



# Sustainable food systems for healthier African diets

## Research Challenges & Policy Issues

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LEI Wageningen UR

# Major Macro Trends

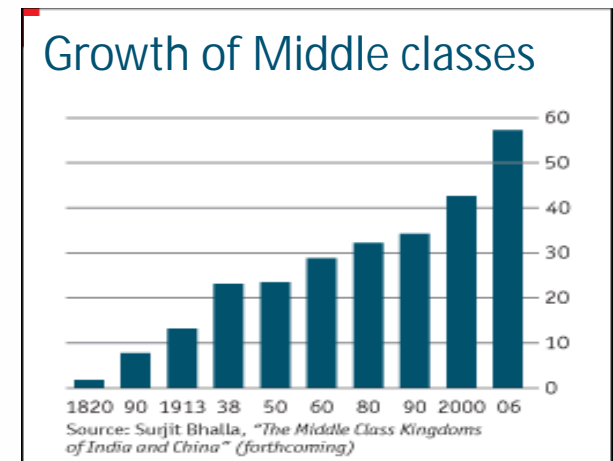
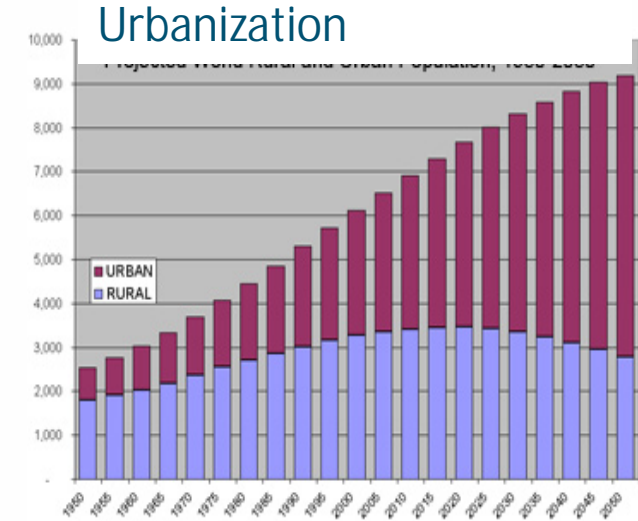
§ Population growth

§ Urbanization

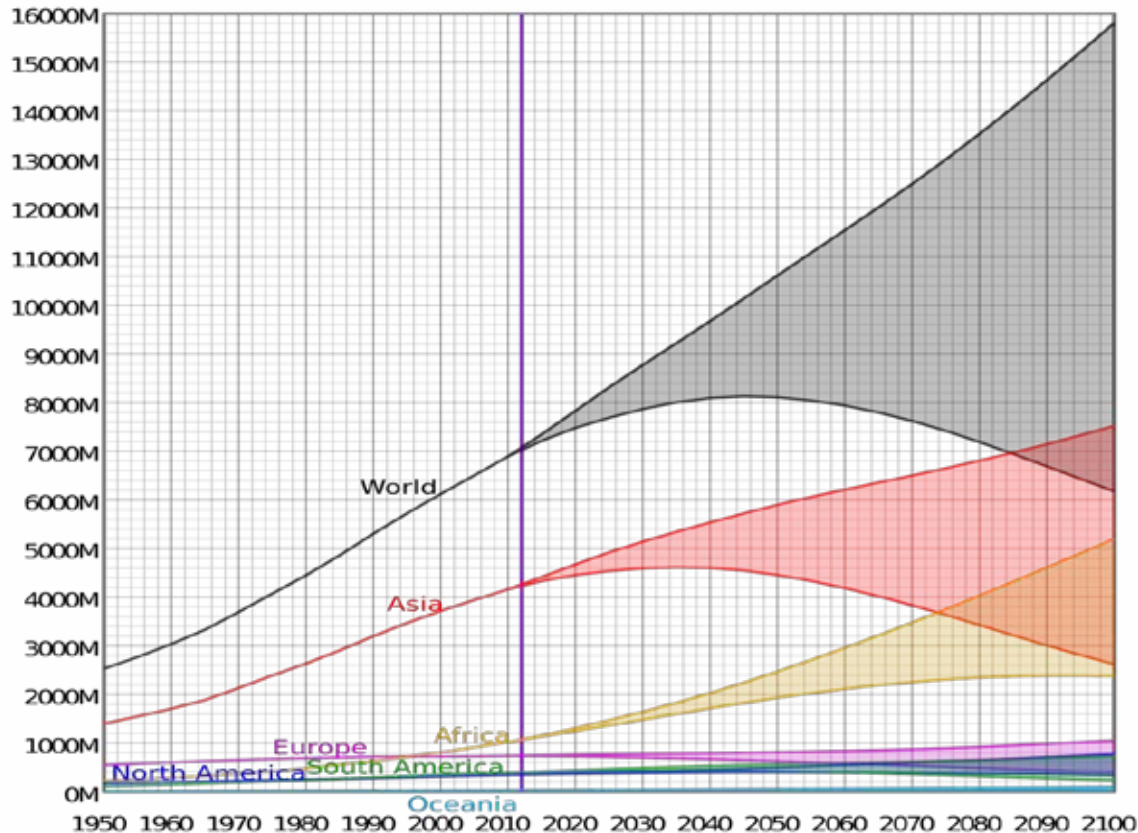
§ Economic growth (welfare)

§ Access to Information / ICT

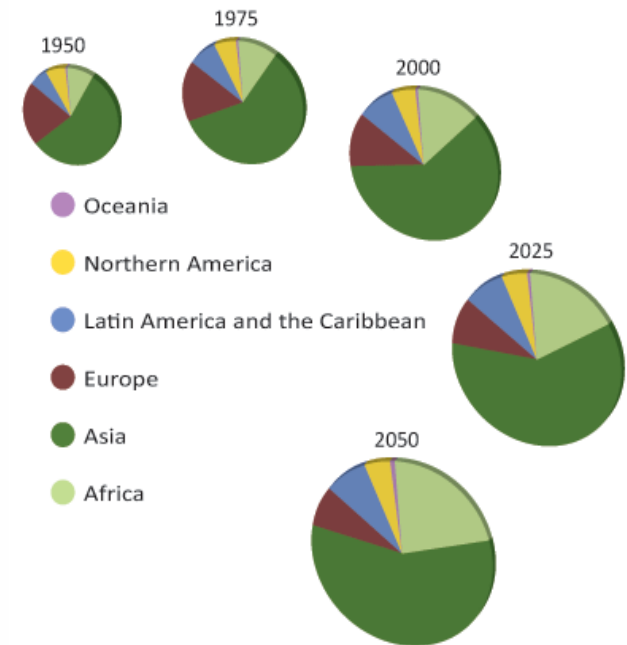
§ Market development (prices)



