

CLIMATE-SMART  
**Agriculture**  
2015



Global Science Conference

March 16-18, 2015  
Le Corum, Montpellier France

# Prioritizing and evaluating climate-smart practices and services

B Campbell,  
C Corner-Dolloff, E Girvetz,  
T Rosenstock and many  
others (CGIAR)



RESEARCH PROGRAM ON  
**Climate Change,  
Agriculture and  
Food Security**



Montpellier

March 16-18, 2015

# Outline

- Introduction – tradeoffs & context specificity
- “CSA-Plan” - 4-step set of planning and implementation tools
  - CSA Country Profiles
  - Prioritization in Guatemala, Mali, Viet Nam
  - Implementation in Africa
- Conclusions

# Compendium of CSA practices

## 65 practices/22 indicators

Photo:  
K. Tully



**Key word search**

144,567  
papers

**Abstract/title review**

16,254  
papers

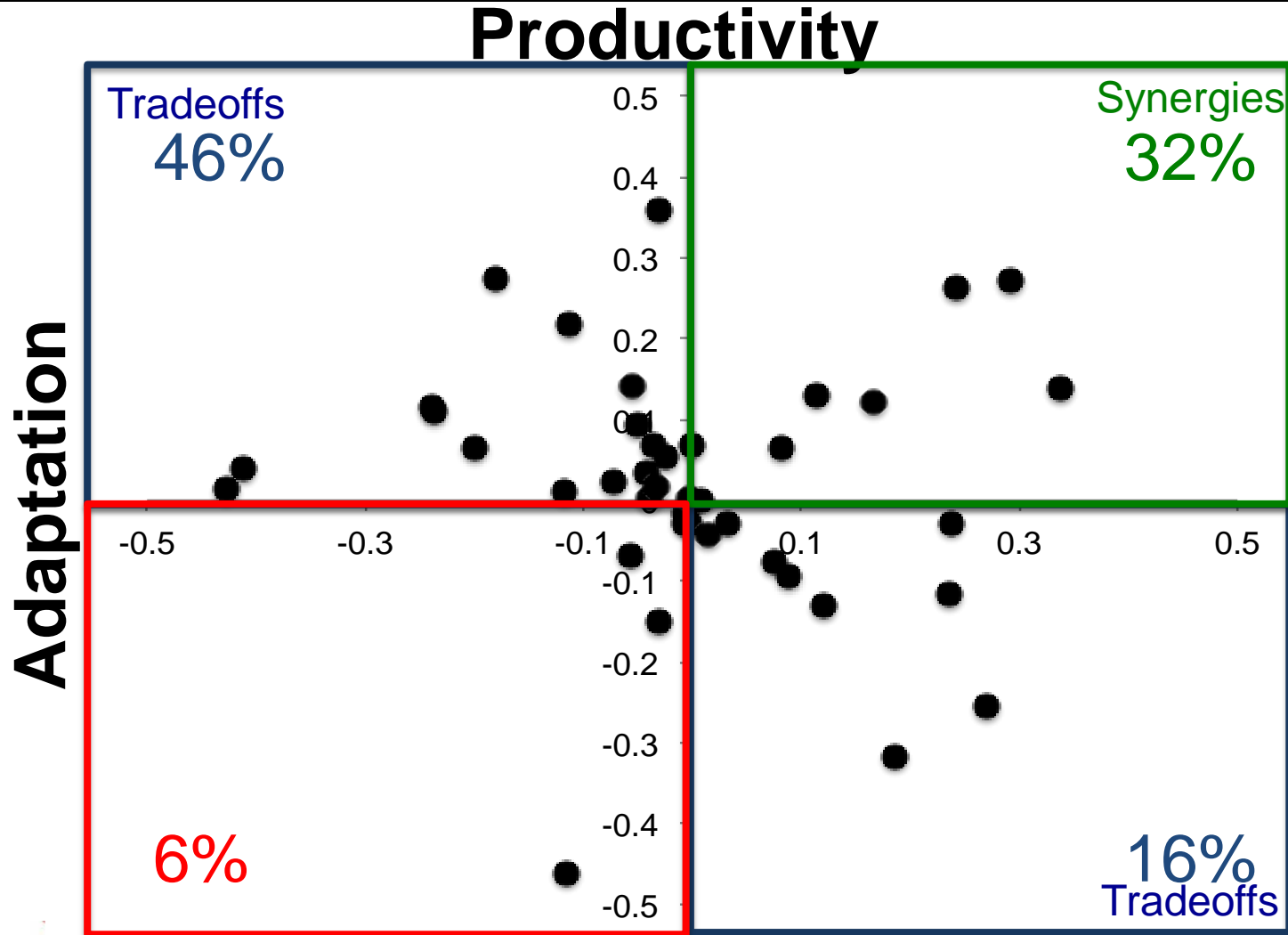
**Full text review**

6,100  
papers

**Data extraction**

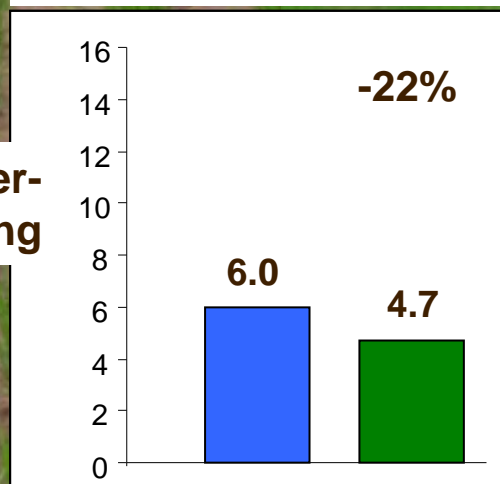
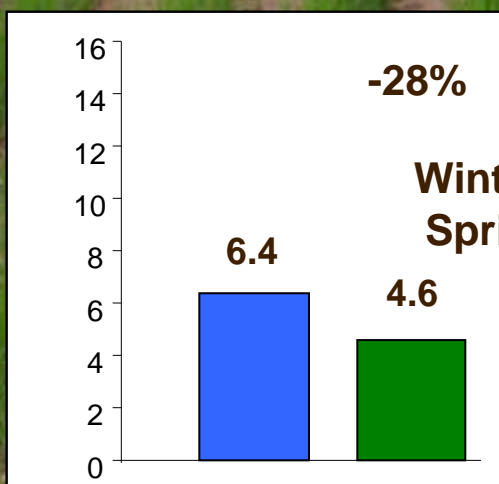
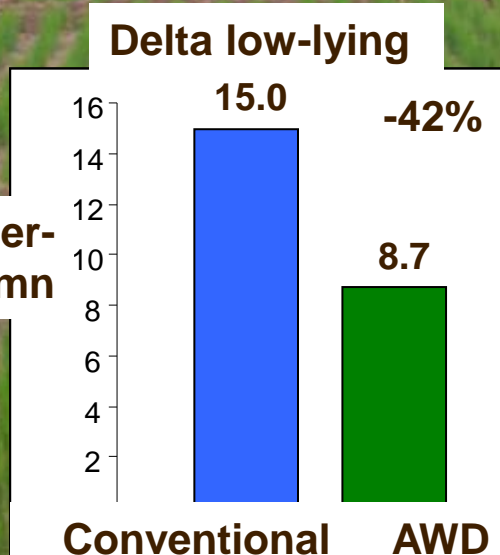
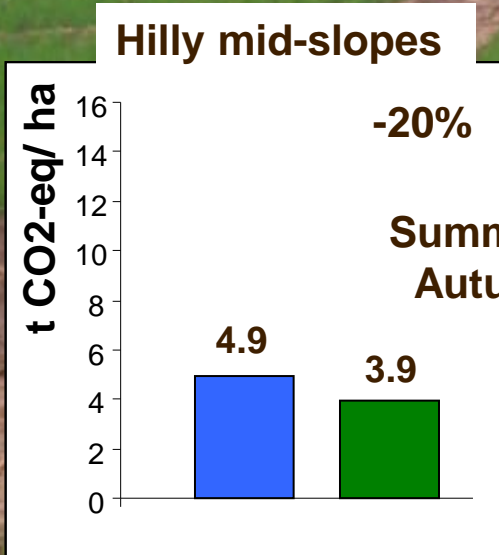
~120,000 data points

# Synergies and tradeoffs between food security and adaptation with CSA



Mean effect from random sample of 130 studies (55 comparisons)

# Alternate-Wetting-and-Drying (AWD)



- Keep flooded for 1<sup>st</sup> 15 days and at flowering
- Irrigate when water drops to 15 cm below the surface

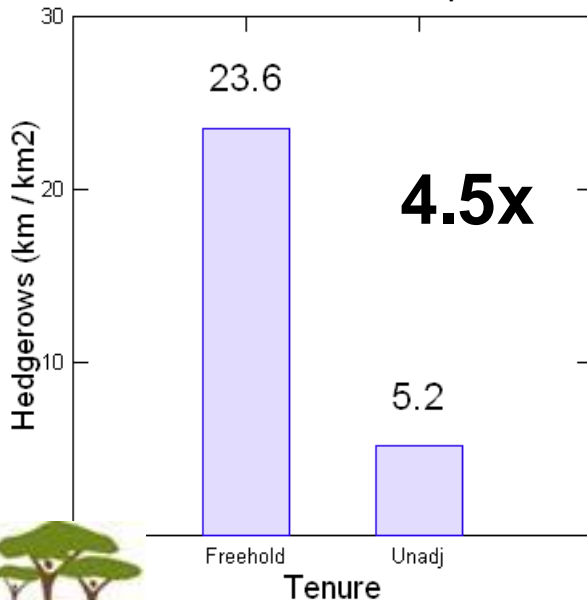
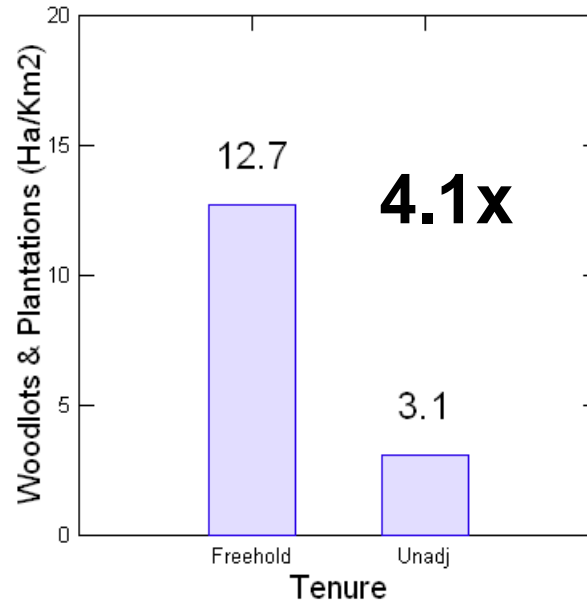
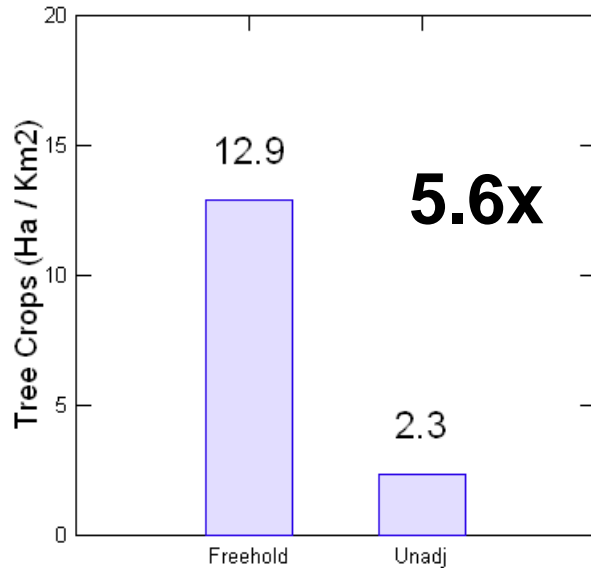



