

Maximizing Impact Across Food Systems

Kelly D. Brownell

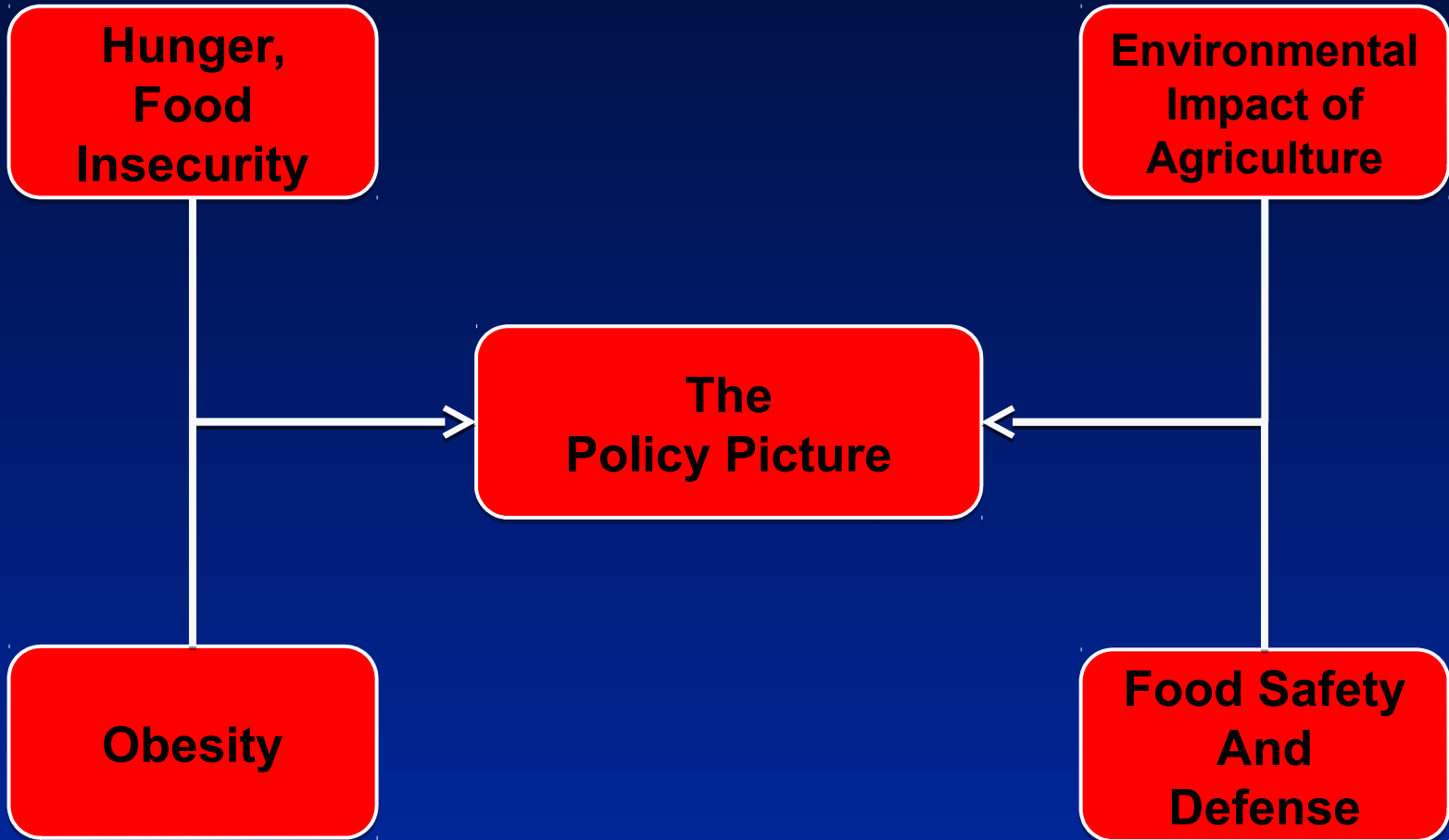




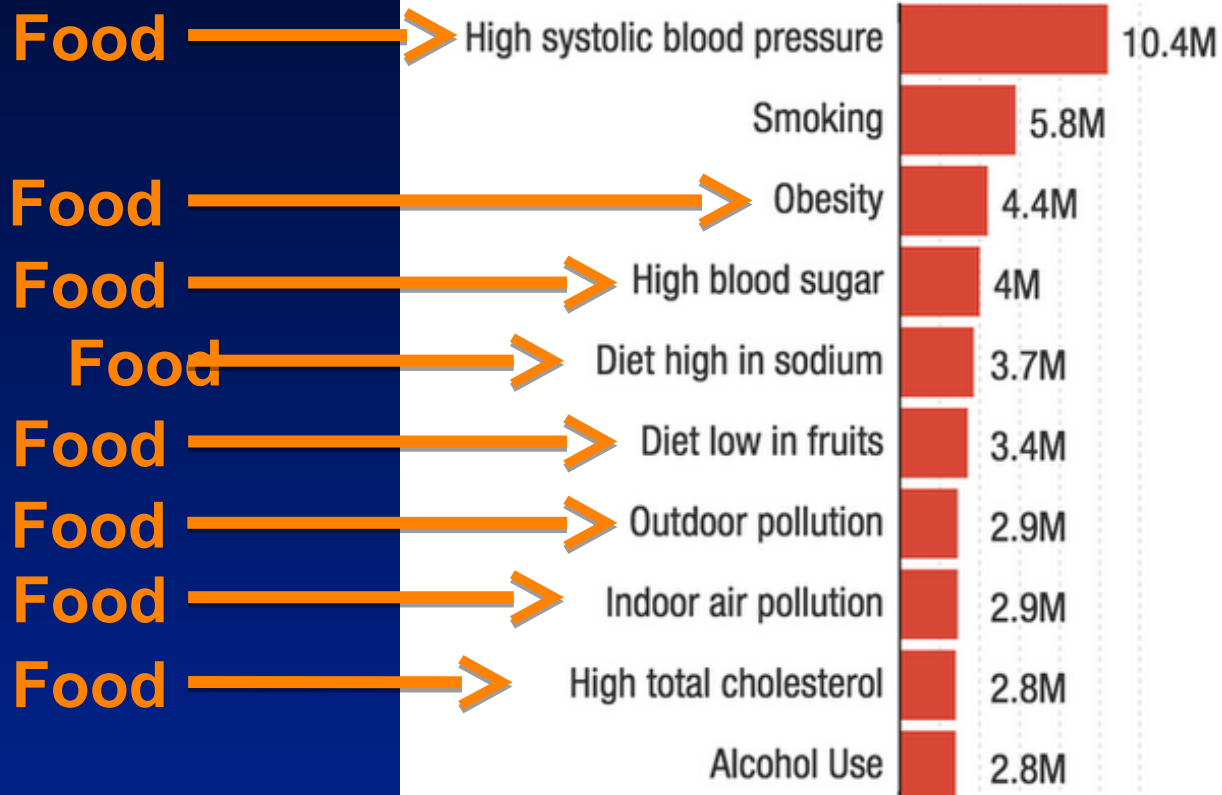
Duke
SANFORD

World Food Policy Center

World Food Issues



Top 10 Risk Factors For Global Deaths, 2013

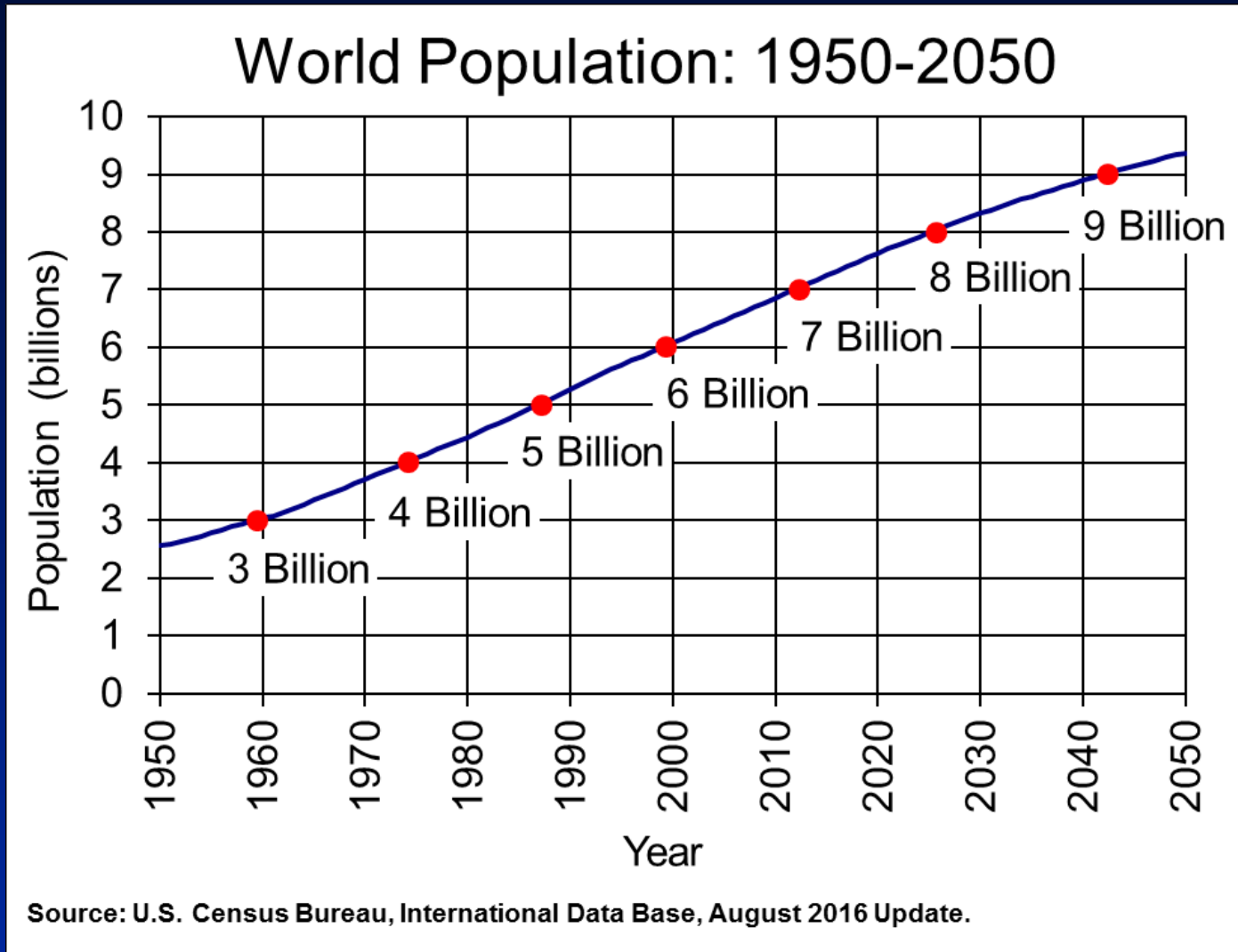


Food Insecurity



**821 million people are
chronically
undernourished**

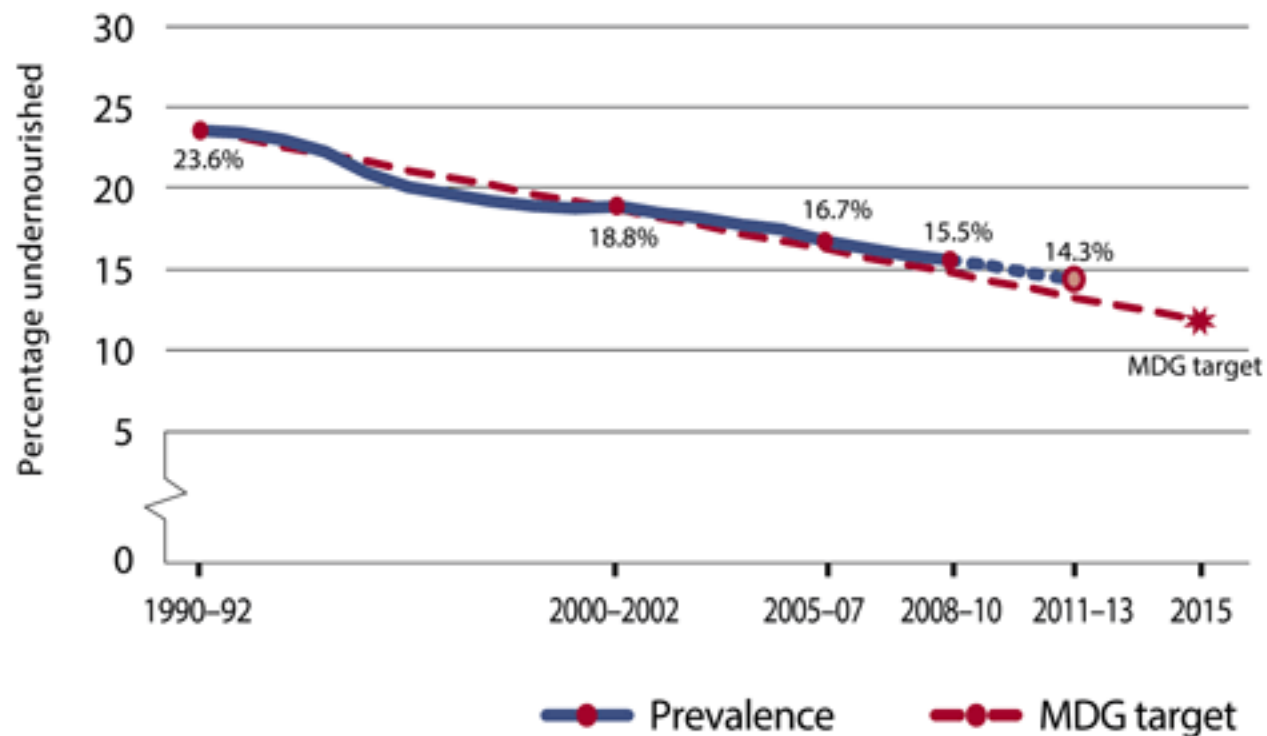
Expected Population Growth



Can This Possibly Be Done?

**The world must produce
as much food
in the next 40 years
as it has
in the last 8000**

Some Good News?



