



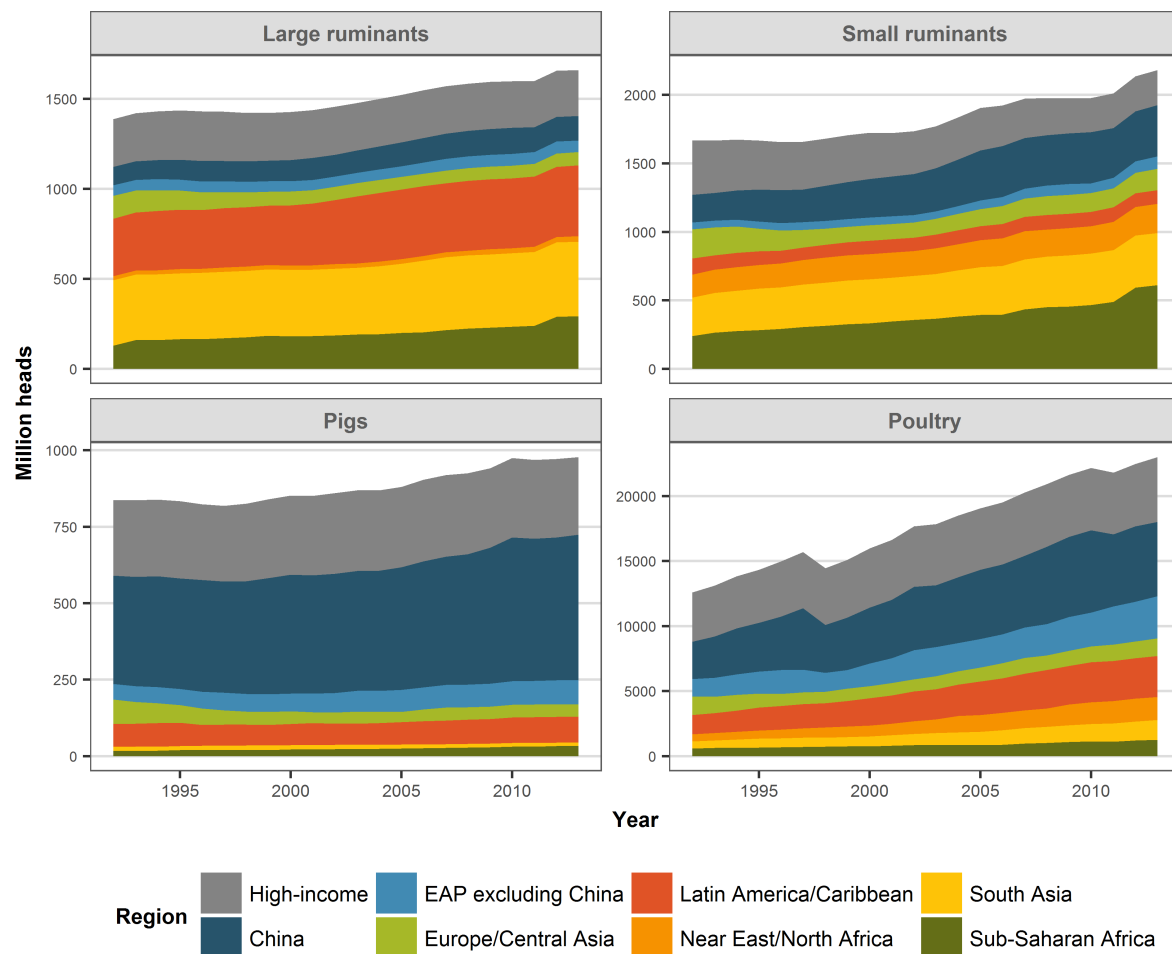
Food and Agriculture Organization
of the United Nations

Livestock, climate and environment: trends, challenges and alternative pathways

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FAO

The 2017 EU Agricultural Outlook conference
18 – 19 December 2017 | Brussels, Belgium

