

Agriculture and Climate

CTA

Jan Verhagen. 20 Sept. 2012, Wageningen



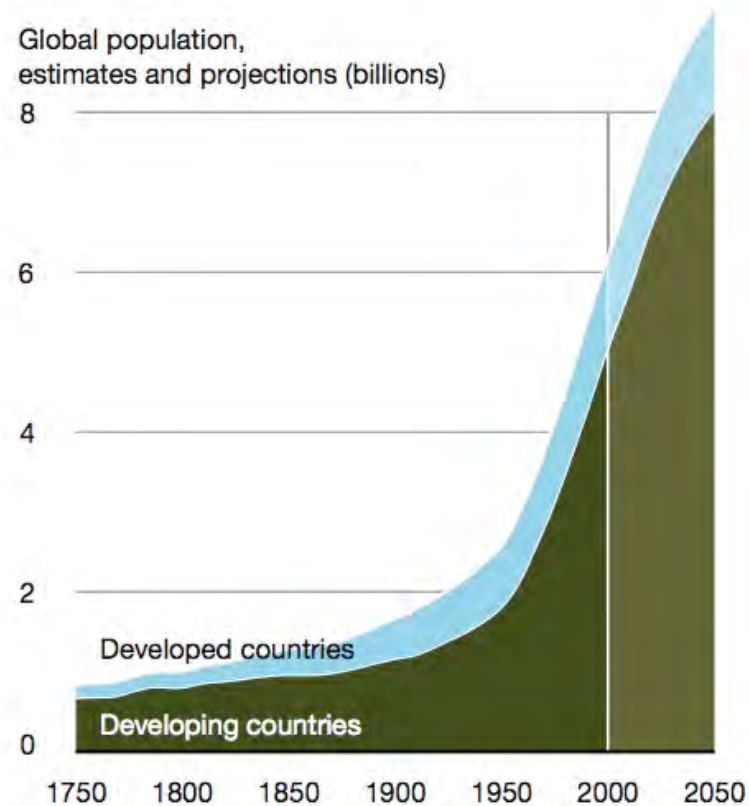
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For quality of life



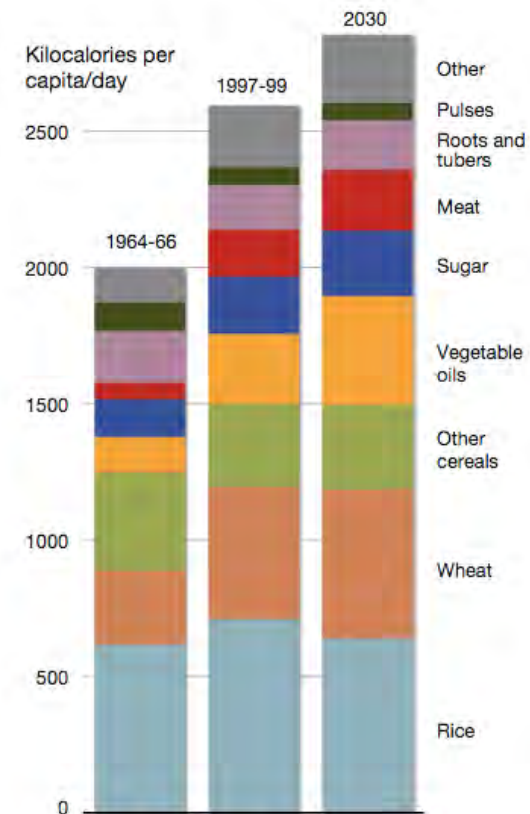
The Challenge: Sustainable Management of an Ever-Changing Planet



