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# **Private sector and market perspectives on agriculture**

Climate Change & Mitigation in Agriculture  
FAO, Rome  
19-20 April 2010



# Agriculture's promise?

1. Reducing emissions/increasing stocks
2. Increasing agricultural productivity and yields
3. Contributing to climate change adaptation for farmers

Maybe. Evidence is still scarce *at scale*.



- I. Private markets after Copenhagen
- II. Agriculture under UNFCCC
- III. Evidence and examples
- IV. How move forward?



# Post-COP15: Stall, not crash

- EU-ETS prices hits 6-month low but not lowest levels
- Uncertainty chilling new investments
- Policy process unclear entering COP16 period

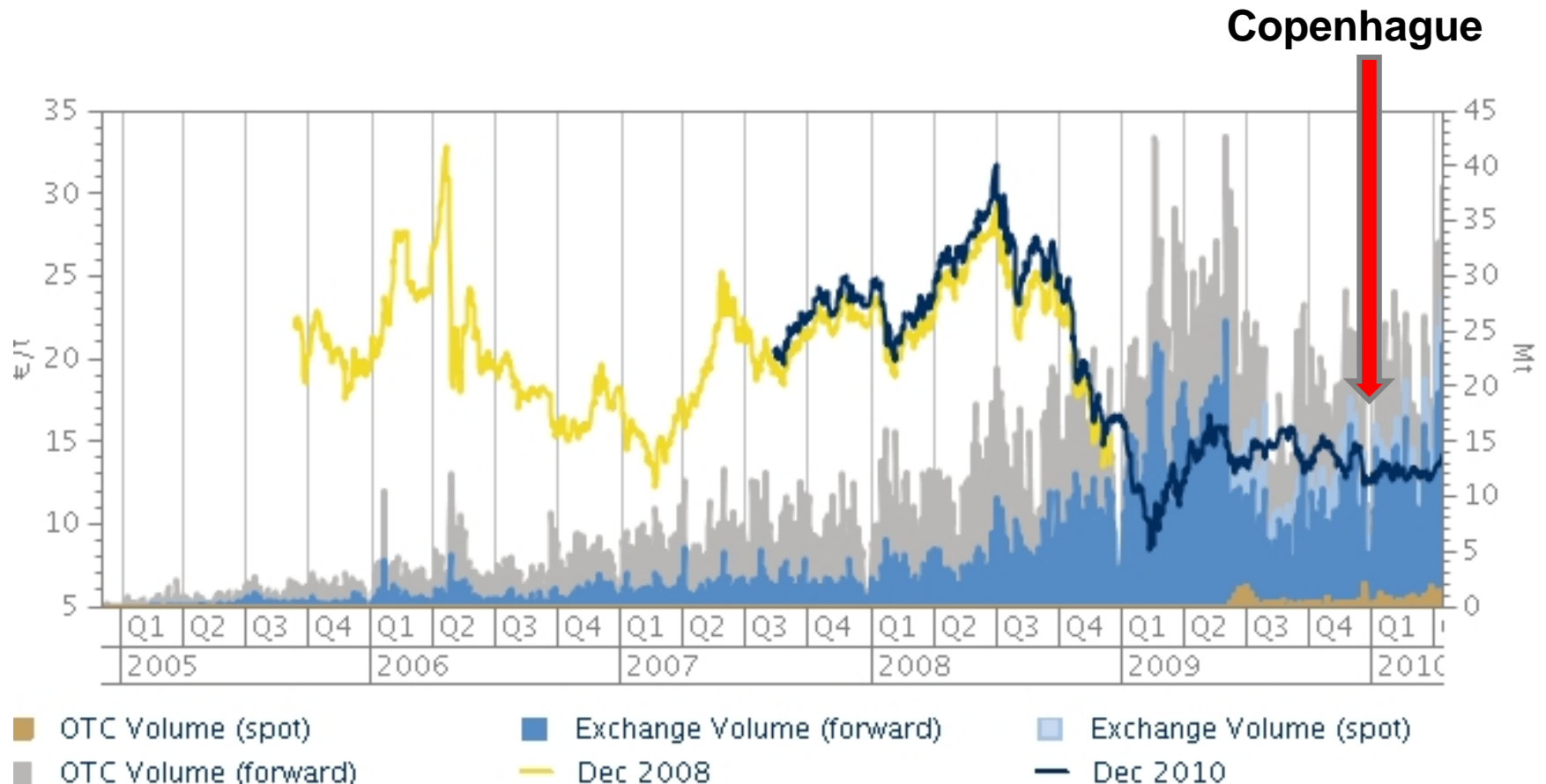
**Post-Copenhagen verdict:** Failure priced in market?.....  
OR long-term prospects remain reasonable but humble

