Colorful Harvest:

From feeding to nourishing a growing world

Emmy Simmons

Madison Hotel

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Edible Horticulture -- Fruits and Vegetables

I do not like broccoli. And I haven't liked it since I was a little kid and my mother made me eat it. And I'm President of the United States and I'm not going to eat any more broccoli.

(George H. W. Bush)

WHAT KIDS LEARN TO EAT IS IMPORTANT

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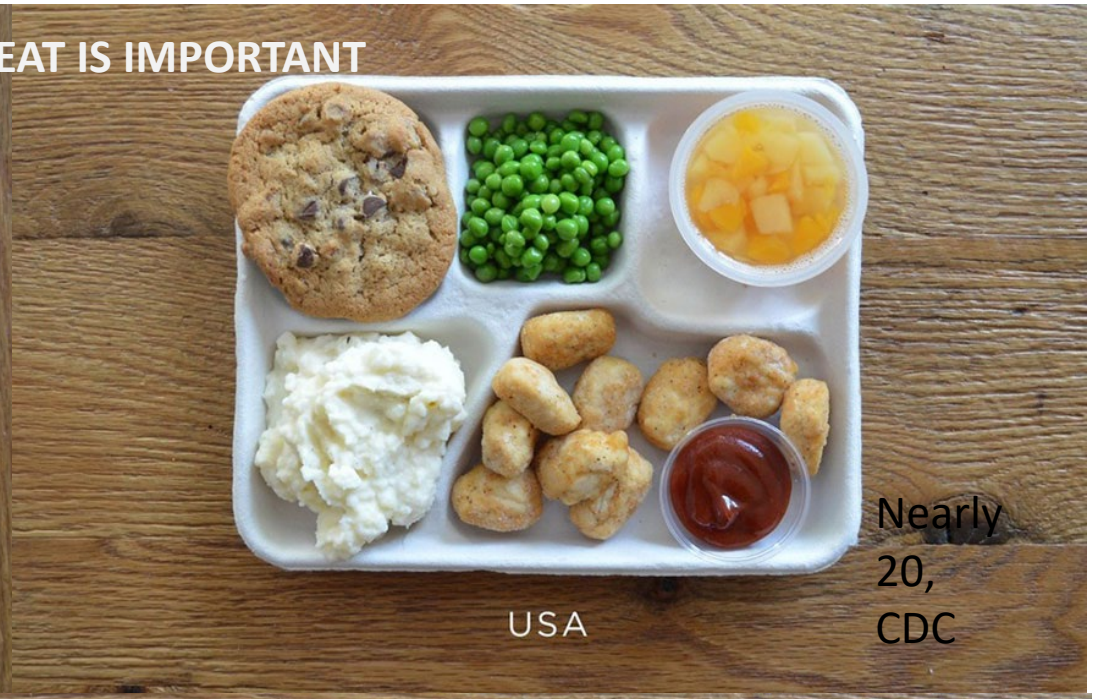


Nearly 20, CDC

2-4

4-10

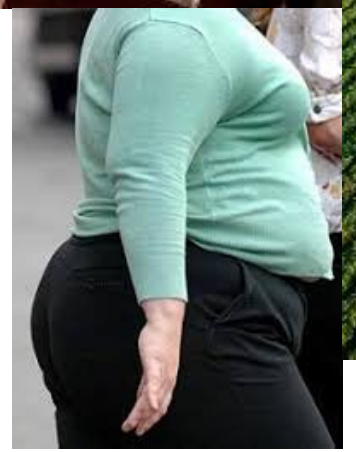
School lunches around the world

Why fruits/vegetables? Why now?

1. The nutrition imperative
2. Urbanizing food markets
3. Food safety concerns
4. The economics of FV production and supply
5. Climate change
6. Long-term sector development

1. The nutrition imperative

- Evidence of poor diets
- Triple burden of disease
- Unsustainable (and inequitable) use of environmental resources
- Realization that there are new R&D frontiers for fruits and vegetables



FV are essential components of healthy diets

Fruits and vegetables are:

- Naturally low in fat and calories (decrease overweight and obesity)
- Important sources of many nutrients, including :

✓ potassium (for healthy blood pressure),

✓ dietary fiber (reduce blood cholesterol and possibly risk of heart disease),

✓ folate (folic acid) (forming red blood cells, fetal development),

✓ vitamin A (eyes, skin, protect against infections), and

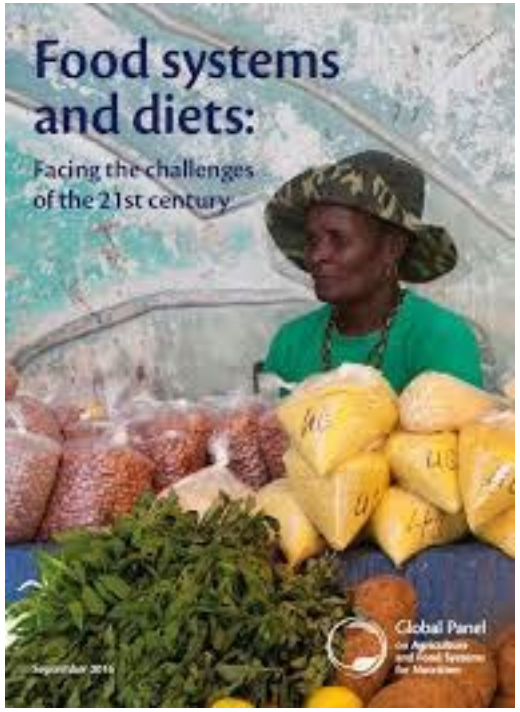
✓ vitamin C (heal cuts and wounds, aid in iron absorption)

But vegetable consumption trends are going in the wrong direction in 3 of 7 world regions from 1990-2013. Fruits, ok trend but not quantity

(p. 47 Global Panel Foresight Report).

