# Food 2030: The role of the livestock sector and animal science in achieving the Sustainable Development Goals

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# Plan



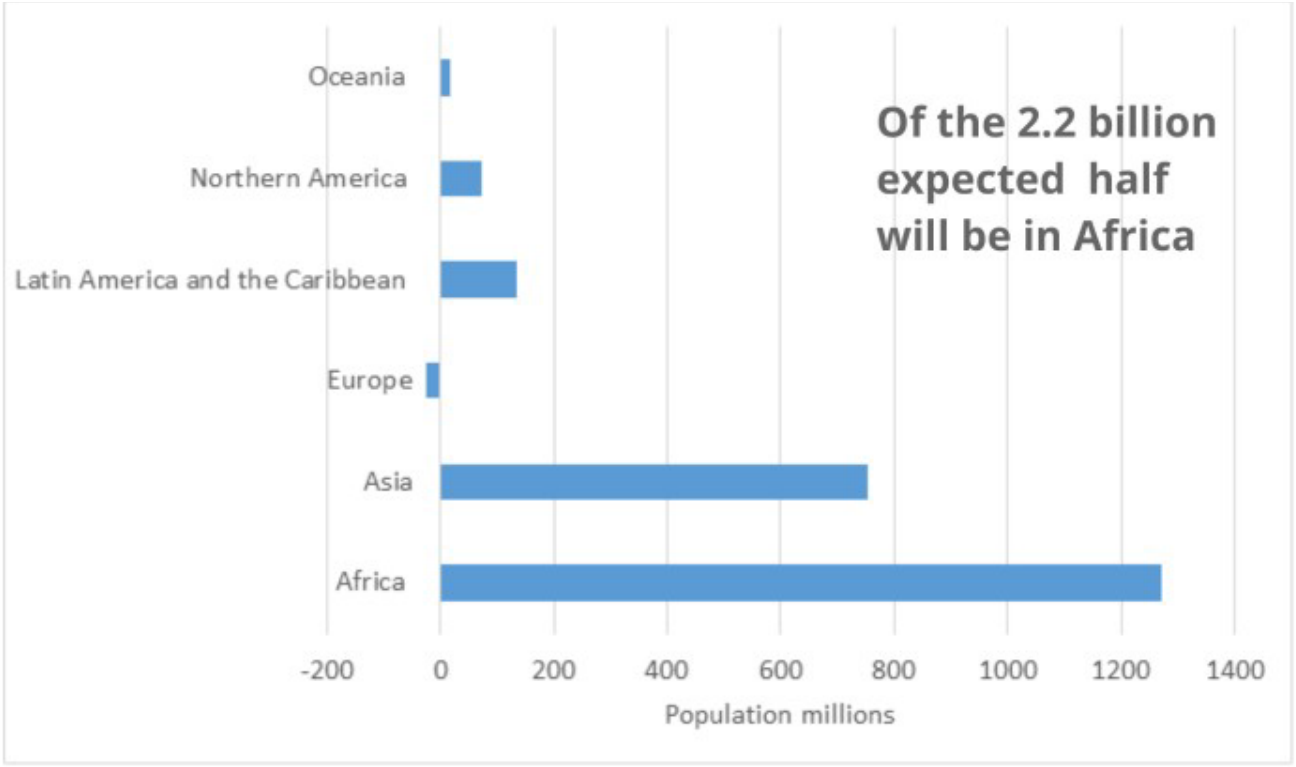
1. Livestock sector drivers and outcomes
2. Livestock and the 2030 Agenda for Sustainable Development
3. Synergies and trade-offs between SDGs
4. Summary

# Livestock sector drivers and outcomes

# Livestock sector drivers and outcomes



## The world's population will reach 8.6 billion by 2030 and 9.8 billion by 2050

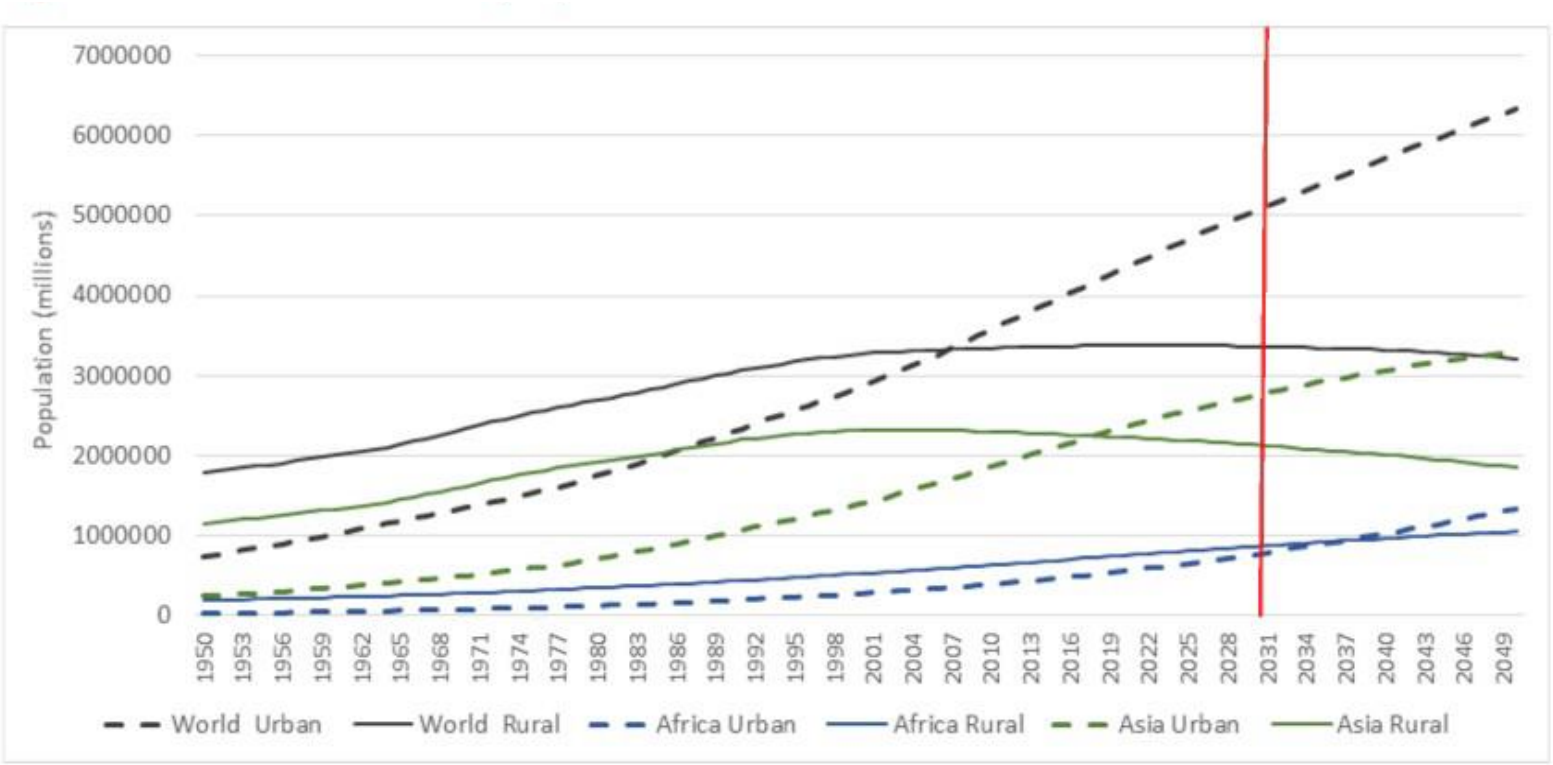



Source: UN, World Population Prospects, 2017 Revision
Data visualization: FAO, AGAL, Livestock Policy Lab (LPL)

