

Food Security & Climate Change

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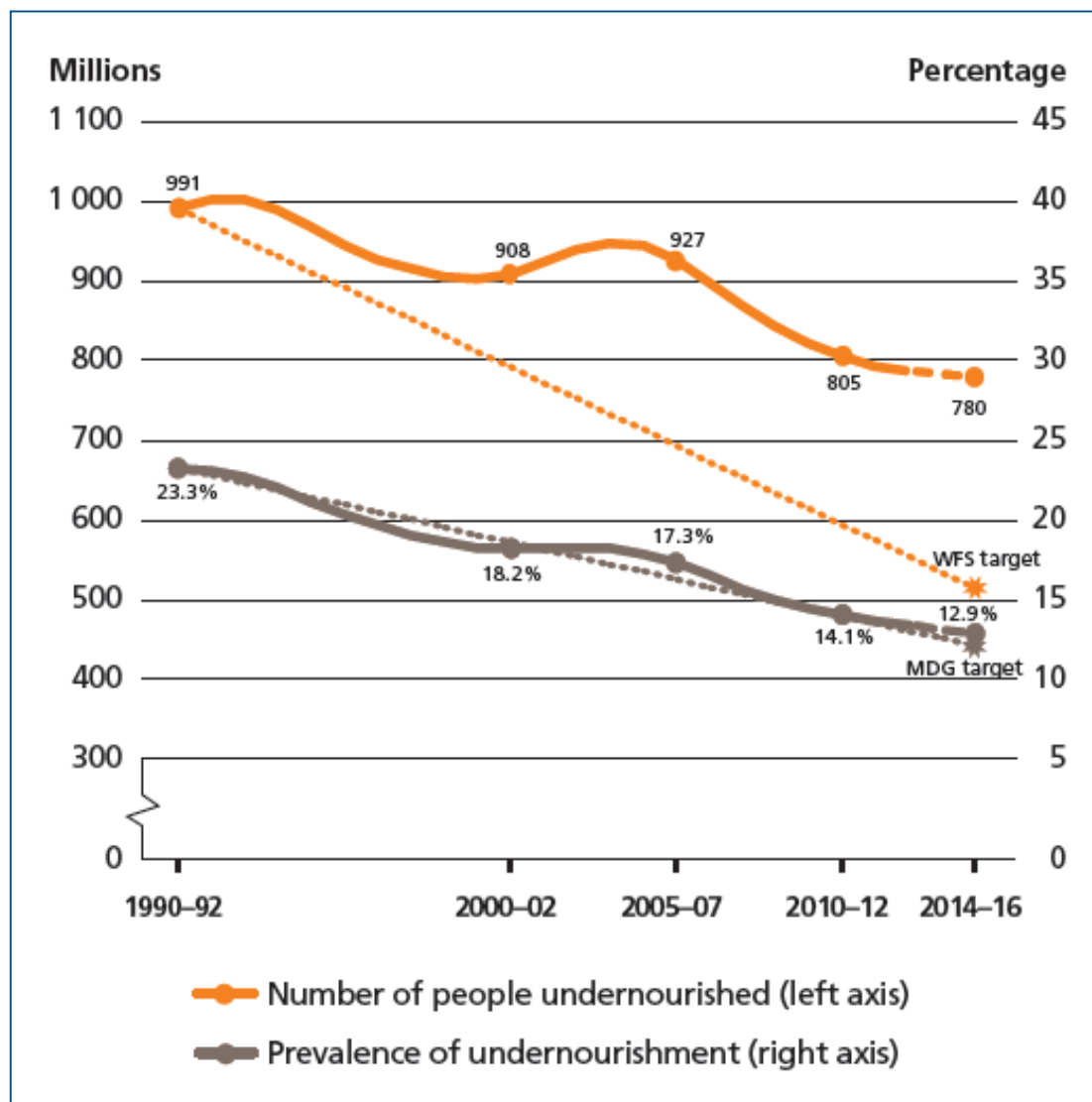


Figure 2.3 World population: 1950-2010 and projections (three variants)

