BioCarbon Fund in Agriculture

Rama Chandra Reddy
Carbon Finance Unit
The World Bank, Washington DC

Workshop on Climate Change Mitigation in Agriculture in Latin America and the Caribbean: Investments and Actions

Food and Agricultural Organization

Rome, Italy, April 19-20, 2010

World Bank Carbon Funds & Facilities

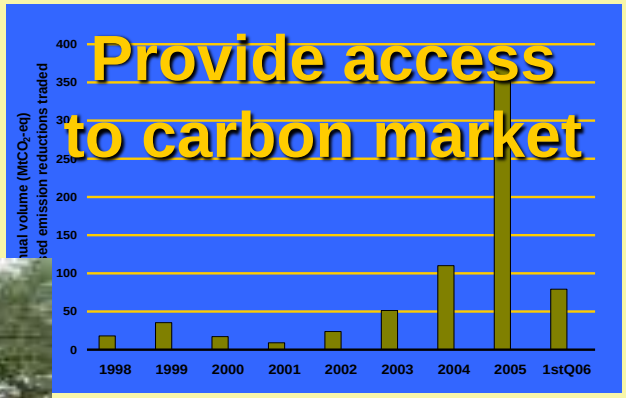
Funds pledged = US$ 2.3 billion (22 governments, 66 firms)

- **Prototype Carbon Fund**. $180 million (closed). Multi-shareholder. Multi-purpose.
- **Netherlands Clean Development Mechanism Facility** -*$ N.A.*- (closed). Netherlands Ministry of Environment. CDM energy, infrastructure and industry projects.
- **Community Development Carbon Fund**. $128.6 million (closed). Multi-shareholder. Small-scale CDM energy projects.
- **BioCarbon Fund**. $89.9 million (Tranche One closed totaling $53.8 million). Multi-shareholder. CDM and JI LULUCF projects.
- **Italian Carbon Fund**. $155.6 million (closed). Multi-shareholder (from Italy only). Multipurpose.
- **Netherlands European Carbon Facility**- *$ N.A.*- (closed). Netherlands Ministry of Economic affairs. JI projects.
- **Spanish Carbon Fund**. $308 million (closed). Multi-shareholder (from Spain only). Multipurpose.
- **Danish Carbon Fund**. $81.2 million (closed). Multi-shareholder (from Denmark only). Multipurpose.
- **Umbrella Carbon Facility**. $737.6 million (Tranche One closed). 2 HFC-23 projects in China.
- **Carbon Fund for Europe**. $70 million. Multi-shareholder. Multi-purpose.
- **Forest Carbon Partnership Facility**. $300 million target. Multi-participants. For national REDD+ (Readiness Fund & Carbon Fund)

Carbon Funds and Facilities in Land Use Sector

- **BioCarbon Fund Windows 1 & 2**
  - Tranche 1: A/R + Project-level “REDD”
  - Tranche 2: A/R + REDD, Agricultural soils
  - Tranche 3: Under development
- **Forest Carbon Partnership Facility**
  - Requested by developing and industrialized countries
  - 37 REDD countries participating
  - Initial focus is on readiness and helping countries prepare national approach
  - Carbon Fund envisaged but not yet operational
  - In line with UNFCCC process - REDDplus

BioCarbon Fund Goals



Contribution of BioCarbon Fund

- Contribution to climate mitigation in land use sector
  - Played a pioneering role in promoting the LULUCF in the carbon market
  - Promoted investments in ecosystem conservation and climate change mitigation
  - Supported training and local capacity for implementing climate change mitigation projects in land use sector
  - Expanded initiatives for afforestation and reforestation, reduction in deforestation and degradation, management of agricultural soils and restoration of wetlands
- Contribution to methodologies and tools
  - Supported the development of 6 out of 10 large scale approved AR CDM methodologies,
  - Initiated the development of methodologies for REDD and agricultural soils
  - Developed Tool for ex ante estimation of carbon stock changes in Afforestation/Reforestation projects (TARAM)
  - Developing Simplified monitoring of afforestation and reforestation tool (SMART)
- Communication with UNFCCC and VCS regulatory bodies
  - Organized meetings involving the stakeholders of UNFCCC and VCS mechanisms
  - Submitted technical inputs concerning rule making on land use sector projects and programs

BioCarbon Fund

Two Windows

First Window

- Kyoto regime
- "Kyoto-grade" credits (tCERs, lCERs, ERUs)
- CDM: Afforestation & Reforestation
- JI: All LULUCF

