Conservation agriculture: farmer adoption of new practices and technologies: evidence and lessons learnt

By Christian Thierfelder

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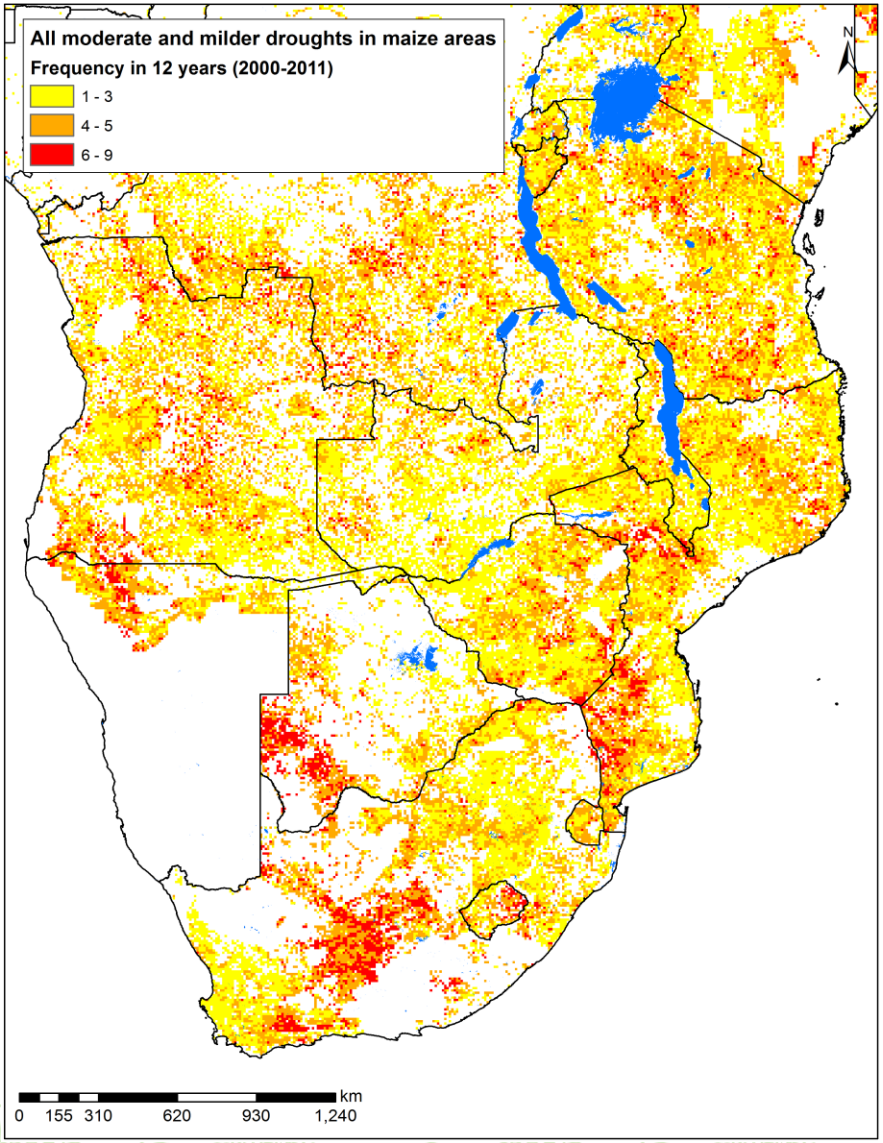
Outline of this presentation

- Introduction
- CA and Climate-smart agriculture
- Conservation agriculture – its benefits and challenges
- Scaling and uptake
- Practical examples

