



Economic and Impact Analysis of Conservation Agriculture Practices

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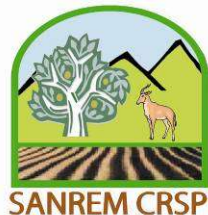
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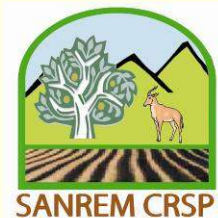
Outline of presentation

- Overview of CAPS economic issues
- Initial approach for economic and environmental impact analyses



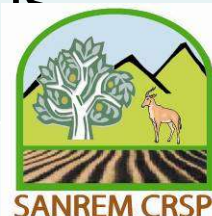
Purpose of economic and impact analyses of conservation agriculture practices on SANREM

- Identify field- and farm-level production systems and sequencing of CAPS elements to maximize net benefits to smallholders, minimize risks, and maximize adoption.
- Assess broader economic and environmental impacts of CAPS



Potential CAPS Short-Term Benefits and Costs

Benefits	Costs
Time: land preparation (gender implications)	Time: weeding (gender implications)
Reduced drought risk (yields/food security)	Herbicides / Soil amendments
Erosion control	Specialized equipment
	Livestock control
	Risk/uncertainly involving new, complex, integrated management systems



Potential CAPS Longer-Term Benefits and Costs (continued)

Benefits	Costs
Time: land preparation (gender implications)	Specialized equipment
Reduced drought risk (yields/food security)	New pests
Erosion control	
Time: Reduced weeding (gender implications)	
Increased productivity (yields/income/food security)	



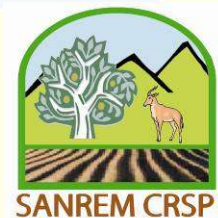
Potential CAPS Longer-Term Benefits and Costs (continued)

Benefits

Ecosystem Services

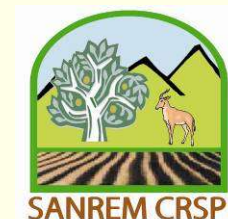
- Carbon sequestration
- Reduced stream siltation/pollution
- Recharged aquifers
- Increased biodiversity
- Others

Costs



Economic Questions Include:

- What are the costs and benefits of CAPS in cropping systems/practices and related animal and forestry sub-systems?
- What are the “optimal” systems and is there an optimal sequencing of CAPS elements?
- What are the broader economic and environmental impacts of wide-scale CAPS adoption?
- What policy or other changes are required to bring about CAPS changes?



Approach

- Work with regional programs to identify farming systems and CAPS elements to be assessed
- Design farm-level optimization model for these systems.
- Collect data for model by region
- Validate model



Linear programming

- Model will maximize (a) net economic benefits to small holders and (b) environmental benefits of the farming systems (using multi-period models)
- Will explore implications of varying weights on the two goals and of changing policies
- Aggregation to market level will involve simple multiplication by number of farms and hectares affected (will ignore price effects)



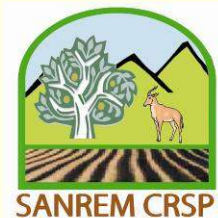
Data needs from LTRAs

- Biophysical and socioeconomic characterization of main production systems in targeted regions (cropping, livestock, forestry subsystems)



Data needs (continued)

- For each CAPS field trial or intervention:
 - Changes in yields
 - Changes in input use (purchased or provided including family and other labor)
 - Changes in biophysical factors such as erosion, soil & water quality



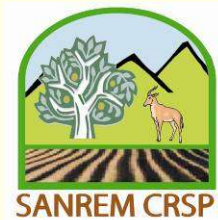
Data needs (continued)

- Data should be collected periodically on:
 - Changes in quantities marketed/consumed by collaborating households
 - Changes in market conditions/ prices
 - Changes in land use conditions
 - Changes in incomes of target group



Sequencing of regions

- All regions should begin collecting data as part of normal research process
- Region(s) modeled first will depend on LTR progress
- Tentatively, will begin with Latin America and West Africa



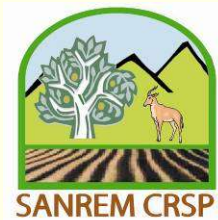
Assessing broader economic and environmental benefits

- As project progresses will assess adoption of CAPs and aggregate benefits
- In addition to economic assessment, we will explore benefits associated with ecosystem services
 - In the LP model
 - Placing monetary value on the services



Conclusion

- Impact assessment theme will work closely with LTRAs to help assess optimal farming systems and economic and environmental impacts of CAPS
- We appreciate the collaboration





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