

# Sustainable Agricultural Development for Food Security and Nutrition: What Roles for Livestock?

*A multidisciplinary report by the CFS High  
Level Panel of Experts on Food Security and  
Nutrition*

**Special International Seminar  
Montpellier, 1 December 2016**

**Wilfrid Legg  
Project Team Leader**

HLPE  
REPORT 10

Sustainable agricultural development  
for food security and nutrition:  
what roles for livestock?

A report by

The High Level Panel of Experts  
on Food Security and Nutrition

July 2016

# Why a focus on livestock?



## Livestock is a:

- key sector, undergoing significant structural change, especially in developing countries
- driver of land use and consumption of feed crops
- powerful engine and a key driver for sustainable agriculture and food system development
- good illustration of possible sustainable pathways
- past focus has often been on livestock as *harming* not *helping* sustainable ag. development for FSN

# Key roles of the livestock sector

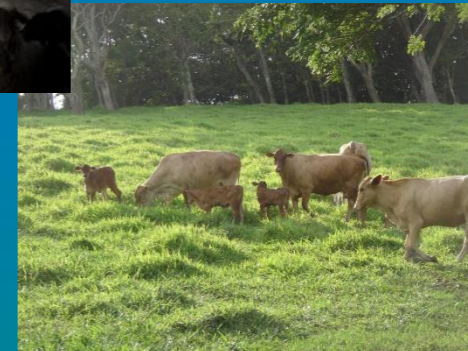


- About 1/3 of global agricultural value
- In 2010, animal products globally provided 16 % of total calories and 31 % of protein
- In developing countries most rural households keep livestock, especially in Africa
- Livestock generates co-products and benefits (wool, skin, manure, draught power, store of wealth and safety nets, landscapes)
- Largest user of land resources (pasture and feed crops: 80%) and a big user of water
- Generates 14.5% of GHGs, but ruminants also sequester carbon in grasslands



# Livestock farming systems

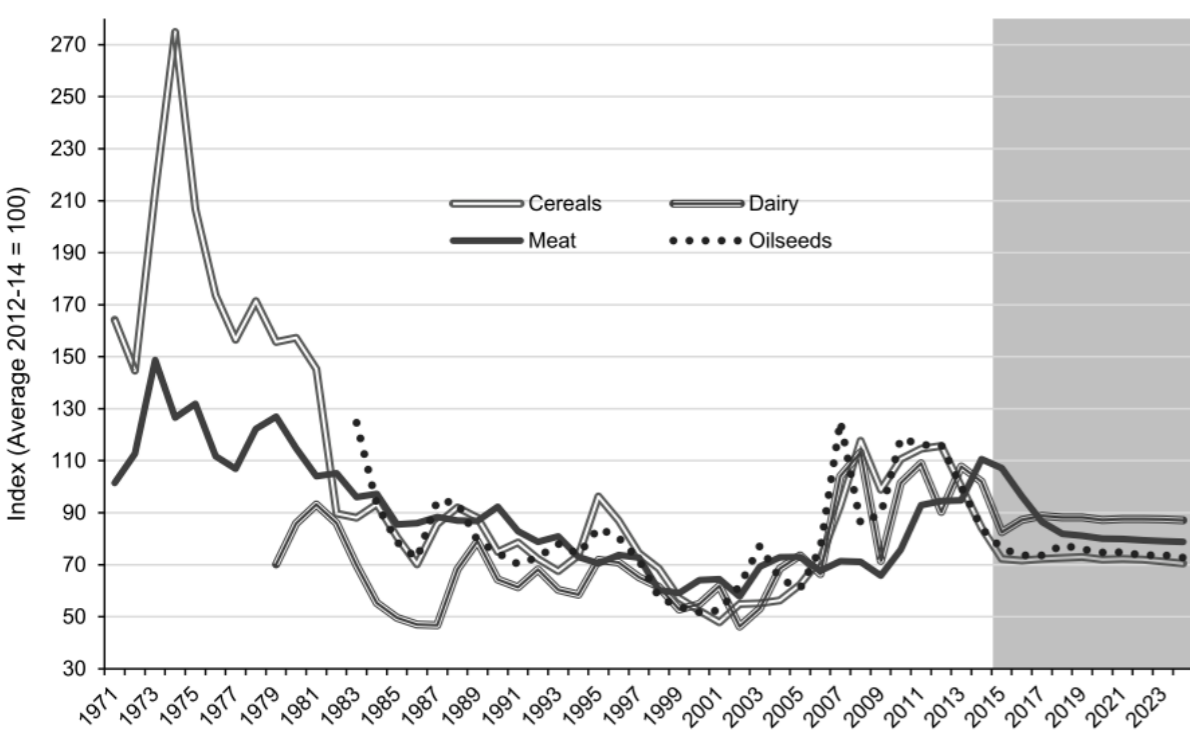
- **Smallholder mixed farming systems**
- **Pastoral systems**
- **Commercial grazing systems**
- **Intensive livestock systems  
(close links with crop systems)**



**But not static, in continual evolution, and  
coexistence of different systems in countries**

- **Global agricultural production is expected to increase by 60 % in volume**
- **Global meat production could increase by 76 % (mostly in developing countries)**
- **Global milk production could grow by**
  - ✓ 1.8 % pa in developing countries
  - ✓ 0.3 % pa in developed countries
- **2 main issues that make the future uncertain:**
  - ✓ Consumption of animal products increasing faster in Asia than in OECD countries: convergence?
  - ✓ Demographic, dietary patterns and farming system transformation in Africa