Population increase & diets



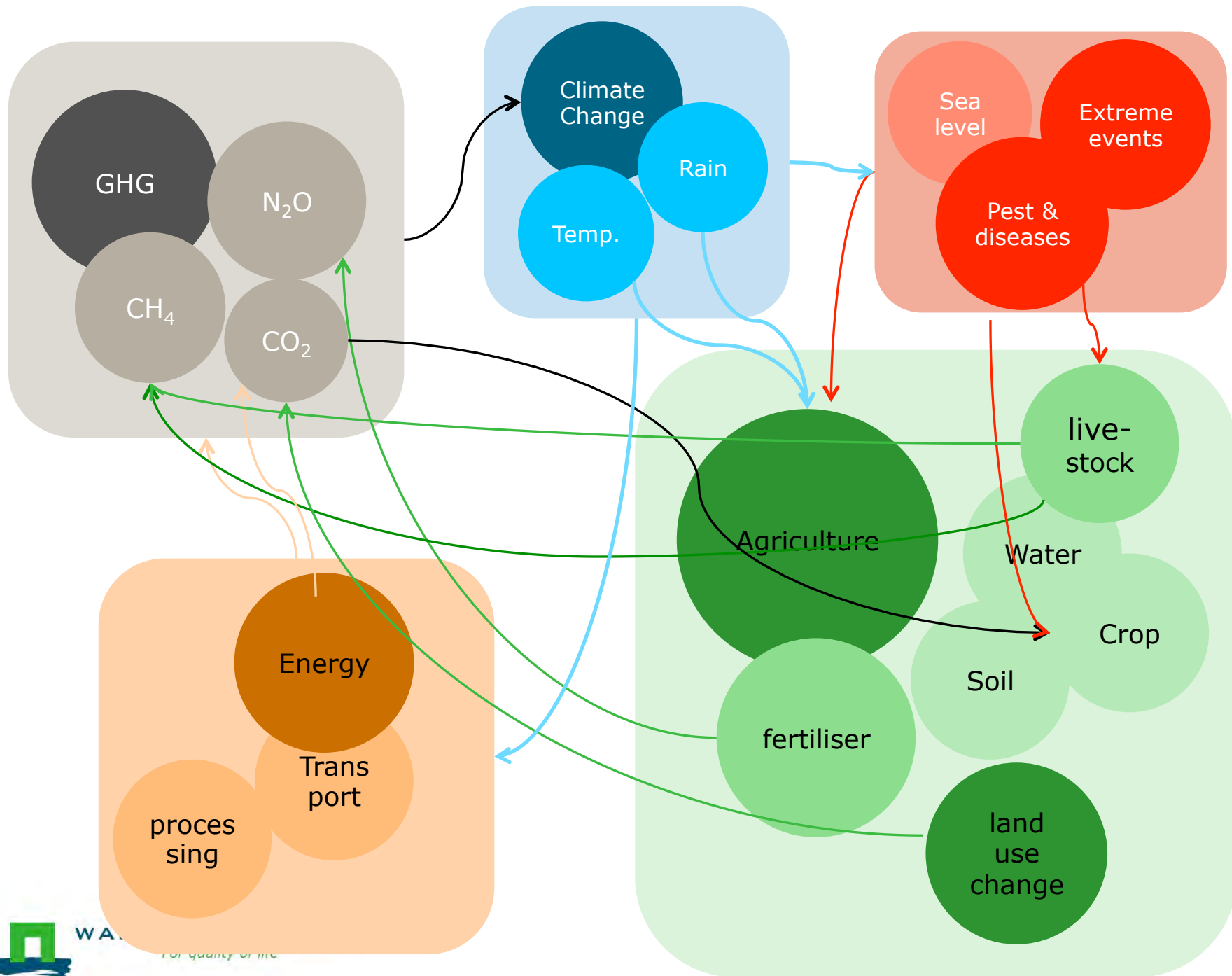
Source: UN Population Division, 2007



Source: FAO, 2008; FAOSTAT, 2009.

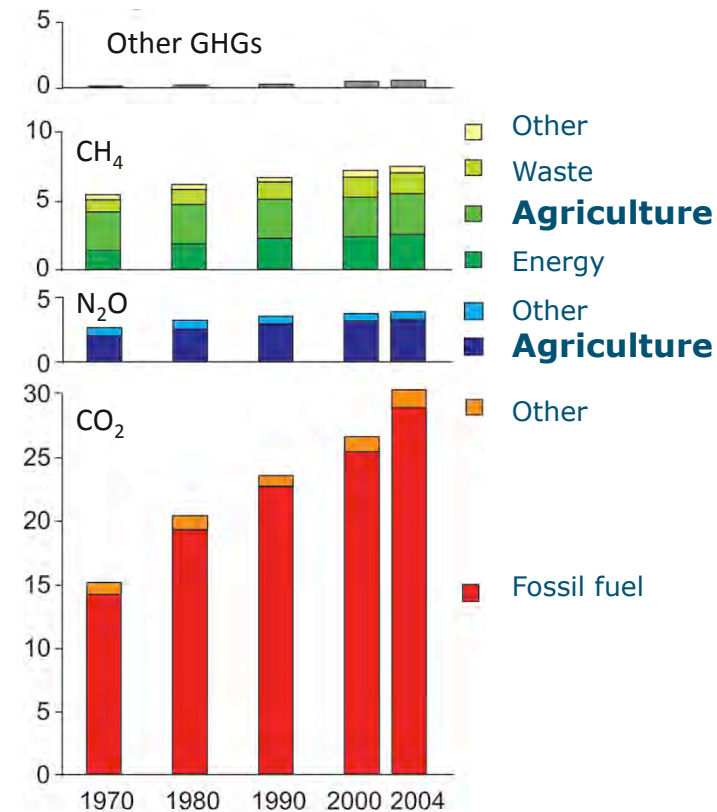
Climate Change & Agriculture: a dual relation

- Emissions → mitigation
- Impacts → adaptation



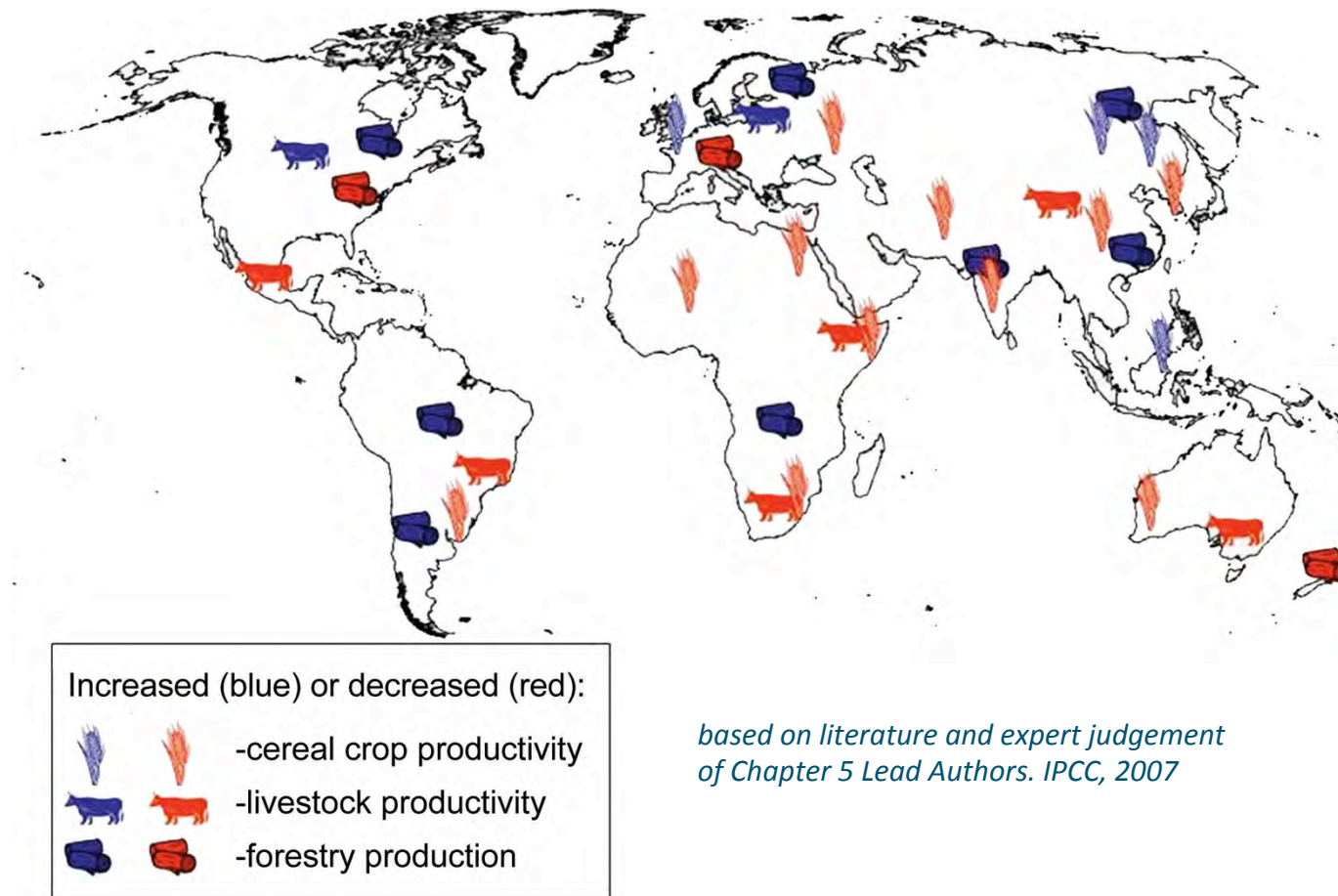
Global GHG emissions (Pg CO₂-eq yr⁻¹)

