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Synergies Between Mitigation and Adaptation to Climate Change:
What is the potential for Sub-Saharan Africa?

Claudia Ringler

Copenhagen, COP 15

December 11, 2009

ILRI

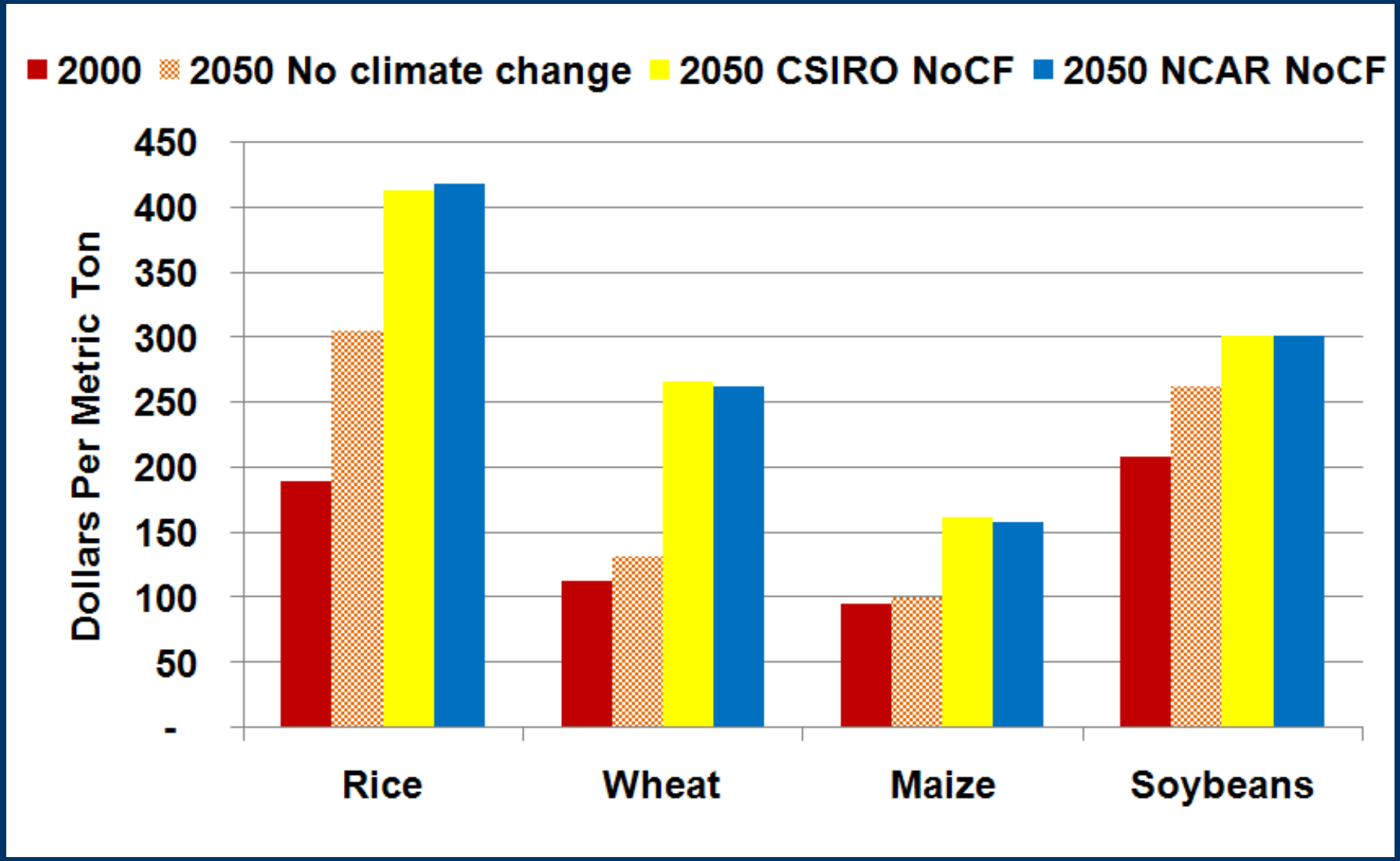
The University of Georgia

Outline

1. Climate Change Compromises Food Security
2. Role of Agriculture in GHG Emissions
3. Synergies between Adaptation and Mitigation
4. Recommendations

