Increasing economic resilience of agriculture sector to climate change

UNFCCC technical workshop

Increasing economic resilience to climate change and reducing reliance on vulnerable economic sectors, including through economic diversification

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Climate Change

A presentation in three parts

1. **Agriculture sector and climate change economic resilience**
2. **<u>A country focus</u>: To integrate climate change adaptation and mitigation into national sector policies and strategies**
3. **<u>An implementation focus</u> with Project and Programme formulation and scaling Up**

1. Agriculture sector and climate change economic resilience

Adaptation versus resilience

- Climate Change Adaptation refers to actions intended to improve the resilience of agriculture, to enhance its capacity to deal with conditions associated with climate change, and hence to reduce the vulnerability of agriculture to changing climate

Mitigation versus resilience

In agriculture sector, adaptation and mitigation are often coming together:

- enriched carbon soils are more resilient to drought and erosion
- Carbon rehabilitated watersheds reduce floods and improve resilience to natural disasters
- carbon fixing mitigation can diversify rural income and strengthen economic resilience of vulnerable households
- Agriculture NAMA would increase resilience of other sectors to disasters

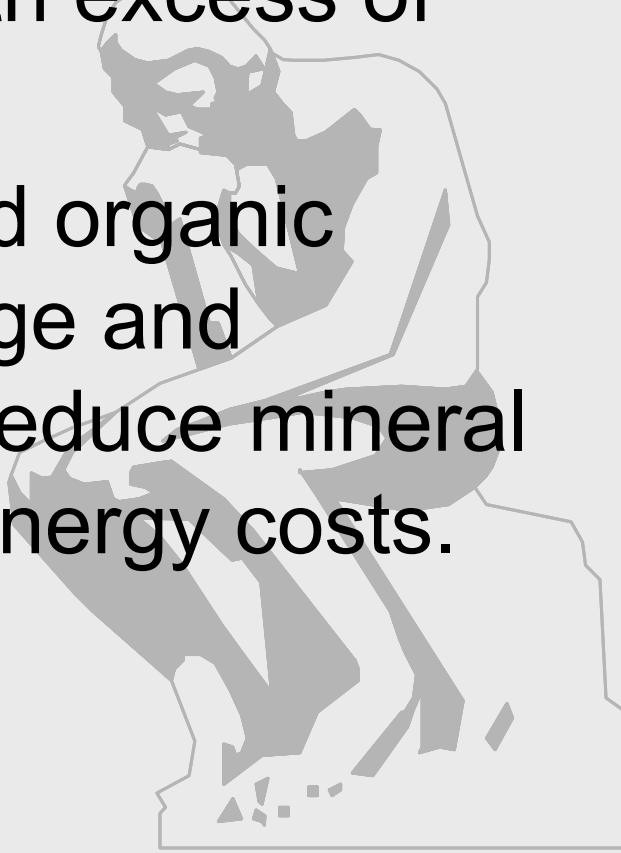
2. A country focus: To integrate climate change adaptation and mitigation into national sector policies and strategies

Three main resilience policy targets

1. **to consolidate the resilience of cropping systems**
2. **to consolidate the resilience of watersheds and infrastructure to Natural disasters**
3. **to consolidate resilience of vulnerable populations to shocks**

to consolidate the resilience of cropping systems

- increase soil organic carbon generates higher resilience against both excess of water and lack of water
- Conservation agriculture and organic agriculture (zero or low tillage and permanent soil cover) also reduce mineral fertilizers use and on-farm energy costs.



Channels	Policies to encourage adapted crop development and farming practises
Public services and external / project support	○Diversify crop types and varieties, including crop substitution, ○Develop new crop varieties, including hybrids, to increase the tolerance and suitability
Support Policies	•Promote seed banks so as to help farmers diversify crops and crop varieties •research and development of new crop varieties that are more resistant •Strengthen capacity of the Department of Agriculture to provide seeds of a diverse mixture of crops •Develop agricultural extension schemes •Set tax and other incentive policies to increase diversification of crops and crop varieties

Channels	Conservative agriculture policies
Public services and external / project support	• Encourage catch or cover crops between successive crops • Encourage crop rotations, preferably with perennial crops • Encourage crop systems with reduced reliance of fertilizers, pesticides, and other inputs • Promote rotations or intercrops with leguminous crops
Support Policies	• Develop schemes to encourage conservation practices such as conservation tillage, zero tillage, furrow diking • Put in place programs to encourage cover cropping with leguminous cover crops to preserve soil moisture, increase soil organic matter, and reduce soil erosion • Develop schemes to promote use of farm equipment, including tractors, harvesters, and other equipment

to consolidate the resilience of watersheds to Natural disasters

Value to society for ecosystem services

- **Reduction in erosion and sedimentation of water bodies.**
- **Improvement in water quality.**
- **limited flooding**
- **regularity of water flows**

Channels	Watershed management policies
farmer technologic / strategic options	○ Use alternative practices to reduce soil erosion (terracing) ○ Adopt adapted agro-forestry practises in slopped areas ○ Participate to maintenance of water drain channels
Public services and external / project support	• Promote reforesting of hillside degraded areas • Provide adequate tree planting materials for household • Develop local watershed / land use planning through municipality and community participatory planning
Support Policies	• Develop schemes to improve watershed resilience building at community level • Mobilize municipality- driven semi permanent labour intensive public works (socio-environment safety nets) • Monitor carbon-fixing impact generated to allow Carbon funding to support such actions

to consolidate resilience of vulnerable populations to shocks

"Adaptive social protection involves examining opportunities that approaches to social protection provide for adaptation, and for developing climate-resilient social protection programmes"