# Livestock sector drivers and outcomes



## By 2030 the world's population will be 60% urban and 40% rural

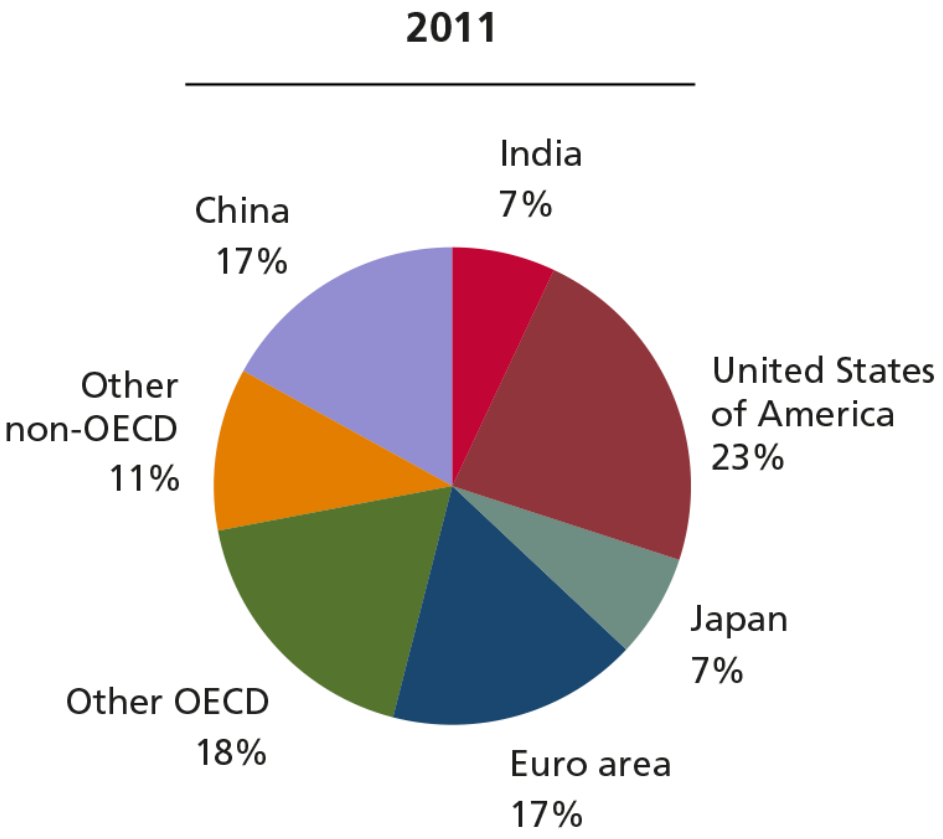


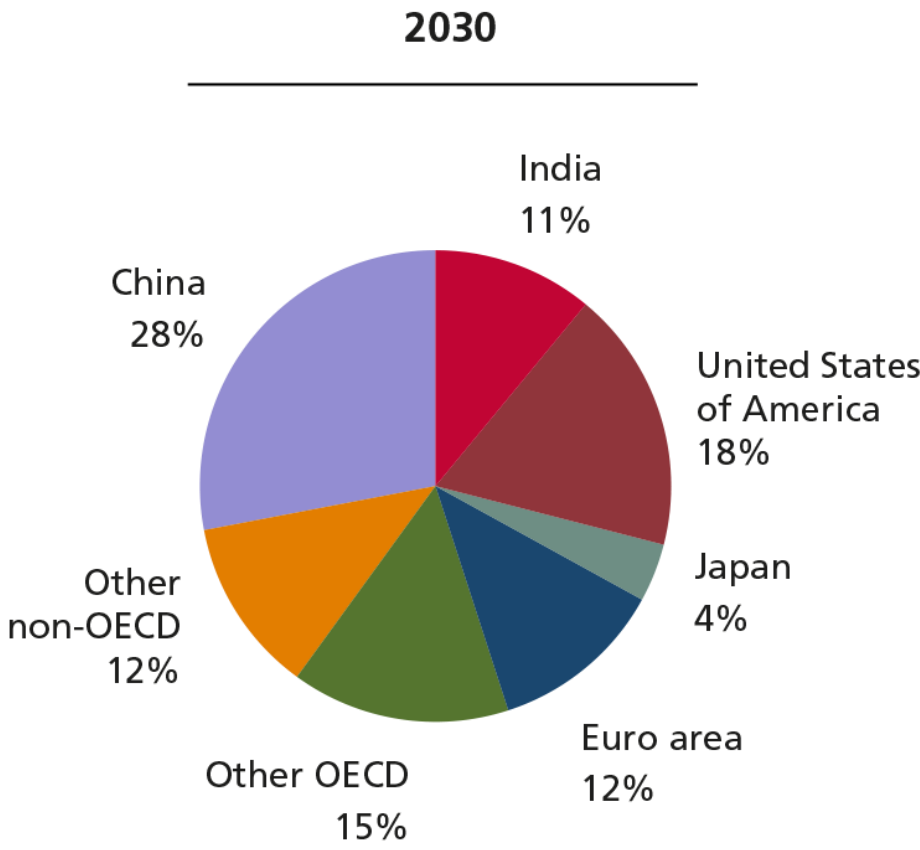

Source: World Urbanization Prospects
Data visualization: FAO, AGAL, Livestock Policy Lab (LPL)