Note: Data for 2011-13 refer to provisional estimates. Source: Adapted from FAO, SOFI 2013.



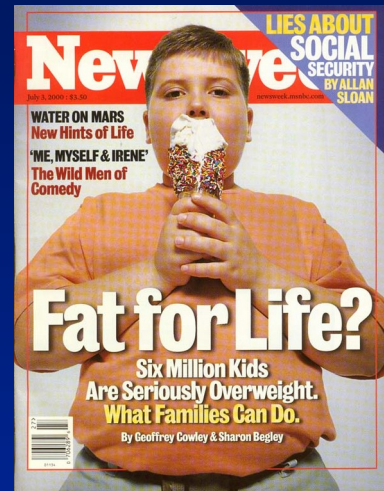
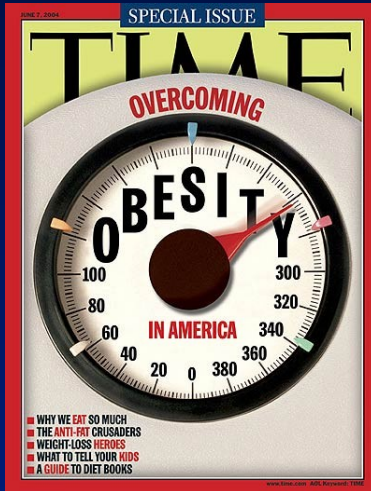
“Evidence continues to signal a rise in world hunger.”

2015 795 million

2016 804 million

2017 821 million

Obesity



Projected % Increase in Diabetes, 2000 - 2030



Yach, Stuckler, Brownell
Nature Medicine, 2006

Changes in Food Norms

Where we eat

When we eat

What we eat

How much we are served

Marketing



4
FOURTHMEAL

THE MEAL BETWEEN
DINNER & BREAKFAST

WHEN YOU'RE OUT LATE, WE KNOW THAT YOU'RE
CRAVING MELTY, CRUNCHY, SPICY AND GRILLED.