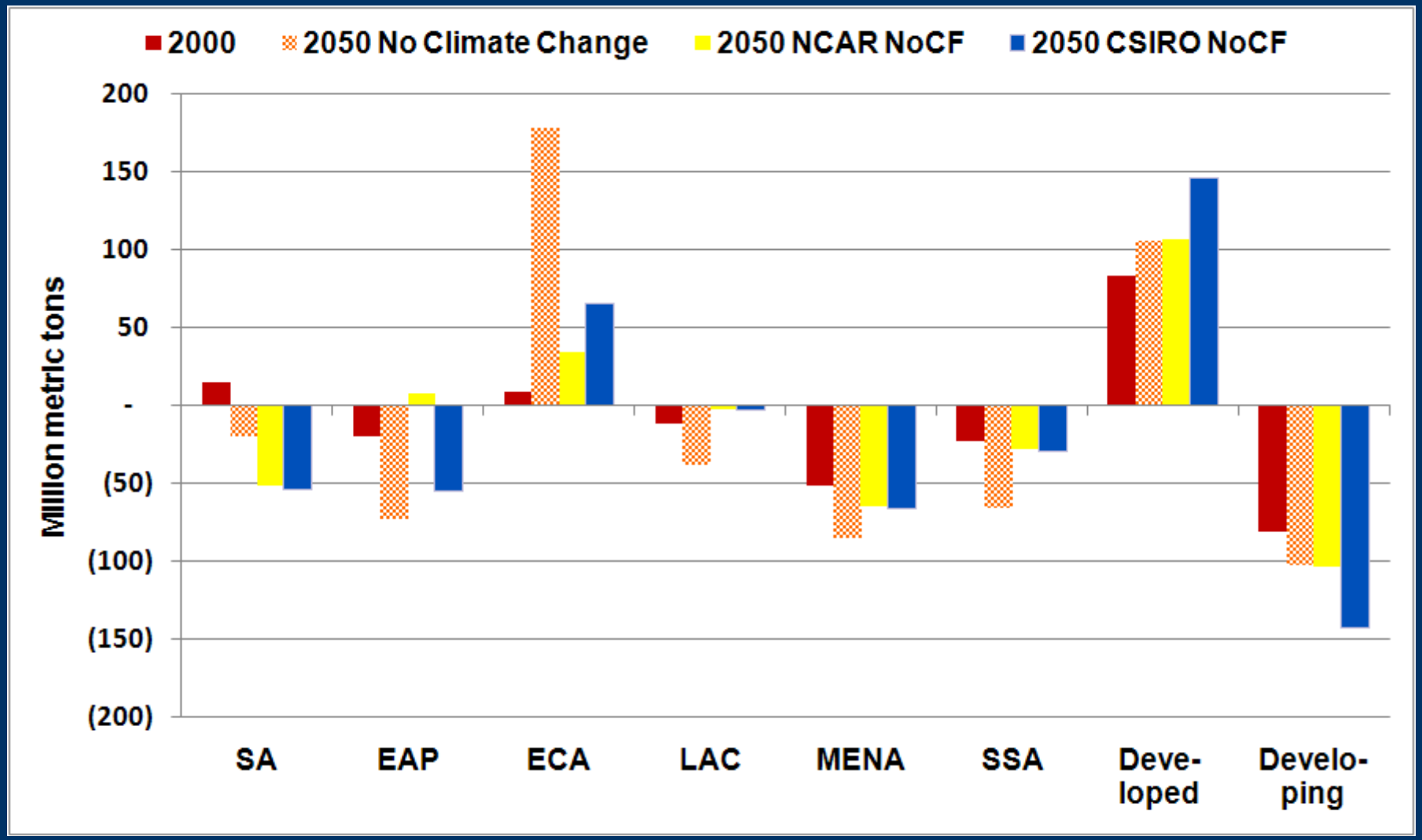

Climate Change
Compromises Food Security

CC Pushes Food Prices Upwards



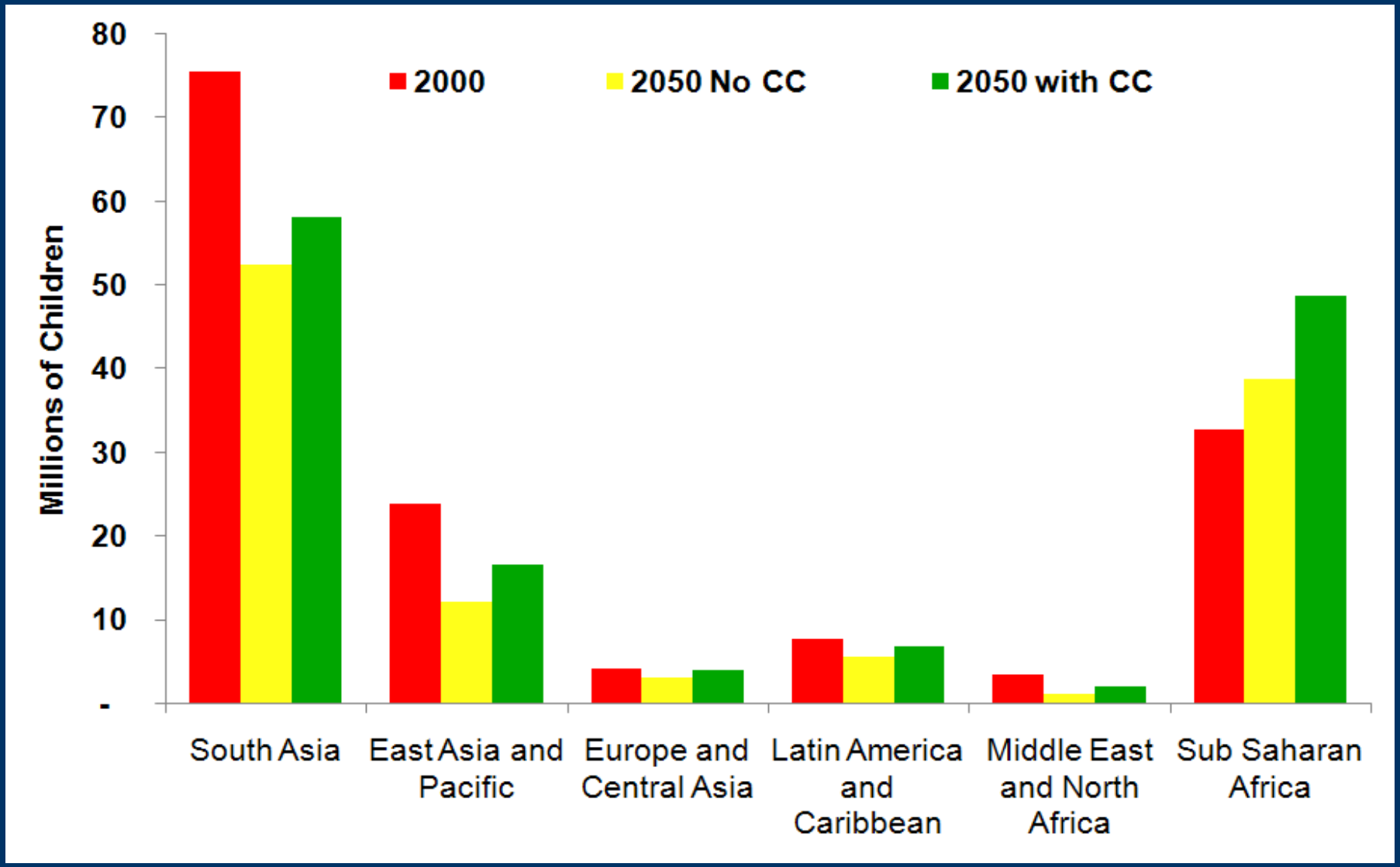
Source: IFPRI (2009)

CC Increases Food Import Needs for Developing Countries



Source: IFPRI (2009)

