Transitioning to CLIMATE-SMART Agriculture: What will it take?

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SUSTAINABLY INCREASES
FARM PRODUCTIVITY AND INCOME

STRENGTHENS RESILIENCE
TO CLIMATE CHANGE AND VARIABILITY

REDUCES AGRICULTURE'S
CONTRIBUTION TO CLIMATE CHANGE
- greenhouse gas emissions
+ carbon storage on farmlands

ENHANCES THE ACHIEVEMENT OF NATIONAL FOOD SECURITY
AND DEVELOPMENT GOALS

CSA involves multiple objectives. Prioritizing them depends on the role of agriculture in economy and society.

In low income, highly agricultural dependent economies where CC impacts are estimated to be significant and negative, CSA involves agricultural growth for food security that incorporates necessary adaptation, and captures potential mitigation

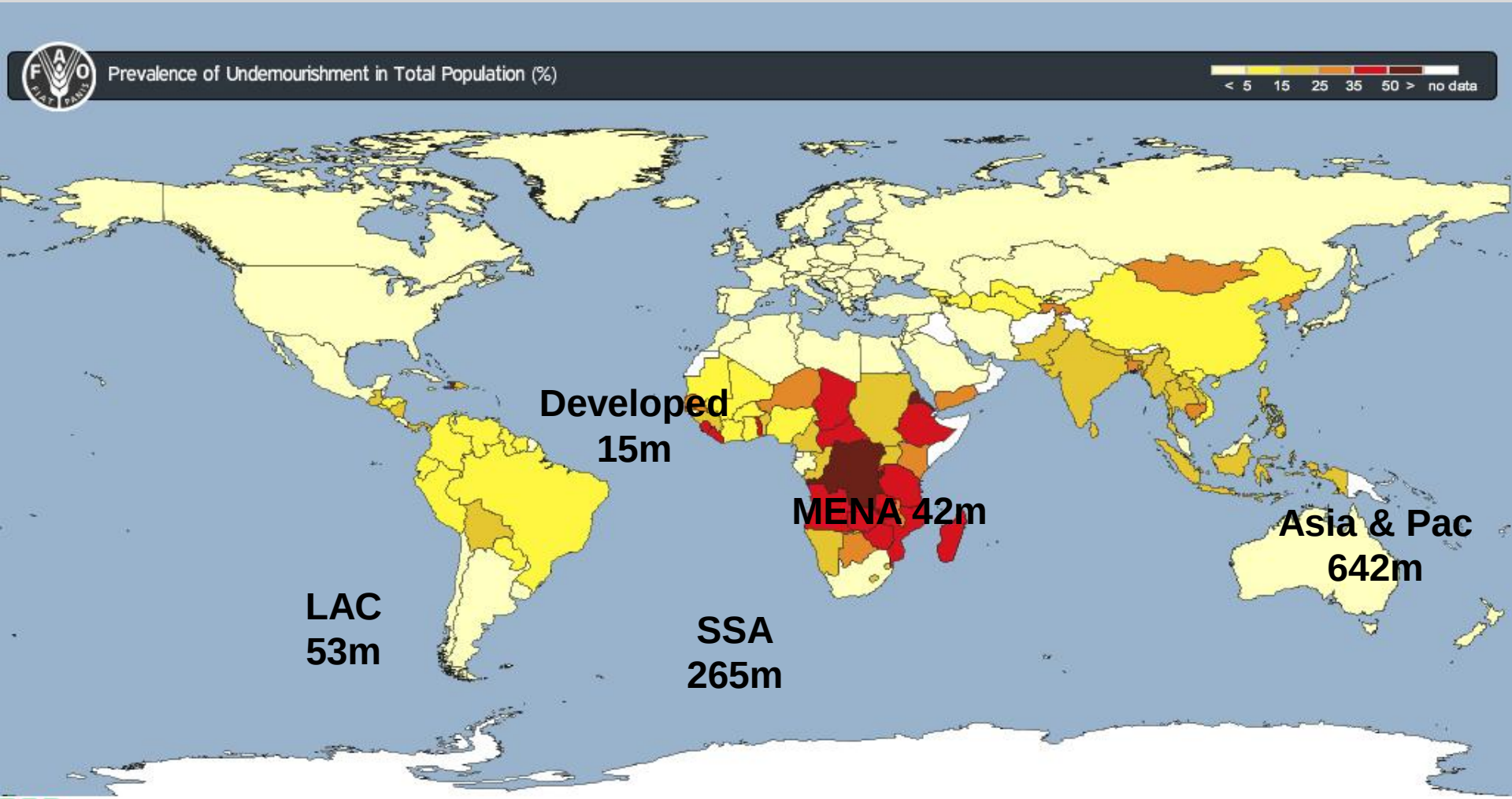
Why is it important now?