YOU'RE CRAVING FOURTHMEAL.

CLICK THE SQUARES TO LEARN ABOUT FOURTHMEAL.

**IT'S NOT JUST FOOD.
IT'S FOURTHMEAL.™**

IF YOU LOVE IT

FRY IT

IF YOU DON'T LOVE IT

FRY IT

UNTIL YOU LOVE IT



Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19.2 million participants

*NCD Risk Factor Collaboration (NCD-RisC)**

“If post-2000 trends continue, the probability of meeting the global obesity target is virtually zero.”

Lancet, 2016

Food Insecurity & Obesity Intersect

Common drivers

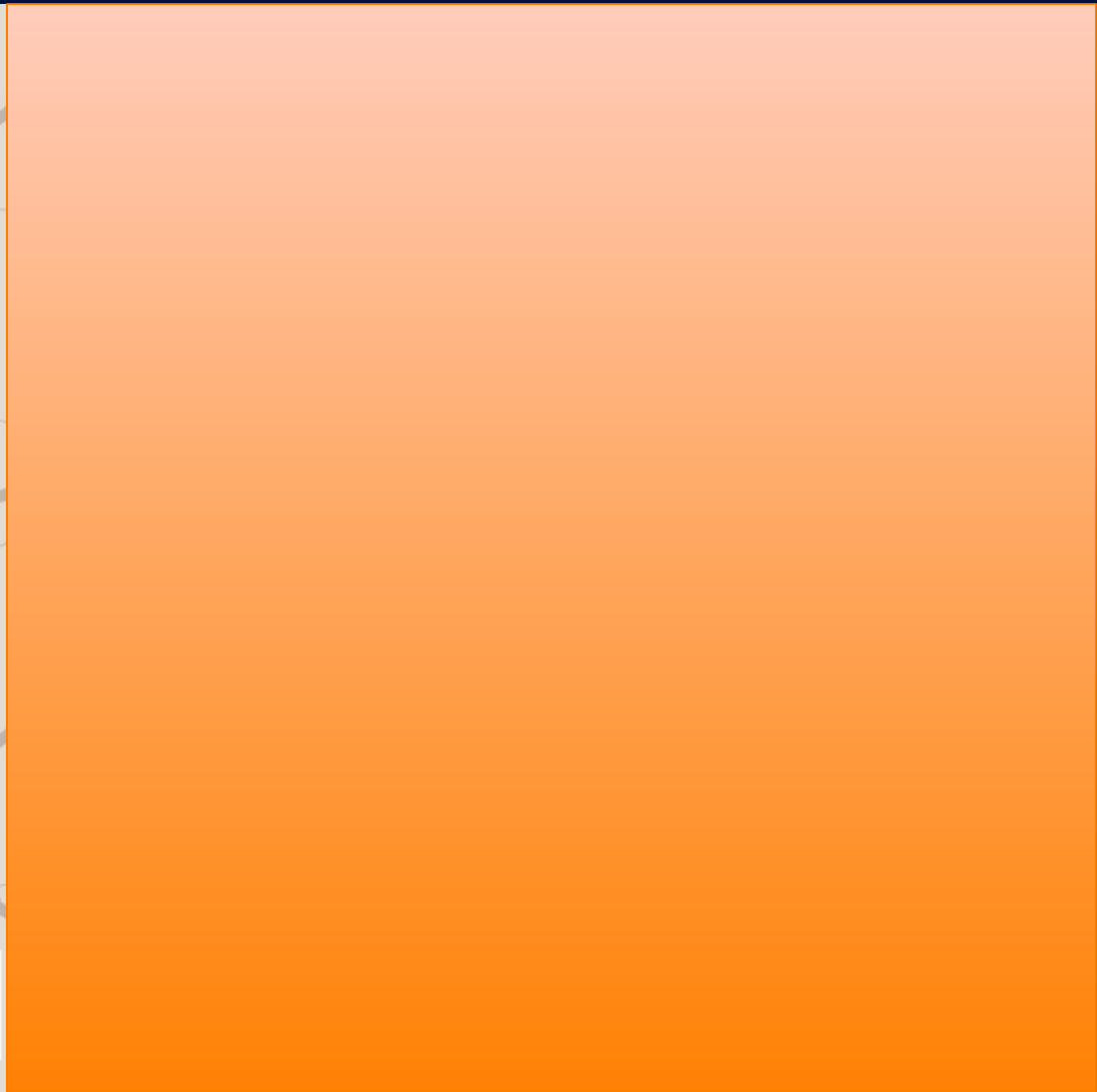
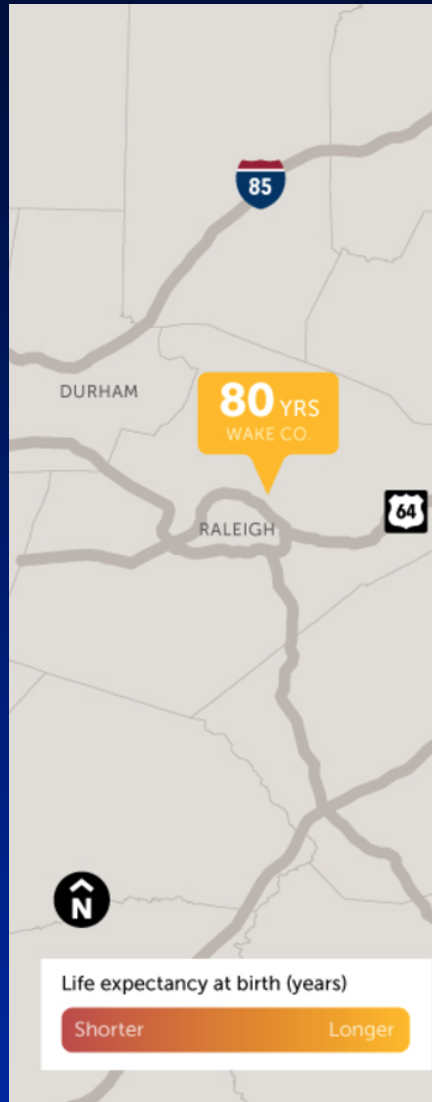
The dual burden

**Early nutrition experiences
(stunting and obesity)**

1 Highway, 5 Counties, 7 Years



Driving east, Life expectancy drops 256 days every 10 minutes



Short Distances to Large Gaps in Health

Life expectancy at birth (years)

