

Conservation Agriculture (CA)

Lessons from smallholder farmers in Eastern & Western Uganda

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Agriculture in the development and natural resource management thrust

General situation



Desired Situation



Development process

Agriculture

Conservation
Agriculture

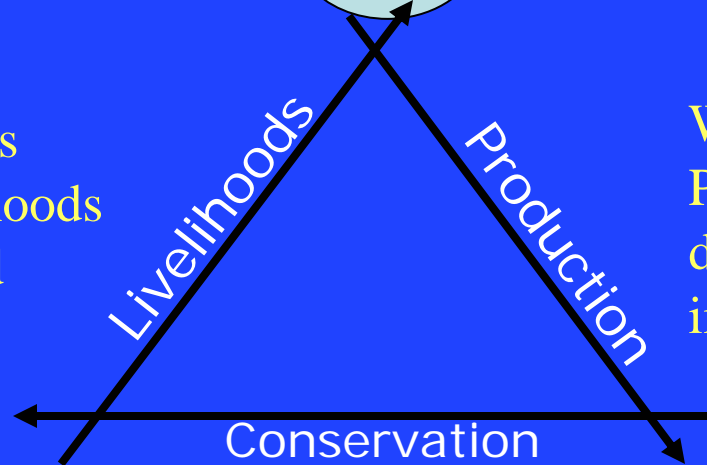


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WHY is it that agriculture's impact on improved livelihoods appear to be piecemeal and unsustainable

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WHY is agricultural PRODUCTIVITY stagnant/declining despite improved technologies



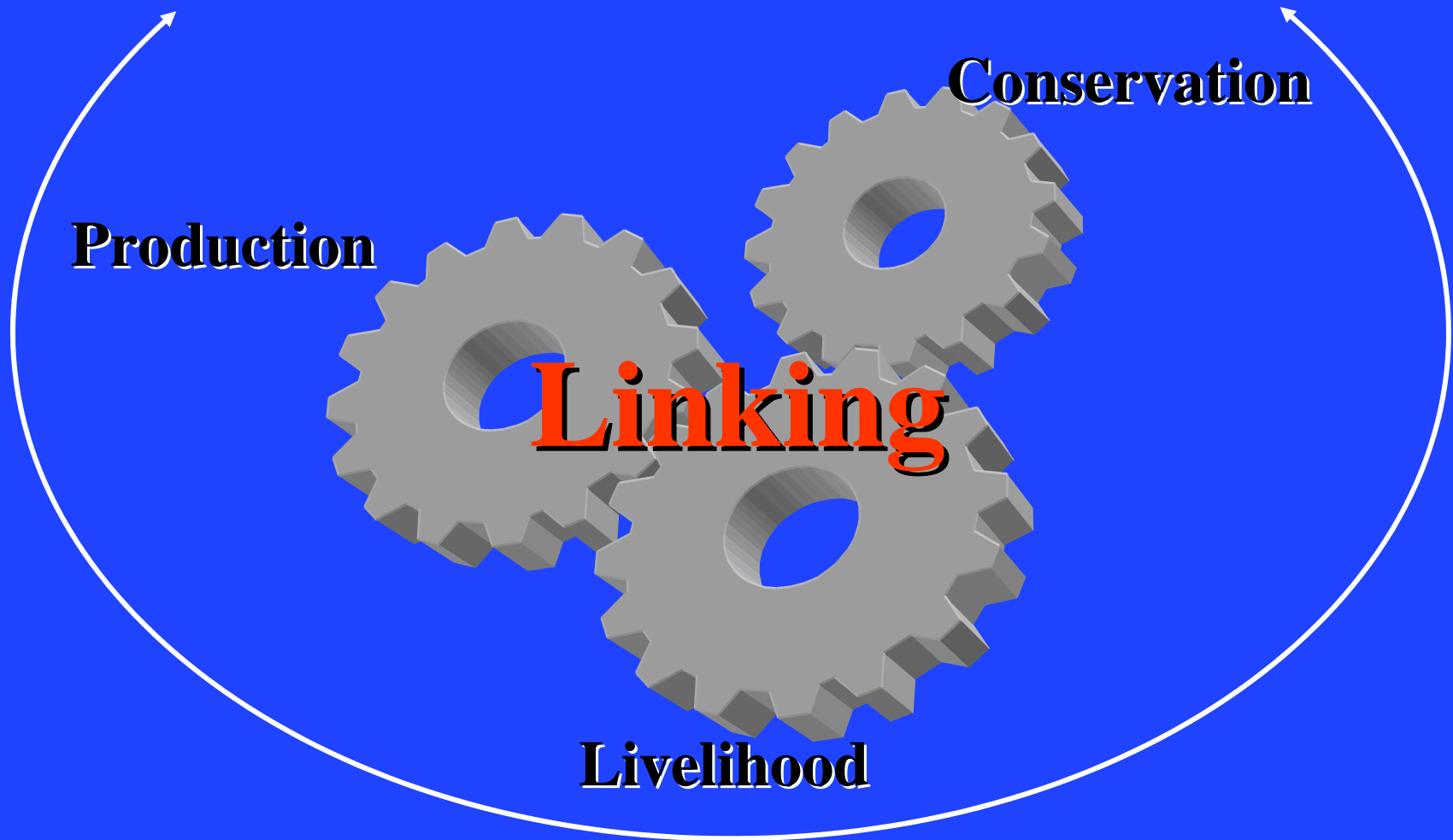
With proven benefits of CA (including enormous promotion efforts), WHY is adoption low

