

INTERNATIONAL AGRIFOOD MARKETS AND POLICY

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Lesson 14.03.2018

1. Agri-food markets

1.4. Agricultural sector in the developed and in developing countries

Specific discussion Topics are:

- ✓ Characteristics of agri-food demand and agri-food supply in the developed countries
- ✓ Characteristics of agri-food demand and agri-food supply in the developing countries
- ✓ Common problems and differences

Agricultural sector in the developed and in developing countries

Market function and the farmer's behavior in the case of agri-food commodities mainly concern the instability and uncertainty in agriculture.

This problem involves some related issues such as:

- Food security
- Supply instability
- Farm income instability
- Market price fluctuation

Agricultural sector in the developed and in developing countries

Market function and the farmer's behavior in the case of agri-food specialties mainly concern the quality of agri-food products and their certification.

This problem involves some related issues such as:

- Food safety
- Quality definition
- Asymmetric information and market failure
- Quality certification

Agricultural sector in the developed and in developing countries

- Food = necessary goods (food security)
- Supply instability (weather condition, animal disease, plant pests and diseases,...)
 - ↓
 - ↘ risk for farms: yields (productivity), production, revenues, income and profit
- Price fluctuation
 - ↗
 - ↓
- Agriculture = marginal sector in economic growth
- Asymmetric information about food characteristics (food safety and food quality)

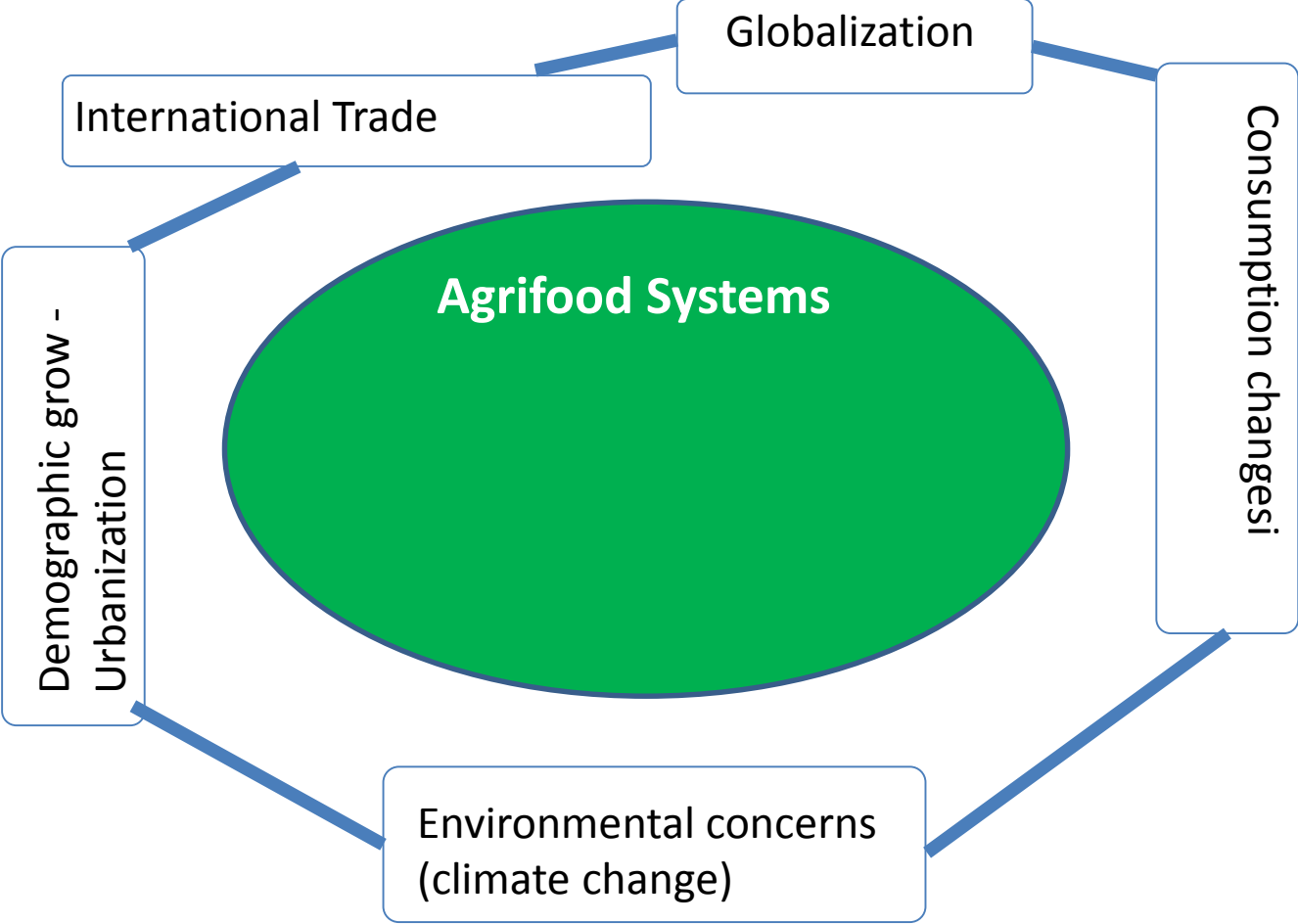


Agricultural sector in the developed and in developing countries

Keyword: Food security – Food safety

- **food security:** is a condition related to the supply of food, and individuals' access to it.
- **food safety:** “**food security**”: refers to handling, preparing and storing food in a way to best reduce the risk of individuals becoming sick from foodborne illnesses. Food safety is a global concern that covers a variety of different areas of everyday life.

Agricultural sector in the developed and in developing countries



Agricultural sector in the developed and in developing countries

High income countries	Low income countries
Low contribution to GNP	High contribution to GNP
Low contribution to Employment ration (high age of farmers)	High contribution to Employment ration
High relevance of Agrifood Industry, Transport and Logistic	Low relevance of Agrifood Industry, Transport and Logistic
Growing environmental problems	
Growing social and environmental functions of agriculture	
Growing demand of high quality food	Demand of normal/necessary food (quality food in emerging countries)
Quality certification systems - labels	
Food Safety (Food Security)	Food Security and Food Safety

World population

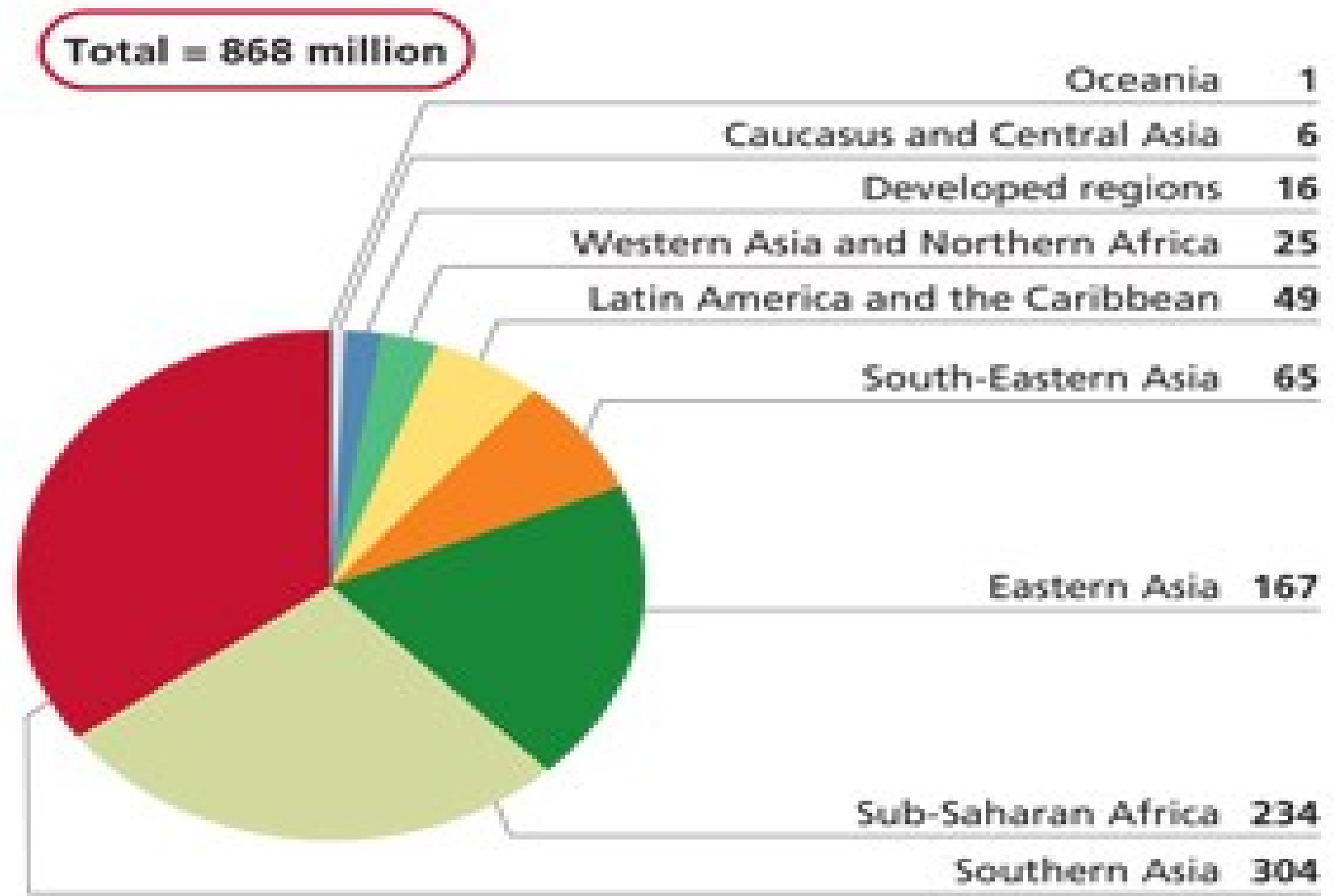
- Today, the world's population continues to grow, albeit more slowly than in the recent past.
- Ten years ago, the global population was growing by 1.24 per cent per year.
- Today, it is growing by 1.10 per cent per year, yielding an additional 83 million people annually.
- The world's population is projected to increase by slightly more than one billion people over the next 13 years, reaching 8.6 billion in 2030, and to increase further to 9.8 billion in 2050 and 11.2 billion by 2100.

Demographic growth and urbanization

- Africa should double their population : from 1 to 2 billion people until 2050
- In the development countries should 2,5 billions people will live in urban areas, in particular in Africa and Asia
- The urbanization process is related to the increase in income and changes in food consumption

Demographic growth and urbanization

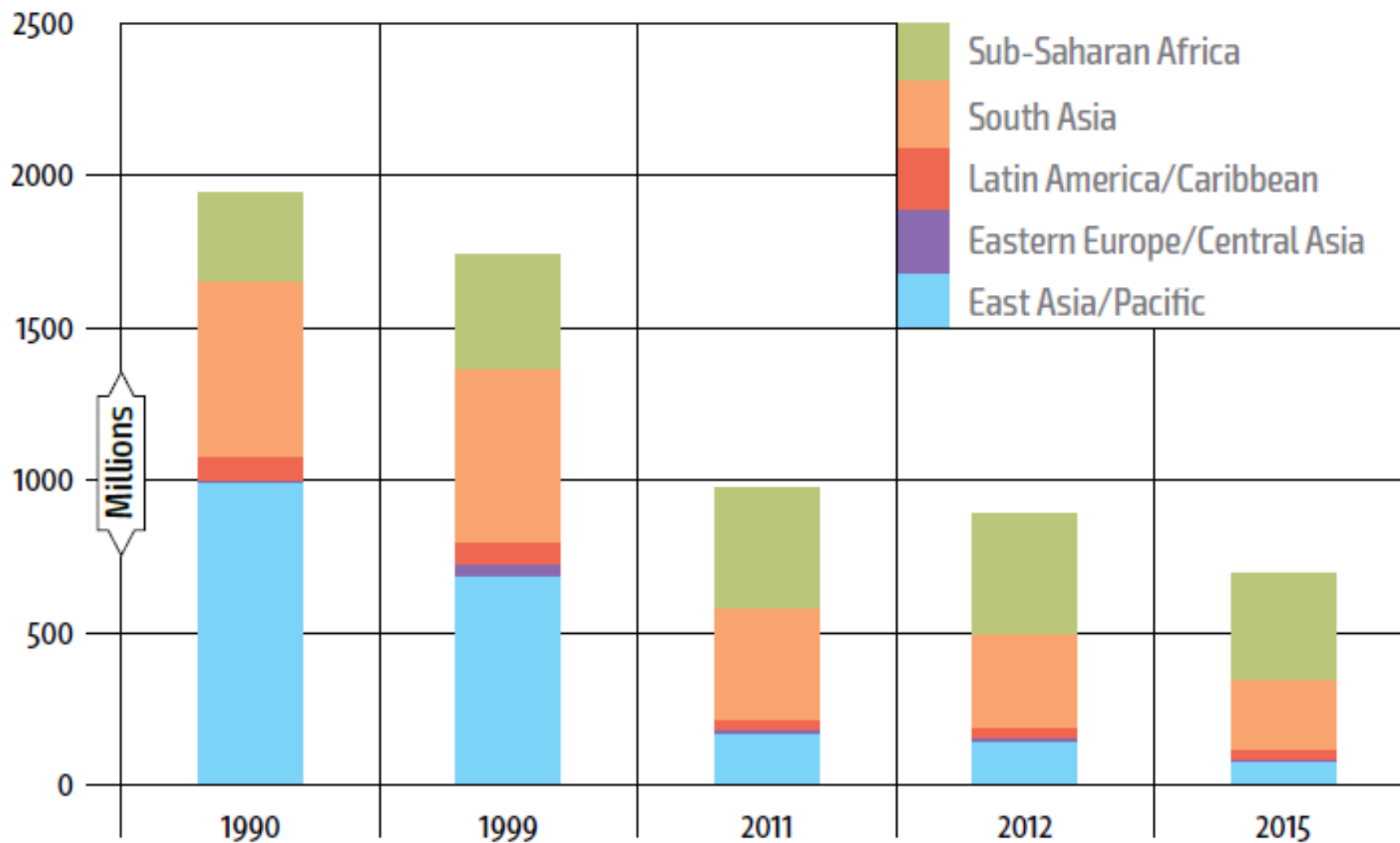
- Currently, 40% of the world's lands are dry, and the increasing temperatures make the deserts move forward. At the current rate it could feed only half the world's population in 2050
- 28% of agriculture is located in regions that suffer from water stress, where agriculture needs 1,500 liters of water to produce 1 kg of wheat and 16,000 liters of water to produce 1 kg of meat



Source: FAO.