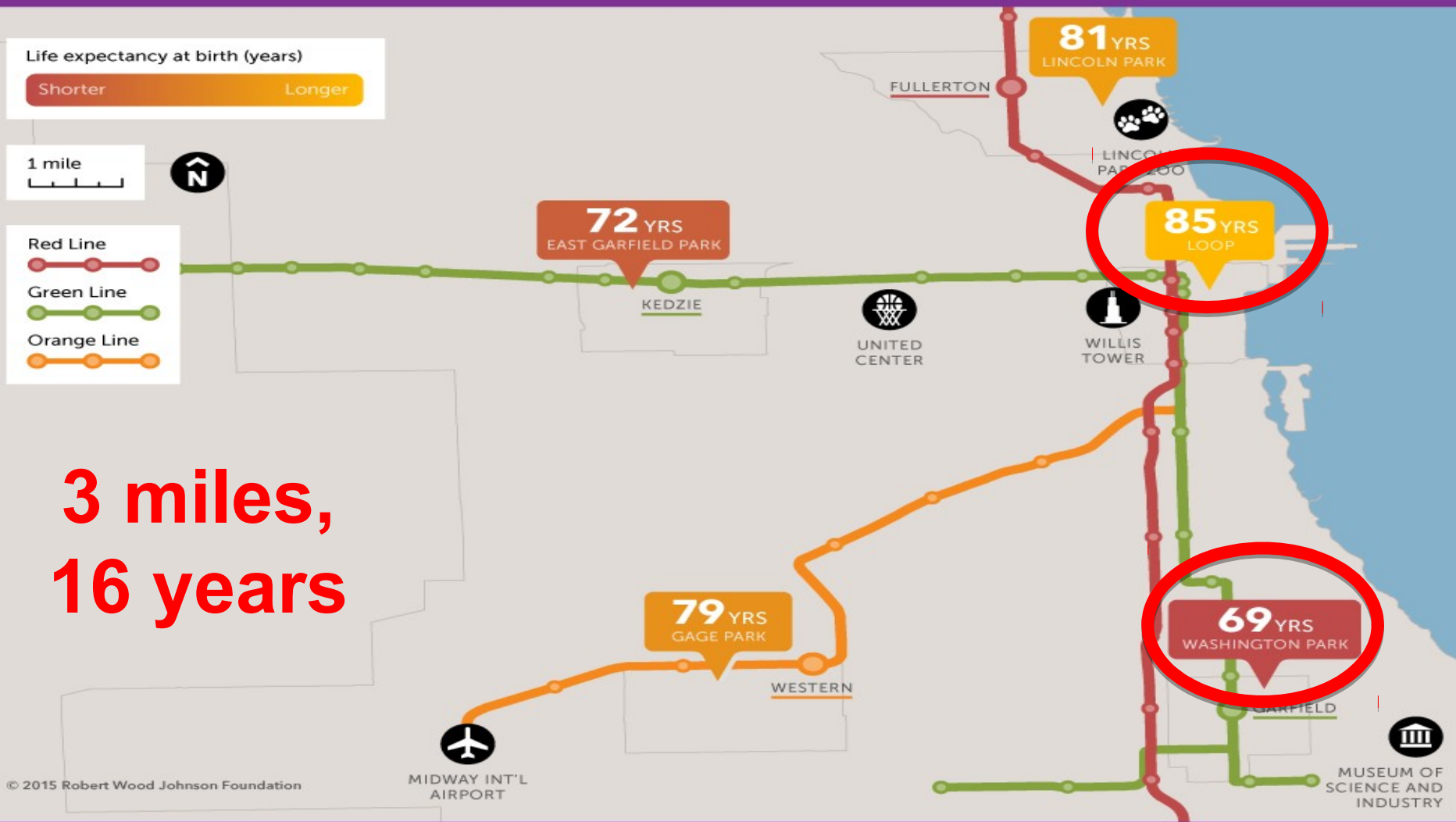
Shorter Longer

1 mile



Red Line
Green Line
Orange Line

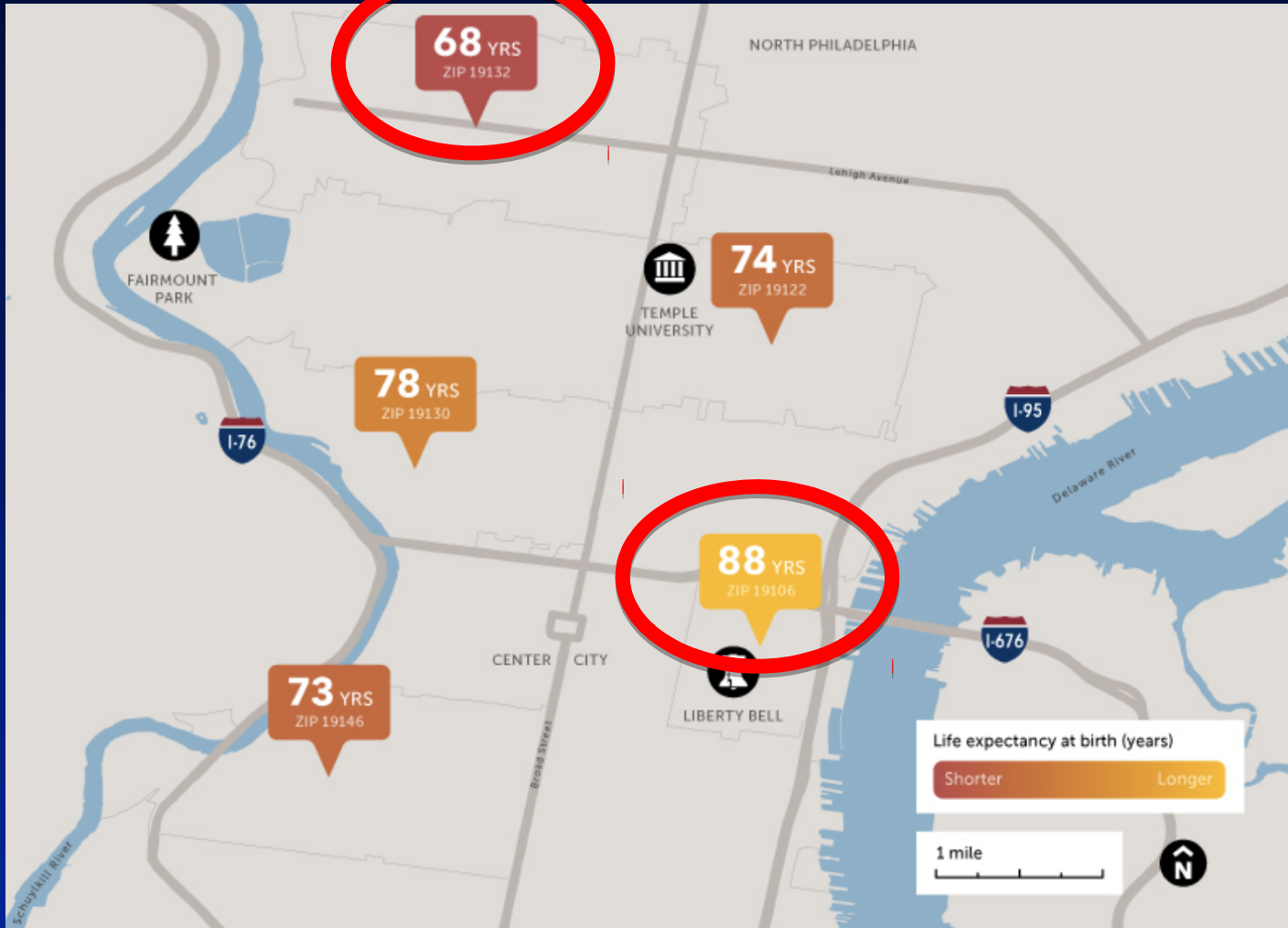
**3 miles,
16 years**



© 2015 Robert Wood Johnson Foundation

Philadelphia

4 miles = 20 years



Some Good News

Information Defaults

Economic Defaults

Access Defaults

Soda Taxes Passed in US

Berkeley

Oakland

San Francisco

Albany, CA

Boulder

Seattle

Philadelphia

Boulder

Navajo Nation

~~**Chicago/Cook County**~~

Taxes Passed Outside US

Barbados

Belgium

Brunei

Chile

Dominica

Fiji

Finland

France

French Polynesia

Hungary

India

Kiribati

Mauritius

Mexico

Norway

Palau

Philippines

Portugal

Samoa

Saudi Arabia

South Africa

Spain (Catalonia)

St. Helena

Thailand

Tonga

Vanatau

Agriculture



Environment

Water depletion

Antibiotic resistance

Water contamination

GMOs

Land degradation

Animal welfare

Monoculture

Biodiversity

Dead zones

Fossil fuel use

Deforestation

Climate change

Water



By 2030

**Half the world's population
will be in areas
of high water stress**

<https://www.un.org/waterforlifedecade/scarcity.shtml>

In less than 3 months, a major international city will likely run out of water



News > World > Africa

Cape Town could become first major city in world to run out of water after 90-day warning