30% water

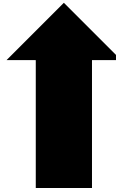
20-50% GHG

Without compromising yield

# Agroforestry: Integrating trees on farms




**Diversified livelihoods, as much as 5 additional uses**


**Carbon**

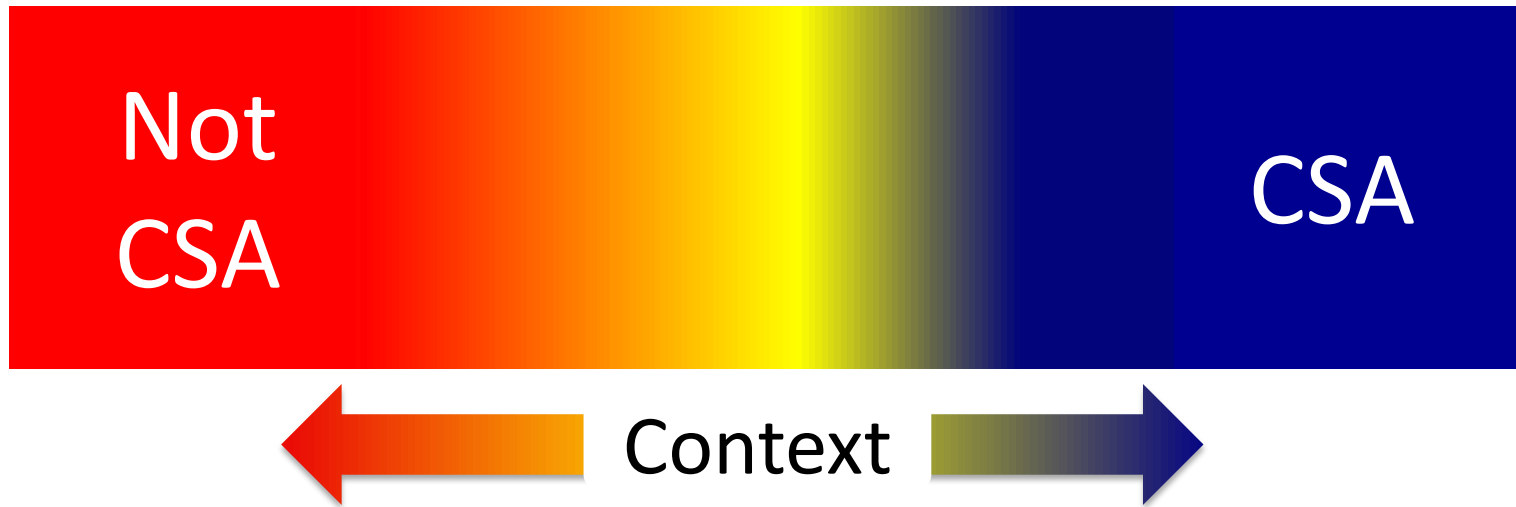
*Reppin in prep*

|  | Unadjud? | Freehold? | Tenure Effect? |
|--|----------|-----------|----------------|
| Net returns to land (\$ha <sup>-1</sup> y <sup>-1</sup> )? | \$126?   | \$288?    | 2.28?          |
| Woody crops, woodlots etc (ha km <sup>-2</sup> )?          | 5.4?     | 25.6?     | 4.7?           |

?