Number of people affected by undernourishment in 2010–12 (by region, in millions)

People below the poverty line (PPP) of US\$ 1.90 per day, 1990–2015

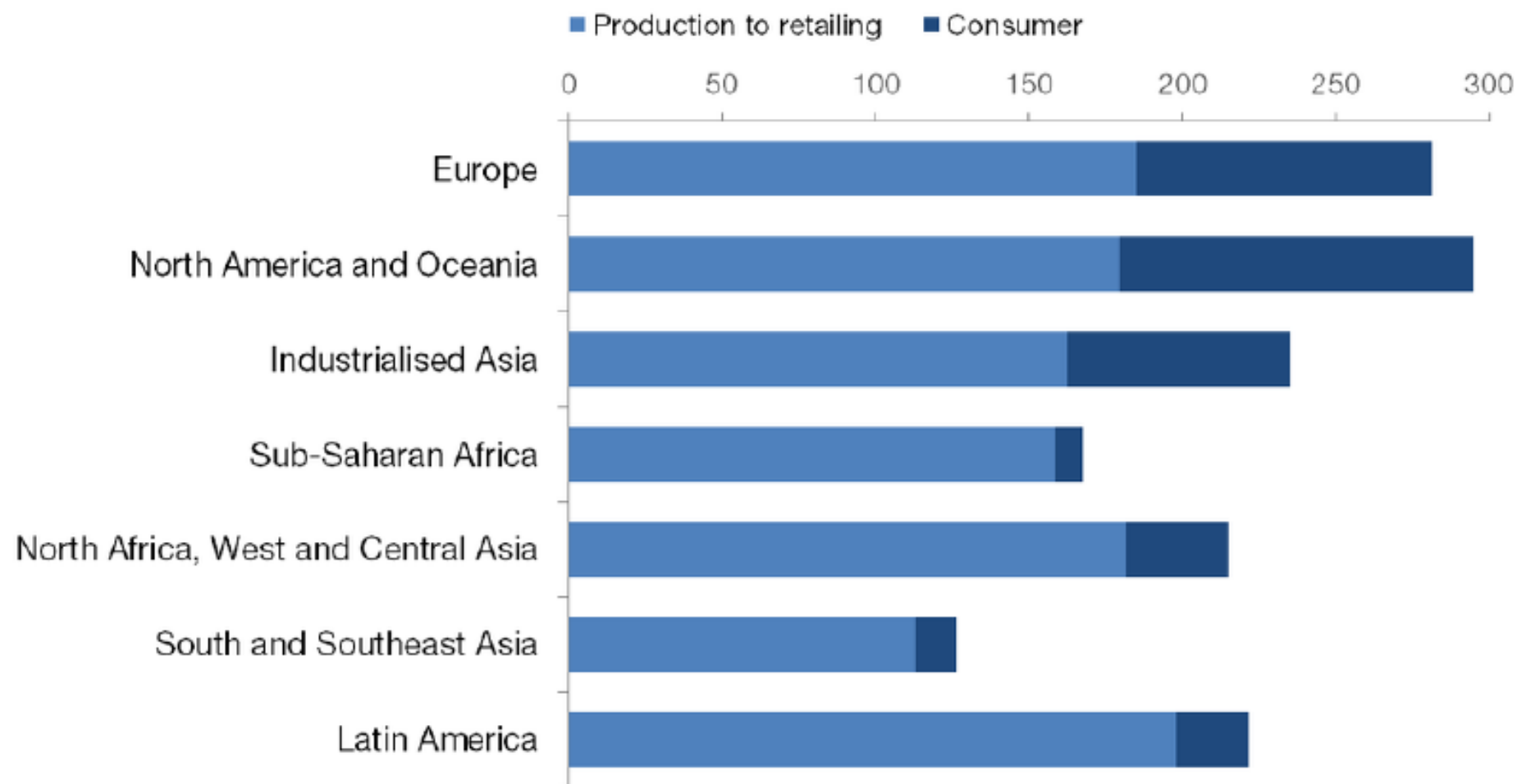


Note: Data for the Near East and North Africa are not available.

Source: FAO Global Perspectives Studies, based on World Bank, 2015.

Which regions waste the most food?

Per capita food losses and waste, kg/year



Source: The Food and Agriculture Organization of the United Nations (FAO)

PERCENTAGE AND NUMBER OF PEOPLE AFFECTED BY SEVERE FOOD INSECURITY, MEASURED USING THE FIES (2014–16)

	Severe food insecurity – prevalence			Severe food insecurity – number of people		
	2014	2015	2016	2014	2015	2016
	<i>Percentage</i>			<i>Millions</i>		
WORLD	9.2 (±0.5)	8.8 (±0.4)	9.3 (±0.4)	665.9 (±35.7)	645.1(±31.7)	688.5 (±27.6)
AFRICA	25.0 (±0.8)	25.1 (±0.7)	27.4 (±0.7)	289.5 (±9.6)	298.0 (±8.7)	333.2 (±8.6)
<i>Of which:</i>						
Sub-Saharan Africa	28.3 (±1.0)	28.7 (±0.9)	31.0 (±0.8)	265.0 (±9.5)	275.7(±8.6)	306.7 (±8.3)
ASIA	7.7 (±0.1)	7.0 (±0.7)	7.0 (±0.6)	337.0 (±34.1)	306.7(±30.1)	309.9 (±26)
<i>Of which:</i>						
Central Asia and Southern Asia	14.4 (±0.5)	12.3 (±1.6)	11.1 (±1.3)	268.7 (±36.2)	233.1(±31.1)	211.9 (±24.4)
Eastern Asia and South-Eastern Asia	2.0 (±0.2)	2.1 (±0.3)	3.1 (±0.5)	44.7 (±5.1)	48.1 (±7.6)	70.5 (±11.8)
LATIN AMERICA	4.7 (±0.3)	4.8 (±0.3)	6.4 (±0.3)	27.7 (±1.8)	28.1 (±1.6)	38.3 (±2.0)
NORTHERN AMERICA AND EUROPE	1.4 (±0.1)	1.6 (±0.1)	1.2 (±0.1)	15.6 (±1.6)	17.1 (±1.6)	13.0 (±1.3)
<i>Other country group:</i>						
Western Asia and Northern Africa	10.7 (±0.6)	10.5 (±0.6)	11.8 (±0.7)	50.3 (±2.9)	50.7(±2.9)	57.9 (±3.2)

NOTES: Prevalence is calculated as the number of people living in households where at least one adult has been found to be severely food insecure, as a percentage of the total population. Margins of error are in parentheses.

SOURCE: FAO, Voices of the Hungry project.

Food security

MILD FOOD INSECURITY

WORRYING ABOUT
ABILITY TO OBTAIN FOOD

MODERATE FOOD INSECURITY

COMPROMISING QUALITY
AND VARIETY OF FOOD

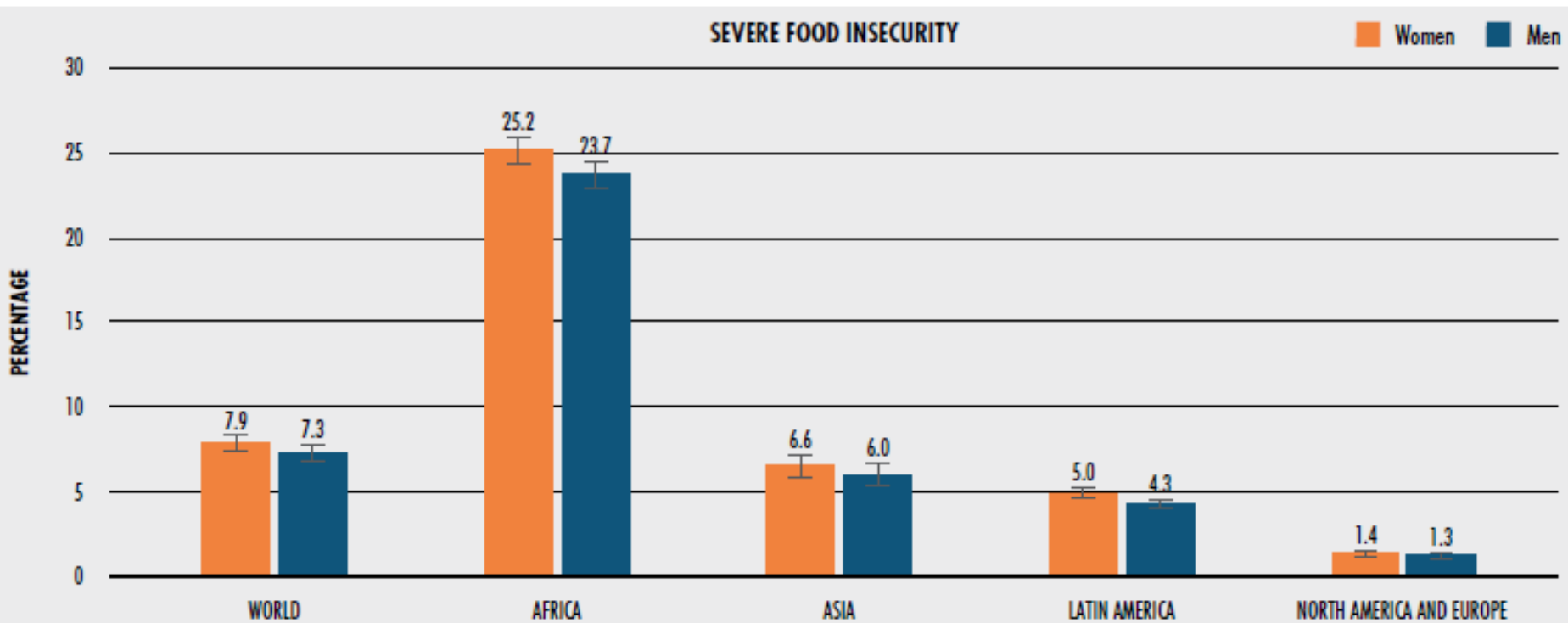
SEVERE FOOD INSECURITY

REDUCING QUANTITIES,
SKIPPING MEALS

EXPERIENCING HUNGER



WOMEN ARE SLIGHTLY MORE LIKELY TO BE FOOD INSECURE THAN MEN IN EVERY REGION OF THE WORLD

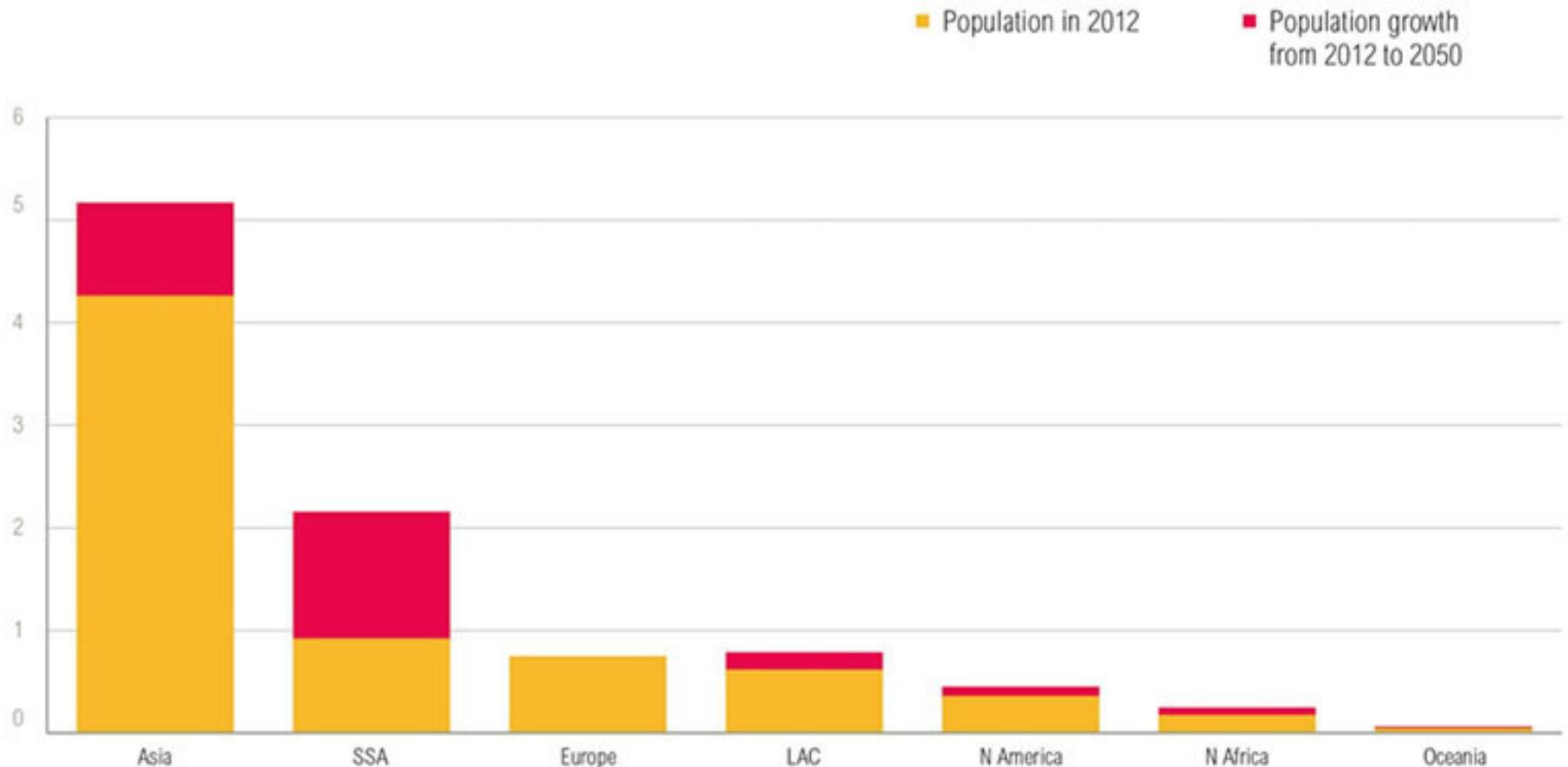


NOTE: Comparison of the prevalence of severe food insecurity among men and women aged 15 years and older (2014–16 three-year averages).

SOURCE: FAO Voices of the Hungry project.

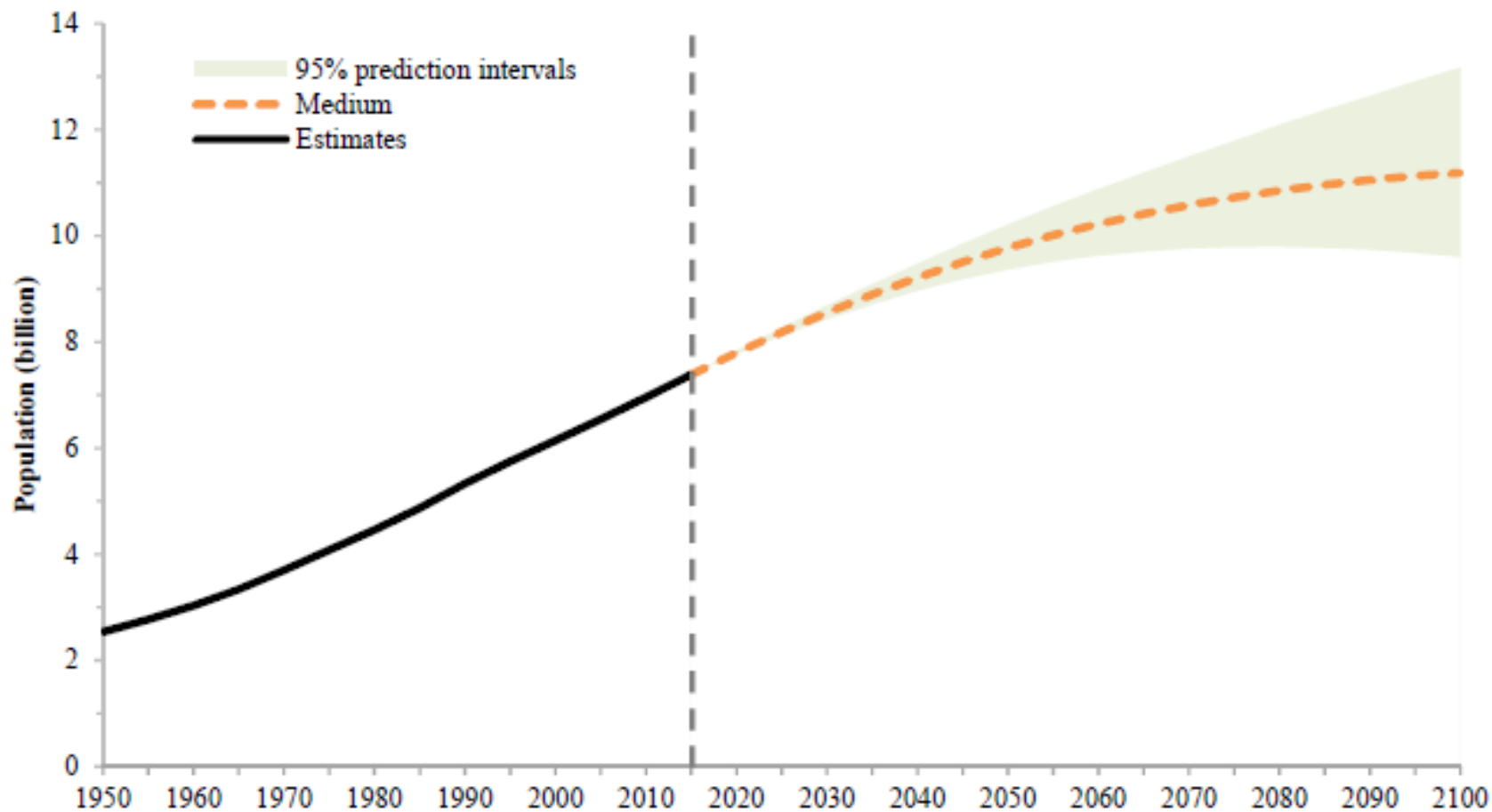
Demographic growth and urbanization

Projected Population Growth (in billions)



Note: "SSA" = Sub-Saharan Africa, including Sudan. "LAC" = Latin America and Caribbean. "N America" = North America. "N Africa" = Rest of Africa.