South African city's mayor warns supply will run dry in April on 'day zero'





i

Kainaz Amaria/NPR

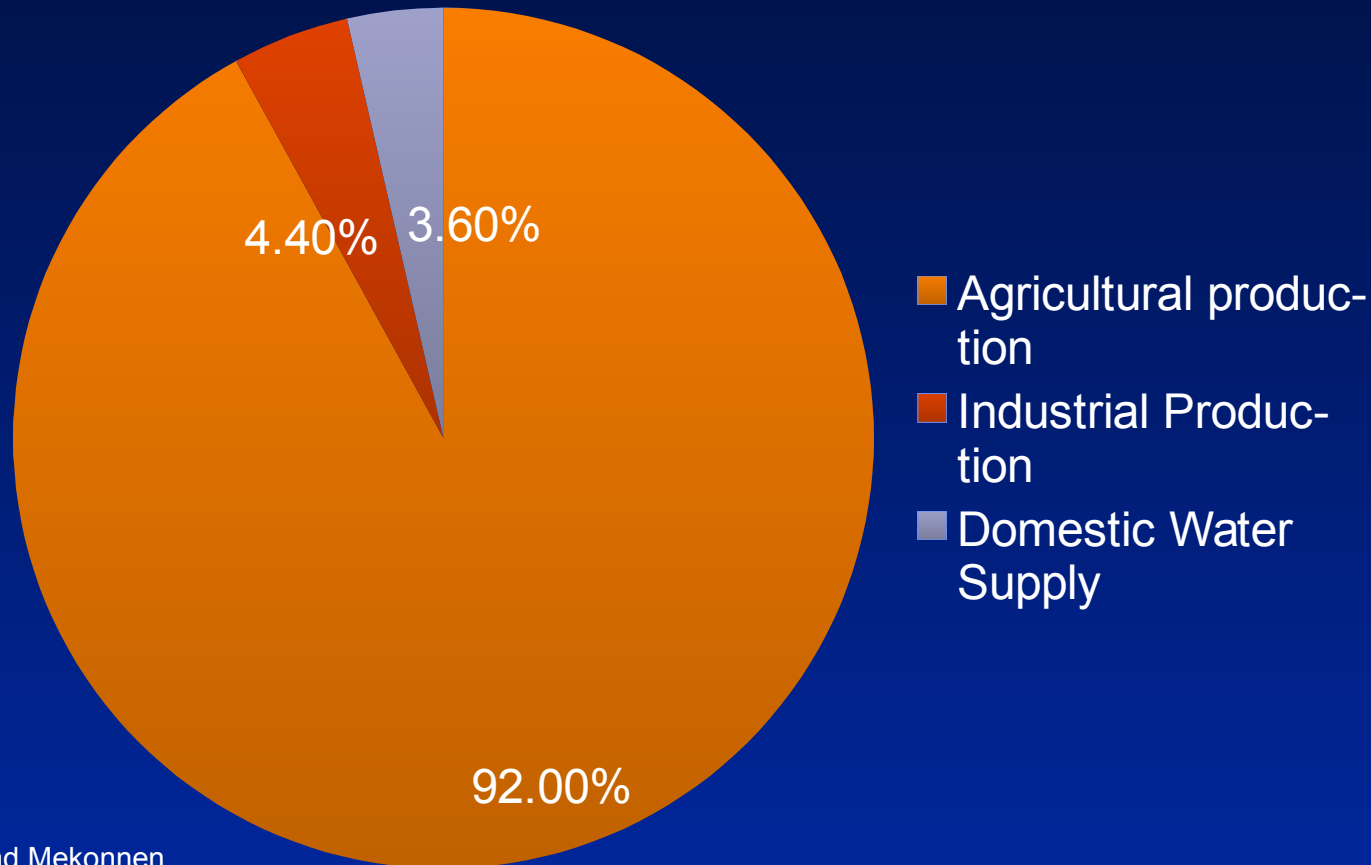
parallels - world news

As Brazil's Largest City Struggles With Drought, Residents Are Leaving

In Sao Paulo, home to 20 million people, water shortages have become part of daily life. Some residents are leaving for lush regions. Ecologists say Amazon deforestation may be affecting rainfall.

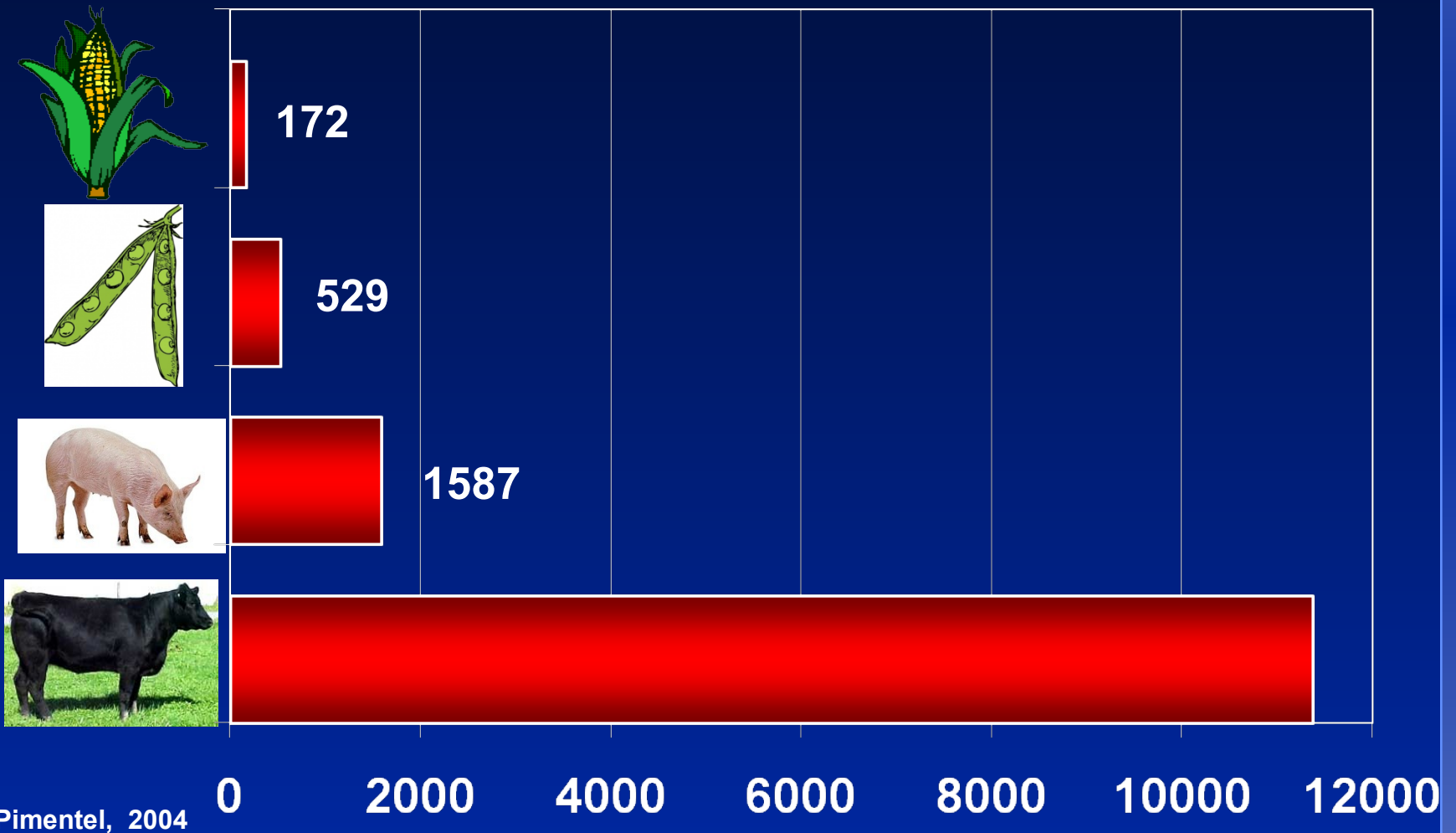
NPR, 11-22-15

Global water footprint of production (1996–2005)



Hoekstra and Mekonnen
Proceedings of the National Academy of Sciences, 2012

Gallons of Irrigated Water to Produce 1 kg of...