- Agricultural land uses: 10-12% of total global anthropogenic emissions of GHG
 - About 60% of N₂O
 - About 50% of CH₄
 - Less than 1% CO₂
- The contribution of land use change emissions to the total emissions from human activities was 12% in 2008, down from 20% in the 1990s (Carbon Budget, 2009)



Climate Change and agriculture: Impacts (2050)

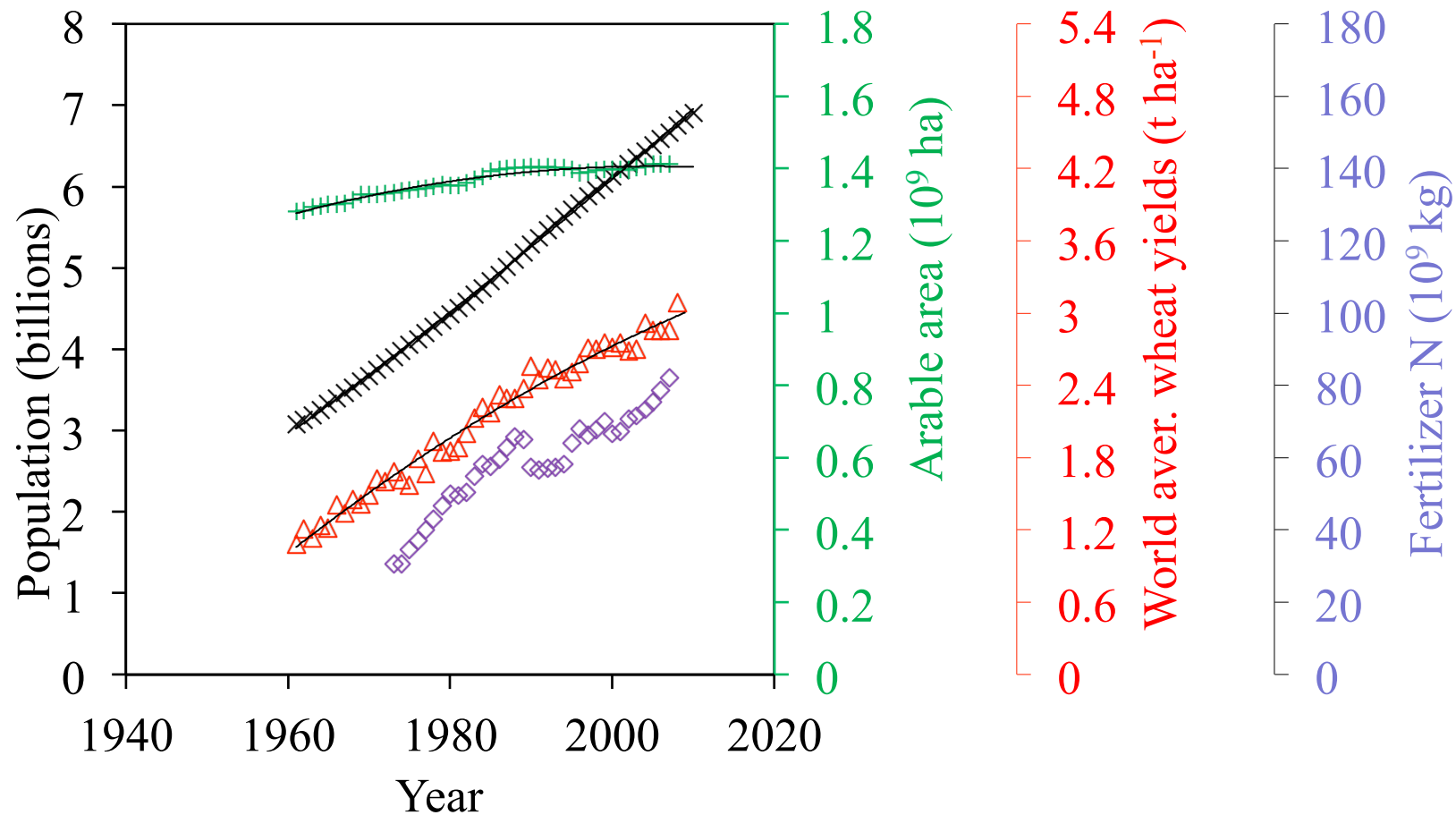
Adaptation is not taken into account.