# Population dynamics

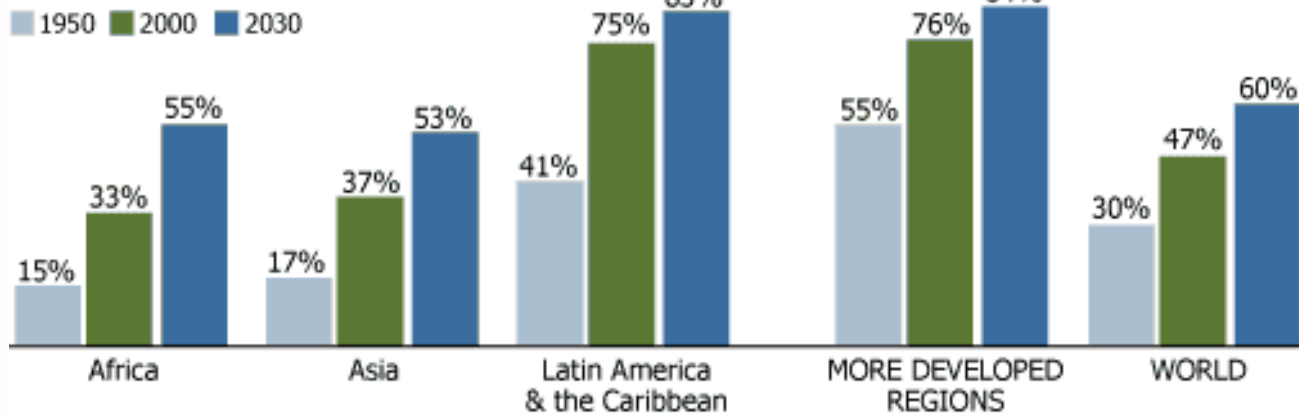


1b Africans in 2010  
2b b/w 2040 & 2050

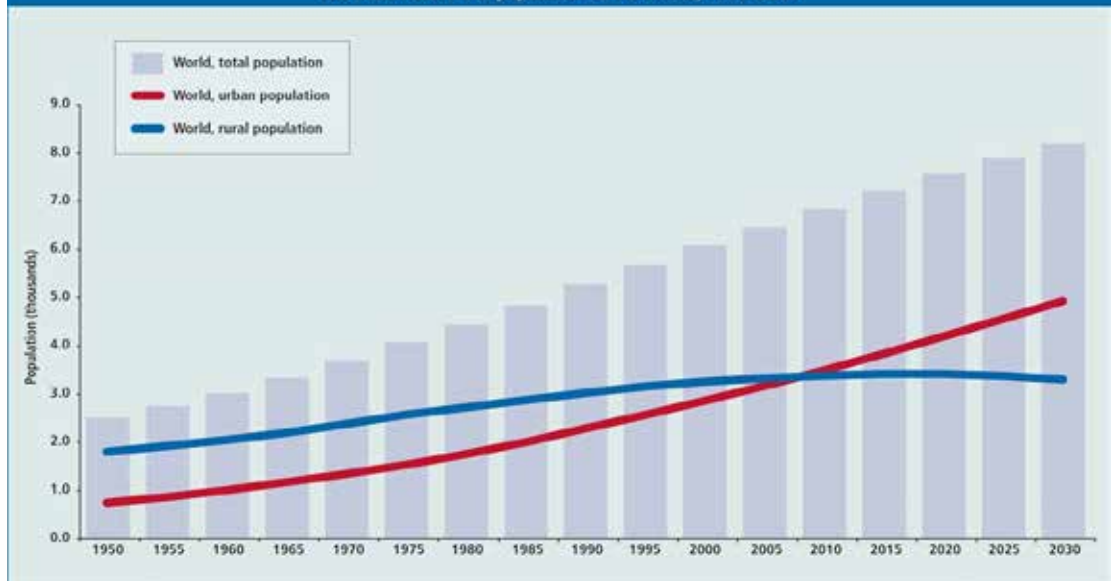


# Urbanization trends

Percent urban population

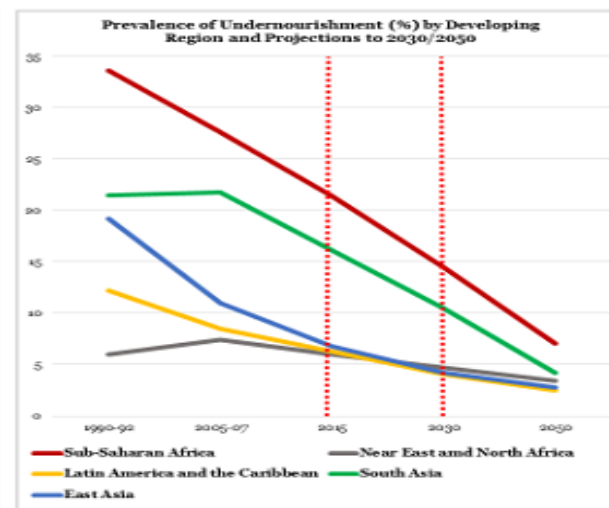
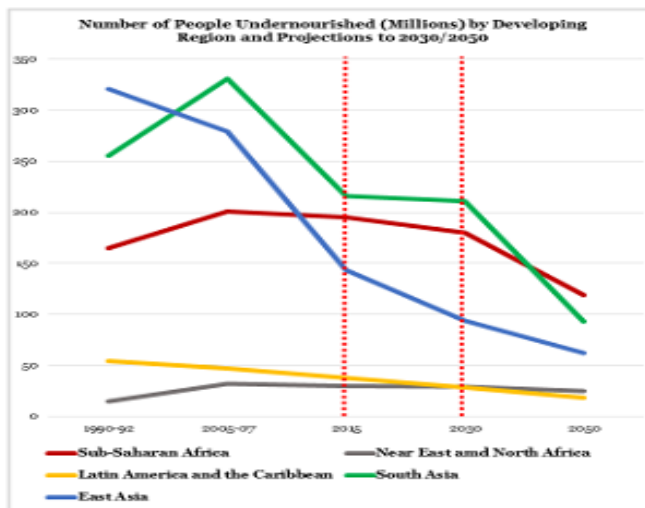
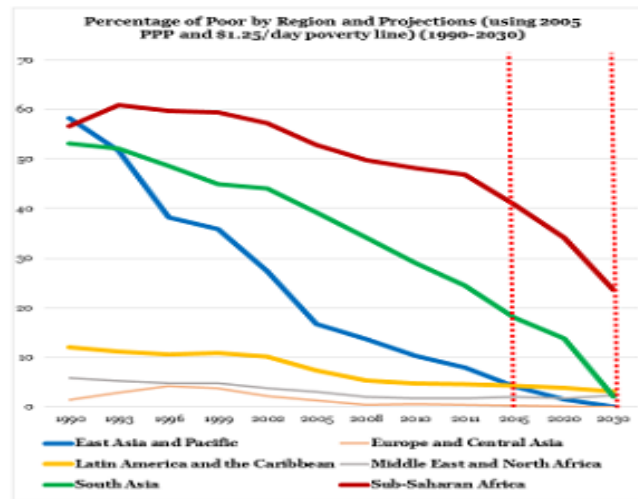
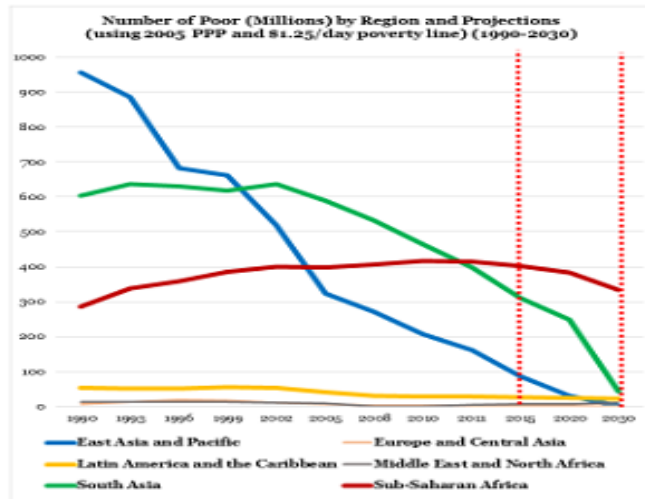