Herd sizes by regions

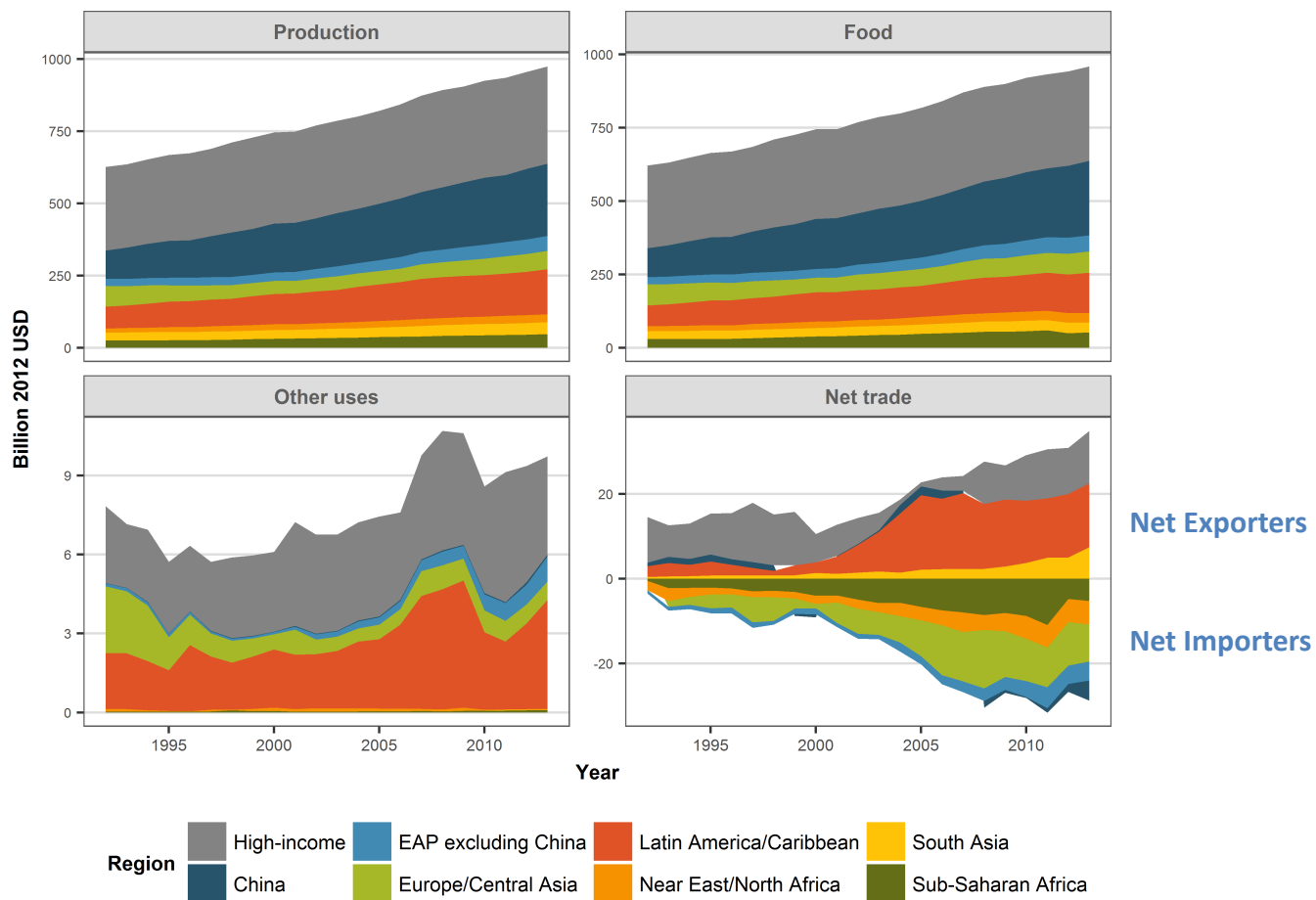


Note: Large ruminants include cattle and buffalo, small ruminants sheep and goat.

Source: FAOSTAT.



Meat production by regions



Note: Meat includes beef, pork, poultry, and sheep and goat meat.

Source: FAOSTAT.



