PARTNERSHIPS FOR SCALING

CLIMATE SMART AGRICULTURE (P4S - CSA)

Linking experiences between LAM, Africa, & Asia

Caitlin Corner-Dolloff

Climate Change Adaptation Specialist, DAPA

Todd Rosenstock (ICRAF), Evan Girvetz (CIAT), Christine Lamanna (ICRAF), Andreea Nowak (CIAT), Miguel Lizarazo (CCAFS-LAM), Sabrina Chesterman (ICRAF), Constance Neeley (ICRAF)

World Agroforestry Centre

CGIAR

RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security

CCAFS

CIAT

International Center for Tropical Agriculture

Since 1967 *Science to cultivate change*

Outline

1. Climate-Smart Agriculture (CSA) Overview
2. Introduction to Partnerships for Scaling CSA (P4S)
3. CSA-Plan
4. Partnerships for impact

Climate-Smart Agriculture

*"The overall aim …. is to **support efforts***

from the local to global levels

for sustainably using agricultural systems to achieve

***food and nutrition** security for all people at all times,*

*integrating necessary **adaptation,** and*

*capturing potential **mitigation**"*

(where possible and appropriate)

Lipper et al. (2014) *Nature: Climate Change*

- 24 authors from 15 institutions

Compendium of CSA practices
65 practices/35 indicators

Photo:
K. Tully

Key word search

144,567 papers

Abstract/title review

16,254 papers

Full text review

6,100 papers

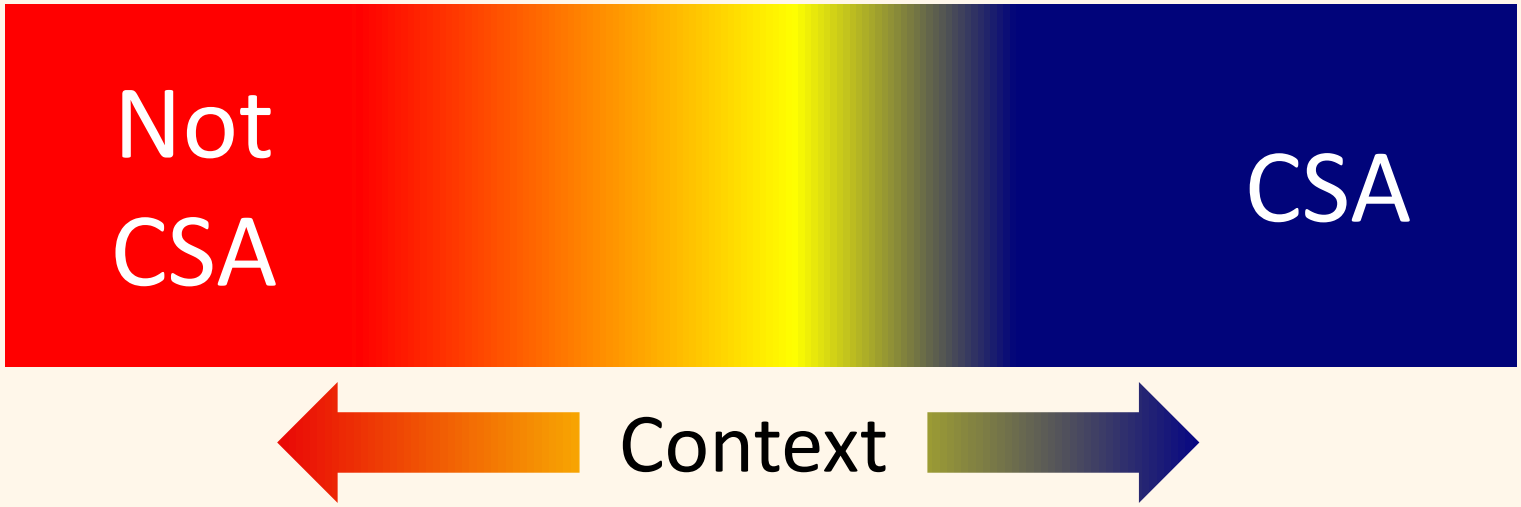
Data extraction

~120,000 data points

World Agroforestry Centre

CIAT
Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture
Consultative Group on International Agricultural Research

No blanket recommendations



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

But **none** are likely CSA everywhere

Rosenstock et al. unpublished

Relative importance among CSA components is context specific

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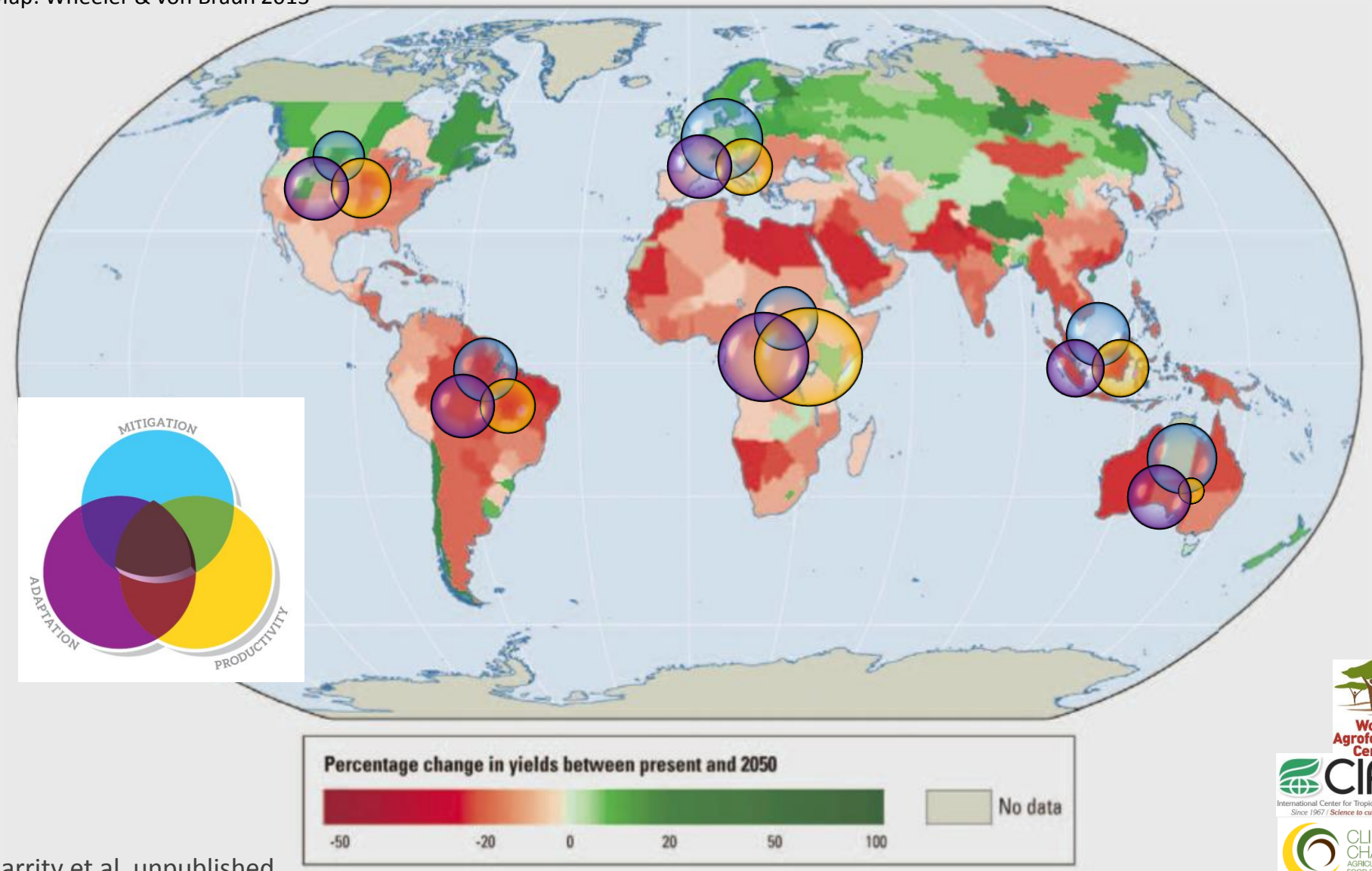
Garrity et al. unpublished

Importance of food security, adaption and mitigation depends on location

Map: Wheeler & von Braun 2013



Garrity et al. unpublished

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CLIMATE CHANGE AGRICULTURE AND FOOD SECURITY

Global momentum building for CSA

GACSA
GLOBAL ALLIANCE FOR CLIMATE-SMART AGRICULTURE

500 million farmers globally

GREEN CLIMATE FUND

CSA one of 5 priority investment areas

West Africa CSA Alliance (WACSAA)

Linking 19 countries

NEPAD TRANSFORMING AFRICA

Vision 25 x 25

Alliance for CSA in Africa

6 million farmers by 2021

Map of a selection of CIAT-ICRAF CSA initiatives with CCAFS, WB, USAID from 2014-2105

