



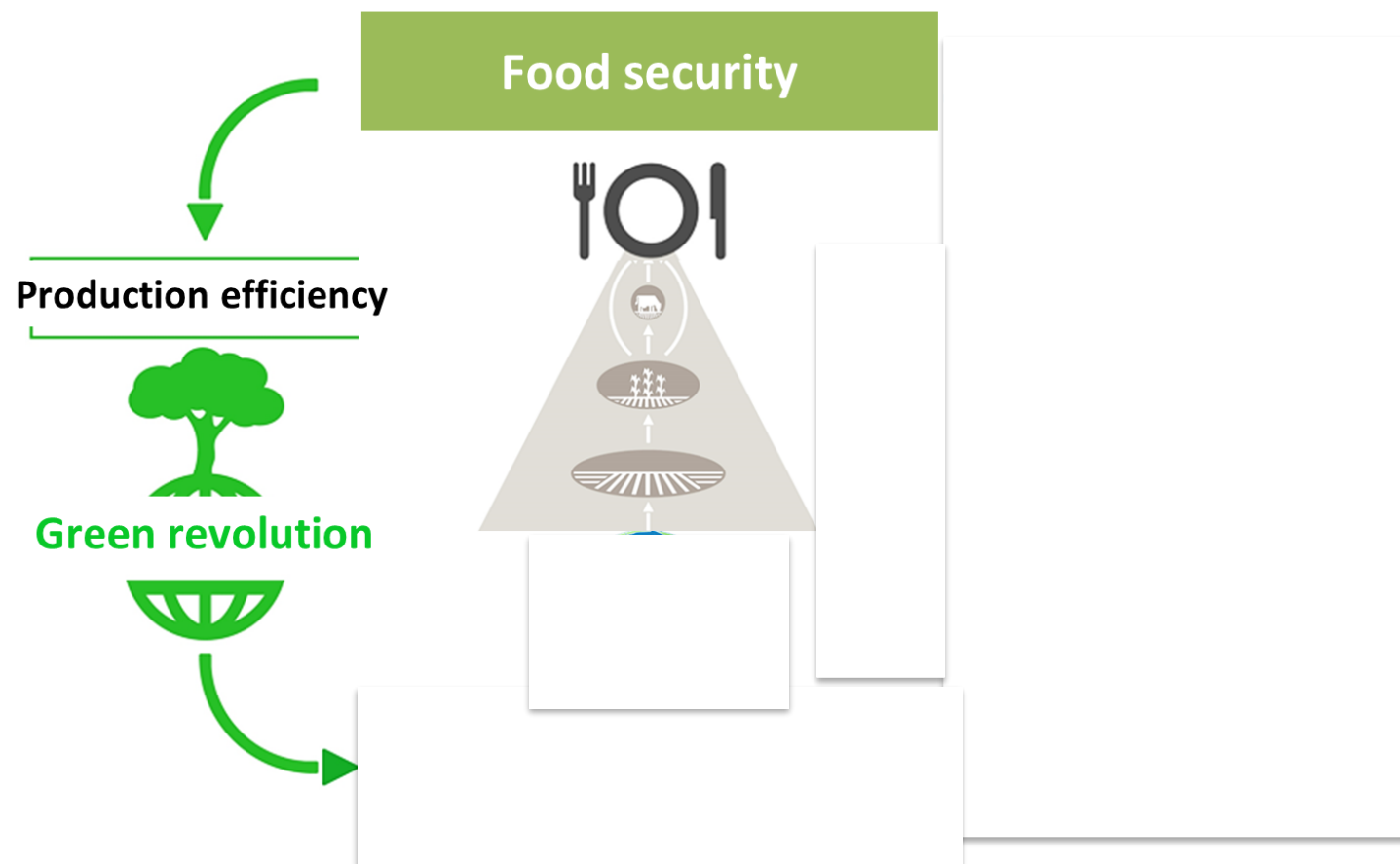
# Towards a sustainable livestock farming

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# Within the Planetary Boundaries: a change of paradigm