The urban and rural population of the world, 1950-2030



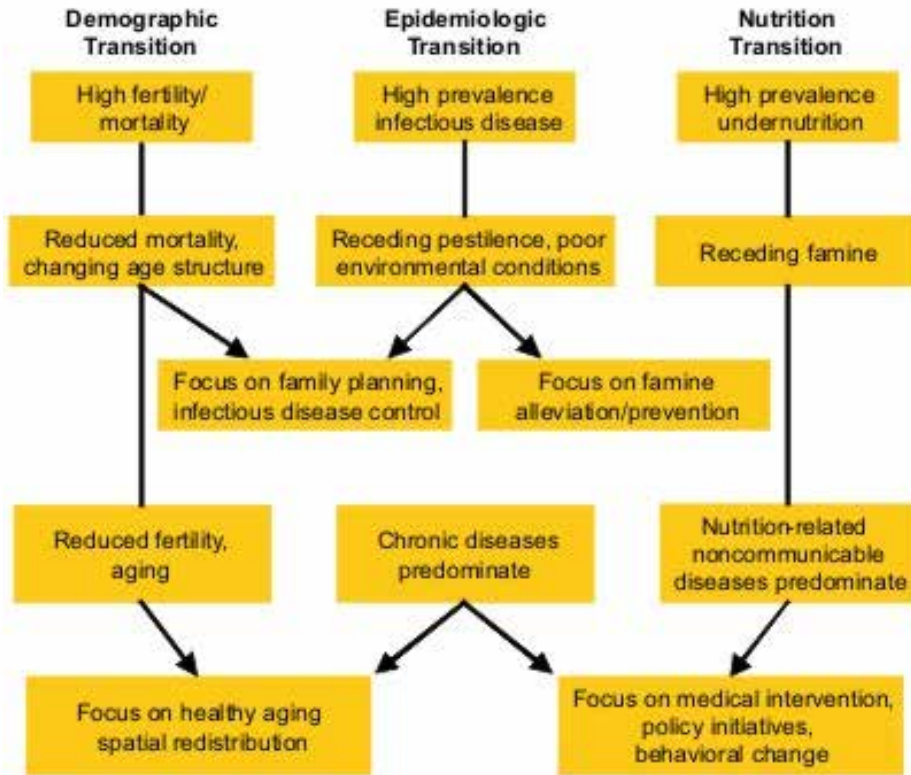


# Declining Poverty & Hunger



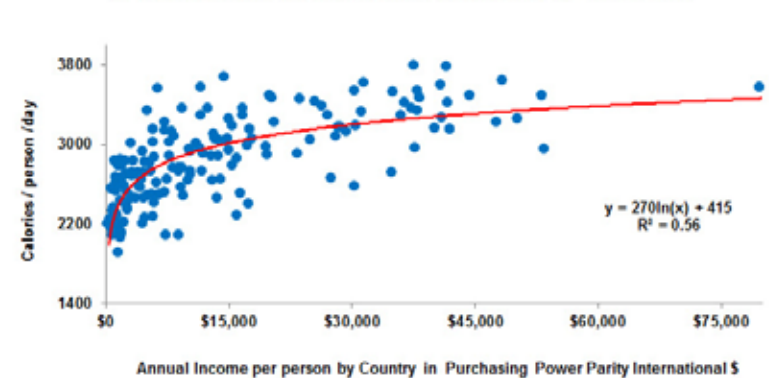
# Diet transitions

Figure 1. Stages of Health, Nutrition, and Demographic Change

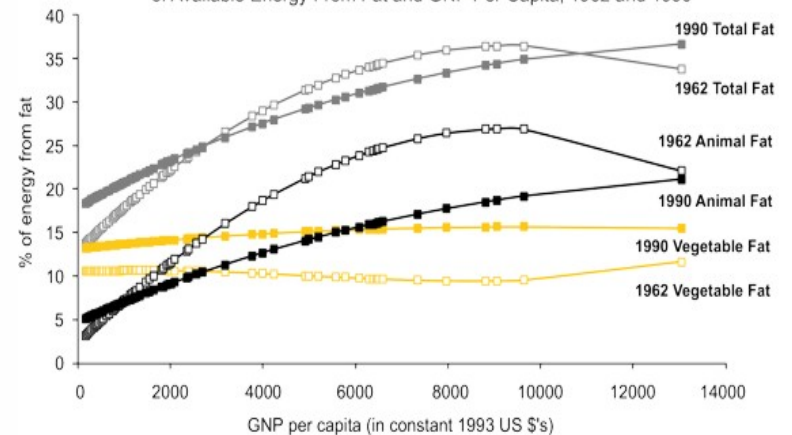


Source: Popkin (2002). Pub. Health Nutr 5.

Figure 1. Calories per person per day vs. Income per person, 2011



Vegetable Fat Intake has Increased Greatly: the Relationship Between the Percentage of Available Energy From Fat and GNP Per Capita, 1962 and 1990

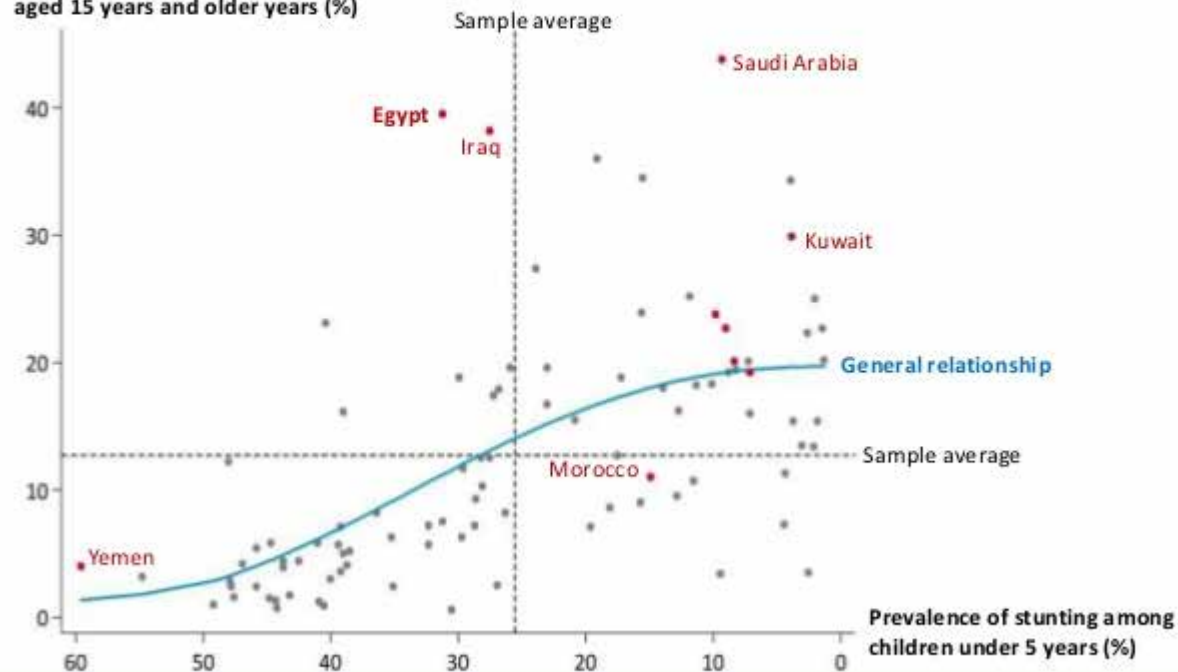


Source: Guo, Xuguang, T.A. Mroz, B.M. Popkin, and F. Zhai. (2000) Structural changes in the impact of income on food consumption in China, 1989-93. Economic Development & Cultural Change 48:737-760.

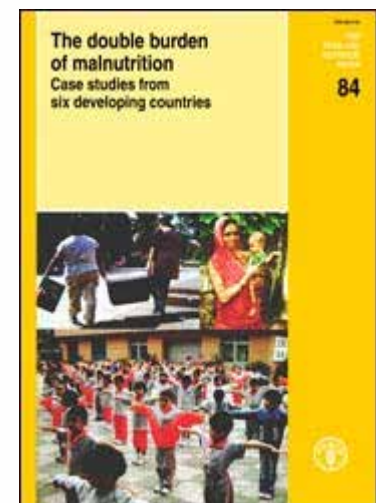
# Double burden

## From undernutrition in childhood to overnutrition in adulthood

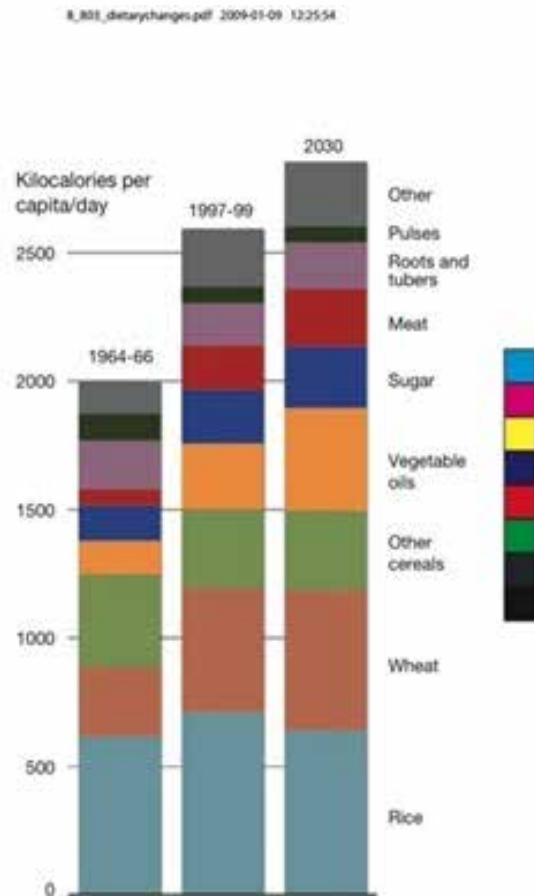
Prevalence of obesity among women aged 15 years and older years (%)