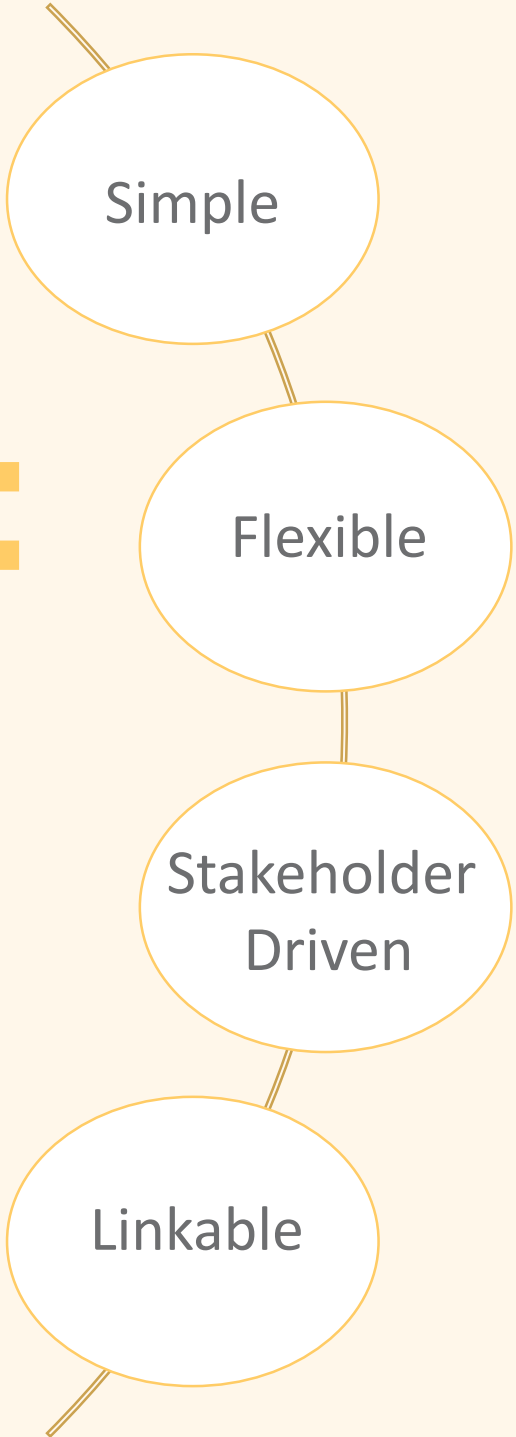
Partnerships for Scaling Climate-Smart Agriculture

- P4S is a CCAFS Flagship 1 Project
- Developing globally applicable frameworks for CSA planning and implementation
  - CSA-Plan methodology
- Focus is on leveraging partnerships in Africa
- Applying methods also in LAM and Asia

P4S

CSA-Plan:

A multi-step planning and implementation guide to scaling CSA



CSA-Plan

P4S

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

CSA-Plan

Situation Analysis

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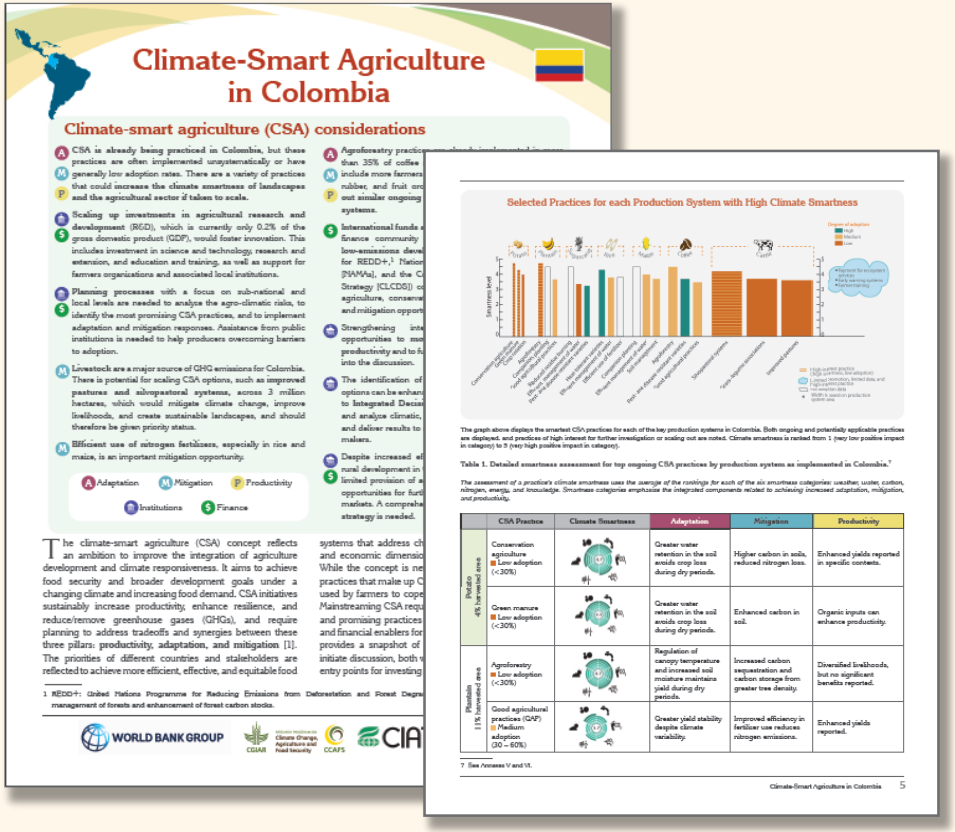
Vulnerability & Impacts + Readiness

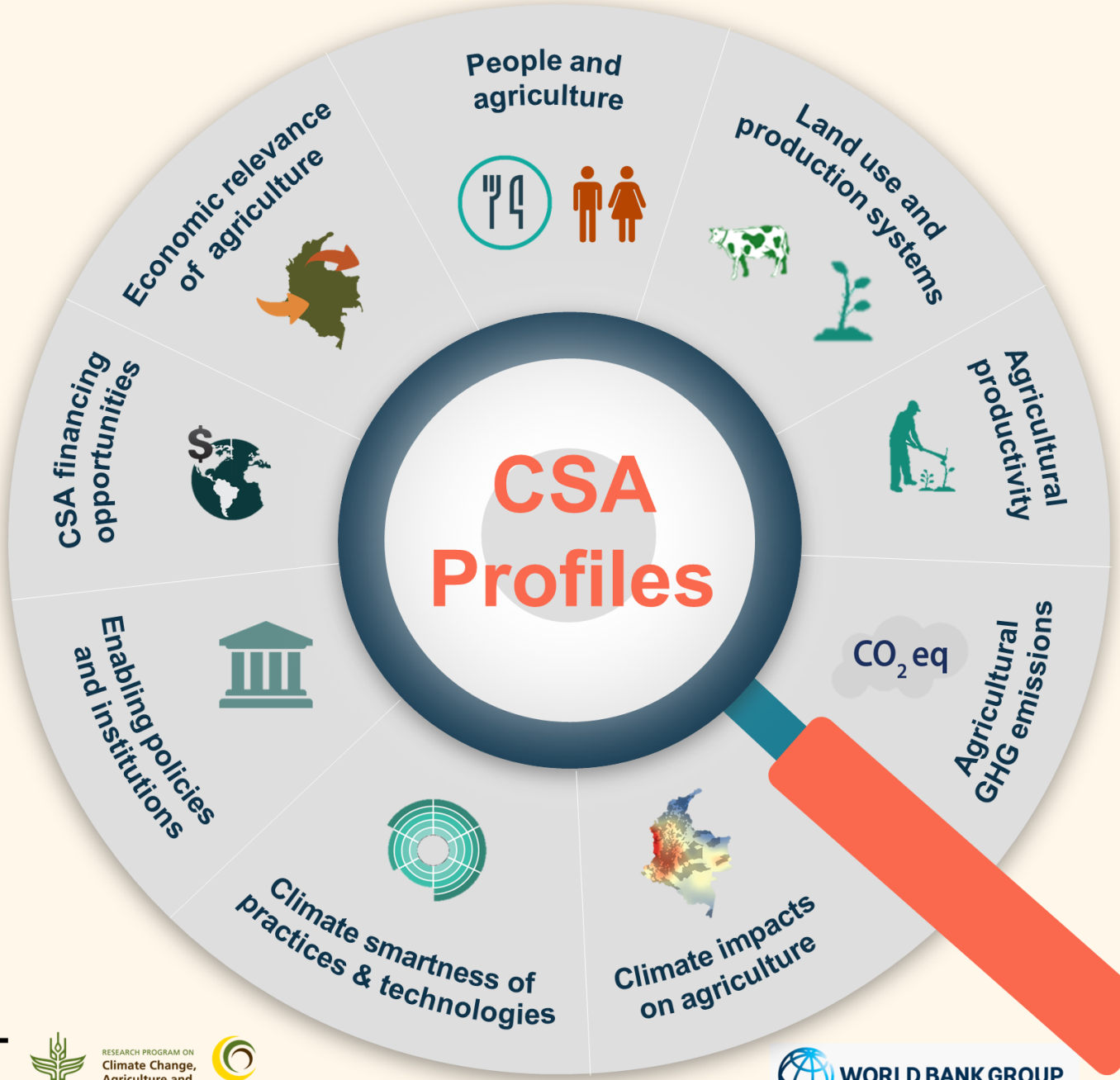
Stocktaking for CSA Action

Provide baselines of existing actions and opportunities for scaling CSA

Highlight entry points for CSA programs and investment



Corner-Dolloff, et. al., 2015



CIAT Centro Internacional de Agricultura Tropical Desde 1967 / Ciencia para cultivar el cambio