# Livestock sector drivers and outcomes



## The next years will see major changes in countries' shares of global GDP



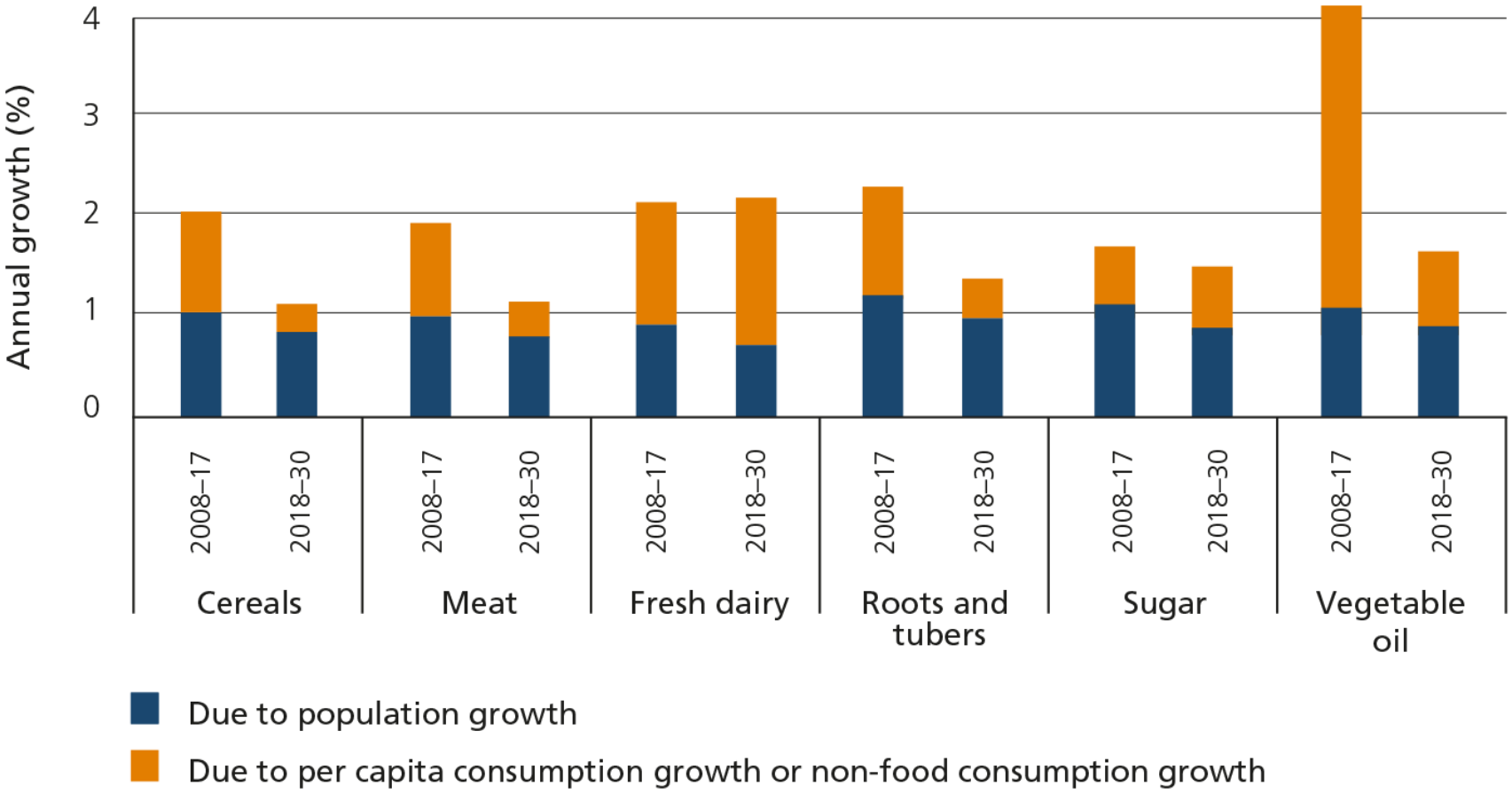




Source: OECD, 2012

# Livestock sector drivers and outcomes



## The demand for animal source foods is expected to increase by 2030

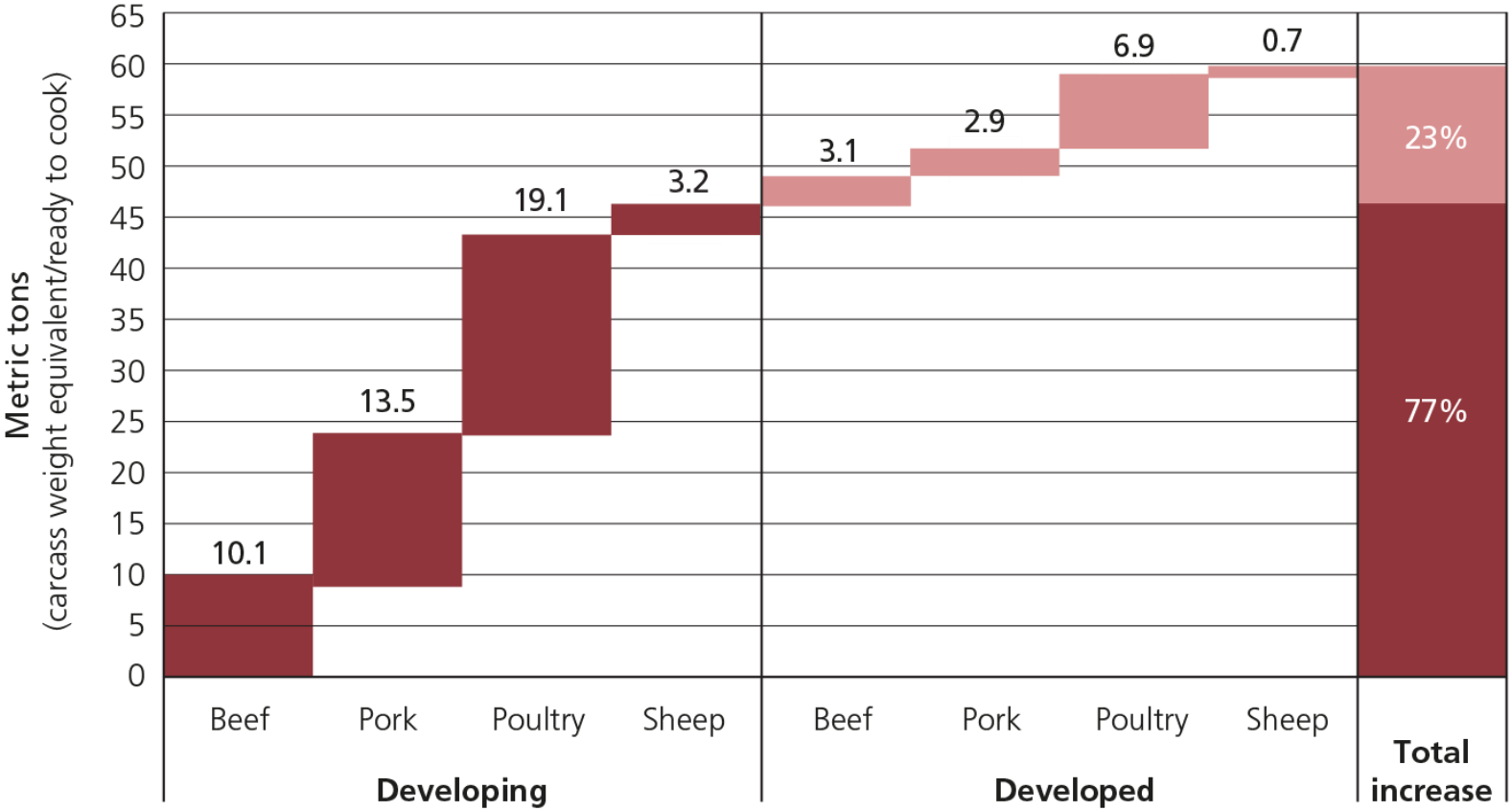



Source: OECD-FAO Outlook, 2017

# Growth in global meat production



## Poultry meat will remain the primary driver of growth in global meat production

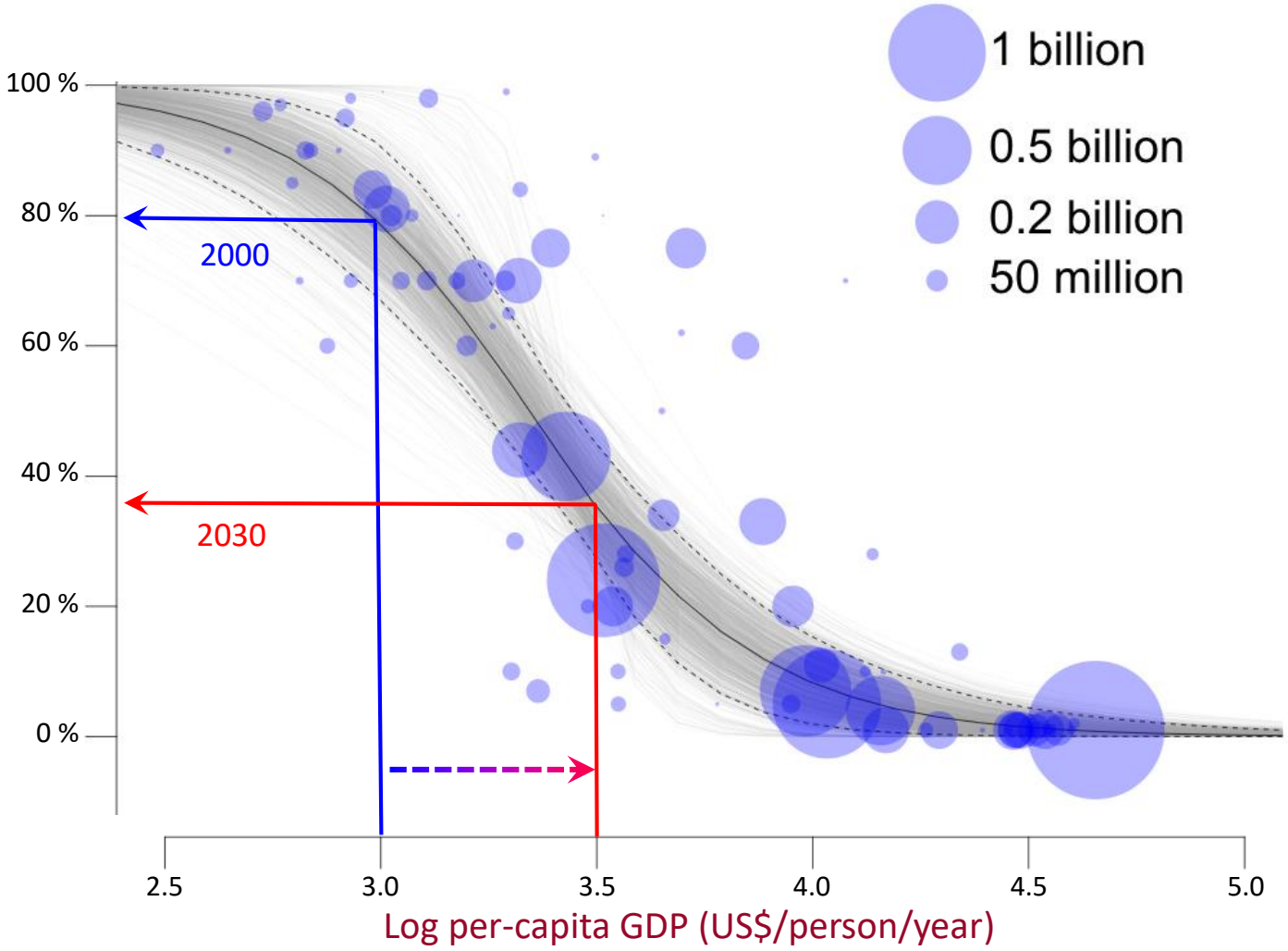



Source: OECD-FAO Agricultural Outlook 2017-2026

# Intensification trajectories



Prop. backyard chicken production






Source: Gilbert *et al*. 2015

# Is the livestock sector able to provide food and livelihood to all in a sustainable way?

# Livestock and the 2030 Agenda for Sustainable Development

# The Sustainable Development Goals




*The adoption of the Agenda 2030 shifted the focus from fostering sustainable production per se, to enhancing the contribution of the sector to the SDGs*