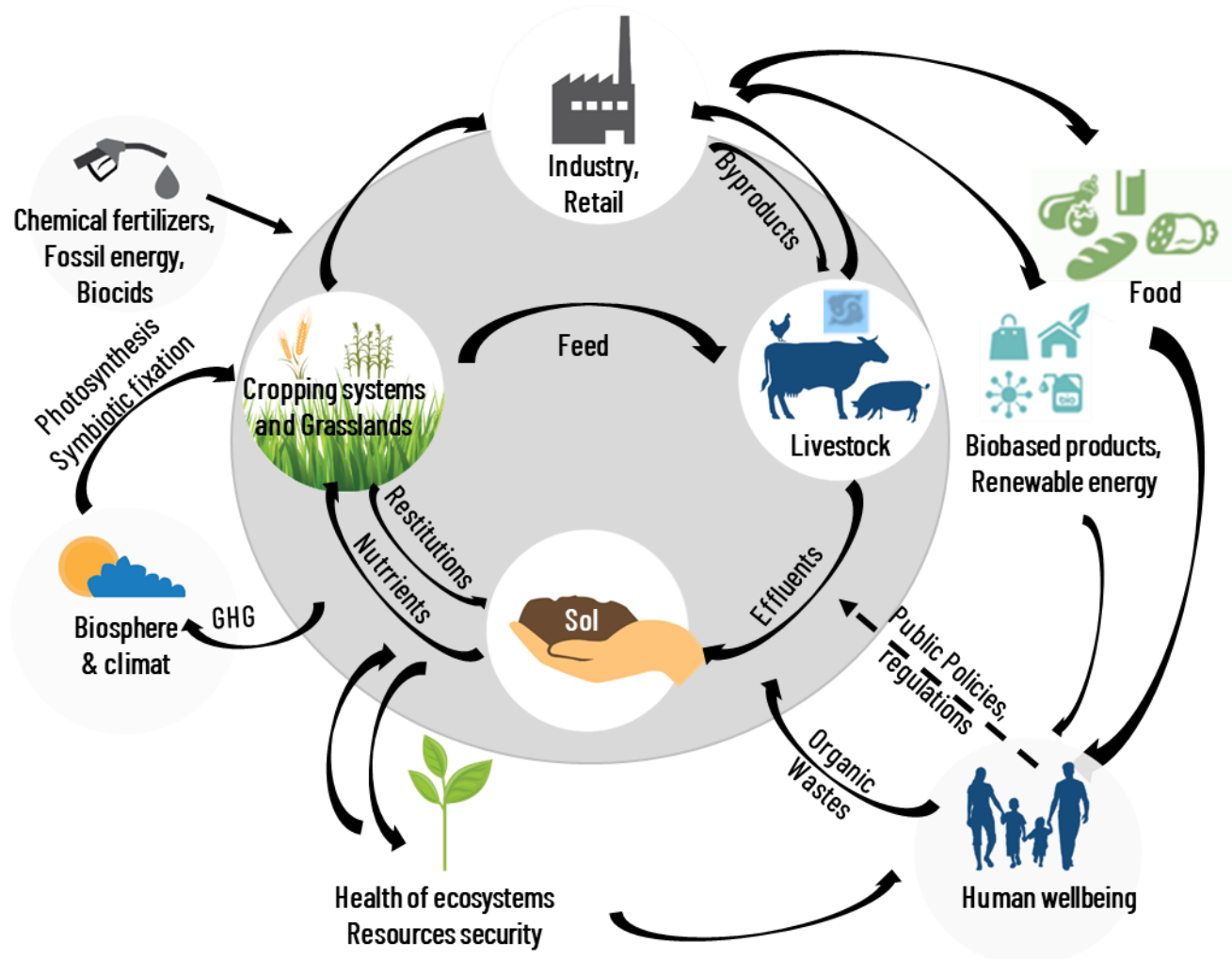
From Food security..... to resource security (and circularity)



- The green revolution has led to significant productivity gains but with a linear approach without considering the amount of mobilized resources and the health of ecosystems
- In a world of finite resources, livestock must be positioned as a relevant link in circular, efficient, agri-food systems that produce goods and services acknowledged by the society
- Balances are to be found according to political choices and territorial contexts  
There is no « one size fits all » optimal solution