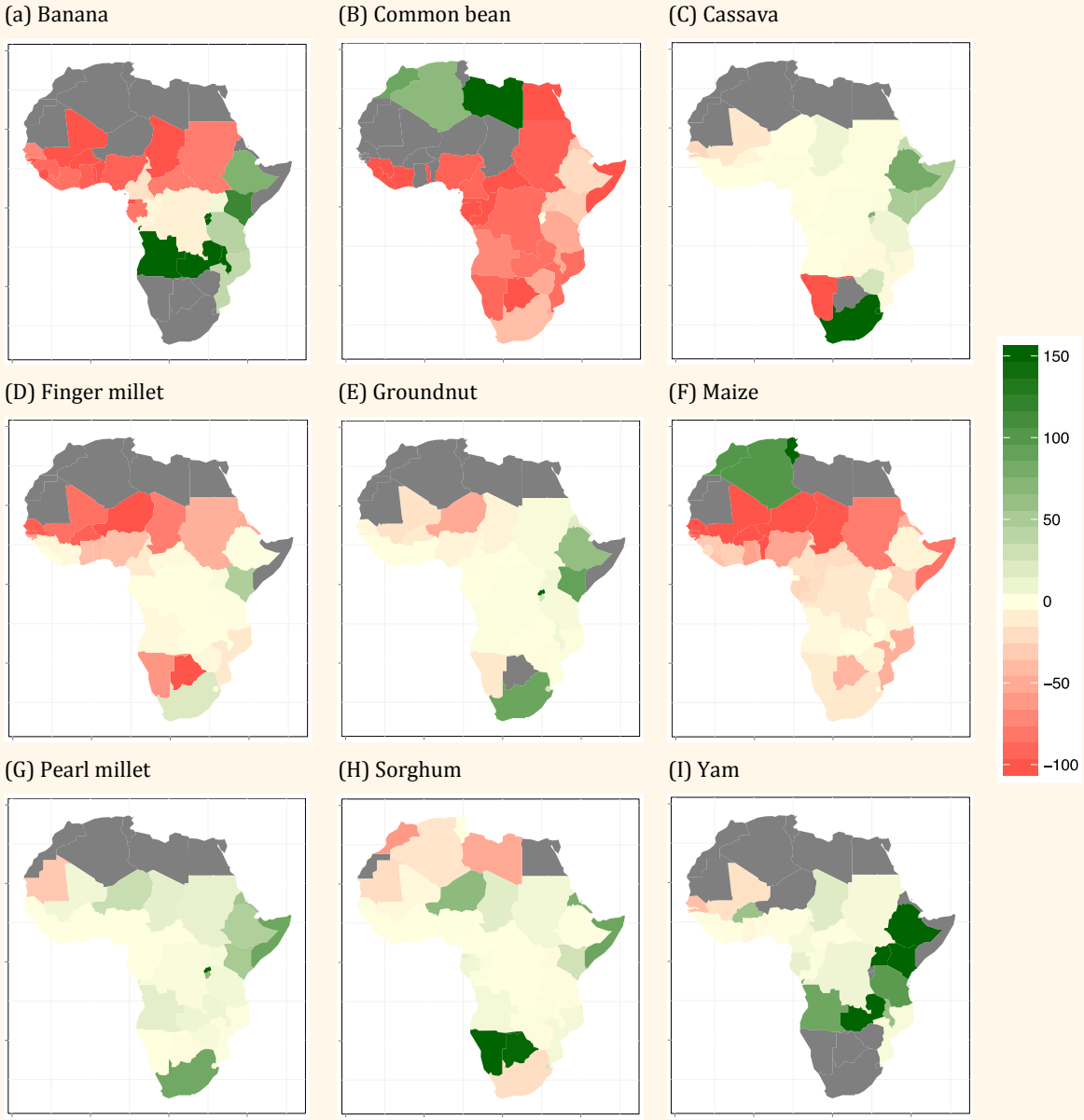
CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security

CCAFS

WORLD BANK GROUP

CATIE Solutions for environment and development Soluciones para el ambiente y desarrollo

Climate (situation) analysis



Percent Area Suitable for 2050 Relative to Historical Period

Climate Change Impacts to Key Crops

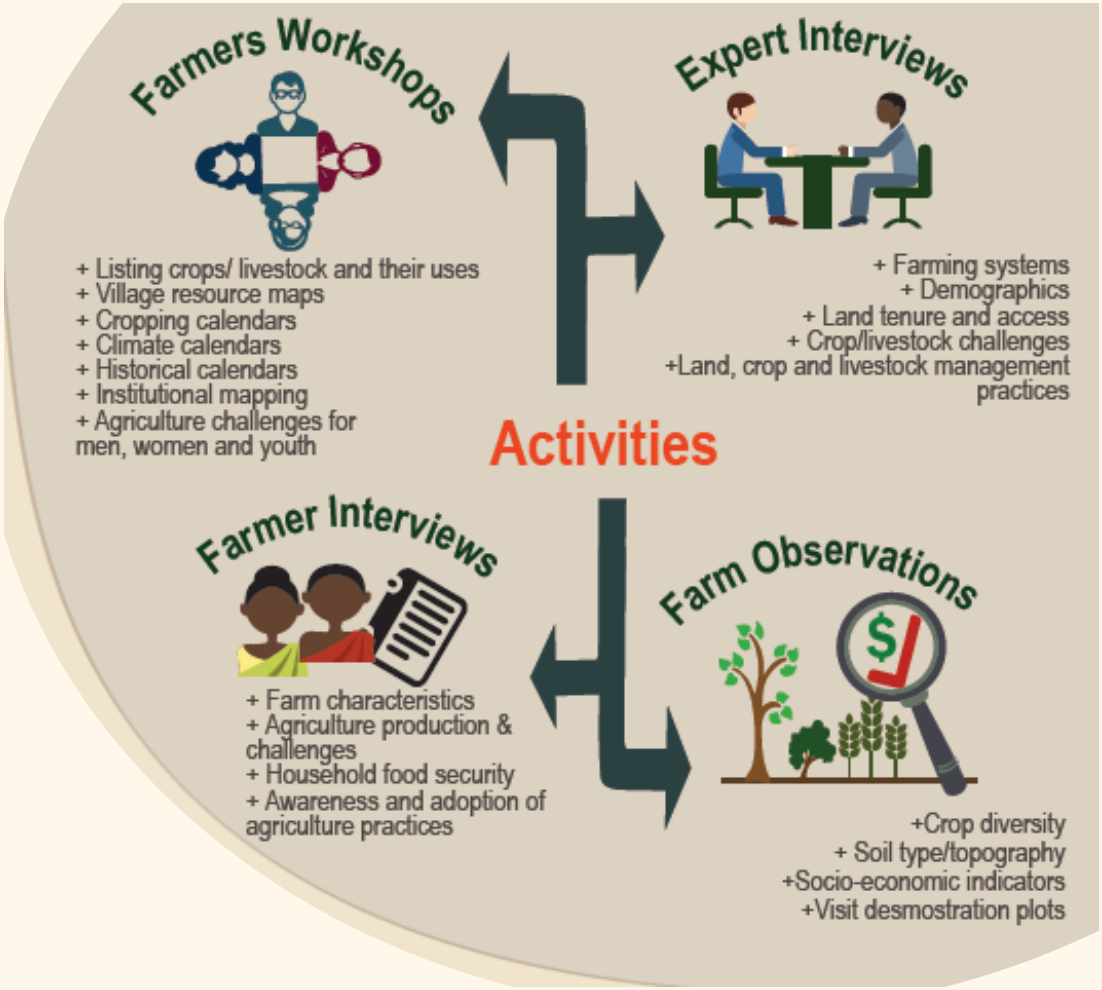
2050

RCP 8.5

Emissions Scenario

Ramirez et al. unpublished

Link with other methods e.g. CSA RAPID



The **CSA Rural Assessment** (CSA-RAPID) was developed as part of an IFAD-funded projected

Inform sub-national investments of the ASAP program

Winowiecki, et al.; Download the CS-RA Manual here: http://dx.doi.org/DVN/28703

CSA-Plan

Situation Analysis
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Stocktaking for CSA Action

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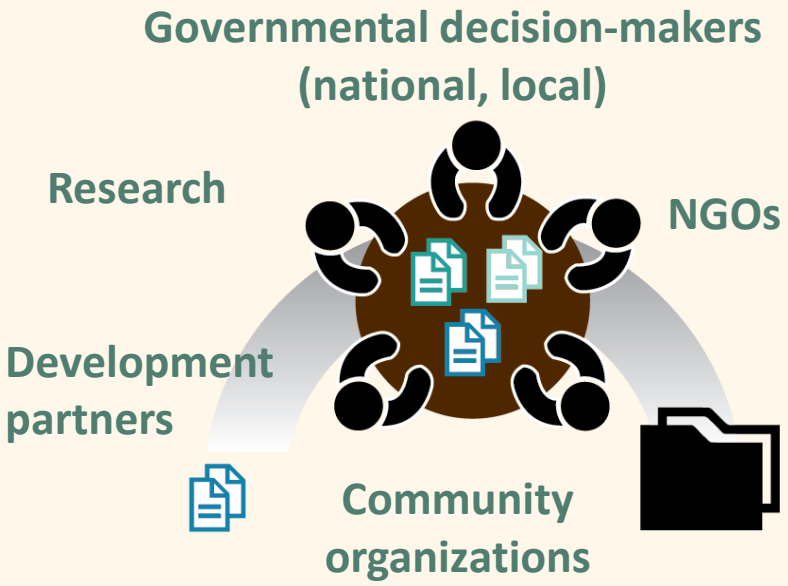
CSA Investment Portfolios

Tool Example:

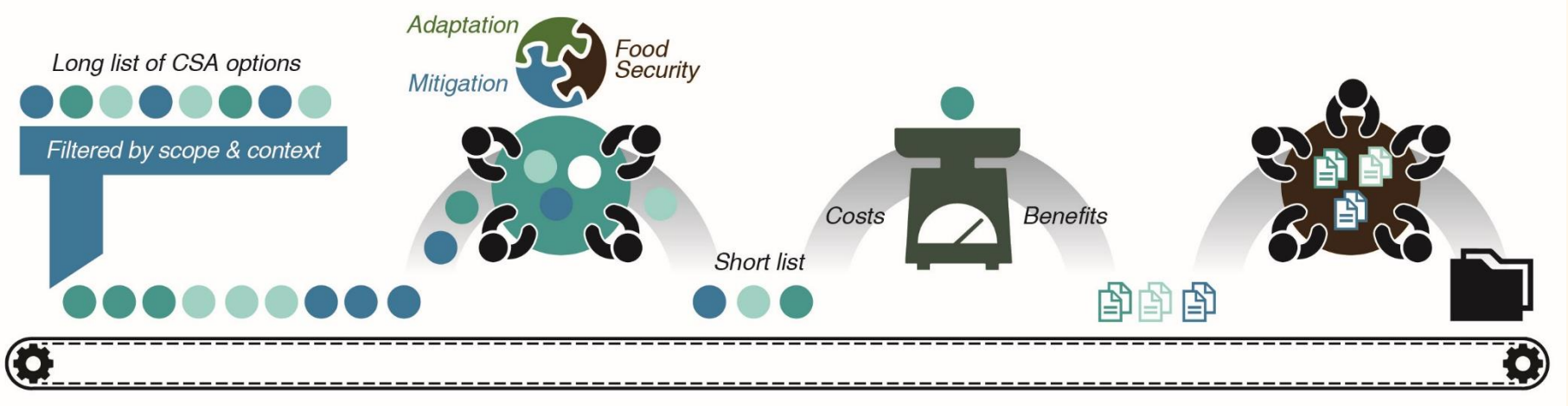
CSA Prioritization Framework

CIAT/CCAFS team: Caitlin Corner-Dolloff, Ana Maria Loboguerrero, Andy Jarvis, Miguel Lizarazo, Andreea Nowak, Nadine Andrieu, Fanny Howland, Osana Bonilla, Deissy Martinez