*“If you are not in the market then it’s rational to wait...If you are confident ...you invest where value will be found.”*

- Climate Change Capital



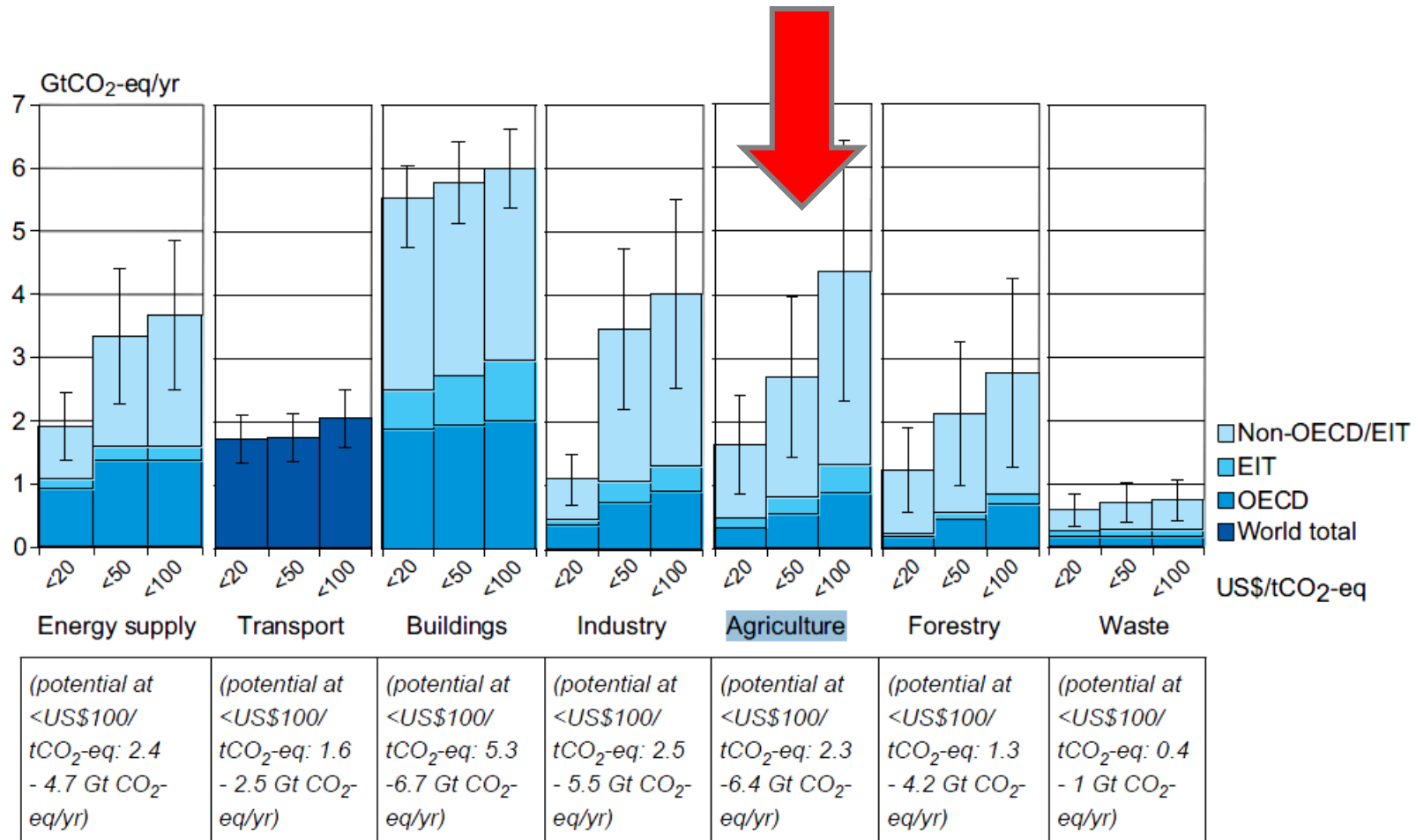
# Carbon market trends: 2005-2010





# IPCC (2007): AG Potential

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**Figure SPM.6:** Estimated sectoral economic potential for global mitigation for different regions as a function of carbon price in 2030 from bottom-up studies, compared to the respective baselines assumed in the sector assessments. A full explanation of the derivation of this figure is found in Section 11.3.

Notes:

# IPCC: Agriculture Potential



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**Agriculture: 12% of global GHGs → 18% with forests**

- Growth in direct emissions (1970 -1990) was 27%

## **Large possible agricultural contribution (IPCC)**

“Agricultural practices collectively can make a significant contribution at low cost to increasing soil carbon sinks, to GHG emission reductions, and by contributing biomass feedstocks for energy use (medium agreement, medium evidence).”

## **No best practice (IPCC)**

“There is no universally applicable list of mitigation practices.”

# VERs and Agriculture



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## Agricultural OTC trades: 2008-2009

	VERs ('000)	Market share	Price \$/tCO <sub>2</sub> e
Methane (livestock)	1,279	2.5%	\$10.00*
A/R Plantation	632	1.2%	\$6.40
Forest management	431	0.8%	\$7.70
Ag soil /land	256	0.5%	\$3.40
Other (terrestrial)	130	0.3%	n/a
<b>Total</b>	<b>2,728</b>	<b>5.3%</b>	<b>\$6.88</b>

### **CCX: Higher proportion AFOLU credits**

- ag soil (15%), ag methane (1%), forestry (22%)
- Rise in forestry (21%), drop in ag soil (33%).



