



International Centre for Trade  
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## Climate Change, Agriculture and Trade: Promoting Political Coherence

# The Treatment of Agriculture in a New Climate Change Regime

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**Daniel L. Martino**

[daniel.martino@carbosur.com.uy](mailto:daniel.martino@carbosur.com.uy)

# IPCC findings: climate change has negative impacts on agriculture and food security

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- **Warming will decrease yields** in seasonally dry and tropical regions. Positive effects in temperate regions
- The number of **people at risk of hunger** tends to decrease with development. Climate change will attenuate this decrease, and cause localized increases (e.g., sub-Saharan region)
- **Adaptation measures exist** (change in practices, relocation). Beyond 3°C warming, adaptation not possible in low latitudes
- **Small landholders/subsistence farmers** will suffer localized impacts (climate variability, snow-pack decrease, disease,...)
- **Food trade expected to increase**, with most developing countries becoming more dependent on food imports conditions.

# Agriculture may have a significant role in mitigation of climate change

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- **GHG emissions from agriculture:** ~30% of total and increasing due to population growth and increased wealth
- The **economic potential for mitigation** has been estimated by IPCC at **2.7 billion t CO<sub>2</sub>/year** at a carbon price (i.e., the cost of emission to atmosphere) of **US\$ 50/tCO<sub>2</sub>**.
  - This is ~14% of total mitigation potential, and if avoided deforestation is considered, it would be equivalent to 20% of the potential
  - **C sequestration in soils** represents 90% of the potential, and about 2/3 is located in developing countries
  - US\$ 50/tCO<sub>2</sub> is equivalent to US\$ 25/oil barrel
  - Indirect mitigation through provision of biomass feedstock for energy has only marginal mitigation potential

# Mitigation measures would help in adaptation and food security

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- **C sequestration in soils and avoided deforestation** represent more than 90% of the potential, mostly located in developing countries
  - Increased soil carbon improves water use efficiency, soil fertility, productivity and resilience against climatic variability; and also helps reducing soil erosion and degradation
  - Implementing measures leading to soil C sequestration and avoided deforestation face several **challenges** related with the need for large scale, MRV, determination of baselines and treatment of non-permanence.
- Some less important mitigation measures (e.g., biofuels) may negatively affect adaptation, food security and sustainable development. However, there are some opportunities for synergies

# C sequestration: a mitigation potential largely missed by the Kyoto Protocol

	Emission Reductions (GtCO <sub>2</sub> -eq/yr)	
Mitigation Practice	Economic Potential	Kyoto Mechanisms
<b>C sequestration in agricultural lands</b>	<b>4.0</b> (2.8/1.2)	~ <b>0</b> (three AI Parties)
<b>Afforestation / Reforestation / Agroforestry</b>	<b>0.8</b> (0.6/0.2)	<b>n/e</b> (nil in NAI Parties)
<b>Reduced emissions from deforestation</b>	<b>0.8</b> (0.7/0.1)	<b>n/e</b> (nil in NAI Parties)
<b>Forest management</b>	<b>1.3</b> (0.7/0.6)	<b>0.2</b> (20 AI Parties)
<b>Total</b>	<b>6.9</b> (4.8/2.1)	<b>&lt;0.5</b>

Annex I countries: net sink of **1.2 Gt CO<sub>2</sub>** in 2004

# Focusing on C intensity of production rather than on absolute emissions is vital for food security

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- Mitigation measures should not lead to decreased production of food and fiber
- **Imposing caps on agriculture emissions may jeopardize food security.** Substitution of high-C intensity systems of production by systems leading to reduced emissions per unit product may be an effective way of achieving mitigation without colliding with food security and sustainable development
  - There is a wide variation in the amount of GHG emitted per unit of a product (e.g., **from 10 to >1,000 kg CO<sub>2</sub>/kg beef**)
  - Considering the substitution of production systems would enhance the role of agriculture in mitigation over IPCC estimates
  - Measures focusing on C intensity face several challenges including the determination of international baselines

# Mitigation measures would help in adaptation and food security

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# The way forward

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- Innovation and dissemination of new technologies in agriculture is important for mitigation and adaptation.
  - Resources for research and capacity building are needed in developing countries
  - Existing tools and knowledge can already be employed
- Focus on intensity rather than on absolute emissions. Carbon price signals must reach farmers in developing countries
- An open and equitable trade system for agricultural products is vital for food security and can contribute to both mitigation and adaptation
- The relevance of agriculture has been recognized in the Bali Action Plan. However, most of the action would come in a work programme post-Copenhagen