CSA Prioritization Framework

Filters for selecting CSA investment portfolios



*Analysis of context variables

Long list of CSA practices

*Ex-ante assessment based on CSA indicators

*Stakeholder workshop

Ranked short list of priorities

*Economic analysis – assess costs and benefits

Ranked short list based on CBA

*Integrated analysis of opportunities & constraints

* Stakeholder workshop

CSA investment portfolios

Pilots underway

Guatemala

Mali

Colombia

Vietnam

Prioritization in action

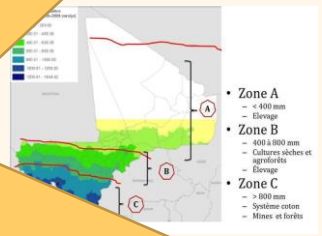
Guatemala

Min. of Agriculture, Liv… …ck, and Food

- 'Dry corridor' - severe drought i… 2014 & 201…
- Assess previously incentivized pr… …s from … …w… …m.
- Prioritize p… …ices for promotio… …rn…

Mali

- Agroeco zones prioritiz…
- Cross-ministerial C…
- Donors (e.…



Colombia

…edras

- Evaluate and improve…
- Create programs t…
- Local participati… …d owners… …ar… …nes

Viet Nam

Min. of …icult… …d Rura… …velopment

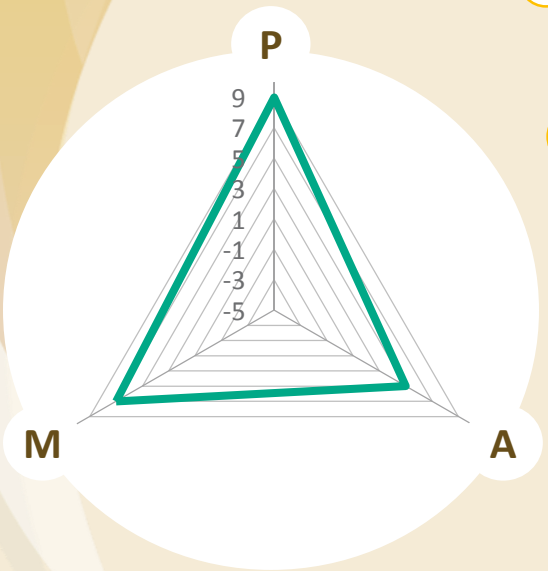
- Identify and evaluate best-best CSA pract… …differentiate… by region
- Promote inclusion of CSA in National CC A… …n Plan
- Strengthen national capacity to evaluate CS… practices

2015 P4S Application:
Ethiopia
Niger
Ghana
(Viet Nam)

Photos: © Neil Palmer/CIAT

Practice name *(Geographic zone prioritized)*

¿What is the impact on CSA pillars?



Nivel de impacto: 10= Muy alto, 0=No efecto, -10 Muy bajo
P: Productividad **A**: Adaptación **M**: Mitigación

P
- ✓ Beneficio A
- ✓ Beneficio B

A
- ✓ Beneficio A
- ✓ Beneficio B

M
- ✓ Beneficio A
- ✓ Beneficio B

1 *What it is?*

Description of the main features of the practice, purpose, particularities to consider for practice implementation in the selected geographical area.

2 *Where can be applied?*

Description of where are the suitable places to implement the practice, for example, where is presented problems of eroded or infertile soils, steep, rainfall excess or shortage, vegetation loss, low biodiversity, shortages of some basic resource like water, food, energy.

3 *When can be applied?*

Here can be mentioned what time of the year is better for practice implementation (months, season), also can be considered any particular phase of the crop cycle.

4 *What practices can be complemtary?*

Here are mentioned other practices that can be related o can be applied together to generate synergies and/or optimize the use of resources.

5 *Crops of interest:*

Here are mentioned the main agricultural production systems (PS) prioritized in the above region, if it applies for other PS is possible to mention as multi-crops

6 *Threats faced*

List the environmental and non-environmental threats or impacts to which the practice seeks deal

7 *What barriers hinder its adoption?*

Institutional, technical, environmental, other?

8 *What opportunities facilitate its adoption?*

Institutional, technical, environmental, other?

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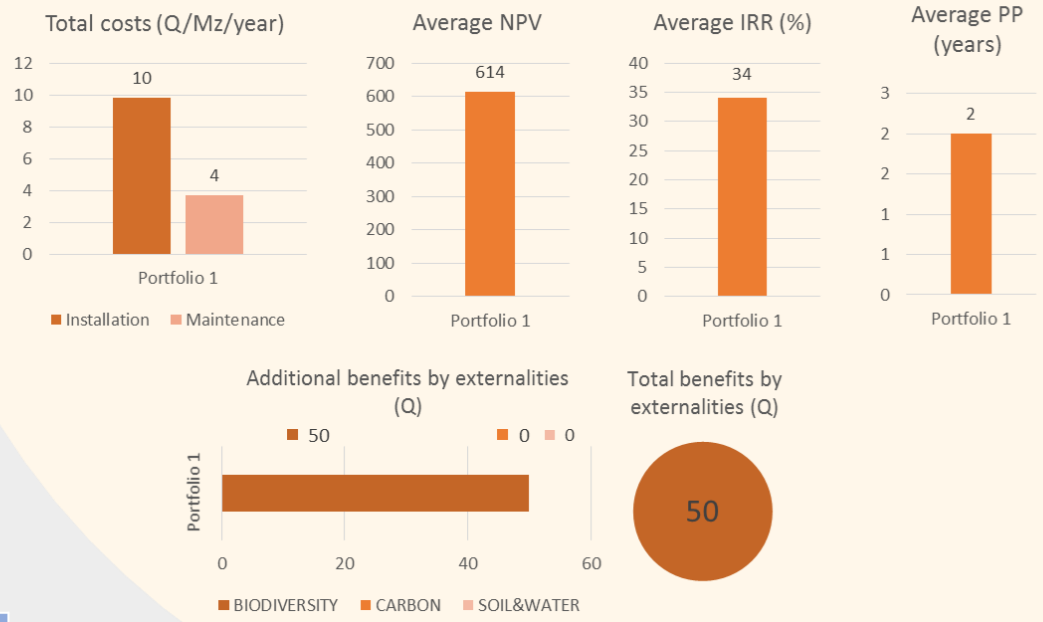
Decision Guides: Evaluating CSA practices

Econ analysis is most highly demanded by decision-makers and donors – data and tools needed to better assess and easily visualize options

Contour trenches *(in the Dry Corridor, Chiquimula y Zacapa)*

1 *Profitability Indicators*

Years	Gross profit expected (Q/Mz)	Costs (Q/Mz)	Net benefits expected (Q/Mz)
1		492	-492
2	363	186	177
3	363	186	177
4	363	186	177
5	363	186	177
6	363	186	177
7	363	186	177
8	363	186	177
9	363	186	177
10	363	186	177
11	363	186	177
12	363		363
	IRR (%)		34
	NPV Q/Mz (12%)		614



2 *Externalities indicators*

Biodiversity	Carbon fixation	Soil and water contamination
Q /Mz/yr	Q /Mz/yr	Q /Mz/yr
50	N/D	N/D

3 *Variation in labor*

Increase in labor (Wages/Mz)		Costs of Wages (Q)	Cost of increased labor (Q/Mz/yr)	
Installation (temporal)	Maintenance (Permanent)		Installation (temporal)	Maintenance (Permanent)
5	2	39	195	78

4 *Basic information*

- Assumption: contour trenches last for 20 years before requiring replacement

a *Implementation scale:*

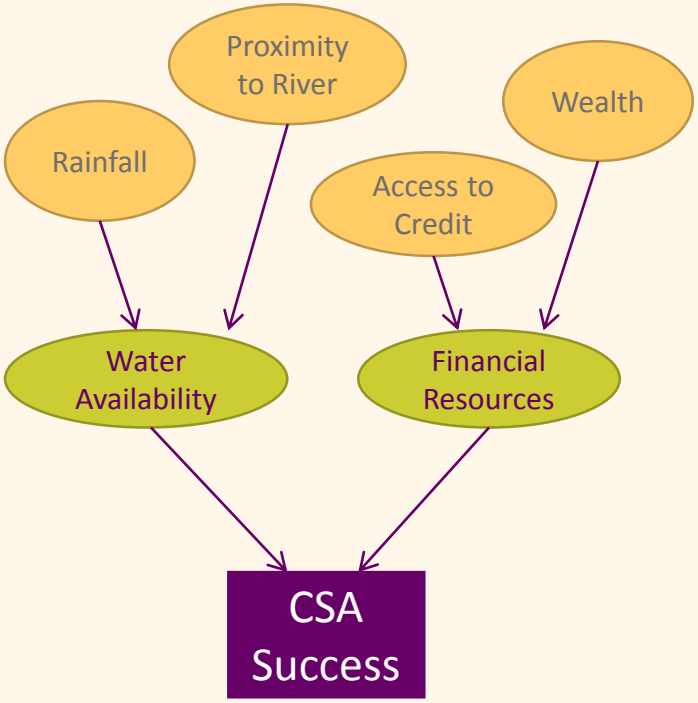
- ✓ On farm
- ❑ Off farm
- ❑ Programmatic (landscape, region, country)

b *Category of the practice*

- ✓ Agronomy
- ❑ Agroforestry
- ❑ Livestock
- ❑ Post-harvest
- ❑ Energy

Bayesian Belief Networks (BBNs)

1. A Network



What is CSA "Success"?