# No blanket recommendations



Many practices/programs/policies can  
be **CSA somewhere**

But **none** are likely CSA everywhere

# Global Alliance CSA: 500 million smallholders

## AU-NEPAD: 25 million smallholders

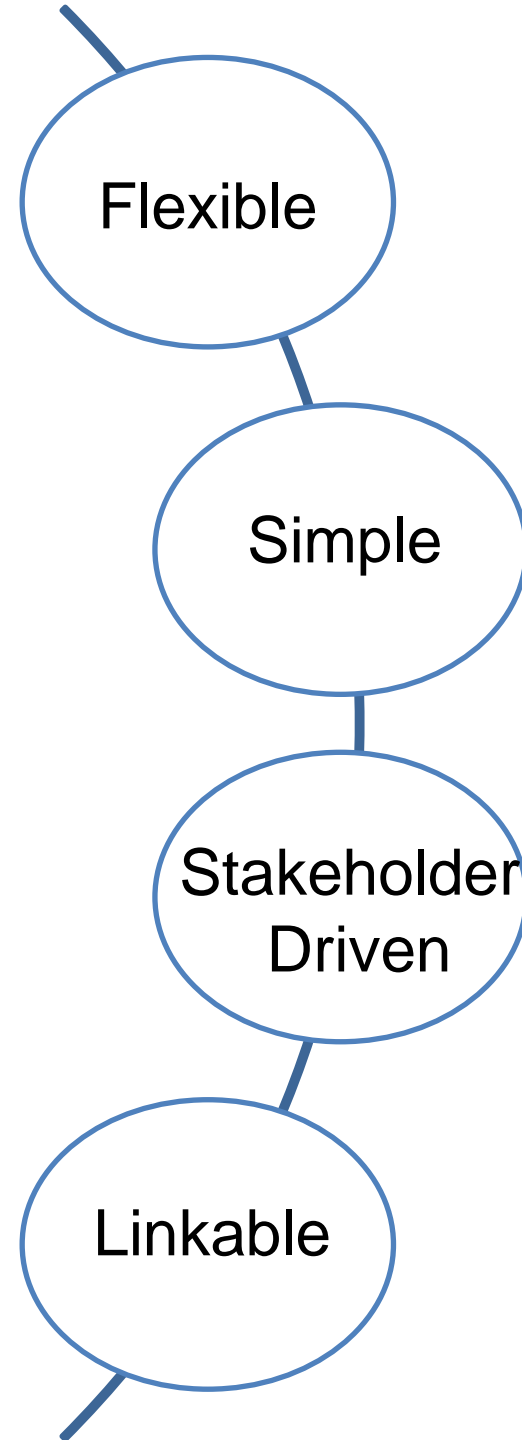


Photo:  
Neil Palmer (CIAT)



# CSA-Plan:

A multi-step planning and implementation guide to scaling CSA



# CSA-Plan

**Engagement**

## Situation Analysis

Risks and Enabling Conditions

**Vulnerability & Impacts + Readiness**

**Stocktaking  
for CSA  
Action**

## Targeting & Prioritizing

Practices, Programs and Policies

**Trade-offs & Value for Money**

**CSA  
Investment  
Portfolios**

## Programing Design

Guidelines & Implementation

**Knowledge into Action**

**Taking CSA  
to Scale**

## Monitoring and Evaluation

Across Scales and Systems

**Evidence Based Results Framework**

**Learning  
from  
Experience**

**Capacity development**

## Situation Analysis Risks and Enabling Conditions

### Vulnerability & Impacts + Readiness

## Stocktaking for CSA Action

- Indicators & targets to achieve
- Agricultural snapshot
- Future climate impacts
- Ongoing & promising CSA practices
- Institutions & policy entry points
- Finance mechanism

### Climate-Smart Agriculture in Colombia

**Climate-smart agriculture (CSA) considerations**

- CSA is already being practiced in Colombia, but these practices are often implemented unsystematically or have generally low adoption rates. There are a variety of practices that could increase the climate smartness of landscapes and the agricultural sector if taken to scale.
- Scaling up investments in agricultural research and development (RD), which is currently only 0.2% of the gross domestic product (GDP), would foster innovation. This includes investment in science and technology research and extension, and education and training, as well as support for farmers organizations and associated local institutions.
- Planning processes with a focus on sub-national and local levels are needed to analyze the agro-climatic risks, to identify the most promising CSA practices, and to implement adaptation and mitigation responses. Assistance from public institutions is needed to help producers overcoming barriers to adoption.
- Livestocks are a major source of GHG emissions for Colombia. There is potential for scaling CSA options, such as improved pastures and silvopastoral systems, across 2 million hectares, which would mitigate climate change, improve livelihoods, and create sustainable landscapes, and should therefore be given priority status.
- Efficient use of nitrogen fertilizers in rice and maize, is an important mitigation opportunity.

**Adaptation** **Mitigation** **Productivity**  
**Institutions** **Finance**

The climate-smart agriculture (CSA) concept reflects an ambition to improve the integration of agriculture development and climate responsiveness. It aims to achieve food security and broader development goals under a changing climate and increasing food demand. CSA initiatives sustainably increase productivity, enhance resilience, and reduce/remove greenhouse gases (GHGs), and require planning to address tradeoffs and synergies between these three pillars: productivity, adaptation, and mitigation (1). The priorities of different countries and stakeholders are reflected to achieve more efficient, effective, and equitable food systems that address ch and economic dimension. While the concept is practices that make up CSA used by farmers to cope Mainstreaming CSA requires financial enablers for provides a snapshot of initiate discussion, both entry points for investing

1. REDD+ Global Platform Programme for Restoring Emissions from Deforestation and Forest Degradation management of forests and enhancement of forest carbon stocks.

**WORLD BANK GROUP** **CGIAR** **RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security** **CCAFS** **CGIAR**

### Selected Practices for each Production System with High Climate Smartness

The graph shows the smartest CSA practices for each of the key production systems in Colombia. Both ongoing and potentially applicable practices are displayed, and practices of high interest for further investigation or scaling out are noted. Climate smartness is ranked from 1 (low) to 5 (high) based on impact in category to 5 (very high positive impact in category).

**Table 1. Detailed smartness assessment for top ongoing CSA practices by production system as implemented in Colombia.<sup>7</sup>**

The assessment of a practice's climate smartness uses the average of the rankings for each of the six smartness categories: weather, water, carbon, nitrogen, energy, and knowledge. Smartness categories emphasize the integrated components related to achieving increased adaptation, mitigation, and productivity.

| CSA Practice   | Climate Smartness | Adaptation   | Mitigation   | Productivity   |
|--|-------------------|--|--|--|
| <b>Conservation agriculture</b><br>• Low adoption (<30%)               | 4                 | Greater water retention in the soil avoids crop loss during dry periods.                         | Higher carbon in soils, reduced nitrogen loss.                               | Enhanced yields reported in specific contexts.                 |
| <b>Clean maize</b><br>• Low adoption (<30%)                            | 4                 | Greater water retention in the soil avoids crop loss during dry periods.                         | Enhanced carbon in soil.   | Organic inputs can enhance productivity.                       |
| <b>Agroforestry</b><br>• Low adoption (<30%)                           | 4                 | Regulation of canopy temperature and increased soil moisture maintains yield during dry periods. | Increased carbon sequestration and carbon storage from greater tree density. | Diversified livelihoods, but no significant benefits reported. |
| <b>Good agricultural practices (GAP)</b><br>• Medium adoption (30-60%) | 4                 | Greater yield stability despite climate variability.   | Improved efficiency in fertilizer use reduces nitrogen emissions.            | Enhanced yields reported.                                      |

<sup>7</sup> See Annexes V and VI.