# CDM and Agriculture



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## Agricultural CDM trades: 2004-2010

	<b>CERs (‘000s)</b>	<b>Market share</b>	<b>Investment (USD, million)</b>	<b>Total projects</b>
Biomass	15,167	4.0%	\$5,441	1,037
Methane avoidance	5,969	2.0%	\$222	328
Forests	0	0.0%	\$58	52
Agriculture	0	0.0%	0	0
<b>Total</b>	<b>21,136</b>	<b>6.0%</b>	<b>\$5,721</b>	<b>1,417</b>

\* Agriculture = irrigation, alternative fertilizers, rice crop CH4 (Biogas under methane avoidance)

# US and AUS Prospects



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US (110 <sup>th</sup> -112 <sup>th</sup> Congress)	Australia
<i>Kerry-Graham-Lieberman, Lieberman-Warner.....etc, etc, etc.</i>	<i>Australian Climate Change Regulatory Authority Bill 2009.</i>
<b>Outlook:</b> “50-50 chance” Senate will pass simpler, moderate bill this year – <i>W. Post</i>	<b>Outlook:</b> Bill defeated on three separate occasions in the Australian Senate, tax floated

- Failed in both countries thus far
- Int’l forestry offsets and domestic AFOLU prominent
- Shift offset market dominated by EU-ETS
  - ag and forests, new players, new locations, new sources.
- **BUT lack of demand without regulation....**

# Update on Copenhagen



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- Accord does not expressly refer to agriculture
  - Developing countries (13 of 33) submitted NAMA plans to adopt mitigation actions in the agricultural sector.
  - Non-quantified agricultural mitigation activities submitted (grassland restoration, fertilization techniques etc.)
- Negotiations ongoing through Working Group on Long-term Cooperative Action (AWG-LCA)
  - activities to “improve the efficiency and productivity of agricultural systems in a sustainable manner”
  - next AWG-LCA meeting to be held in April 2010 in Bonn.