Return on Investment

Productivity

Water Use Efficiency

Adaptive Capacity

Food Security

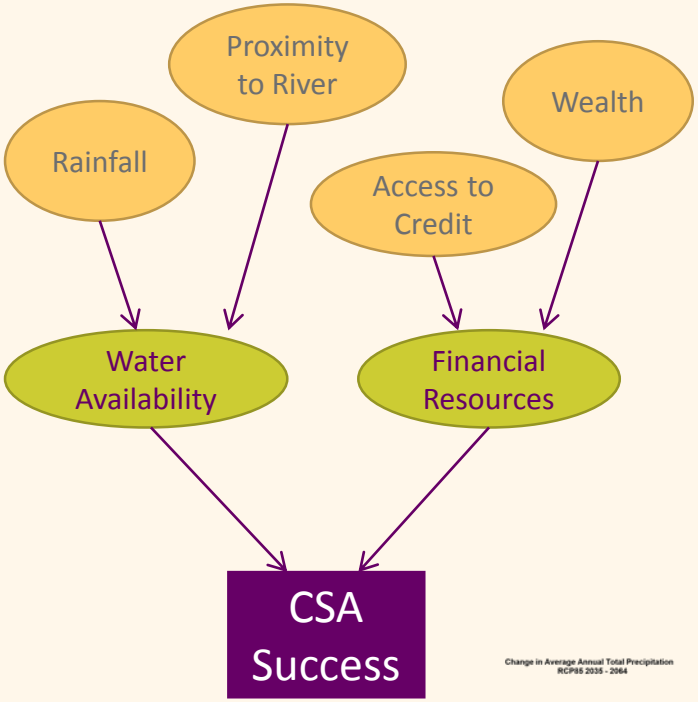
Mitigation

What affects CSA "Success"?

Lamanna, upublished

Bayesian Belief Networks (BBNs)

1. A Network



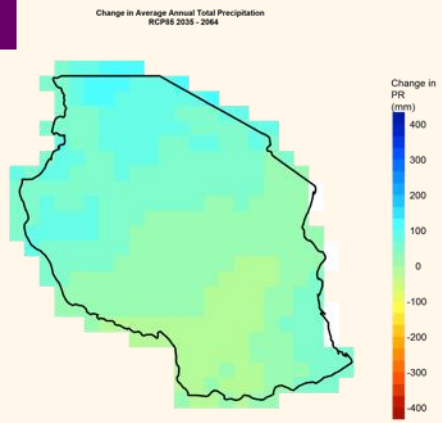
2. Relative Importance
(Conditional Probabilities)

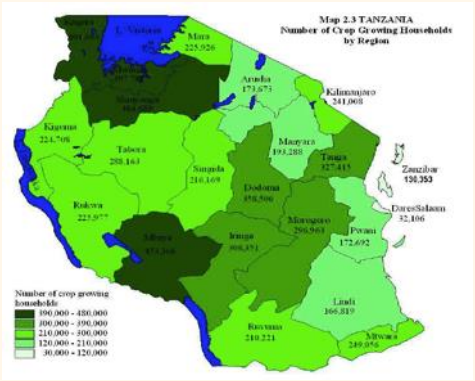
Precipitation is twice as important to Water Availability as Proximity to Rivers

For irrigation, you must have Access to Credit.

Success of a water harvest project depends more on Financial Resources than it does on Water Availability

3. Data





Lamanna, upublished

CSA-Plan

Situation Analysis
Risks and Enabling Conditions

Vulnerability & Impacts + Readiness

Stocktaking for CSA Action

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CSA Investment Portfolios

Programming Design
Guidelines & Implementation

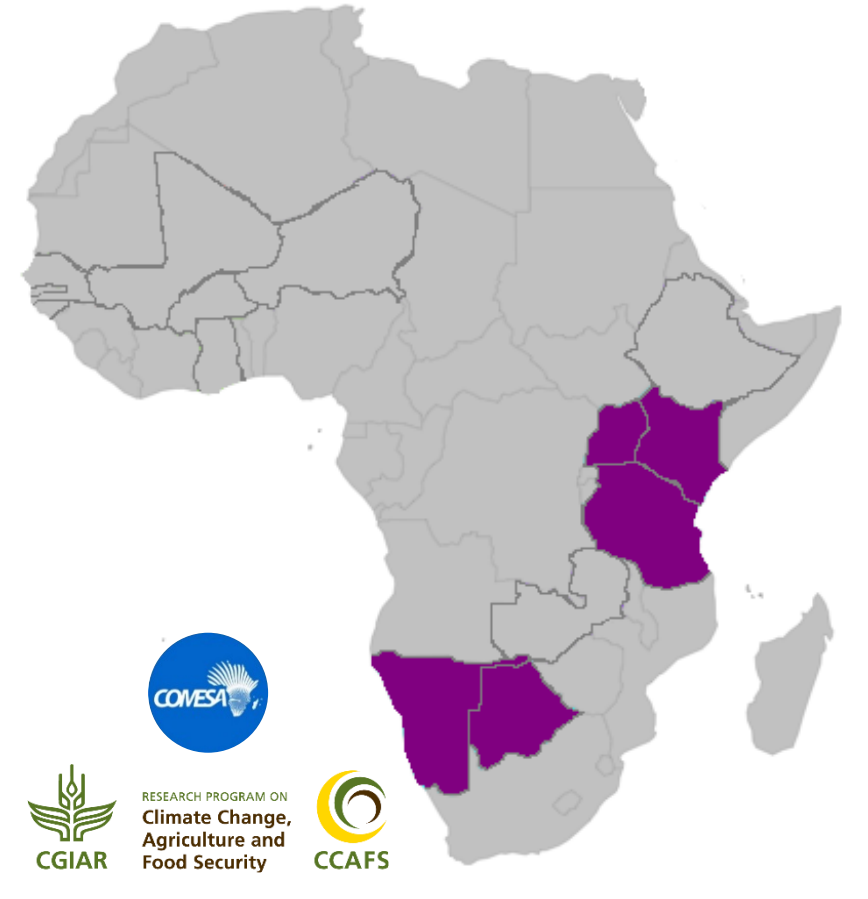
Knowledge into Action

Taking CSA to Scale

- Implementation Guides
- Business Models

Development of CSA Country Programs

COMESA led, CCAFS supported



January 2015

Stage 1: Visioning

Evidence

Stage 2:
Plan Development

Analysis

June 2015

Stage 3: National Validation

REPUBLIC OF KENYA

CLIMATE SMART AGRICULTURE PROGRAMME

JOINTLY IMPLEMENTED BY

MINISTRY OF ENVIRONMENT, WATER AND NATURAL RESOURCES

AND

MINISTRY OF AGRICULTURE, LIVESTOCK AND FISHERIES

2015 - 2025

Country CSA Programme

I. Preface by MoA & MoE
II. Executive Summary
III. Situation Analysis
IV. Vision & Objectives
V. Results Area 1: Productivity
VI. Results Area 2: Resilience
VII. Results Area 3: Mitigation co-benefits
VIII. Coordination
IX. Financing
X. Monitoring, reporting & verification

Practical guides for implementation

Manual Seeding Systems

Name of the specific system: Dibble Stick planting

General description/rationale of the system: Manual seeding with a dibble stick apply to areas where farmers have no animal draft power, where soils are too heavy to make planting basins and where excessive rainfall would cause widespread water logging if planting basins were dug. Dibble stick can have different shapes and range from about 1.5m to 0.6m length. Holes created by the dibble stick should not exceed 5cm depth and it is advisable to push the dibble stick twice into the ground to create a hole for each seed and fertilizer.

Plate 1: Seeding with a dibble stick into crop residues can be fast and effective (left), a good stand of maize planted with the dibble stick (right).

Where has the system been tried? Direct seeding with a dibble stick has been tried mainly in Malawi and extensive knowledge is available from CIMMYT (www.cimmyt.org) and Total Land Care (www.totallandcare.org). Seeding with a dibble stick is also done in the traditional ridge and furrow system of Malawi and is therefore not a completely new in rainfall areas above 700mm a^{-1}.

Animal Traction Seeding Systems

Name of the specific system: Animal Traction Direct Seeding

General description/rationale of the system: The Animal Traction Direct Seeding system is done using animal traction (e.g. a pair of oxen or donkeys) and specifically designed direct seeding equipment. Products available are currently supplied by Fitarelli and Werner (both Brazil) and the locally manufactured tools from Grownet and Zimplow (Zimbabwe). The Animal Traction Direct Seeder cuts through the mulch (with a cutting disc/coulter), creates a ripline, places seed and fertilizer automatically and closes the ripline. The seeding tool can be operated by one person with a pair of trained oxen.

Plate 1: Animal traction direct seeder (Fitarelli) planting into sunnhemp residues (left) and a Grownet planter with inclined seed plate (right)

Where has the system been tried? The Animal Traction Direct Seeder has been tried in southern Africa and tested mainly in areas where animal traction is common (e.g. Zimbabwe and Zambia as well as some parts of Mozambique). Experiences have also been gathered in Kenia and Tanzania.

The systems was tried for which crops? The Animal Traction Direct Seeder has been tested for maize, sorghum, soybeans, cowpea, sunflower, beans, sunnhemp. Seeding groundnuts requires an inclined seed plate to avoid squashing of the fragile groundnuts during seeding.

Detailed description of the system:

a) ***Soil management/land preparation:*** The land can be unploughed and covered with residues at seeding. Seeding is normally done after the first effective rains.