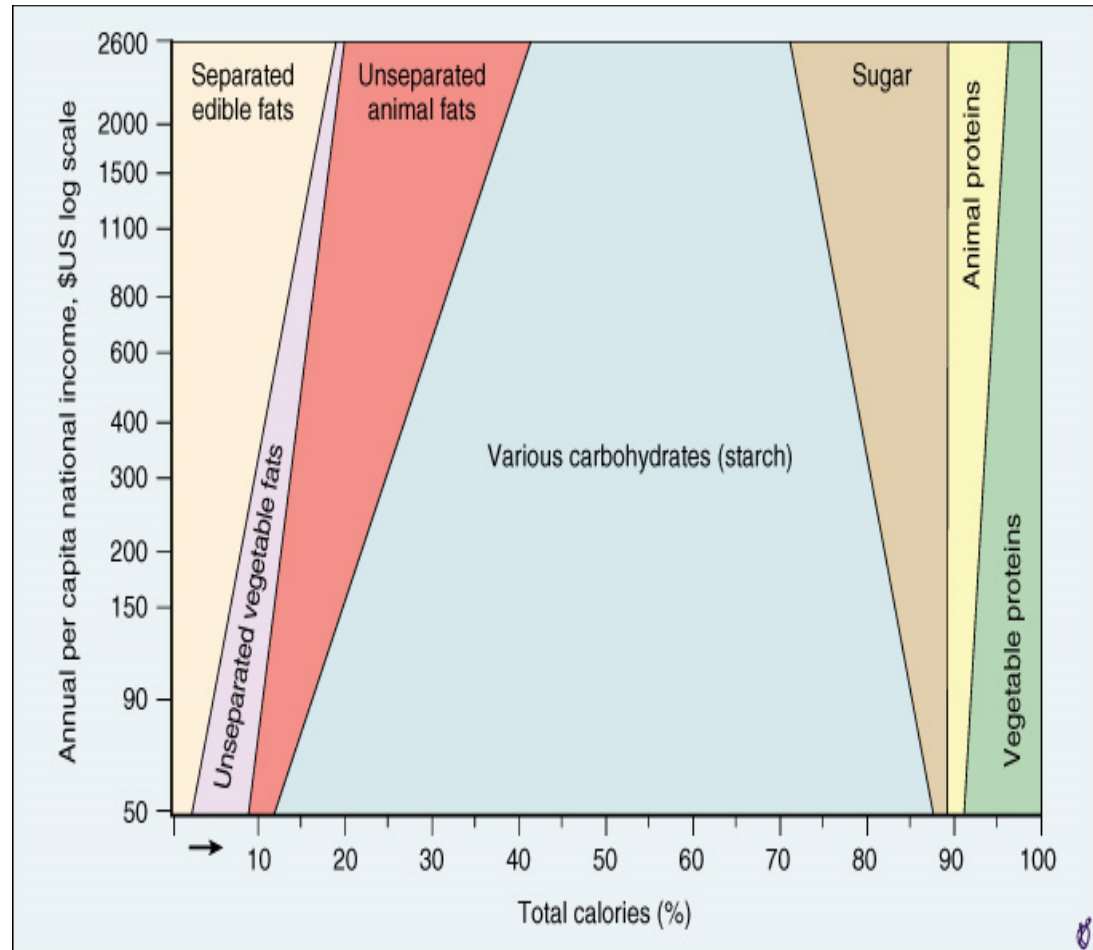
Source: Own estimation based on World Bank's WDI data, complemented with IMF's WEO, UNSTAT, and 2010/11 HIECS data.



# Dietary transitions



Diet composition



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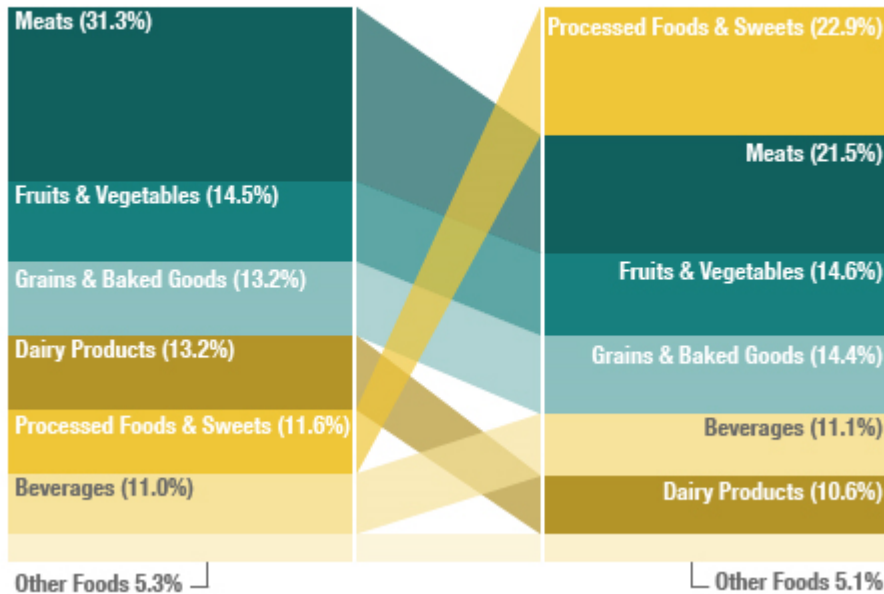


# Processed Food: Soja, Salt & Sugar

Breakdown Of Money Spent On Groceries

1982

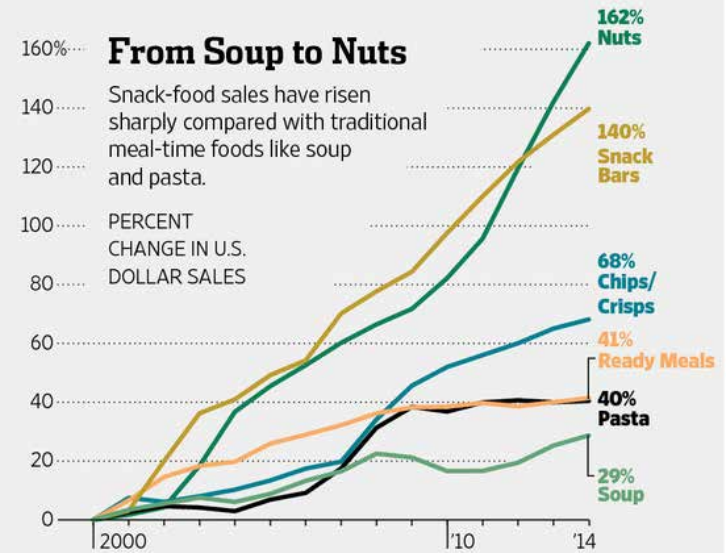
2012



## From Soup to Nuts

Snack-food sales have risen sharply compared with traditional meal-time foods like soup and pasta.

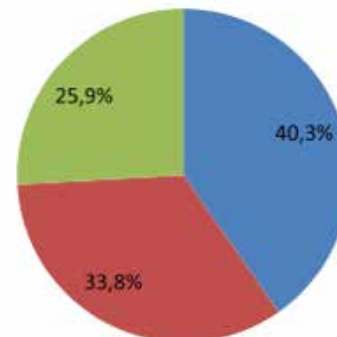
PERCENT  
CHANGE IN U.S.  
DOLLAR SALES



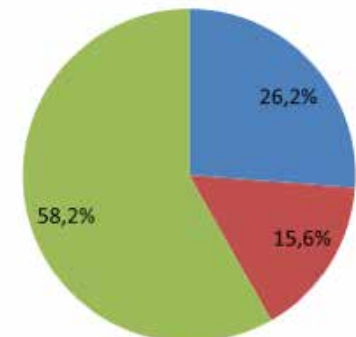
Source: Euromonitor International

The Wall Street Journal

Brazil 2008



UK 2008



■ Fresh or minimally processed foods ■ Processed culinary ingredients ■ Ultra-processed foods



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# Value chains (data for S+E Africa)

- 30-50% of African consumption now passes through markets
- Must look into processing and non-grain foods

1. 55 per cent of the region's "middle class" (\$2-20 p.d.) is rural
2. 61–83 per cent of the middle class's food is purchased
3. processed food occupies 70–80 per cent of the class's food expenditure
4. perishable products account for 44–55 per cent of the class's expenditure

Tschirley et al 2015.  
*J. Int. Dev*





At what level of wealth does consumer expenditure begin to diversify into non-staples?

“\$3 per day is enough to purchase 3500 calories of maize meal at prevailing prices” (Tschirley 2015)

Demand-pull for higher-value products:

- Dairy, eggs, fish and meat
- Vegetable oils
- Possibly convenience foods



# Processed foods entering food baskets – impact on nutrition & food systems?

Table 7. Expenditure elasticities by food category, rural and urban [East and Southern Africa (ESA)]

Purchased food category	Rural	Urban	ESA wide
Non-perishable			
Unprocessed	0.75	0.51	0.69
Processed low	0.79	0.61	0.75
Processed high	1.07	1.00	1.05
Perishable			
Unprocessed	0.78	0.73	0.77
Processed low	1.14	1.07	1.12
Processed high	1.54	1.38	1.50

Source: Authors' calculations from Living Standards Measurement Study data. Mean of midpoint arc and Tobit-Engel's elasticities.