# Summary: Ag NAMAs

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Country	Pastoral land mgmt	Livestock mgmt		Crop land management								Waste mgmt	Peat land mgmt
	Restoration & conservation	Improved livestock mgmt	Introduction / of fodder crops	Conservation farming	Conservation tillage	Agroforestry	Soil C-sequestration	N-fixing species	Efficient fertilizer application	Crop improvement	Irrigation	Crop residues and animal waste	Improved management
Brazil	83-104 Mt CO <sub>2</sub>	18-22 Mt CO <sub>2</sub>			16-20 Mt CO <sub>2</sub>			16-20 Mt CO <sub>2</sub>					
Rep. of Congo				x				x			x		
Côte d'Ivoire				x									
Ethiopia						on 261,840 km <sup>2</sup>	on 80,000 km <sup>2</sup>						
Ghana					x				x	x		x	x
Indonesia													x
Jordan	x								x				
Rep Macedonia											x	x	
Madagascar		x	x						x	x			
Mongolia		x				x							
Morocco							≥ 2 Mt CO <sub>2</sub> /yr						
Papua New Guinea	Decrease agricultural GHG emissions by 15-27 MtCO <sub>2</sub> /year (activities are not specified)												
Sierra Leone				x		x							



# Agriculture activities

## Emission Reduction

- Enteric fermentation ( $\text{CH}_4$ )<sup>†</sup>
- Manure management ( $\text{CH}_4$  and  $\text{N}_2\text{O}$ )<sup>†</sup>
- Reduced or no tillage<sup>†</sup>
- Use of nitrification inhibitors and efficient use of fertilizer ( $\text{CO}_2$ )
- Water management and waste residue management ( $\text{CH}_4$ )
- emissions from rice cultivation ( $\text{CH}_4$ )
- Emissions associated with conversion of land (all)

## Carbon stock enhancement

- Grassland management
- Cropland management
- Agroforestry
- Agronomic practices such as perennial species

*<sup>†</sup> Also enhances carbon stocks.*

## To deliver....

1. Higher yields / productivity
2. Carbon stocks / carbon benefits
3. Ecological resilience and food security benefits.



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# An African Agricultural Carbon Facility

## Feasibility Assessment and Design Recommendations

Forest Trends, The Katoomba Group, Ecoagriculture Partners, and Climate Focus  
with support from The Rockefeller Foundation

February 1, 2010





# Agriculture: Moving ahead?

## Barriers

- Aggregation and coordination
- Project methodologies
- Scientific certainty (permanence, MRV, GHG, co-benefits)
- Technical constraints and capacity
- Few financing mechanisms , market access
- Country risk: legal, financial and political

## Still, there are opportunities.....

- Huge potential
- Multiple revenue streams
- Co-benefits of investments in SLM (carbon & co-benefits) very high
- strong additionality
- lack of competition with Annex I countries/sectors.



# Critical Questions

- 1) Promising agricultural practices?
- 2) Incentives needed for farmers to change practices?
- 3) Institutions, financing & management to sustain practices?
- 4) How can they access the benefits? How distribute them?

## Outputs

What design and function of agriculture carbon facility and financing mechanism?





# What examples exist?

- **Ethiopia:** Humbo Assisted Regeneration
- **Kenya:** Green Belt Tree-Planting Project
- **Kenya:** Smallholder Coffee Carbon Project
- **Zambia:** ICRAF
- **Kenya:** Western Kenya Smallholder Agriculture Carbon Project
- **Tanzania:** Uchindile and Mapanda Forest Project
- **Uganda:** Trees for Global Benefits

# Case studies



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	<b>W. Kenya Smallholder Agriculture C. Project</b>	<b>Kenya Smallholder Coffee Carbon Project</b>
<b>Region</b>	Western Kenya	Central Kenya
<b>Area</b>	86,000 ha	~ 10,000 ha
<b>Aggregator</b>	80,000 farms (assoc.)	9,000 members (smallholders)
<b>Ag Objectives</b>	Restoring ag production, adopting farm enterprise approach, Reducing vulnerability	Restoring coffee production & specialty/ best coffee practices. Reducing vulnerability
<b>Expected VERS*</b>	516,000 tCO <sub>2</sub> e/yr (max)	~30,000 tCO <sub>2</sub> e/year, phase I