CC Increases Child Malnutrition



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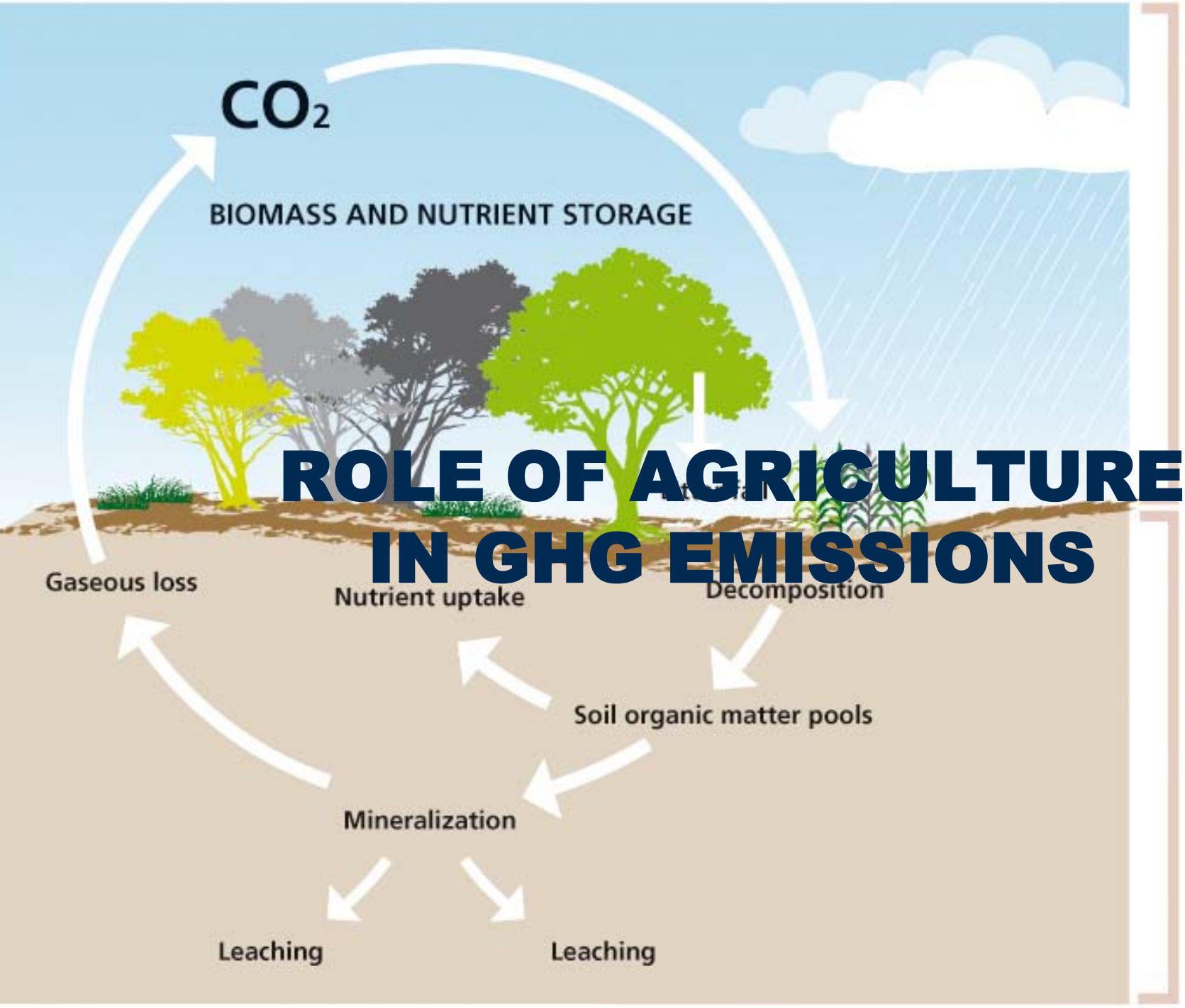
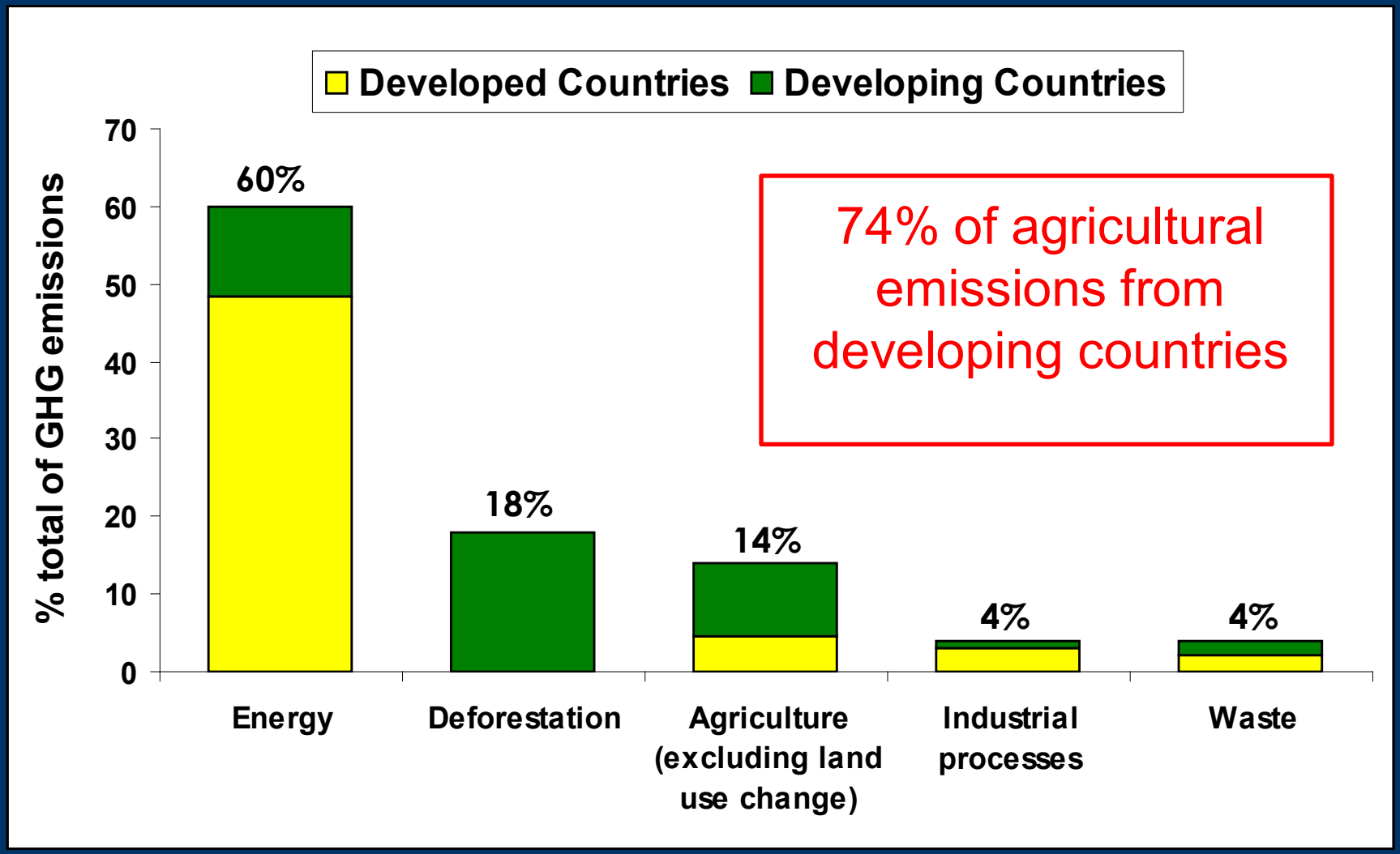