- A) Maize meal and sugars instead of maize (and legumes)
- B) Dairy and food away from home
- C) Meat and dairy products





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Demand-pull for higher-value products:

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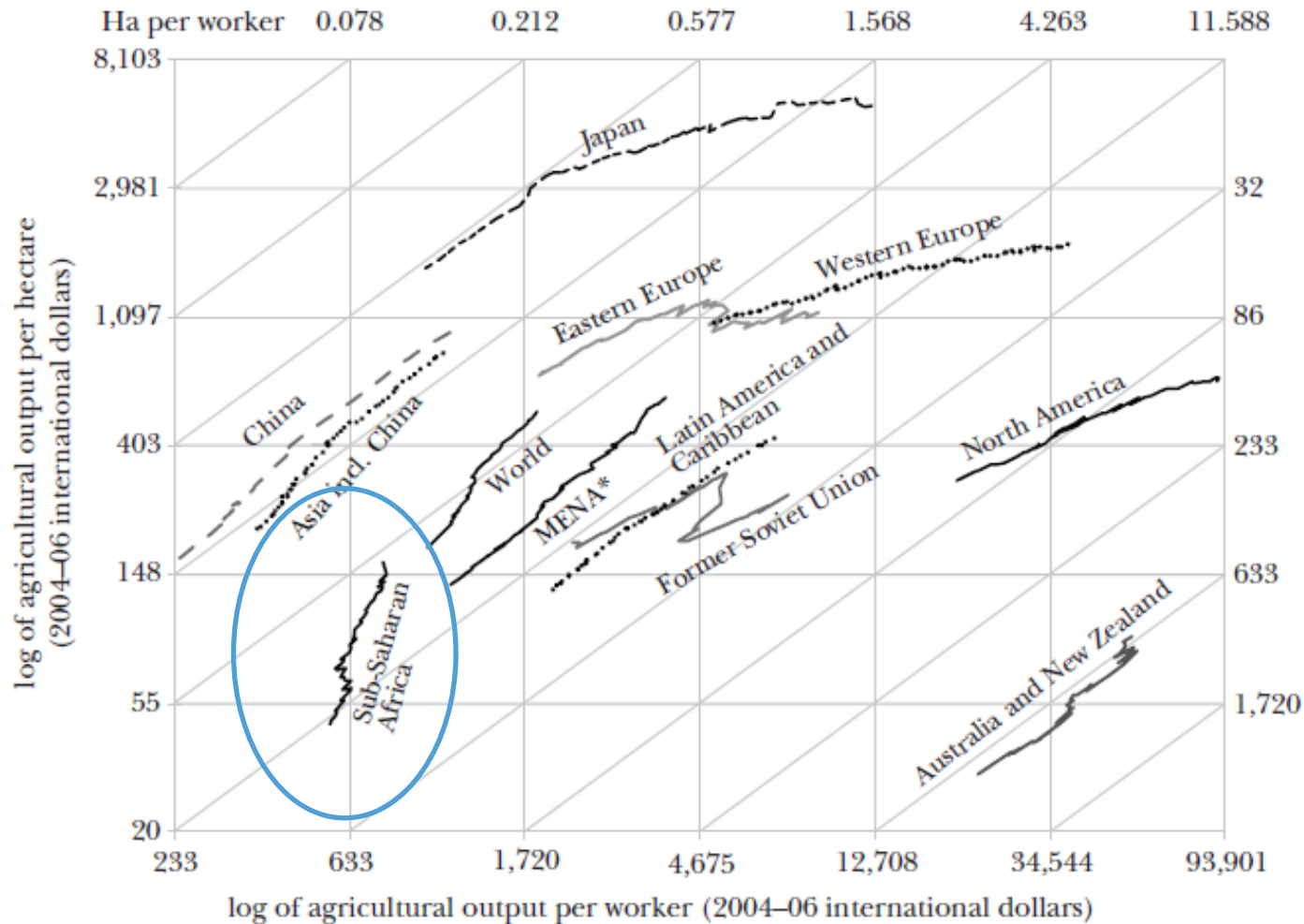
## African farming systems respond/adapt?

- “Climate-smart”
- Nitrogen-balanced
- “Resilient” to shock
- Labor-intensive
- Nutrition-driven
- Chain-integrated



# Catching up? agricultural productivity

Land and Labor Productivity by Region, 1961–2011



# Striking rural-urban similarities in diet and agriculture-nutrition linkages

What impact of crop diversification on household diet diversity in Uganda?

§ Similar dietary diversity in Central+ N+W regions (7.5-7.9) with East slightly lower (6.5)

Preliminary findings

§ farm production diversity by households increases their consumption diversity

§ farm production diversity leads to higher household caloric intake.



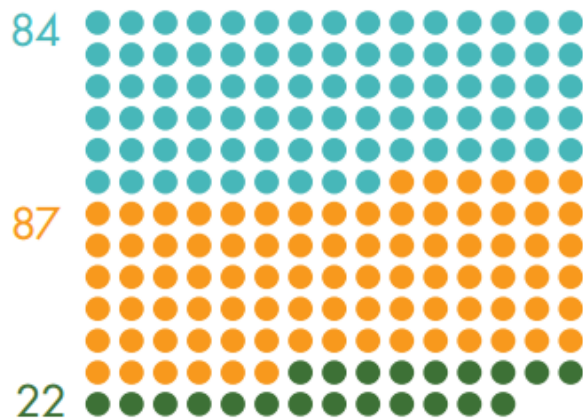
# Maximize contributions to nutrition, balance with other objectives

COUNTRY STATUS: ● No data ● Off course ● On course

## REDUCE STUNTING

in children under age five by 40%

Stunting—when children are too short for their age—is associated with a host of negative health, educational, and economic consequences.



## PREVENT OVERWEIGHT

among children under age five from increasing

Overweight and obese children are more likely to develop noncommunicable diseases like diabetes and cardiovascular diseases at a younger age.



## CUT WASTING

in children under age five to less than 5%

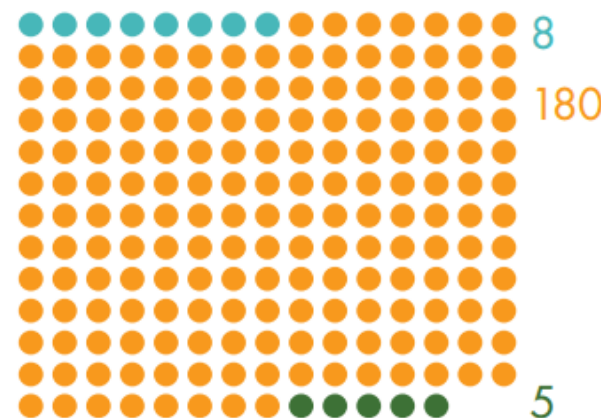
Wasting—when children are too thin for their height—increases the risk of death from nutrition-related causes.



## HALVE ANEMIA

in women of reproductive age

Anemia—a form of iron deficiency and the most widespread nutritional disorder in the world—results in ill health, lost earnings, and premature death.