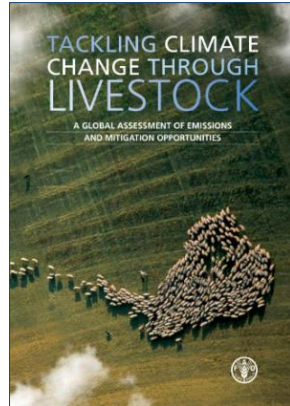
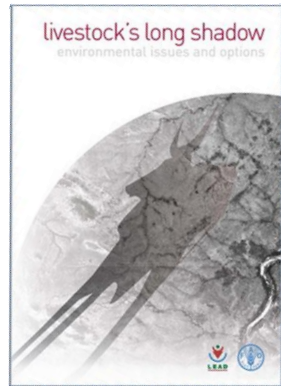
# A new paradigm for the future of livestock farming sector

**Livestock is a key issue for sustainable agri-food systems but this requires:**



- Rethinking the place and roles of livestock farming to reduce impacts and to increase positive contributions
- Rethinking multi-performance of the sector: preserving health and well-being (one-health), climate-smart and diversified production systems
- Rethinking the links between livestock and crop production in territories for an efficient and agro-ecological agriculture
- Rethinking the links between livestock farming, products and consumption of animal based products

# Mitigation of DISServices provided by livestock farming: GHG emission

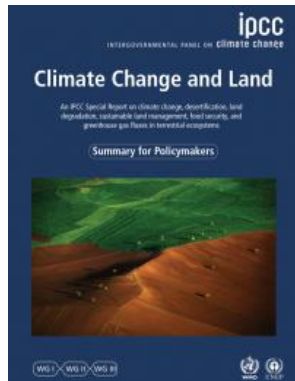


## • Direct mitigation options

- Genotyping low methane production for selection
- Improving feed quality, rumen microbes
- Improving animal health and husbandry conditions
- Improving manure management

## • Indirect mitigation options

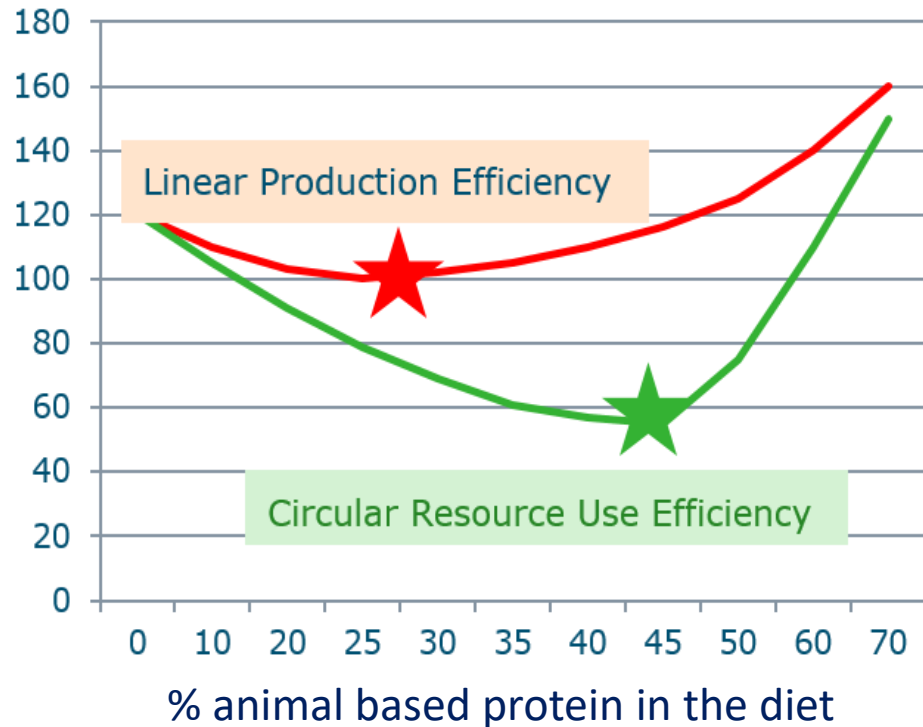
- Better agricultural land use,
- More efficient use of food crops (including residuals), (permanent) grassland
- Less specific feed production
- Low emission husbandry management
- Smart use of manure for biobased organic fertilizing
- More carbon sequestration in soils and biomass