Climate-Smart Agriculture in Colombia 5

# CSA-Plan

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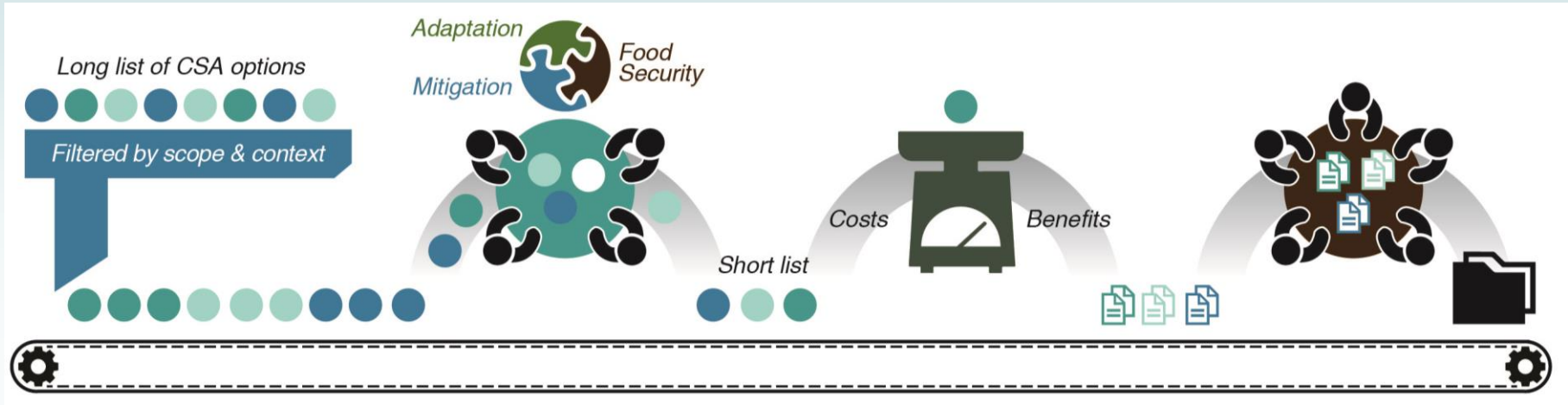
Targeting & Prioritizing  
Practices, Programs and Policies

Trade-offs & Value for Money

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Investment  
Portfolios

# Prioritization

## Action Research Methodology



### ➔ Results

Ranked **long list** of CSA practices

### ➔ Results

- **Short list** of priority practices and programs
- Stakeholder selection via **workshops**

### ➔ Results

Ranked short list based on **economic analysis**

### ➔ Results

- **CSA investment portfolios**
- Identified opportunities and constraints

# Prioritization in action

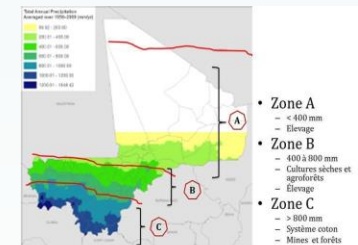
## Guatemala Ministry of Agriculture, Livestock, and Food

- 'Dry corridor' - severe drought in 2014
- Objectives
  - Assess and validate the previously incentivized practices from food for work program
  - Prioritize practices for promotion by government extension.



## Mali National Science Policy Dialogue Platform

- Three zones prioritized – cc impact, production systems
- Objectives:
  - Create technical info for farmers
  - Cross-ministerial CSA programs to incentivize adoption & investment