Highlight lessons

?

Highlight experiences

What has been missing ?



Growing experiences
world wide with
Conservation
Agriculture

I WCCA (Spain, 2001)

- ✓ Collaboration and partnerships
- ✓ Need for CA

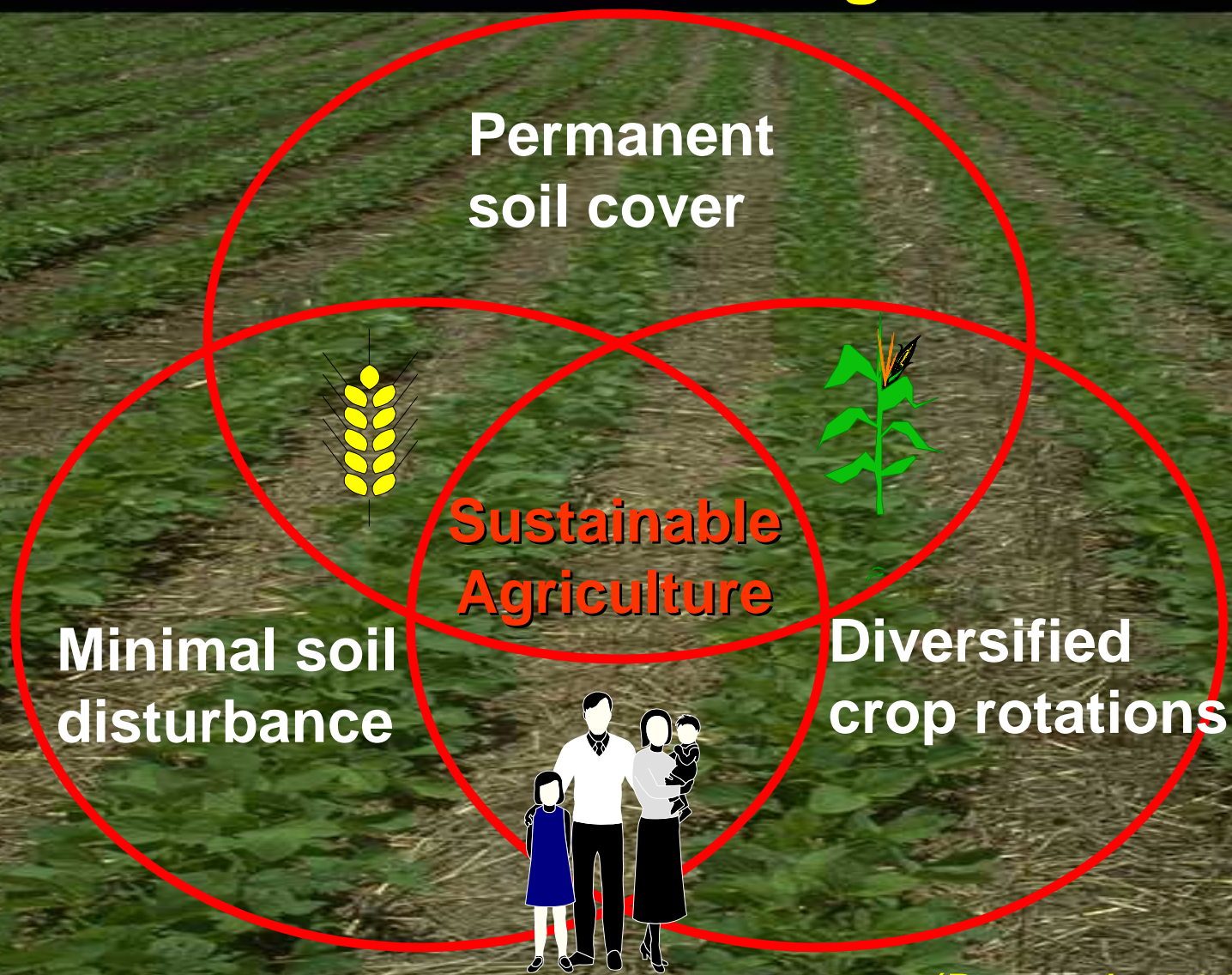
“Champions”