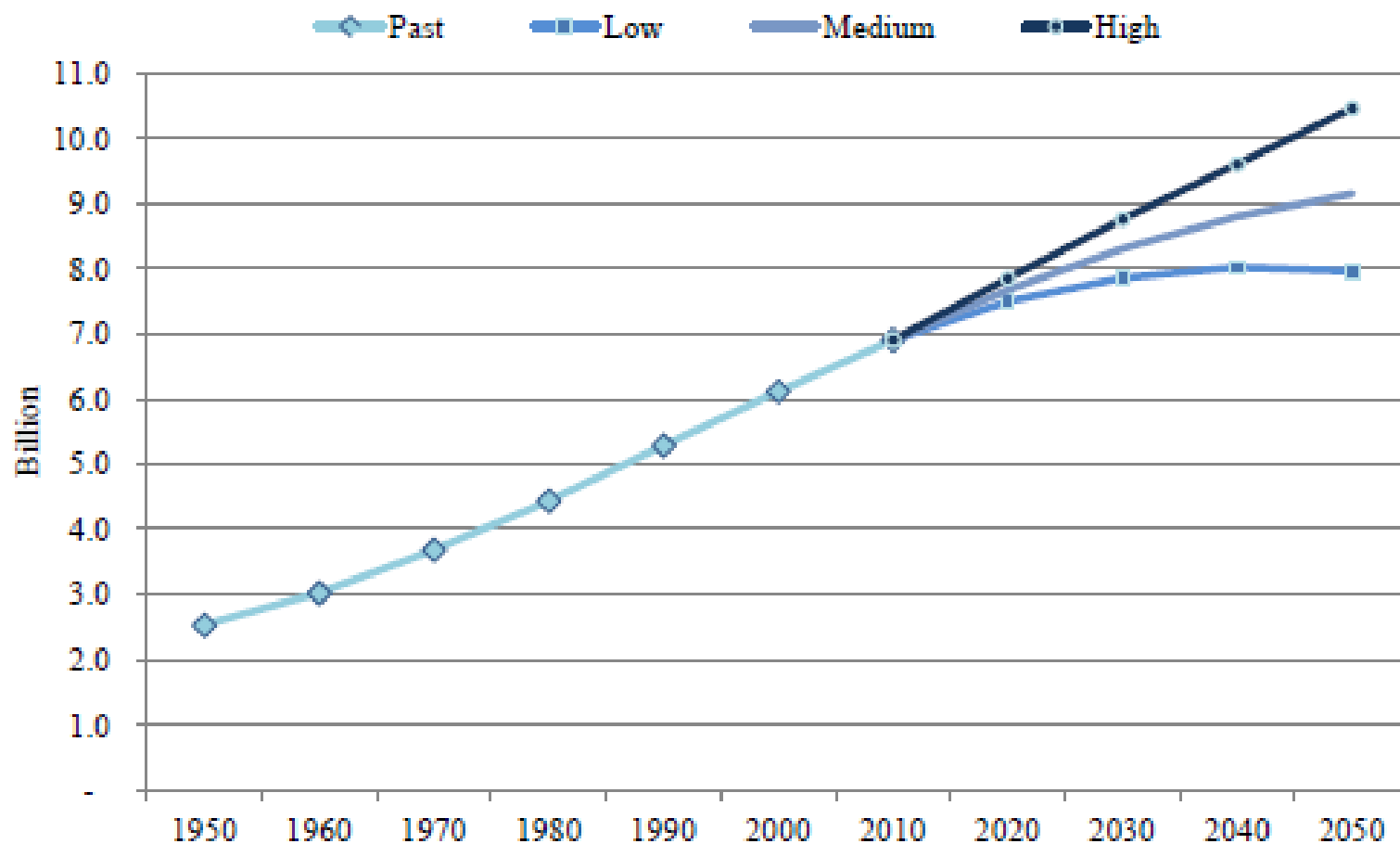
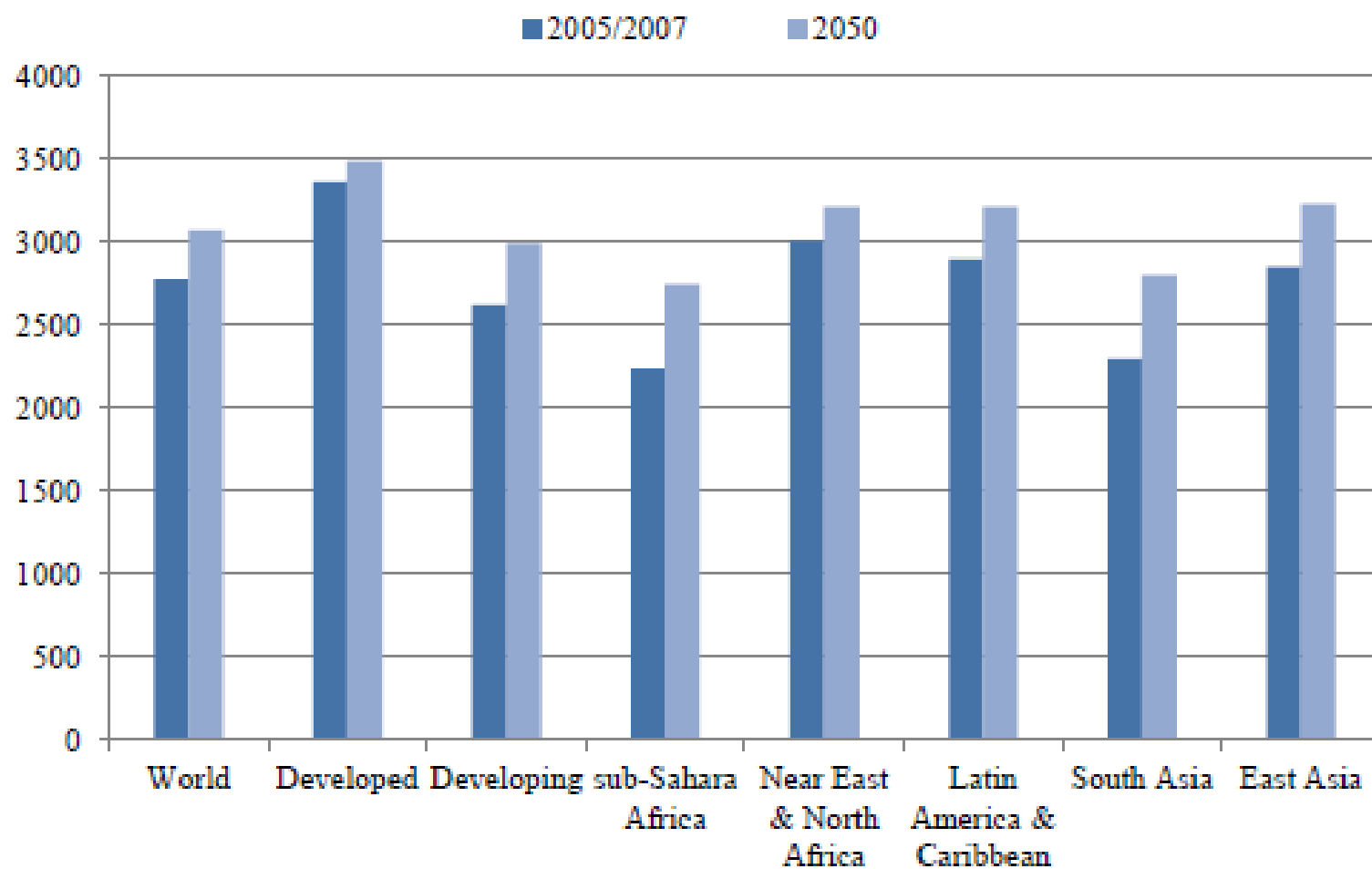
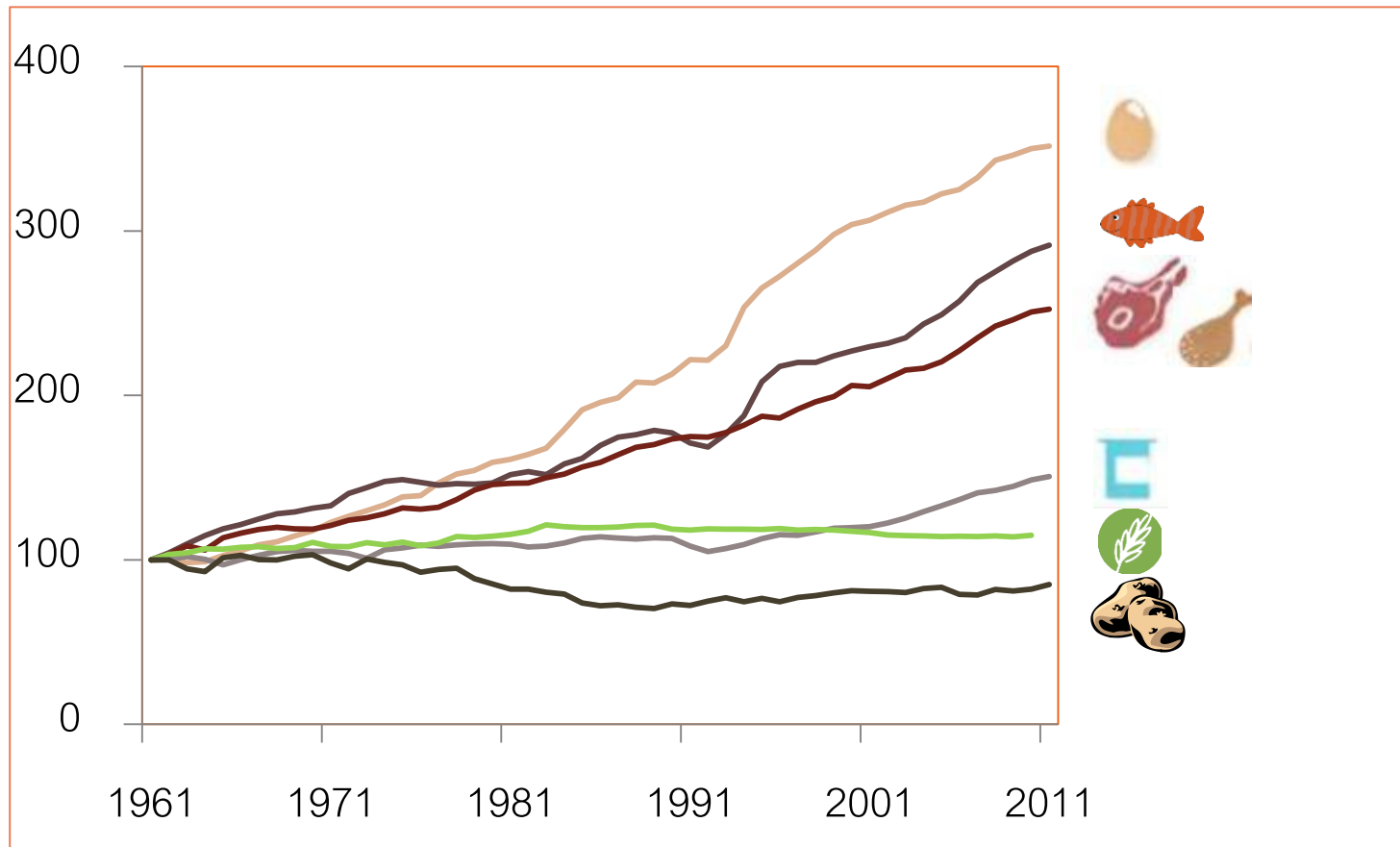