# Concerns over sustainability



Food and nutrition security

Livelihoods and economic growth

Health and animal welfare

Climate and natural resource use

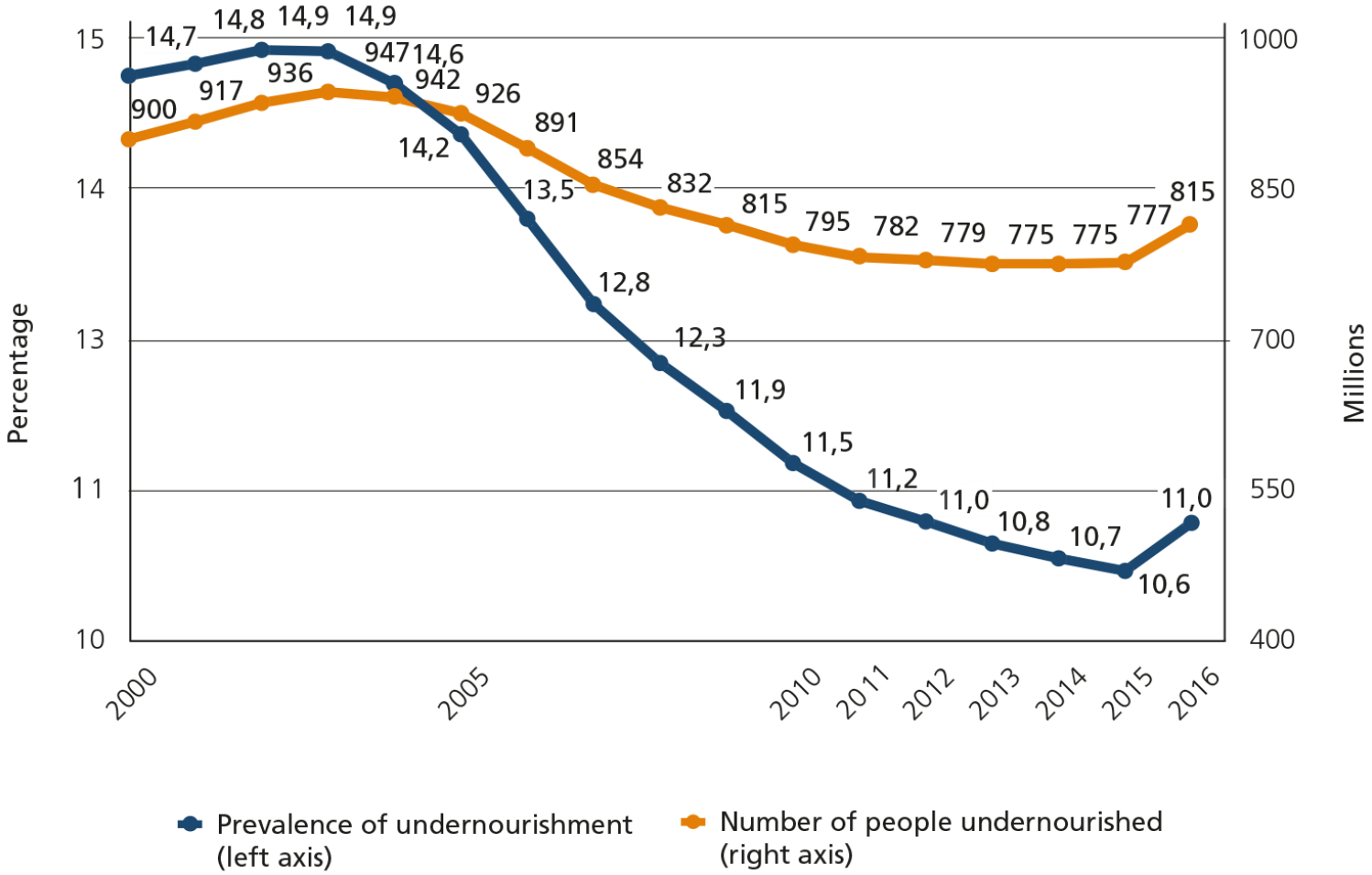
# Food and nutrition security


- Many are undernourished and many are overweight

# Food Security and Nutrition



## 815 million go hungry

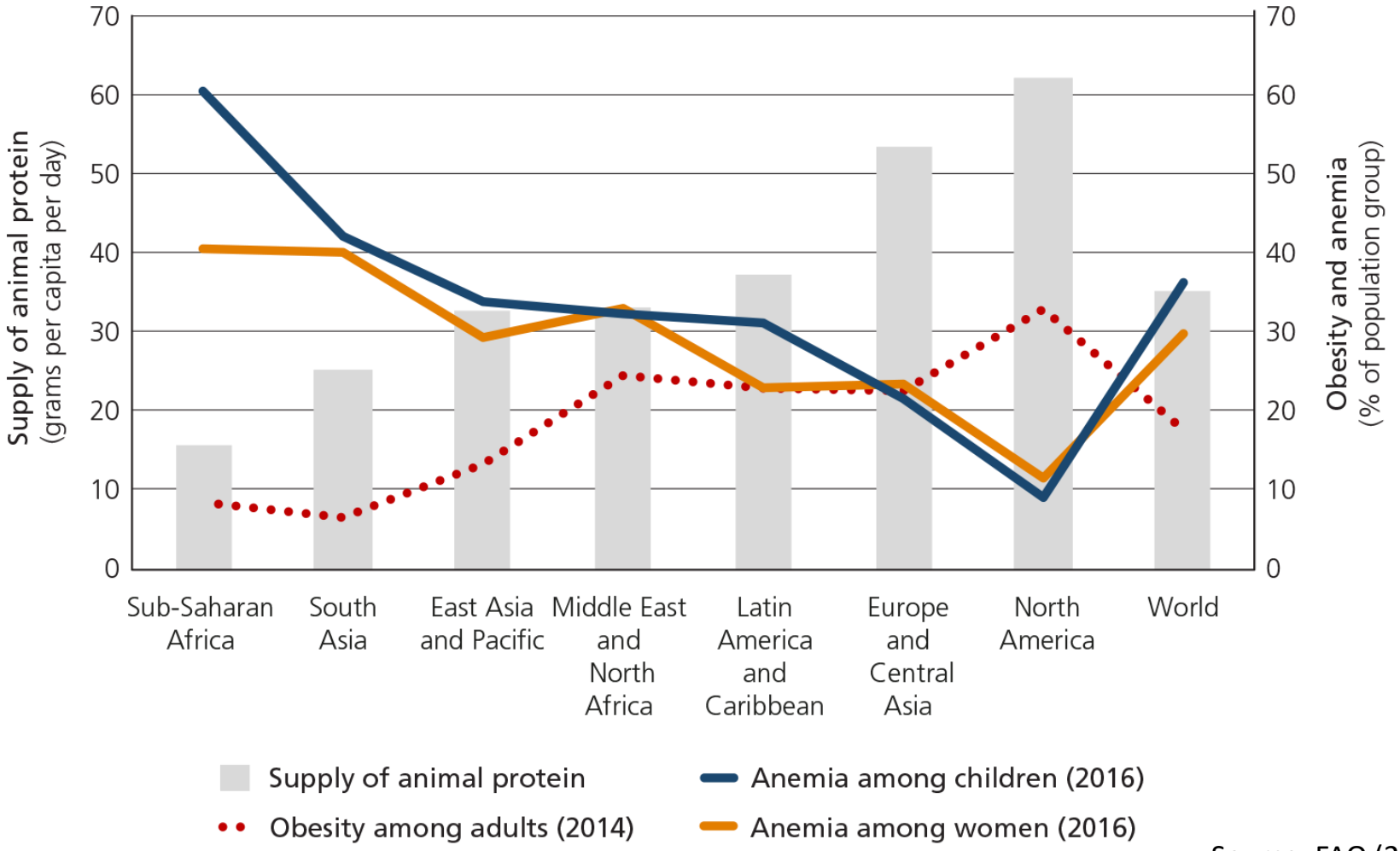



*Source: FAO, The State of Food Security and Nutrition in the World, 2017*

# Anaemia, obesity and supply of animal protein per regions



## 813 million malnourished and 680 million overweight




Source: FAO (2018)

# Food and nutrition security


- Many are undernourished and many are overweight
- ASF for Healthy diet
  - ✓ 33% of protein intake
  - ✓ 17% of calorie intake-

# Micronutrients in animal source food



## MAJOR MICRONUTRIENTS (PER 100 G) CONTAINED IN SELECTED ANIMAL-SOURCE FOODS[a]

| ANIMAL-SOURCE FOOD (ASF) | IRON *(mg)* | ZINC *(mg)* | VITAMIN $B_{12}$ *(µg)* | VITAMIN A[b] *(µg RAE[c])* | CALCIUM *(mg)* |
|---|---|---|---|---|---|
| Meat | | | | | |
| Beef, medium fat, cooked | 0.32 | 2.05 | 1.87 | 15 | 8 |
| Goat meat (moderately fat) | 2.3 | 4.0 | 1.13 | 0 | 11 |
| Liver, beef | 10 | 4.9 | 52.7 | 1500 | 8 |
| Mutton | 2 | 2.9 | 2.2 | 10 | 10 |
| Pork | 1.8 | 4.4 | 5.5 | 2 | 11 |
| Poultry | 1.1 | 4.0 | 0.10 | 85 | 10 |
| Milk whole, unfortified | 0.01 | 0.18 | 0.39 | 55 | 119 |
| Hen eggs, cooked | 3.2 | 0.9 (raw) | 2.0 (raw) | 500 | 61 |

*Notes:* (a) Nutrient contents are approximate and based on different sources; (b) Vitamin A content varies with cooking method; (c) RAE (retinol activity equivalent).

*Source:* Adapted from Neumann *et al.*, 2013.

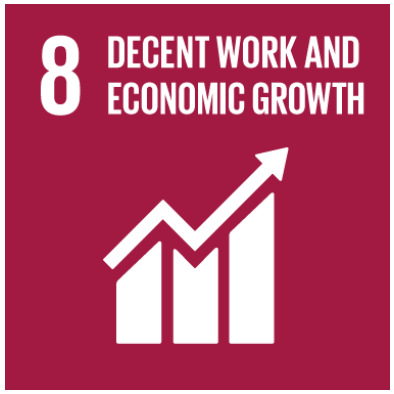
# Food and nutrition security

## Areas of actions

- Address triple burden of malnutrition
- Promote healthy diets for all, especially first 1,000 days of life
- Improve management of livestock production systems