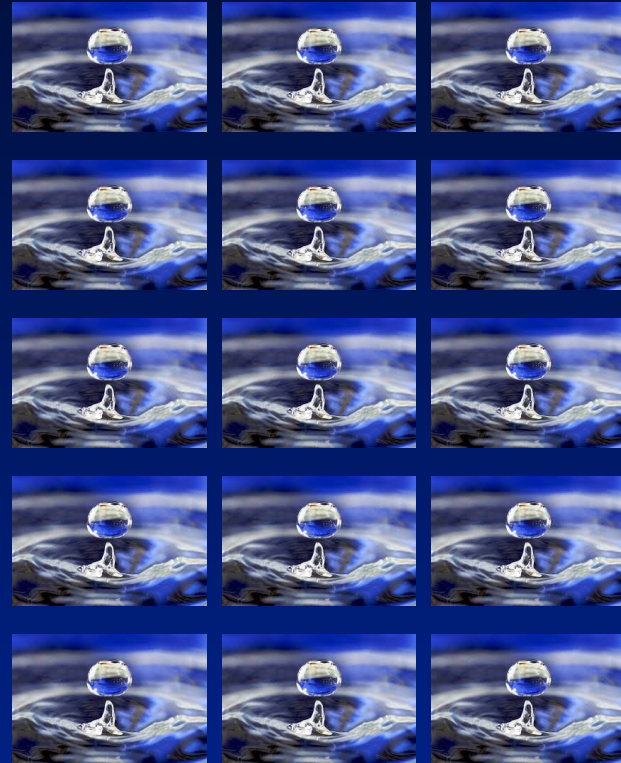


Plant Based Diet



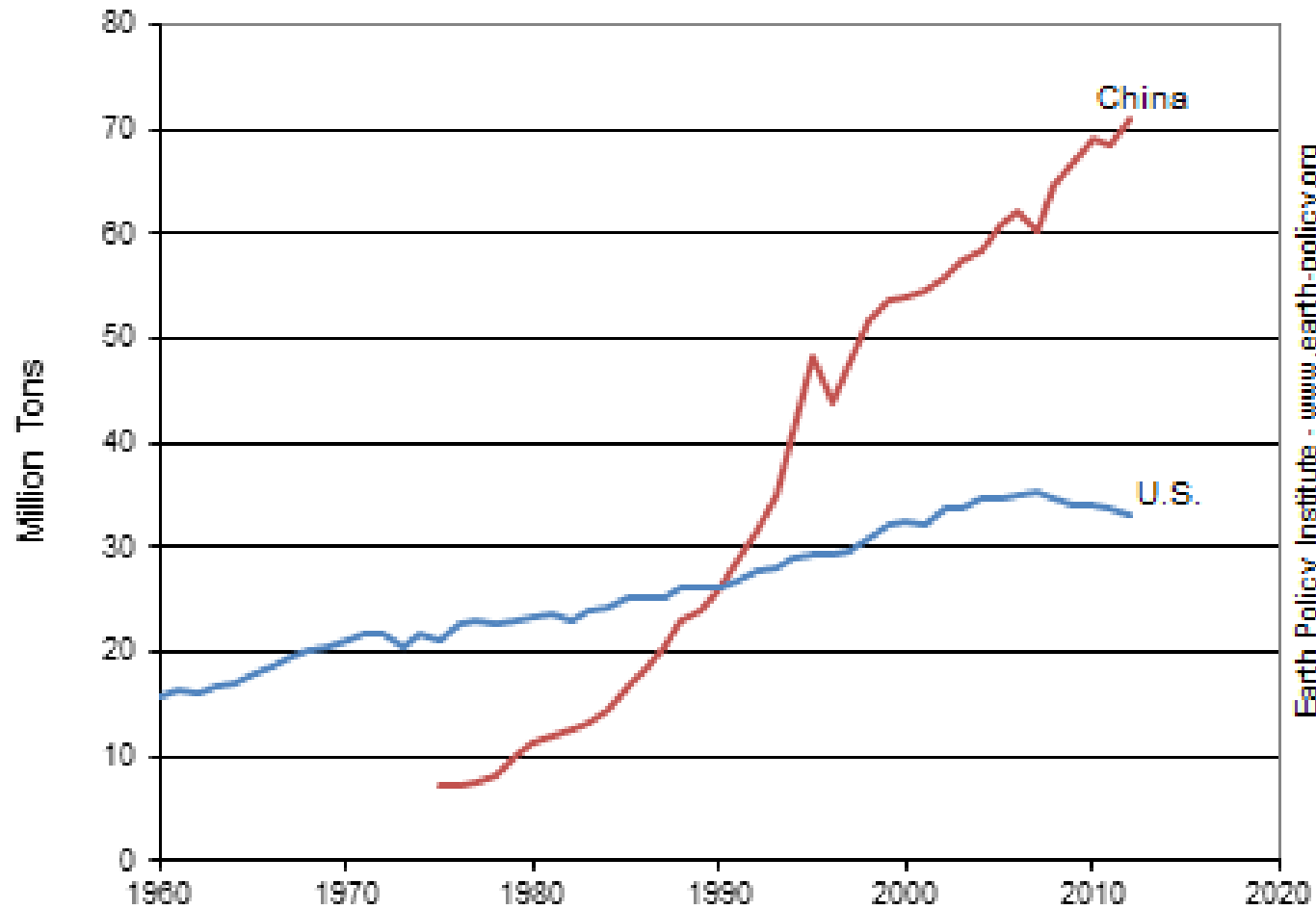
1m³ per day

Meat Based Diet



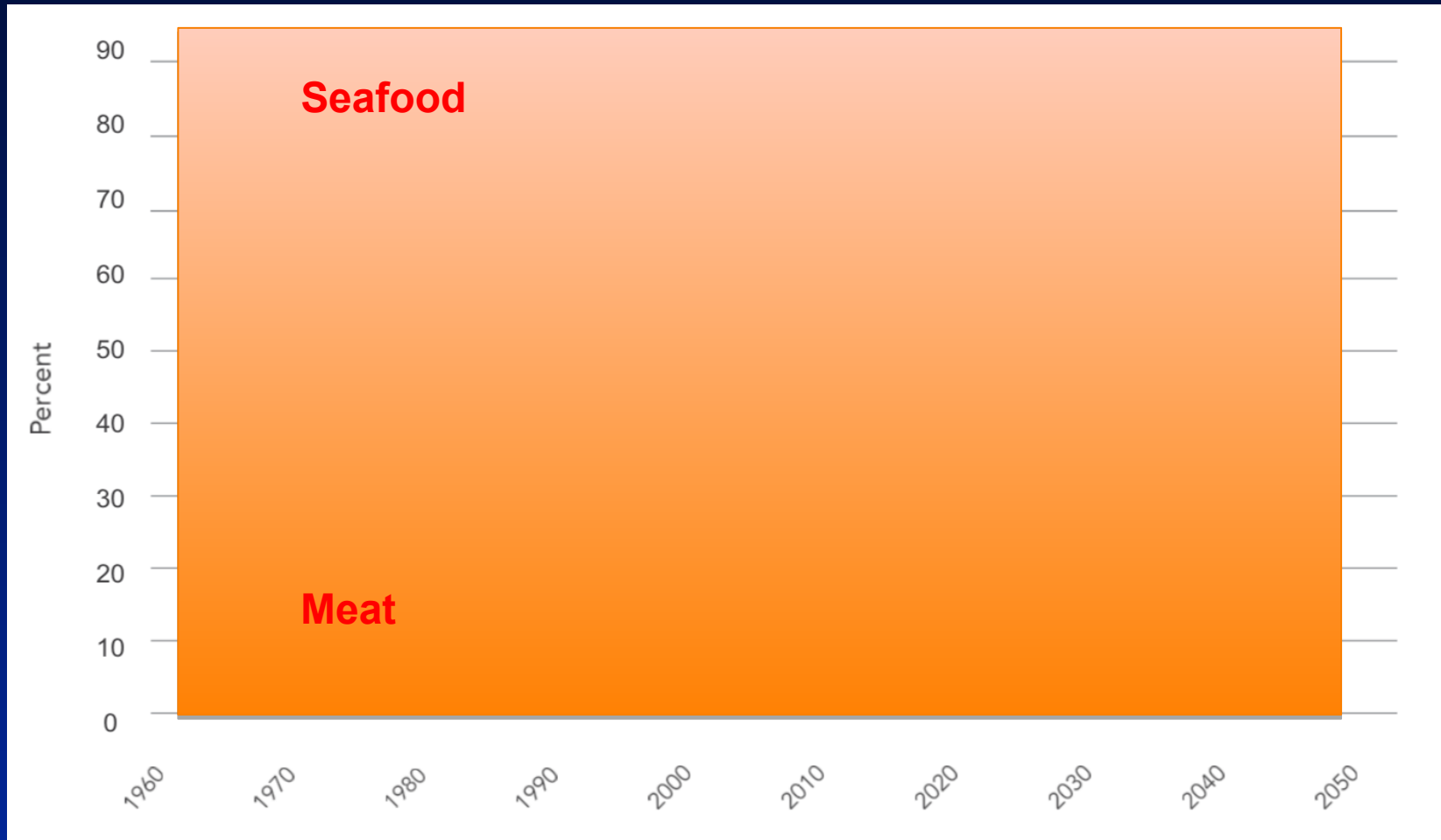
15m³ per day

Meat Consumption in China and the United States, 1960-2012



Source: USDA

Food Consumption in Japan, 1960-2050





Climate Change



livestock's long shadow
environmental issues and options



**Global greenhouse
gas emissions from
animal agriculture
exceed
emissions from
transportation**

Steinfeld et al., 2006
Rome, FAO

WHEAT REGION SHIFTS NORTH





Food and Agriculture
Organization of the
United Nations

2016

THE STATE OF WORLD FISHERIES AND AQUACULTURE

CONTRIBUTING TO
FOOD SECURITY AND
NUTRITION FOR ALL

“The fisheries and aquaculture sector plays and can continue to play a prominent role in world food security”