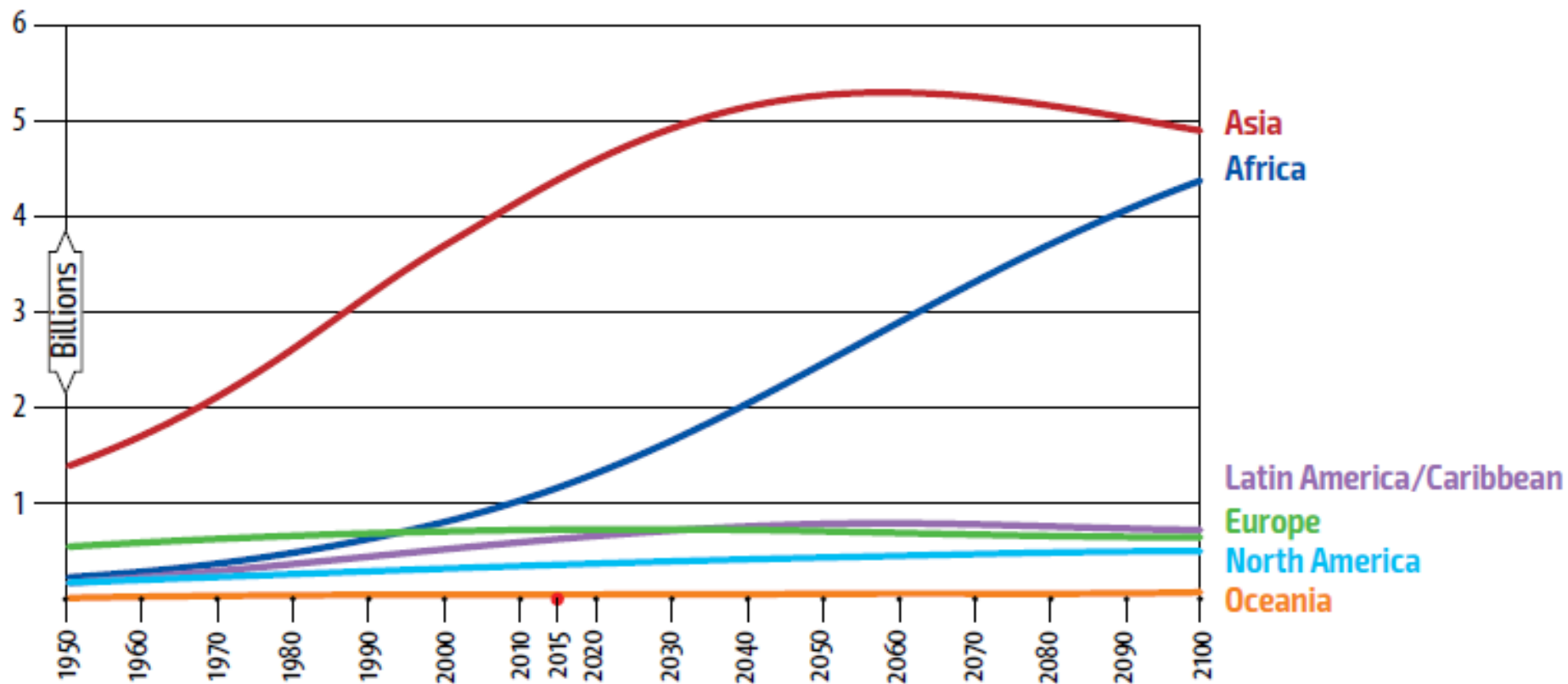
Demographic growth and urbanization



Source: United Nations, Department of Economic and Social Affairs, Population Division (2017).
World Population Prospects: The 2017 Revision. New York: United Nations.

Demographic growth and urbanization

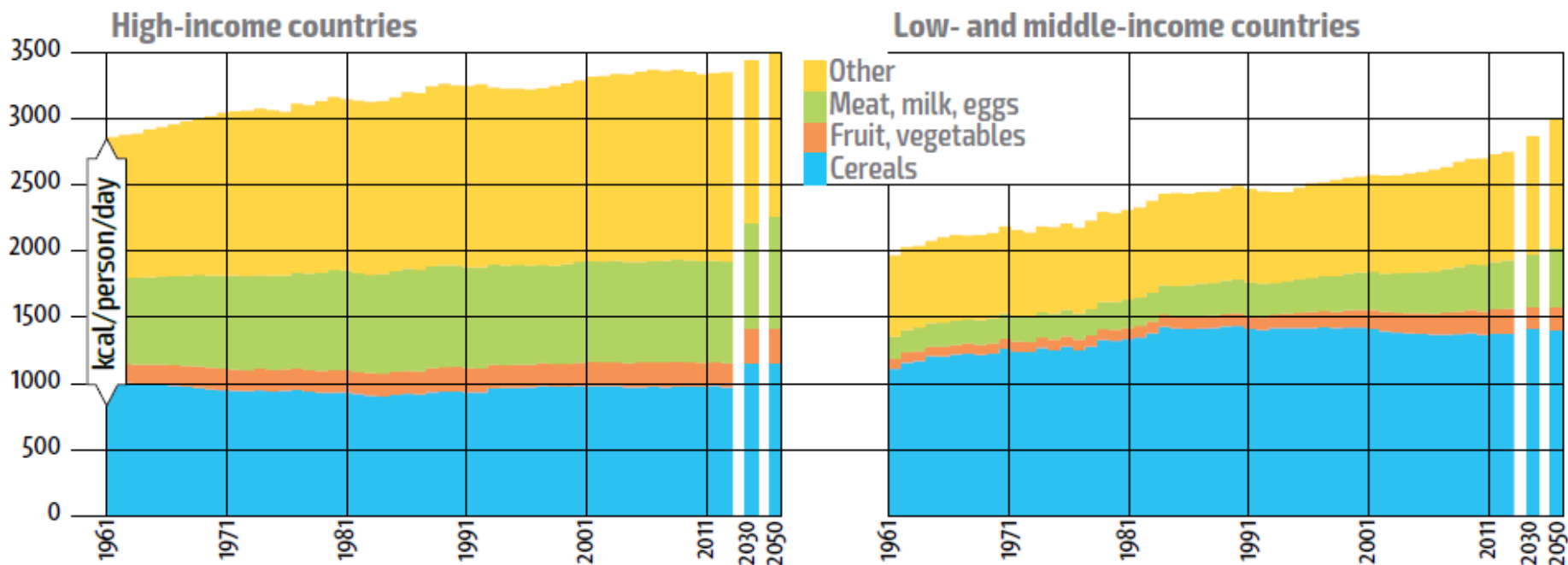
Population growth to 2100, by region (medium variant)



Source: UN, 2015.

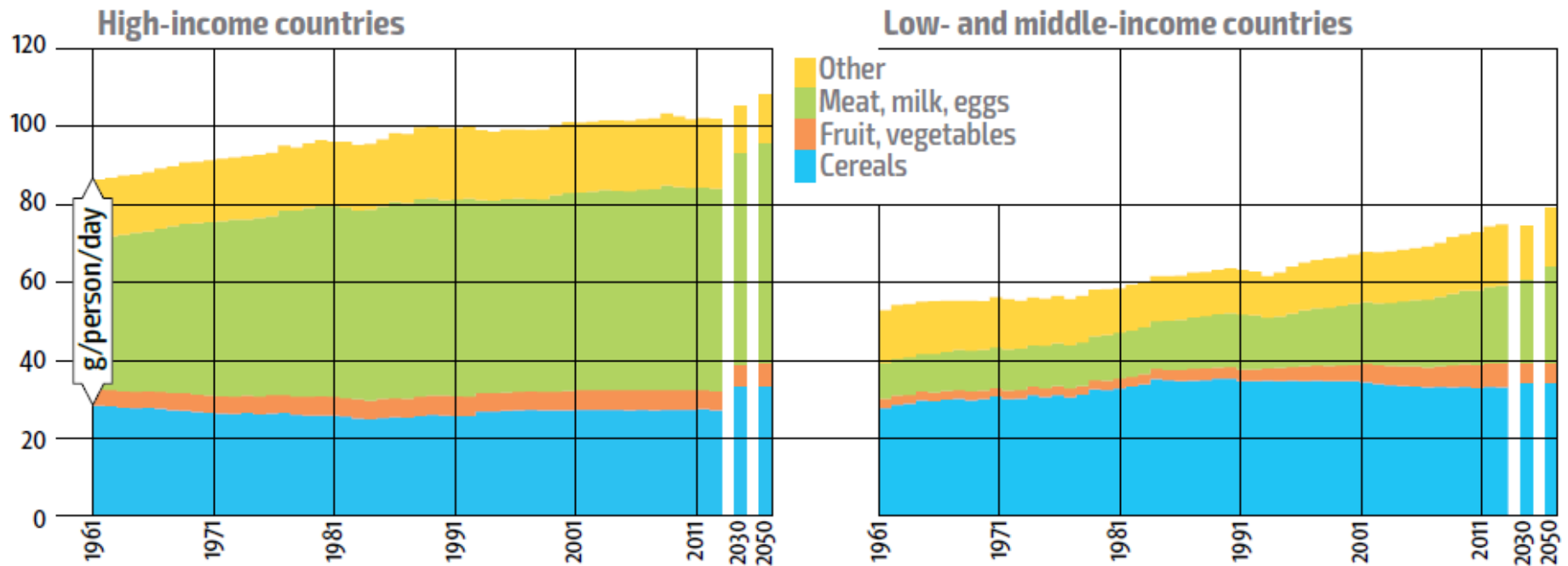
Demographic growth and urbanization

Per capita calorie intake by source, 1961–2050



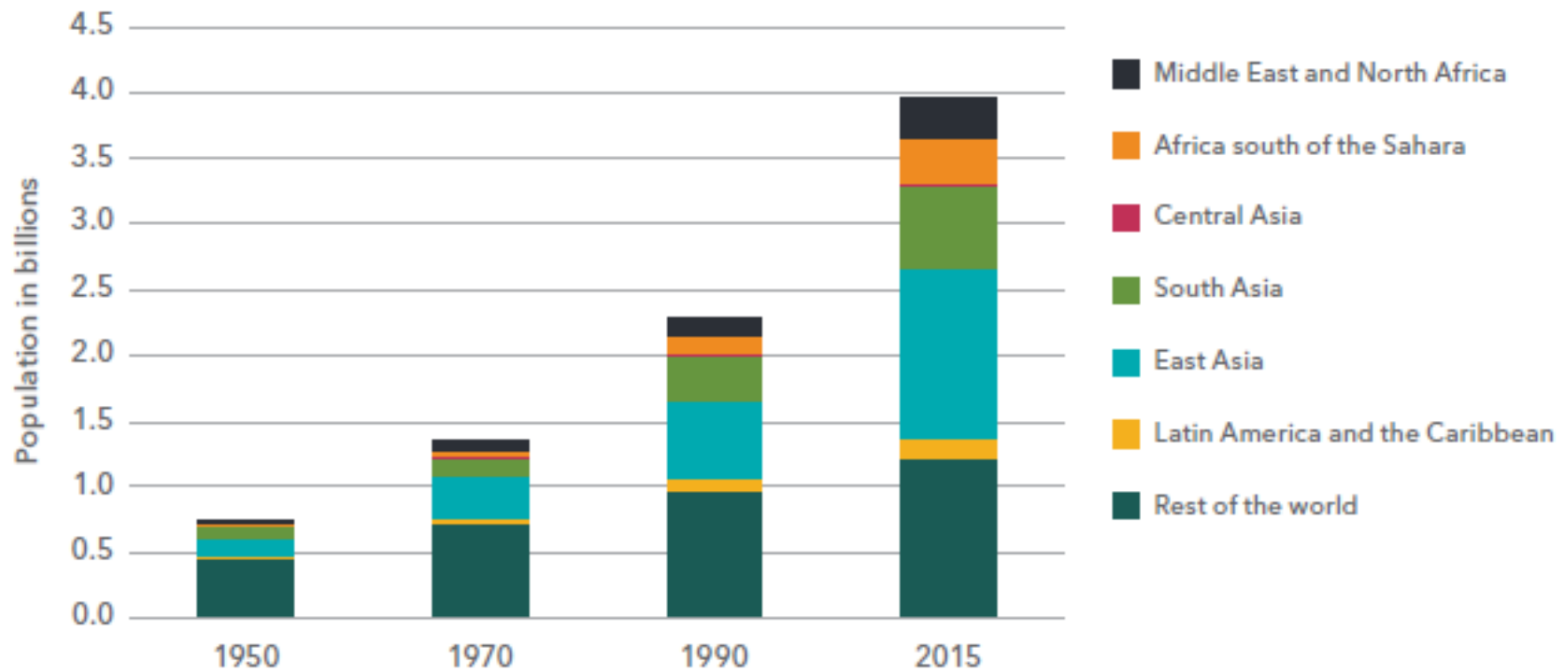
Demographic growth and urbanization

Per capita protein intake by source, 1961–2050



Demographic growth and urbanization

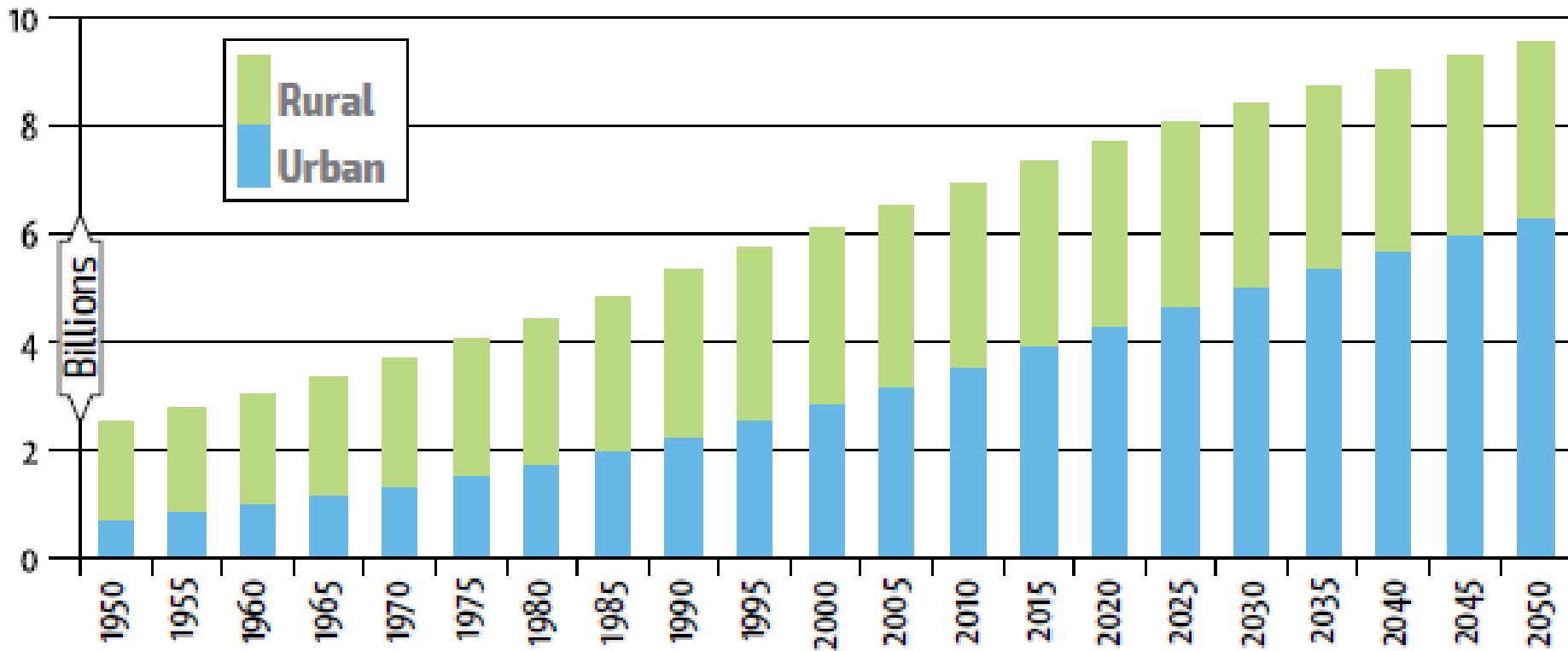
Growth of urban population in major developing regions



Source: Food and Agriculture Organization of the United Nations, FAOSTAT (2016), www.fao.org/faostat/.