- **Agricultural growth key to reducing food insecurity**
  - The agriculture sector is the main source of livelihoods of most of the world's food insecure and the largest growth in projected populations is expected to occur in agricultural-based economies that already have high food insecurity. Agricultural growth is needed not only to increase food supply, but to increase the incomes of poor producers and rural populations to increase their access to food.

- **Negative CC impacts projected for agricultural-based poor areas- thus adaptation is necessary to achieve food security/poverty reduction**
  - adverse impacts of climate change will increase difficulty of obtaining needed agricultural growth. IPCC: Africa to be hardest hit

- **Current emissions growth indicates urgent priority of adaptation**
  - Lack of ambition on emission reduction targets, possible demise of Kyoto Protocol suggest emissions are likely to continue to increase, 2 degree goal not be met. Agriculture has tremendous mitigation potential, and considering this is particularly important at a moment when new investments into agricultural growth are being made.

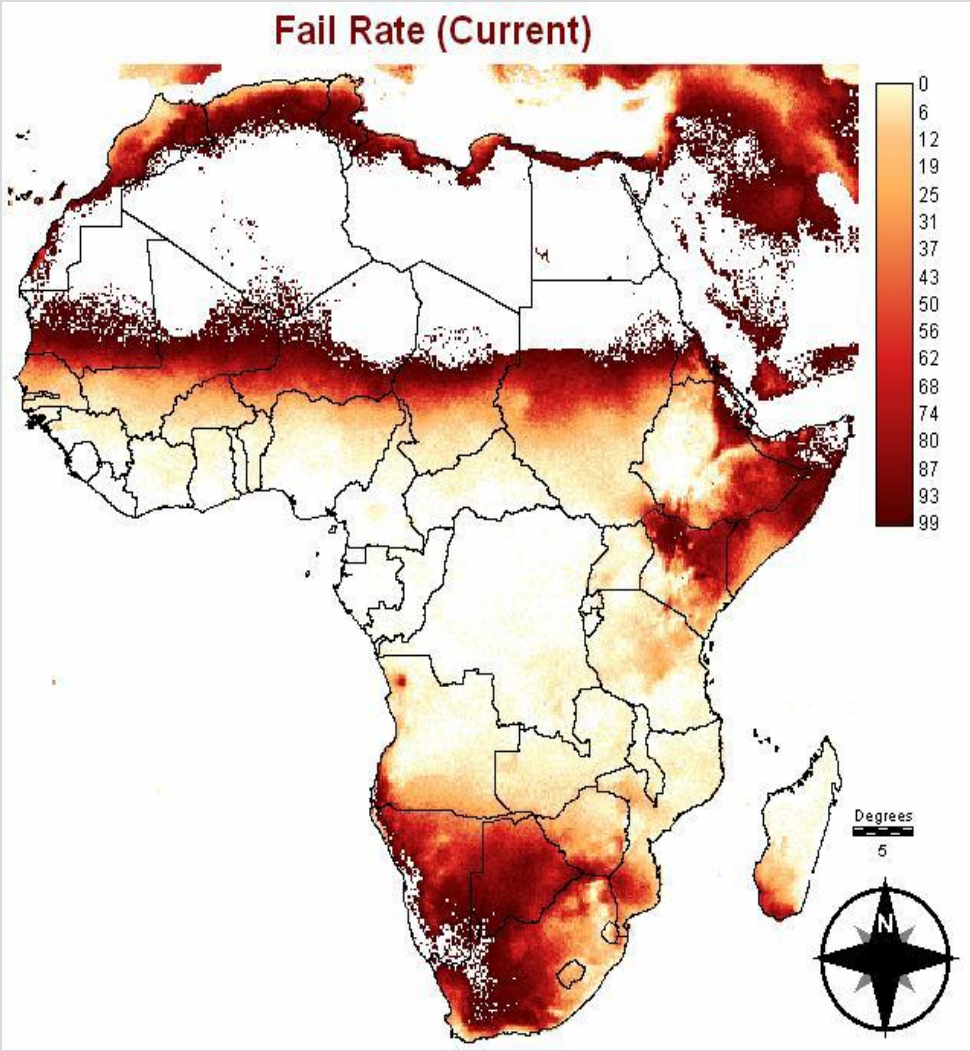
Food security situation: 1.02 billion hungry in 2009