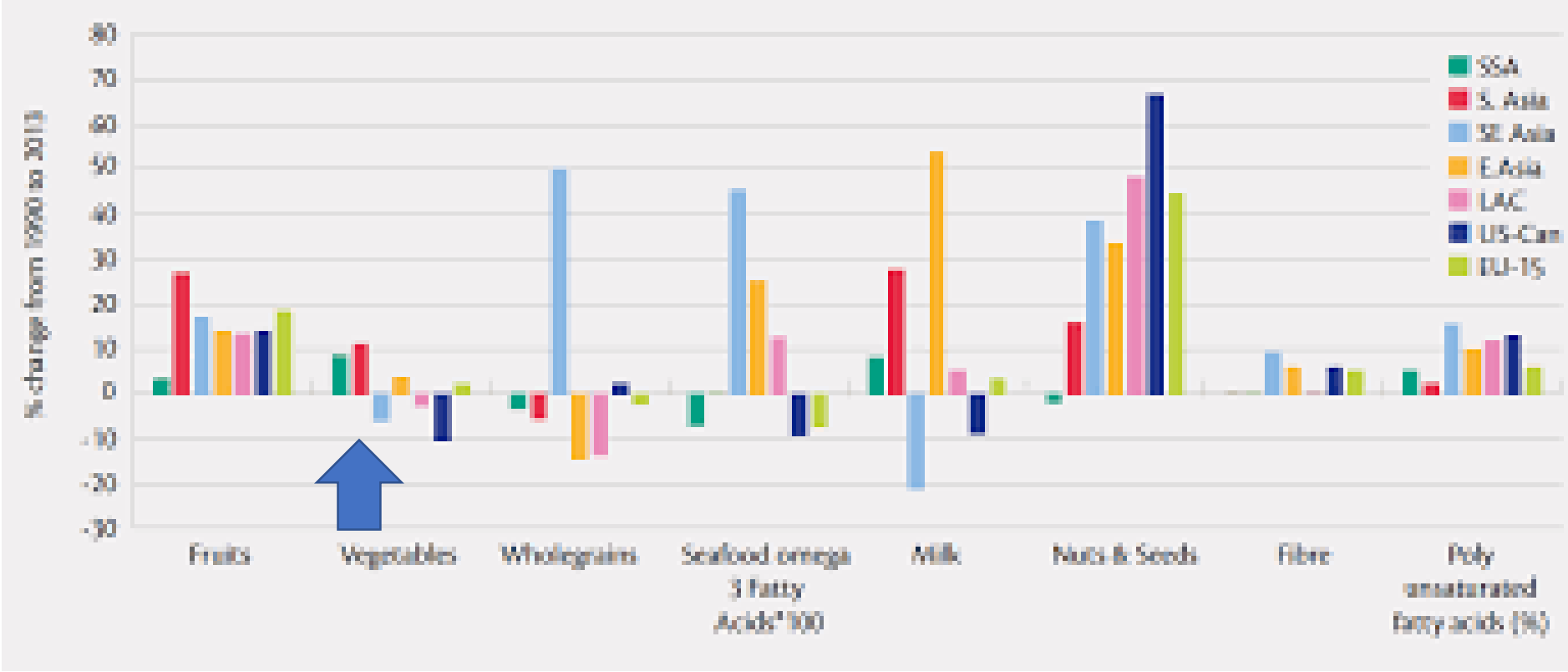
And, on average, decreasing by income group– Fruits increasing

(p. 48, GloPan)



1.7 million (2.8%) of deaths worldwide are attributable to low fruit and vegetable consumption.

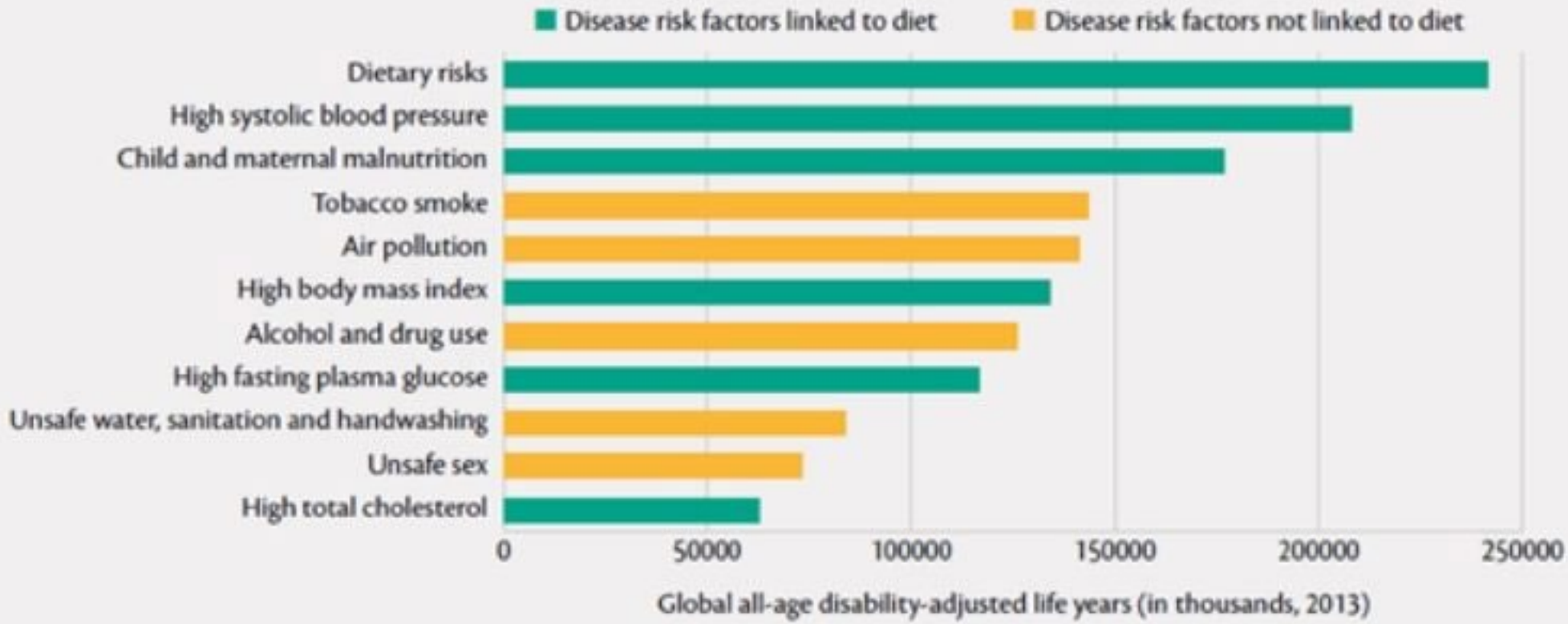
https://www.who.int/dietphysicalactivity/fruit/en/



Diet is the number one risk factor in the global burden of disease.