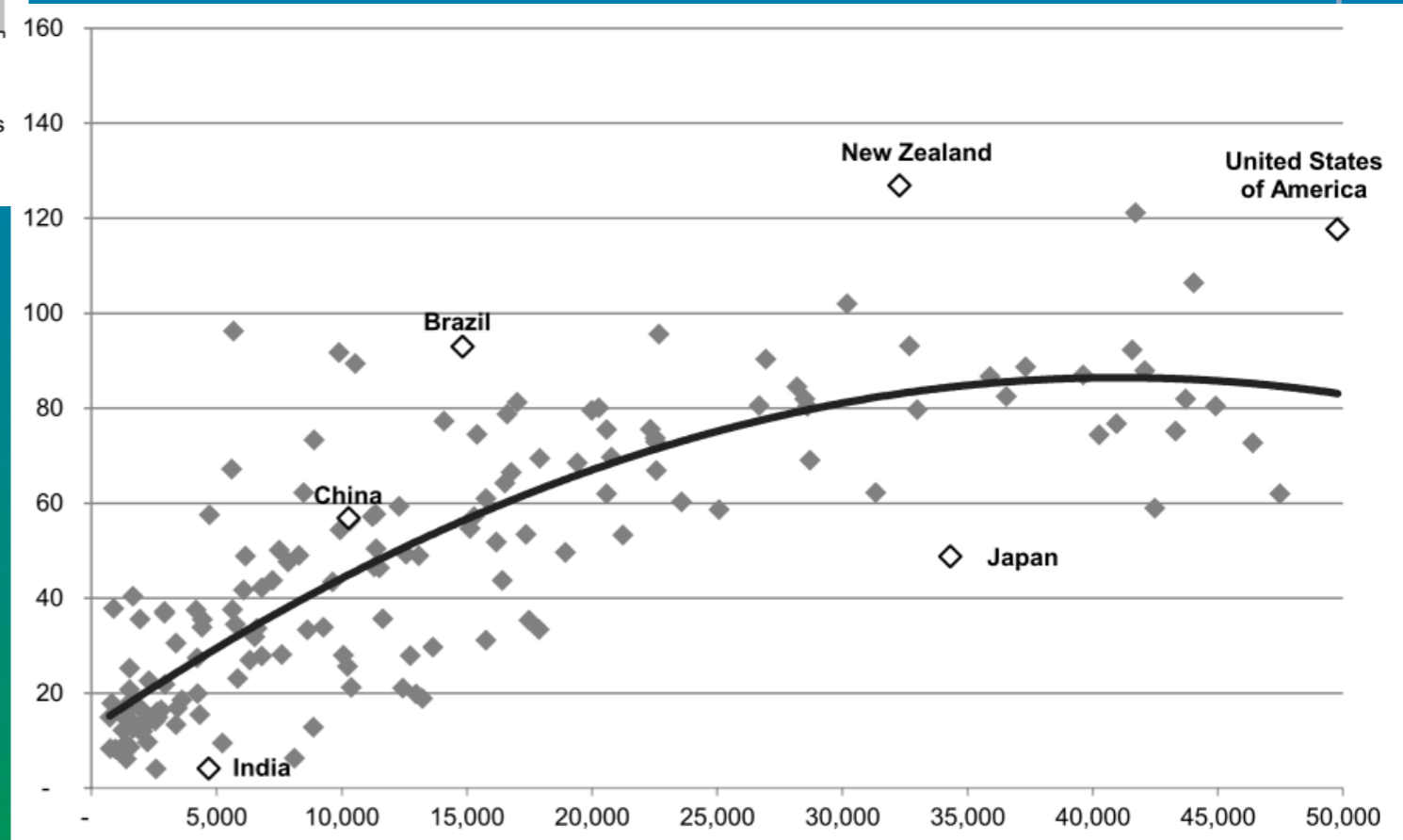
# Evolution and transformation – 2 examples



Source: OECD.Stat (<http://stats.oecd.org/>). Note: Index calculated by a constant weighting of commodities within each aggregate. The weight is calculated by the average 2012–14 real terms production value. 2015 figures are provisional.

## Income and meat consumption

## Evolution of real commodity prices



Source: Adapted from FAO (2009a). Based on data from FAOSTAT (FAO, 2015a) for per capita meat consumption and the World Bank for per capita GDP. Note: GDP per capita (horizontal axis) is measured at purchasing power parity (PPP) in constant 2011 US dollar. Per capita meat consumption (vertical axis) is measured in kg/capita/year.

# Challenges

- **Environment:** reducing the footprint of livestock/feed crops
- **Economic:** better functioning and connection to markets
- **Social:** greater attention to equity and responsibility issues
- **Health:** addressing malnutrition and food-borne diseases (One Health approach)
- **Animal Welfare:** implementing OIE standards