# Livelihoods and economic growth







- One in eight people live in extreme poverty

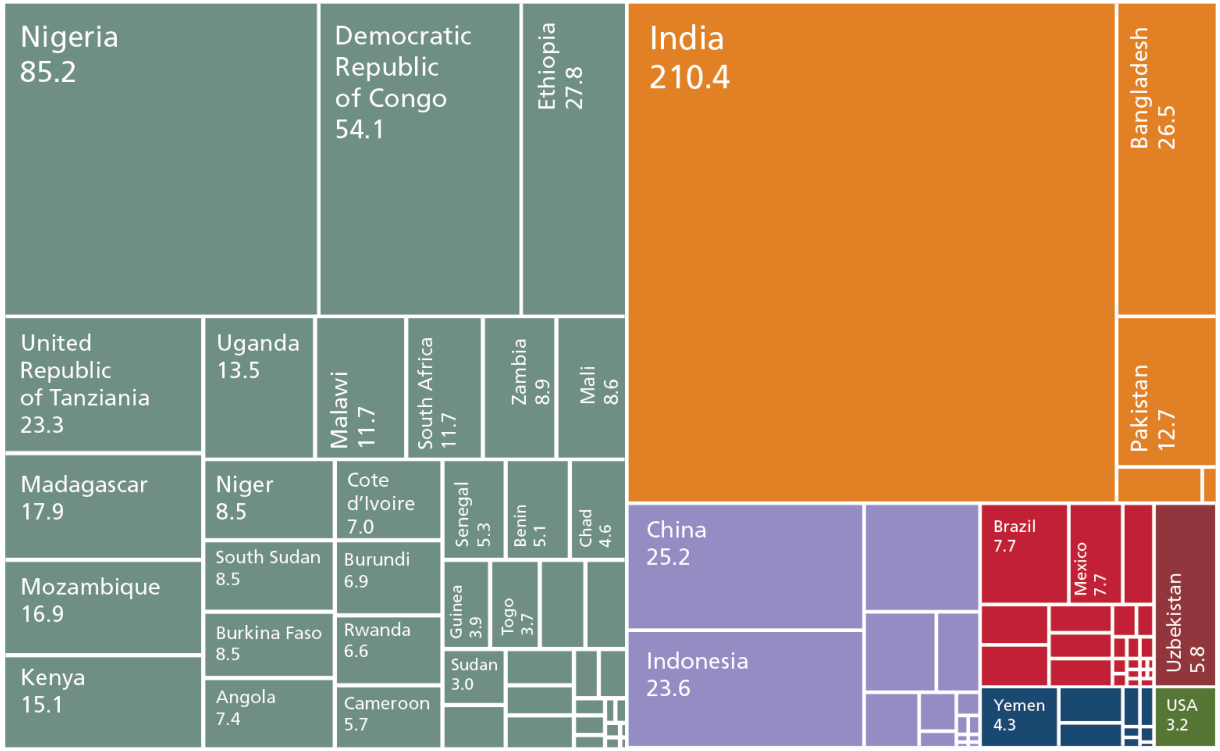
# Livelihoods and economic growth



## Globally there are 746 million people in extreme poverty (in 2013)

Sub-Saharan Africa (390 M)

South Asia (249 M)




Est Asia & Pacific (74 M)

Source: FAO (2018) based on data from World Bank

# Livelihoods and economic growth


- One in eight people live in extreme poverty
- Diverse-products and services beyond food and nutrition

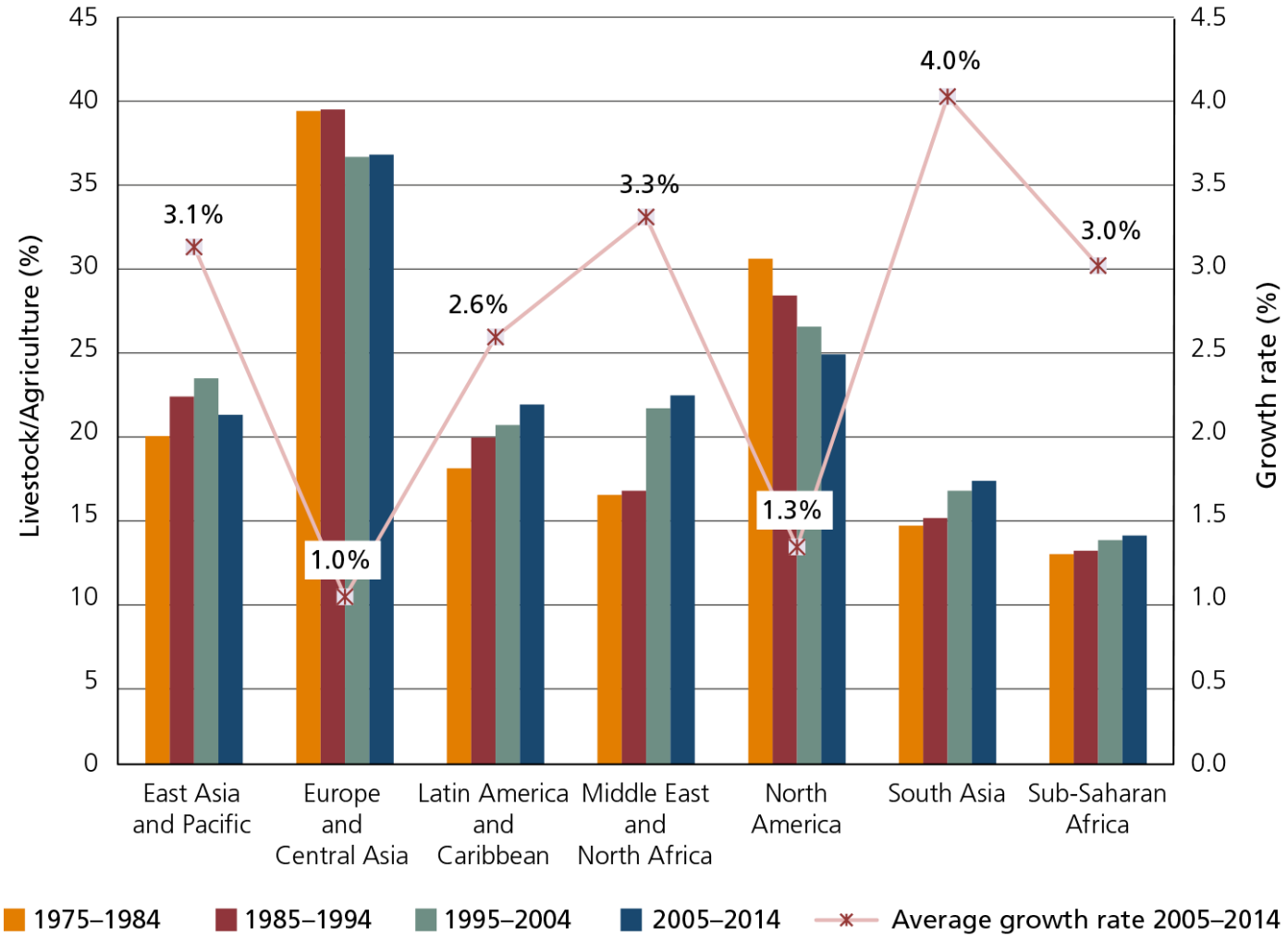
# Livelihoods and economic growth


- One in eight people live in extreme poverty
- Diverse-products and services beyond food and nutrition
- Contribution to economic growth

# Livelihoods and economic growth



## Contribution of livestock to the economy



# Livelihoods and economic growth


- One in eight people live in extreme poverty
- Diverse-products and services beyond food and nutrition
- Contributions to economic growth
- Equity – women, children and youth

# Livelihoods and economic growth

## Areas of actions

- Link growth with poverty reduction
- Promote sustainable intensification
- Support inclusive value chain
- Support value addition

# Animal and Public Health


- Zoonoses, emerging disease and pandemic threats

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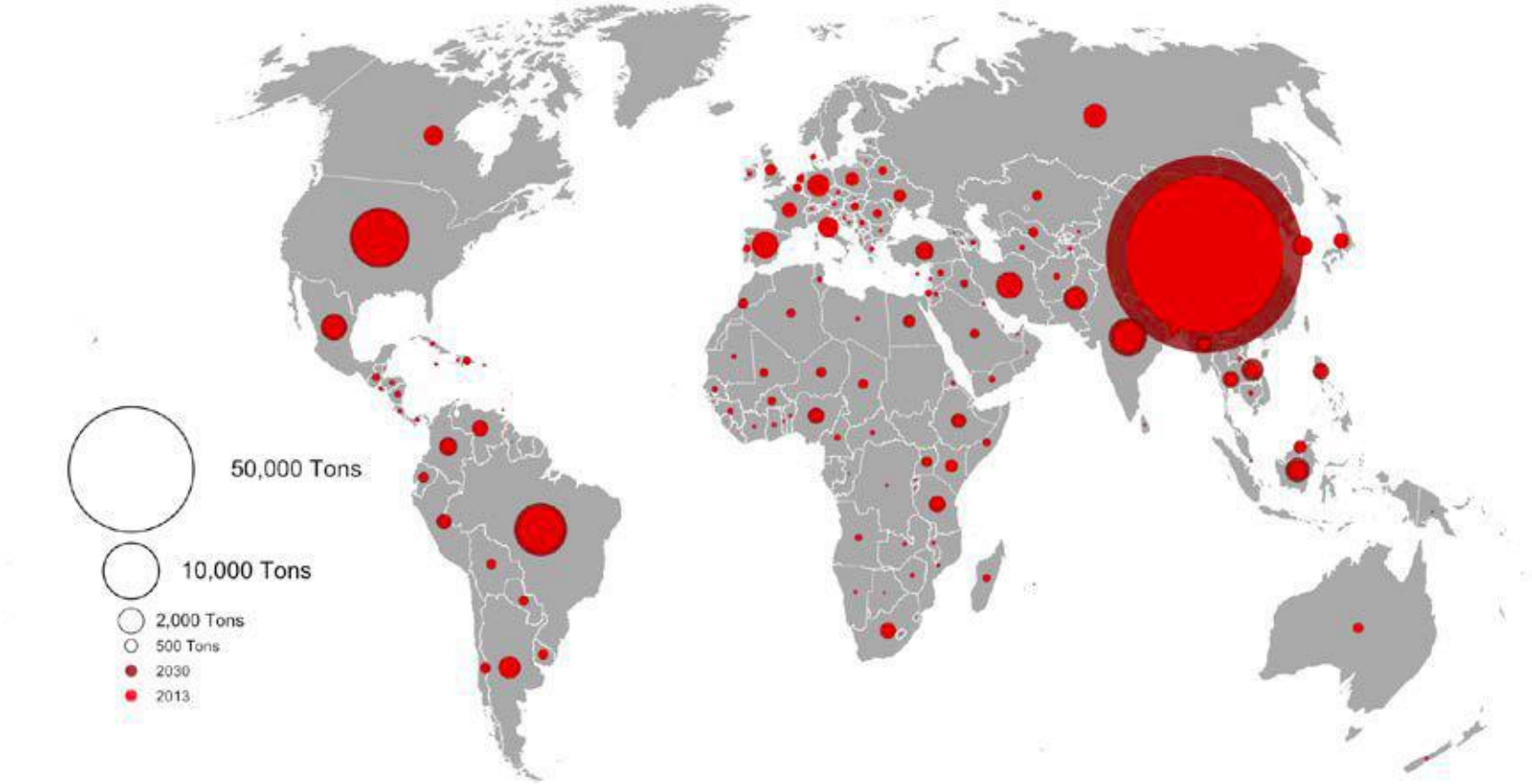
- Zoonoses, emerging disease and pandemic threats
- Overuse and misuse of antimicrobials