From the Global Panel's Foresight report: *Food systems and diets: Facing the challenges of the 21st century*

Global Panel on **Agriculture** and **Food Systems** for **Nutrition**

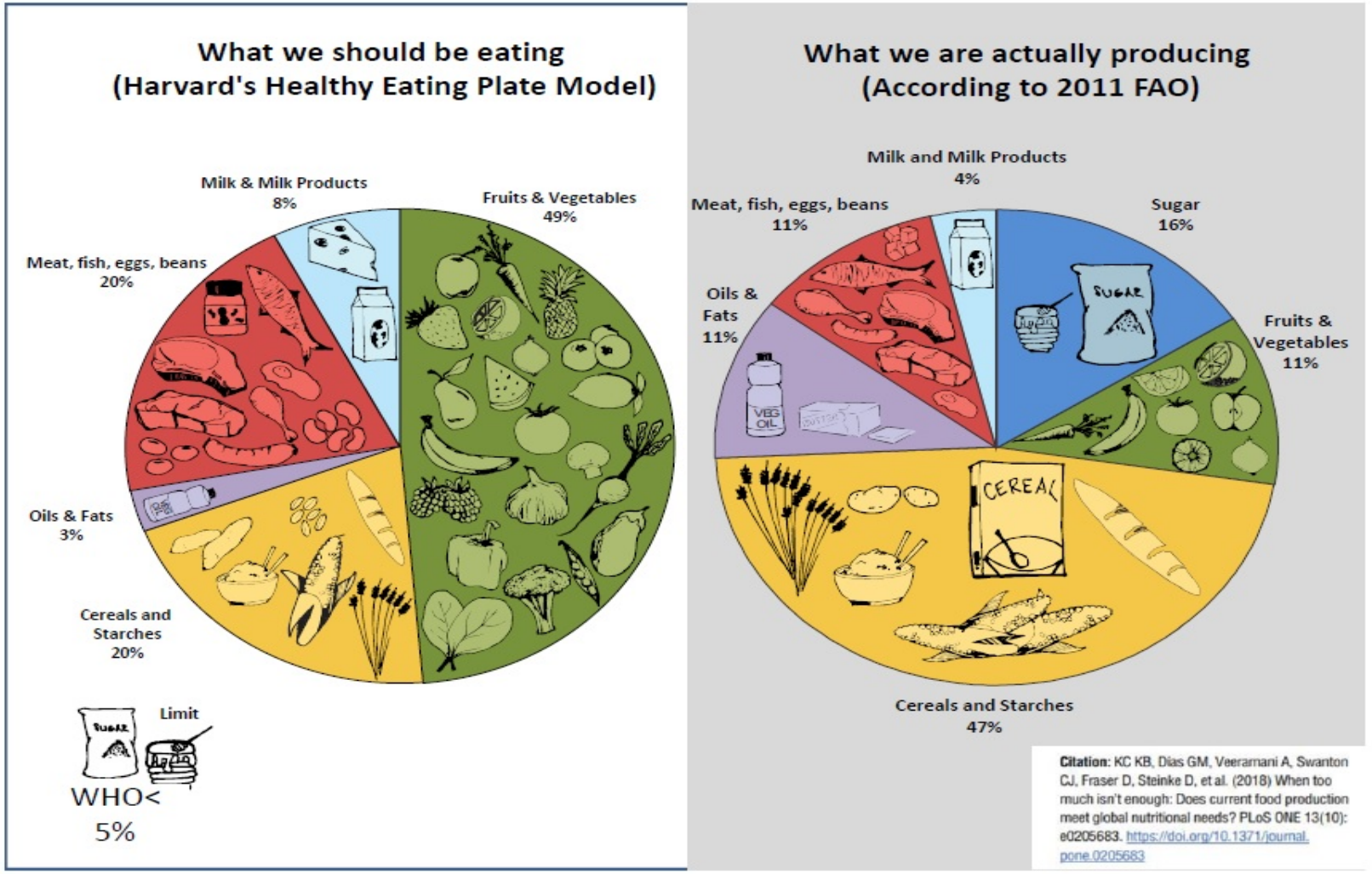


Source: Global Burden of Disease Study 2013 Collaborators (2015), Figure 5

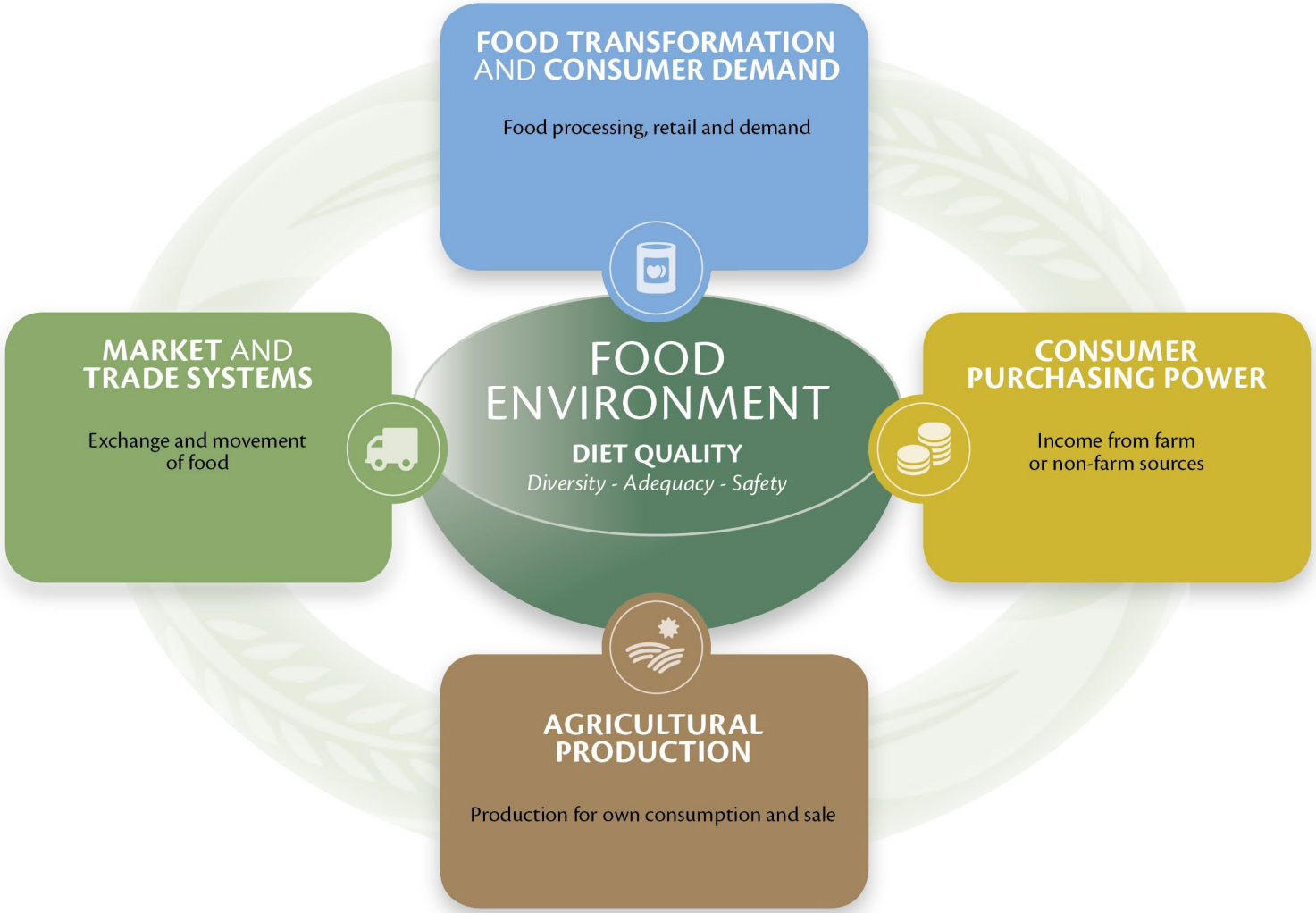