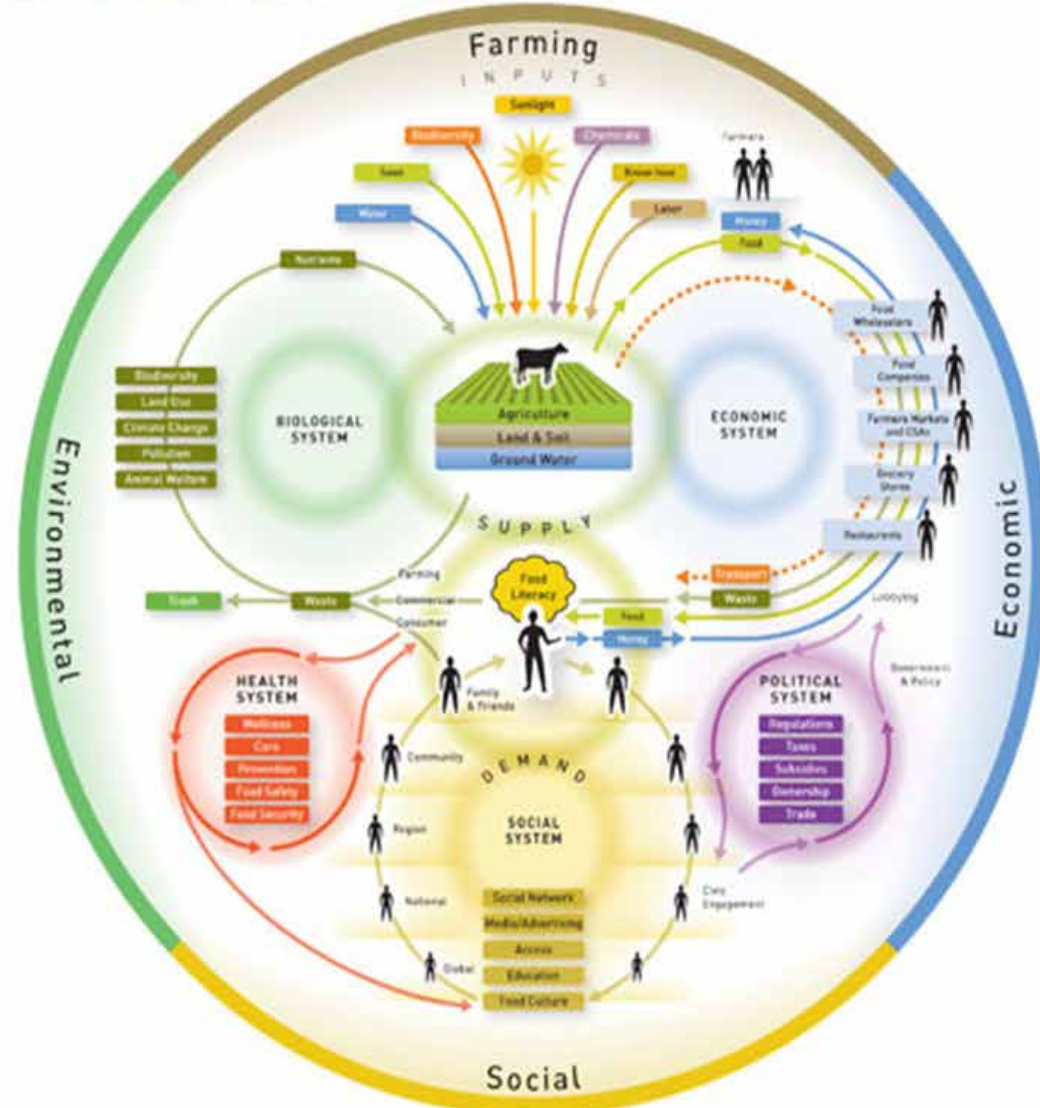


# Focus on food systems

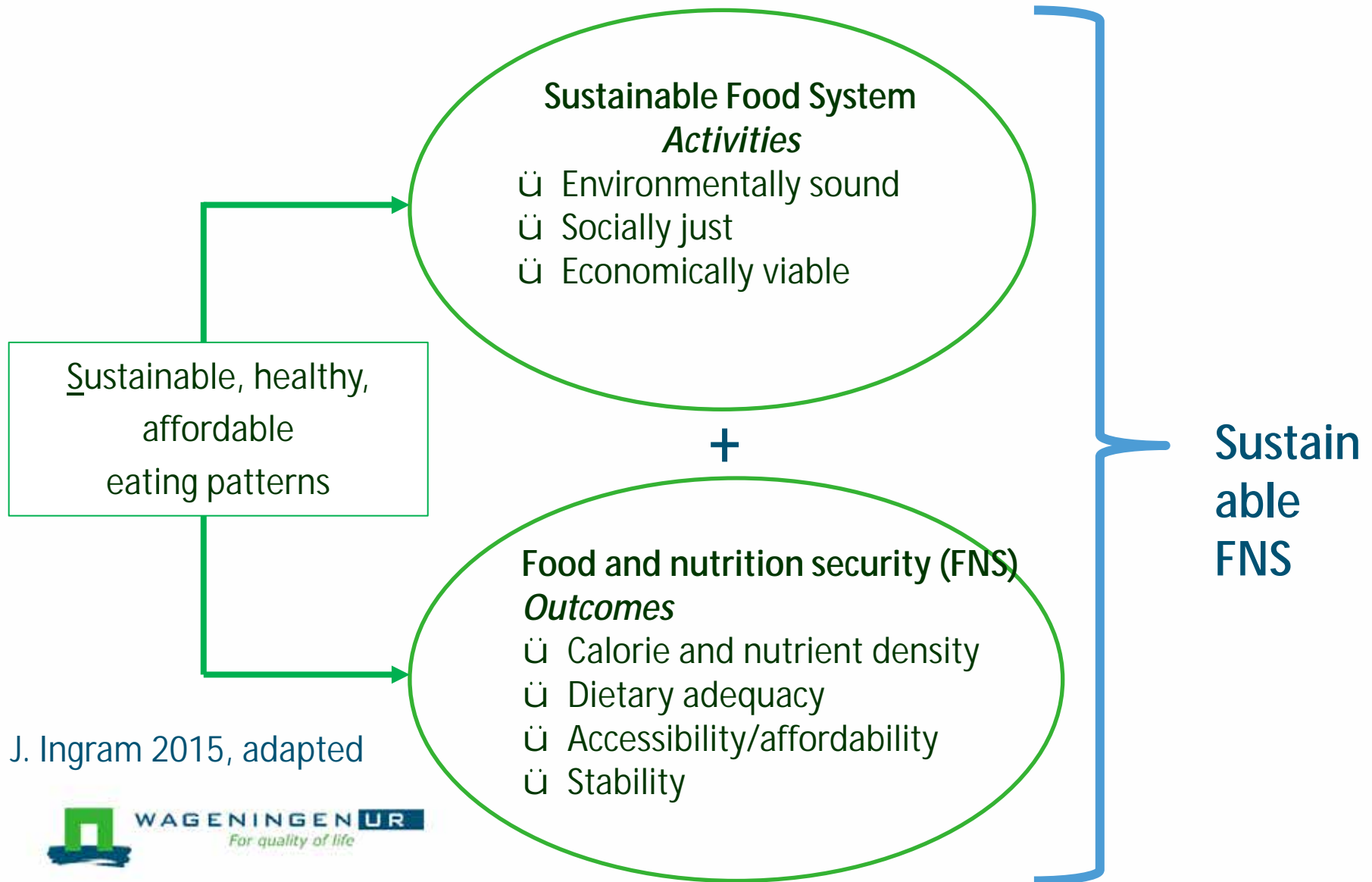
## KEY ASPECTS

- Consumer orientation (behaviour)
- Understanding change & dynamics
- Multiple levels
- Horizontal (space) & vertical (chain) dimensions
- Policy & Governance
- Health & sustainability outcomes