# Framework for pathways to Sustainable Agricultural Development

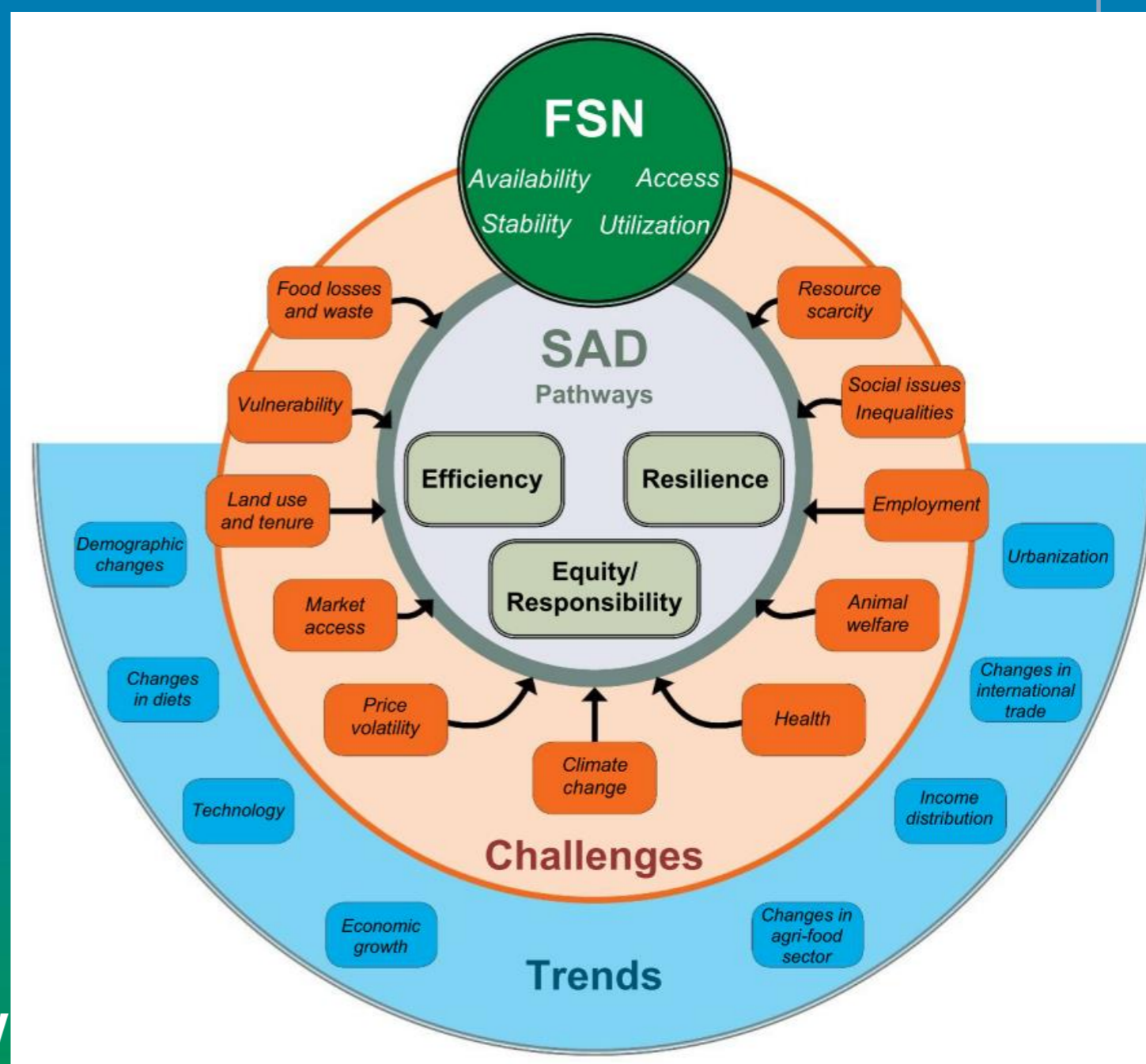
Sustainable agricultural development (SAD) is defined as agricultural development that contributes to...