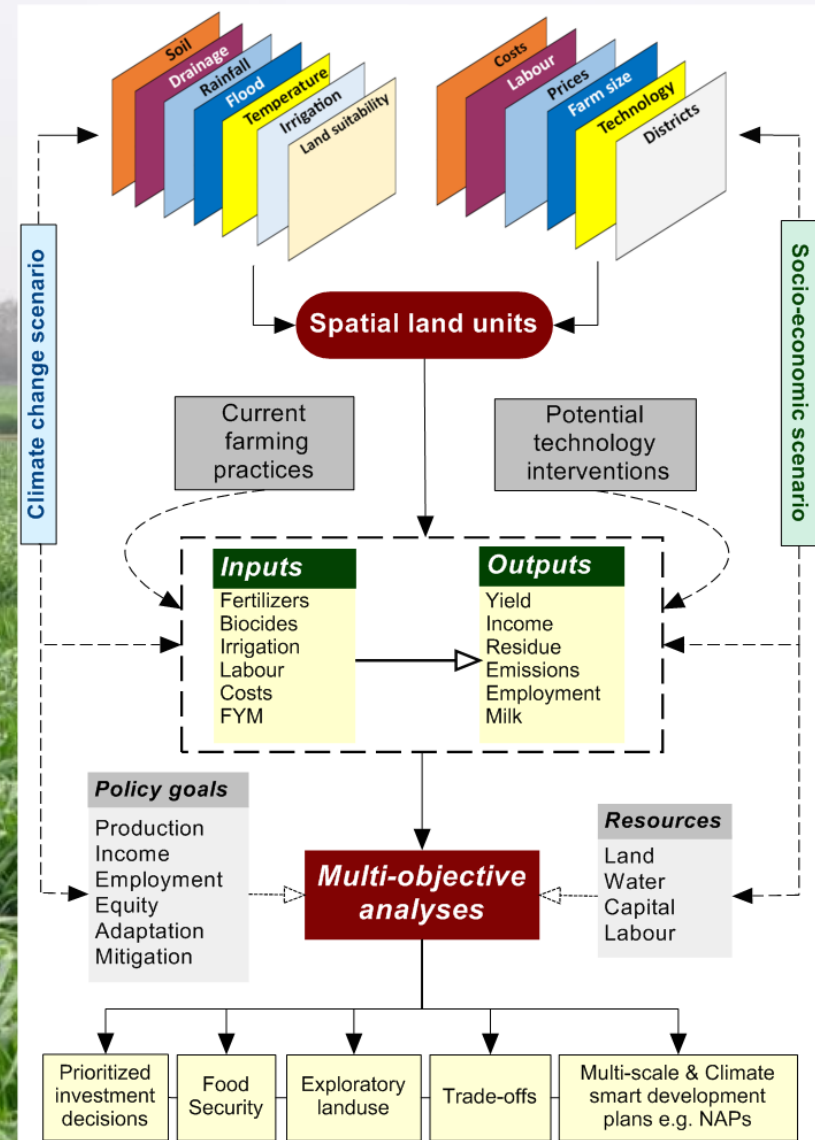
## Colombia Local organization: Foundation Rio Las Piedras

- Objectives:
  - Evaluate ongoing CSA practices
  - Improve existing practices
  - Create programs to scale up high outcome practices



# Multiple prioritization tools

- Spatially explicit
- Integrated modeling framework
- Climatic and socio-economic scenarios
- Supports multi-objective trade-off analyses



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## Programming Design

Guidelines & Implementation

Knowledge into Action

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to Scale

- CSA Toolbox
- Decision trees
- Business models



# CSA-Plan

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Learning  
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Experience

# Indicators and metrics

## A Monitoring Instrument for Resilience

Working Paper No. 96

CGIAR Research Program on Climate Change,  
Agriculture and Food Security (CCAFS)

Terry Hills  
Emilia Pramova  
Henry Neufeldt  
Polly Ericksen  
Philip Thornton  
Andrew Noble  
Elizabeth Weight  
Bruce Campbell  
Matthew McCartney



Working Paper

# CSA-Plan

**Engagement**

## **Situation Analysis**

**Risks and Enabling Conditions**

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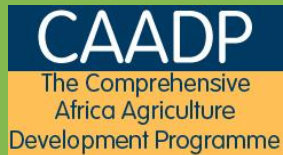
**Learning  
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# CSA Integration Across Scales in Africa



## African Union – New Partnership for African Development



AFRICA  
CSA Alliance

## Regional Economic Communities (RECs)



## National Agricultural Investment Plans (NAIPs)

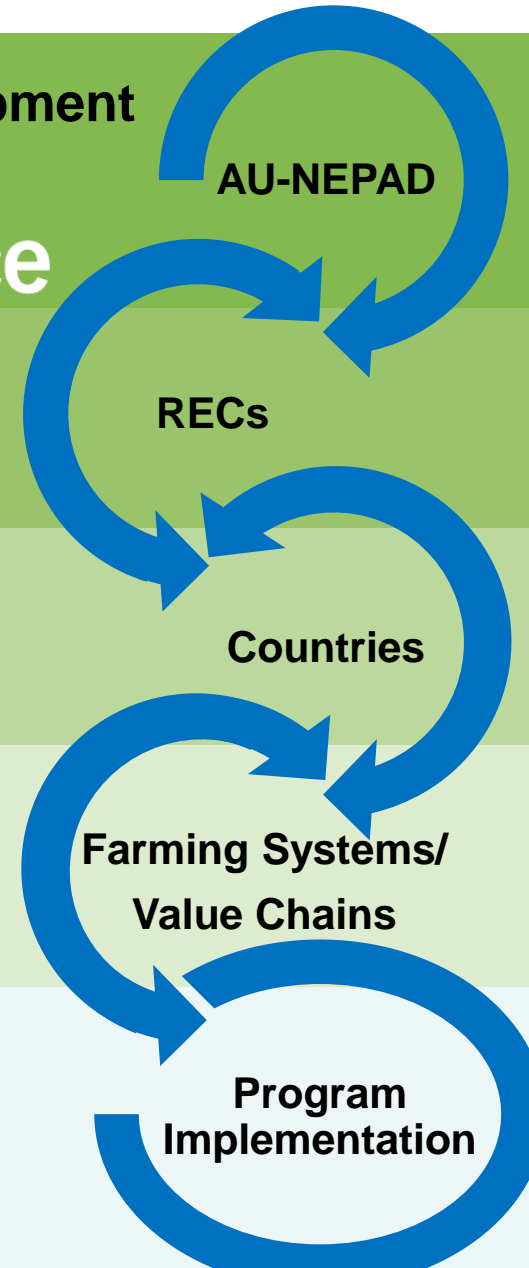
Other National Level Policies (NAPAs/NAPs/NAMAs, etc.)