Figure 1.1 Per capita food consumption (kcal/person/day)

Demand for animal products is growing rapidly in developing countries



Diminishing growth rates

Figure 1.9 World cereals, average yield and harvested area

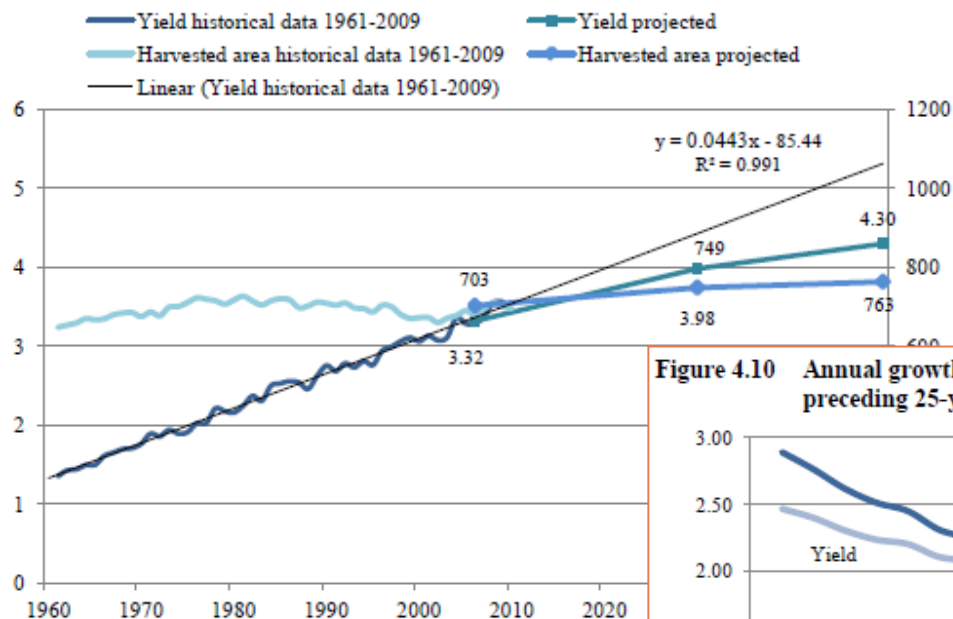
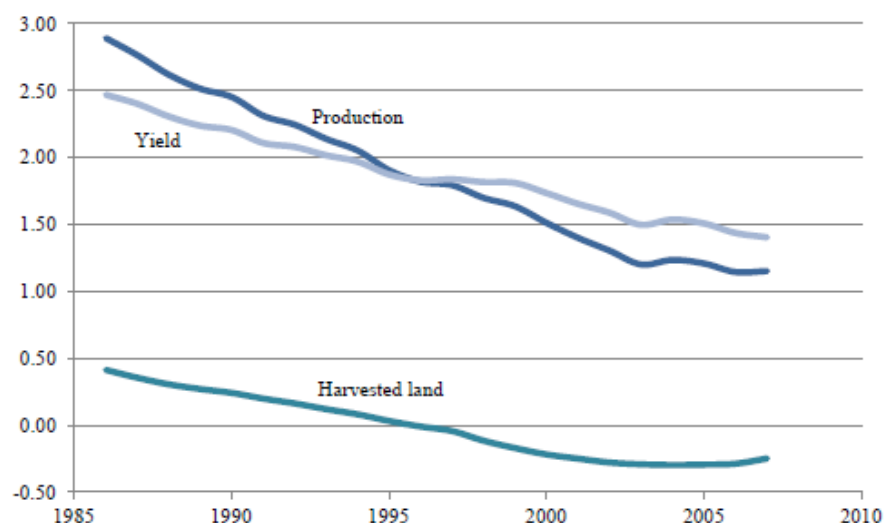
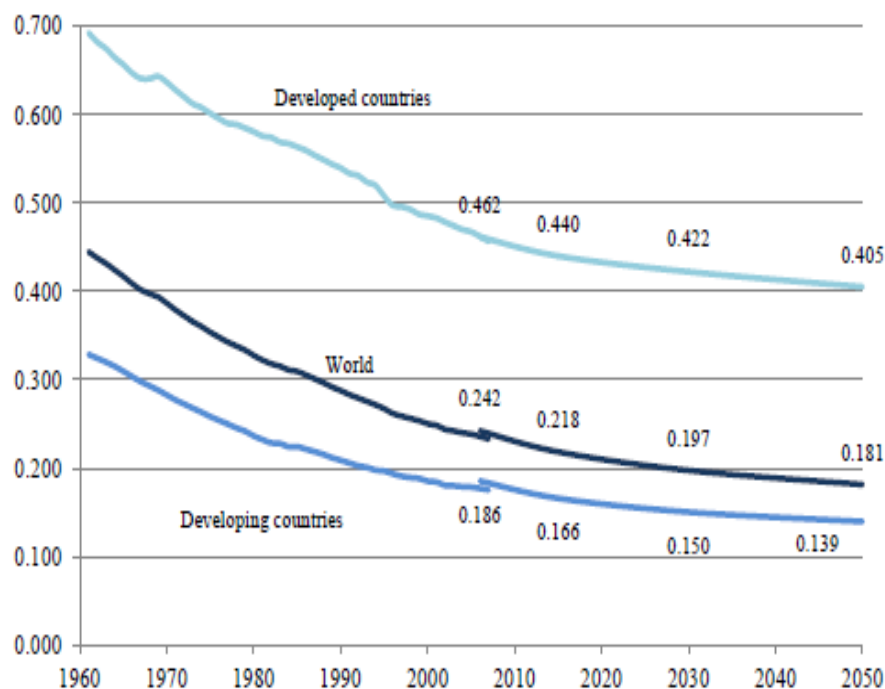