“Climate change, variability and extreme weather events are also compounding threats to the sustainability of capture fisheries and aquaculture development in marine and freshwater environments...”



Women from a traditional sea-harvesting community fishing in Mozambique.

Fall in fish catch threatens human health

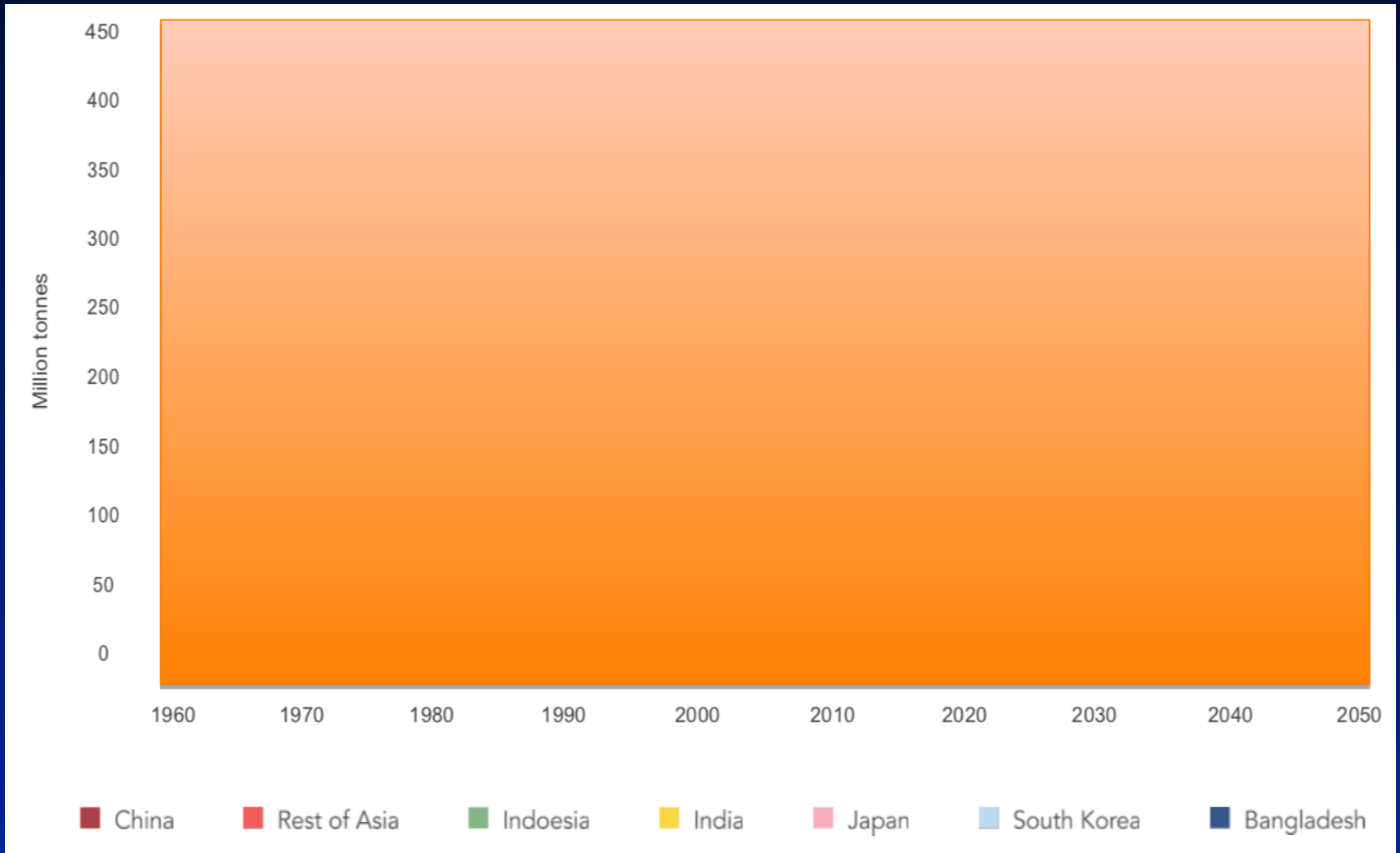
CHARTING ASIA'S PROTEIN JOURNEY



**Meat & seafood consumption
will rise**

**Due to increased wealth and
urbanization**

Projected Meat & Seafood Consumption in Asia

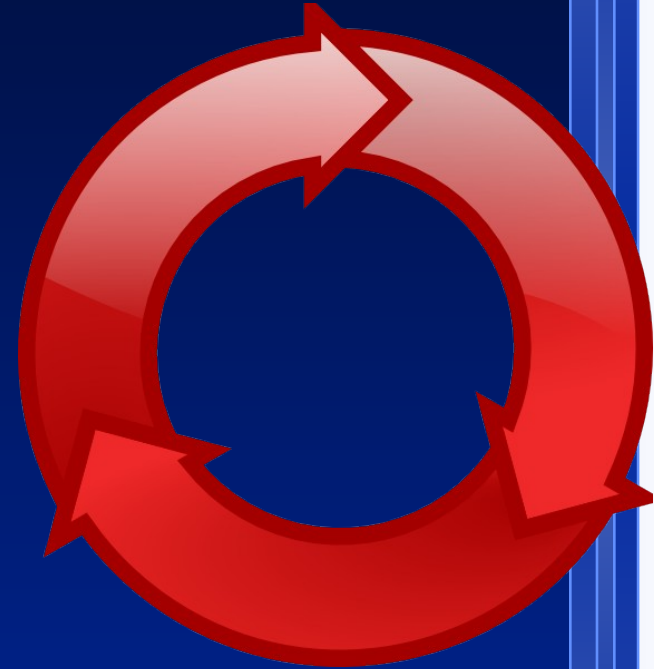


From Now to 2050

Will Increase By

Meat & seafood consumption	78%
Resulting greenhouse gas emissions	90%
Land use for production	81%
Water use	83%
Antimicrobial use	44%