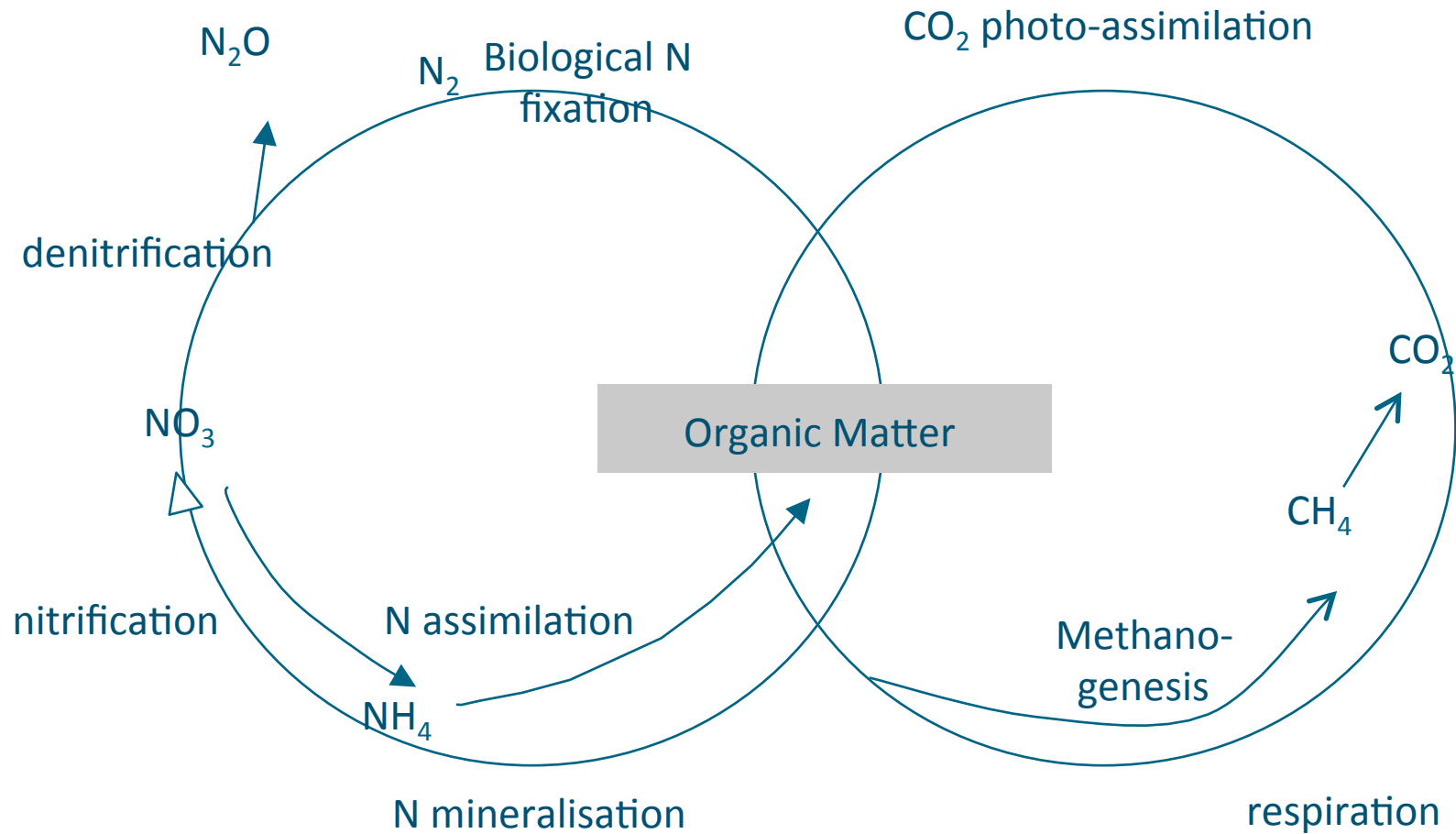
Climate Smart Agriculture

- start from development priorities in agriculture
- production systems with low vulnerability to climate change
- agricultural products with low GHG emission intensity