Figure 4.10 Annual growth rates (percent) of world cereal production and yields (over preceding 25-year period; historical 1961 - 2007)



Pressures on land

Figure 4.3 Arable land per capita (ha in use per person)

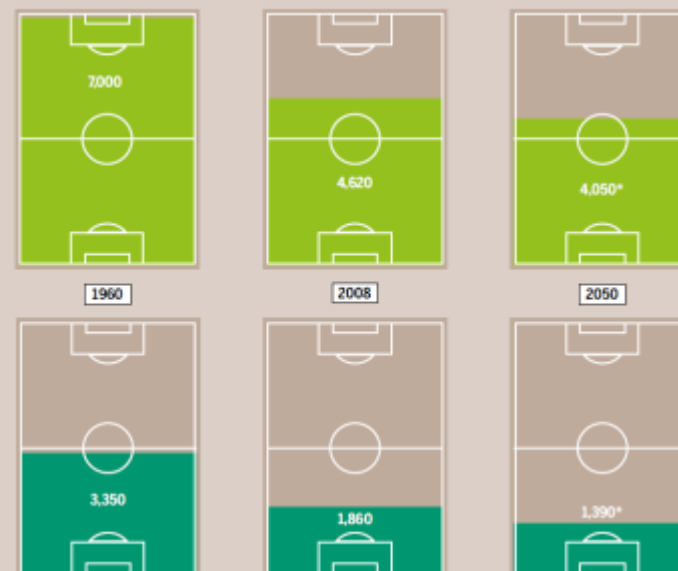


A SHRINKING FIELD

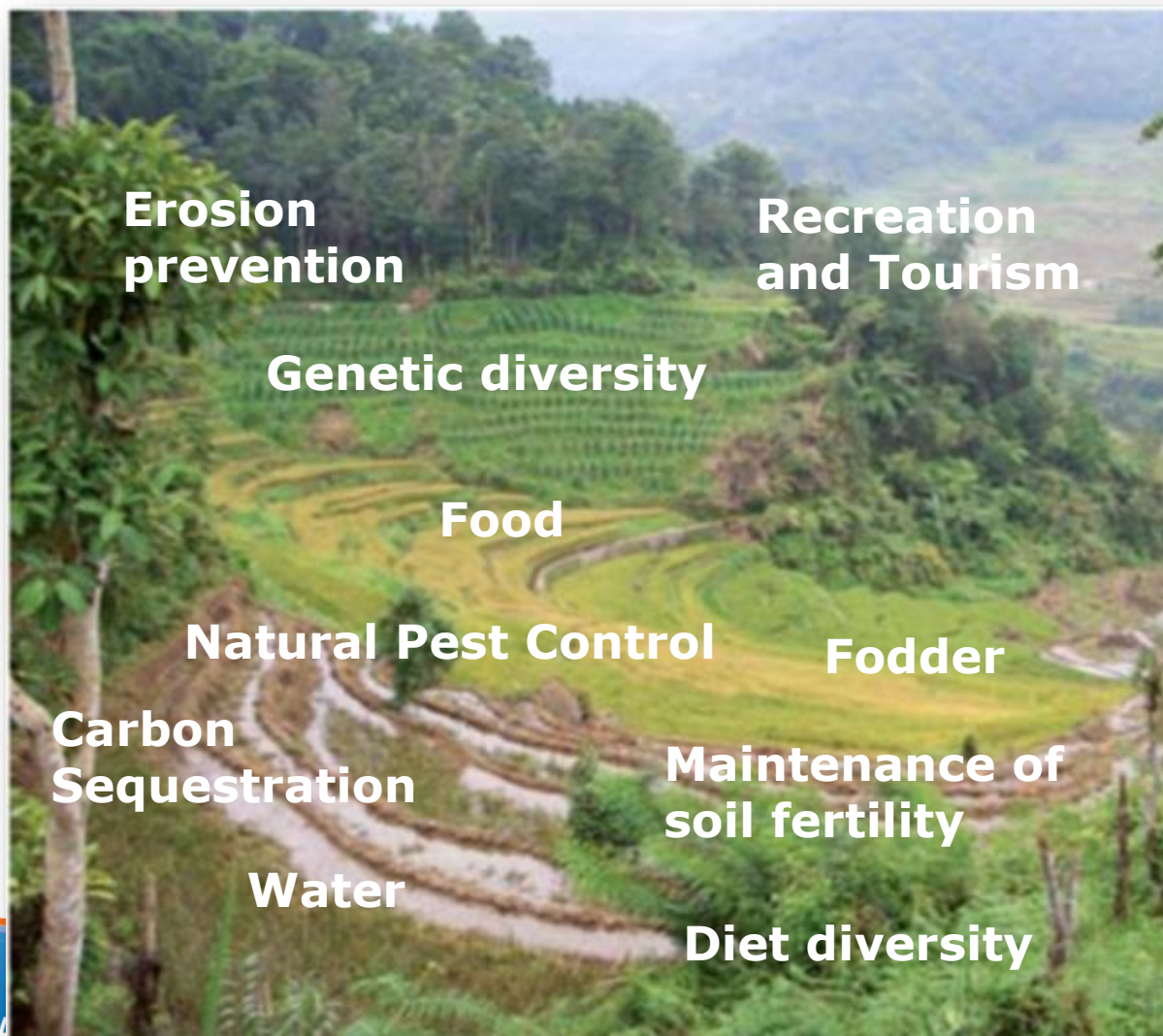
Agricultural area per person, in square metres
Compared with 1 football field = 7,140 square metres