improve **resource efficiency**,

strengthen **resilience**, and

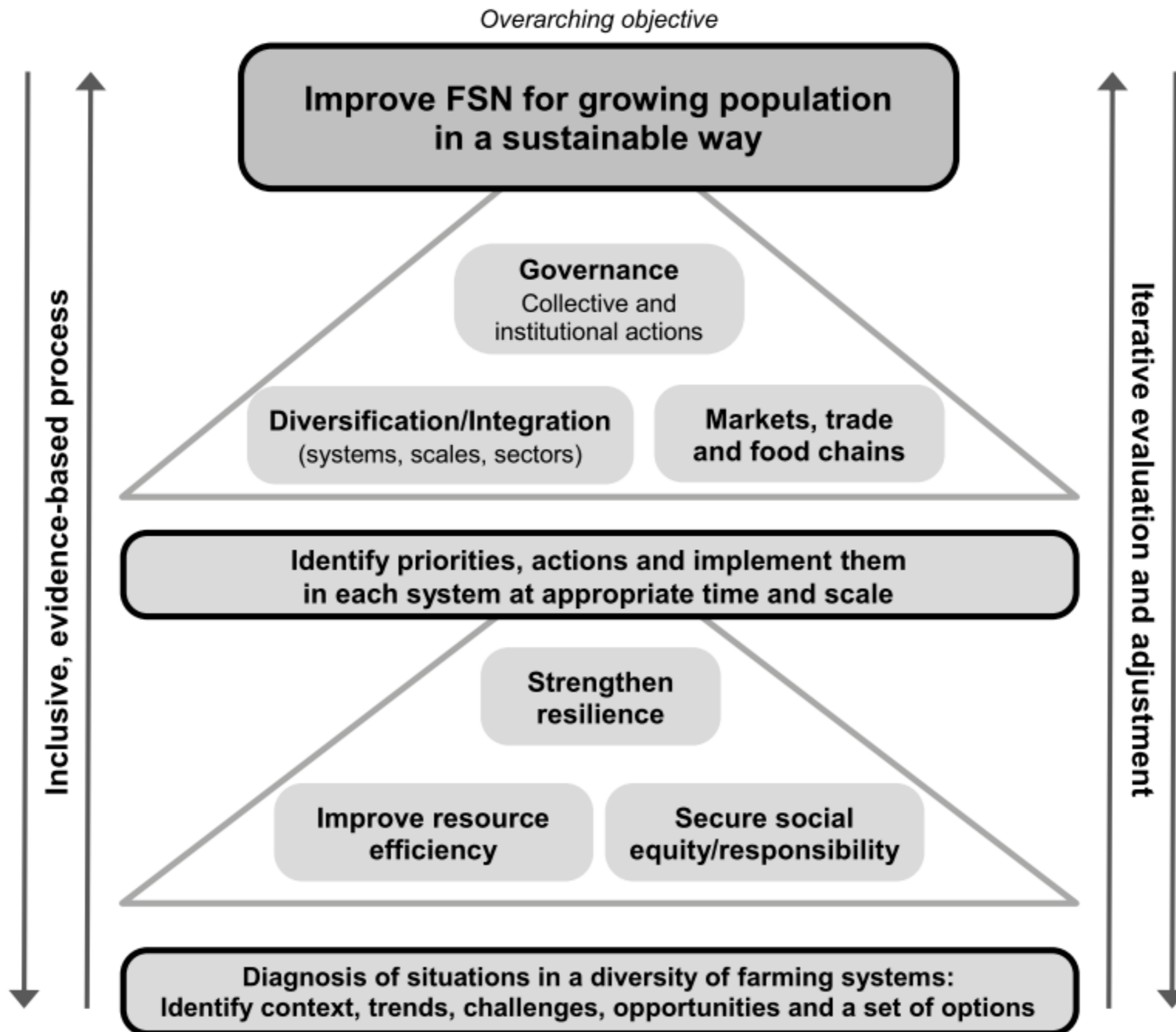
secure **social equity / responsibility**

...of agriculture and food systems in order to **ensure food security and nutrition** for all, now and in the future (FSN)





# Common approach for pathways (1)



## Pathways towards SAD for FSN will have to:

- address multiple challenges at the same time and cover all the dimensions of sustainability and FSN
- be context specific and vary across countries / farming systems
- combine technical actions, investments and enabling policy instruments

The HLPE proposes a **common and iterative approach** to achieve SAD pathways

- Improve **resource efficiency** (of production, natural resources and the environment)
- Strengthen **resilience** (ability to respond and adapt to shocks)
- Secure **social equity/responsibility** (addressing and respecting the diversity of social issues)

- Reduce animal mortality (improve access to veterinary services in developing countries)
- Reduce yield gaps **and** environmental footprint (GHG emissions could be reduced by 18-30 % if all producers adopted best practices in a given system and region)
- Improve animal feed efficiency
- Close nutrient cycles
- Reduce food losses and waste



# Strengthen resilience through



- **Adapting to climate change**
- **Protecting and managing genetic resources**
- **Strengthening actions to improve animal health**
- **Widening application of risk management tools**

**Covers a wide range of social issues: income distribution, human rights, gender, tenure and property rights, discriminations, responsibility of all actors (individual, corporate, collective)...**

**Among the operational priorities for action:**

- **Developing social protection systems, in particular for smallholders**
- **Improving working conditions (legislation, law enforcement, practical guidelines)**
- **Enhancing animal welfare (OIE standards, technical innovations)**

- **All agricultural systems:**

1. Foster policy coherence for food security and nutrition
2. Address nutrition, food safety, working conditions and services
3. Foster gender equality and women's empowerment
4. Foster youth empowerment
5. Protect the environment and promote sustainable management and efficient use of natural resources
6. Enhance resilience against risks and variability
7. Promote co-operation and collaboration in innovation, R&D, and address data needs

- **All livestock systems:**

8. Improve animal health and welfare (OIE standards)

- **Specific livestock systems:**

9. Recognize, protect, and support pastoral systems for livelihoods and sustainable resource management (enhance resilience, access to resources and services, pastoral organizations)

10. Promote and support sustainable grazing systems (enhance provision of ecosystems, restore degraded land)

11. Promote and support mixed systems (strengthen crop-livestock integration, leverage livestock as a means for sustainable livelihoods for smallholders)

