protection services: increase unconditional cash transfers and supplementary food allowances
- Promote energy-efficient methods of food preparation
- Recognize differing consumption needs of ASF in LMIC vs. HIC

Consumption and Utilization

Recommendations: Undernutrition & CC



Recommendations: Research

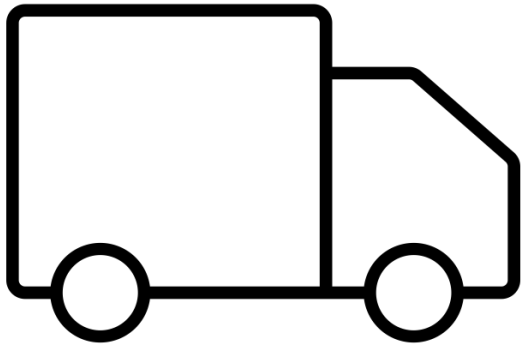
More evidence-based research

AND

Specific guidance

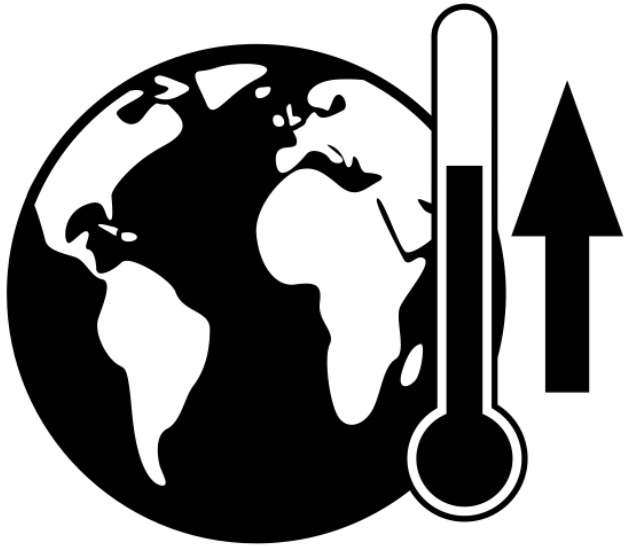
ON

Mitigating and Adapting to CC at EACH step of the food value chain



WE NEED….

- Climate-smart & nutrition-sensitive food system
- Mitigation & adaptation strategies that include nutrition



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