FAOSTAT

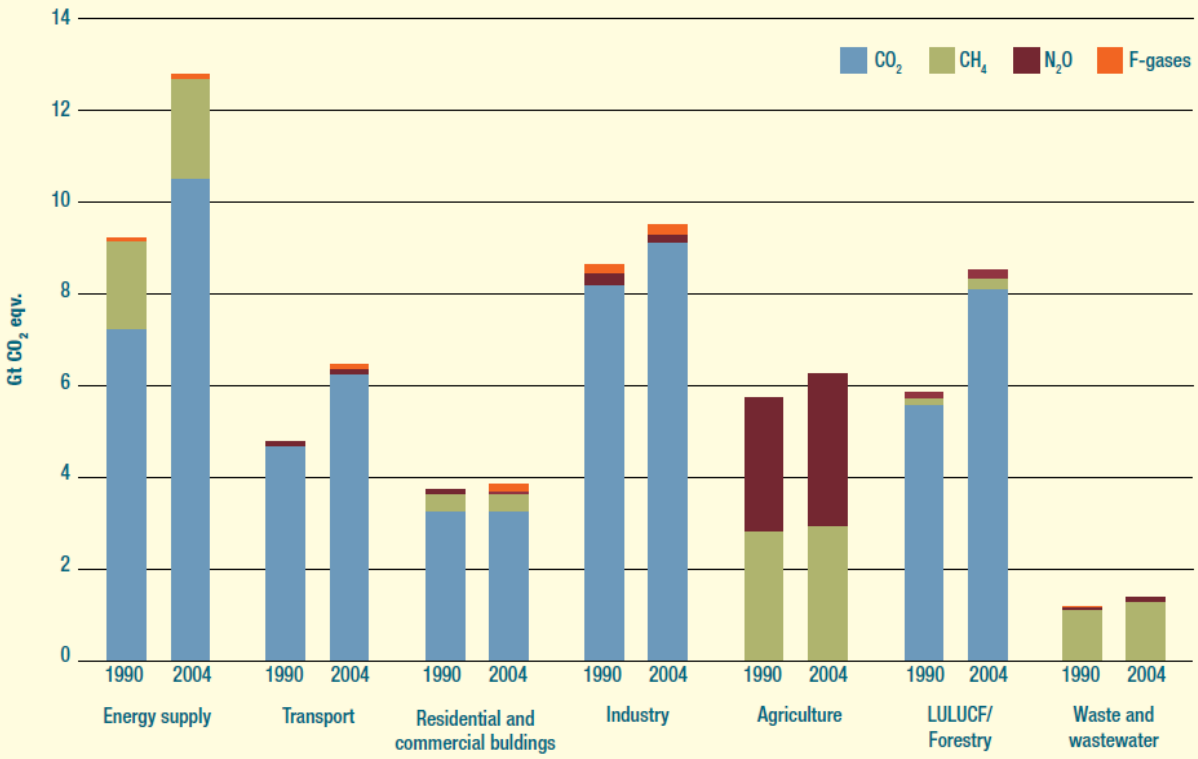
Note: This map shows the prevalence of undernourishment in 102 developing countries in the world. It uses statistics covering the period from 2004-2006, based on FAO's flagship publication *The State of Food Insecurity in the World 2009*. For more information, visit: www.fao.org/publications/sofi.