Second Window

- Non-Kyoto regimes
- Exploration & demonstration. Rules may change after 2012
- Non-CDM: REDD, Revegetation, Forest Management, Agriculture & Soil Management

Project Types in BioCarbon Fund

Name	Technology Distribution	Region
Albania: Assisted Natural Regeneration	Assisted Regeneration	Europe & Central Asia
China: Pearl River Watershed Management	Environmental Restoration	East Asia & Pacific
Colombia: San Nicolás Agroforestry	Agroforestry	Latin America & Caribbean
Colombia: Caribbean Savannah	Silvopastoral	Latin America & Caribbean
Costa Rica: Coopeagri Forestry	Agroforestry	Latin America & Caribbean
Ethiopia: Humbo Community Managed Natural Regeneration	Assisted Regeneration	Africa
Honduras: Pico Bonito Forestry	Agroforestry	Latin America & Caribbean
India: Improving Rural Livelihoods	Farm forestry	South Asia
Kenya: Greenbelt Movement	Community Reforestation	Africa
Madagascar: Biodiversity Corridor Restoration	Environmental Restoration	Africa
Moldova: Soil Conservation	Environmental Restoration	Europe & Central Asia
Nicaragua: Precious Woods	Plantations	Latin America & Caribbean
Niger: Acacia Community Plantations	Community Reforestation	Africa
Moldova: Community Forestry Development Project	Community Reforestation	Europe & Central Asia
Uganda: Nile Basin Reforestation	Community Reforestation	Africa
Trinidad and Tobago: Nariva Wetland Restoration Project	Environmental Restoration	Latin America & Caribbean
Colombia: San Nicolás REDD	REDD	Latin America & Caribbean
Honduras: Pico Bonito REDD	REDD	Latin America & Caribbean
Madagascar: Biodiversity Corridor Conservation	REDD	Africa
Kenya: Smallholder Agricultural Carbon Project	Soil Carbon Sequestration	Africa

Experience of BioCarbon Fund

- LULUCF projects can be put into practice – well beyond theory and rules
- LULUCF projects are neither easy nor cheap to prepare
  - Sustainability conditions and incentives must be built in, which takes times
  - Market for LULUCF credits less developed
- Inclusion of rural communities
  - 1/3 of BioCF portfolio is associated with the [project activities involving rural communities
  - Scale up of community participation through agroforestry, farm forestry, silvopastoral and agricultural soils
- Biological carbon sequestration takes time
  - Growth rates are not linear
  - A small delay at the beginning of the project translates in higher ER loss before 2012 or even 2017
  - Purchases till 2017. No more than 50-60% of BioCF needs before 2012
- Financing is a big constraint
  - Price for carbon sequestration is paid upon delivery of credits
  - Advance payments partially support investment costs
- Methodologies
  - Requires time in the approval of methologies, which meant a slow start;
  - Consolidation of AR methodologies his happening; tools are available nto aid project developers
- Regulation
  - Time required for the evolution of regulatory process can not be underestimated

BioCF Experience from Afforestation and Reforestation Portfolio

- **Market context**
  - <1% of total CERs and ERUs
  - A small fraction of the cap (1% of 1990 emissions)
- **Reason for Challenges**
  - Rule making was late
  - Some rules are not conducive
  - Demand restricted: exclusion from EU ETS deters private sector
  - Slow biological sequestration
- **What can still be done before 2012?**
  - Changes adopted now will pave way for post-2012
  - Countries speaking up in the negotiations process