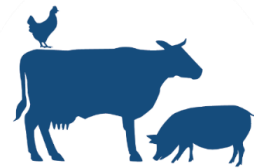
# Improvement of services provided by livestock farming: some examples

- **No circularity without livestock**

Production of Human edible proteins per ha of land without depletion of productivity and biodiversity



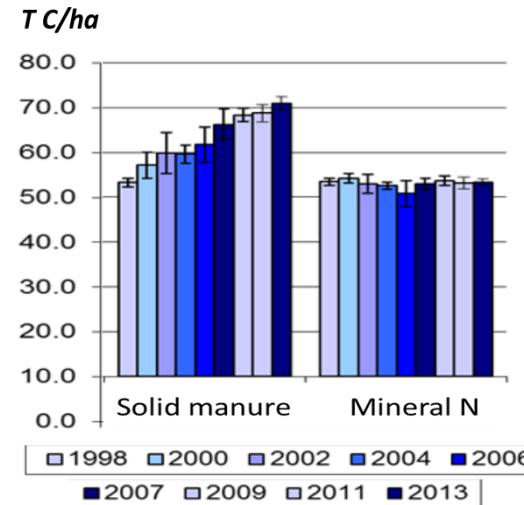
- **Livestock to foster soil quality**





Manure, Grassland













**More biomass**  
**High soil OM**  
**Less erosion**



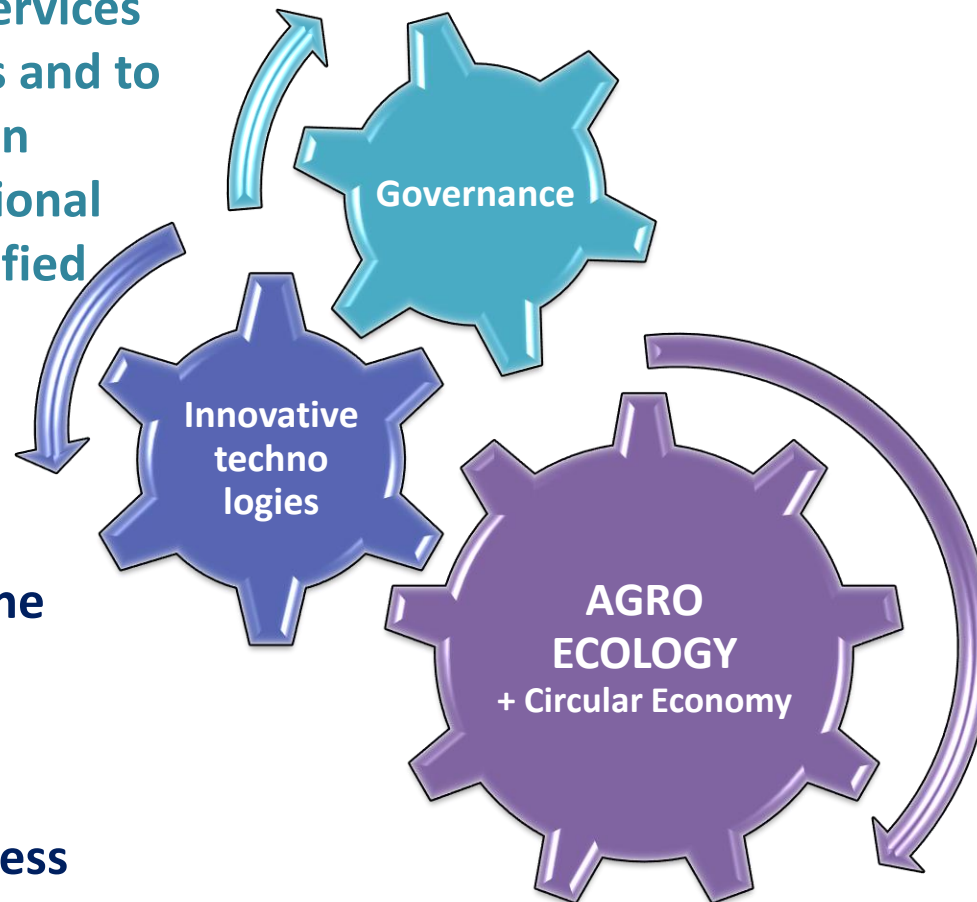
		
OM (t/ha)	40	80
Erosion (t OM/ha/y)	3.6	0.3
Invertebrates (t/ha)	0.5	3.5
Microbes (µg/g soil)	8.0	11.6

# Livestock to sustain SDGs: a European vision for the challenges

Sustainable domains	Challenges
  <p><b>Food and nutrition security</b></p>	<ul style="list-style-type: none"> <li>• Increasing food availability for affordable prices</li> <li>• Improving human nutrition (role of animal products)</li> </ul>
   <p><b>Livelihoods and economic growth</b></p>	<ul style="list-style-type: none"> <li>• Improving rural vitality and livelihoods</li> <li>• Promoting more socially acceptable farming systems</li> <li>• Increasing resilience of farming systems</li> </ul>
 <p><b>Health and animal welfare (one health)</b></p>	<ul style="list-style-type: none"> <li>• Controlling infectious (emerging) diseases</li> <li>• Improving animal welfare and health</li> <li>• Ensuring food safety with less chemicals</li> </ul>
    <p><b>Climate and natural resources use</b></p>	<ul style="list-style-type: none"> <li>• Increasing resources use efficiency</li> <li>• Reducing emissions intensities and total emissions</li> <li>• Closing nutrient cycles</li> <li>• Increasing biodiversity and avoiding biodiversity losses</li> </ul>

# A conceptual framework to develop innovation

- Controversies about production models and markets
- Assessment of impacts and services
- Public policies to steer efforts and to facilitate innovations adoption
- New economic and organizational pathways for new and diversified value chains
- Attractiveness of jobs
- Genomics + HD phenotyping,
- Mastery of the microbiome, the epigenome and the initial programming of individuals
- Digital technologies
- Technological innovation process