Demographic growth and urbanization

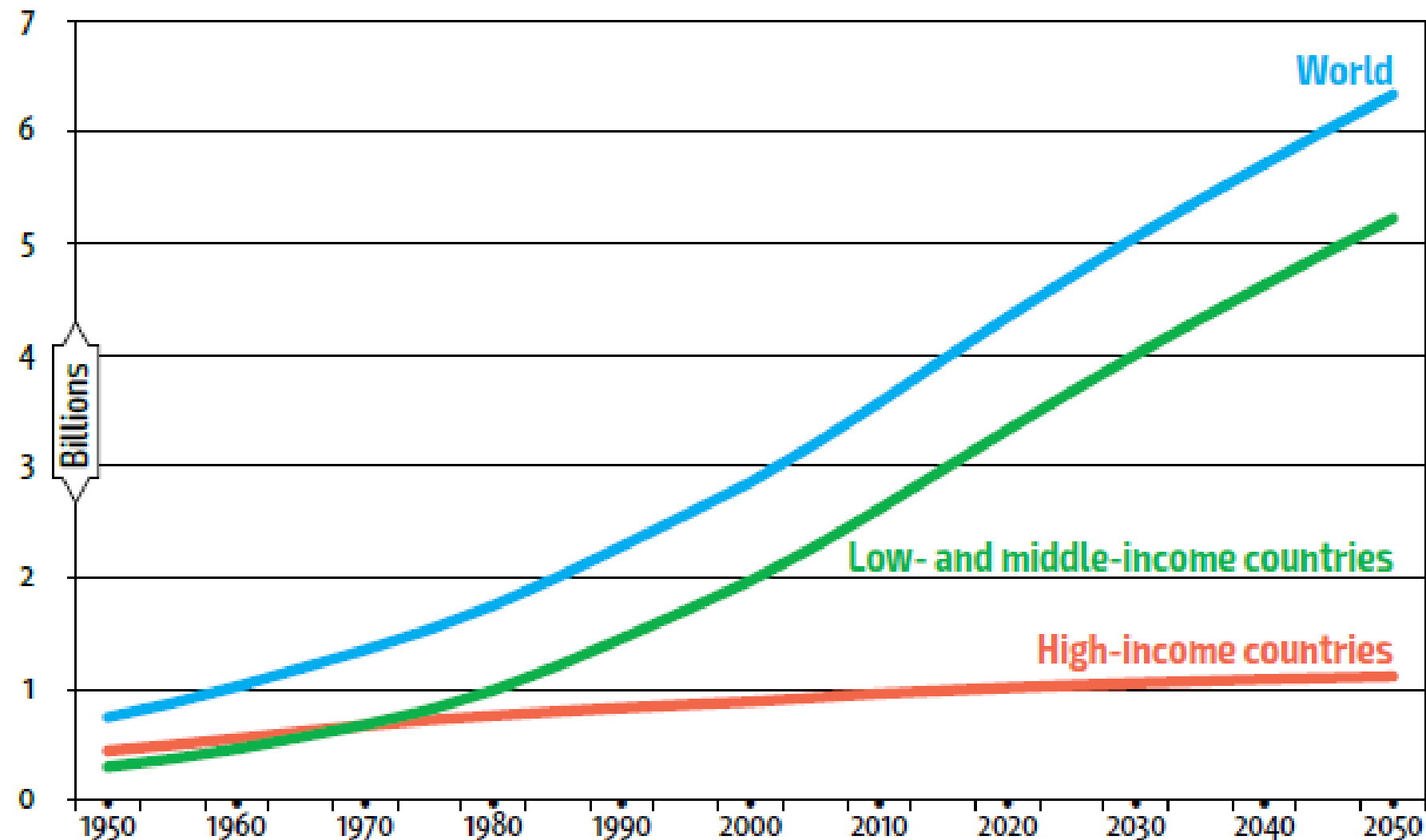
Growth in global urban and rural populations to 2050



Source: UN, 2015.

Demographic growth and urbanization

Urbanization trends, by region



Demographic growth and urbanization

Global Consumption of Meat and Milk Products

REGION	LIVESTOCK (KCAL/PERSON/DAY)			BEEF AND MUTTON (KCAL/PERSON/DAY)		
	2006	2050	% CHANGE	2006	2050	% CHANGE
European Union	864	925	7%	80	75	-6%
Canada & USA	907	887	-2%	117	95	-19%
China	561	820	46%	41	89	116%
Brazil	606	803	33%	151	173	15%
Former Soviet Union	601	768	28%	118	156	32%
Other OECD	529	674	27%	64	84	31%
Latin America (ex. Brazil)	475	628	32%	59	86	45%
Middle East and North Africa	303	416	37%	59	86	45%
Asia (ex. China, India)	233	400	72%	24	43	79%
India	184	357	94%	8	19	138%
Sub-Saharan Africa	144	185	29%	41	51	26%
World	413	506	23%	50	65	30%

Demographic growth and urbanization

Food from small farms to big cities

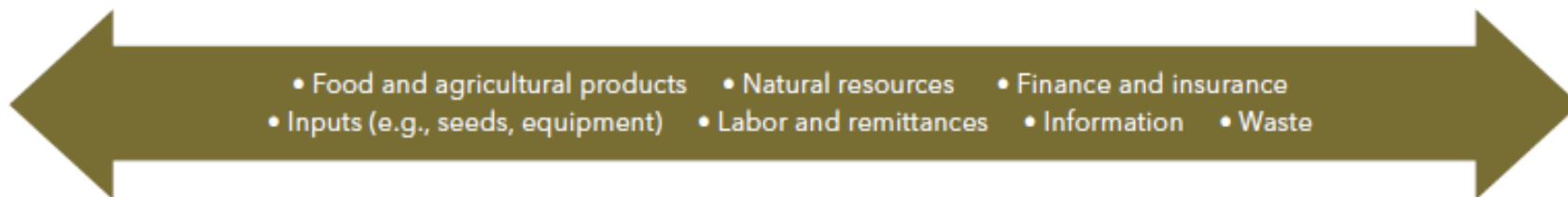
SUPPLY CHAIN ACTIVITIES AND ACTORS



RURAL-URBAN CONTINUUM

Very rural — Rural — Small towns — Intermediate cities — Peri-urban — Very urban

FOOD-SECTOR FLOWS

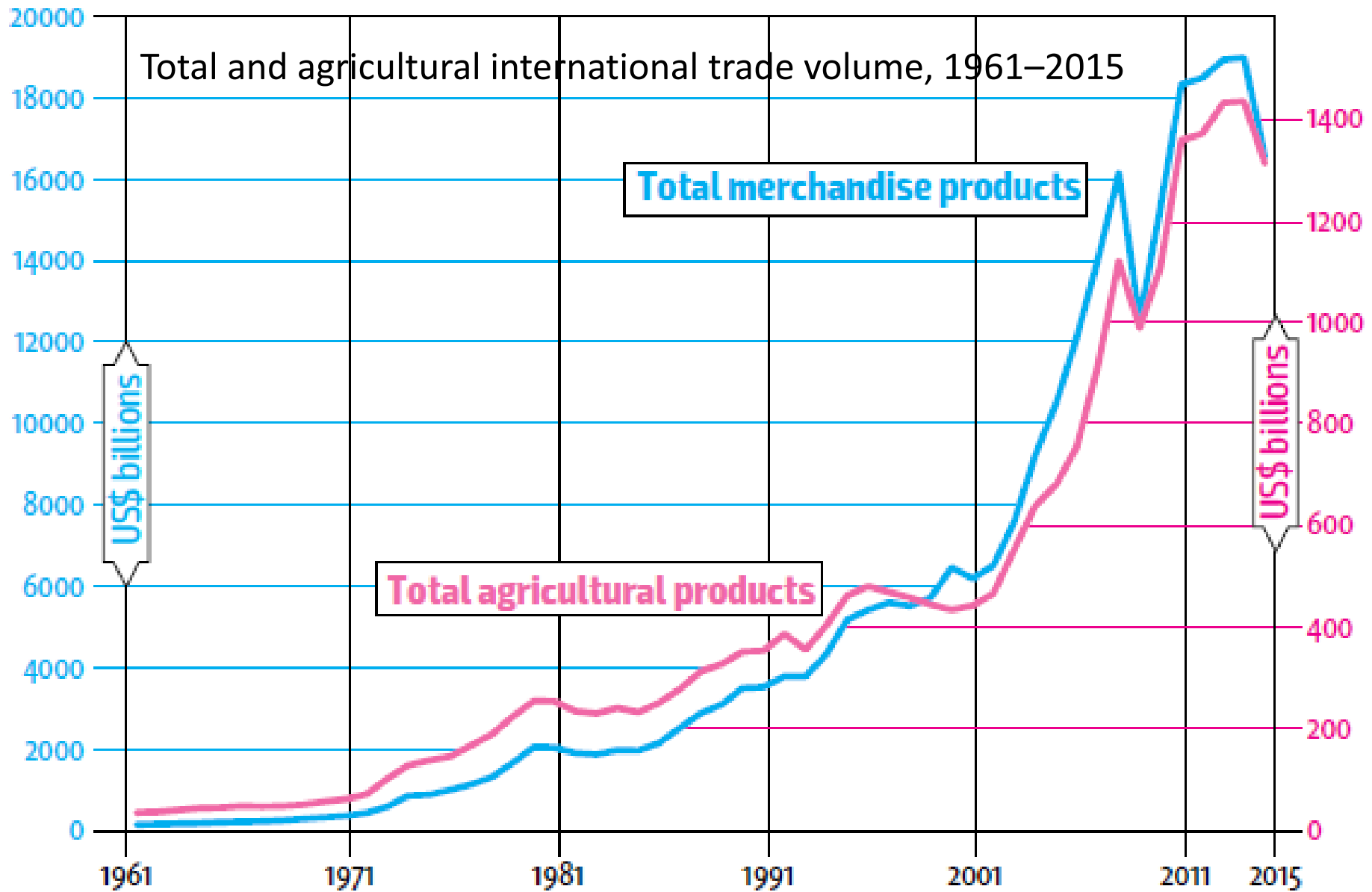


Source: Adapted from J. von Braun, “Rural-Urban Linkages for Growth, Employment, and Poverty Reduction,” presented at the Fifth International Conference on the Ethiopian Economy, Ethiopian Economics Association, Addis Ababa, June 7–9, 2007.

Demographic growth and urbanization

- Increase in agricultural production and agricultural productivity
- Growing distance between the places of consumption and the place of production
- Increase in international trade
- Increase in the transport of goods (investments in transport, logistics, food security)
- Risks of greater environmental impact
- Information asymmetries (between producer and consumer)

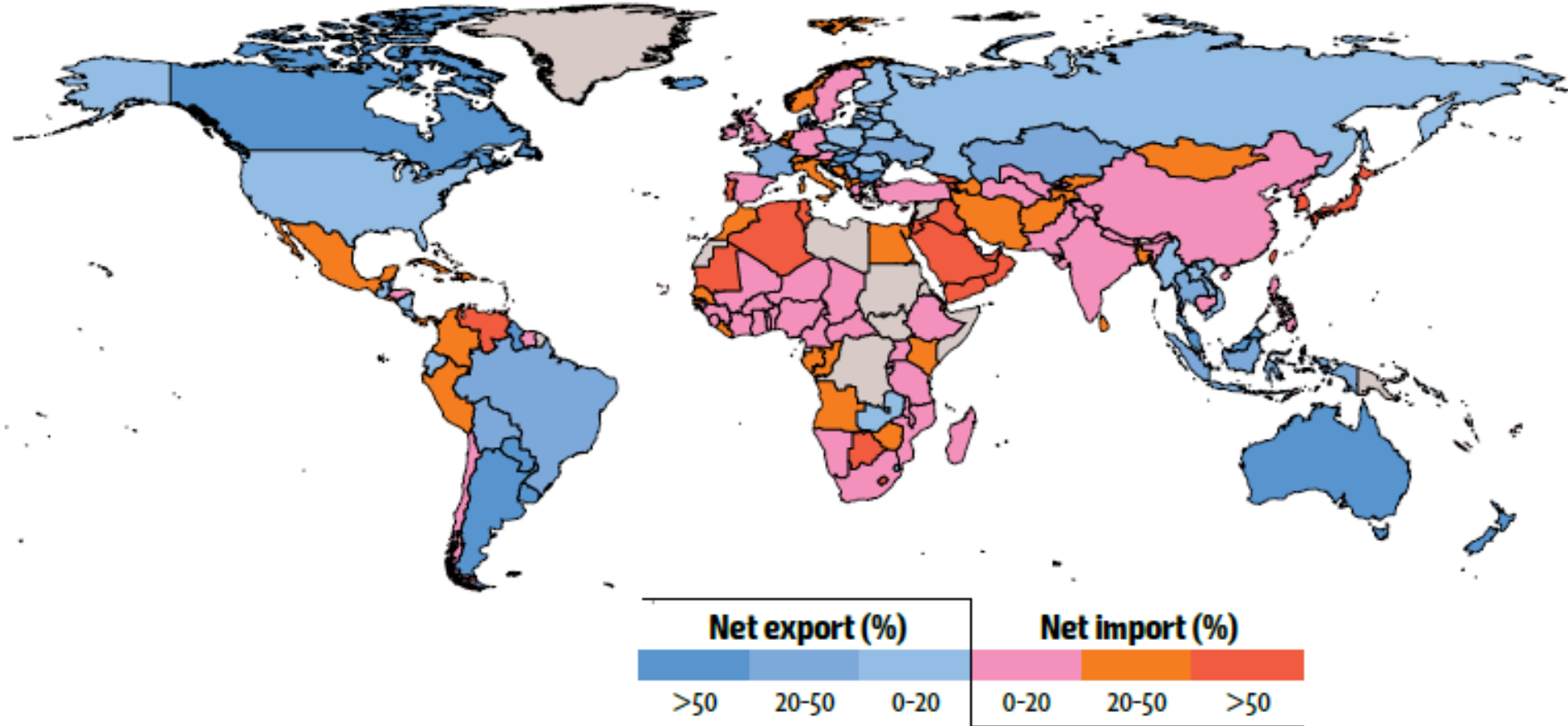
Agri-food international Trade



Source: Data from 1961–2013 are based on FAO, 2016a; data for 2014 and 2015 are based on ITC, 2016.

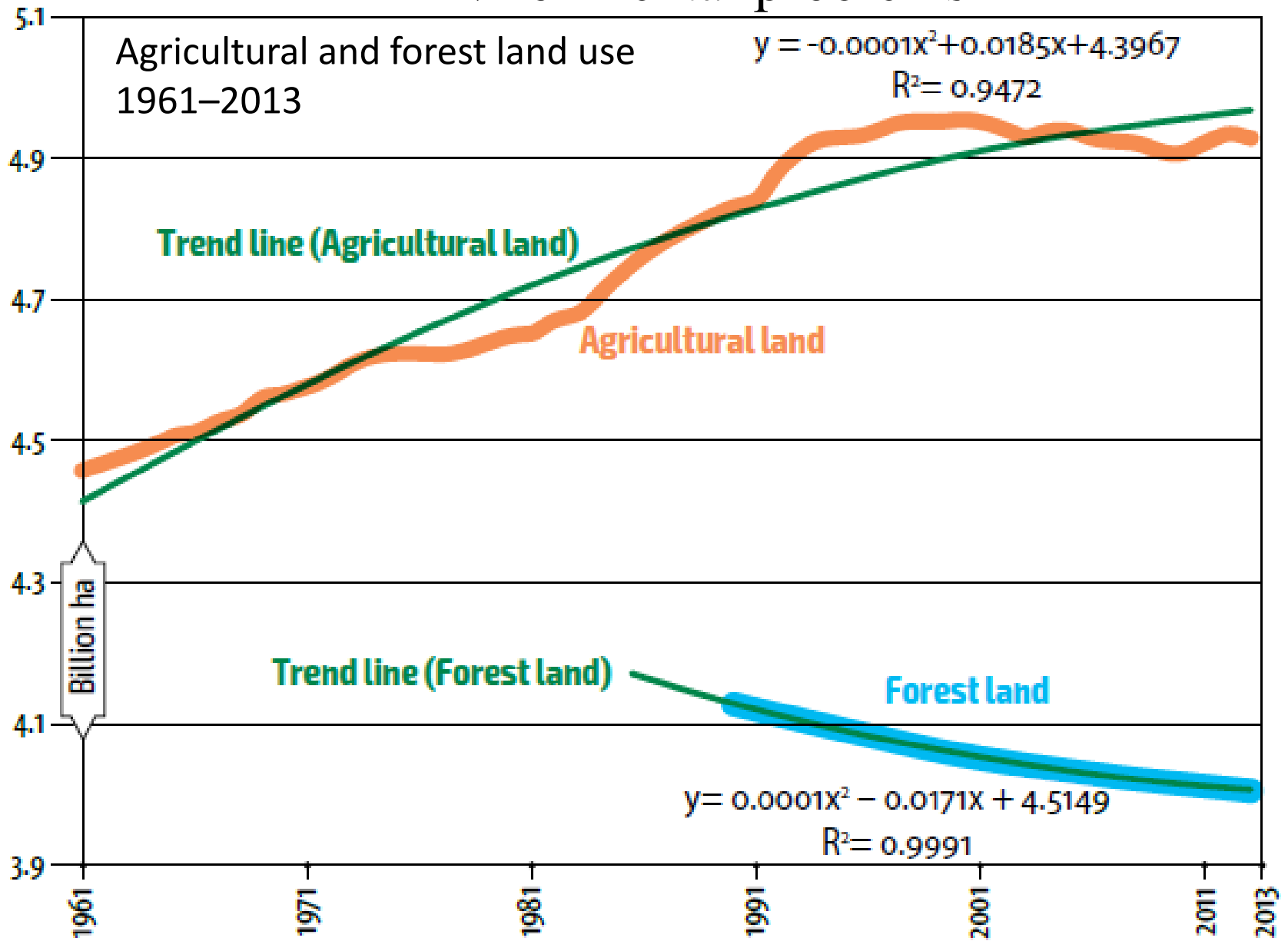
Agri-food international Trade

Percentage of net food imports in domestic food supply in total calories



Source: FAO Global Perspectives Studies, using 2011 food balance sheets from FAO, 2016a.