## FOOD SYSTEM MAP



# Healthy diet from a sustainable food system



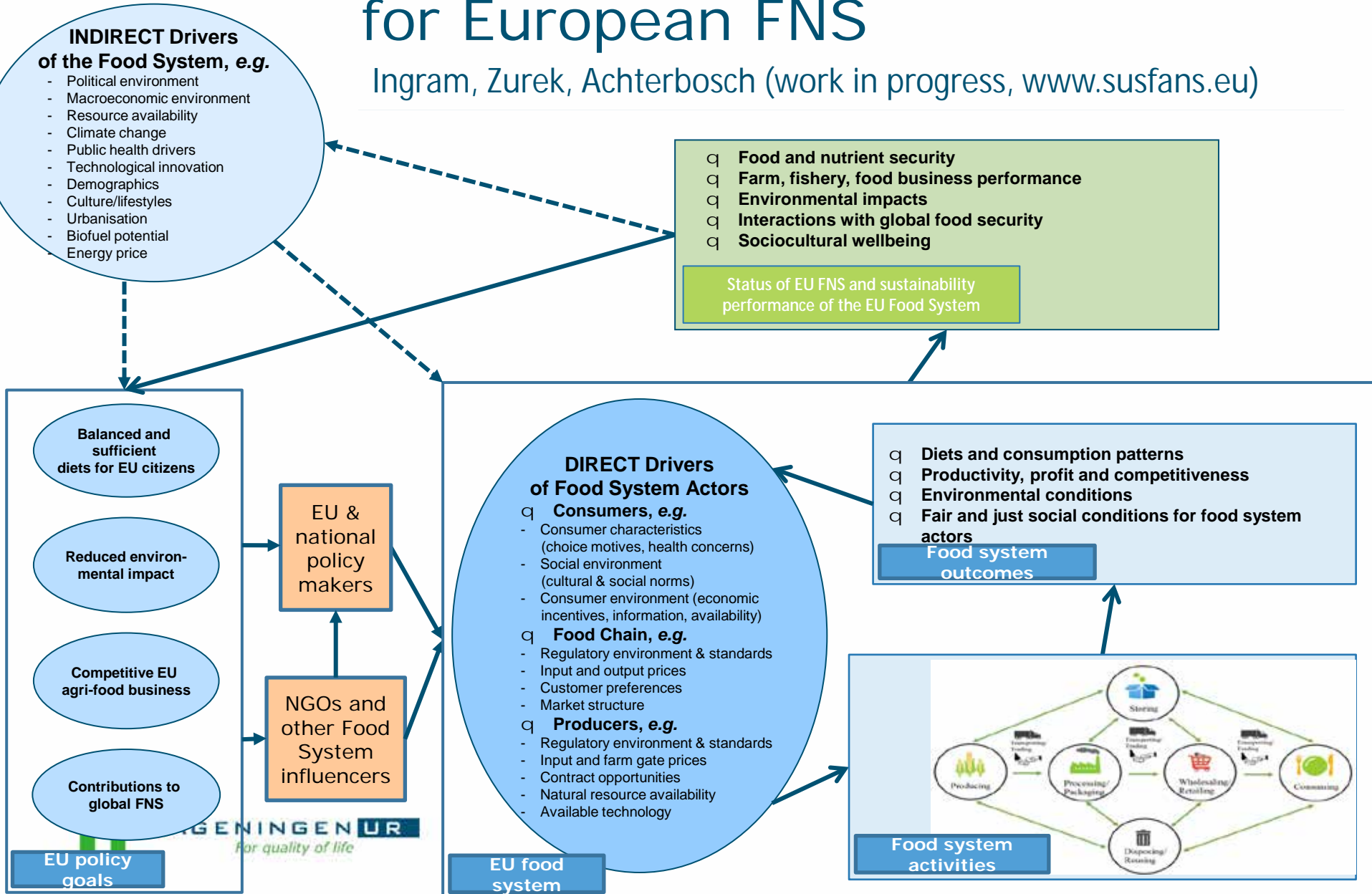
J. Ingram 2015, adapted



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# SUSFANS project – food systems for European FNS

Ingram, Zurek, Achterbosch (work in progress, [www.susfans.eu](http://www.susfans.eu))





# *"Food systems for healthier diets"*

Flagship under CGIAR program A4NH from 2017 onwards, hosted by Wageningen UR

## 3 Pillars:

1. Food System Diagnostics: Metrics & Models on food systems & diet quality at regional/country level (in 4 countries)
2. Nutrient-sensitive value chains: Fruit & vegetables  
Dairy  
Aquaculture  
Poultry & eggs  
+ Processed foods
3. Food system Innovations: Consumer choice experiments  
(demand-side innovations) (nudging) in innovation platforms & business networks

# FNS through food systems (1)

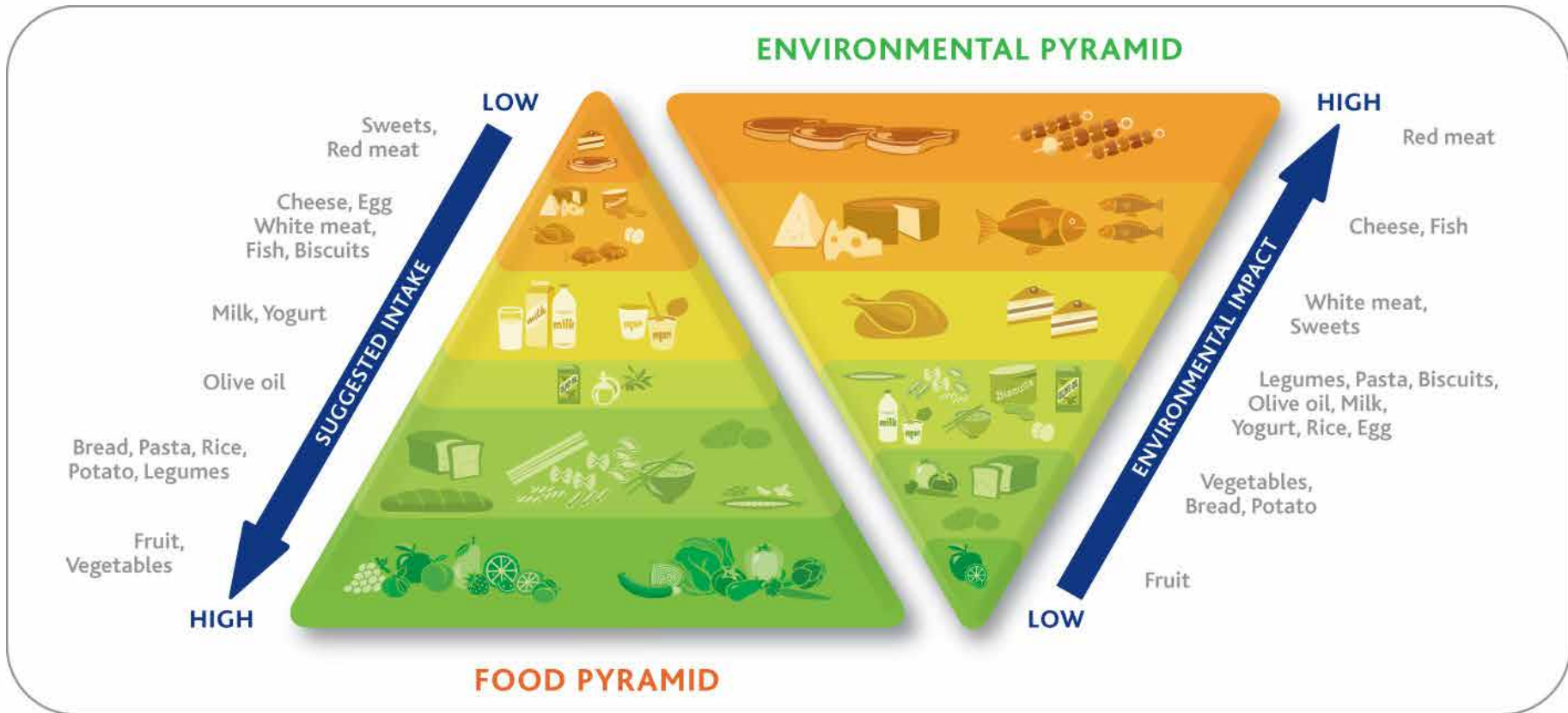
Nutrient availability for human consumption

§ Farming systems, crop diversity, and mixed crop-livestock systems, logistics & trade