Note: The graph shows global disability-adjusted life years (DALYs) attributed to level 2 risk factors in 2013 for both sexes combined.

Glopan.org/foresight

Politics matters: Aligning agricultural production priorities with healthy diets



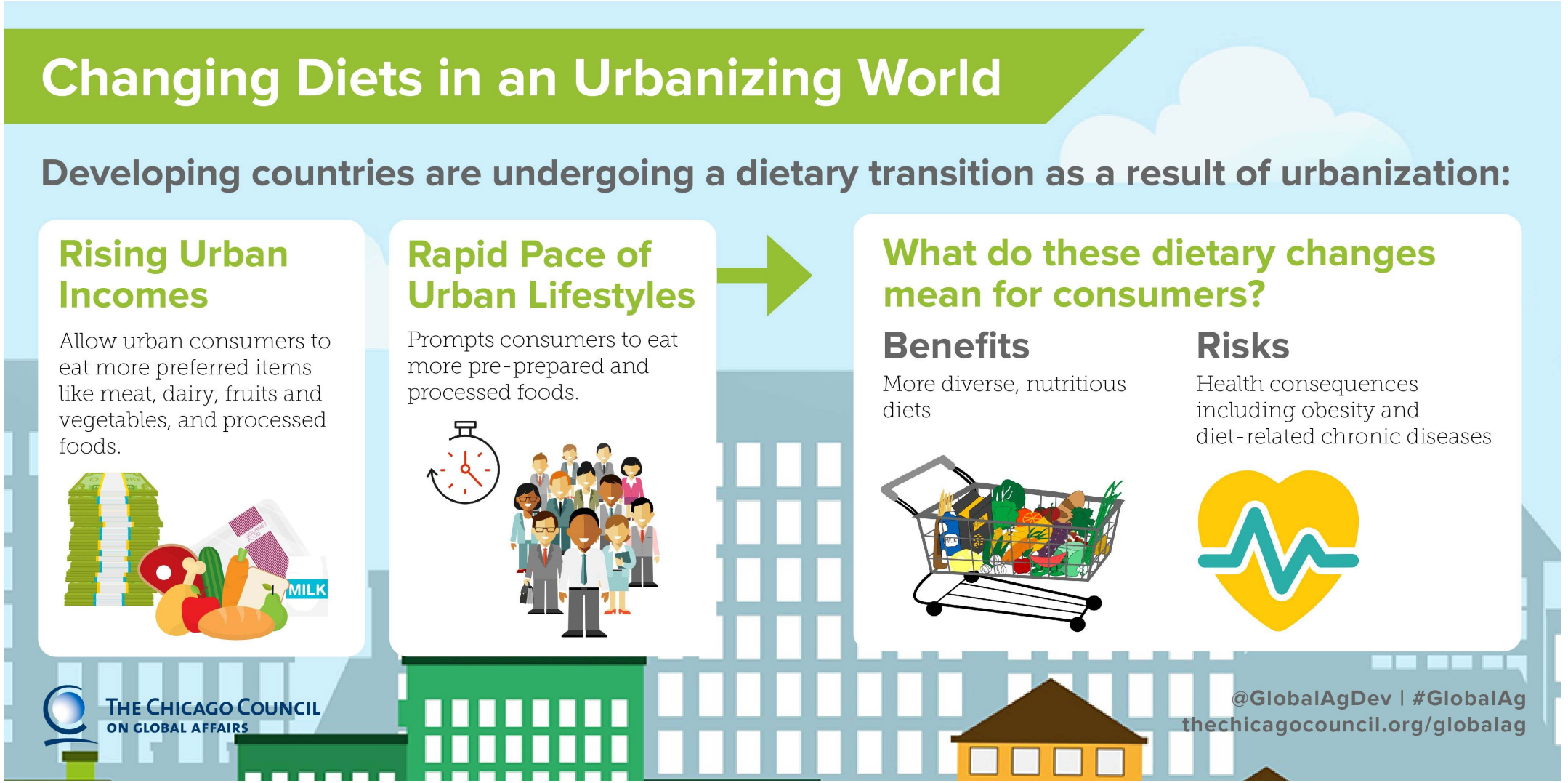
A complex food system…yes
but lots of opportunities to change incentives and performance throughout the system