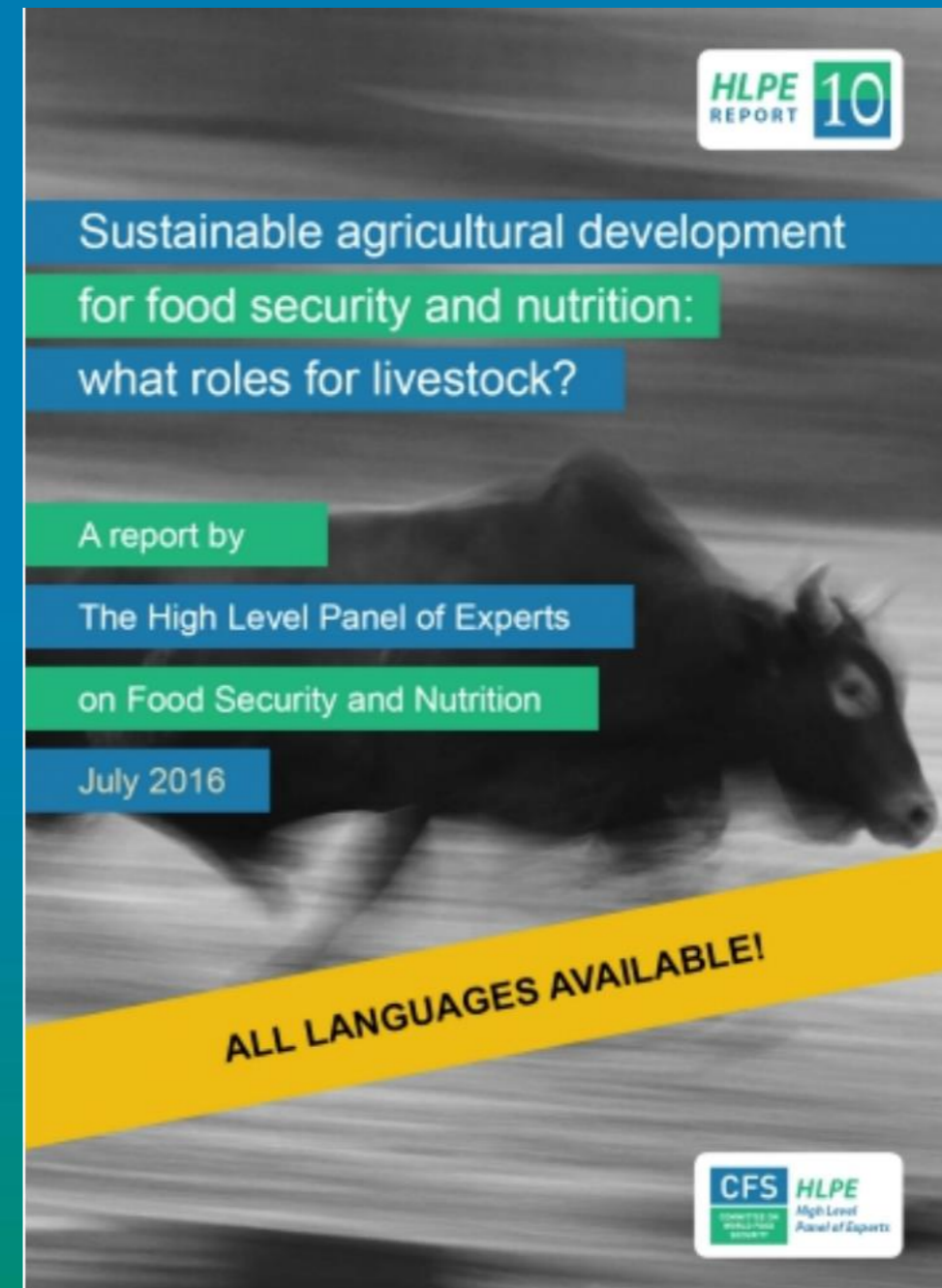
12. Promote the sustainability of intensive systems (promote efficiency of feed crops, protect the environment, share innovative technologies and practices, improve working conditions and animal welfare)



# Key messages

- **Business as usual is not a sustainable option**
- **All farming systems face challenges to improve sustainability: no one system provides the “silver bullet” but sharing experiences helps!**
- **Adapting the pathways framework to particular contexts recognises the diversity, evolution and linkages across livestock systems**
- **Urgent need by policy makers and actors in the agri-food chain, at all levels of governance, to transform recommendations into actions**

# Thank you for your attention



For more information about the HLPE and to download the reports, please visit the HLPE website at: [www.fao.org/cfs/cfs-hlpe](http://www.fao.org/cfs/cfs-hlpe)

# Specific challenges (1):

## Smallholder mixed farming systems:

- Access to resources, markets and services
- Resource efficiency and resilience

## Pastoral systems:

- Conflicts for land and water
- Discrimination / Social and gender inequity
- Human and animal health challenges

# Specific challenges (2):

## « Commercial » grazing systems:

- Grassland degradation, biodiversity loss
- Conflicts for land and resources
- Working conditions

## Intensive livestock systems:

- Water, soil and air pollution
- Pressure on land (feed production)
- Antimicrobial resistance
- Working conditions & occupational hazards



# Elaboration of key messages



- Impossible to look at livestock sustainability and livestock development without looking at the whole agricultural sector
- Need to assess and balance benefits and undesirable consequences from a wide range of criteria and expectations and not the only production
- Need to promote integration and complementarities of crop and livestock at all scales, even more so as specialisation has led to disappearance of integration related benefits
- Impossible to look at livestock sustainability and livestock development related sustainability without looking at this issue at the world wide level
- Impossible to look at livestock sustainability and livestock development without taking into account local specificity... call for specific assessment at each level and definition of local specific strategies at each level by addressing complementarities and trade offs (local, sub national, national, regional, global)
- Need to align strategies among scales for consistency towards sustainable development (farm, local, sub national, national, regional, global)
- Need to grasp diversity and to build upon it to design strategies at all levels for resilience and sustainable development