Simulated Failure Rate of the Primary Season (%) Current Condition
Source: Jones and Thornton 2008



Emissions by sector: CSA potentially affects all

FIGURE 2 – Contribution of agriculture, land-use change and forestry to GHG emissions (Figure TS.2a. from IPCC 2007b)



Agricultural growth strategies for food security and poverty reduction: what have we learned?

1) Needed food production increases will have to come from increased productivity in most areas – due to limited potential for expansion

2) Past models of agricultural development have been based on increasing input use (fertilizer, improved seeds, irrigation) focusing on increasing average productivity in high potential zones.

3) New challenges – lower potential production areas, higher rates of volatility (from markets as well as climate), environmental damage resulting from overuse of inputs, rising energy costs, indicate a change in the old model is needed.

4) Key points for change include: 1) improving efficiency of input use, 2) better use of natural resources in agricultural production systems, 3) importance of improving resilience 4) wider view of full range of ecosystems services agriculture can produce

What is needed?

- To meet food security/poverty reduction objectives, increasing productivity, reducing variability of production, and increasing returns to agriculture production are key measures required

- In many areas – climate change adaptation must be incorporated in strategies to achieve agricultural development goals (building resilience in the food system – not just production systems)

  – We need to improve risk-adjusted returns to agriculture

- Incorporating mitigation into planning/strategies can offer potential for additional financing (e.g. think of broader ecosystem services from agriculture)

Adaptation benefits:

- slow onset
- extreme events

Increased physical resilience	water access technology & watershed management, soil resource & soil fertility, seed and livestock
Increased economic resilience	crop insurance, safety nets, income diversification,&distribution, risk management, off-farm earnings, diversity of employment opportunities, access to health and social services, market access
Increased social and human resilience	extension and research, technical kinow-how, connection to social networks, education and training, information management
Extreme events	(floods, heavy hail/snow events, heavy wind & dust storms, droughts&dry spells, heat waves&warm spells, cold spells)

Mitigation benefits:

Achievements against A Business as Usual Emissions growth path

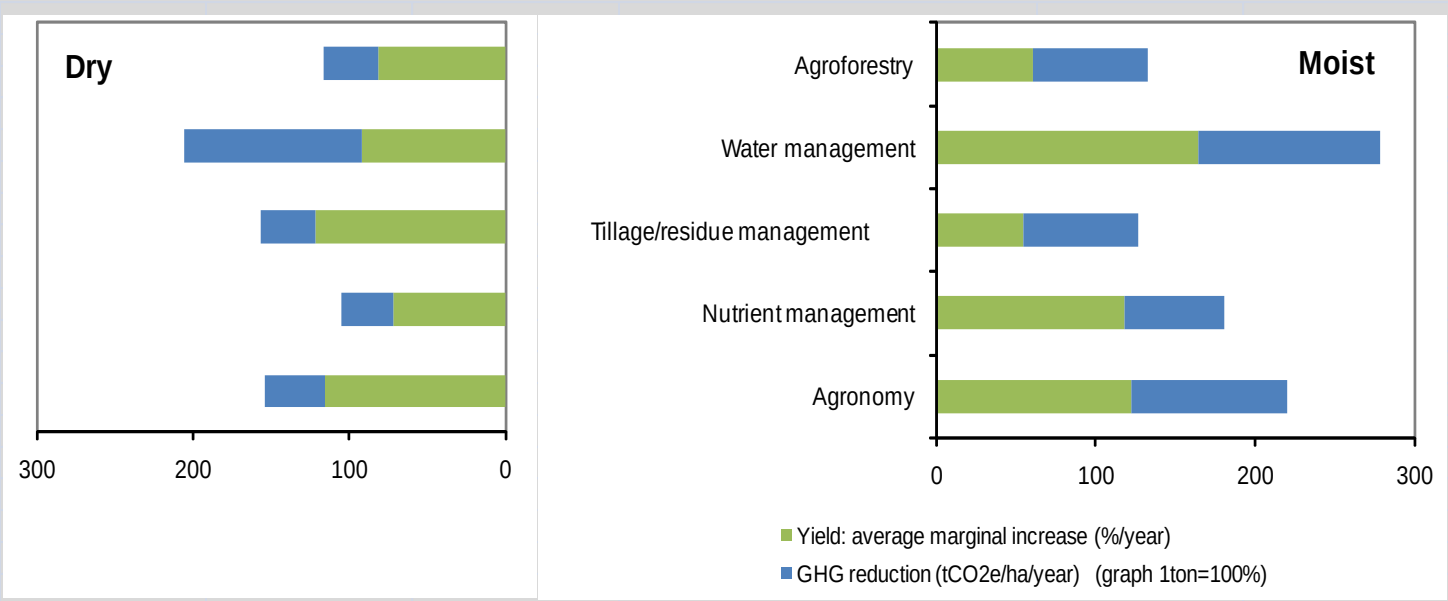
Mitigation
Carbon sequestration: • C sequestered (tCO_2/ha) (net balance)
GHG emission reductions: • GHG reduced (tCO_2/ha) (net balance)
GHG emission efficiency: • GHG reduced from increased efficiency of production (tCO_2/unit of product) (net balance)