Thierfelder et al. unpublished

CSA-Plan

P4S

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Across Scales and Systems
Evidence Based Results Framework

Learning from Experience

Monitoring Impact

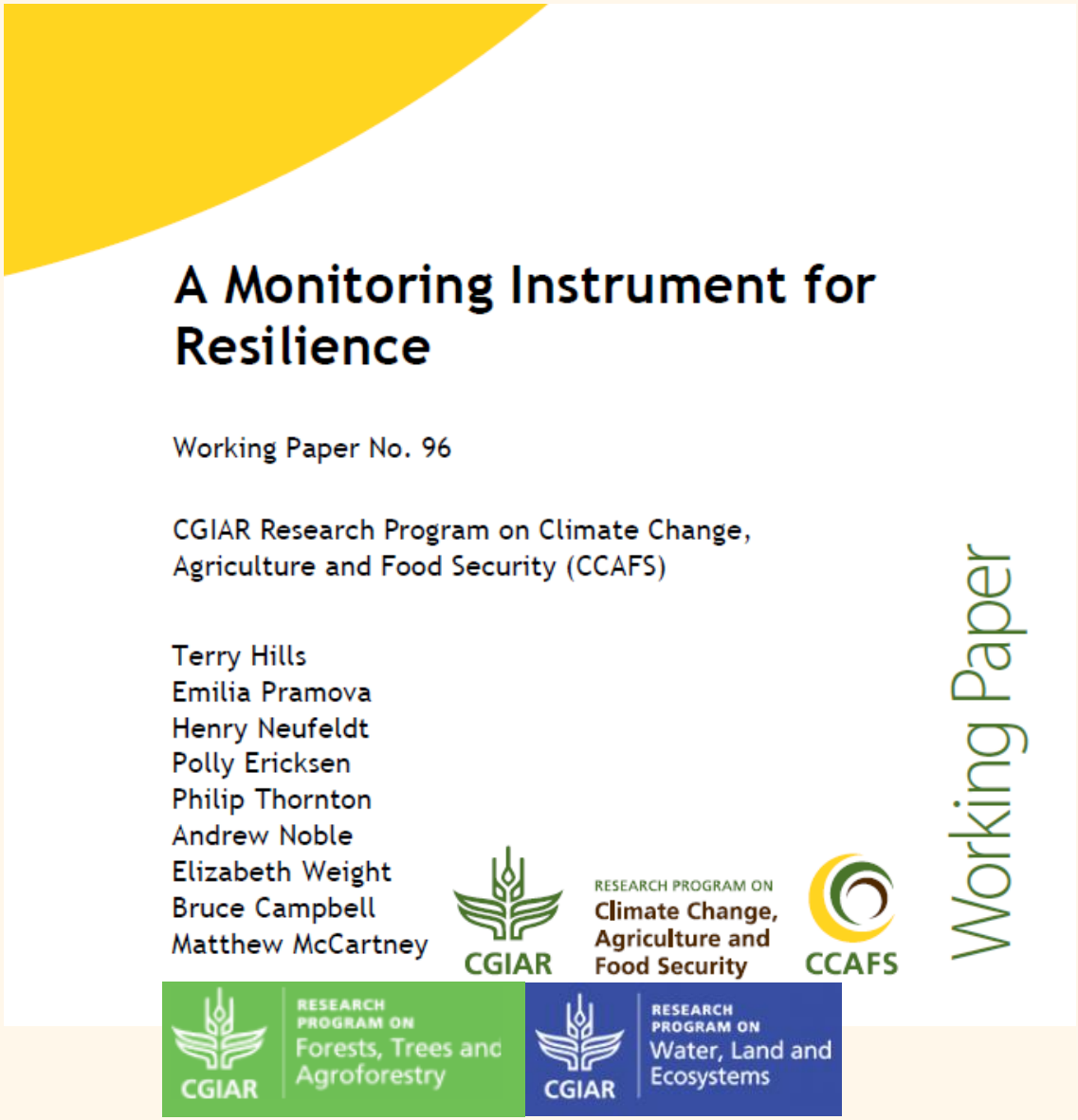
- Challenges for monitoring CSA
  - *Multi-objective complexity*
  - *Scale of impact*
  - *Multi-institutional coordination*

- The design of CSA M&E systems
  - *M&E of what?*
  - *What to monitor to determine impact?*
  - *What indicators of outcomes to include?*
  - *What tools for monitoring?*
  - *How to implement M&E system?*

Two-Page
Discussion Brief
"**Monitoring Impact: Challenges to Consider**"

Rosenstock, et al.

Metrics and Monitoring CSA



Three primary components:

- Metrics
- Sampling designs
- Data collection and reporting

Results based payments

CSA indicators for evaluating practices

Pillar	Indicator	Sub Indicator	Measure

Production

Δ Yield *	Δ (kg/ha/yr)
Δ Variability *	ΔSD(kg/ha/yr)
Δ Labor *	Δ (hr/ha/yr)
Δ Income *	Δ(net $/ha/yr)

** Indicator also currently being included in CSA Compendium;*
*** Indicators currently being included in CSA compendium, but different calculation being used*

Mitigation

Δ Off farm CO2-eq emissions	Δ (aggregated sub-indicators)

Δ carbon dioxide equivalent emissions*	Δ (kg/ha/yr, kg/ha, kg/yr)
Δ nitrous oxide (N_2O) emissions *	Δ (kg/ha/yr, kg/ha, kg/yr)
Δ methane (CH_4) emissions*	Δ (kg/ha/yr, kg/ha, kg/yr)
Δ Carbon dioxide (CO_2) emissions*	Δ (kg/ha/yr, kg/ha, kg/yr)
Δ Black carbon (BC) emissions	Δ (BC m2/yr)
Δ Albedo	Δ (0-1 reflectivity coefficient and W/m2)

Corner-Dolloff, et al.

CSA indicators for evaluating practices

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International Center for Tropical Agriculture
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Mitigation

Δ On farm CO2-eq emissions	Δ (aggregated sub-indicators)	Δ carbon dioxide equivalent emissions*	Δ (kg/ha/yr, kg/ha, kg/yr)
		Δ nitrous oxide (N2O) emissions *	Δ (kg/ha/yr, kg/ha, kg/yr)
		Δ methane (CH4) emissions*	Δ (kg/ha/yr, kg/ha, kg/yr)
		Δ Carbon dioxide (CO2) emissions*	Δ (kg/ha/yr, kg/ha, kg/yr)
Δ On farm stock CO2-eq	Δ (aggregated sub-indicators)	Δ Soil organic carbon (SOC) stocks*	Δ (g/kg, %, kg/ha)
		Δ Plant biomass (aboveground)*	Δ (kg/ha/yr, kg/ha)
		Δ Plant biomass (belowground)*	Δ (kg/ha/yr, kg/ha)
Δ On farm sequestration CO2 Eq	Δ On-farm CH4 uptake	Δ (t/ha year)	
Δ On farm stock CO2 Eq	Δ total soil carbon (organic + inorganic) stocks	Δ (t/ha year)	
Δ gross avoided emissions Δ net avoided emissions	Δ (aggregated sub-indicators)	Δ avoided CO2 equivalent emissions*	Δ (kg/ha/yr, kg/ha, kg/yr)
		Δ avoided nitrous oxide emissions *	Δ (kg/ha/yr, kg/ha, kg/yr)
		Δ avoided methane emissions*	Δ (kg/ha/yr, kg/ha, kg/yr)
		Δ Avoided Carbon dioxide emissions*	Δ (kg/ha/yr, kg/ha, kg/yr)
Δ Emissions intensity *	Δ Emissions (CO2 eq) per unit of output	Δ (g CO2-eq /kg, g CO2eq/$)	
Δ reduced fuel wood consumption*	Δ avoided woody biomass consumption	Δ (t/year; kg/ha/year)	

** Indicator also currently being included in CSA Compendium;*
*** Indicators currently being included in CSA compendium, but different calculation being used*

Corner-Dolloff, et al.

CSA indicators for evaluating practices

Adaptation

Δ Food access **	Δ (kcal/person/yr)
Δ Resilience	Set of questions
Δ Gendered impacts *	Δ (aggregated sub-indicators)
Δ Labor by women **	Δ (hr/ha/yr)
Δ Adaptive capacity of women	Qualitative (i.e. -10 to10)
Δ Income of women **	Δ(net $/ha/yr)
Δ Eco-efficiency *	Δ (aggregated sub-indicators)
Δ use of irrigation water *	Δ litre/kg product/year
Δ use of fertilizer**	Δ kg/kg product/year
Δ use of agrochemicals	Δ kg/kg of product/year
Δ use of non-renewable energy **	%Δ output/input ratio per kg product/year
Δ Ecosystem services *	Δ (aggregated sub-indicators)
Δ Biodiversity**	Set of questions
Δ Pest-pathogen **	%yiled lost -Control
Δ Groundwater availability	Qualitative (i.e. -10 to 10)
Δ Erosion *	Kg/ha/yr
Δ Soil quality **	Δ % Soil Organic Carbon/year or Δ % Soil Organic matter /year)

** Indicator also currently being included in CSA Compendium;*
*** Indicators currently being included in CSA compendium, but different calculation being used*

Corner-Dolloff, et al.