Summary production trends

Herd sizes

- Regional proportions of animal herds fairly stable over last 25 years
- But: recently higher growth rates for ruminant herds in **sub-Saharan Africa**
- Also: Accelerating growth for poultry in **South Asia** and **Near East/North Africa**
- High-income countries (including EU) have low to negative growth rates for all herds

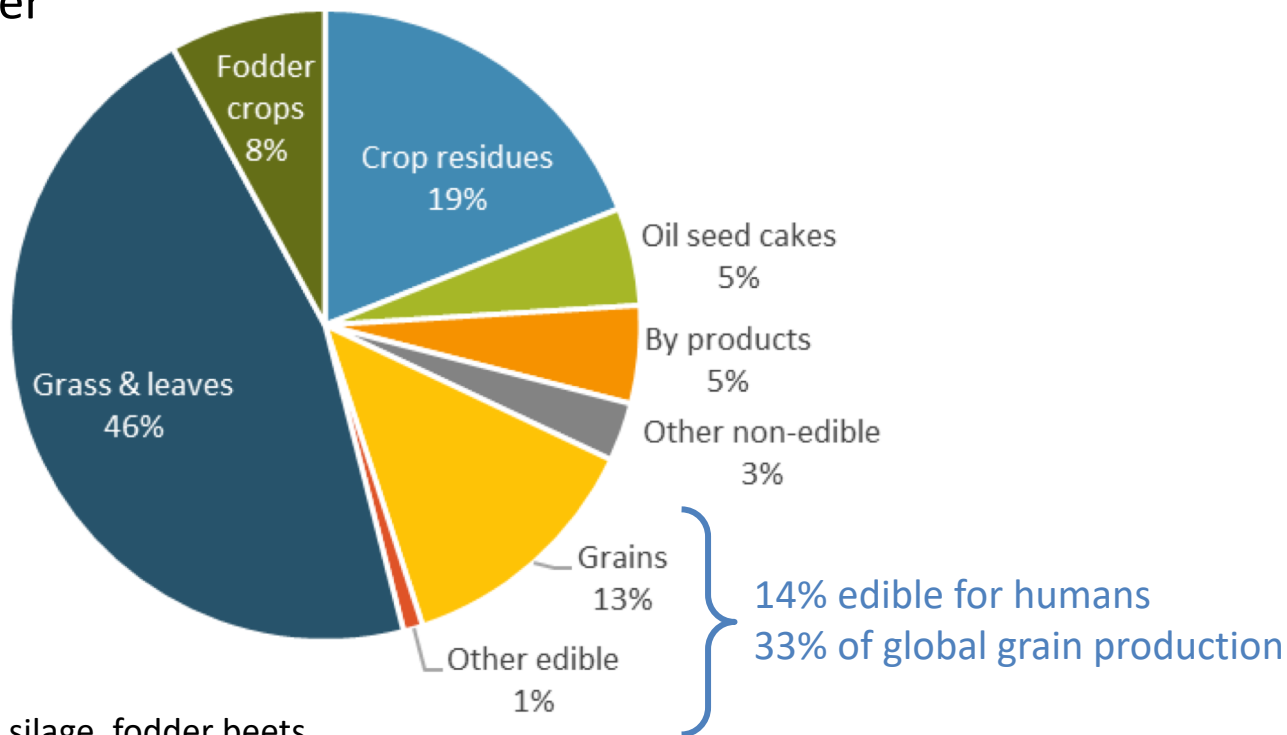
Meat markets

- High-income countries largest producer of meat, China and Latin-America/Caribbean expanding
 - International trade of meat and meat products expanded but remains low compared to domestic production and food use
 - Domestic demand largely met by domestic production
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Global livestock feed ration composition

6 billion tons dry matter



Fodder crops: grain and legume silage, fodder beets

Crop residues: straws and stover, sugar cane tops, banana stems

By-products: brans, corn gluten meal and feed, molasses, beetroot pulp and spent breweries, distilleries, biofuel grains

Other non-edible: second grade cereals, swill, fishmeal, synthetic amino acids, lime

Other edible: cassava pellets, beans and soy beans, rapeseed and soy oil



Land-use for livestock production

Global land-use for forage and feed production by regions and species (million ha).