Developed countries

Developing countries



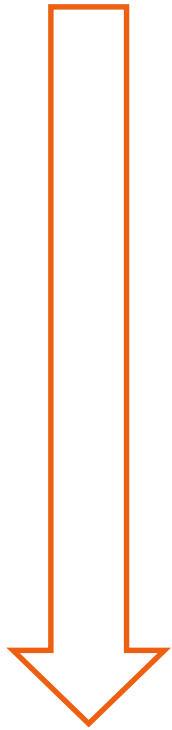
Pressure on natural resources & ecosystem services





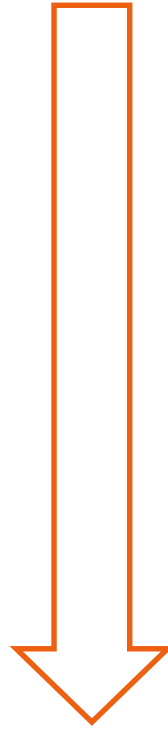
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Increased demand

- Population growth
- Dietary changes



Sustainability

- Availability of land
- Pressure on natural resources & ecosystem services

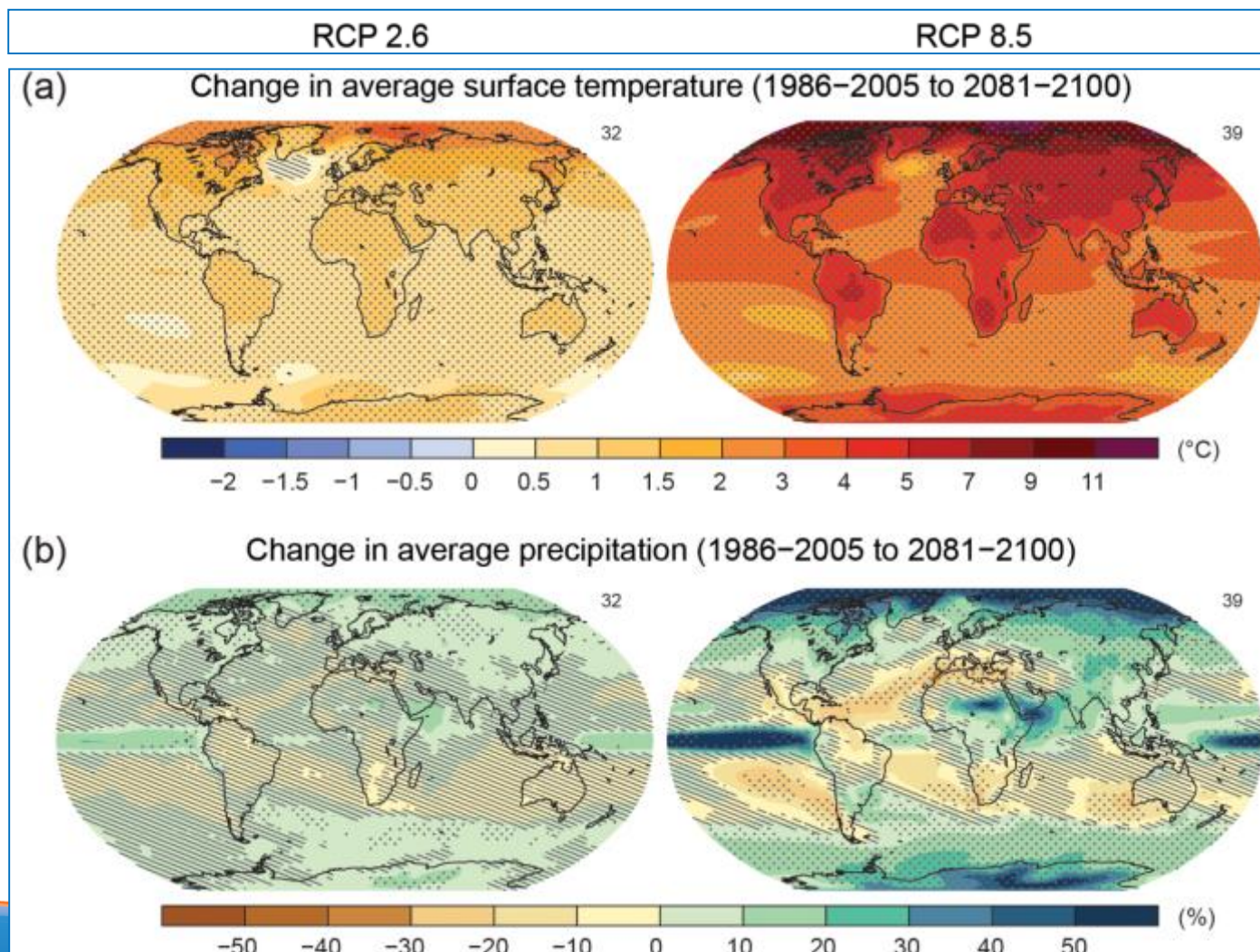
→ Increase, in a sustainable manner, productivity and income growth in agriculture.