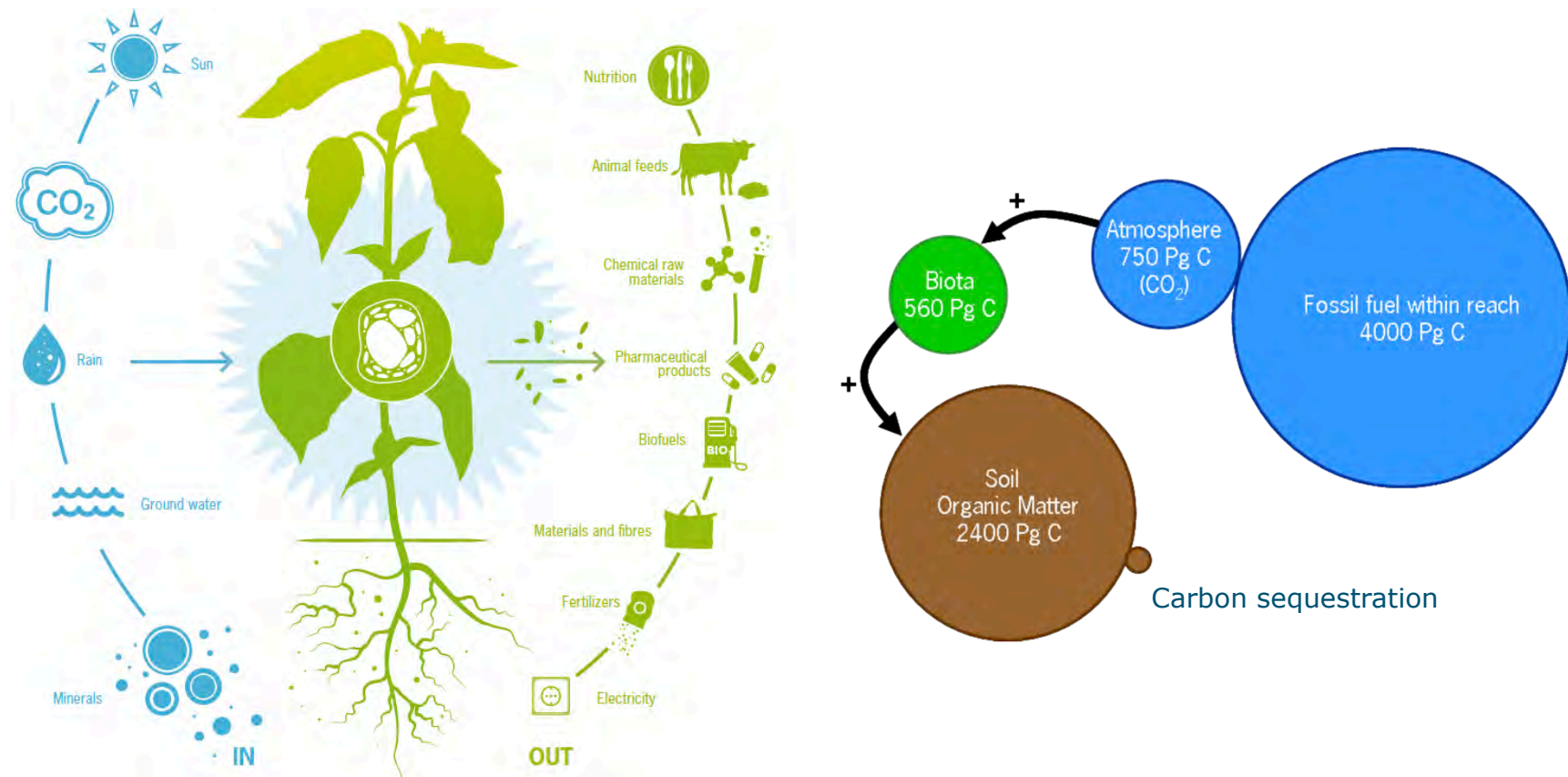
Required growth for *food and feed* is nothing new



Managing N and C cycles (Oenema et al 2001)