Sustainable land management: a key CSA activity

- Following IPCC (2007), four broad categories
  - Cropland Management
  - Grassland Management
  - Management of Organic Soils
  - Restoration of Degraded Lands

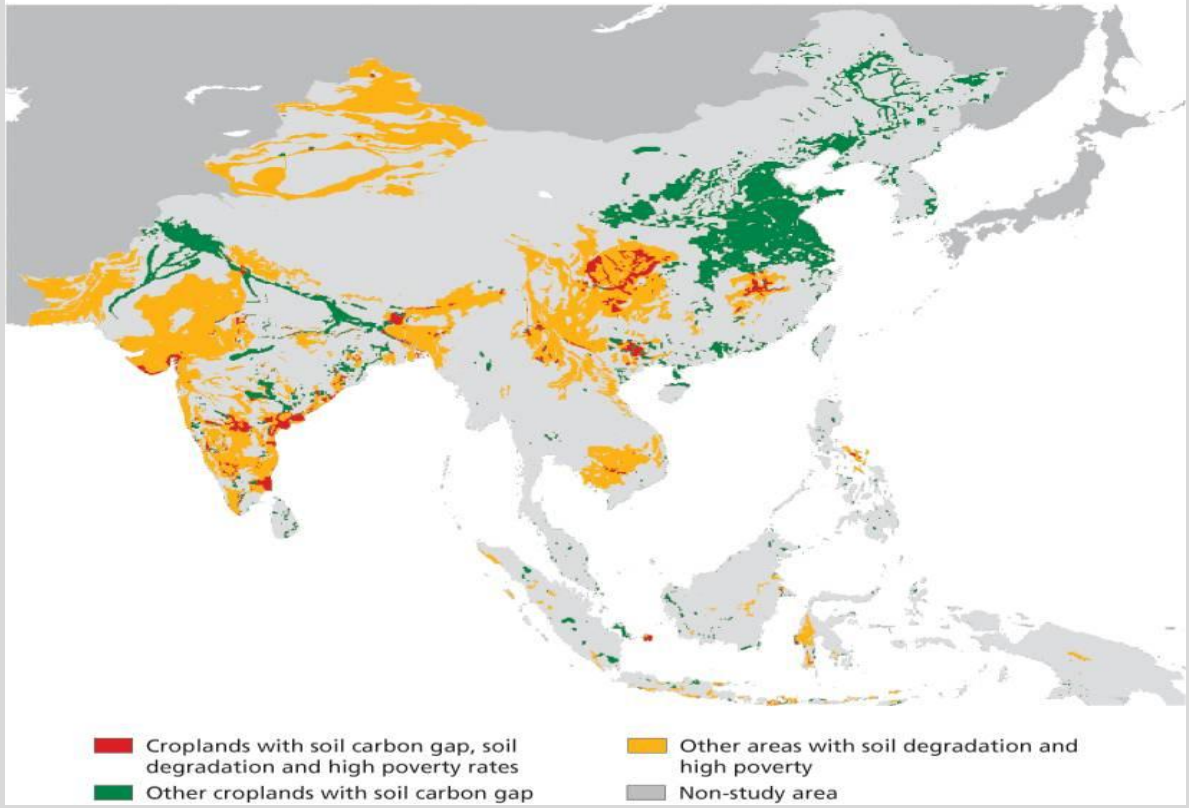
- Cropland Management includes:
  - Avoiding bare fallow, use of cover crops
  - Soil and water conservation structures
  - Tillage management (e.g. conservation agriculture