Priority areas of response to the nutrition imperative

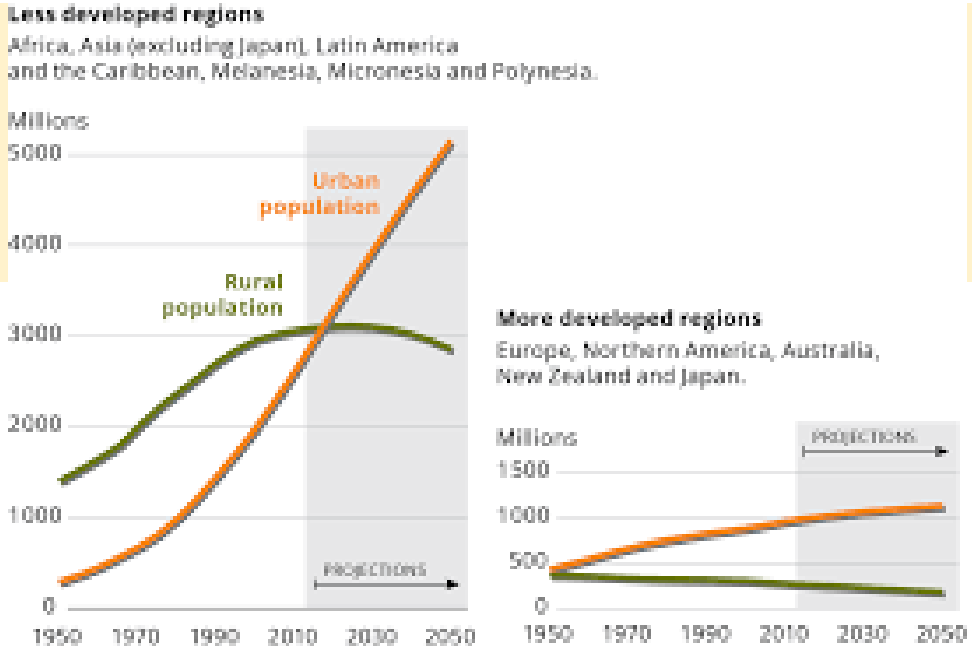
- Focus on the quality of diets – not just calorie counts: food systems need to be modified -- FV availability, access, and affordability are key
- Understand the causality of the triple burden of disease: are food availability, choice, nutritional knowledge at fault? poverty? lack of time?
- Take the environmental dimensions (resource use, climate change, GHG emissions) into account
    - EAT Lancet Commission Report Published**Online** January 27, 2019 http://dx.doi.org/10.1016/ S0140-6736(18)32822-8
    - These three pandemics— obesity, undernutrition, and climate change—represent The Global Syndemic that affects most people in every country and region worldwide
- FV research and development a key response to the “imperative”

2. Urbanizing food markets



Urbanizing FV systems

- Accessibility, affordability, taste, ease of consumption – for a growing, highly-diverse consumer base that is market-dependent
- Expanding infrastructure for freshness, cost reduction, reducing loss and waste – especially key for FFV
- Organizational innovations, expansion of profitable processing at all levels, but also availability of “fresh, local”



3. Food safety concerns

Foodborne Illnesses in the US and World

THE CHICAGO COUNCIL ON GLOBAL AFFAIRS

In the United States, **1 in 6** Americans contract a foodborne illness each year.

That's **48 million** annually. Resulting in...

128,000 hospitalizations

3,000 deaths

Source: US Centers for Disease Control and Prevention

600M around the globe contract a foodborne illness each year.