# Structural transformation in agriculture

## From « Green » to « Livestock revolution »

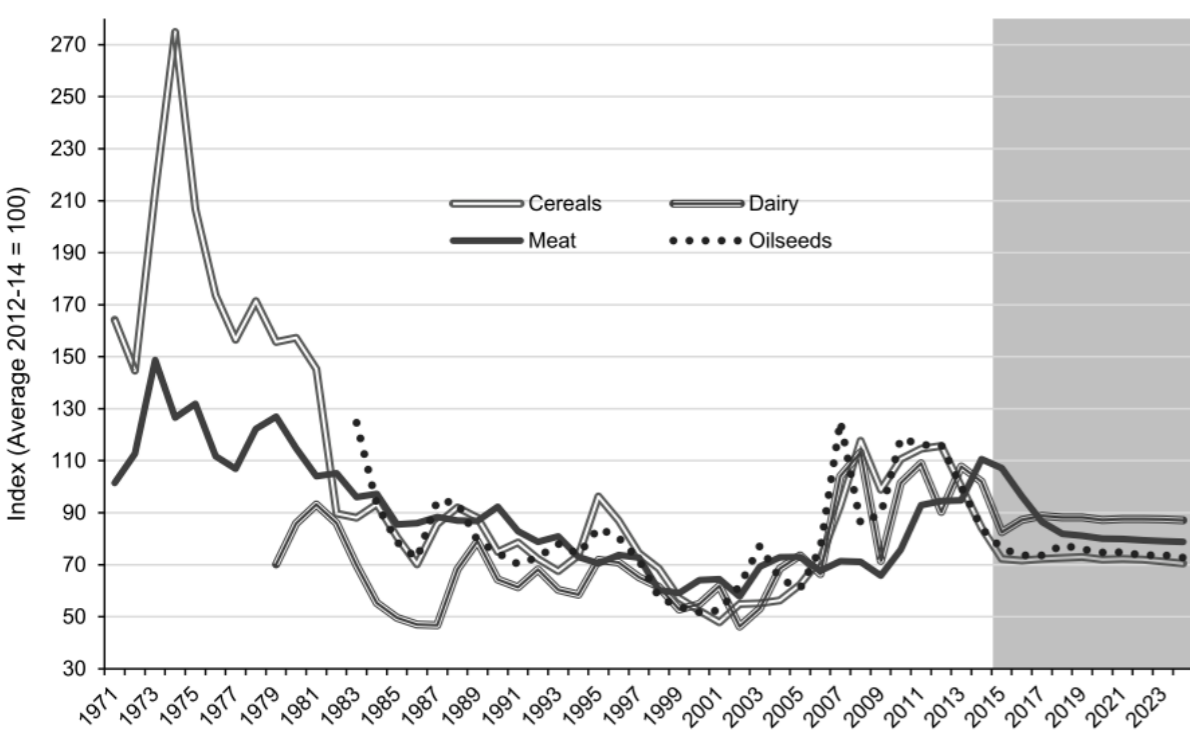
### Over the last 50 years:

- Meat production x 4
- Milk production x 2
- Egg production x 4
- **Radical transformation of livestock farming systems through:**
  - ✓ Intensification and industrialization
  - ✓ Specialization at the farm and territorial levels
  - ✓ Evolution of crop-livestock linkages
  - ✓ Greater complexity and globalization of food supply chains
  - ✓ Growing market concentration in agro-food
  - ✓ Main changes in developing countries
  - ✓ Rapid technological changes
  - ✓ Enhanced impact of environmental, animal welfare and health/nutrition policies, standards and advice, especially in OECD countries

|                         | Population heads (percent) |       |          |          |              |            |
|-------------------------|----------------------------|-------|----------|----------|--------------|------------|
|                         | Grazing                    | Mixed | Feedlots | Backyard | Intermediate | Industrial |
| Cattle & Buffaloes      | 32.7%                      | 64.0% | 3.3%     | n.a.     | n.a.         | n.a.       |
| Small Rum.              | 44.2%                      | 55.8% | n.a.     | n.a.     | n.a.         | n.a.       |
| Pigs                    | n.a.                       | n.a.  | n.a.     | 45.2%    | 16.6%        | 38.2%      |
| Chickens                | n.a.                       | n.a.  | n.a.     | 18.5%    |              | 81.5%      |
|                         | Production (percent)       |       |          |          |              |            |
|                         | Grazing                    | Mixed | Feedlots | Backyard | Intermediate | Industrial |
| Cattle & Buffaloes Milk | 32.5%                      | 67.5% | n.a.     | n.a.     | n.a.         | n.a.       |
| Cattle & Buffaloes Meat | 30.7%                      | 57.0% | 12.2%    | n.a.     | n.a.         | n.a.       |
| Small Rum. Milk         | 37.6%                      | 62.4% |          | n.a.     | n.a.         | n.a.       |
| Small Rum. Meat         | 44.3%                      | 55.7% | n.a.     | n.a.     | n.a.         | n.a.       |
| Pork                    | n.a.                       | n.a.  | n.a.     | 26.2%    | 17.6%        | 56.2%      |
| Chicken meat            | n.a.                       | n.a.  | n.a.     | 1.8%     | n.a.         | 98.2%      |
| Eggs                    | n.a.                       | n.a.  | n.a.     | 7.9%     | n.a.         | 92.1%      |

Yet huge diversity as illustrated in the table (source: GLEAM, 2010)