Agriculture



Environment

Food Safety and Food Security

Food Policy Is

Health policy

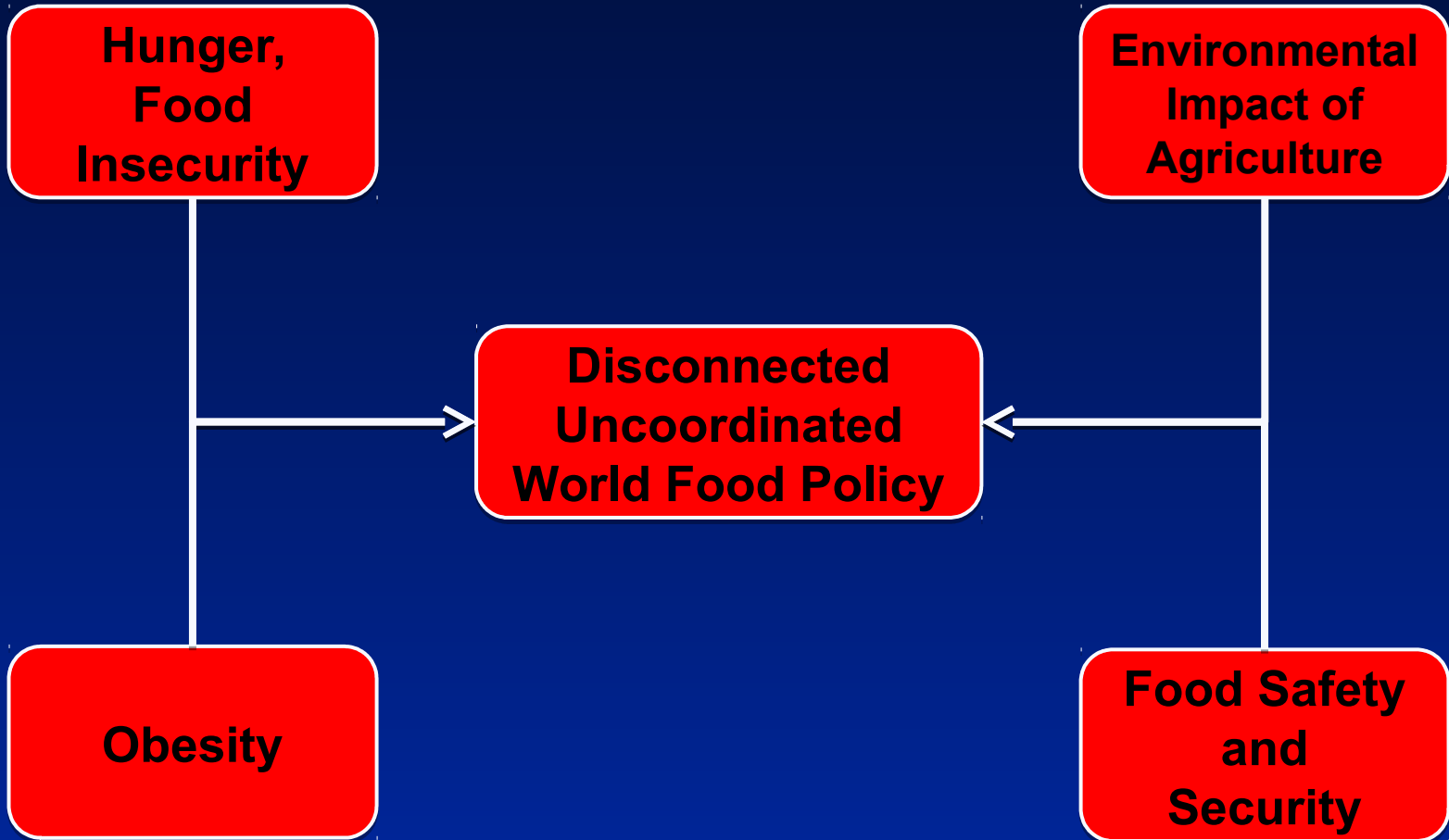
Environment policy

Education policy

Development policy

Foreign policy

The Problem





Examples of Conflicts

- **Food industry growth vs public health**
- **Green Revolution vs. the environment**
- **SNAP benefits and soda**
- **Corn to ethanol supports**
- **Development and nutrition**

2030 Sustainable Development Goals

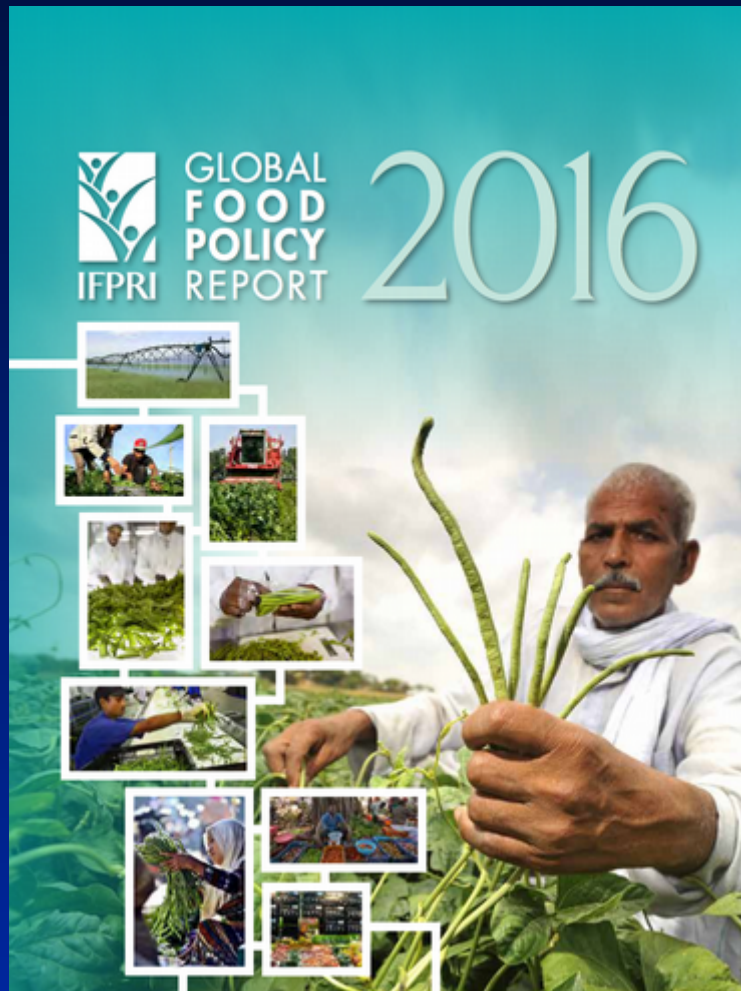




End hunger, achieve food security and improved nutrition and promote sustainable agriculture

-
- **End all forms of malnutrition**
-
- **Ensure sustainable food production systems that increase production and productivity**
-
-
-
-

“How We Feed the World is Unsustainable”



**How Far Can
Technology Take Us?**

**Who Is Watching
The Store?**

**Hunger,
Food
Insecurity**

**Environmental
Impact of
Agriculture**



Obesity

**Food Safety
and
Security**

**Hunger,
Food
Insecurity**

**Environmental
Impact of
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Obesity

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**World Health
Organization**

Obesity

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**Food and Agriculture
Organization of the
United Nations**

Obesity

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Agriculture**

THE
ROCKEFELLER
FOUNDATION

BILL & MELINDA
GATES *foundation*

Obesity

**Food Safety
and
Security**



Duke
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World Food Policy Center

Expertise

**Hunger,
Food
Insecurity**

Economics

Agriculture

Nutrition

Policy/Politics

Medicine

Business

Law

Environment

More ...

Obesity

Stakeholders

World Organizations

Governments

Universities

Industry

Foundations

NGOs

Community Groups

**Environmental
Impact of
Agriculture**

**Food Safety
and
Security**



World Health Organization



THE WORLD BANK
IBRD • IDA



Food and Agriculture Organization of the United Nations



Union of Concerned Scientists



INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

IFPRI



PEPSICO

McKinsey & Company



United Nations World Food Programme



SUSTAINABLE AGRICULTURE & FOOD SYSTEMS FUNDERS



CITY UNIVERSITY LONDON



BIPARTISAN POLICY CENTER

COUNCIL ON FOREIGN RELATIONS



CGIAR



THE WHITE HOUSE WASHINGTON

Areas of Emphasis

Early child development and nutrition

Food and faith

Food waste

Central kitchens

Food innovation and entrepreneurship