§ Sustainable nutrition: competition food & feed

§ Landscape planning, ecosystem services

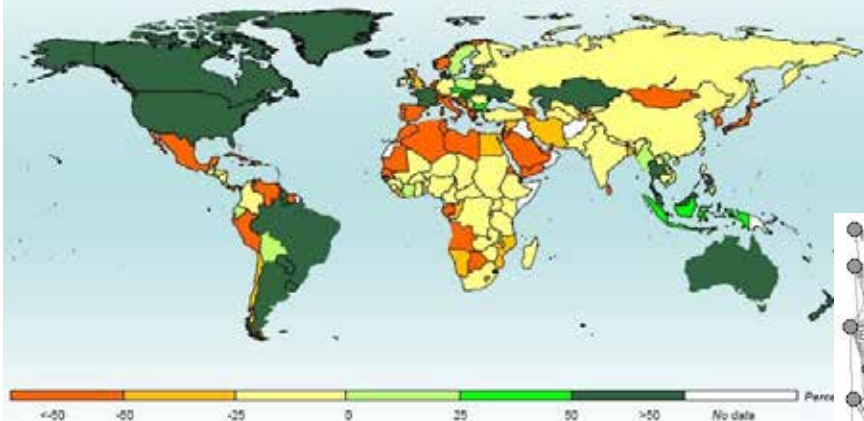
# Food & Environment



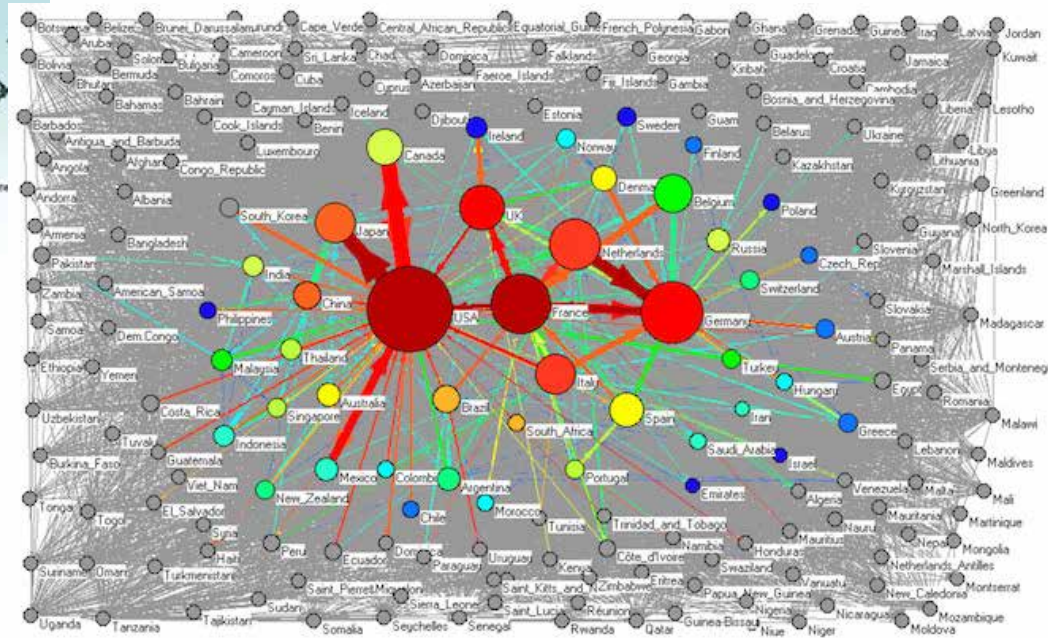
# Food trade

Role of Net Food Trade in Food Consumption \*

2003 - 05



\* (Food Exports - Food Imports) / Food available for human consumption in terms of dietary energy

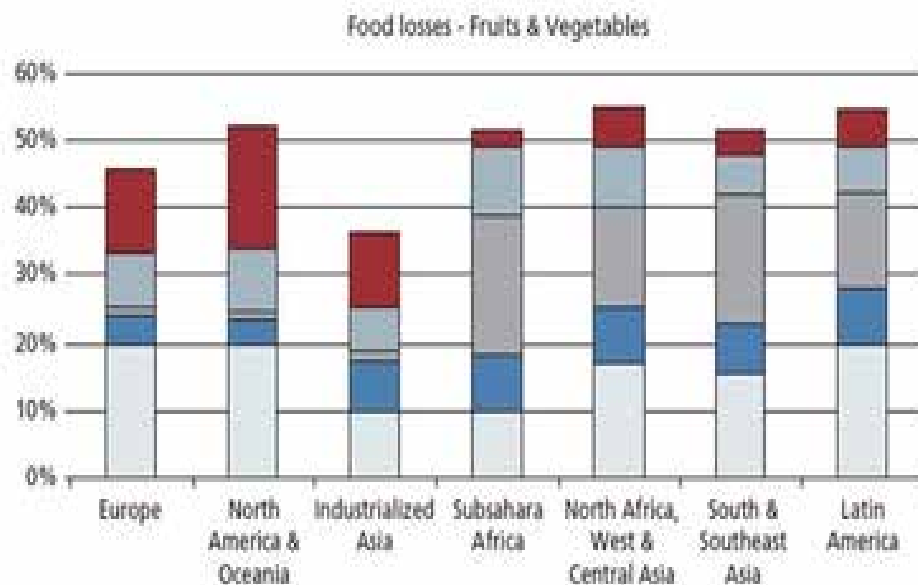


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# Post harvest losses

Figure 6. Part of the initial production lost or wasted at different stages of the FSC for fruits and vegetables in different regions



Harvesting/field drying	4-8%
Transport to homestead	2-4%
Drying	1-2%
Threshing/shelling	1-3%
Winnowing	1-3%
Farm storage	2-5%
Transport to market	1-2%
Market storage	2-4%
<b>Cumulative loss from production</b>	<b>10-23%</b>

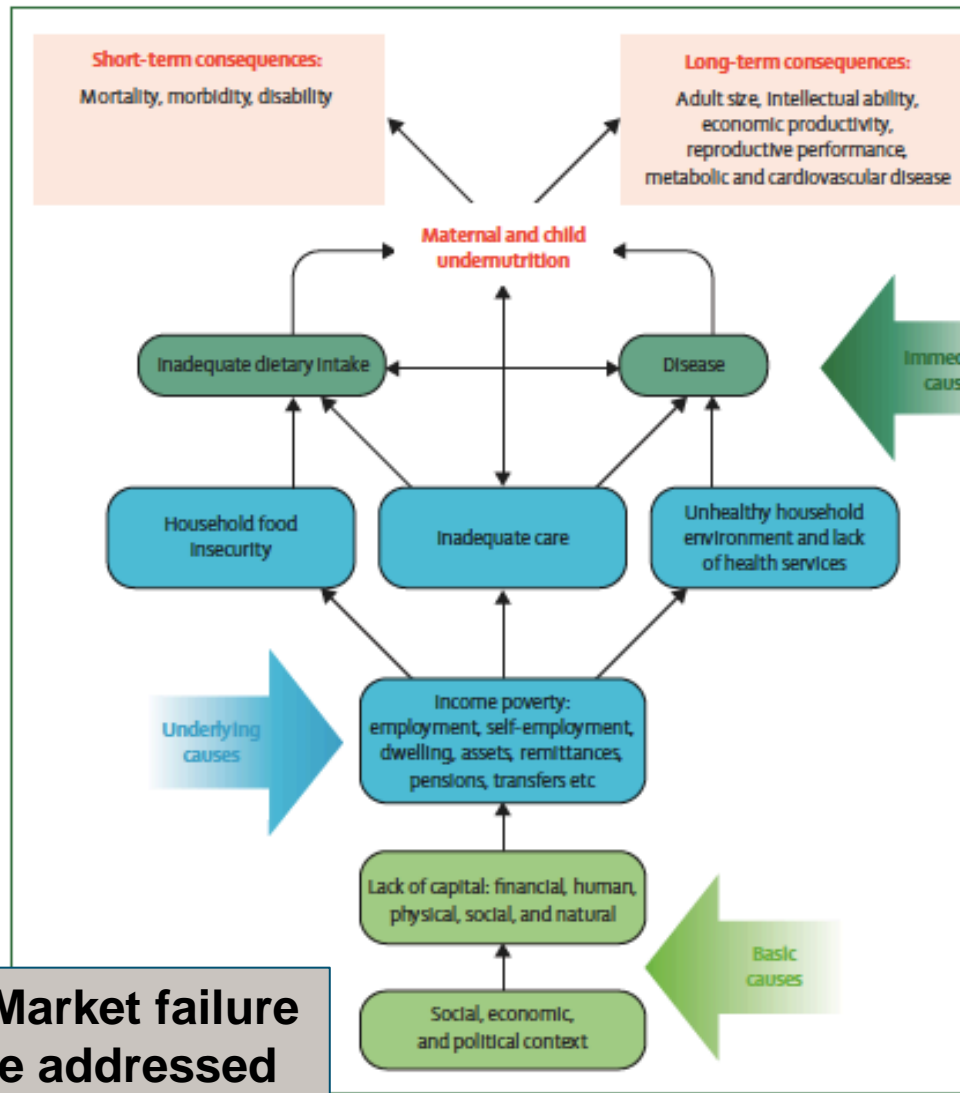
# FNS through food systems (2)

Micronutrient deficiencies among children and women

§ Targeted interventions at the intersection of health and nutrition sectors (e.g. fortified foods, complementary feeding)

§ biofortified crops and crop diversification (agriculture for nutrition)

**Policy and Market failure Issues to be addressed**



# FNS through food systems (3)

Greater diversity in the diet

§ Availability and affordability of nutritious foods

- Legumes? (bio-availability)

§ Making the healthy and sustainable choice attractive for consumers

§ Innovation & social innovation

§ Education and policy incentives



# Shift from Agricultural to Food Policy

## OUTCOMES

Food Availability

Food Access

Food Use

Food Stability



## IMPACT

Health

Environment



## INSTRUMENTS

- Incentives (nudging)
- Rules & legislation
- Signalling (Information / certification)



# Thank you for your attention



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