II WCCA (Brazil, 2003)

- ✓ Common understanding of CA
- ✓ On-farm Application of CA

The III World Congress
on
Conservation Agriculture

What we need to know about CA approach to land & water management



(Derpsch, 2001)

Conservation Agriculture, CA

Reduced soil disturbance

Soil Cover

Rotations and intercropping

Evidence - Results - Benefits

CA Practice

- Improving (rain) water productivity
- Improving input productivity — fertiliser, labour, etc...
- Soil life and soil nutrient management
- Increase and stability in yields

TYPE OF CA PRACTICES

- Farmers have been practicing “improved” land management practices such as:
 - establishment of soil and water conservation structures (Fanya and Fanya Chinni),
 - use of cover crops as improved fallows and
 - various forms of crop rotations and combinations
- CA practice to land management involve use of site (situation) specific combination of practices aimed at:
 - Checking and minimizing soil erosion
 - Improving water infiltration rate and increasing the soil moisture content
 - Improving soil organic matter content, the chemical and physical properties of the soil
 - Controlling and checking weeds
 - Increasing soil cover to protect the soil from rainfall and/or heat hazards and conserving soil moisture during dry spells.

CA PRACTICES: Land Preparation



Conventional practice - hand hoe



Soil cover (Mucuna) sprayed with herbicide then plant



Soil cover (Mucuna) slashed then plant



Soil cover (Mucuna) knocked down by an oxen drawn knife Roller before direct planting

CA PRACTICES: **Direct Planting**



Direct planting using a planting stick 'Jobbe'



Direct planting using a Job planter



Direct seeding using a triton planter



Calibration of a triton planter

CA PRACTICES: *Permanent Oblong Holes (Planting Stations).*



Maize at one week after planting in a permanent planting station



Maize established in permanent planting stations intercropped with cover crop

The planting pits are dug 35 cm long, 15 cm wide and 15 cm deep, spaced at an interval of 70 to 90 cm between rows depending on the crop. The holes are filled with 1-2kg of compost manure, 9 seeds (maize) are planted in each hole. This method is used in the production of seasonal crops e.g maize, beans, soya beans

CA PRACTICES: *Use of cover crops*



Desired situation

Banana interplanted with Mucuna cover crop and well managed- smothering weed & providing a complete cover and not interfering with the bananas.



Undesired situation

Banana interplanted with Mucuna cover crop but NOT well managed- the Mucuna out competed the banana

CA PRACTICES: *Use of cover crops*



Desired situation

Banana/coffee interplanted
with Mucuna cover crop and
well managed



Undesired situation

Vanilla interplanted with Mucuna
cover crop but NOT well managed

CA PRACTICES: *Crop rotations & associations*



A typical vegetable crop rotation field (beans and cabbages) on permanent narrow based terraces, in Busano Mbale