- Adaptive capacities of animals and systems
- Integrated management and animal health and welfare
- Metabolism of agro-ecosystems with animals
- Preservation and use of functional (bio) diversity
- Exploitation of the aptitude of the animals to valorize various biomasses
- Biomass recycling and value of livestock (by) products

# Suggested research priorities

**Develop Livestock production systems that create values and meet societal expectations.**

**Use ability of animals to use a diversity of biomasses as feed for developing agro-ecological agriculture, closing cycles of nutrients**

**Adapt animals and propose more sustainable livestock farming systems**

- Understanding the context, evaluating (disruptive) scenario of evolution
  - Using diversity at all level of organization to increase resilience/sustainability
  - Developing the concept of bunches of services and unbiased metrics for evaluating the performances of production systems
  - Studying new policies instruments (CAP, regional....)
- 
- Mastering the elaboration of animal phenotypes
  - Developing innovative systems for animal health and welfare
  - Developing climate-intelligent systems
  - Building the quality (intrinsic and extrinsic) of livestock products and valuing bioactive compounds of animal (by) products
- 
- Using livestock to valorize diversified crops rotations to reduce pesticides use, to increase C sequestration and to increase EU protein self sufficiency
  - Developing manure as commercial biofertilizers
  - Identifying and extracting health promoting components from plants
  - Developing innovative feed value chains



# Take home Messages

- **Think twice: do not step into a simple and narrow vision of livestock farming systems**
- **Reducing impacts of livestock farming is essential: the shadow of livestock can be mitigated**
- **Reducing impacts is not sufficient to regain legitimacy and livestock farming should contribute to the restoration of damaged ecosystems**
- **Europe needs an ambition for livestock farming systems**
- **ATF has provided a vision paper and will present a SRA**  
**A joint position paper has been produced with P4F**