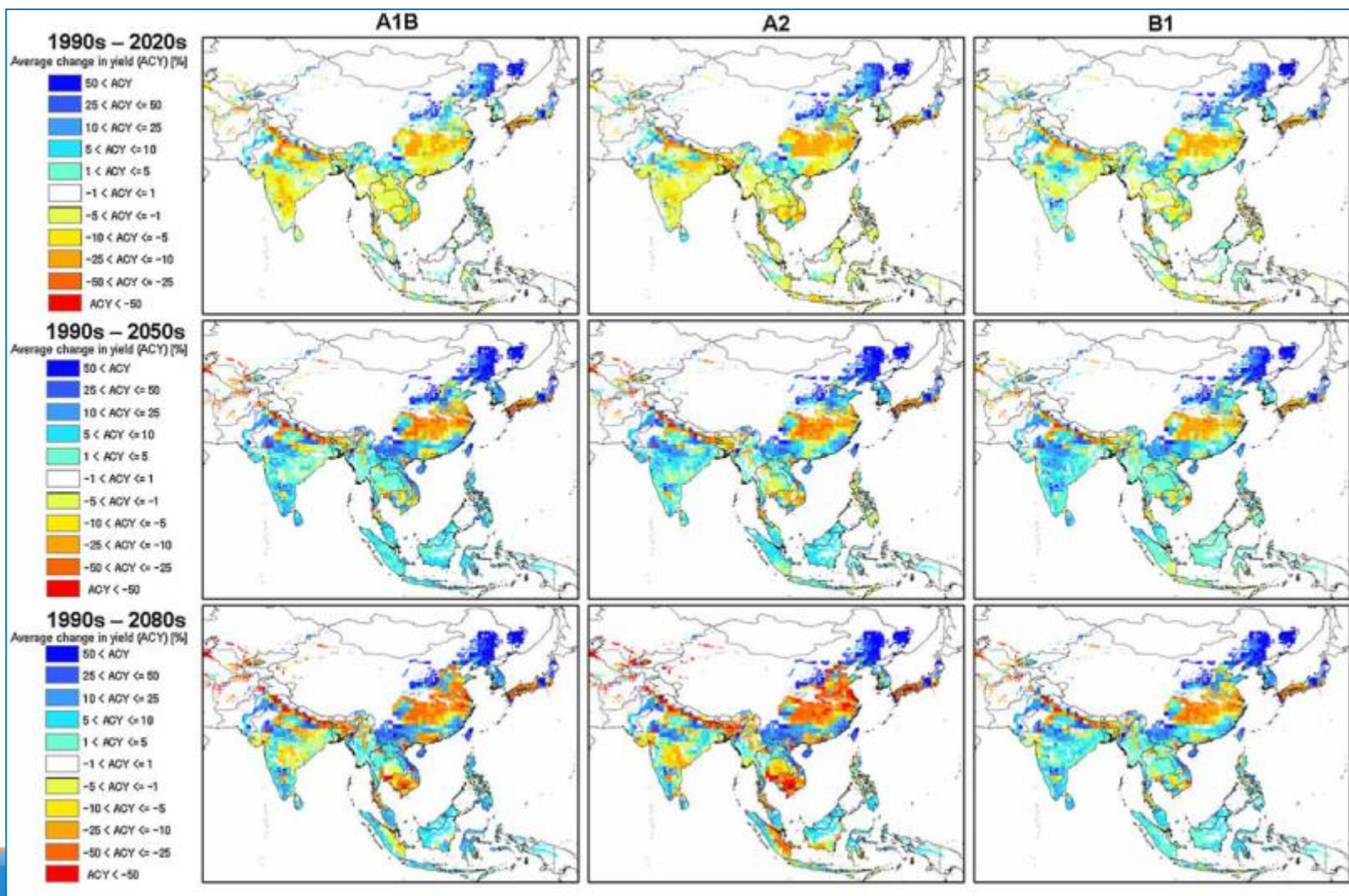
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Temperature and precipitation projections: Global



Average change in rice yield in Asia



Predicted changes as a result of **climate change** (based on scenarios):

Changes in the nature and the geographic distribution of environmental conditions, e.g.:

- Air temperature
- Rainfall amounts and distribution
- Extreme weather events (droughts, storms)
- River flows
- Sea levels
- Ocean temperature and acidity



Affecting:

- Growing conditions of crops, livestock, fish, trees
- Ecosystems services
- Livelihood of people, often the poorest



→ Support adaptation across the agricultural sectors to expected climatic changes and build resilience.



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Agroforestry: Honduras



- **Quesungual System:** combination of technologies, management of soil, water, nutrients, vegetation.
- **Based on three types of soil cover:** management of stubble crops, shrubs and scattered trees with natural regeneration.



Diversification: Nepal



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Principles - Conservation Agriculture (FAO)



- Continuous minimum mechanical soil disturbance
- Permanent soil cover (crop or mulch)
- Diversification of crop species in sequence/association