		Grasslands suitable for crops	Grasslands unsuitable for crops	Cereal and legume silage, fodder beet	Cereals grains	Oil seed and oil seed cakes	Other crops ^a	By-products ^b	Crop residues	Total
Non OECD	Cattle & buffaloes	436.2	442.6	46.8	42.7	22.7	0	22.1	100.7	1113.8
	Small Ruminants	139.9	769.6	9.1	0.7	0.9	0	2.1	17.8	940.1
	Poultry	0	0	0	73.8	43.4	0.7	1.4	0	119.23
	Pigs	0	0	0	24.7	27.0	1.4	2.8	4.2	60.1
	Cattle & buffaloes	88.5	40.0	9.6	28.0	8.2	0	3.7	2.2	180.2
OECD	Small Ruminants	20.3	12.2	0.4	0.9	0.2	0	0.5	0.9	35.4
	Poultry	0	0	0	19.3	16.9	0.0	0.0	0	36.2
	Pigs	0	0	0	20.4	12.0	0.8	0.5	0.3	34.0
	Cattle & buffaloes	524.7	478.5	56.5	70.7	30.9	0	25.8	103.0	1290.1
	Small Ruminants	160.3	781.8	9.5	1.6	1.1	0	2.6	18.6	975.5
World	Poultry	0	0	0	93.1	60.3	0.7	1.4	0	155.5
	Pigs	0	0	0	45.1	39.0	2.5	3.3	4.4	94.0
	All	684.9	1260.4	65.9	210.5	131.3	2.9	33.1	126.0	2,505.6

^a Pulses, cassava and banana

^b Corn gluten feed and meal, brans, middling, molasses, sugar beet pulp, and by-products from breweries, distilleries and biofuels

^c Straws, sugar cane tops, banana stems

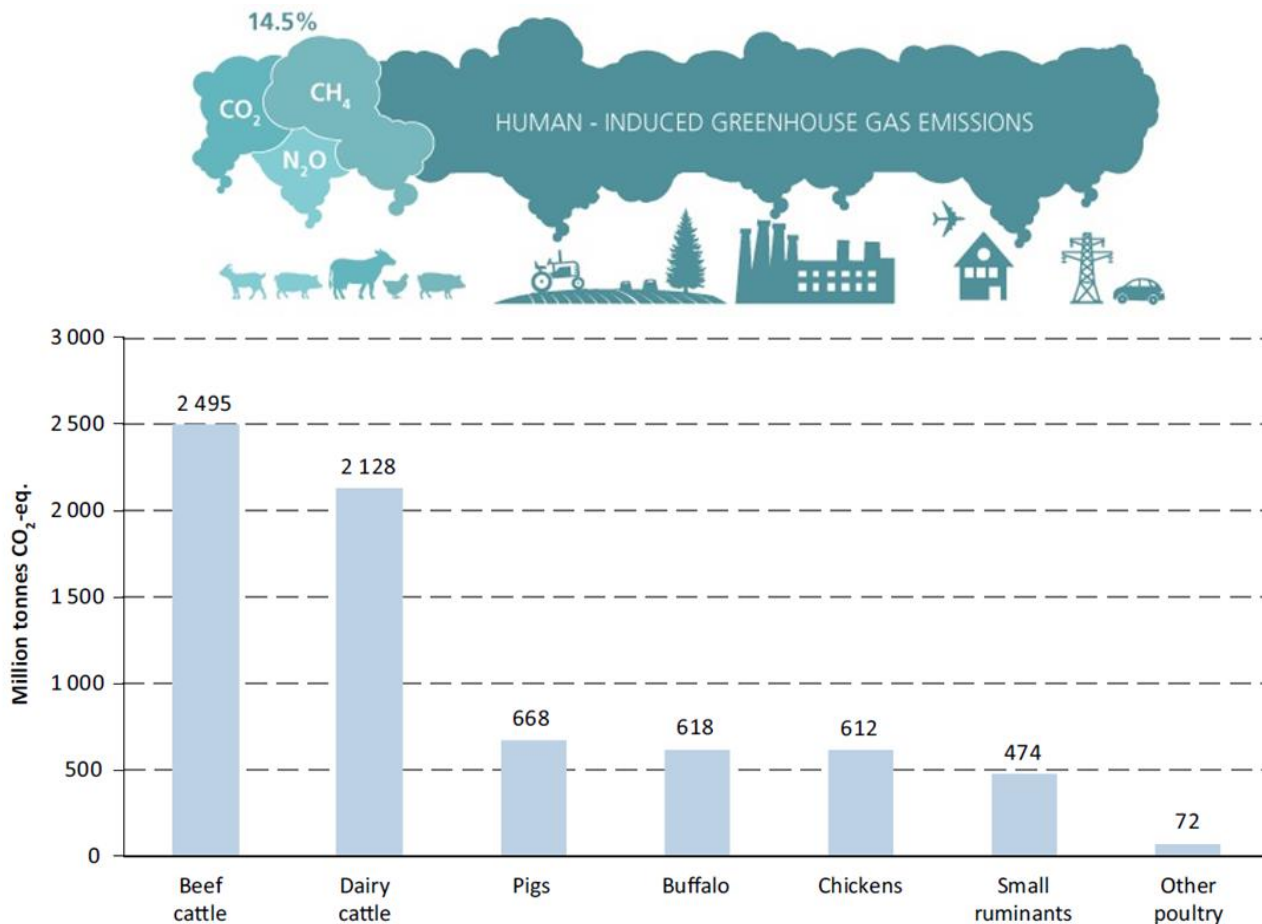
At global scale:

- 2505 million ha used for livestock production
- 1260 million ha on grassland not suitable for crops, ~ 50%

OECD countries:

- 286 million ha used for livestock
- 52 million ha on grassland not suitable for crops, ~ 18%

Total GHG emissions from livestock supply chains

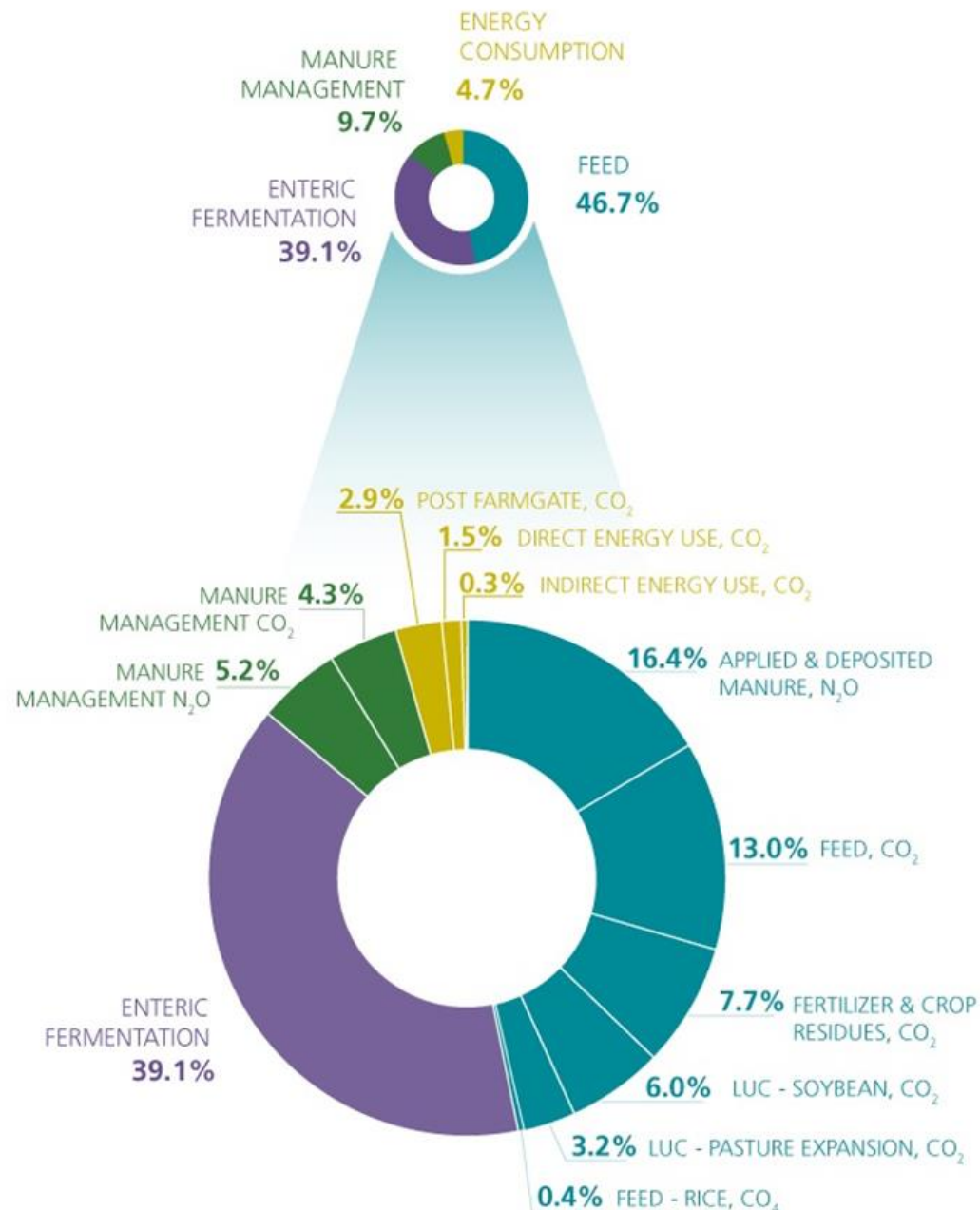


* Includes emissions attributed to edible products and to other goods and services, such as draught power and wool.