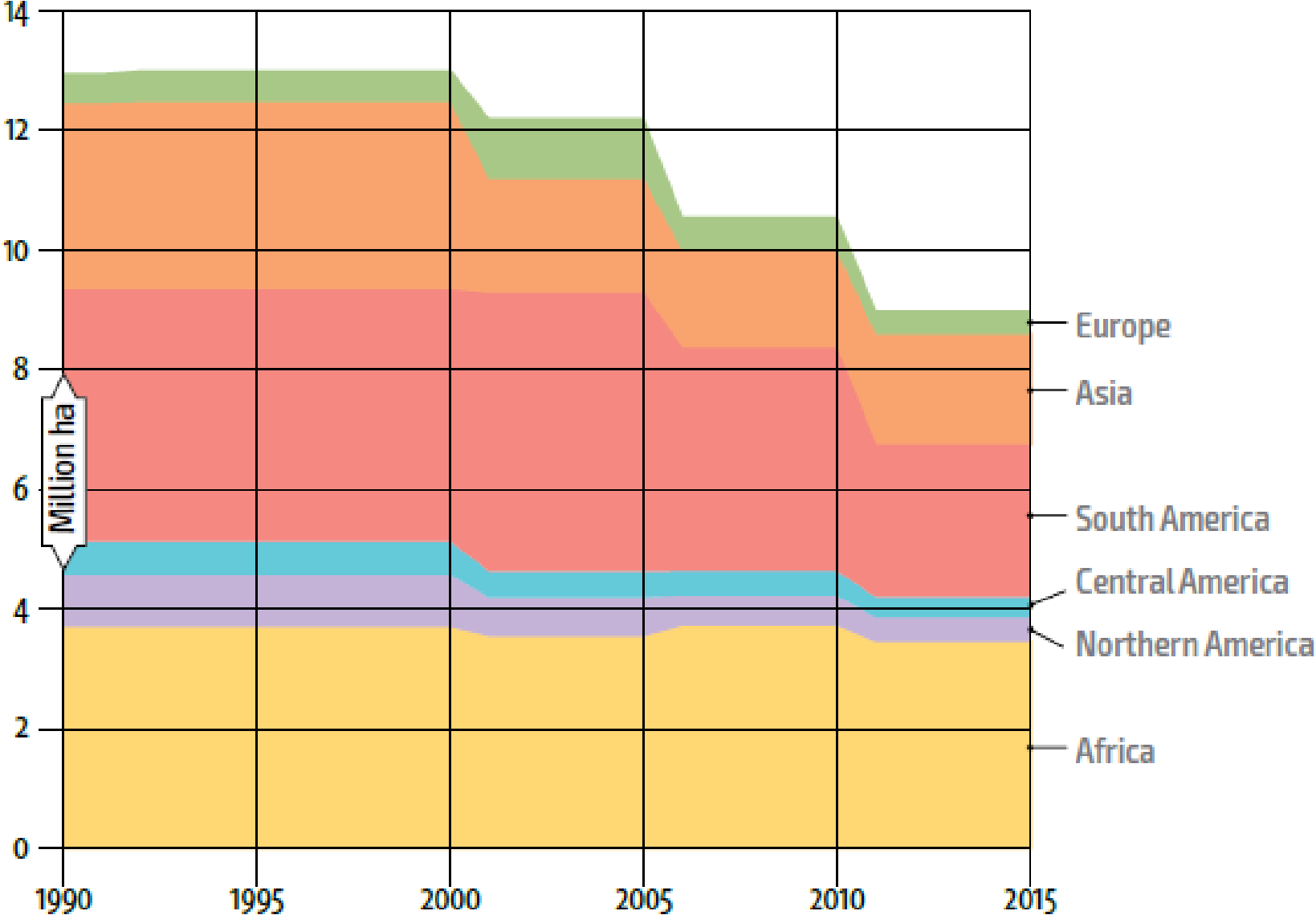
Environmental problems



Source: FAO Global Perspectives Studies calculations based on FAO, 2016b.

Environmental problems

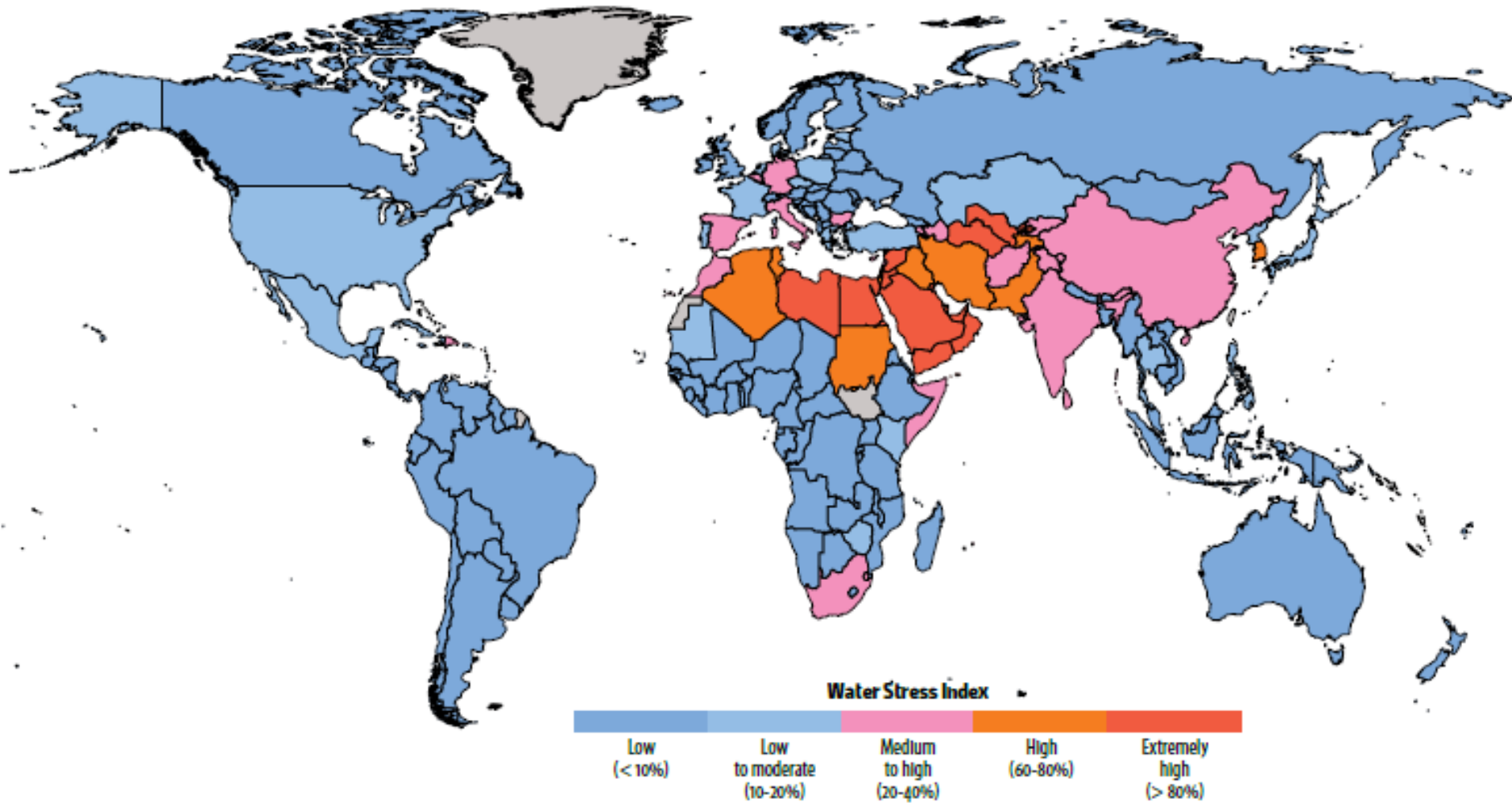
Net forests conversion, by region, 1990–2015



Source: FAO, 2016b.

Environmental problems

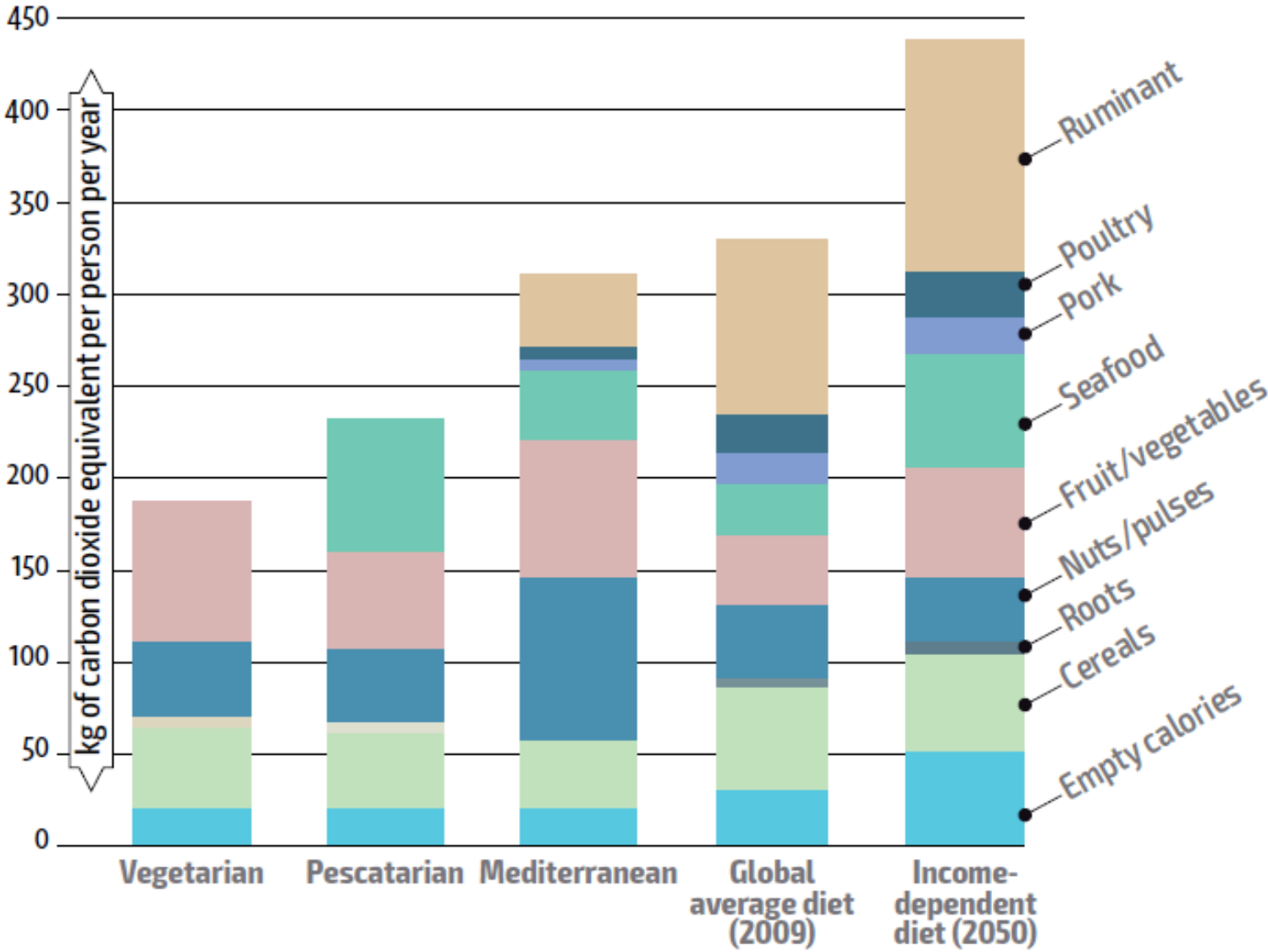
Freshwater withdrawals as a percentage of total renewable resources



Source: FAO, 2016a.

Environmental problems

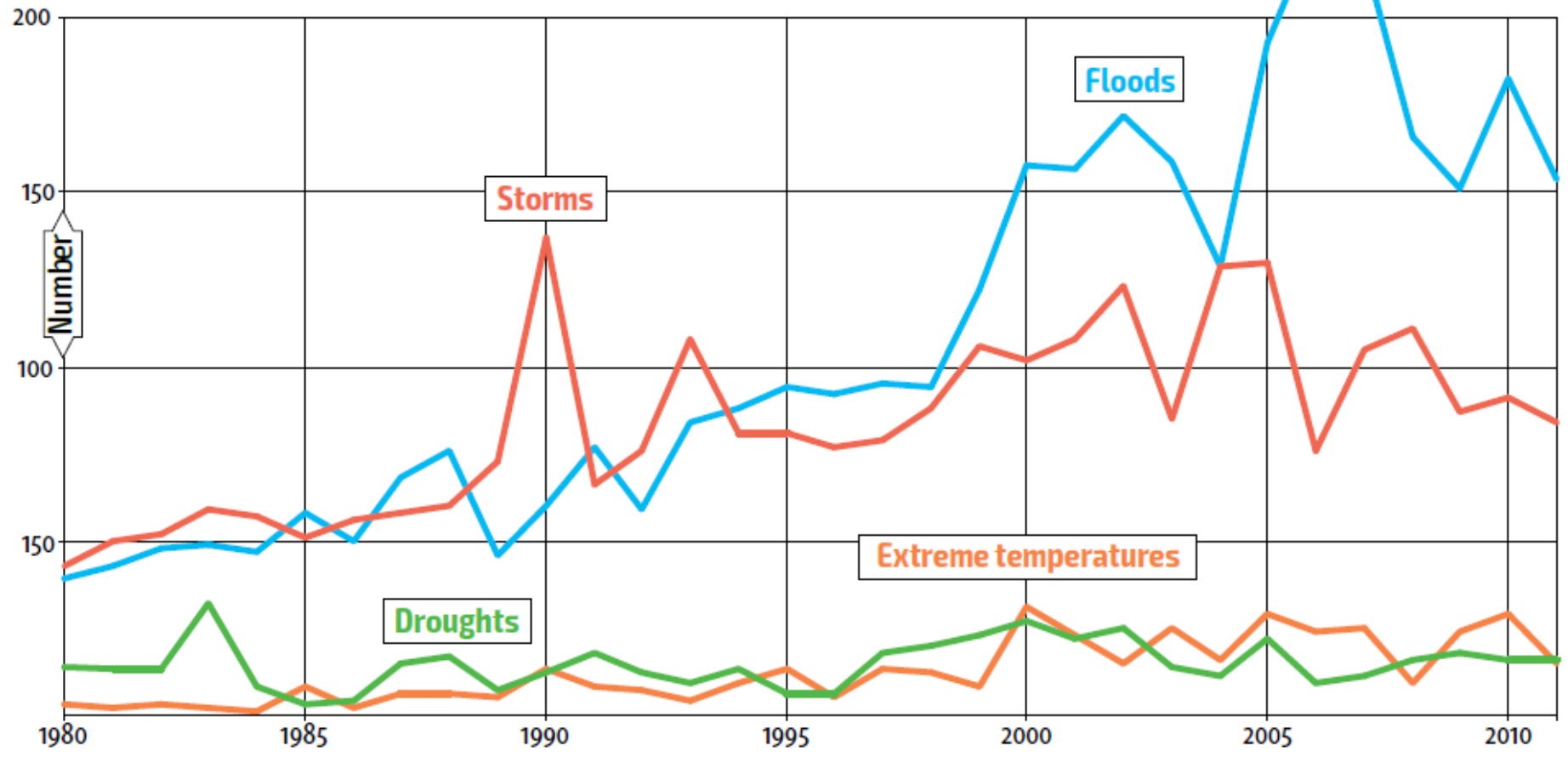
Greenhouse gas emissions by diet type



Source: IFPRI, 2015.