ROLE OF AGRICULTURE IN GHG EMISSIONS

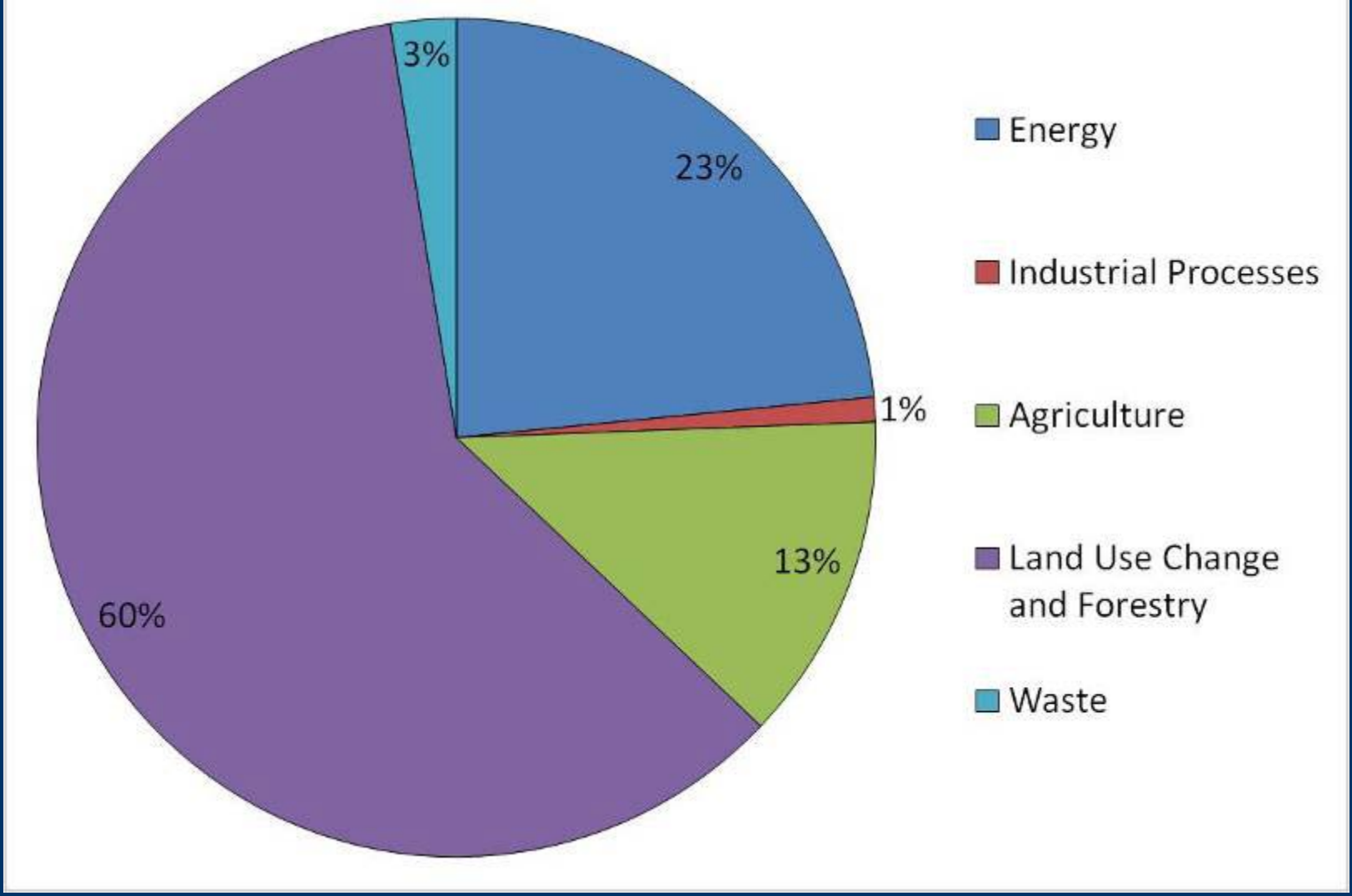
Share of Emissions

Share of global total GHG emissions by source



Sources: World Resources Institute (2007); World Development Report (2008)

Share of Emissions
by Sector in Sub-Saharan Africa



Source: CAIT (2008), World Resources Institute

Potential for Mitigation through Agriculture

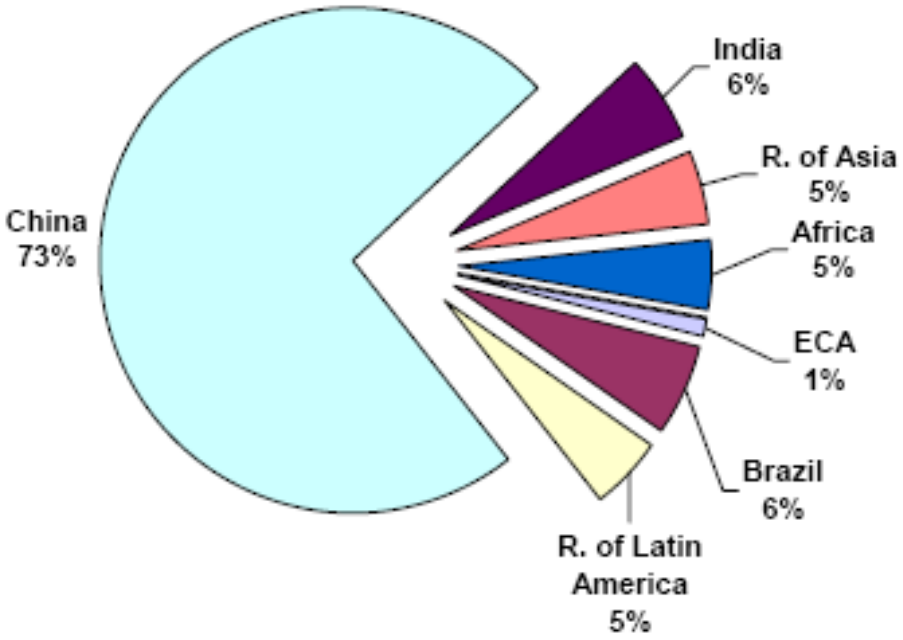
- GHG emissions from agriculture are expected to increase because
  - food production will have to grow by 190% bw 2000-2050 to meet rising demand
  - food preferences are shifting towards commodities that contribute to greater GHG emissions
- By 2030, the *technical potential* of mitigation through agriculture is expected to be 5,500-6,000 $MtCO_2e$
- By 2030, the *economic potential* of mitigation through agriculture is expected to be 1,500-4,300 $MtCO_2e$ (at carbon prices of US$100 per tCO_2e)

Potential for Mitigation through Agriculture in Africa (17% of the global total)

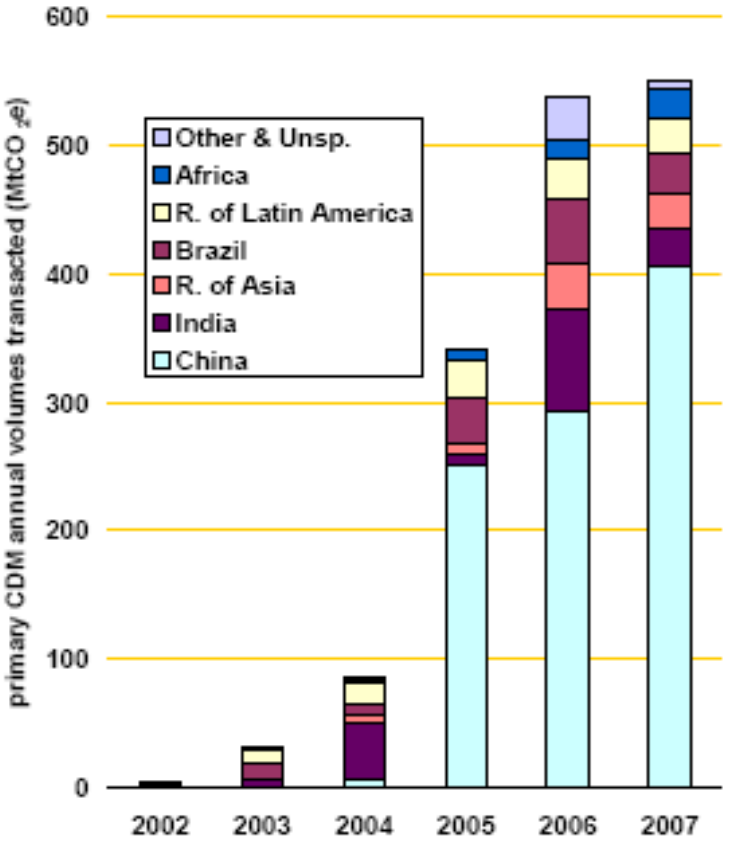
	Economic Mitigation Potential by 2030 at 0-20$/ton CO2eq (MtCO2e/yr)					
	Cropland mgt.	Grazing land mgt.	Rest. organic soils	Rest. degraded land	Other practices	Total
East Africa	28	27	25	13	15	109
Central Africa	13	12	11	6	7	49
North Africa	6	6	6	3	3	25
South Africa	6	5	5	3	3	22
West Africa	16	15	14	7	8	60
Total	69 (26%)	65 (25%)	61 (23%)	33 (12%)	37 (14%)	265

Source: Smith et al. (2008)