FAO Action Plan on AMR at http://www.fao.org/antimicrobial-resistance/en/

# Animal and Public Health



## Estimates of the use of antimicrobials in the livestock sector in the World




63,153 tons used in livestock globally in 2010

Van Boeckel et al. Science, 2017

# Animal and Public Health


- Zoonoses, emerging disease and pandemic threats
- Use and abuse of antimicrobials
- Animal welfare

# Animal and Public Health

## Areas of actions

- Promote One Health approach
- Optimize use of AM
- Treat welfare of animals as priority


FAO Action Plan on AMR at
http://www.fao.org/antimicrobial-resistance/en/

# Climate and natural resources use

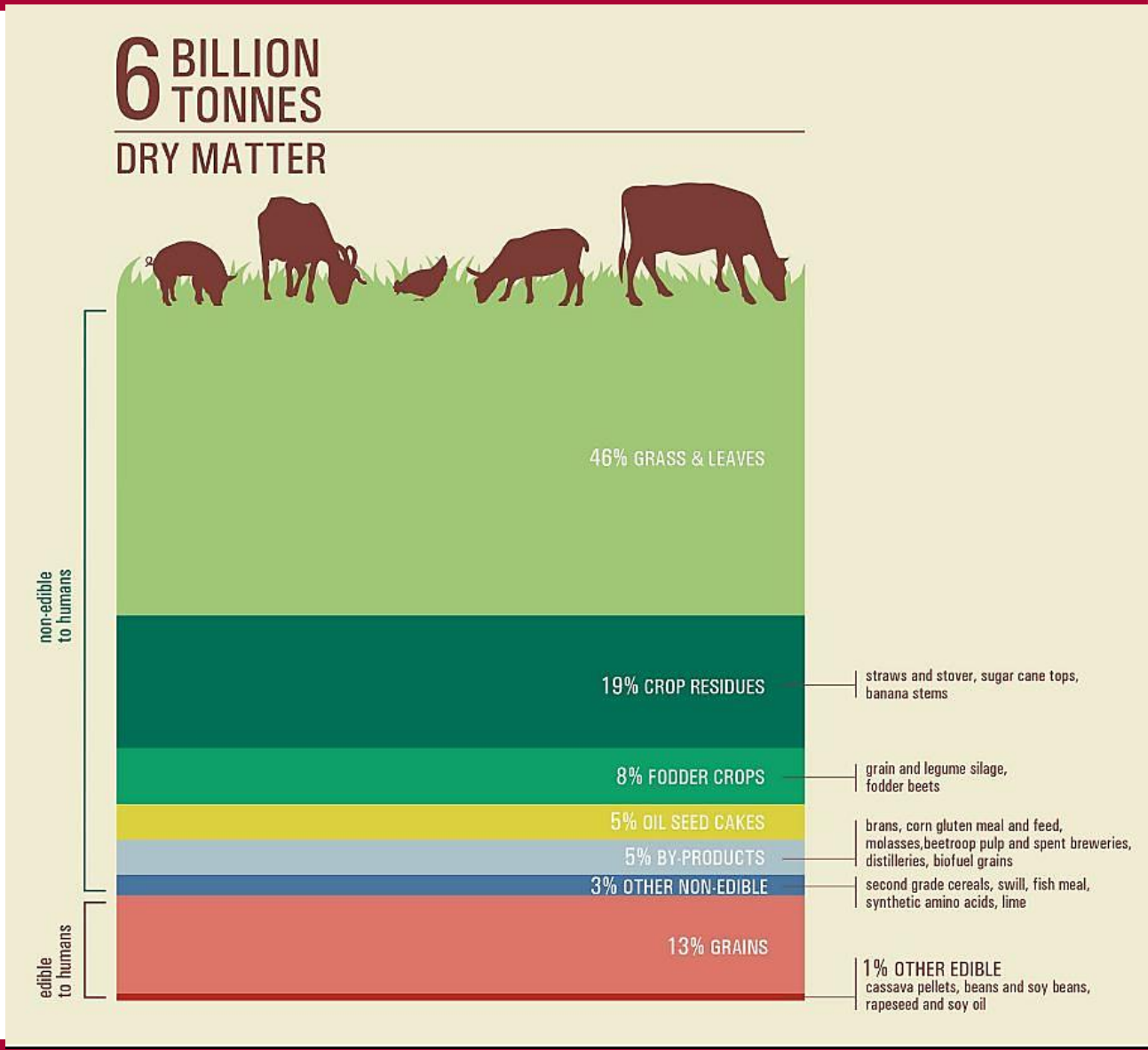


- Natural resource use and biodiversity
  - ✓ 2.5 billion ha used, 2/3 no use for HN
  - ✓ 40% of global arable land

# Climate and natural resources use



Global livestock feed ration composition



# Climate and natural resources use

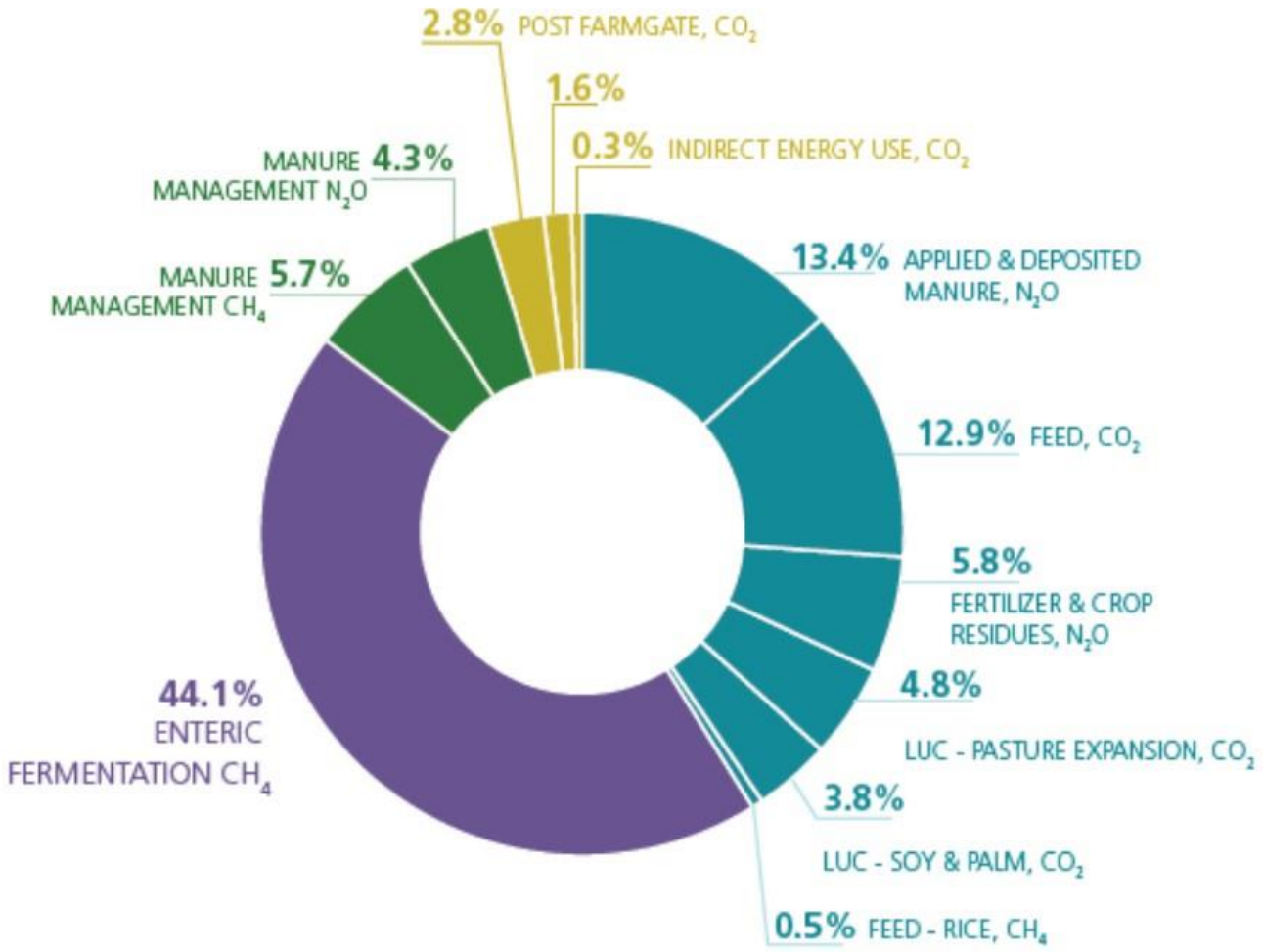


- Natural resource use and biodiversity
- Livestock and climate change
  - ✓ 7.1GT CO2
  - ✓ 14.5% GHG emissions