Source: GLEAM.



Key sources of emissions



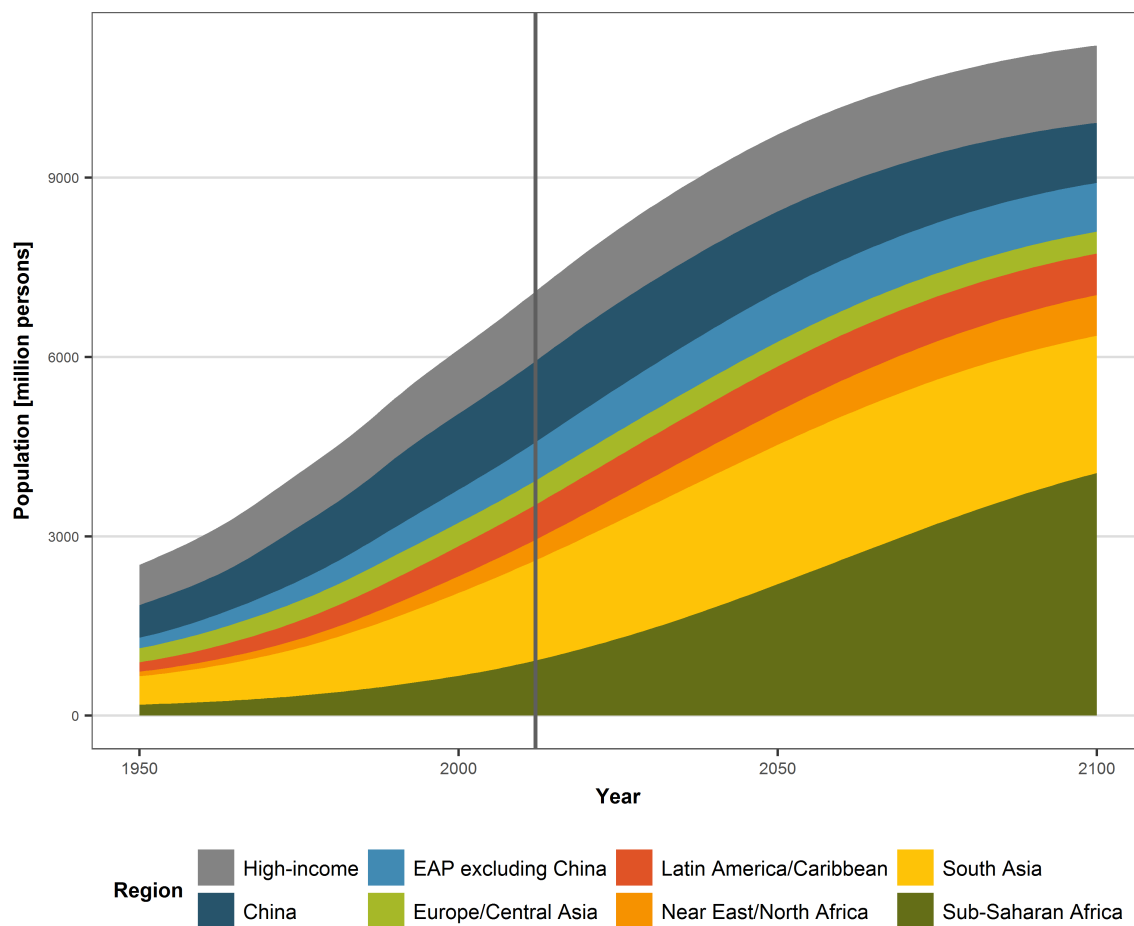


Summary feed, land and emissions

- 33% percent of grain production used for feed (but not all immediately usable for human consumption).
 - Half of the area required for livestock production uses grassland that is not usable for crop production.
