Agricultural Mitigation of GHGs among Smallholder Farmers in Developing Countries

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Poverty and inequity
20% in industrialized world
80% in poverty

Demand for food: 60-70% increase in production to feed 9 billion people

Climate
550/450/350?
Adaptation
Who pays?

Agriculture is primary livelihood for 1/3 of current workforce

2050
Policy momentum starting...

Support for agriculture after IPCC 4th Assessment Report and April 2009 (esp. Mexico and Uruguay)
Baseline emissions: Agriculture

Developing Regions

1990-2005: +32%

Agriculture Emissions 2005

Main drivers for trends

- Increase in GHGs: population pressure, income increase, diet changes, technological changes
- Decrease in GHGs: increased land productivity, conservation tillage, non-climate policies
74% of mitigation potential is in developing regions –

Agriculture contributes significant proportion of developing country emissions: Uruguay -80%, Mexico – 50% (AFOLU)
Challenges for an international agricultural policy

• Agriculture seen as messy (like REDD in 2005). Requires demonstration of feasibility, credibility and coalition building
• Adaptation, food security and trade are higher priority than mitigation
• G77 countries worried about US and Europe using agreement to reduce competition by restricting agricultural expansion.
• China and Brazil have strong vested interests in expansion
• REDD agreement is fragile, so negotiators reluctant to add an agricultural component. Yet most see agriculture as essential to success of REDD
Opportunities

• Technical experts and some negotiators agree that an AFOLU approach to mitigation needed
• Non-forest nations (esp. Africa) see agriculture as their “REDD”
• Mitigation as co-benefit of sustainable agricultural development programs
• AR5 will include all land use in a single analysis, which should help to integrate forestry and agriculture
Project-level initiatives

FAO April 2010 survey

• 50 agricultural mitigation projects: Africa (20), Asia (14), LAC (15), E. Europe (1)
• Brazil (4); Kenya, Nigeria and India (3 each).
• Generally small: Avg of 5,500 ha, excluding 2 largest projects of 5 million ha and 250k ha
• Phase: implementation (50%) planning (15%), feasibility (15%), only 2 have done payments
## Incentives

### Table 3. Benefits received by different recipients through the projects

<table>
<thead>
<tr>
<th>Who receives the benefits?</th>
<th>Payments</th>
<th>PES* biodiversity</th>
<th>PES* watershed: conservation</th>
<th>Recognition of land use rights</th>
<th>Non-timber forest products</th>
<th>Carbon rights</th>
<th>Increased agricultural productivity</th>
<th>Other</th>
<th>Total</th>
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</tbody>
</table>

*PES - Payments for ecosystem services
Project Level Issues

- Mixed crop-livestock-tree systems
- Measurement vs. practice-based payments
- Transaction costs: aggregation required across thousands of farms
- Raising expectations of farmers about carbon payment versus transparency
- Limited in-county capacity
2009 Initiative established with Earth Systems Science Program (ESSP) and 14 CGIAR centers

Dec 2010- Likely to become formal CGIAR climate change program (ca. $60mil/yr)
CCAFS Objectives

1. Identify and develop pro-poor adaptation and mitigation practices, technologies and policies for agriculture and food systems

2. Support the inclusion of agriculture in climate change policies, and of climate issues in agricultural policies, at all levels.
Climate Variability and Change

Current agricultural, NRM & food systems

Research with partners:
1. Managing climate risk
2. Adaptation
3. Mitigation

Improved Environmental Benefits

Improved Livelihoods

Improved Food Security

Trade-offs and synergies

Adapted agricultural, NRM & food systems
Initial CCAFS regions

2-4 further regions to be selected over next 2 years

West Africa, East Africa, Indo-Gangetic Plain
CCAFS Research Theme 3: Poverty alleviation through mitigation

Identify trade-offs and synergies among mitigation, food security and poverty alleviation, while ensuring ecosystem health.

Objectives

• Inform decision makers about **low C agricultural** development pathways and options for low carbon livelihoods.

• Test **on-farm mitigation** and landscape level implications

• Test **institutions and incentives** that enable smallholder farmers to participate effectively in carbon markets.
Examples of CCAFS Mitigation Research

• Regional and country-level baseline emissions from agriculture and how changes in farming practices would reduce them. (With Winrock and Applied Geosolution)

• Institutional best practices for smallholders to participate in C market (With Ecoagriculture, CARE Kenya)
• How intensification of cocoa systems in Ghana reduces pressure for forest conversion (with IITA, NSRC)
• Synthesis of trade-offs for food security and mitigation for livestock (ILRI)
Towards an international X-AGG?

• What can we learn about stakeholder involvement and coalitions?

• How can we build on technical reviews?

• How do food security, poverty alleviation and adaptation challenges change the process?
www.ccafs.cgiar.org

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Challenges (cont)

• Developing countries cannot negotiate without better data on their mitigation potential
• Lack of technical confidence in data
• Lack of cap-and-trade bills in the US and Australia has slowed progress
• CCX experience created scepticism.
• Few agriculture proponents/experts in UNFCCC
Initiatives (cont)

• German Marshall Fund – Technical guidance
• Meridian Report planned, UK DFID – Background papers
• Agriculture and Rural Development Day 2 by Global Donor Platform (COP16)
## Synergies and Trade-offs

|---|---|
| - Expand cropping on marginal lands  
- Expand energy-intensive irrigation  
- Expand energy-intensive mechanized systems | - Restore degraded land  
- Expand low energy-intensive irrigation  
- Change from bare to improved fallow  
- Agro-forestry options that increase food or incomes  
- Conservation tillage and residue mgmt, where limited trade-offs with livestock  
- Improved soil nutrient management |
| - Bare fallow  
- Continuous cropping without use of organic or inorganic fertilization  
- Slope ploughing  
- Over-grazing | - Reforestation/afforestation  
- Restore/maintain organic soils  
- Expanding bio-fuel production  
- Agro-forestry options that yield limited food or income benefits  
- Conservation tillage and residue mgmt, where limited trade-offs with livestock |