National Risk management Policies

Typical components of national risk management policies include:

- monitoring and forecasting hazardous events, including weather,
- climate information,
- reliable and timely early warning systems,
- infrastructure investments to minimize exposure
- insurance and other risk financing instruments
- emergency response capacity
- livelihood investments to enhance resiliency in outcomes

Channels	Crop and income loss risk management policies
farmer technologic / strategic options	○Purchase crop insurance to reduce the risks of climate-related income loss ○Diversify source of household income ○strengthen self help groups
Public services and external / project support	○Establish weather/meteorological stations ○Develop private insurance to reduce climate-related risks ○Participate in income stabilization programs
Support Policies	○Mobilize adequate community based risk managements tools to face crop failures and soaring food prices (grain banks, tontines, self help groups) ○Modify crop insurance programs ○Develop innovative risk financing instruments and insurance schemes to spread residual risks

Disaster risk management policies (flood, drought...)

Channels	Disaster risk management policies (flood, drought...)
farmer technologic / strategic options	• Diversify source of household income in order to address the risk of climate-related income loss
Public services and external / project support	• Develop early warning systems • infrastructure investments to protect against asset loss; • protecting equipped areas from flood damage and maintaining drainage outlets
Support Policies	• to strengthen the meteorological department, • Incentive policies to encourage better drought management programs • Policies to alter cropping patterns to suit drought • planting more water-efficient and/or drought tolerant crop varieties,

3. An implementation focus for Project and Programme formulation and scaling Up

Ex ante Analysis of carbon balance

- an acceptable method to measure Carbon-balance Impact within ex ante project and investment programmes appraisal
- An analysis which complements usual ex ante economic analysis (NPV, IRR).
- A tool which fits within the time constraints of a formulation process

Enhancing the Poverty Reduction Potential of Payments for Environmental Services

To provide analysis and policy insights as to how natural resource management can result in enhanced food security, poverty alleviation, and sustainable development.

- **Linking Payments for Environmental Services to Poverty Reduction**
- **Mitigating Climate Change through Land Use Change: A Way Out of Rural Poverty?**

Productive socio-environmental safety nets

In Madagascar and Haiti, FAO has proposed an initiative based on municipalities and watersheds for the Strengthening of rural community climate resilience to fill a triple role:

(i) Strengthen the social safety-net of structurally vulnerable populations in rural areas (creation of jobs)

(ii) Strengthen the resilient capacity of infrastructure and fragile areas faced with weather shocks through the reforestation of hillside ponds, anti-erosion dams, consolidation of embankments and bridge infrastructure,

(iii) Fill the gaps in maintenance and desilting of irrigation canals in order to reduce the recurrence of floods and the loss of crops.

Thank You

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LULUCF sector still lacks tools and methodologies

- it would help project designers to integrate significant climate response activities in small holders agriculture development projects.
- Investments in such activities, given their potential contribution to the reduction of GHGs emission in all sub-sectors (livestock, cropping, forestry and other land use), would received due attention at project development stage if justified by reasonable carbon ex-ante appraisals

Developing an *ex ante* Project-Programme-Policy Carbon-Balance Impact Appraisal method (3PCIA)

Project Name	
Pays	
Climate	Tropical Moist

BASELINE

Land Use Main Categories	Area (ha)
Cropland - CL	10000
Forest land - FL	1000
Grassland - GL	2000
Settlement - SL	50
Wetlands - WL	15
Other land use - OL	0
Total	13065

PROJECT

Duration of the project (years)	20

Net land-use conversion matrix

Land Use Main Categories of the Baseline	Expected Land Use							
	CL	FL	GL	SL	WL	OL		Check
Cropland - CL	9400	500	100				10000	ok
Forest land - FL	100	795	100			5	1000	ok
Grassland - GL		200	1800				2000	ok
Settlement - SSL				50			50	ok
Wetlands - WL					15		15	ok
Other land use - OL						0	0	ok
							13065	ok

Resilience of rural communities to climatic accidents

A need to scale up socio-environmental safety nets "*Adaptive social protection involves examining opportunities that approaches to social protection provide for adaptation, and for developing climate-resilient social protection programmes".*

to define an approach for the development of communal land-use management which would reinforce the survival of both production centres and public infrastructure through the intermediary of public works sites.

Briefly agriculture and climate change

- Climate change will affect agriculture
  - Higher global temperatures, more precipitation,
  - more extreme events and disaster (droughts,floods)
  - more risks
- Adaptation/resilience: Agriculture will need
  - New varieties, more infrastructure, changes in management practices and policies
  - institutions and capacities to improve resilience
- Mitigation: Agriculture can
  - Reduce emissions of greenhouse gasses
  - Act as a sink for other sectors

Channels	Irrigation and water resource management policies
Public services and external / project support	•Develop water management innovations to address the risk of droughts. •Improve infrastructure for small-scale water capture, storage and use •Reuse wastewater for agricultural purposes.
Support Policies	•Develop schemes to reduce distribution losses of irrigation water •Improve pricing schemes for irrigation water to encourage use efficiency •Develop schemes to encourage improved irrigation methods like drip and sprinkler irrigation •removal of subsidies for energy used for pumping irrigation water

- Climate change and variability as challenges facing Least Developed Countries because of their strong economic reliance on natural resources and rain-fed agriculture.
- The risks and vulnerabilities of the poor who live in insecure places and need to build their resilience to cope with climatic fluctuations are among the more important challenges in adapting to increasing climate variability and climate change.