Africa's Share in Carbon Markets is TINY



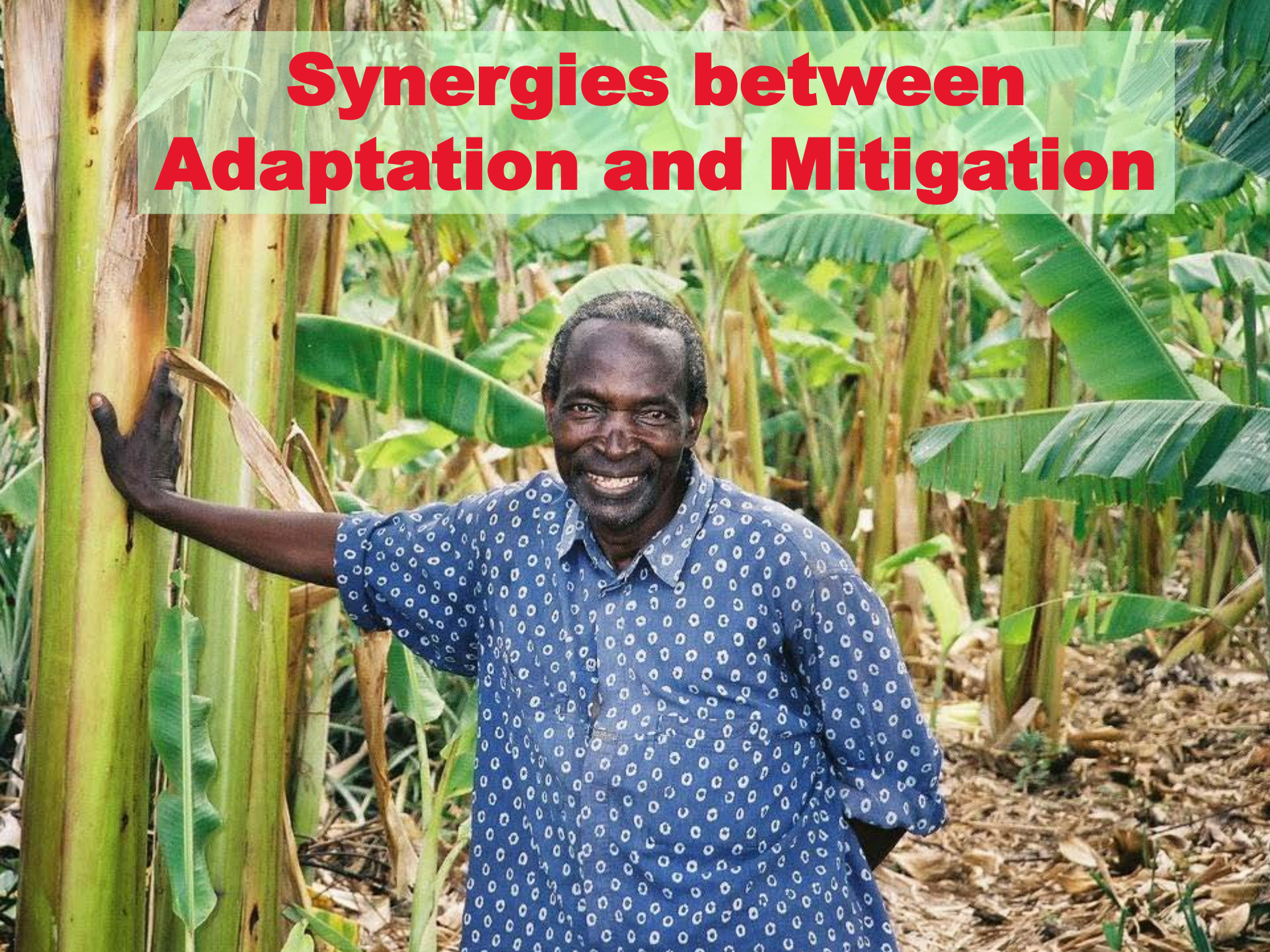
2007
(As a share of volumes supplied)[45]



2002-2007

Source: Capoor and Ambrosi (2008)

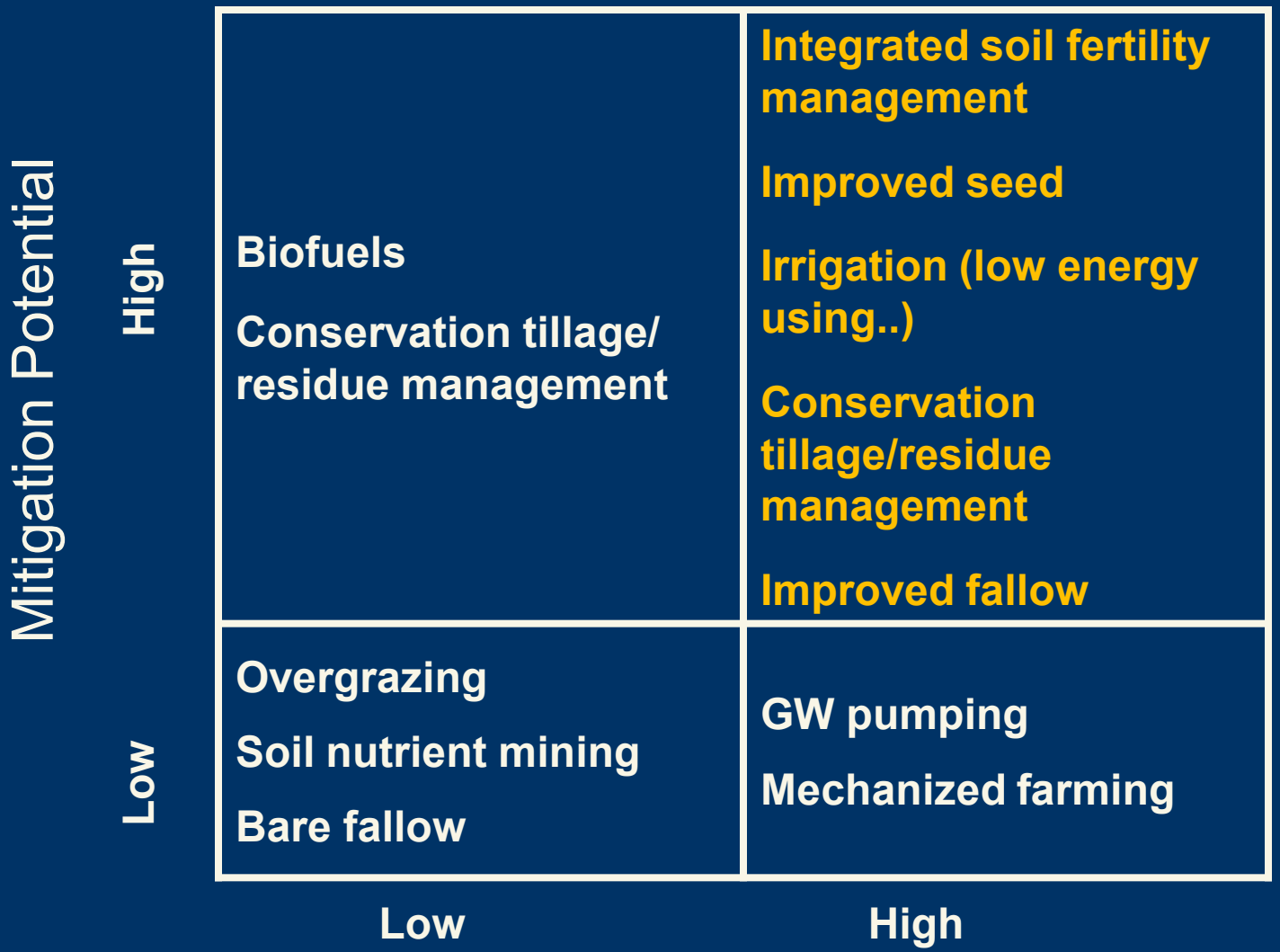
Synergies between Adaptation and Mitigation