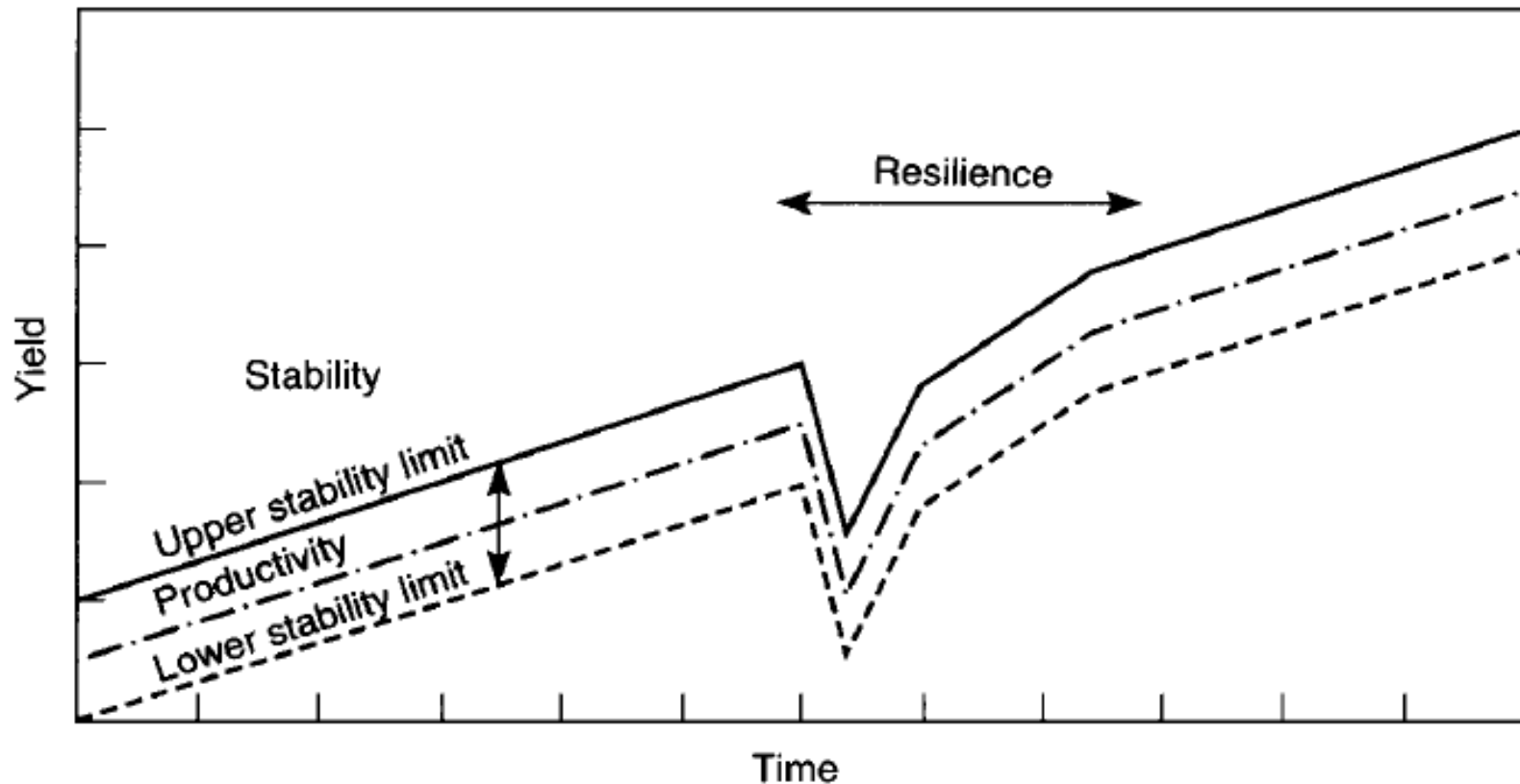
Ambitious and realistic



CSA

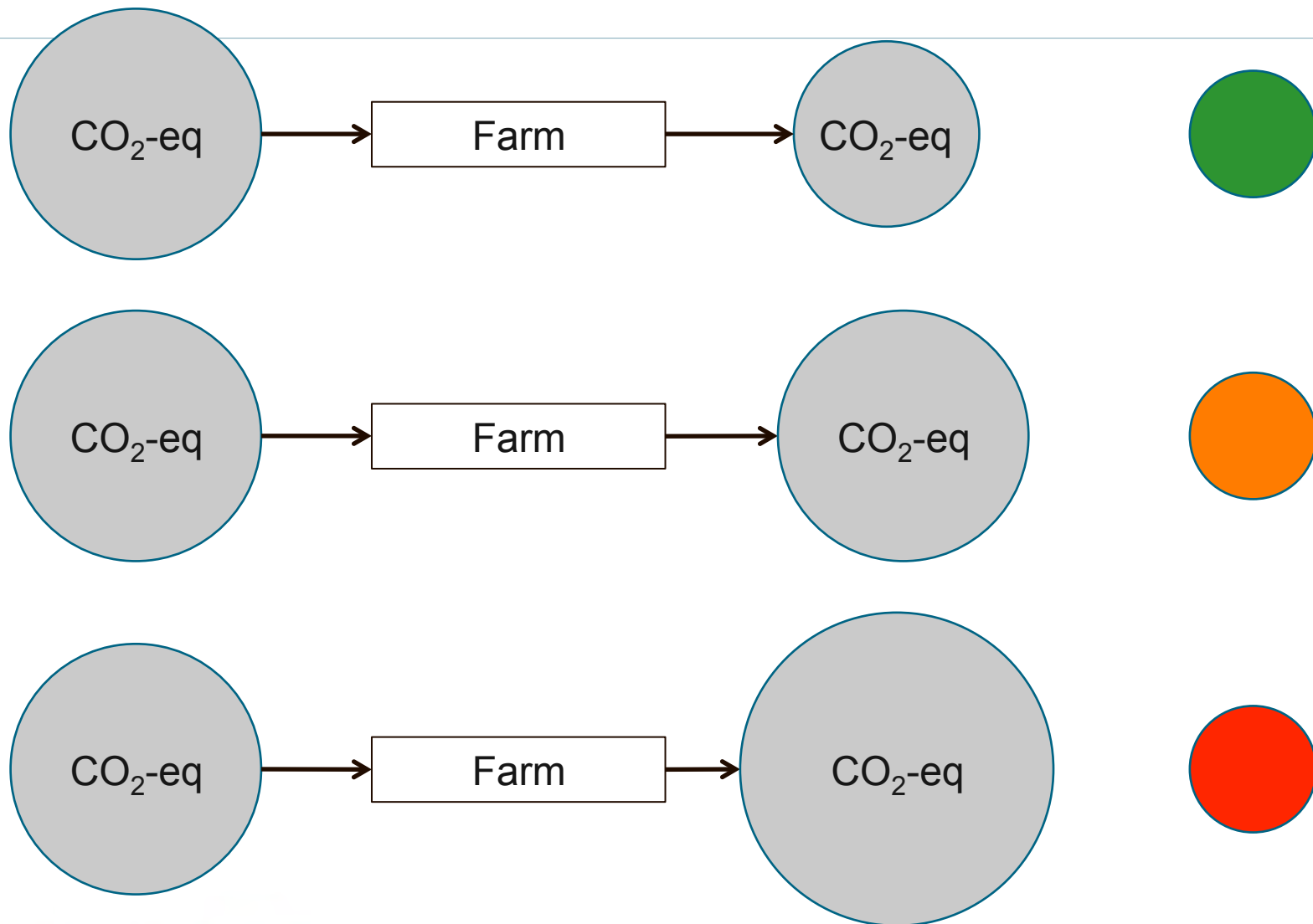
- create adaptive and resilient systems: “doing things differently” to “doing different things”
- reduce emissions intensity of agricultural production and conserve or increase soil carbon stocks in agricultural managed land