Cotton interplanted with Canavalia – compatible association



Cotton interplanted with lablab – cotton was completely suppressed



Cotton interplanted with Cajanas cajan – compatible association

CA PRACTICES: *Crop rotations & associations*



Maize intercropped with *Cajana cajan*, both providing food



Banana interplanted with pumpkins, both providing food

Results: Timeliness & labour requirement for land preparation per hectare

| Activity/operation | Treatments | | | | | | | | | |
|---|--------------|-------------|---------------|-----------|-------------|-----------|--------------------|-----------|------------------------|-----------|
| | Conventional | | Herbicide use | | Slashing | | Cover crop + Slash | | Cover crop + Herbicide | |
| | man days* | oxen days** | man days | oxen days | man days | oxen days | man days | oxen days | man days | oxen days |
| Time spent bush clearing | 17.5 | 5 | 17.5 | 5 | 17.5 | 5 | 0 | 0 | 0 | 0 |
| Time spent on 1 st ploughing | 37.5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Time spent on 2 nd ploughing | 18.7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Time spent on spraying herbicide | 0 | 0 | 5 | 5 | 0 | 0 | 5 | 5 | 0 | 0 |
| Time spent on slashing weeds/cover crop | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 5 | 5 |
| Total | 73.7 | 8 | 22.5 | 10 | 22.5 | 10 | 5 | 5 | 5 | 5 |

*1 human workday = 4 hours of effective working, **1 oxen day = 6 hours of effective working

Results: Land preparation costs (UgSh) per hectare of maize

| Activity/operation | Land preparation (Treatments) cost | | | | |
|------------------------------------|------------------------------------|----------------|---------------|--------------------|------------------------|
| | Conventional | Herbicide Use | Slashing | Cover crop + Slash | Cover crop + Herbicide |
| Bush clearing | 37,500 | 37,500 | 37,500 | 0 | 37,500 |
| Cost of 1 st ploughing | 37,500 | 0 | | 0 | 0 |
| Cost of 2 nd ploughing | 37,500 | 0 | | 0 | 0 |
| Inputs | | | | | |
| Cost of herbicides - Round up max | 0 | 50,000 | 0 | 90,000 | 0 |
| Cost of herbicides - Laso atrizine | 0 | 45,500 | 0 | 0 | 0 |
| Cost of hiring a spraying pump | 0 | 2,500 | 0 | 2,500 | 0 |
| Cost of labour for spraying | 0 | 7,000 | 0 | 7,000 | 0 |
| Total | 112,500 | 142,500 | 37,500 | 99,500 | 37,500 |

Results: Weeding labour requirement and cost per hectare of maize

| Activity | Treatments | | | | | | | | | |
|-------------------------|-------------------|---------------|-------------------|-------------|-------------------|----------------|--------------------|---------------|------------------------|---------------|
| | Conventional | | Herbicide use | | Slashing | | Cover crop + Slash | | Cover crop + Herbicide | |
| | Labour (workdays) | Cost (UgSh) | Labour (workdays) | Cost (UgSh) | Labour (workdays) | Cost (UgSh) | Labour (workdays) | Cost (UgSh) | Labour (workdays) | Cost (UgSh) |
| 1 st weeding | 17.5 | 37,500 | 0 | 0 | 17.5 | 37,500 | 9 | 12,500 | 9 | 12,500 |
| 2 nd weeding | 17.5 | 37,500 | 0 | 0 | 17.5 | 37,500 | 0 | 0 | 0 | 0 |
| 3 rd weeding | 0 | 0 | 0 | 0 | 17.5 | 25,000 | 0 | 0 | 0 | 0 |
| Total | 35 | 75,000 | 0 | 0 | 52.5 | 100,000 | 9 | 12,500 | 9 | 12,500 |