 - 14.5% of global greenhouse gas emissions originate from livestock production:
 - Large ruminants have highest share
 - Feed production and enteric fermentation contribute most
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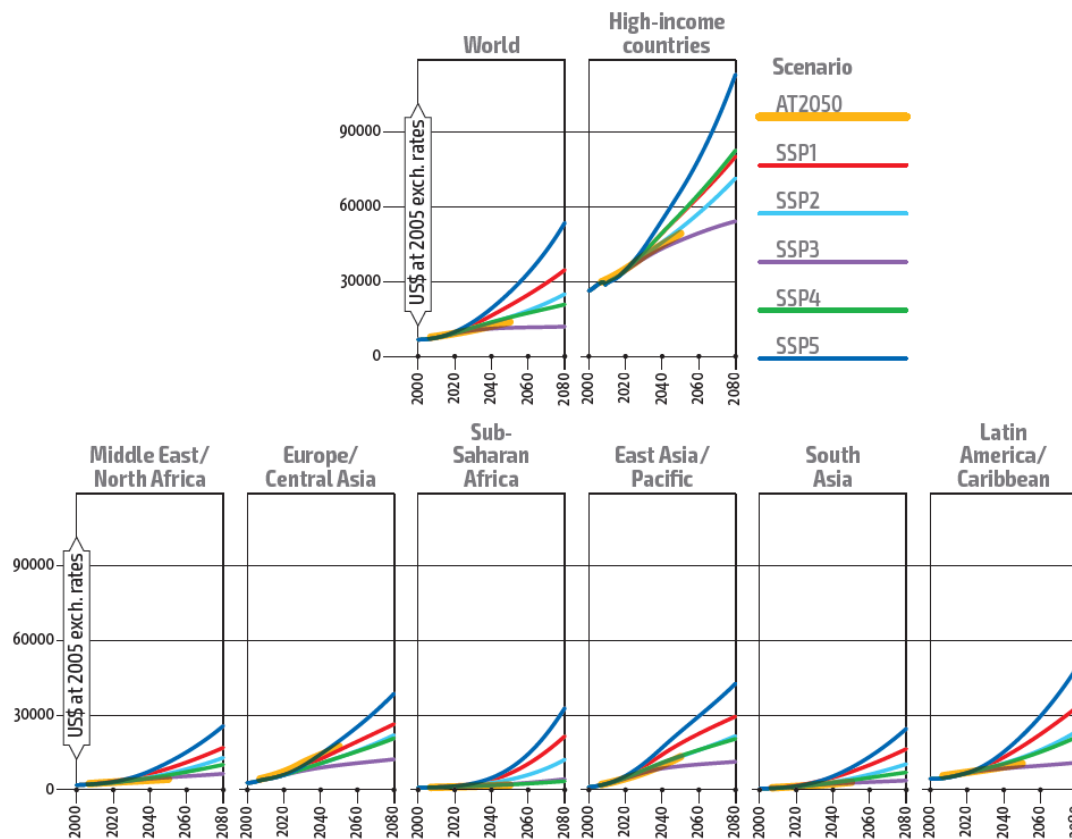