Tool Example: 5Q Approach

CIAT developed
Bill and Melinda Gates funded

- Asking simple questions to get feedback often
- Linking feedback on project across users
- Utilize ICT to decrease costs and increase connections

CSA-Plan

P4S

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Learning from Experience

Capacity development

Partnering for Impact

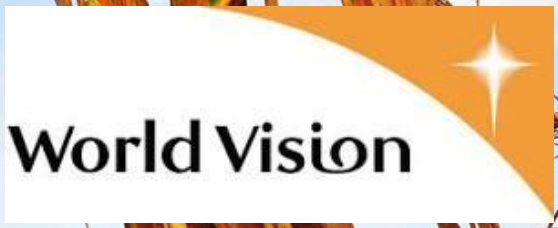
Government, NGO, Donor, Research/Academia, Producers

Multiple Alliances working from Global to Local

Global Alliance for CSA (GACSA)	• Knowledge • Finance • Enabling Conditions
Africa CSA Alliance (ACSAA)	
West Africa CSA Alliance (WACSAA)	• Policy • Investment Plans
NEPAD-iNGO Alliance for CSA in Africa	• Implementation

Alliance for CSA in Africa

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



CSA-Plan Integration Across Scales in Africa

African Union – New Partnership for African Development

NEPAD TRANSFORMING AFRICA

CAADP The Comprehensive Africa Agriculture Development Programme

AFRICA CSA Alliance

Regional Economic Communities (RECs)

COMESA

SADC SOUTHERN AFRICAN DEVELOPMENT COMMUNITY TOWARDS A COMMON FUTURE

CEDEAO ECOWAS

National Agricultural Investment Plans (NAIPs)

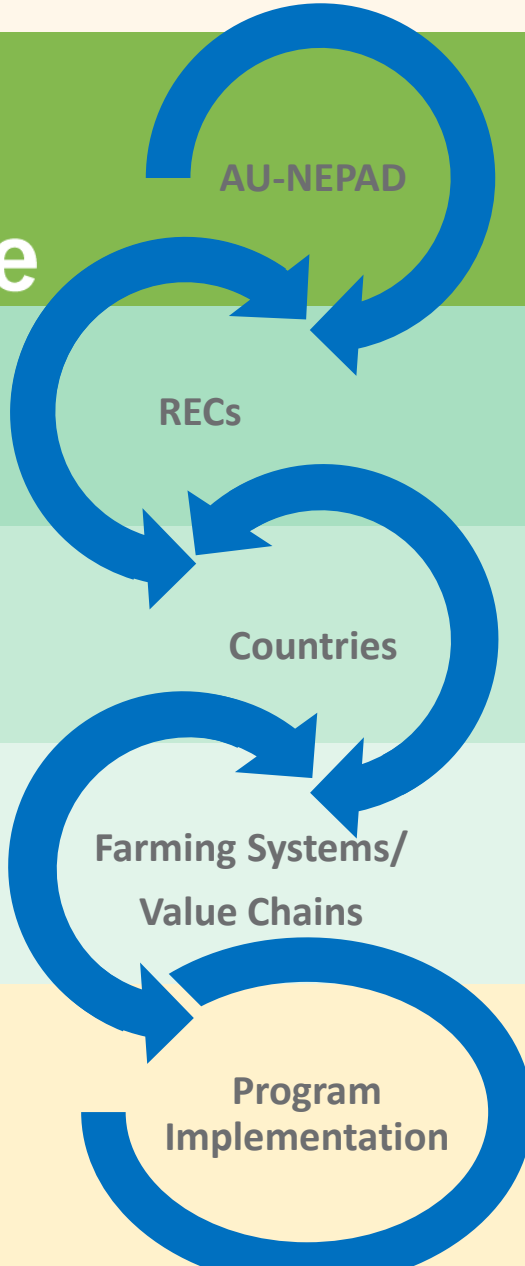
Other National Level Policies (NAPAs/NAPs/NAMAs, etc.)

Programmatic Investments and Policies

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

CSA Adoption by farmers

Through development partner implementation



CSA-Plan Integration Across Scales in Africa

Situation Analysis
Risks and Enabling Conditions
Vulnerability & Impacts + Readiness

Stocktaking for CSA Action

Targeting & Prioritizing
Practices, Programs and Policies
Trade-offs & Value for Money

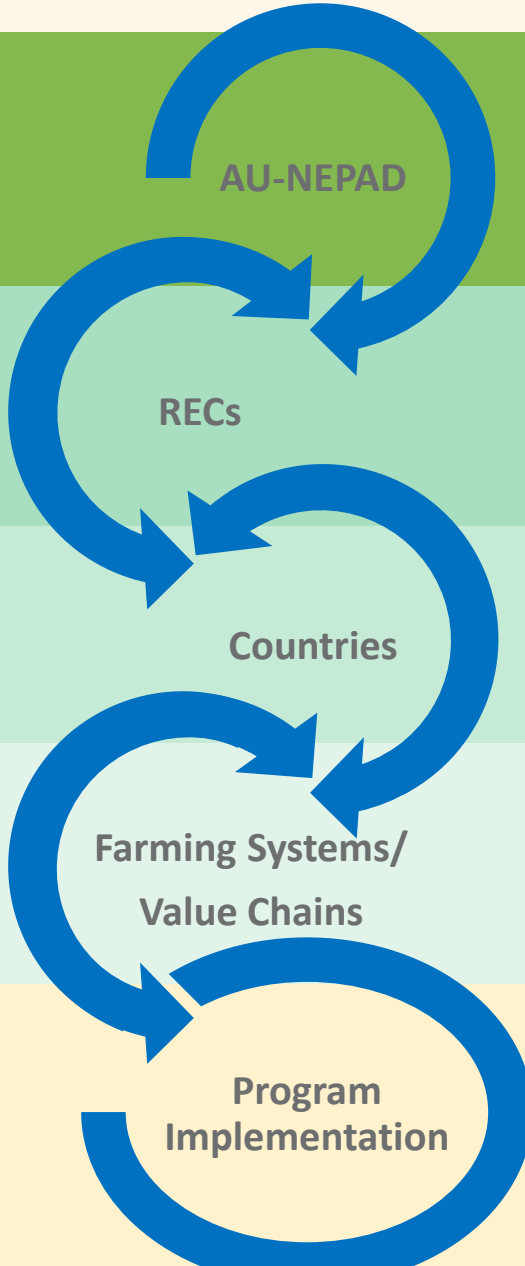
CSA Investment Portfolios

Designing Programming
Guidelines & Implementation
Knowledge into Action

Taking CSA to Scale

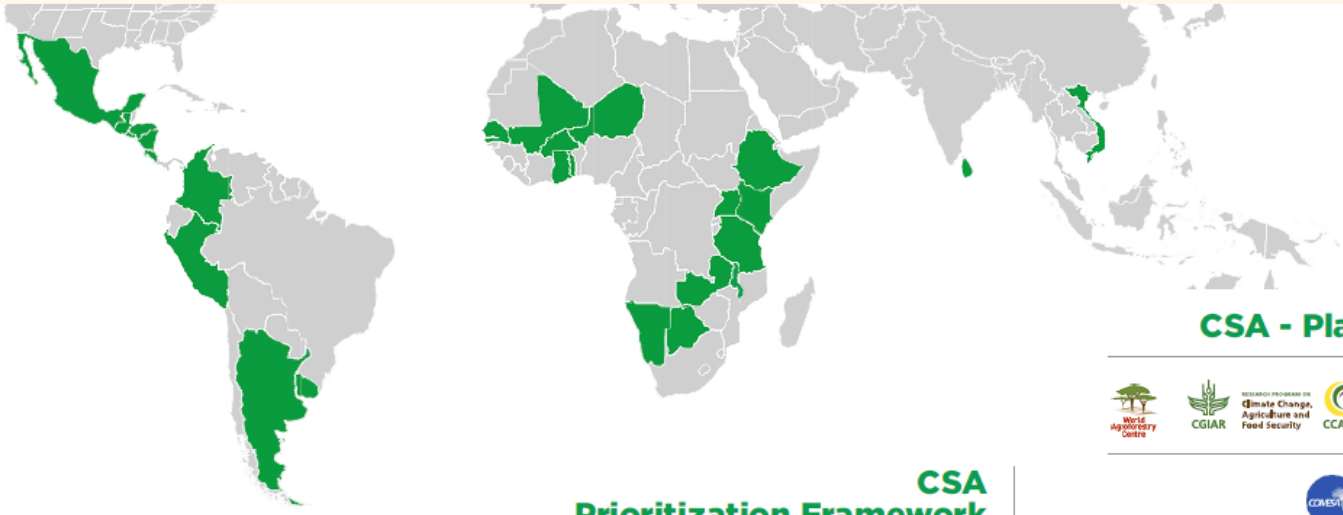
Monitoring and Evaluation
Across Scales and Systems
Evidence Based Results Framework

Learning from Experience



Ongoing CSA initiatives

CIAT and CCAFS engage with partners around the world to scale out CSA



CSA Country Profiles

THE WORLD BANK
IBRD · IDA | WORLD BANK GROUP

Argentina
Colombia
Costa Rica
El Salvador
Grenada
Mexico
Nicaragua
Peru
Uruguay

Kenya
Rwanda

Sri Lanka

CSA Country Profiles & Prioritization Framework

IITA Research to Nourish Africa
USAID FROM THE AMERICAN PEOPLE

Ethiopia
Ghana
Mali
Niger
Senegal
Uganda

CSA Prioritization Framework

CGIAR
Climate Change, Agriculture and Food Security
CCAFS

Colombia
Ethiopia
Ghana
Guatemala
Nicaragua
Trifinio Region (El Salvador, Guatemala, Honduras)

Vietnam

Mali

CSA - Plan

World Agroforestry Centre
CGIAR
Climate Change, Agriculture and Food Security
CCAFS

COMESA

Botswana
Kenya
Namibia
Tanzania
Uganda

AFRICA CSA Alliance

Ethiopia
Malawi
Niger
Uganda
Zambia

Next Steps

Strengthen CSA-Plan

- New models for evidence-based decision making
- Clear menu of options for users
  - Including fast and cheaper analysis options
- Templates and tools for all steps

Build on partnerships

- Sub-national CSA Profiles to direct local funding streams (Kenya – 15 County Profiles)
- COMESA – action across all countries on CSA
- NEPAD – provide technical support to actualize 25x25 Vision