Results: Influence of land preparation practice on maize productivity

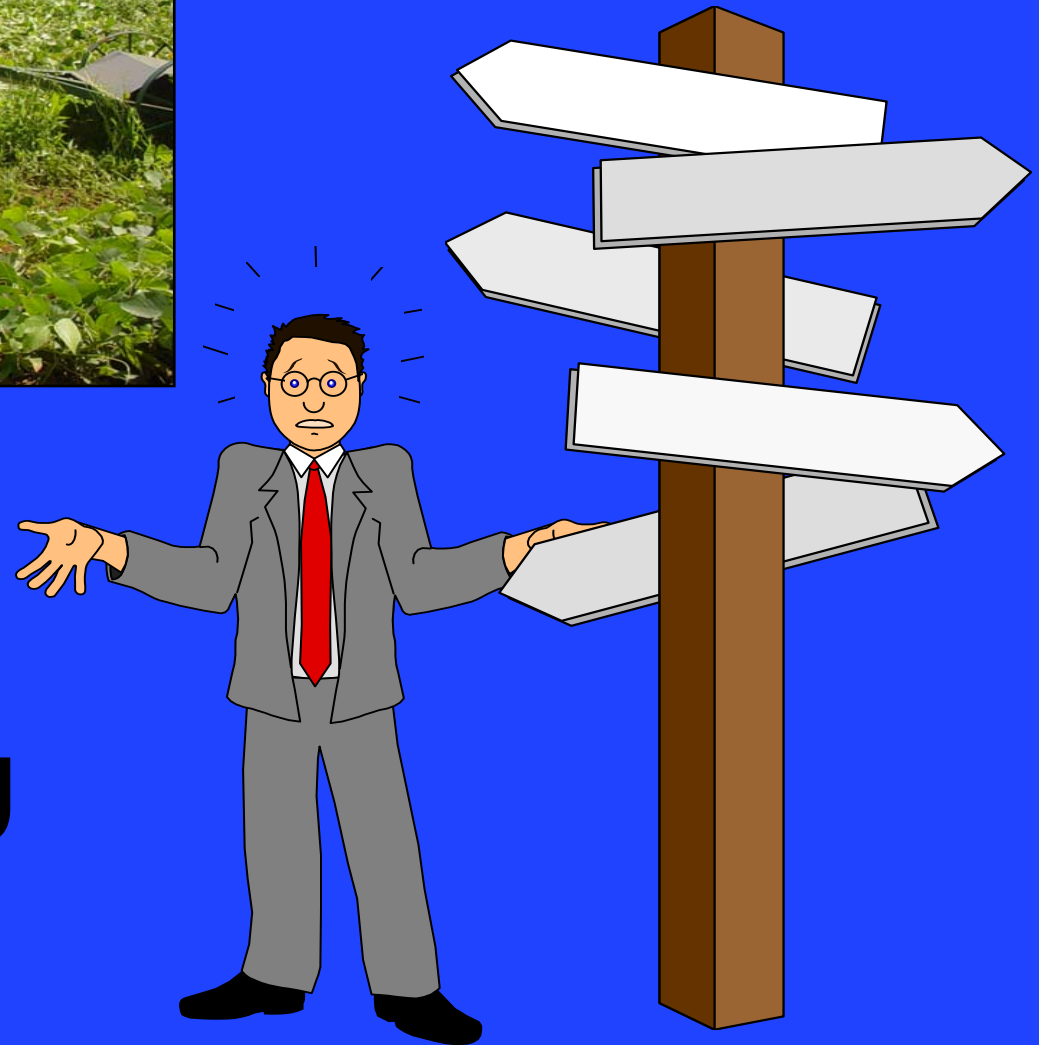
| Land preparation option (Treatments) | Grain yield (kg/ha) |
|---|------------------------|
| Conventional | 2,458.6 |
| Herbicide Use | 2,618.6 |
| Slashing | 2,453.8 |
| Cover crop + Slash | 3,126.0 |
| Cover crop + Herbicide | 3,008.0 |

CONCLUSIONS AND RECOMMENDATIONS

- a) Strengthen the FFSs for self-reliant, improve access to CA tools and equipment and other inputs and encourage establishment of facilities like micro finance to facilitate farmer purchase of the required tools and equipment.
- b) The three pilot districts should use the FFS experiences and structures to advocate for and mobilize the communities for development, scale up and out success stories.
- c) MAAIF through NAADS should consider turning the pilot project into a programme and be extended to other sub counties within the pilot districts and also other districts.
- d) The pilot districts should consider including CA-FFS in their annual budgets at all levels (district and sub counties) for continuity and sustainability of the CA-FFS initiatives.
- e) There is a need to carryout CA-FFS campaign in the country to sensitize civic leaders and entire public about the role of CA-FFS in modernizing agriculture



We have the opportunity to
make a difference ...



THANK YOU