Environmental problems

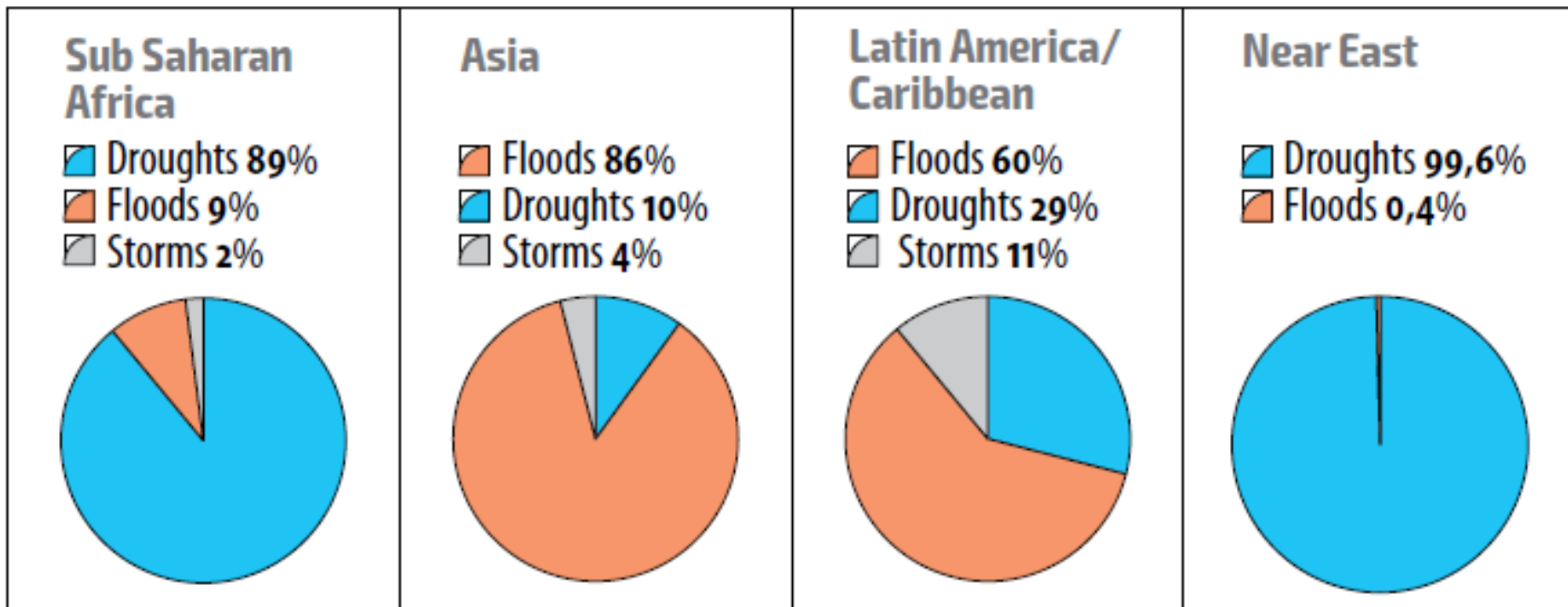
Climate-related disasters, 1980–2011



Source: UNISDR, 2016.

Environmental problems

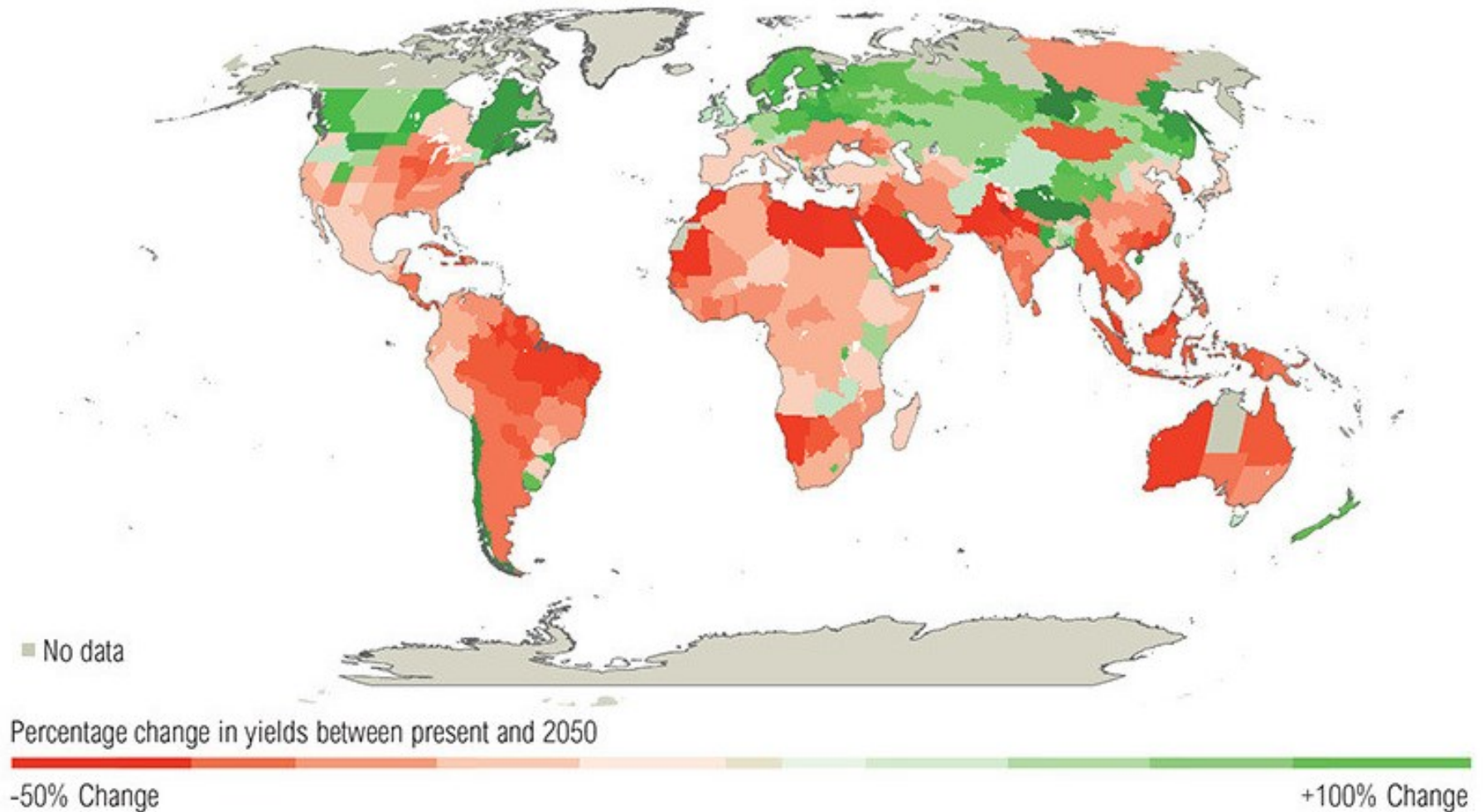
Agricultural production losses after medium- to large-scale disasters in developing countries, by cause and region, 2003–2013



Source: FAO, 2015.

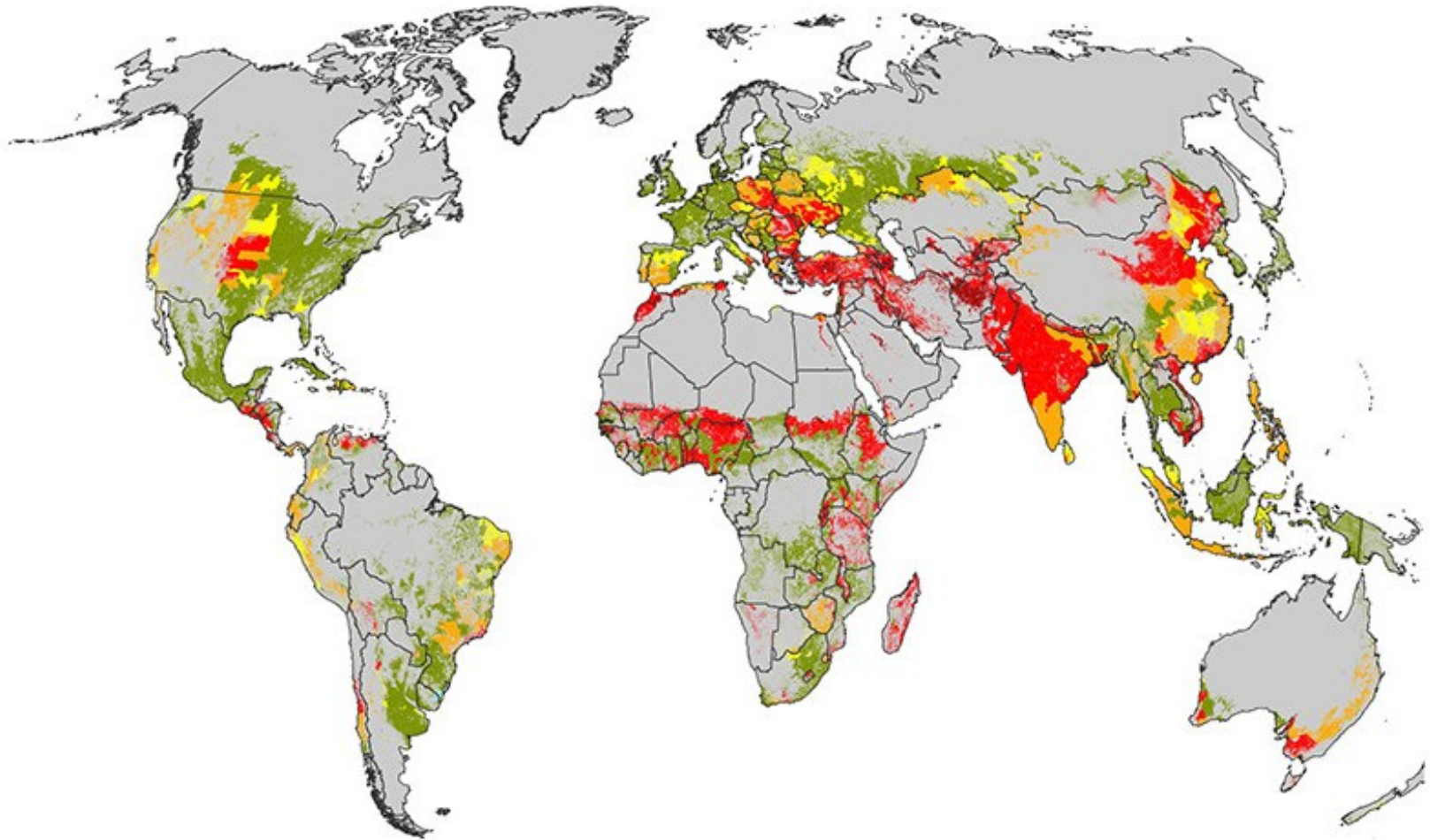
Environmental problems

Most studies now project adverse impacts on crop yields due to climate change (3°C warmer world)



Environmental problems

Water stress will increase in many agricultural areas by 2025 due to growing water use and higher temperatures (based on IPCC scenario A1B)



Water Stress Condition



Demographic growth and urbanization

Sustainable development

- Sustainable development is the organizing principle for meeting human development goals while at the same time sustaining the ability of natural systems to provide the natural resources and ecosystem services upon which the economy and society depend.
- The desired result is a state of society where living conditions and resource use continue to meet human needs without undermining the integrity and stability of the natural system and sustainable development can be classified as development that meet the needs of the present without compromising the ability of the future generation.

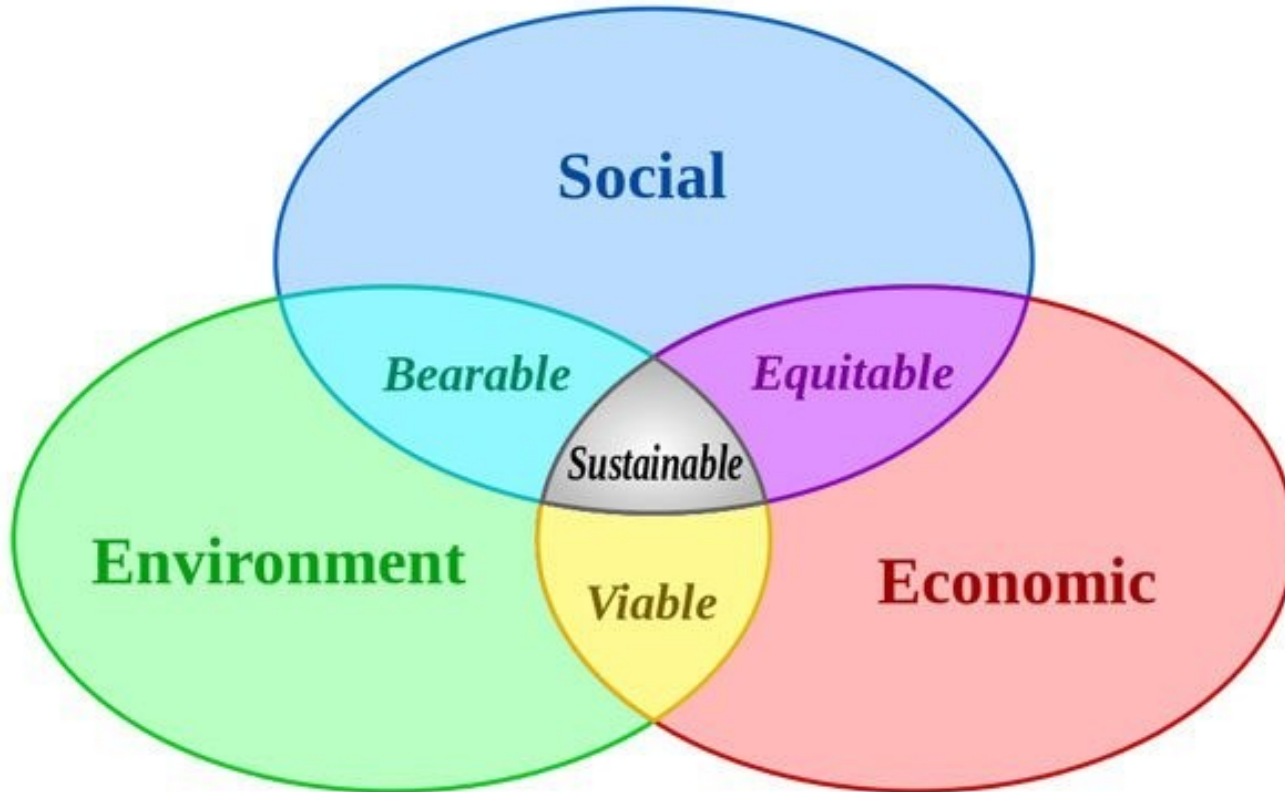
Sustainable development

- The modern concept of sustainable development is derived mostly from the 1987 Brundtland Report
- As the concept developed, it has shifted to focus more on economic development, social development and environmental protection for future generations.
- Formerly known as the World Commission on Environment and Development (WCED), the mission of the Brundtland Commission is to unite countries to pursue sustainable development together.
 - Gro Harlem Brundtland was the former Prime Minister of Norway and was chosen due to her strong background in the sciences and public health.
- At the time, the UN General Assembly realized that there was a heavy deterioration of the human environment and natural resources.