Soil health: Australia



No tillage vs. Tillage



As well as a broader range of interventions to support resilience



Bangladesh

Early Warning systems



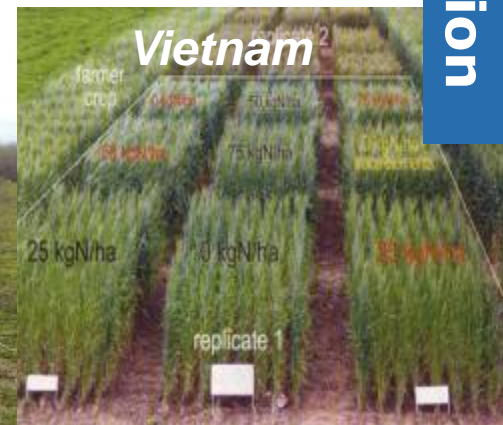
Bolivia

Financial services for climate risk management



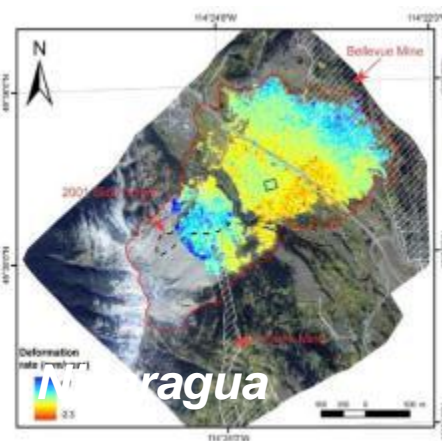
Lesotho

Access to better weather information



Vietnam

Drought/salt/flood - tolerant crop options



Nicaragua

Better risk analysis & preparedness



Nigeria

More robust/flexible infrastructure



Rwanda

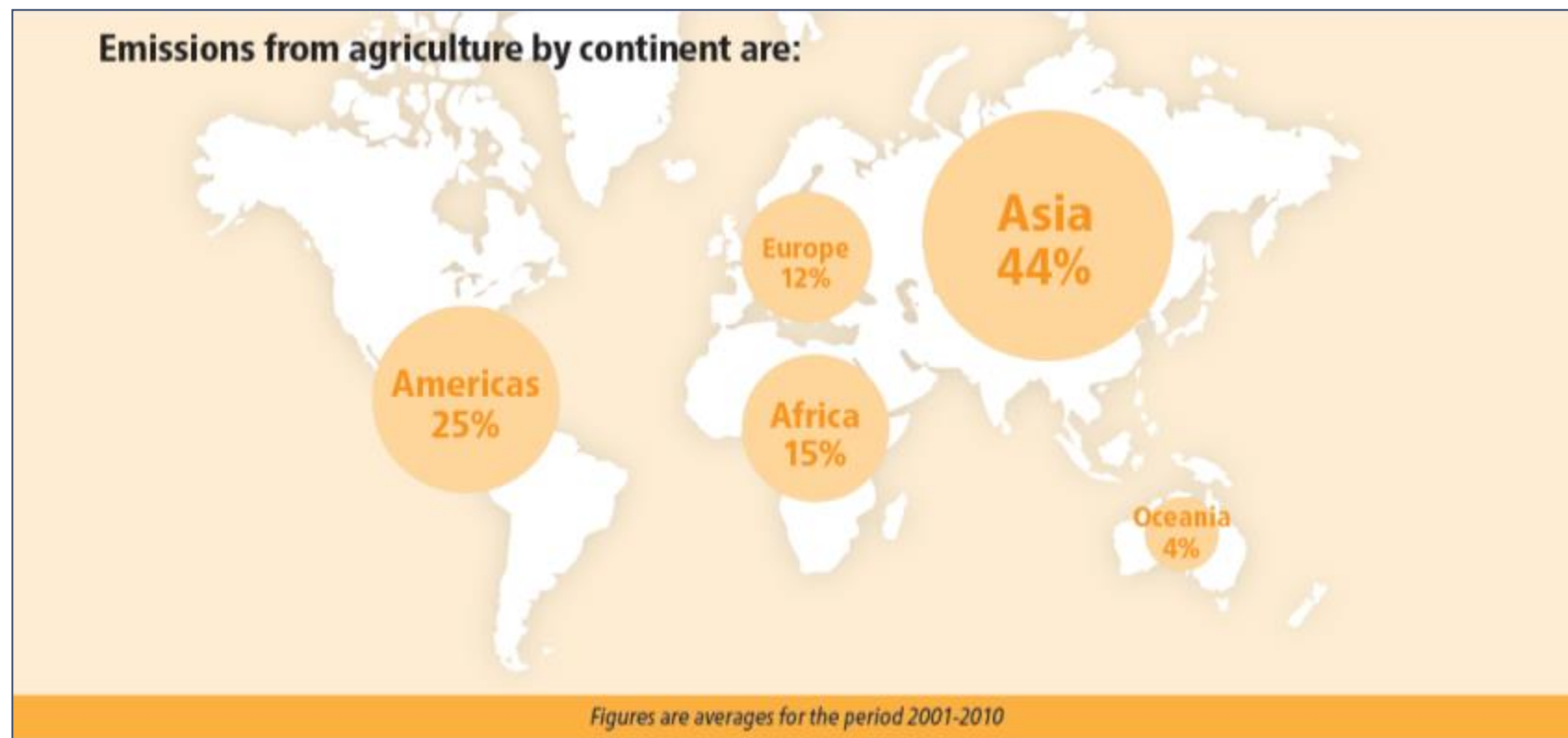
Better post-harvest protection



Djibouti

Green technologies for heating, cooling, pumping

Greenhouse Gas Emissions from Agriculture, Forestry and Other Land Use





The largest emitters in agriculture are:



Figures are averages for the period 2001-2010

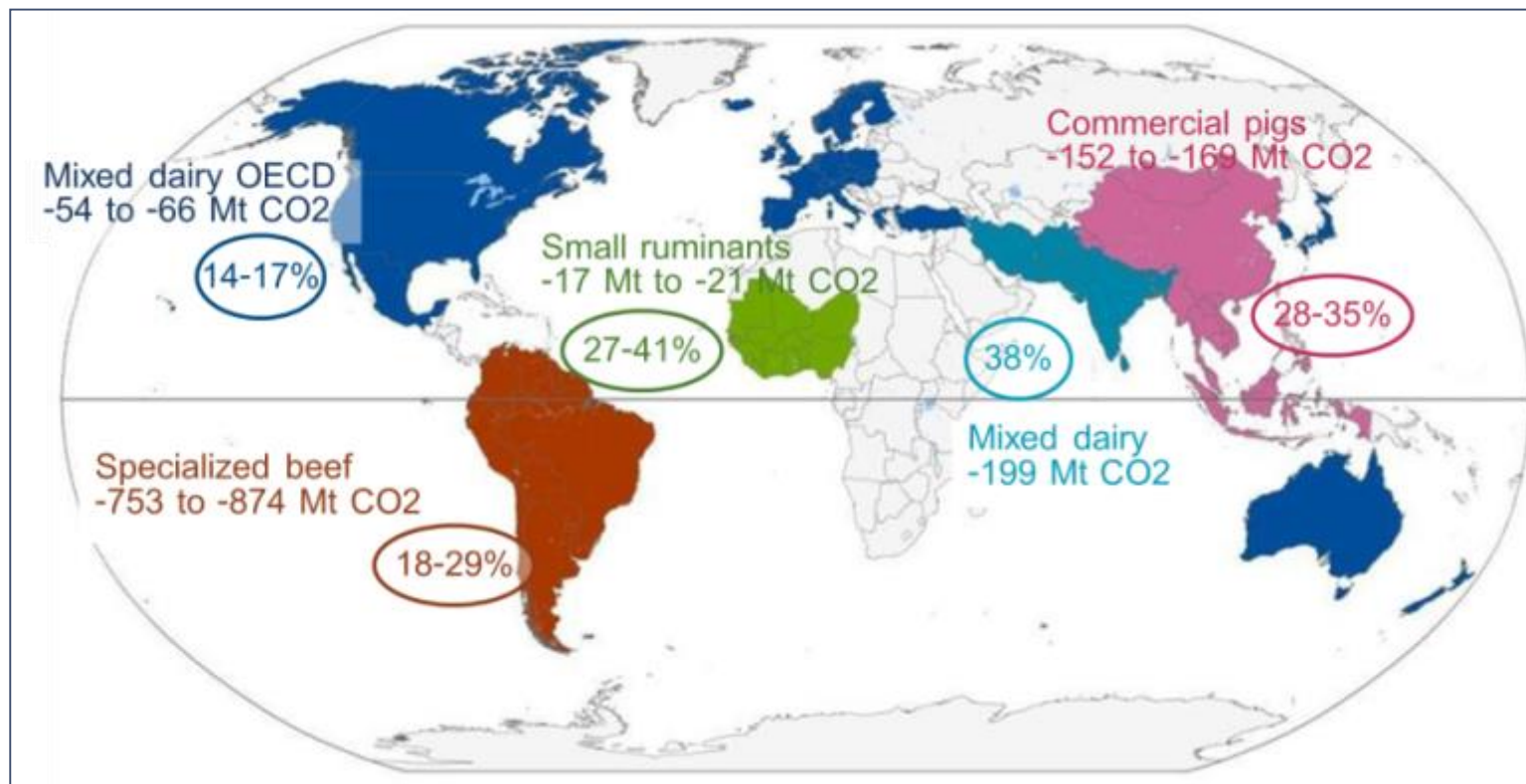
Livestock-related emissions from enteric fermentation and manure contributed nearly two-thirds of the total.