## Programmatic Investments and Policies

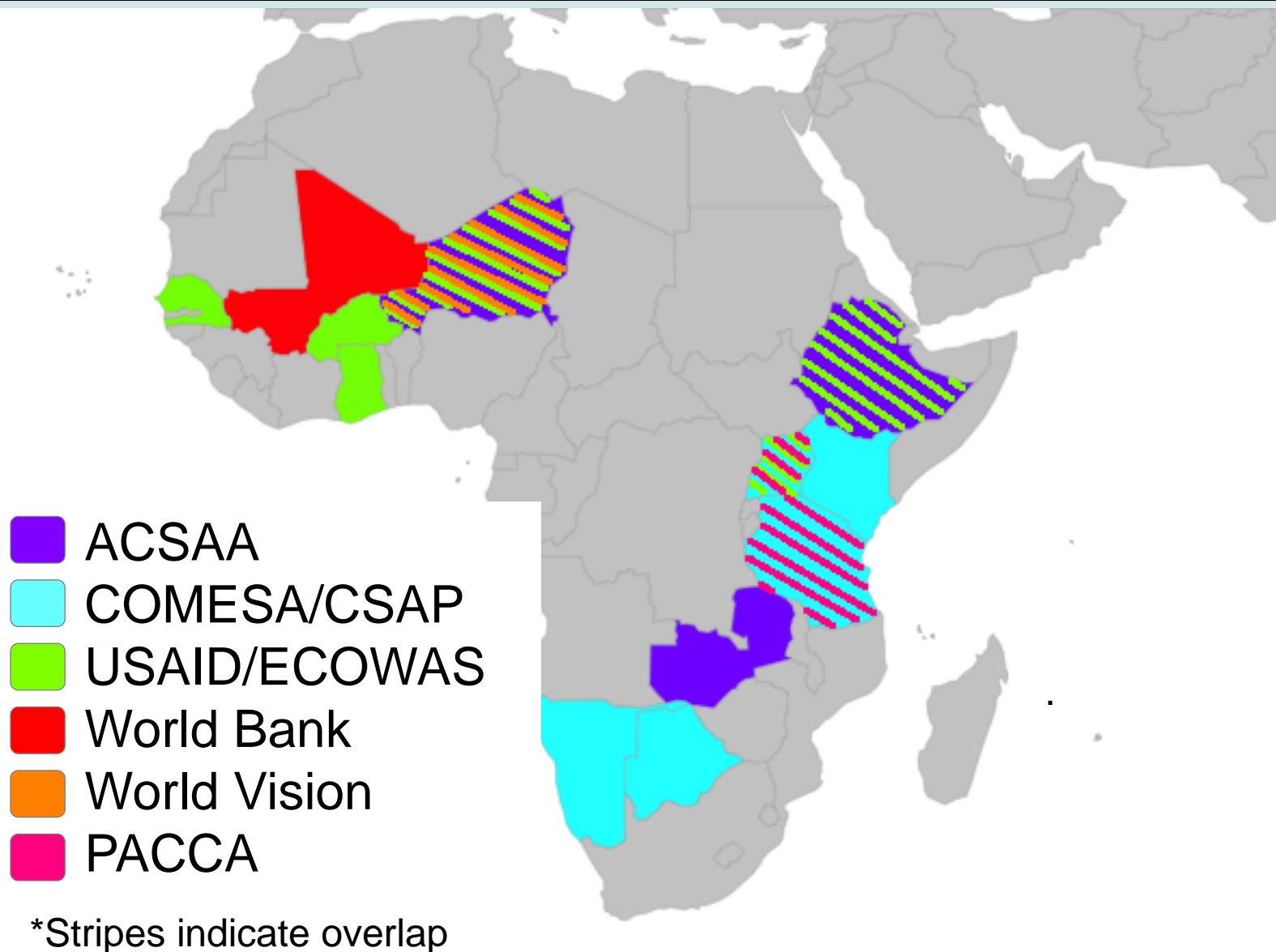
Staple Crops, Cash Crops, Livestock/Dairy, etc.