# Carbon benefits



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## Western Kenya Smallholder Agriculture Carbon Project      Kenya Smallholder Coffee Carbon Project

**Table 3.7: High production t/CO<sub>2</sub>e/ha**

	N	R	NM	NM2	NM4	RM	RM2	RM4
N		0.99	0.40	1.61	3.19	1.39	2.60	4.22
R			-0.62	0.59	2.20	0.40	1.61	3.19
NM					2.79	0.29		3.81
NM2								
NM4								
RM						-1.80		0.99
RM2								2.79
RM4								

Acronyms	
N	all residues removed from the field
R	all residues left in the field
M	1 tC/ha of manure distributed during the year
M2	2 tC/ha of manure distributed during the year
M4	4 tC/ha of manure distributed during the year
Residues and manure scenarios are combined. For example:	
NM	all residues removed+and 1tC/ha distributed in the field



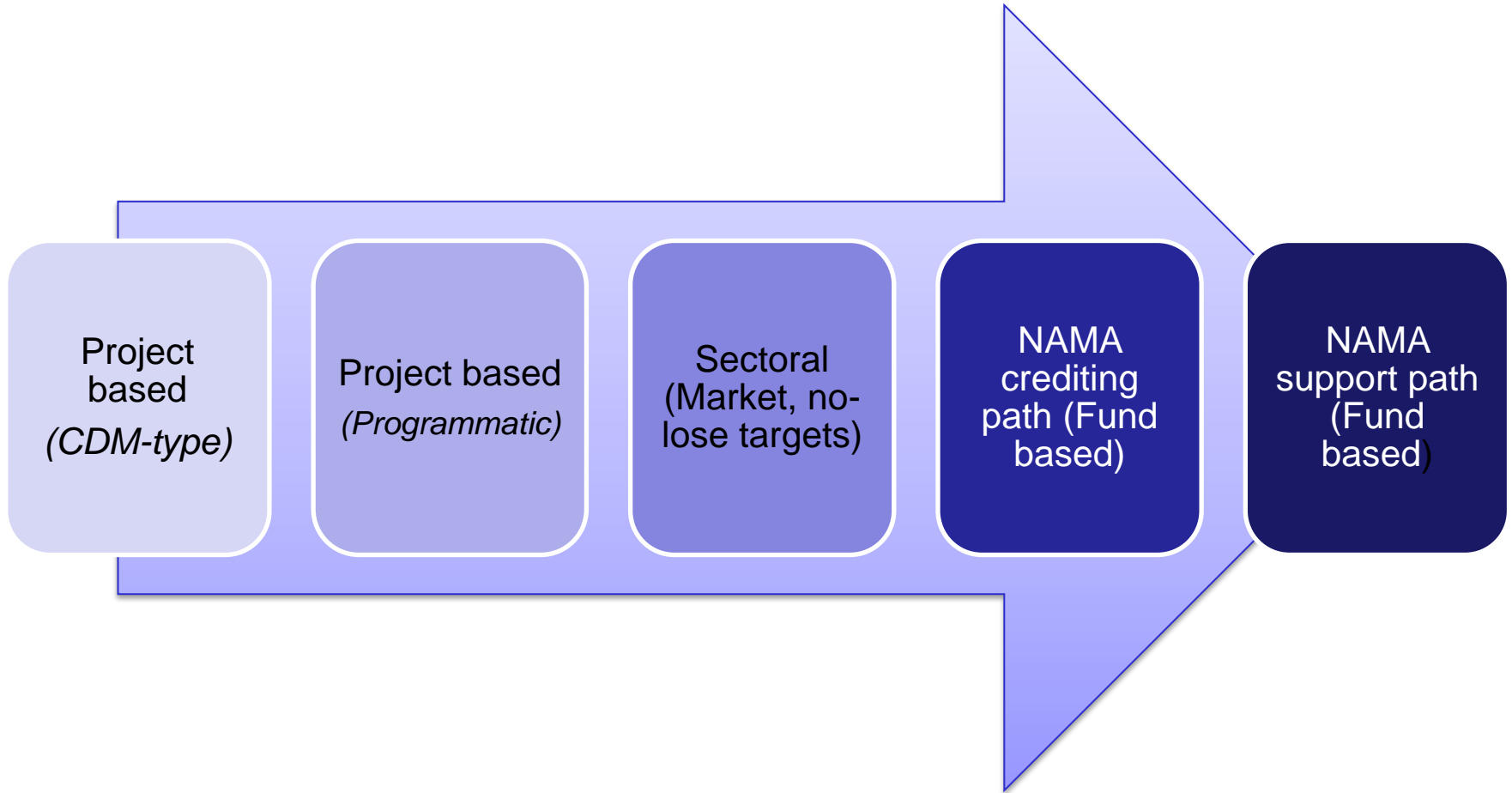
# Project size and potential

Project size (ha)	Project size (mi <sup>2</sup> )	Annual revenue ('000s)	
		<i>Low</i> (\$5/tCO <sub>2</sub> e)	<i>High</i> (\$30/tCO <sub>2</sub> e)
5,000	19	\$41	\$244
62,500	241	\$508	\$3,050
100,000	386	\$813	\$4,880
200,000	772	\$1,600	\$9,760
500,000	1930	\$4,100	\$24,400