# Climate and natural resources use



## GHG emissions from livestock supply chains

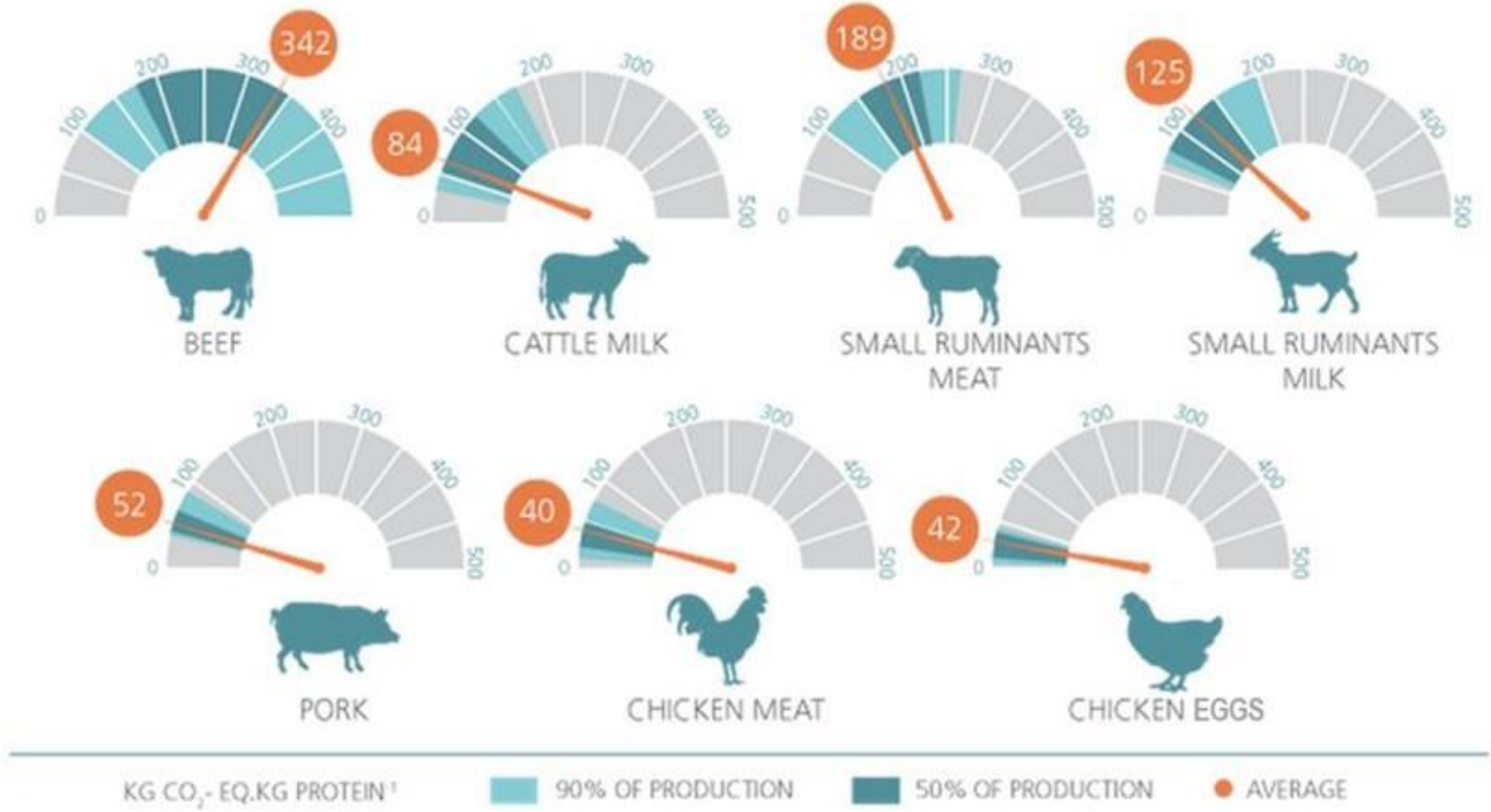



Reference year 2010. FAO, 2016

# Climate and natural resources use



## Emission intensities variability




Source: Gerber *et al.*, 2013

# Climate and natural resources use

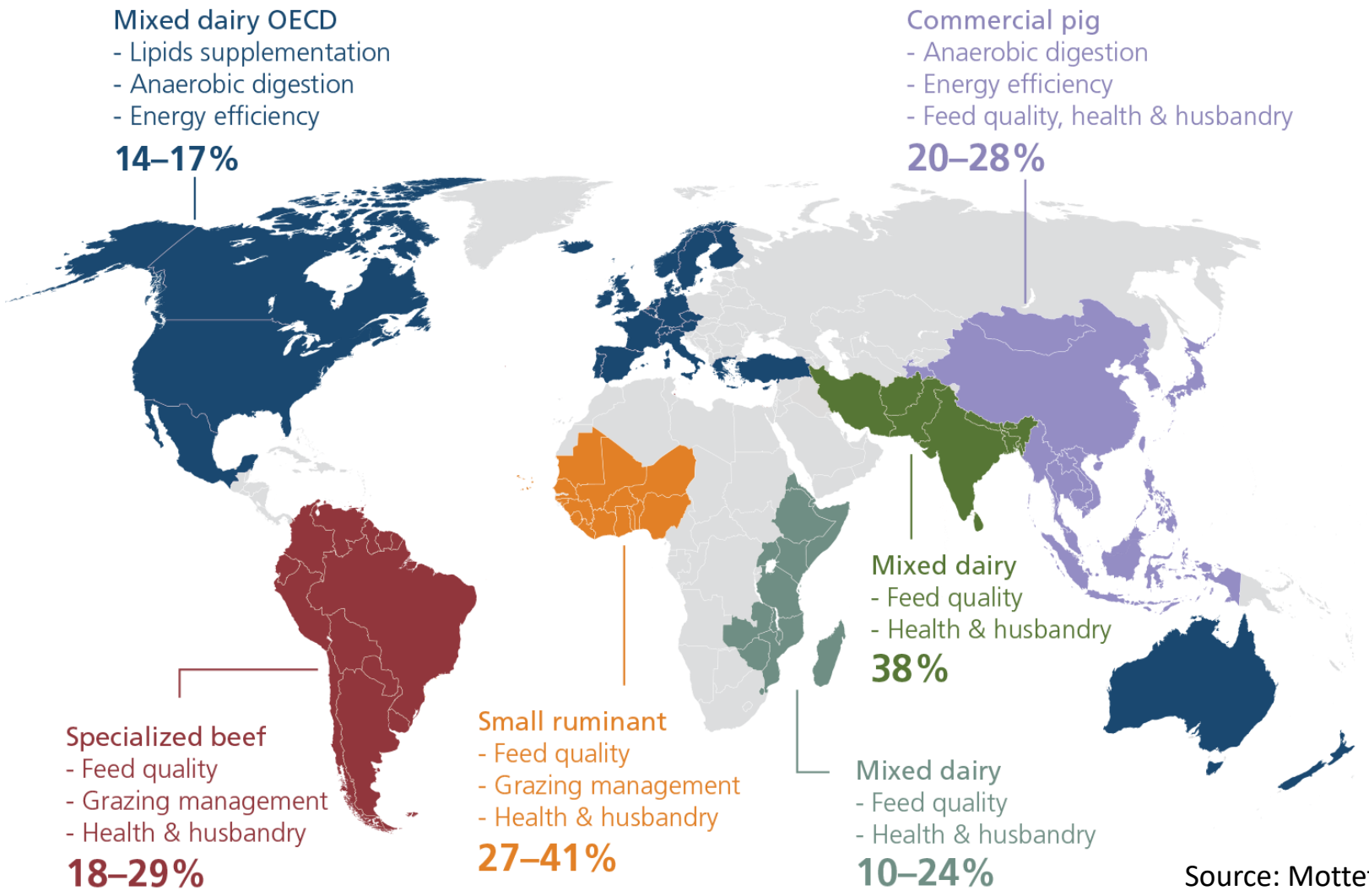


- Natural resource use and ecosystem services
- Livestock and climate change
- Efficient use of resources and nutrient cycling