## CSA Adoption by farmers

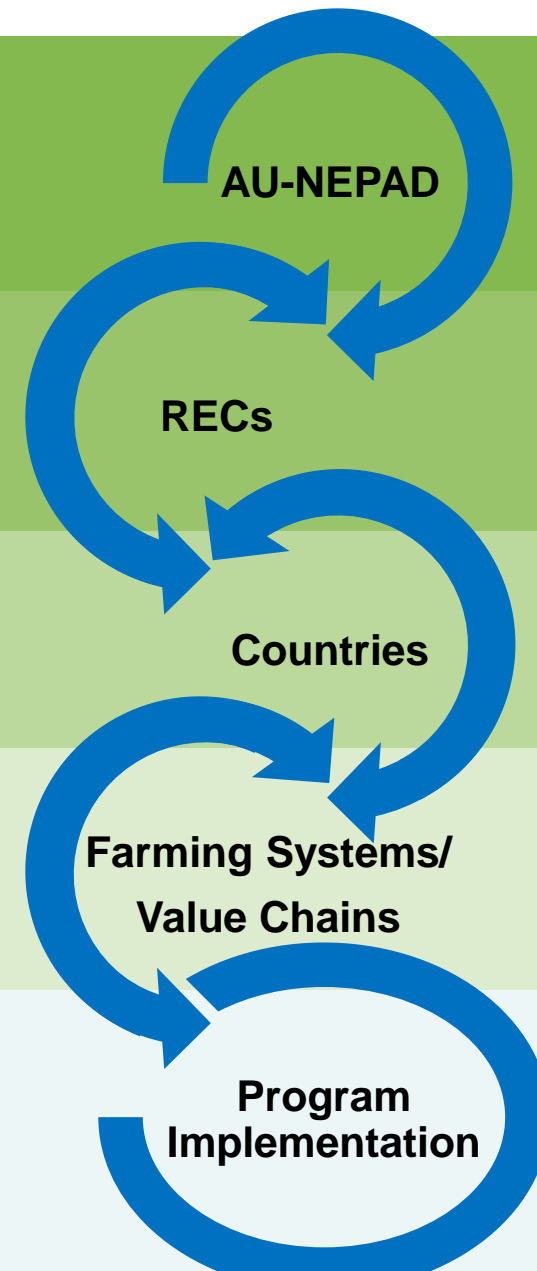
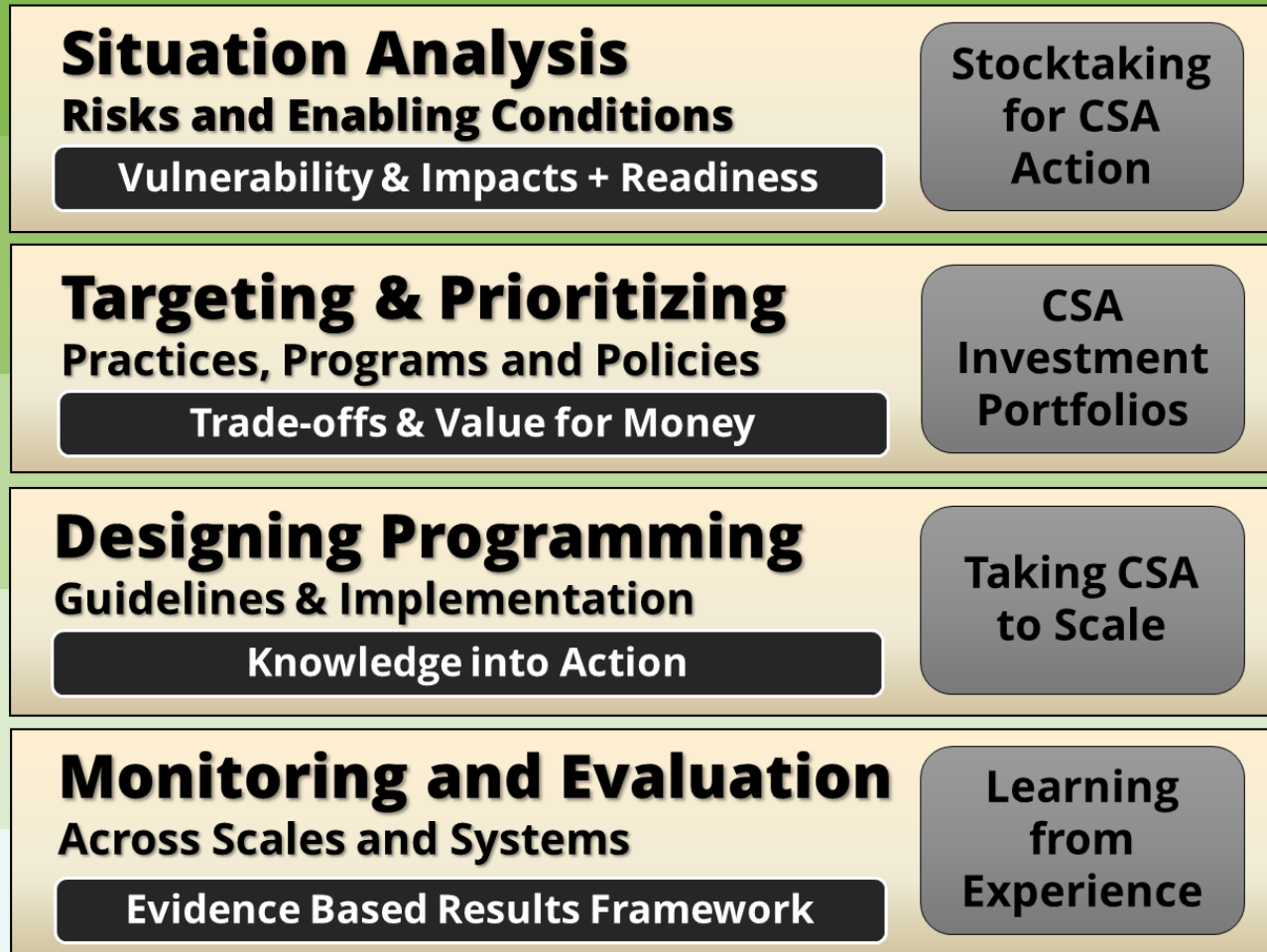
Through development partner implementation



# Current Engagements for Scaling CSA in Africa



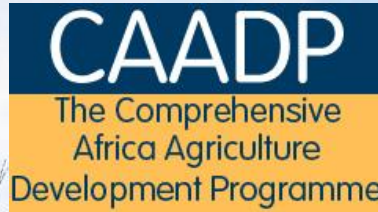
# CSA Integration Across Scales in Africa





# Alliance for CSA in Africa

Empowering 6 million  
smallholder farmers in  
Sub-Saharan African by 2021



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# Thanks!

For more information check out our posters

Tuesday: 38, 42, 59

Wednesday: 59, 126





# Overarching Issues



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Food Security



- Operational Minimum Criteria for being CSA
  - Modified within bounds by RECs & Countries
  - Indicators & criteria chosen at REC/County level
  - MRV or other similar approach
- Links directly to the engagement pathways, strategy, and country engagement plan
- Tools and analyses incorporated from Technical Support Workstream

# Conclusions

- Major investments in CSA coming
- Key challenge: What is CSA for a particular context
- Now testing a set of planning tools in multiple situations
- We can support CSA through deep engagement with non-research stakeholders