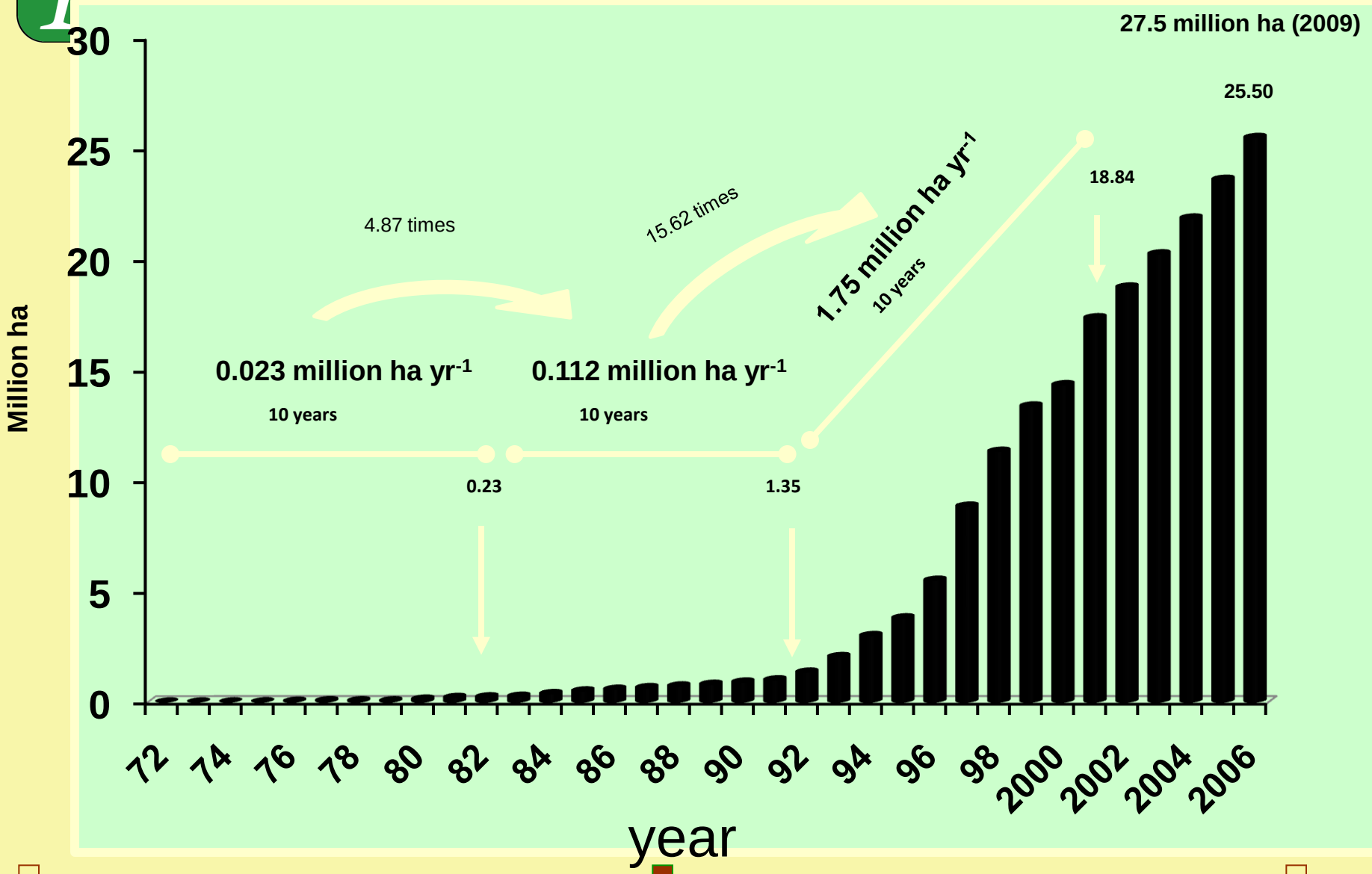
Focus of BioCF on Climate Mitigation Potential of Sustainable Agricultural Technologies

- **Agronomy**
  - Species, growth (annual/perennial)
  - Inter crop (strip, alley, relay)
  - Rotation (multi-cropping)
  - Biomass (green manure)
- **Tillage and residue**
  - Reduced tillage (No till)
  - Residue management
- **Nutrient Management**
  - Improved fallow
  - Manure management
  - Composting
  - Fertilization (time, placement)
- **Multi-enterprise**
  - Agroforestry
  - Silvipatoral

Focus on Latin America: Adoption of No Till Agriculture

Country	Area (Million ha)	Country	Area (Million ha)
United States	25.3	Spain	0.3
Brazil	23.6	Venezuela	0.3
Argentina	18.3	Uruguay	0.3
Canada	12.5	New Zealand	0.2
Australia	9.0	France	0.2
Paraguay	1.7	Chile	0.1
India	1.9	China	0.1
Bolivia	0.6	Columbia	0.1
South Africa	0.4	Others	1.0
Total			**96.0**

No-till Agriculture in Brazil (1972 – 2006)



Source: www.febrapdp.org.br (Brazilian No-till Federation), 2008

Focus on Africa:
Potential for Food Production and Carbon Sequestration
(with an increase of 1 tonne C/ha/yr soil organic carbon)