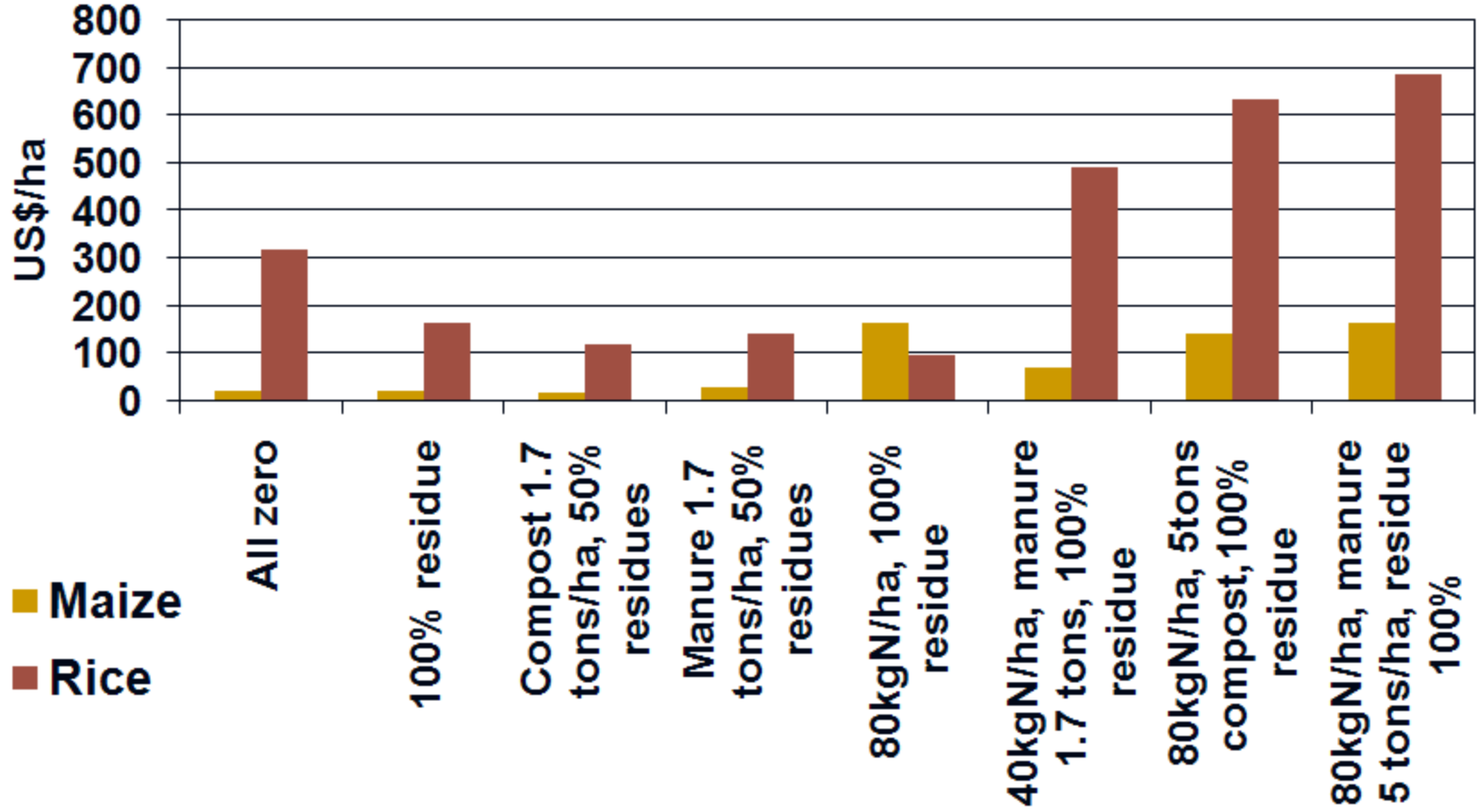
Synergies between Adaptation, Mitigation and Profitability

- *Agronomic Practices*: Improved crop varieties, cover crops, green manure, crop rotations, and intercropping, reduced tillage
- *Nutrient Management*: Mulching, improved fallowing, manure management, composting, and improved fertilizer use efficiency
- *Residue Management*
- *Water Management* (e.g. terracing and water harvesting)
- *Agroforestry*
- *Restoration and Rehabilitation of Degraded Land*
- *Livestock and Rangeland Management*