# Climate Finance

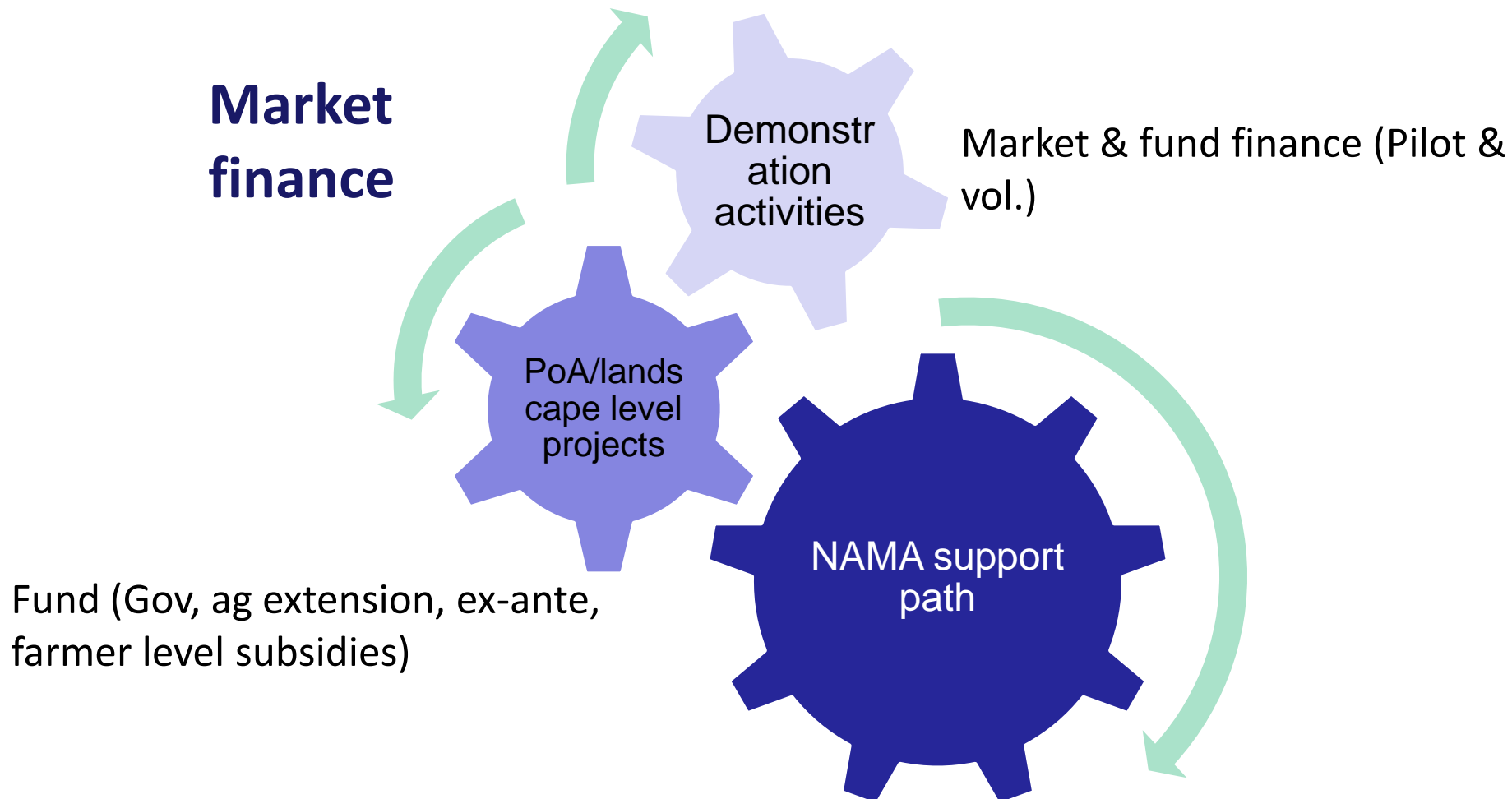


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# A basket of approaches



# Facility Benefits Flow



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**\$ Financing**

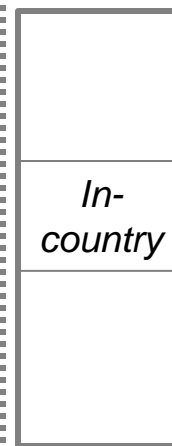
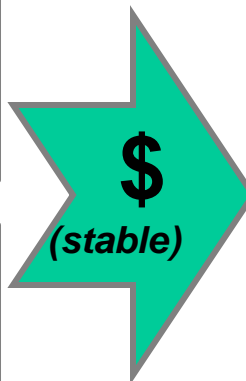
**Intermediaries**

**Aggregators**

**Producers**

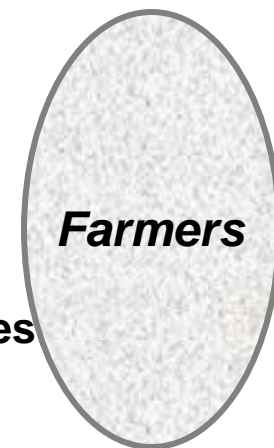
## Carbon

*Voluntary Mkts*  
*Regulated Mkts*  
*Sectoral/REDD*  
*NAMA*  
*Adaptation*



**Training**

**Resources**



> *resilience*

> *yields*

> *incomes*

> *carbon stocks*

*(Emission reductions)?*

# Next Steps



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<b>Phase 2: Demonstration (2010-2012)</b>	<b>Phase 3: Bridging (2012-2015)</b>	<b>Phase 4: Commercialization (2015 onward)</b>
<p><b>Activity:</b> <i>Demo projects &amp; capacity</i></p> <p><b>Objectives:</b> <i>Collect data, establish methodology, identify project types and intermediaries</i></p> <p><b>Finance:</b> <i>High proportion of public finance</i></p>	<p><b>Activity:</b> <i>Project scaling &amp; commercialization</i></p> <p><b>Objectives:</b> <i>Prove and expand agricultural and terrestrial carbon projects, Attract private capital , Build supply chains, manage training and MRV</i></p> <p><b>Finance:</b> <i>Public finance, decreasing fraction</i></p>	<p><b>Activity:</b> <i>Establish equity funds to finance, VERs</i></p> <p><b>Objectives:</b> <i>Direct private capital into landscape-scale activities, minimal transaction costs</i></p> <p><b>Finance:</b> <i>Mostly private investment, with ongoing public finance for certain infrastructure and services</i></p>



# Case Study: Danone Europe



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## Problem

Dairy GHG emissions, health, sustainability, milk quality

## Approach

LCA of supply chain → identify sources → develop MRV → technologies → launch pilot program (2005, 20 French farms) → scale program (> 500 farms)

## Results

Milk composition (Omega 3); Reduced GHG (methane) by 20-30%; Yield increases 8-10%, better cow health, lower feed costs

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