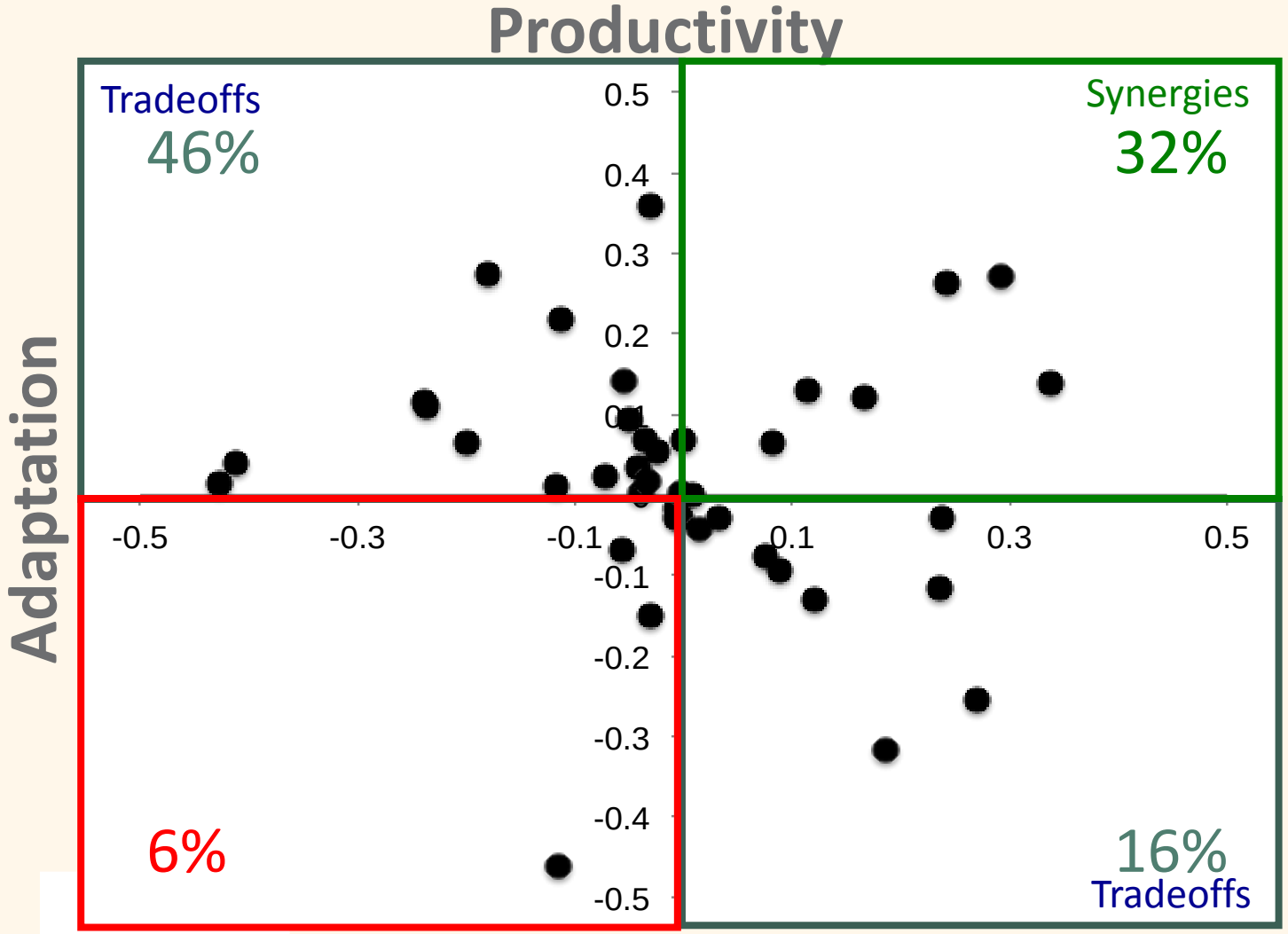
THANKS!

Caitlin Corner-Dolloff
c.corner-dolloff@cgiar.org

PARTNERSHIPS FOR SCALING
CLIMATE SMART AGRICULTURE (P4S - CSA)

World Agroforestry Centre
CGIAR
RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security
CCAFS
CIAT
International Center for Tropical Agriculture
Since 1967 Science to cultivate change

Synergies and tradeoffs between food security and adaptation with CSA

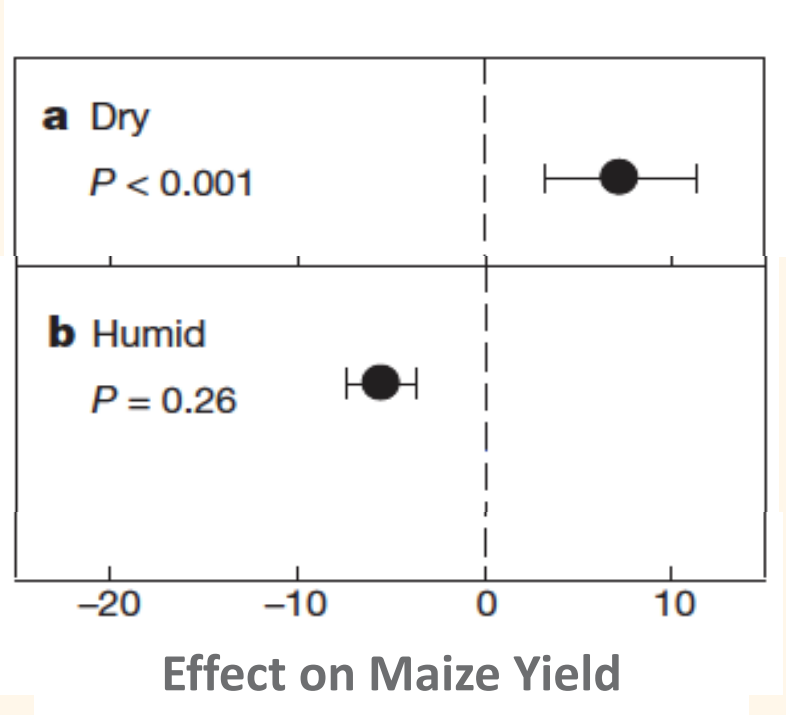


Mean effect from random sample of 130 studies (*55 comparisons)*

World Agroforestry Centre

Nothing is CSA Everywhere

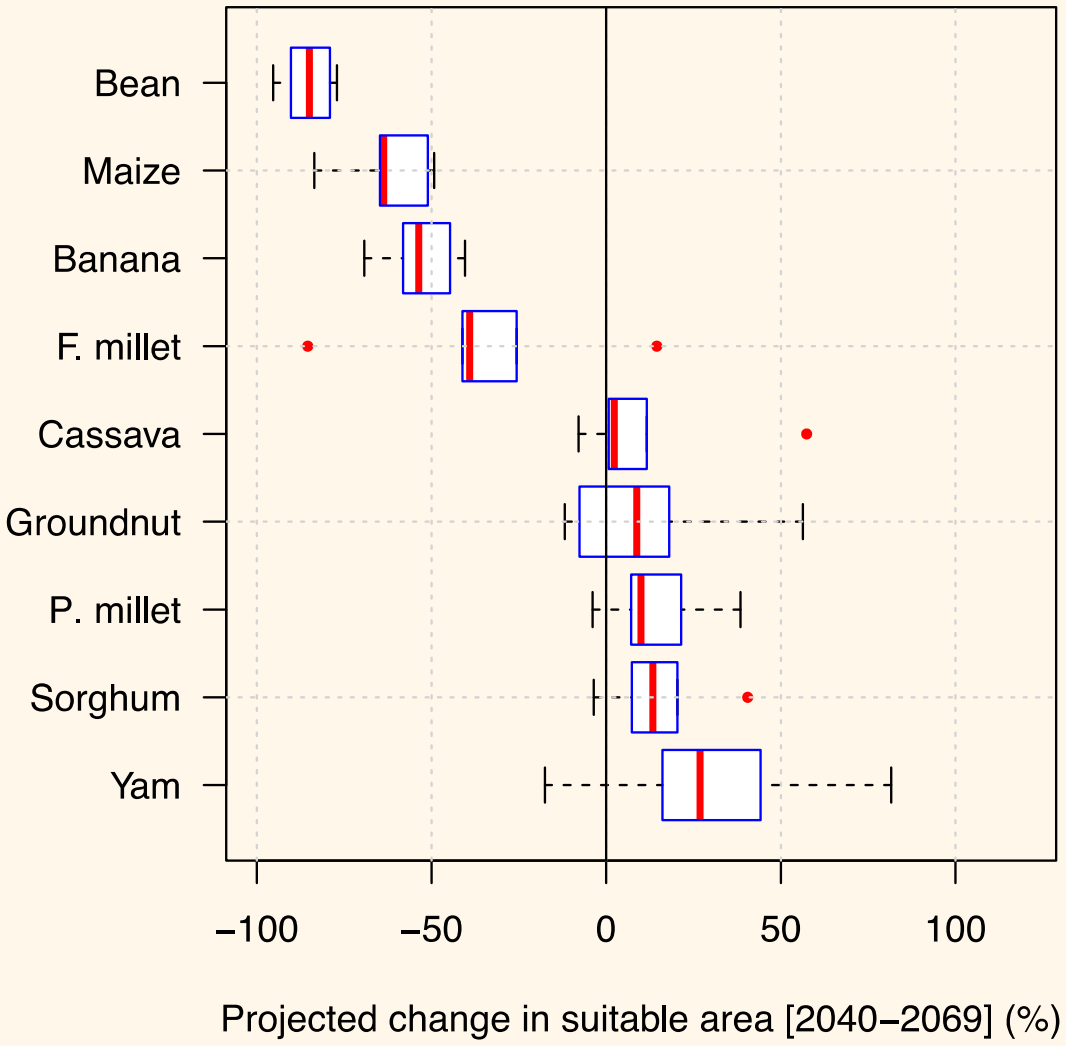
Conservation Agriculture



Pittelkow et al. 2014

Garrity et al. unpublished

Changes to Agriculture in the Sahel



J. Ramirez, et al. in preparation