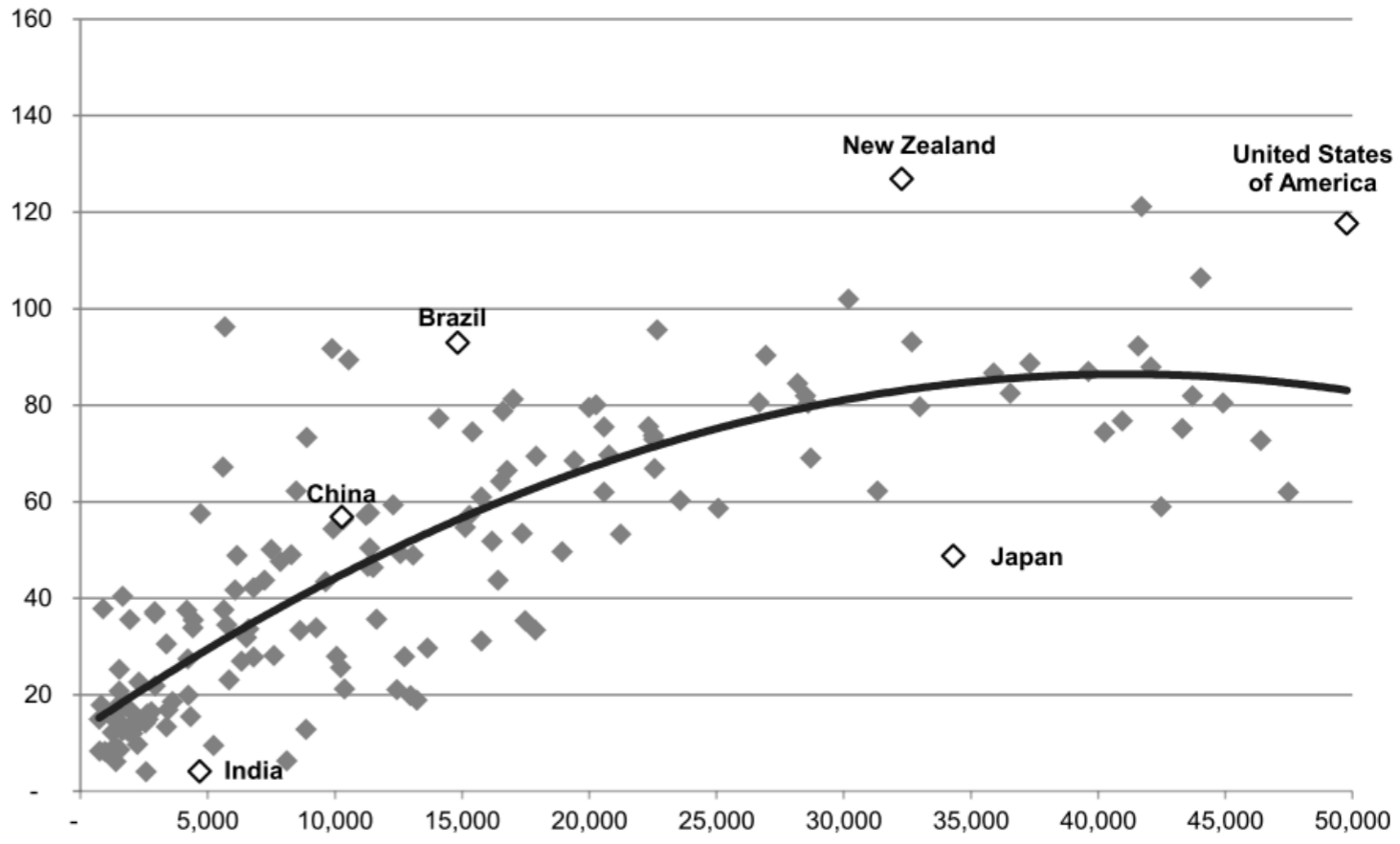
# Evolution and transformation – 2 examples



Source: OECD.Stat (<http://stats.oecd.org/>). Note: Index calculated by a constant weighting of commodities within each aggregate. The weight is calculated by the average 2012–14 real terms production value. 2015 figures are provisional.