# Climate and natural resources use



## Mitigation options and potential for greenhouse gas emission reduction




Source: Mottet, 2017

# Climate and natural resources use

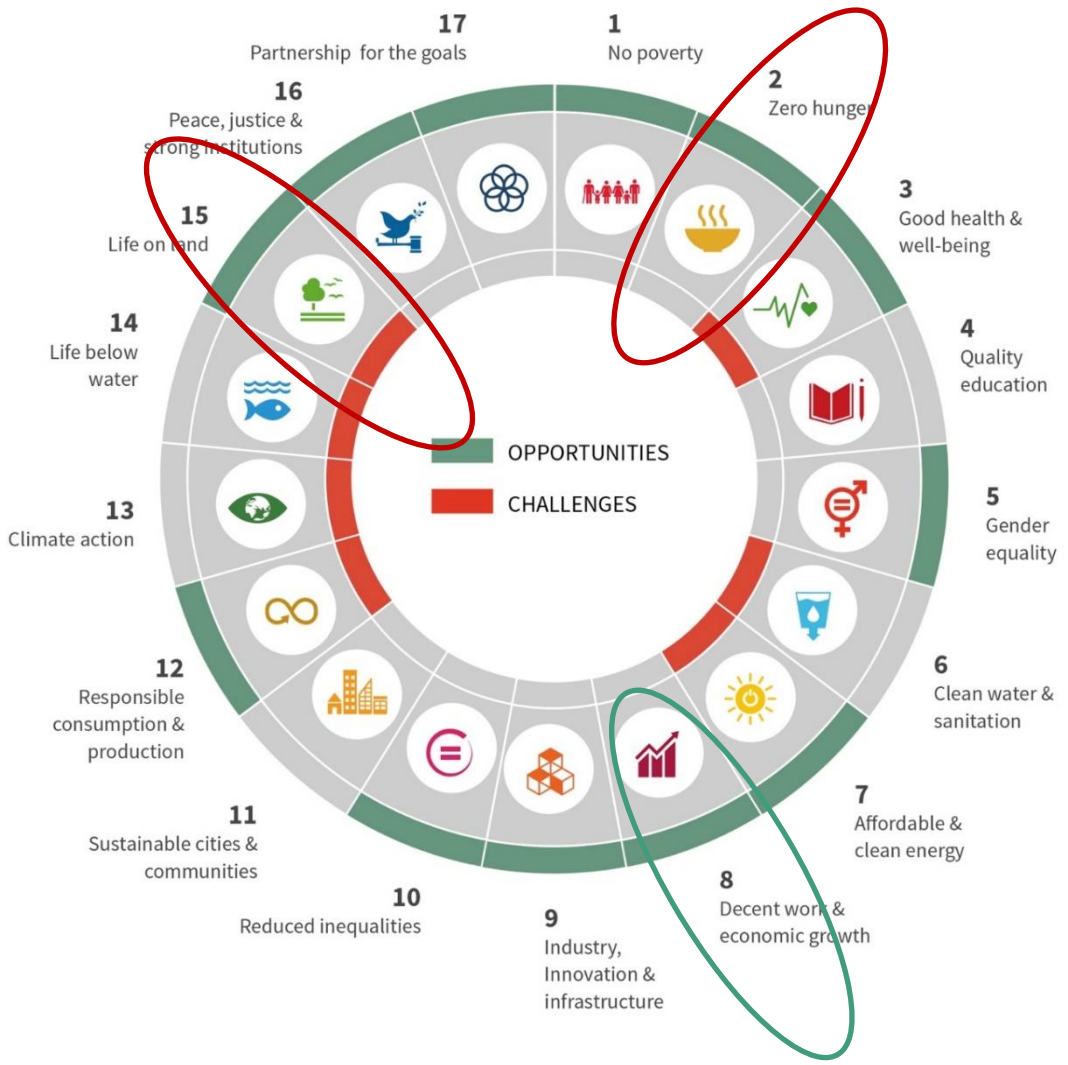
## Areas of actions

- Improve quantification of GHG emissions
- Promote productivity improvements
- Stock carbon in the soil
- Integrate livestock in the circular bio-economy
- promote agroecology and enhance biodiversity and provision of ESS by livestock

# Synergies and trade-offs between SDGs

# Livestock and the 2030 Agenda






Development of LS:

+ increase contribution to economic growth
- constrain availability of land for staple foods;
- threaten food and nutrition security

# Livestock and the 2030 Agenda




Shift to monogastrics

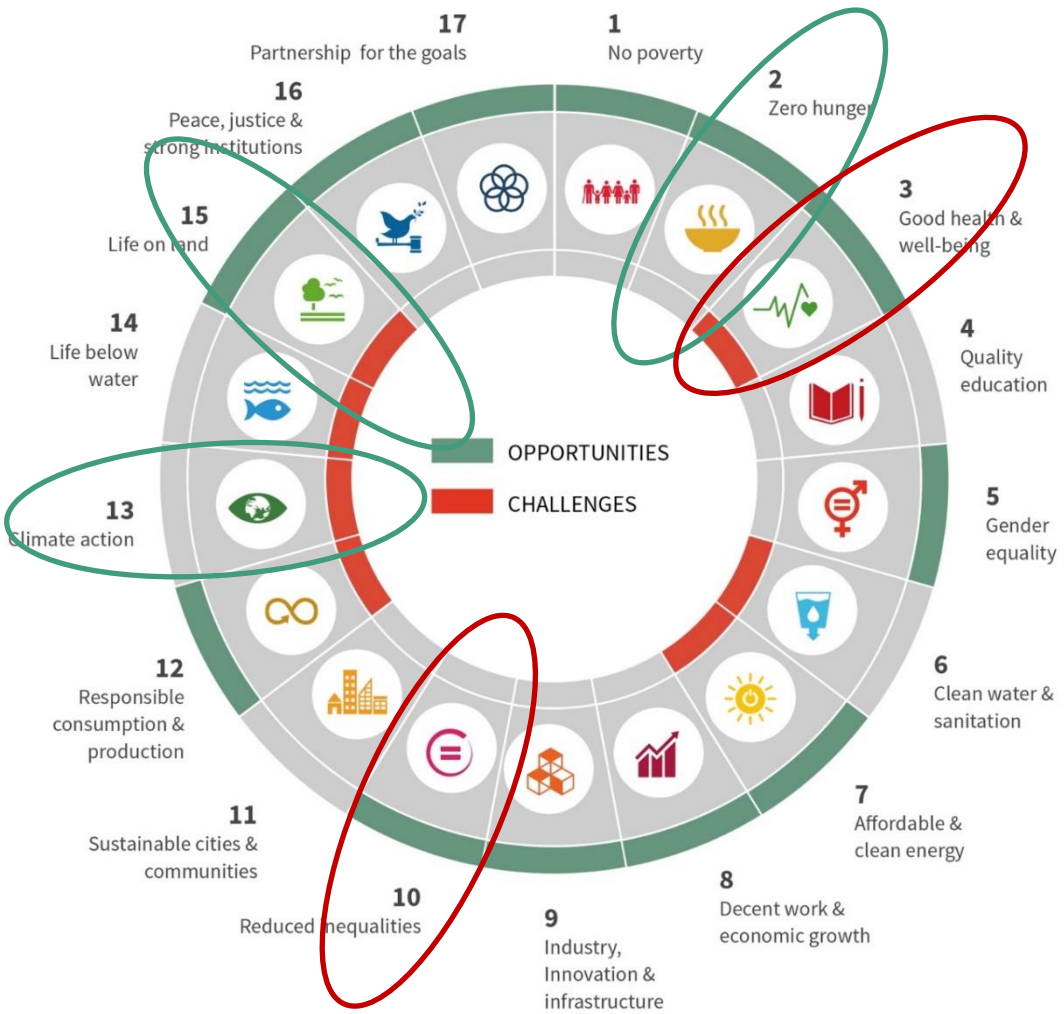
+ reduce GHG emissions

- increase the use of grains and legumes for animal feed

- threaten food and nutrition security

# Livestock and the 2030 Agenda






Intensification increase efficiency and output,

+ Increase food available
+ reduce environmental burden
+ reduce emission intensities
- increase risk for animal health and welfare (AM use, zoonosis)
- Increase risk of inequality

# In summary

# In Summary



- ✓ UN 2030 Agenda for Sustainable Development, an overarching framework guiding the development of the livestock sector, taking into account synergies and trade-offs between SDGs .
- ✓ Livestock's role as a vehicle for food security and nutrition, poverty reduction and economic growth, and resilience of vulnerable populations.
- ✓ ASF's role for healthy diets, child growth and cognitive development.
- ✓ Diversity and multiple functions of the sector recognized and accounted for, including the ESS they provide.

# In Summary



- ✓ Animal science and research should provide the necessary objectivity in the passionate, and sometimes “biased” debate on livestock sustainability
- ✓ Omics, bigdata, precision farming … what is in it for developing countries?
- ✓ Research and development are needed
  - ✓ On biophysical processes, i.e. to identify efficiency gains through improvements in feed, genetic resources, animal health, food and feed competition, technological innovations for the protection of the environment;
  - ✓ On production and food systems, i.e. farms and territories trajectories, modeling scenarios of development integrating not only supply and demand aspects but also land-use and land-use changes; and
  - ✓ On governance, institutional and political processes, i.e. to create the necessary incentives or regulations, to build market models, to support investment through information and tools
- ✓ Enhance international cooperation with LMICs

# Thank you


http://www.fao.org/3/i8098en/I8098EN.pdf


http://www.fao.org/3/i8384en/I8384EN.pdf