Global population projections



Source: UN World Population Prospects 2015, medium variant

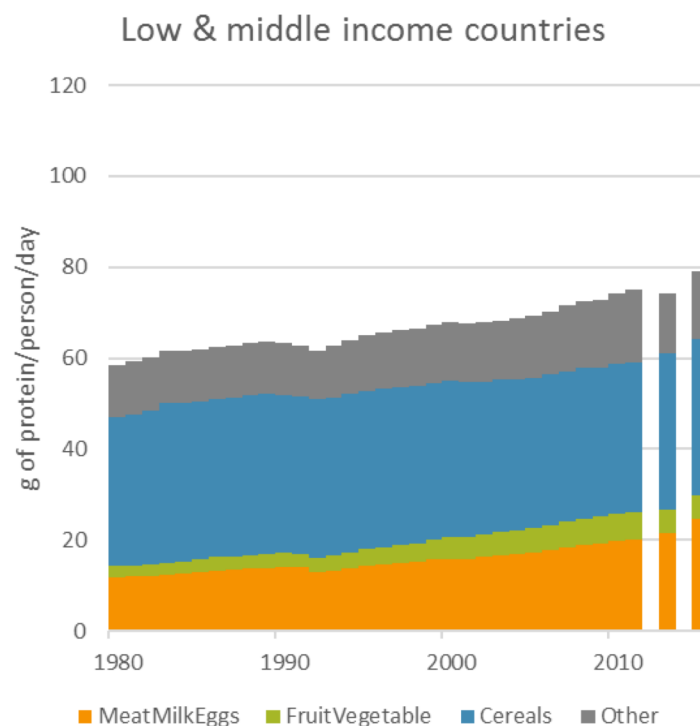
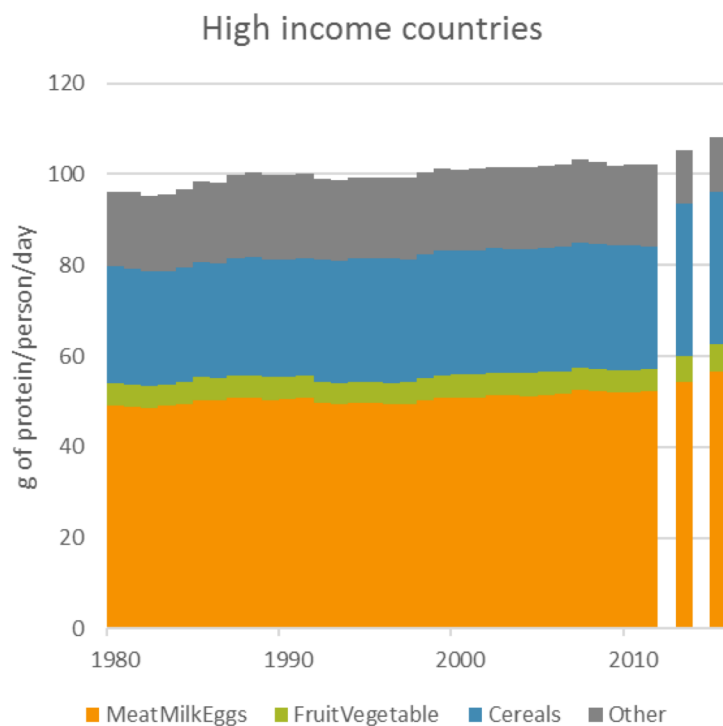
Income per capita projections (Shared Socio-Economic Pathways, SSP)



Note: Regional groups do not include high-income countries.

Source: FAO Global Perspectives Studies, based on IIASA, 2016; Alexandratos and Bruinsma, 2012.

Protein consumption per capita, historical and projections



Notes: Projections start after red vertical line.

All commodity groups expressed in primary equivalents.

Due to different definitions, direct comparison between “Other” and “Cereals” not always possible.

Source: FAO, 2017



Summary challenges

- Largest population growth projected for Sub-Saharan Africa and South Asia
 - Projections for income per capita vary substantially across scenarios (here Shared Socio-Economic Pathways), but:
 - Low- income countries do not catch up to high-income countries
 - Increased income causes higher demand for food protein per capita, animal products (meat, milk, eggs) gain importance in low- and middle income countries
 - If domestic demand continues to be mainly met by domestic production (as in the past), large expansion of animal production in Sub-Saharan Africa to be expected
 - Expansion of ruminant herds and poultry
 - Global greenhouse gas emissions from livestock continue to grow
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Possible alternative pathways

- Investment in feed production technologies in major producing regions to reduce emissions (46.7% of livestock-related emissions)
 - Improved feed efficiency and composition of animal diets to reduce emissions from enteric fermentation (39.1% of livestock-related emissions)
 - Reduction of animal products share in high-income countries' diets
 - Global trade integration: Production in regions with comparative advantage, including emission and energy efficiency?
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Global Perspectives Studies at FAO: Publications

Corporate reports on key issues

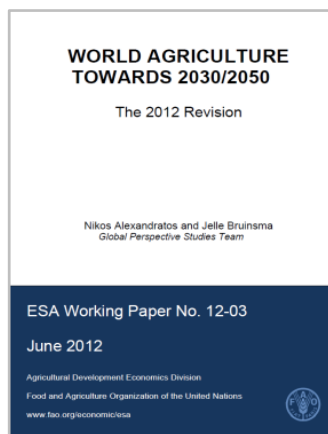
- E.g. report on *“The future of food and agriculture – Trends and challenges”* (2017)

World Agriculture towards 20XX

- long-term projections of agriculture, food security and natural resource use. Last baseline projection until 2050 (**AT2050**, Alexandratos and Bruinsma, 2012)

Upcoming report:

The future of food and agriculture – Alternative pathways to 2050





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Thank you

www.fao.org/global-perspectives-studies