Comparing effects on average yields and carbon sequestration from adopting SLM



Where could the poor benefit from sequestering soil carbon on croplands?

MAP 8
Highly degraded croplands with soil carbon sequestration potential and high poverty rates



SLM Adoption Costs and Barriers

- Up-front financing costs can be high, but on-farm benefits not realized until medium-long term
  - Local credit markets very thin
  - Local insurance options very limited
- Tenure Security & Management of Common-Pool Resources
- Limited Access to Information, e.g. Research & Extension
- Risk management and need for flexibility

Findings about barriers to adoption

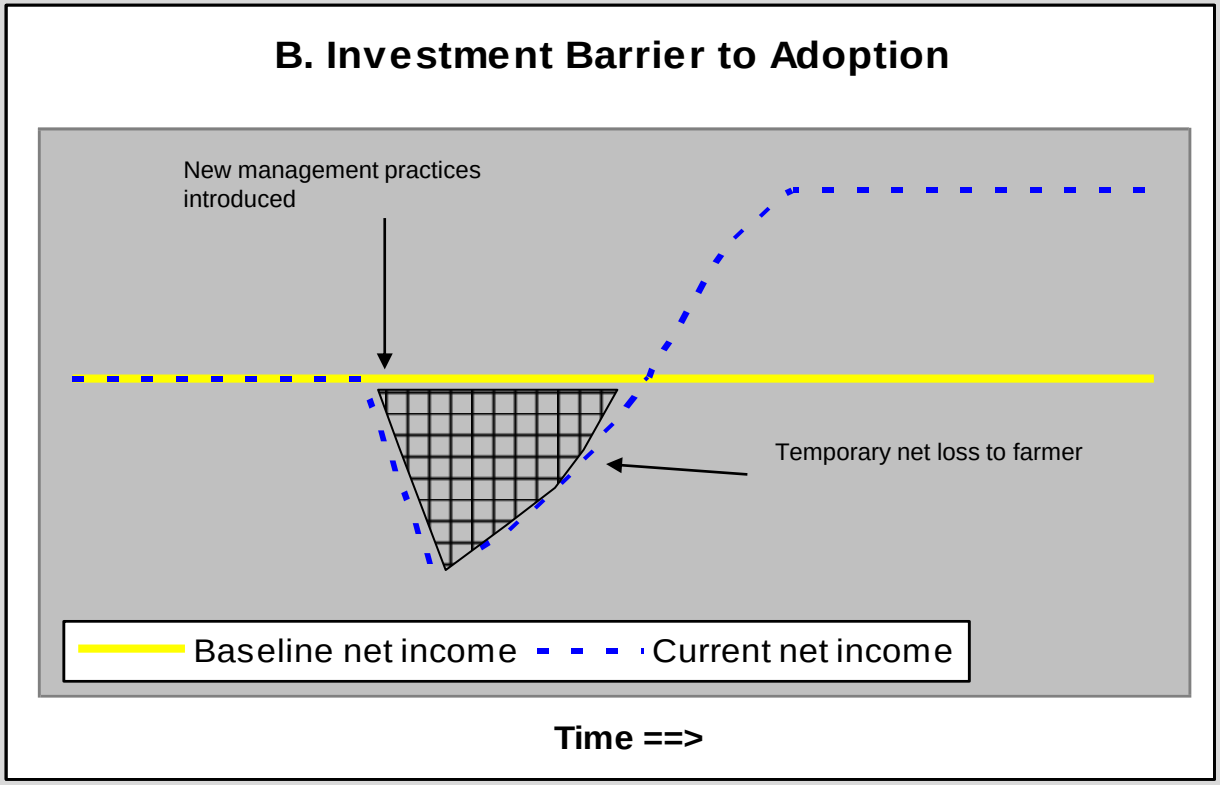
1) It can take up to 10 years before farm incomes reach pre-adoption levels – and lag times are longer for lower income/smaller producers