Synergies and Tradeoffs between Mitigation and Food Security

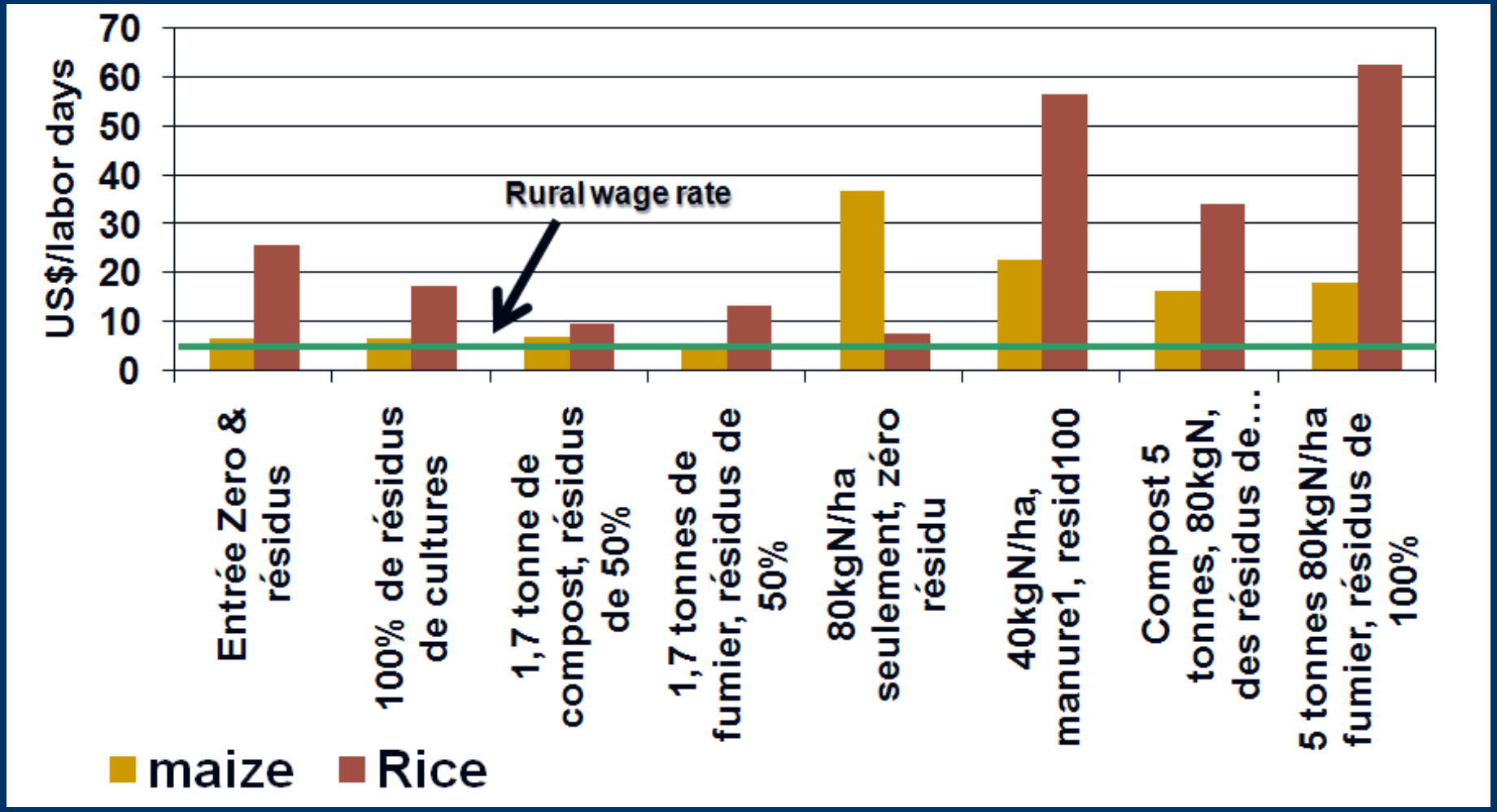


Profits are Higher for Mitigation Practices: ex. Mali



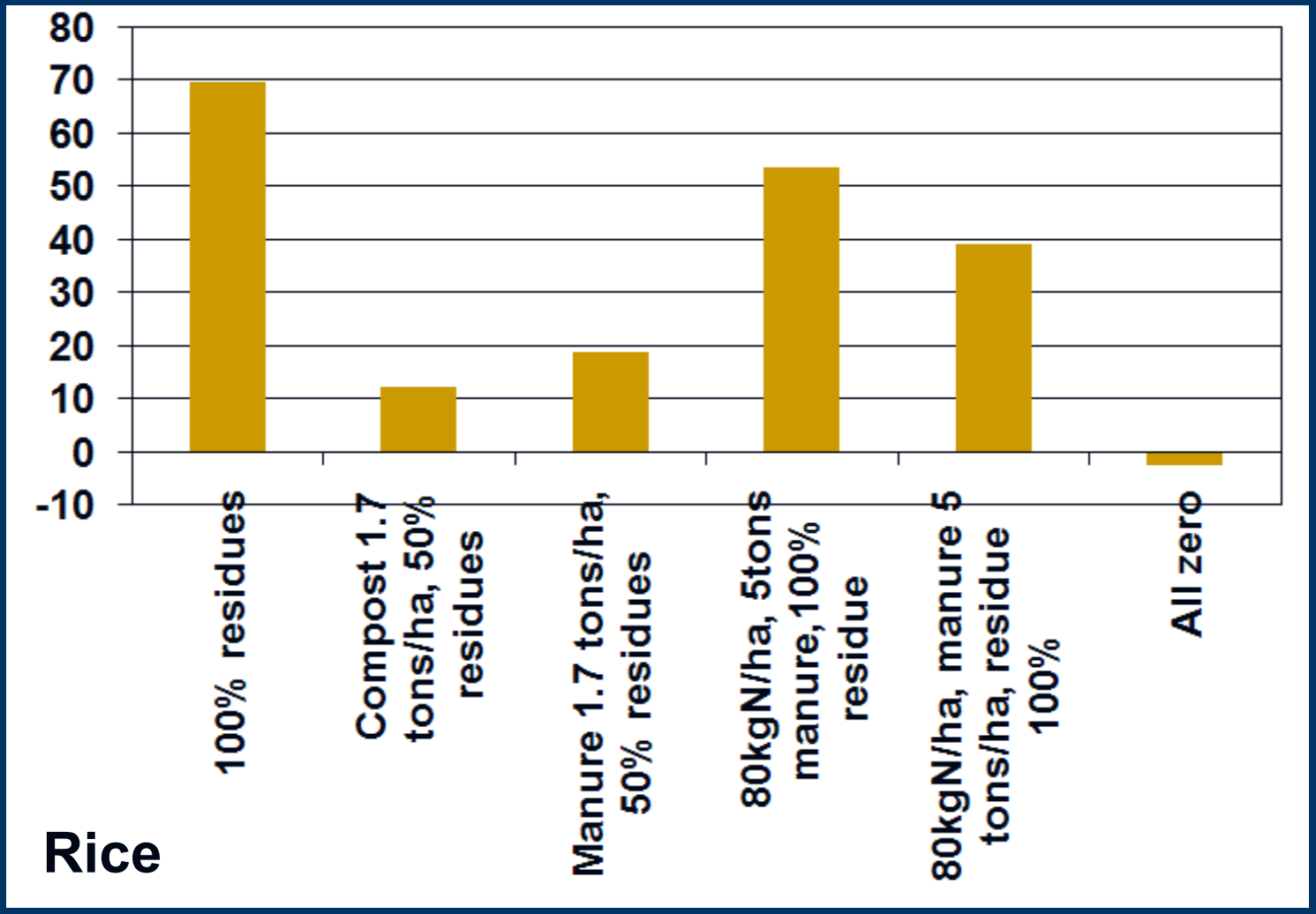
Source: Nkonya et al. (2009)

Returns to Labor are Higher for Mitigation Practices: ex. Mali



Source: Nkonya et al. (2009)

Mitigating Practices Support Long-term Crop Yield Sustainability: ex. Mali



Source: Nkonya et al. (2009)

(yields of last 10 years minus yields of first 10 years, 30-year simulation period)