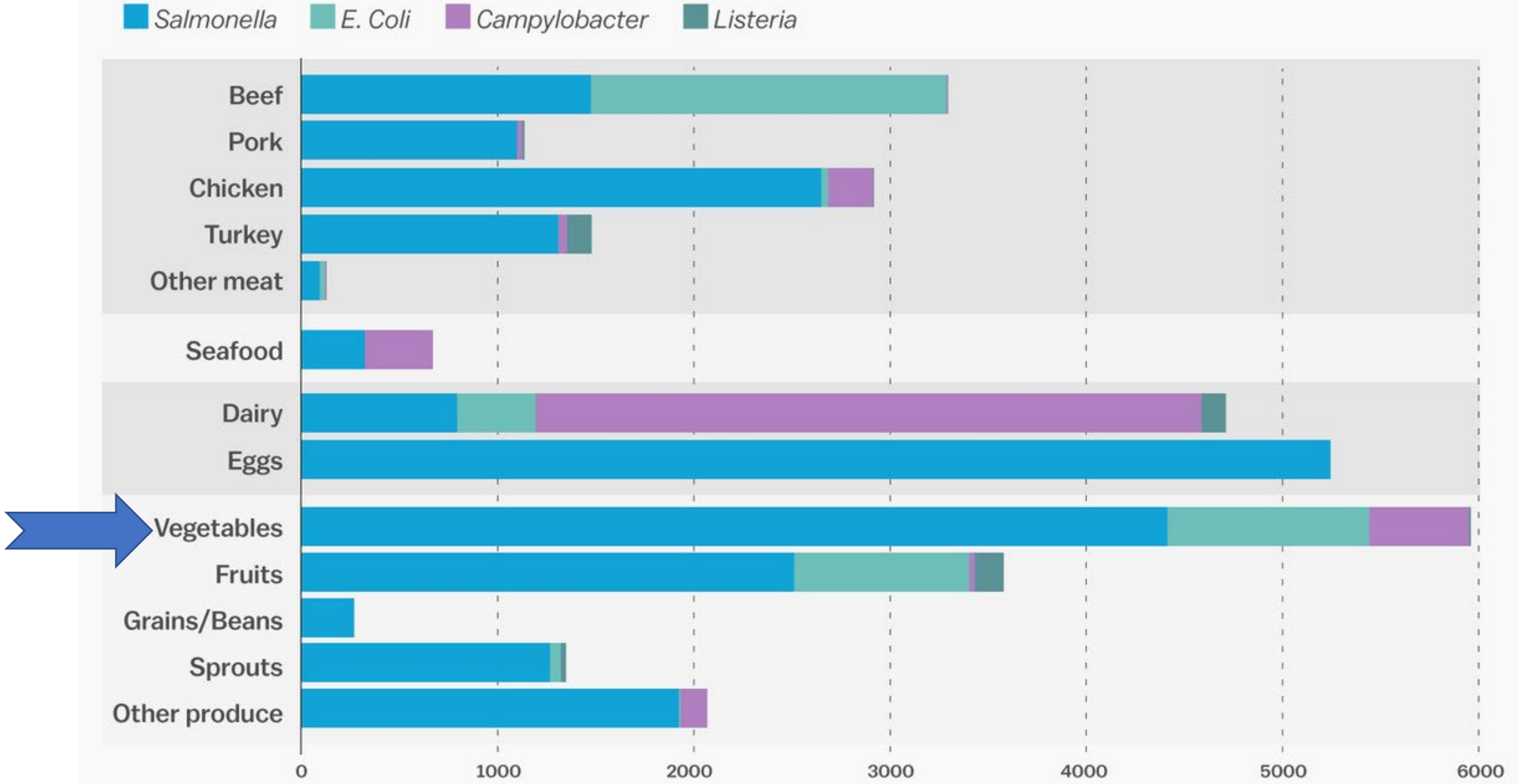
420,000 cases end in death.

Children under 5 are only **9%** of the world population, but **30%** of foodborne illness deaths. They bear **3x** their share of the burden.

Source: World Health Organization, Foodborne Disease Burden Epidemiology Reference Group

Common sources of food poisoning

Estimated total illnesses from outbreaks in 1998-2012



**Includes estimated total illnesses for only outbreaks that could be attributed to a single pathogen and food category*

SOURCE: Centers for Disease Control and Prevention

Vox

RECENT OUTBREAKS ATTRIBUTED TO CONTAMINATED WATER

April to June

An outbreak of E. coli O157:H7 infections linked to romaine lettuce from farms in Imperial County, California, and Yuma County, Arizona caused 210 reported illnesses from 36 states, resulting in 96 hospitalizations, 27 cases of hemolytic uremic syndrome (HUS) and five deaths.

Early October to early December

Reported illnesses of E. coli O157:H7 linked to romaine lettuce from Santa Barbara County, California caused in 62 reported illnesses in 16 states and the District of Columbia, resulting in 25 hospitalizations and two cases of hemolytic uremic syndrome (HUS). There were no deaths.

Agricultural water includes water used in growing activities (including irrigation water applied using direct water application methods, water used for preparing crop sprays, and water used for growing sprouts) and in harvesting, packing, and holding activities (including water used for washing or cooling harvested produce and water used for preventing dehydration of covered produce).

Focus areas for food safety in FV

- Contamination in production: intentional, accidental
- Inadequate handling and packaging in post-farmgate segments of supply chain
- Poor management in home



4. The economics of FV production and supply: Labor intensity and returns

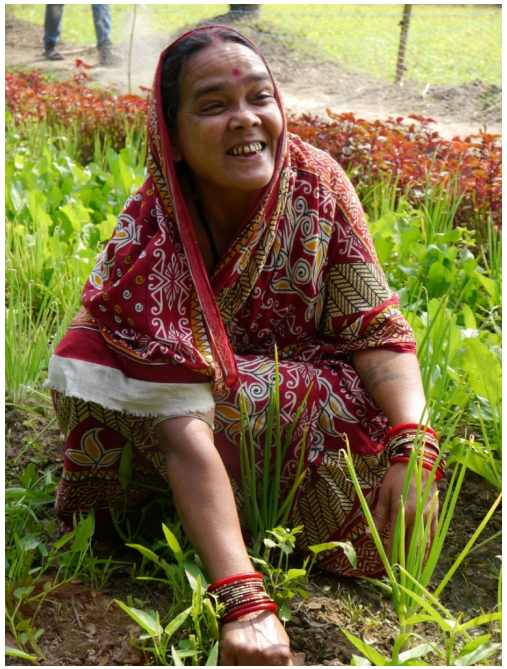
- **FV production is labor-intensive.** (In the US, labor accounts for 42% of costs of FV production per Calvin and Martin 2010.)
- Labor intensity in FV production/supply does **not always mean higher returns to labor** in the supply chain.
    - https://www.oxfamamerica.org/static/media/files/Ripe_for_Change_Ending_Human_Suffering_in_Supermarket_Supply_Chains_report.pdf
- FV supply chains are **highly-competitive** so there is pressure in buyer-driven operations to keep wages low.
- When market is dominated by uncoordinated informal producers**, seasonal gluts** can reduce returns to labor.
- **Mechanization** can reduce the costs of labor to the grower and increase the returns to workers. But it is more capital-intensive and generally results in greater FV waste and loss.

The workers' perspective

- The seasonality of FV production often means **labor migration**. This is a political as well as economic issue when border crossings are involved.
- **Women** are often preferentially employed in certain segments of the FV supply chain, e.g., packhouses. Pro's and con's.
- The relatively smaller scale and short-season turnaround of FV production in developing countries implies relatively **easy entry for youthful entrepreneurs.**
- Do young women and men have equal opportunities for FV production, processing, and marketing (e.g., regarding access to land, finance, training)?