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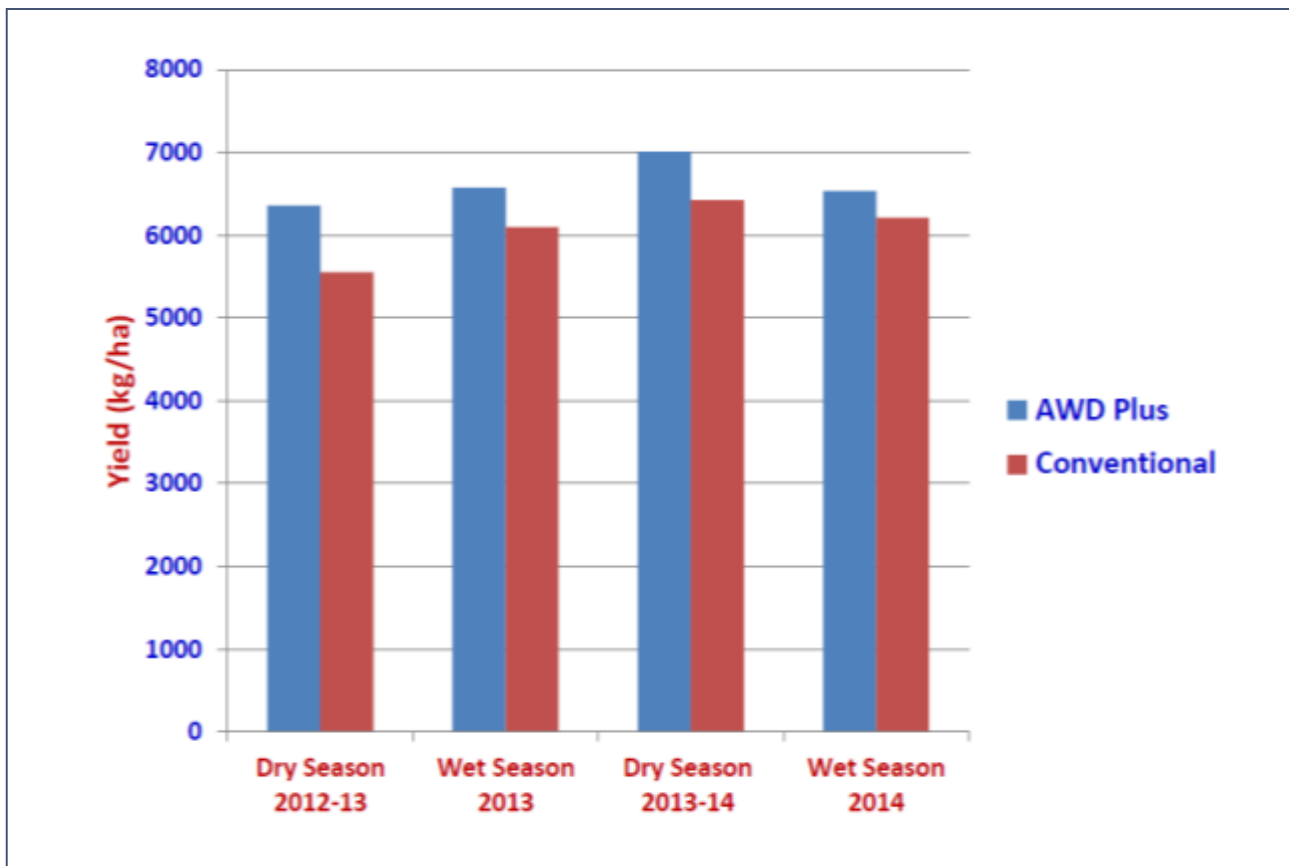
Sustainable Livestock



- Production increases by 7-40% in all case studies, except OECD.
- Overwhelming effects of feed, health and energy generation/efficiency.

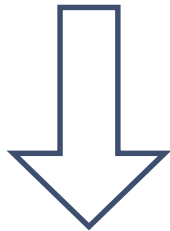


Alternate Wetting and Drying of paddy rice: Hoa Tien Cooperative, Vietnam

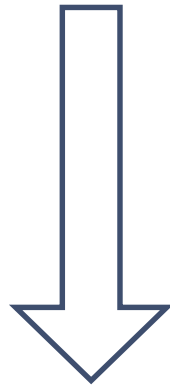


→ Reduce, where possible, the greenhouse gas emission intensity of production systems

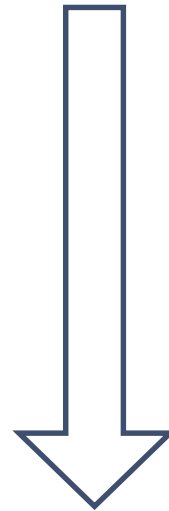
Key elements:



Resource Use Efficiency



Improved management



Combining reduction of emission intensity with productivity increase



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Climate-smart agriculture (CSA) as defined by FAO:

An approach to help guide actions to **transform** and re-orient agricultural systems to effectively and sustainably support **food security** under the new realities of **climate change**.

Three pillars:

1. Increase, in a **sustainable** manner, **productivity** and income growth in agriculture.
2. Support **adaptation** across the agricultural sectors to expected climatic changes and build **resilience**.
3. Reduce, **where possible**, the greenhouse gas **emission intensity** of production systems.



Areas of work of FAO towards integrating climate change in strategies, policies and practices for agriculture

- A. Including the agricultural sectors and the CSA approach in mid to long-term **development planning processes** and investments (NAPs, NAIPs)
- B. Creating the required **policy, financial and enabling environment** to provide the knowledge, support and access to required resources and services. Requires the preparation of the evidence base.
- C. **Technical support and capacity development** of key institutions and organizations to provide the essential support for the sustained implementation and uptake of locally appropriate CSA systems.
- D. Identification and assessment of technological, management and policy options for CC adaptation and mitigation: **Tools, Methods, Data**, etc.
- E. Preparation of, and readiness for, **UNFCCC** related planning, implementation, reporting and financing mechanisms: NAPs, REDD+, BURs, INDCs, NAMAs.



*"Preparation of, and readiness for, **UNFCCC** related planning, implementation, reporting and financing mechanisms: NAPs, REDD+, BURs, INDCs, NAMAs."*

UNFCCC related mechanisms

- Intended Nationally Determined Contributions (INDCs) submitted before COP21; assessing the role of agriculture in the realization of these contributions, in particular through NAPs and NAMAs
- Ensuring that agriculture is included in the National Adaptation Plan (NAP) process
- Identification of suitable "Nationally Appropriate Mitigation Actions" (NAMAs)
- Exploring the Green Climate Fund as financing source for the implementation of NAMA's



“Identification and assessment of technological, management and policy options for CC adaptation and mitigation”.

Research and Extension have a key role to play here, including:

- Develop crop varieties that are more drought, salt or temperature resistant and more productive
- Identify land management options and crop production systems that are more resource use efficient, incl. fertilizer use efficiency, more productive and more sustainable.
- Identify livestock management options that can increase productivity and incomes and result in less GHG emissions
- Paddy rice management options that can reduce methane emissions and increase fertilizer efficiency while improving productivity



Thank you!

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