Sustainable development

- To rally countries to work and pursue sustainable development together, the UN decided to establish the Brundtland Commission. The Brundtland Commission officially dissolved in December 1987 after releasing Our Common Future, also known as the Brundtland Report, in October 1987, a document which coined, and defined the meaning of the term "Sustainable Development".
- The organization Center for Our Common Future was started in April 1988 to take the place of the Commission.

Sustainable development



Green Economy

Green Economy: a way to sustainable development

improved resilience and disaster
preparedness

food security and sustainable
agriculture and water
resources

Energy
Efficiency and Renewable
Energy, Energy Storage



Sustainable Cities

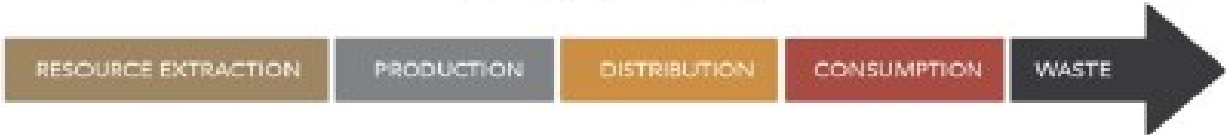
Green jobs and social
inclusion

Circular Economy - Economia circolare

- Cycles, such as of water and nutrients, abound in nature — discards become resources for others.
- There is an alternative. A ‘circular economy’ would turn goods that are at the end of their service life into resources for others, closing loops in industrial ecosystems and minimizing waste (see ‘Closing loops’).
- Circular economy. A new relationship with our goods and materials would save resources and energy and create local jobs

Circular Economy

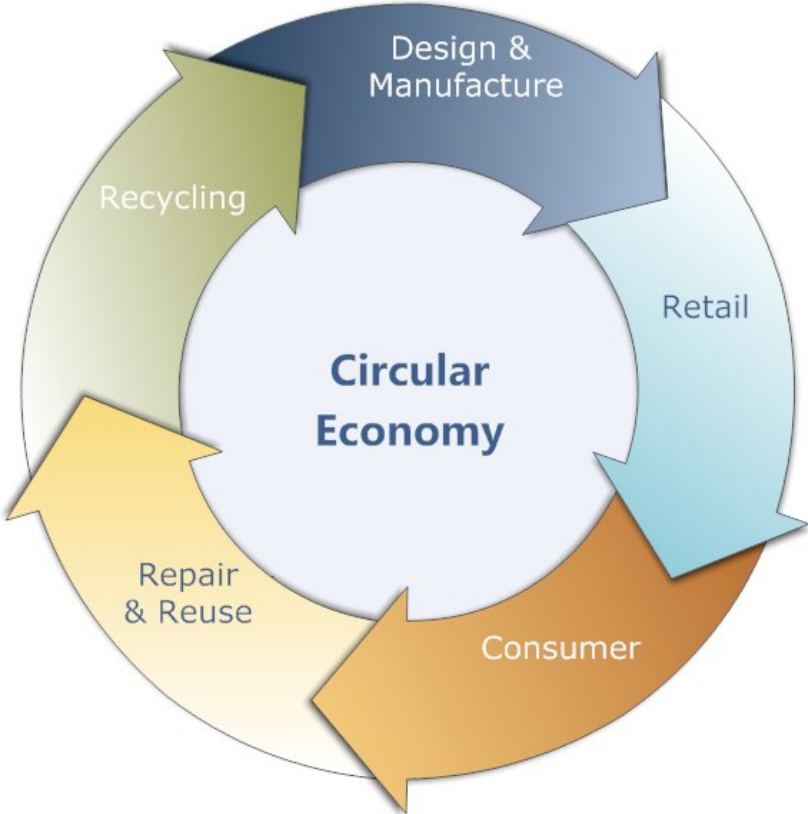
LINEAR ECONOMY



CIRCULAR ECONOMY



Circular Economy



1 NO POVERTY



2 ZERO HUNGER



3 GOOD HEALTH AND WELL-BEING



4 QUALITY EDUCATION



5 GENDER EQUALITY



6 CLEAN WATER AND SANITATION



7 AFFORDABLE AND CLEAN ENERGY



8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



10 REDUCED INEQUALITIES



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



14 LIFE BELOW WATER



15 LIFE ON LAND



16 PEACE, JUSTICE AND STRONG INSTITUTIONS



17 PARTNERSHIPS FOR THE GOALS




SUSTAINABLE
DEVELOPMENT
GOALS

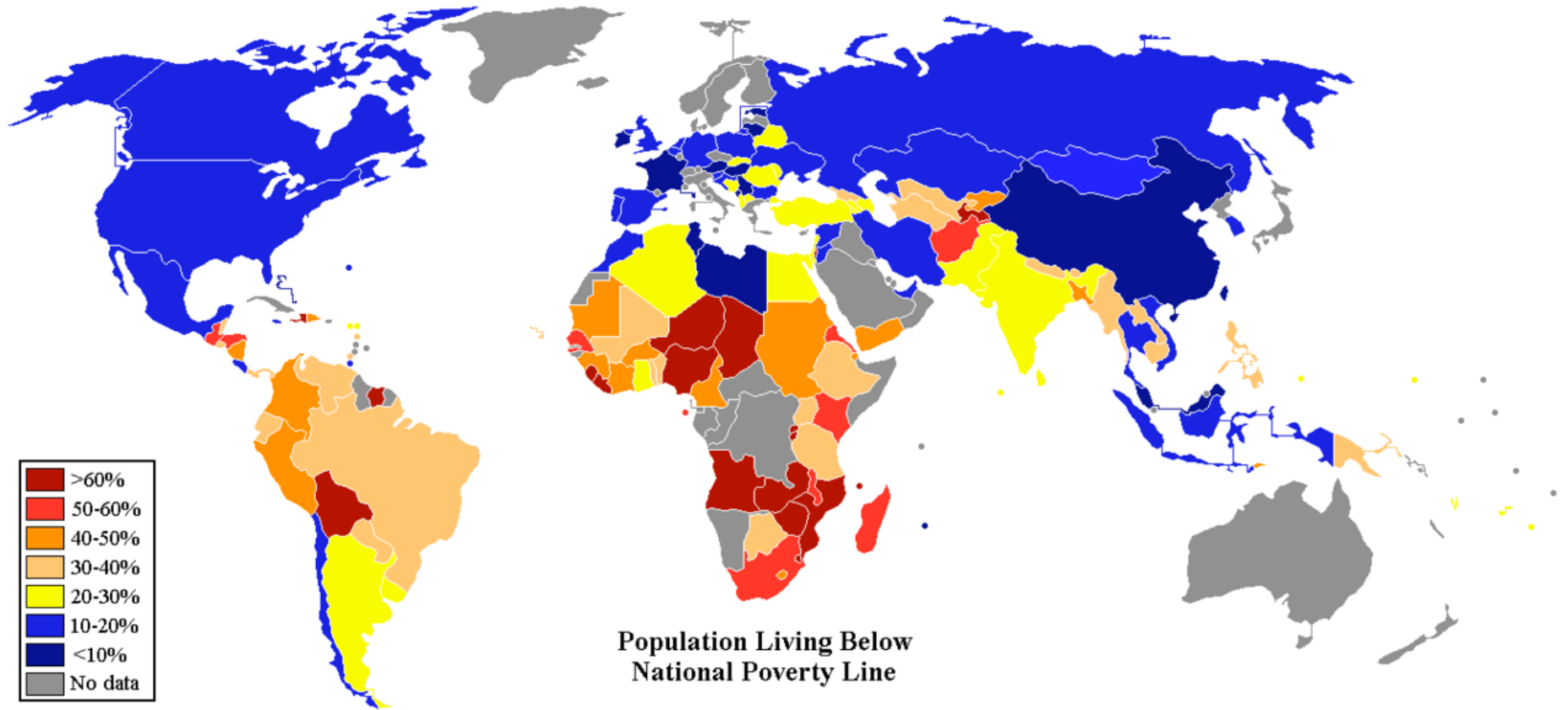
17 SDG - Sustainable Development Goals) of United Nation

- The Sustainable Development Goals (SDGs) are a collection of 17 global goals set by the United Nations.
- The broad goals are interrelated though each has its own targets to achieve.
- The total number of targets is 169.
- The SDGs cover a broad range of social and economic development issues. These include poverty, hunger, health, education, climate change, and gender

17 SDG - Sustainable Development Goals) of United Nation

- The goals were developed to replace the Millennium Development Goals (MDGs) which ended in 2015.
- Unlike the MDGs, the SDG framework does not distinguish between "developed" and "developing" nations. Instead, the goals apply to all countries.
- Many of these goals and targets concern nutrition, food, food security, food safety, agriculture, rural areas...

17 SDG - Sustainable Development Goals) of United Nation



Source: CIA World Factbook 2008

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High income countries	Low income countries
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High relevance of Agrifood Industry, Transport and Logistic	Low relevance of Agrifood Industry, Transport and Logistic
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Food Safety (Food Security)	Food Security and Food Safety

Sustainable development

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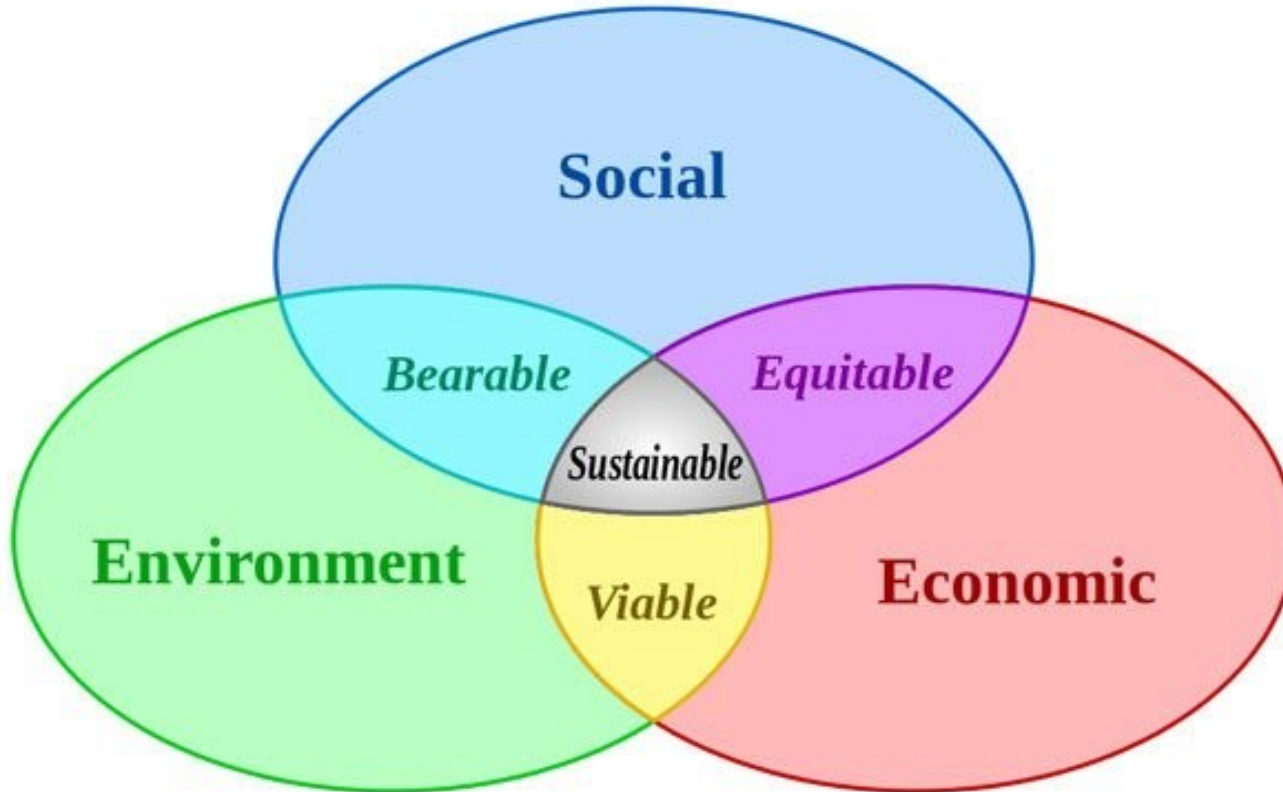
Sustainable development

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Sustainable development

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Sustainable development



Sustainable development

Related to sustainable development are the concept of

- Green Economy
- Circular Economy

Green Economy

Green Economy: a way to sustainable development



Circular Economy

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Circular Economy

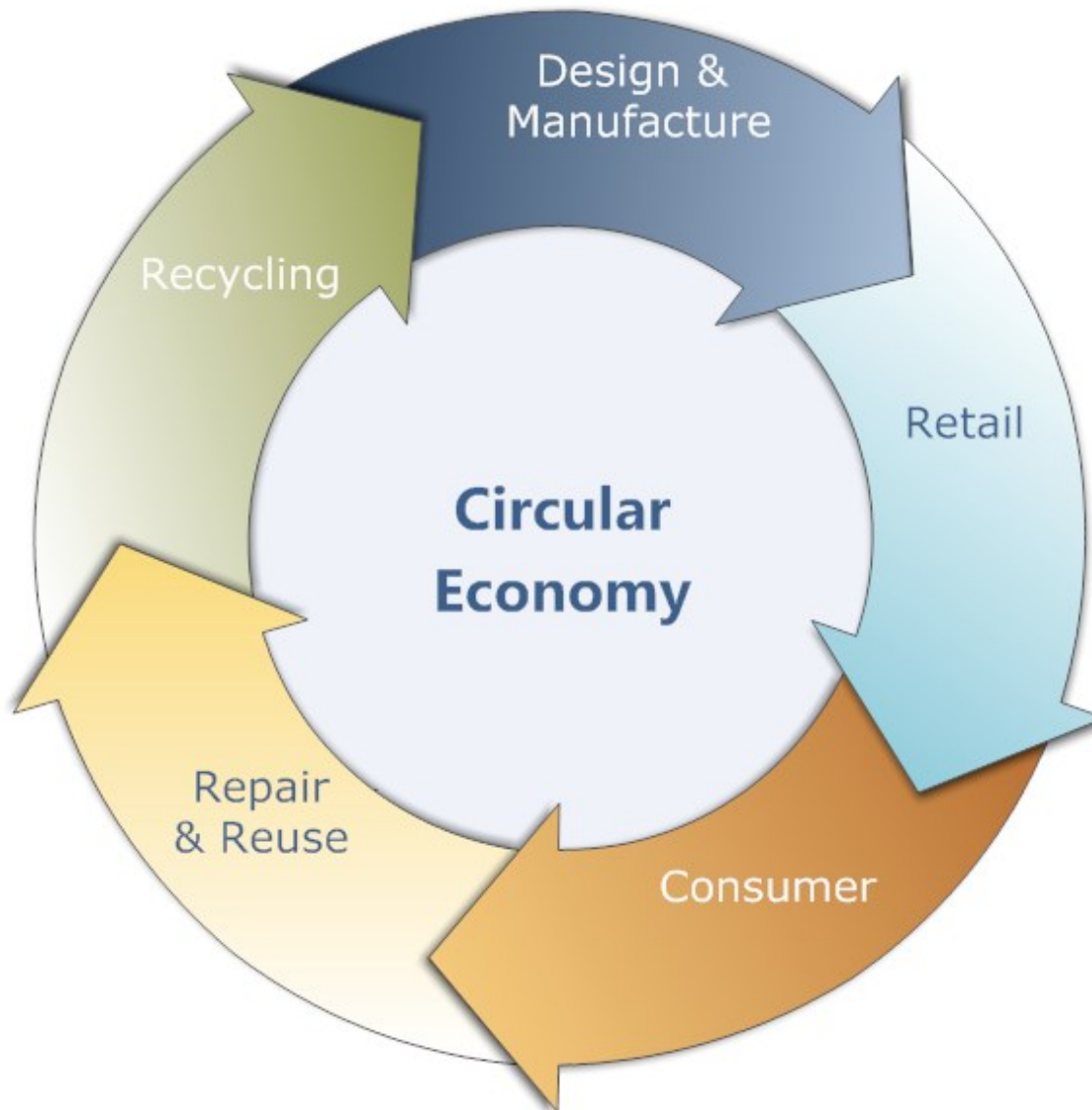
LINEAR ECONOMY



CIRCULAR ECONOMY



Circular Economy



17 SDG - Sustainable Development Goals) of United Nation

- the United Nations follow the sustainable development approach to reach its goals
- In particular with the so called 17 SDG - Sustainable Development Goals)