Type	Annual Increase (Million tonnes/yr)
Food grain	3.3 - 5.4
Roots and Tubers	3.0 - 6.2
Total	6.3 - 11.6

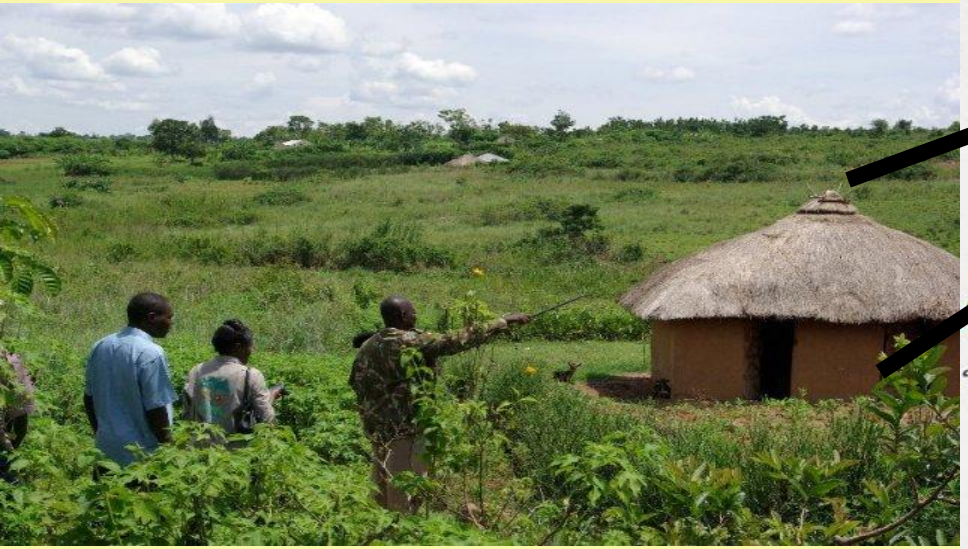
Note: One tonne of carbon removes 3.667 tonnes of CO_2e

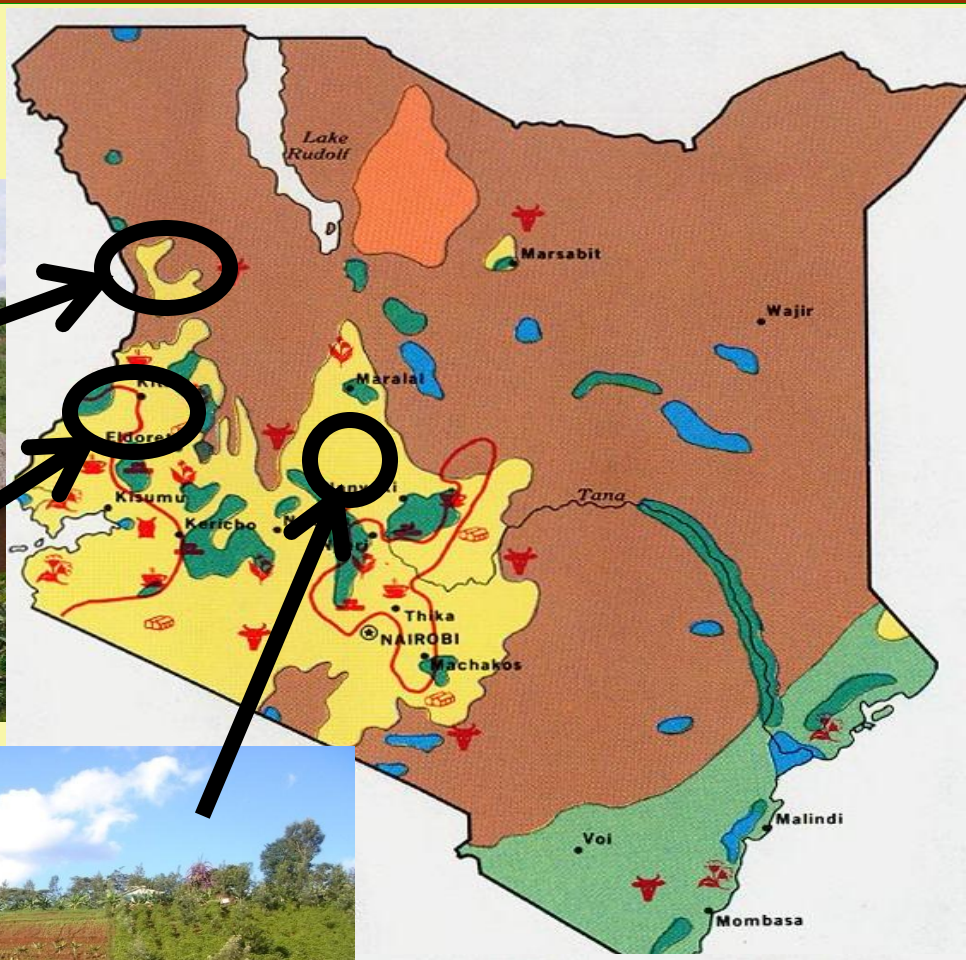
Kenya: Climate Mitigation Potential of Agricultural Soils