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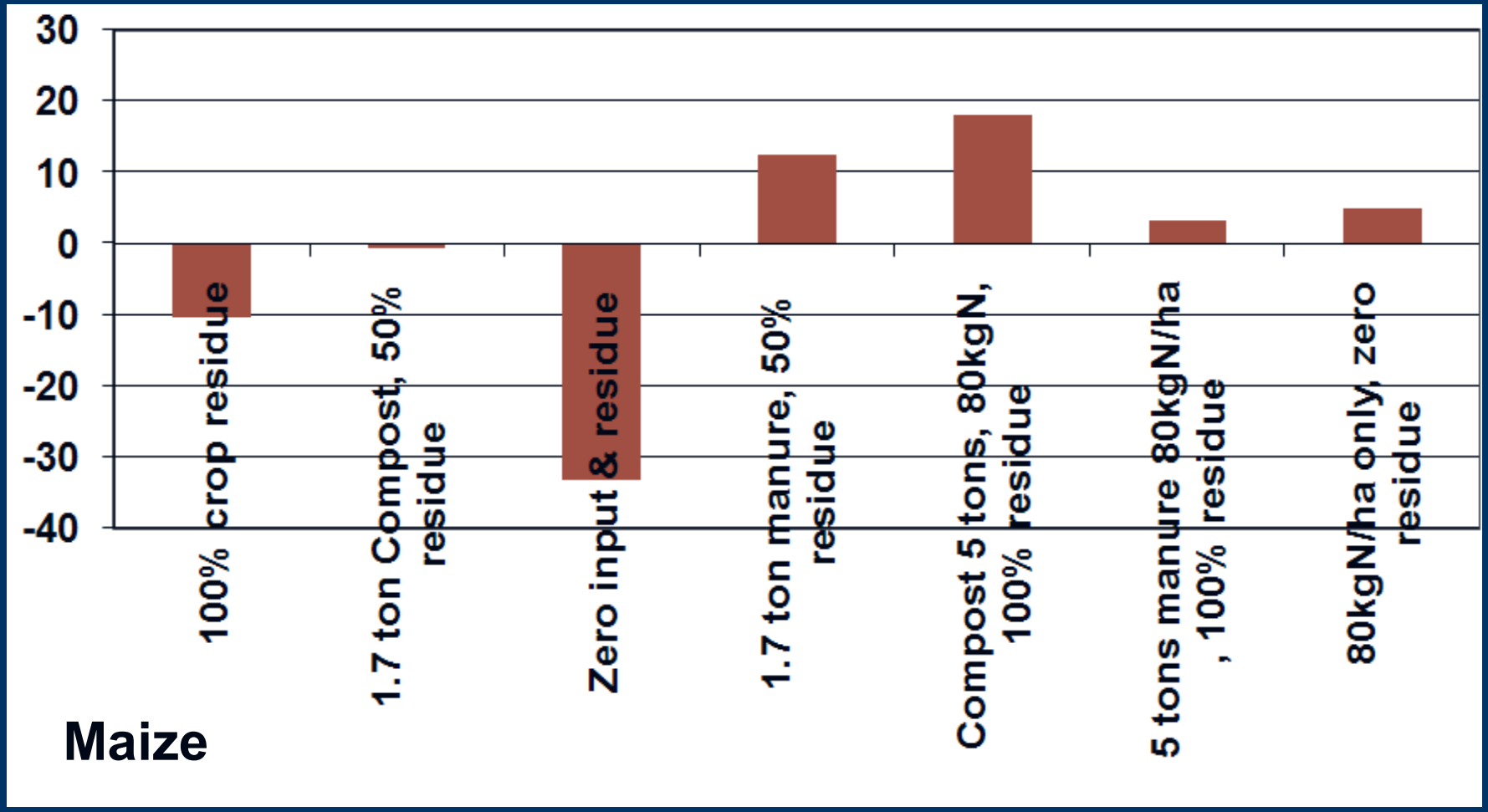

Source: Nkonya et al. (2009)

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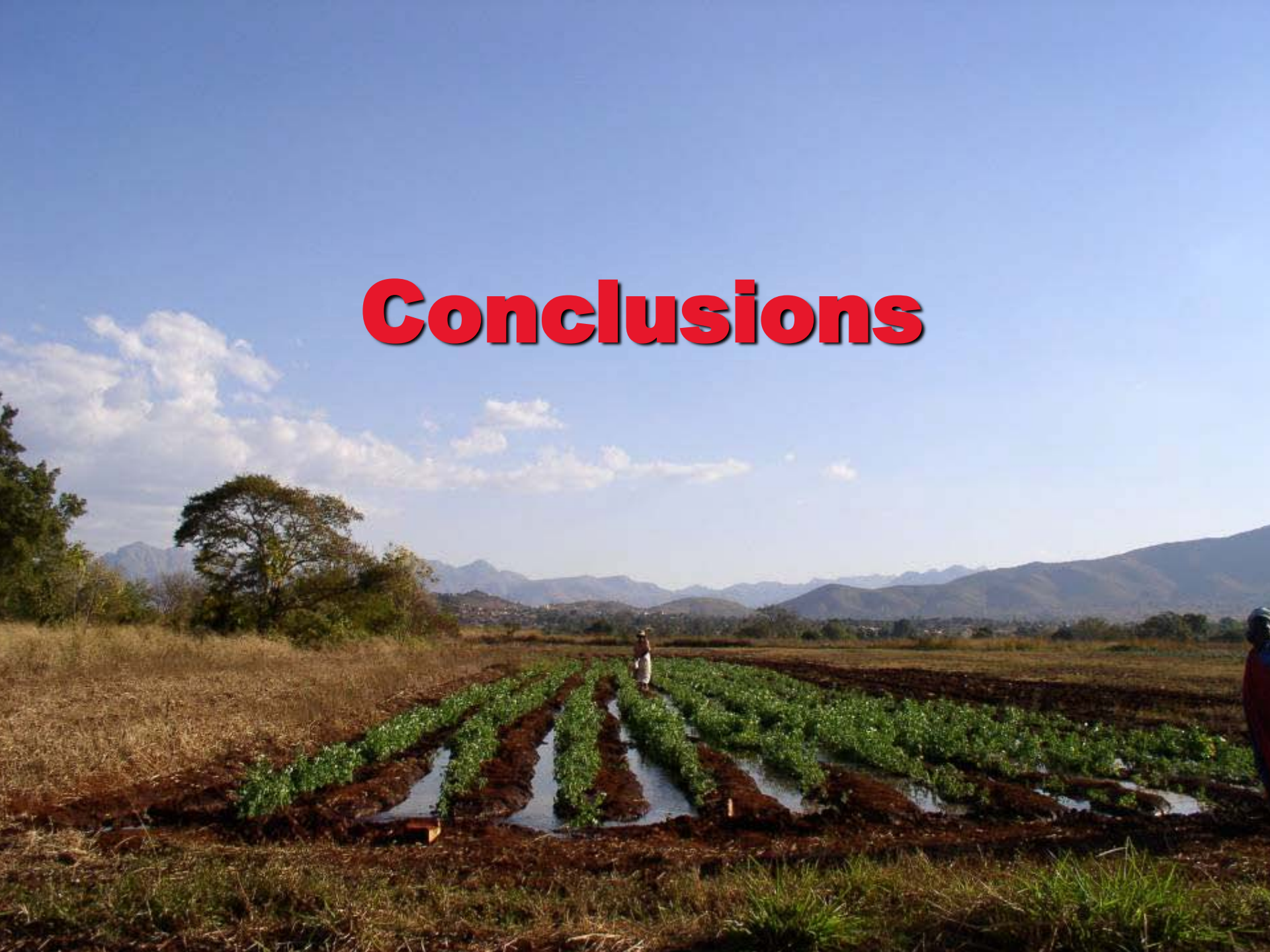
Conclusions



Potential for Agricultural Mitigation in SSA is Large

- Agriculture can contribute to mitigation because:
  - It is cost competitive with mitigation options in other sectors
  - Potential is considerable: 17% of global total agricultural mitigation potential
- Agricultural mitigation could provide US$5.3 billion (@ US$20/ton carbon) to smallholders in SSA (3-4 times the annual aid flows to agriculture)

Many Obstacles Prevent the Fulfillment of this Potential

- But… agriculture is currently excluded from formal carbon markets
- And.. even if agriculture is included, SSA faces huge challenges due to :
  - high transaction costs
  - Insecure and complex property rights
  - substantial need for capacity building

Synergies between Adaptation and Mitigation are Large

- Agriculture can mitigate emissions through **adoption** of agricultural technologies and management practices that can also help farmers adapt to climate change
- Many synergies have been identified between agricultural adaptation, mitigation and income generation for SSA farmers
- To maximize synergies and reduce tradeoffs, mitigation and adaptation strategies should be **closely integrated**

The Way Forward

- Continue to fund pilot studies on smallholder agricultural mitigation, started by WB Biocarbon Fund and IFAD
- Encourage the inclusion of agriculture (and forestry) in the post-Kyoto Agreement with simple standards for measuring GHG offsets
- Target voluntary markets that include agriculture
- Invest in capacity building and development of institutional frameworks for project implementation and verification