5. Climate change

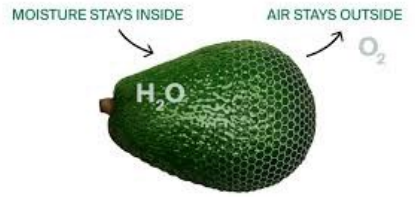
- Higher temperatures affect FV productivity
- Spread of pests and diseases
- Extreme weather and natural disasters – destruction
- Vegetables as a positive element of recovery after crisis
- High rates of waste/loss in FV systems contribute to GHG emissions



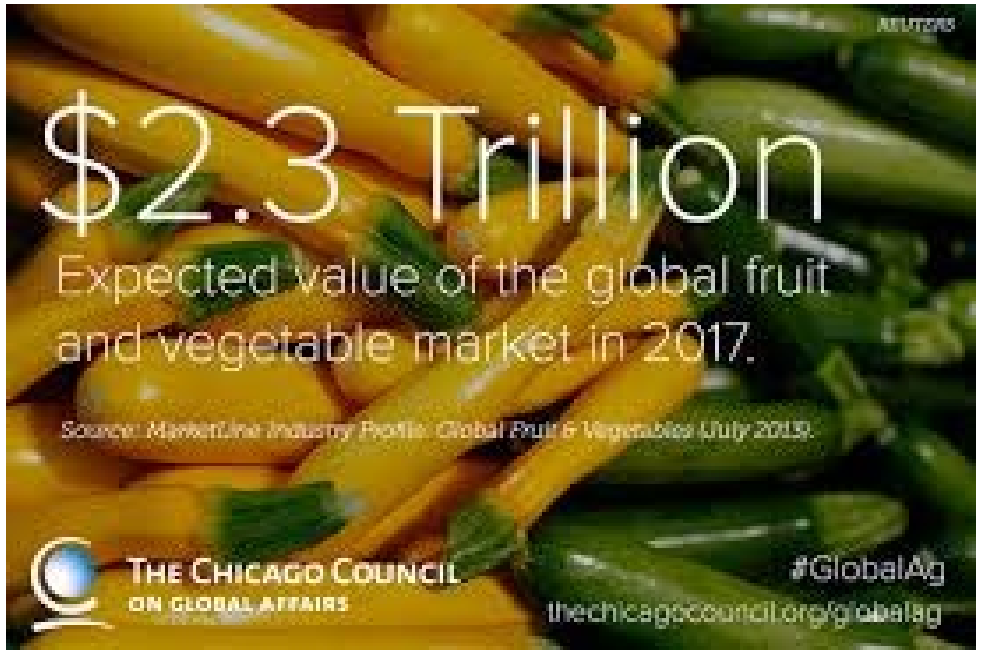
R&D FV opportunities to mitigate/adapt to climate change

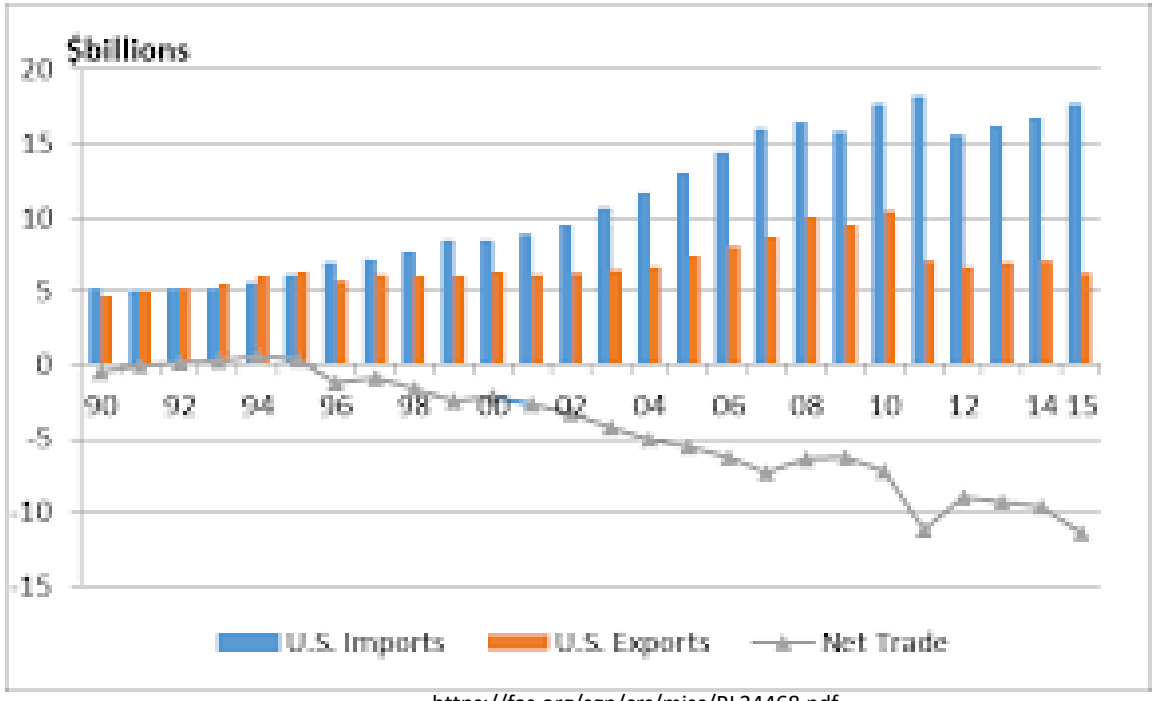
- Adapted varieties
- Expanded/efficient use of irrigation
- Increasing water use efficiency (mulching, use of beds)
- Conservation of biodiversity
- Better understanding of effects on nutrient quality
- Reduce waste/loss