2) Access to information and good management are key to improving efficiency of production systems – and current extension systems are incapable of providing needed level of support

3) Input supply (having the correct seeds, fertilizer, machinery at the time it is needed) is a major constraint

4) Risk – of reduced production/incomes/food security is a key barrier to adoption . Risk can be addressed through several means – safety nets, insurance, but also tenure, information

Adoption Barriers: Up-Front Financing Costs



Source: FAO 2007

Supporting functions of land tenure to support the transition to climate smart agriculture

- Provide incentives for and enable long term investments
- Facilitate collective management of natural resources
- Reduce risk and provide insurance
- Facilitate aggregation of MRV activities
- Provide equitable level of access – including to “carbon” rights

Transitioning to climate smart agriculture: what will it take? Focus on local institutions

Local institutions (local markets, land tenure systems, extension, safety net programs) affect the benefits/costs/risks farmers face in adopting new technologies

- Extension to focus on efficiency of input use
- Safety nets – to support incentives to invest in production
- Credit/alternative income sources over transition periods
- Targeting women for extension/input/market programs
- Improving input supply chains
- Tenure – building on informal systems

Transitioning to climate smart agriculture: what will it take? Focus on national/international policies

- 1) National policy frameworks that integrate climate change, agriculture development and food security objectives
  - Incorporating climate smart agriculture planning into CAADP/GAFPS planning
  - Coordination of NAPAs, NAMAs and national agricultural planning

2) International policy agreements
  - UNFCCC – recognition of importance of agriculture for food security and need for adaptation; potential for mitigation and enabling resources to support them
  - Agricultural development finance: enabling needed transitions for CSA
  - Committee on Food Security

Transitioning to climate smart agriculture: what will it take? Focus on financing

1) At present, there are not sufficient committed resources (nationally, internationally) to achieve needed transitions

2) Public sector finance plays a key role in providing needed infrastructure, information, institutions to provide incentives for private sector finance

2) Developing resources and mechanisms to support transitions over extended periods of time is a major challenge

3) Linking climate finance – both adaptation and mitigation financing to agricultural development finance for climate smart agriculture transformation is needed.

4) Building mechanisms to credit/channel finance to such efforts is a challenge to met in successfully linking climate finance to climate smart agriculture transitions.

Some key FAO efforts to support CSA

1) EC-FAO project on climate smart agriculture: three partner countries (Malawi, Zambia, Vietnam) Four main objectives:
   - Identify country specific climate smart agricultural practices
   - Build capacity for integrating climate change, agricultural development and food security across relevant policy frameworks
   - Identify mechanisms for channeling climate finance to CSA activities
   - Develop investment proposals for climate smart agriculture project

2) CAADP-FAO-World Bank partnership to identify climate smart agriculture investment priorities in CAADP investment plans

3) MICCA : Support efforts in developing country agriculture to contribute to mitigation by providing evidence, on mitigation from adopting climate smart agriculture practices. Includes
   - Global GHG assessment from agriculture
   - Pilot project based activities

4) FAO-ADAPT: incorporates adaptation into FAO-wide programs; to work with developing country partners on adaptation planning in agriculture

Thank you!