Production, stability and resilience

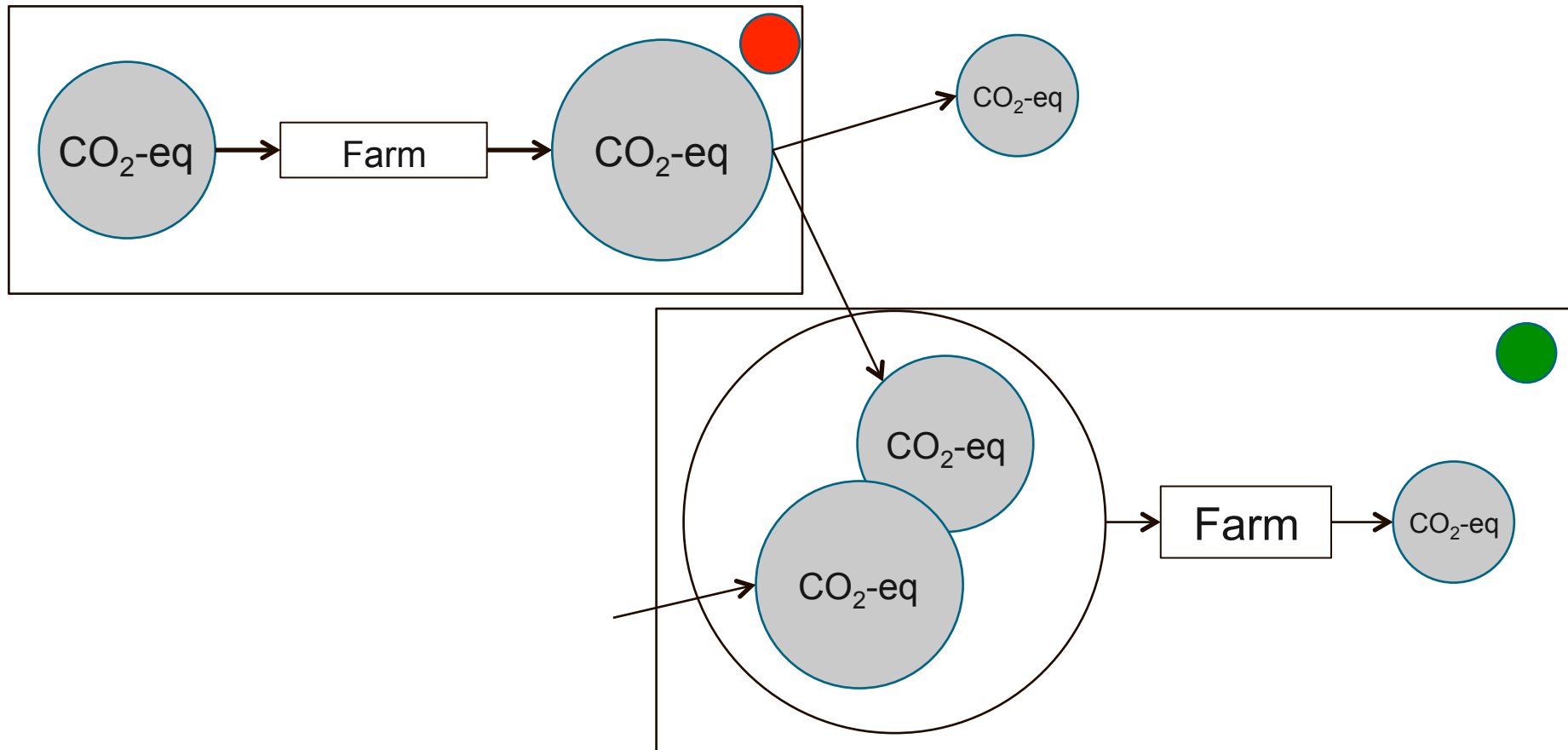


Fresco, L, and S Kroonenberg. 1992. "Time and Spatial Scales in Ecological Sustainability." *Land Use Policy* (January 1).

GHG management



Smart combination



Agricultural practices



Good Agricultural Practices & Climate Smart?

- adaptive and resilient systems
- reduce emissions intensity of agricultural production and conserve or increase soil carbon stocks in agricultural managed land.
- Eco-efficiency
- Precision agriculture
- Water management
- Crop rotation
- Functional biodiversity
- Energy balance
-?