6. Long-term sector development

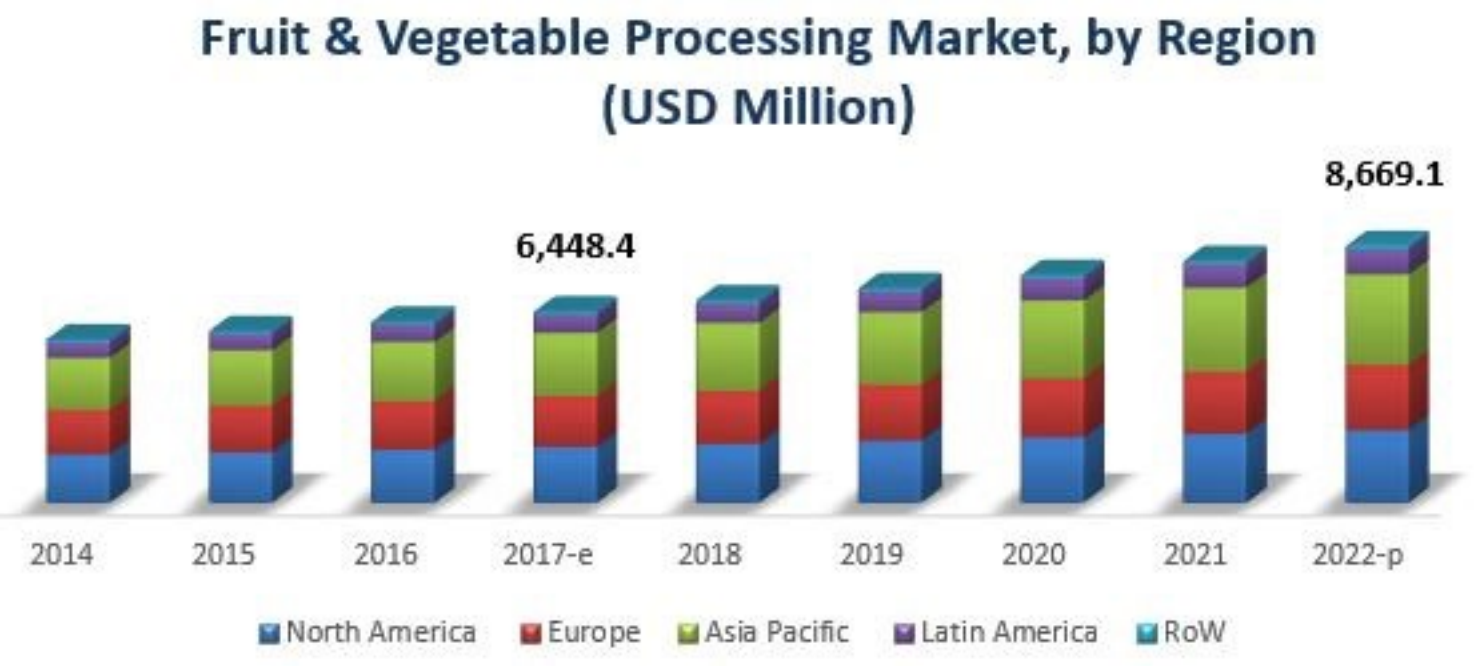


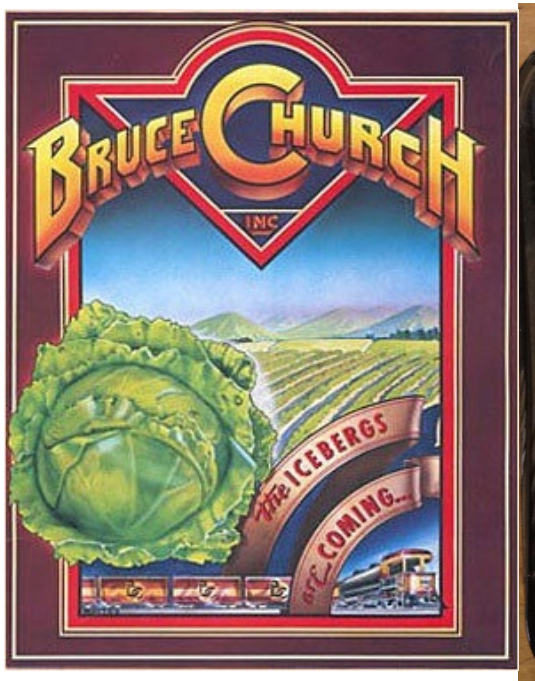
- Urban and peri-urban agriculture
- Expanding protected cultivation
- Addressing issues and opportunities of buyer-led supply chains with local-sourcing policies
- Geo-spatial advantages and disadvantages
- Collection and exploitation of wild relatives and more indigenous FV
- Conservation of germplasm
- New techniques in genetic development
- Expansion of processing options
- Promoting demand – for fresh and processed
- Donor interest
- Private sector investments



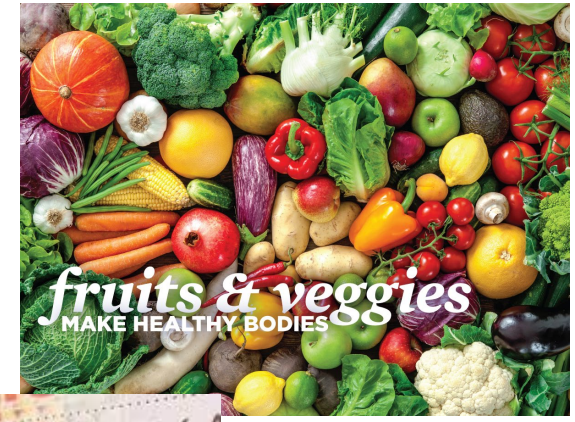


https://fas.org/sgp/crs/misc/RL34468.pdf





Time for a more robust coalition of interests



- Health
- Nutrition
- Industry: processing, marketing
- Production Agriculture: farmers and workers
- Inputs to production
- Crop insurance and other support
- R&D – climate change, disaster recovery, mechanization, production methods

Looking for a great discussion of Colorful Harvests!

Thanks.