## Income and meat consumption

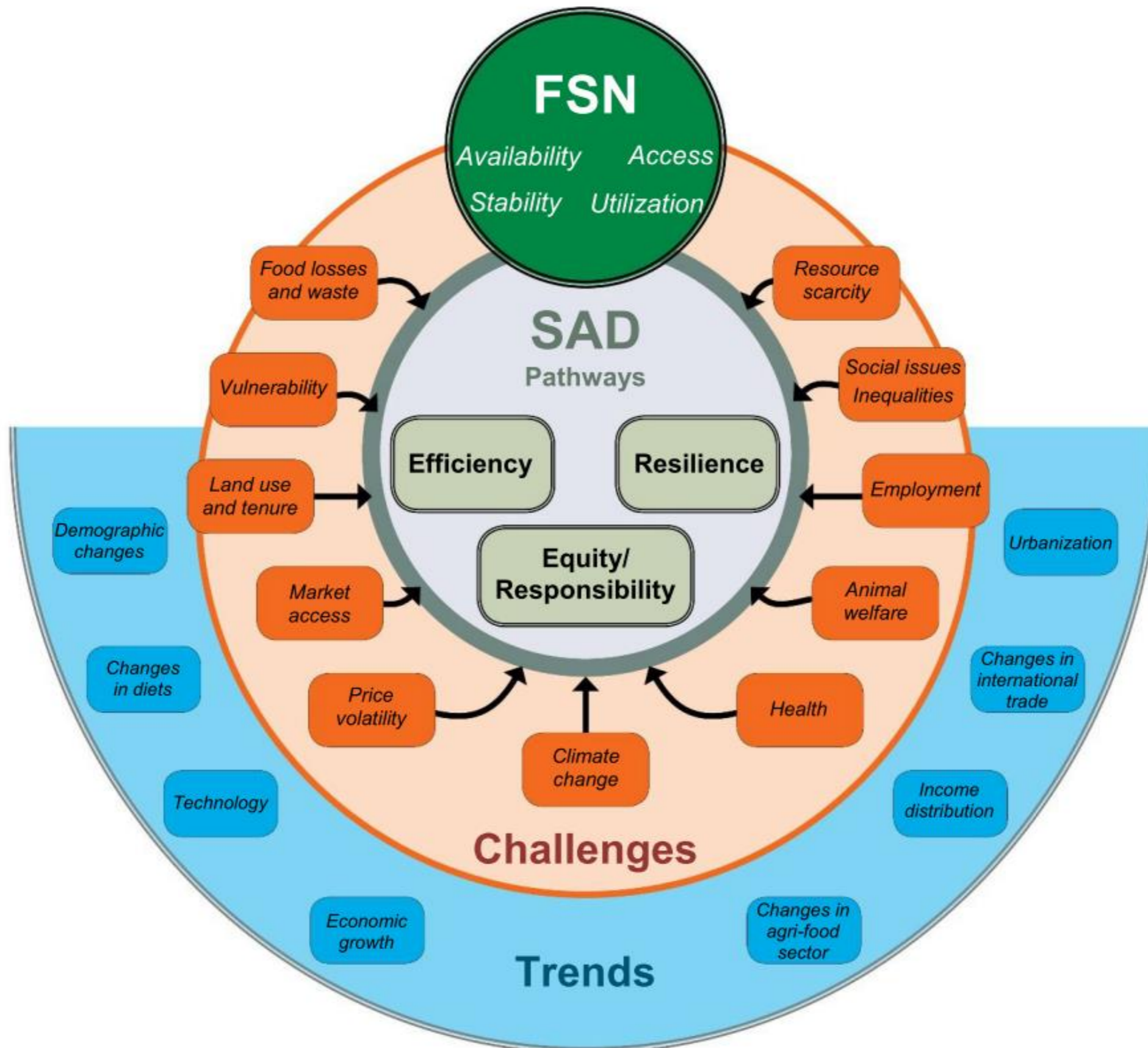
## Evolution of real commodity prices



Source: Adapted from FAO (2009a). Based on data from FAOSTAT (FAO, 2015a) for per capita meat consumption and the World Bank for per capita GDP. Note: GDP per capita (horizontal axis) is measured at purchasing power parity (PPP) in constant 2011 US dollar. Per capita meat consumption (vertical axis) is measured in kg/capita/year.



# Pathways - conceptual framework



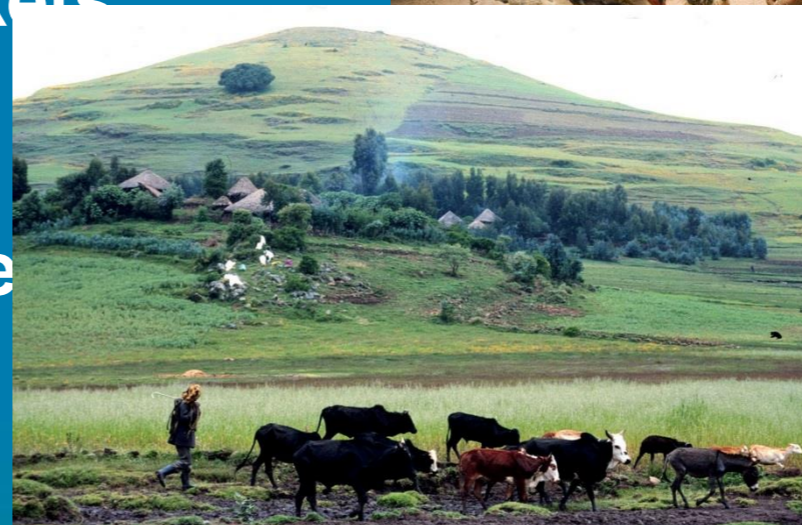


# Pathways towards greater sustainability of livestock systems need to....

- **Improve resource efficiency (productivity and environmental performance)**
  - ✓ Reduce animal mortality
  - ✓ Reduce yield gaps **and** environmental footprint
  - ✓ Improve animal feed efficiency
  - ✓ Close nutrient cycles
  - ✓ Reduce food losses and waste
  - ✓ Embrace appropriate technologies
- **Strengthen resilience through diversification and integration**
  - ✓ Adapt to climate change
  - ✓ Protect and manage genetic resources
  - ✓ Improve animal health
  - ✓ Apply risk management tools
- **Secure social equity/responsibility by better access to resources and markets**
  - ✓ Implement social protection systems, in particular for smallholders
  - ✓ Reinforce property rights to land, water and genetic resources
  - ✓ Promote and implement gender equality policies and actions
  - ✓ Improve working conditions (legislation, law enforcement, practical guidelines)
  - ✓ Enhance animal welfare (OIE standards)

## Smallholder mixed farming systems

- Enhance productivity and access to resources, markets and services
- Create an enabling environment for collective organization



## Intensive livestock systems

- Identify options to raise production while minimizing harmful environmental effects
- Explore and implement approaches to reduce antimicrobial resistance
- Ensure decent working conditions



Photo credit: ILRI/Fred Unger