➔ context specific

GAP & CSA

Agricultural practices

GAP

CSA

Agricultural practices

GAP

CSA

Agricultural practices

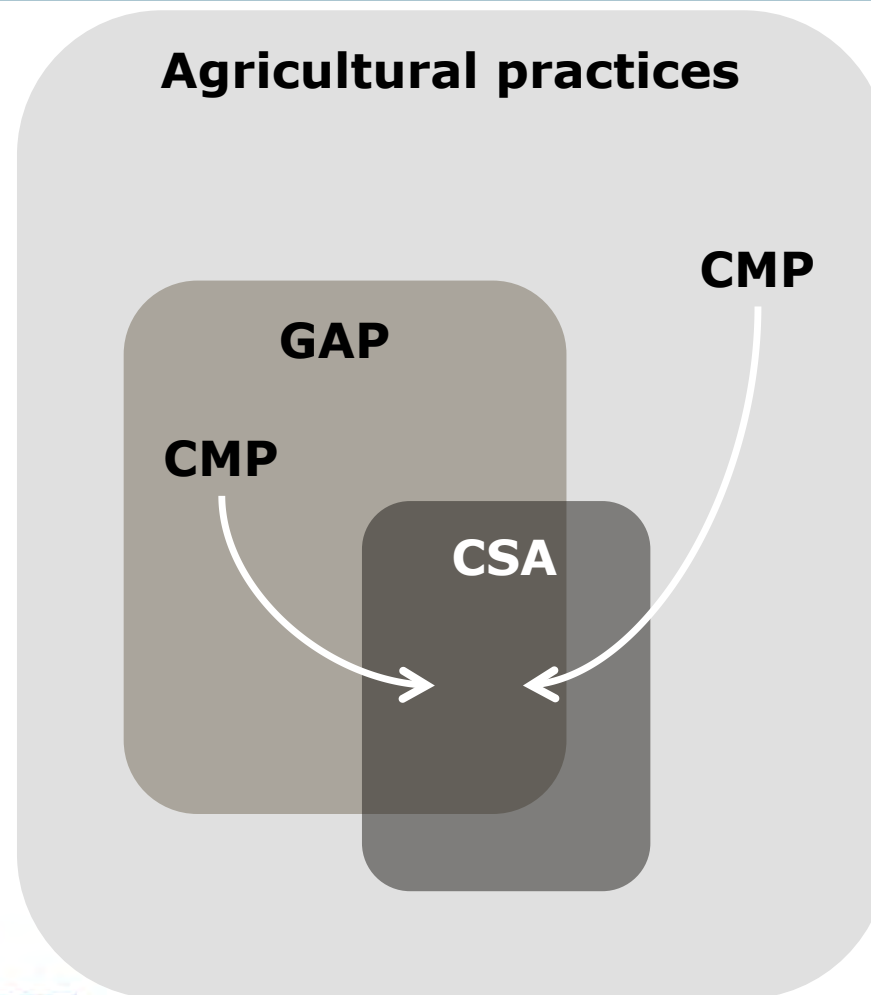
GAP

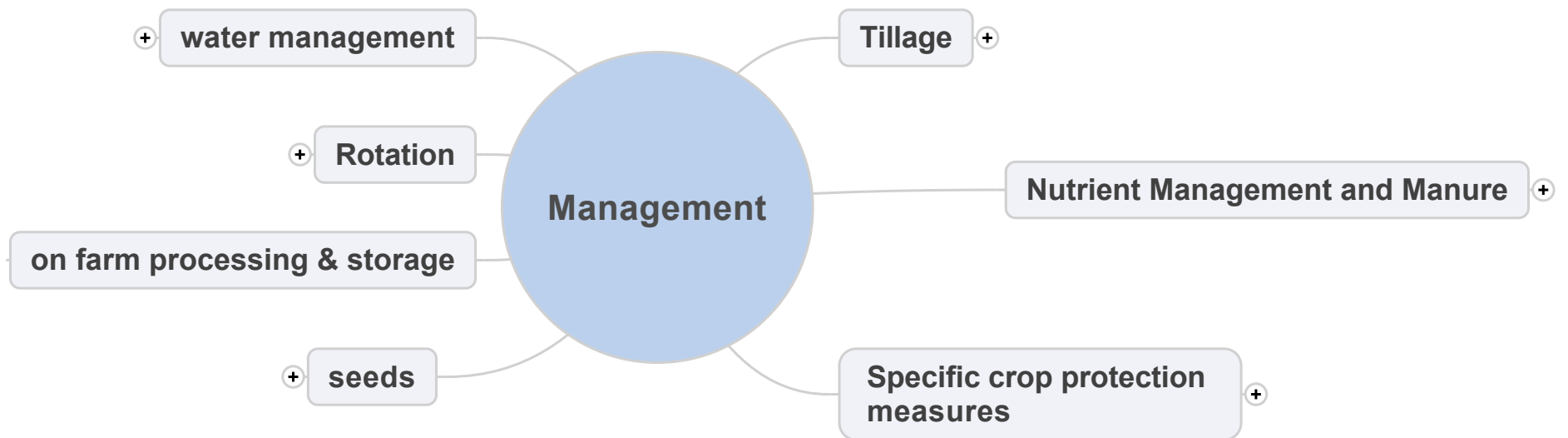
CSA

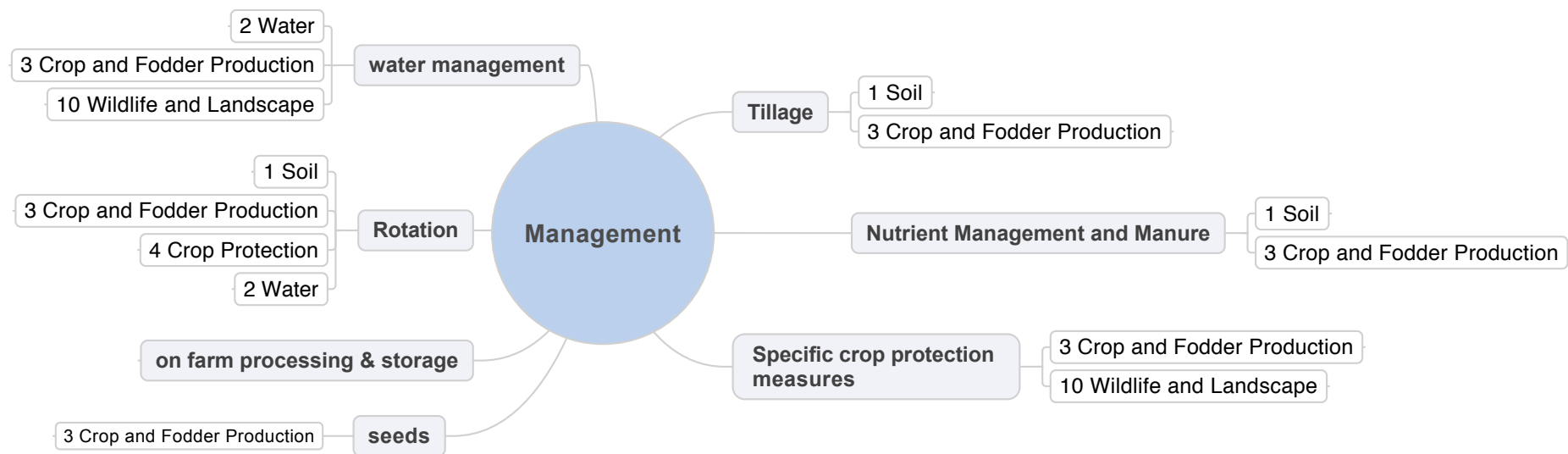


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From Current Management Practices (CMP) to GAP/CSA







Informed decision making at all levels

- Based on available scientific information
- Need to understand systems to identify effective and efficient mitigation and adaptation measures
- Need (monitoring) data and modeling to support claims of GHG reductions and C-sequestration.
- Uncertainty and variability will not go away.
- Identify effective and efficient activities/measures

Tackle climate change

- Awareness and commitment
- Start from political and economic context
- Make climate information available for everyday practices of stakeholders
- Show realism in dealing with synergies and trade-offs
- Effectiveness and efficiency not always easy: time scales.
- Adaptation should lead mitigation: priority remains with feeding the increasing population.

Thanks



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