17 SDG - Sustainable Development Goals) of United Nation



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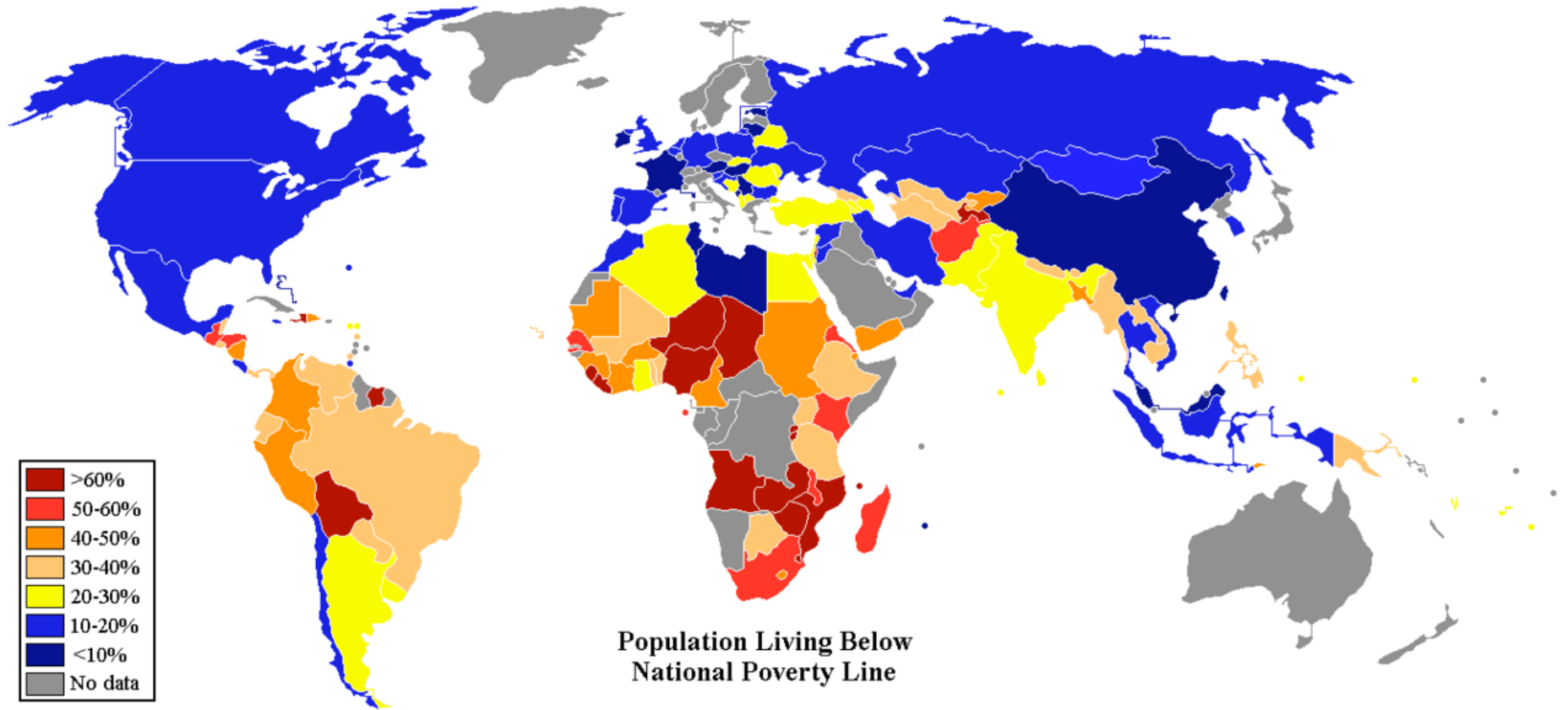
17 SDG - Sustainable Development Goals) of United Nation

- The SDGs cover a broad range of social and economic development issues. These include poverty, hunger, health, education, climate change, gender equality, water, sanitation, energy, environment and social justice.
- The SDGs are also known as "Transforming our World: the 2030 Agenda for Sustainable Development" or 2030 Agenda in short.

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17 SDG - Sustainable Development Goals) of United Nation



Source: CIA World Factbook 2008

17 SDG - Sustainable Development Goals) and food

Goal 1 – No Poverty

Goal 2 – Zero Hunger

Goal 3 - Good health and well-being

Goal 4 - Quality education

Goal 5 - Gender equality

Goal 6 – Clean Water and Sanitation

Goal 7 – Affordable and Clean Energy

Goal 8 - Decent work and economic growth

Goal 9 - Industry, innovation and infrastructure

17 SDG - Sustainable Development Goals) and food

Goal 10 - Reduced inequalities

Goal 11 – Sustainable cities and countries

Goal 12 – Responsible Consumption and Production

Goal 13 – Climate Action

Goal 14 – Life Below Water

Goal 15 – Life on Land

Goal 16 – Peace, Justice and Strong Institutions

Goal 17 - Partnerships for the goals

17 SDG - Sustainable Development Goals) and food

Goal 1 – No Poverty

Includes targets for the eradication of extreme poverty (incomes of less than USD 1.25 a day) and 50% reduction of poverty by 2030.

Agriculture is a potent force for poverty reduction in many developing countries in particular

Almost 80 percent of the world's extreme poor live in rural areas where most are dependent on agriculture.

Agriculture is the single largest employer in the world.

Agricultural growth in low-income and agrarian economies is at least twice as effective as growth in other sectors in reducing hunger and poverty

17 SDG - Sustainable Development Goals) and food

Goal 2 – Zero Hunger

Numerous relevant targets, including the ending of hunger and malnutrition; the doubling of agricultural productivity and incomes of small-scale food producers; the correction of international trade restrictions; increased investment in agricultural research, extension services and technology; and the implementation of environmentally sustainable food production systems by 2030

17 SDG - Sustainable Development Goals) and food

Goal 2 – Zero Hunger

In particular:

- The number of undernourished has fallen by 216 million since 1990–92, but one in nine people on the planet still suffer from hunger.
- Only a small fraction of the around 800 million hungry have access to some form of social protection.
- Malnutrition exacts high economic and social costs on society.

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Goal 2 – Zero Hunger

In particular:

- While two billion people do not consume enough vitamins and minerals, obesity rates have doubled over the past 30 years.
- Some 1.4 billion people are overweight, and 500 million obese.

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Goal 3 - Good health and well-being

- Includes the reduction of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.
- Relevant for agro-chemical and manure use

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Goal 4 - Quality education

- Relevant for agricultural training and extension, both of which can enable farmers to adopt environmentally sustainable farming practices and improve competitiveness

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Goal 5 - Gender equality

- Includes the eradication of gender discrimination, including in land ownership.
- Bridging the yield gap which currently exists between male and female farmers in developing countries could increase total agricultural output of these countries by 2.5-4%, thereby reducing global hunger by 12-17%.¹

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Goal 6 – Clean Water and Sanitation

- Relevant for water use efficiency of agricultural production, the improvement of water quality via the reduction of pollution, and the protection of water-related ecosystems.
- Farming accounts for around 70% of water used worldwide and contributes to water pollution from excess nutrients, pesticides and other pollutants.
- How to increase food production using less water is one of the great challenges of the future.

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Goal 6 – Clean Water and Sanitation

- Crops and livestock use 70 percent of all water withdrawals and up to 95 percent is some developing countries.
- By 2025, 1.8 billion people are projected to be living in countries or regions with absolute water scarcity

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Goal 7 – Affordable and Clean Energy

- Includes targets for the substantial increase of renewable energy and doubling of the improvement in global energy efficiency by 2030.
- Energy has a key enabling role in achieving food security and better nutrition.
- Food systems, which currently consume 30 percent of the world's energy, will gradually need to decouple from fossil fuel dependence to deliver more food with less and cleaner energy

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Goal 7 – Affordable and Clean Energy

- Energy prices influence food prices.
- Relevant for agricultural energy use efficiency and bioenergy production

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Goal 8 - Decent work and economic growth

- Features relevant targets for sustainable per capita economic growth; improvement of resource use efficiency; and access to financial services and insurance.

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Goal 9 - Industry, innovation and infrastructure

- Agriculture-relevant targets include the development of sustainable and resilient infrastructure;
- increased SME access to financial services and their integration into value chains;
- the encouragement of innovation.

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Goal 10 - Reduced inequalities

- Targets include the achievement, by 2030, of the sustainable income growth of the bottom 40% of the population at a higher rate than the national average.
- Relevant for reasons mentioned under Goal 1.

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Goal 11 – Sustainable cities and countries

- Food security and food safety goals contribute to ensure the sustainability of the cities.
- Food security, food safety and sustainable agriculture contribute to ensure the sustainability of the countries.

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Goal 12 – Responsible Consumption and Production

Sustainable consumption and production

Includes the reduction of post-harvest losses; efficient use of natural resources; environmentally-sound management of chemicals and waste; and the reduction of fossilfuel subsidies

- Every year, the world loses or wastes about a third of the food it produces.
- To feed the world sustainably, producers need to grow more food while reducing negative environmental impacts such as soil, water and nutrient loss, greenhouse gas emissions, and degradation of ecosystems.
- Consumers must be encouraged to shift to nutritious and safe diets with a lower environmental footprint.

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Goal 13 – Climate Action

Combat Climate change

- Targets strengthened resilience to climate-related hazards and the joint mobilisation of USD 100 billion annually by 2020 to facilitate climate change mitigation by developing countries.
- Climate change is highly relevant for agriculture, both impacting and being impacted by it.
- Agriculture has a major role to play in responding to climate change.

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Goal 13 – Climate Action

Combat Climate change

- While temperature rises pose a real threat to global food production, investments in all sectors of agriculture can simultaneously support climate change adaptation and mitigation while improving rural people's livelihoods.

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Goal 14 – Life Below Water

Oceans, Seas and Marine resources

- Includes the prevention and significant reduction by 2025 of marine pollution, nutrient pollution in particular; the effective regulation of fishing to ensure sustainable fishing practices; and the prohibition of certain fisheries subsidies by 2020
- Worldwide nearly three billion people receive 20 percent of their daily animal protein intake from fish.
- About 29 percent of commercially important assessed marine fish stocks are overfished and 61 percent fully fished.

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Goal 15 – Life on land

- Targets the conservation and sustainable use of freshwater ecosystems and the promotion of sustainable forest management (the halting of deforestation included) by 2020;
- the combatting of desertification and restoration of degraded soil by 2030;
- the prevention of biodiversity loss.
- As farming is the human activity which occupies the largest share of total land in many OECD countries, agriculture can not only significantly impact biodiversity, but is also dependent upon it.

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Goal 15 – Life on land

In particular:

- Forests make vital contributions to biodiversity; they act as a source of food, medicine and fuel for more than a billion people.
- Mountains supply more than half of humankind with water.
- A third of farmland is degraded, up to 75 percent of crop genetic diversity has been lost and 22 percent of animal breeds are at risk.
- Soil is non-renewable – its loss is not recoverable within a human lifespan.

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Goal 16 – Peace, Justice and Strong Institutions

Food security, food safety and rural development contribute to ensure the goal n. 16

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Goal 17 - Partnerships for the goals

Features agriculture-relevant targets on international trade, including the promotion of an open, non-discriminatory and equitable multilateral trading system and the conclusion of the WTO Doha Development Round.

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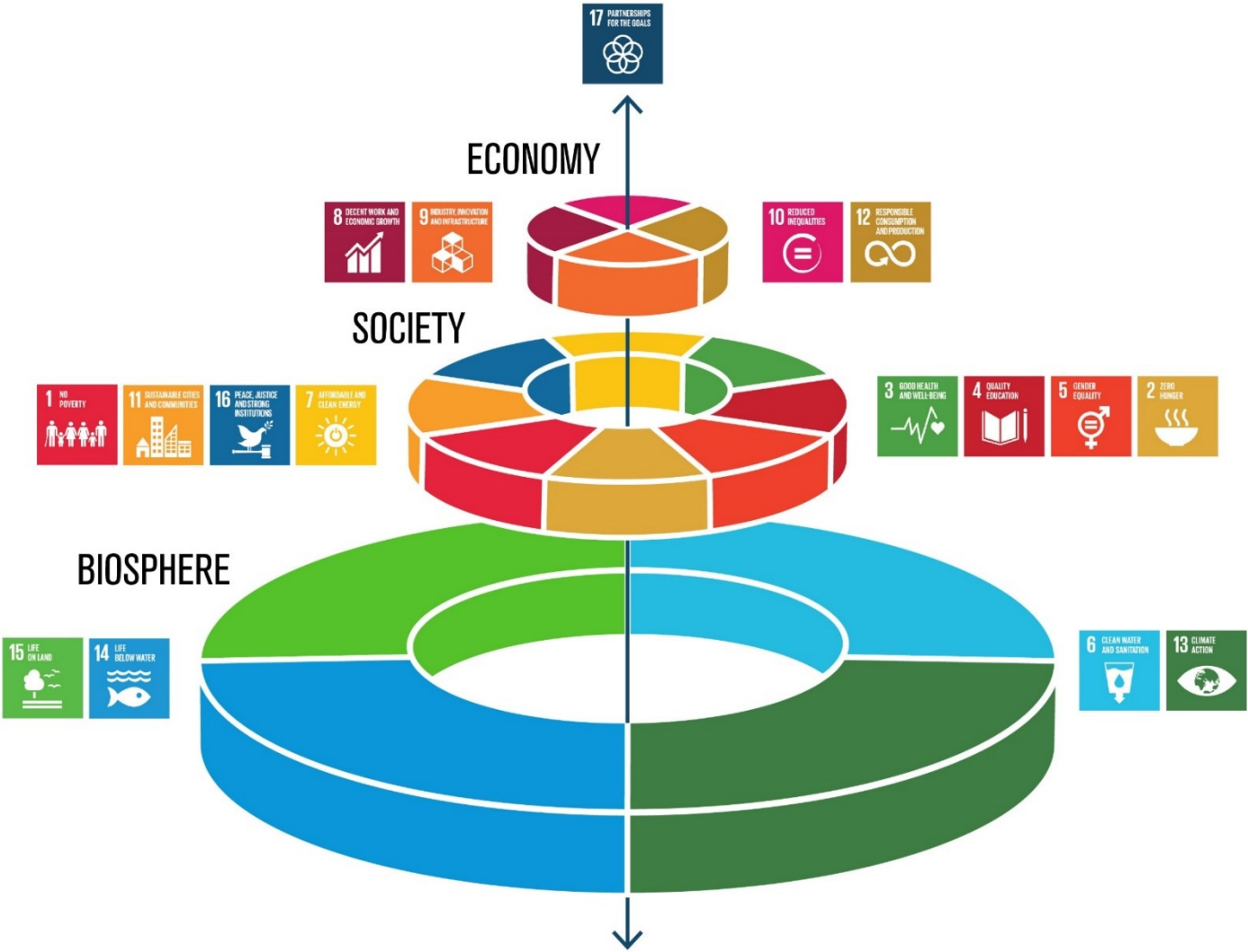
FAO's Strategic Objectives are:

1. Help eliminate hunger, food insecurity and malnutrition
2. Make agriculture, forestry and fisheries more productive and sustainable
3. Reduce rural poverty
4. Enable inclusive and efficient agricultural and food systems
5. Increase the resilience of livelihoods to threats and crises

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- Recently the Stockholm Resilience Centre of University of Stockholm present a new way of viewing the Sustainable Development Goals and how they are all linked to food
- This model represents new way of viewing the Sustainable Development Goals and how they are all linked to food.
- It calls for a shift away from the current sectorial approach where social, economic, and ecological development are seen as separate parts.
- Instead we must transition toward a logic where the economy serves society so that it evolves within the safe operating space of the planet.

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- The new illustration is based on one of the iconic figures of the center, “the wedding cake”.
- It implies that economies and societies are seen as embedded parts of the biosphere.
- This model try to changes the paradigm for development, moving away from the current sectorial approach where social, economic, and ecological development are seen as separate parts.
- The model take into account a transition toward a world logic where the economy serves society so that it evolves within the safe operating space of the planet
- See the video of the presentation:
<https://youtu.be/tah8QlhQLeQ>