Variable	Mixed cropping systems	Maize	Bio-fuels	Coffee	Sugarcane
Area available in ha (million)	3	1.6	0.9	0.15	0.14
GHG mitigation activities	SALM: Agronomy Nutrient mgmt Water mgmt Agroforestry	Residue management	Jatropha/ Croton a) Fuel-switch b) AR	1) Shade trees, multiple cropping 2) Mulching 3) Fertilizer efficiency	1) No burning of residues 2) Mulching systems 3) Fertilizer related emissions
GHG mitigation potential in t CO_2e/ha/y.	**2 - 5**	0.5	a) 1-12 b) 2.5-5.0	**3 – 6**	6-8

Kenya:
Agricultural Soil Carbon Pilot projects

Western Kenya Smallholder Agriculture Carbon Finance Project





Kenya Coffee Sector Agricultural Carbon Finance Project

Agricultural Soil Carbon Projects in Kenya

Characteristics	Kenya Smallholder Agricultural Carbon Project	Kenya Smallholder Coffee Carbon Project
Objectives	Restoring soil productivity, farm enterprise approach, carbon sequestration	Improved practices for production of specialty coffee, carbon sequestration
Project area	Kisumu & Kitale in Western Kenya; 80,000 ha	Near Mt. Kenya in Central Kenya
Project entity	VI Swedish Cooperative Center	ECOM Agro-industrial Corporation
Aggregator	Farmers Associations; 60,000 farms	Komothai smallholder farmers cooperative; 9000 farms
Emission Reductions in 20 years (t CO2e/ha/y)	134,000	31,000

Copenhagen COP:
Improved Scope for Climate Mitigation in Land Use Sector

COP 15 requested for consideration of additional LULUCF options:

- Revegetation
- Forest management
- Cropland management
- Grazing land management
- Wetland management

Evolving Market for Agricultural Soil Carbon

- **United States:** Chicago Climate Exchange

  - Land use categories

  - **Conservation tillage**: Continuous no-till, low till ridge till
  - **Grass planting**: projects initiated after January 1, 1999 in CCX eligible counties
  - **Rangeland management:** stocking , rotational grazing

  - **Aggregator**s: P**ublic sector (**Farm Bureaus, cooperatives); private sector
  - **Volume**: ~16 million tons over past 4 years, growing market
  - Focus on improving protocols for soil carbon assessment.

- **Canada:** Alberta

  - **Tillage system management protocol**: technically rigorous, permanence assurance estimates, baseline assessments by region

- **Australia:**

  -- Carbon pollution reduction scheme: proposal for inclusion of agriculture offset generation under the scheme

- **Global:** BioCarbon Fund, The World Bank

  - Small number of developing country soil carbon projects (e.g., Kenya)

  - Voluntary Carbon Standard (VCS) methodologies soil carbon sequestration are in development

Proposals for Improvement

Afforestation and Reforestation

- Permit afforestation/reforestation to supply more than 1% of Annex I 1990 emissions
- Allow A/R on land deforested after December 31, 1989
- Reconsider the replacement of temporary credits after 60 years

Agriculture

- Inclusion of agricultural soil carbon sequestration under UNFCCC
- Scaling up carbon market access through programmatic approaches
- Cost effective methodologies for assessing soil carbon sequestration in different agro-ecological zones
- Linking agricultural productivity and environmental services at landscape level to enable farmers to receive additional revenue
- Strengthening policy linkages on rural credit, extension and agricultural technology
- Policies for conservation agriculture that will reduce intensive inputs, improve soil carbon and biodiversity
- Payment for environmental services to strengthen sustainable agriculture and promote incentive payments for carbon sequestration

Thank you!

www.carbonfinance.org

www.biocarbonfund.org

Email: rreddy1@worldbank.org