The Challenges in Africa



Source: Sonder, unpublished

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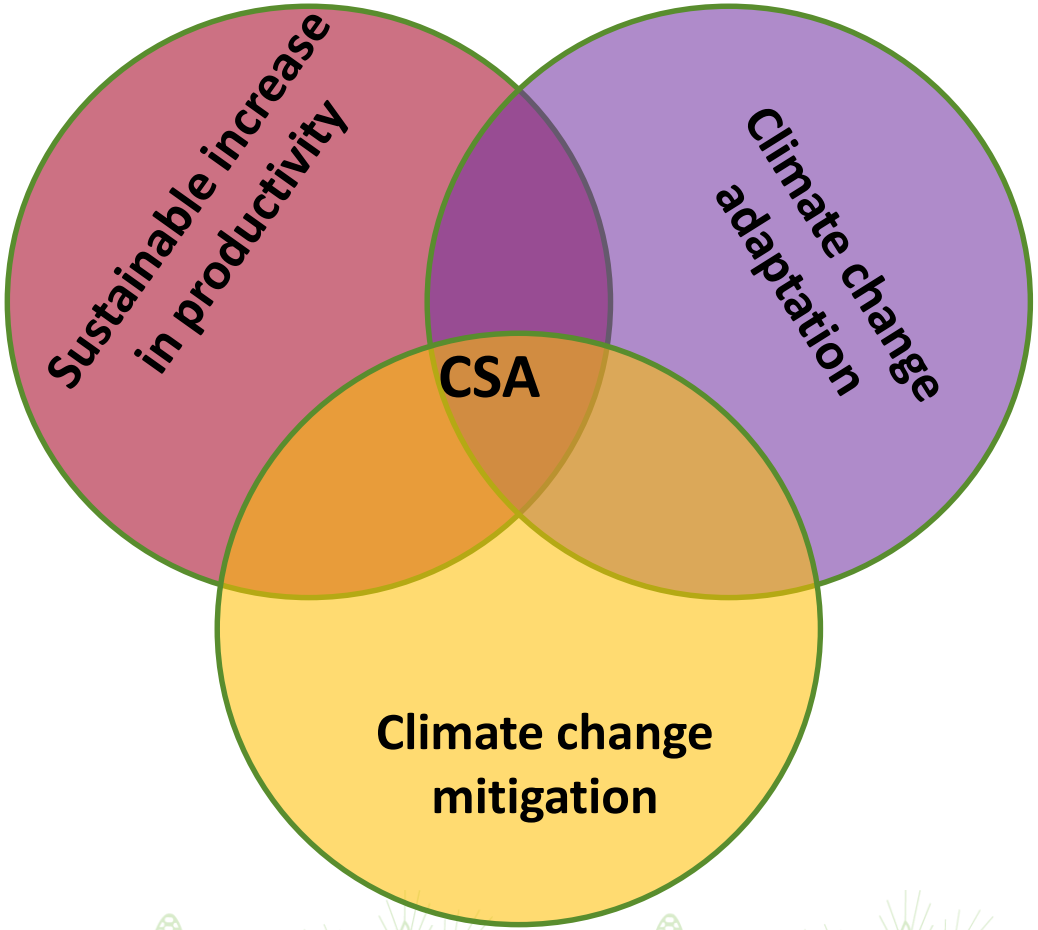
What do we understand by Climate-smart Agriculture (CSA)?



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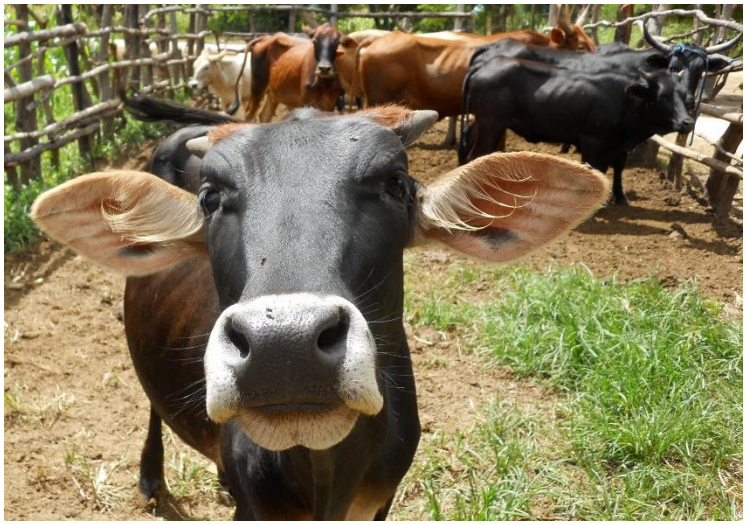
What practices could be lumped under the CSA umbrella?

- Conservation agriculture
- Agroforestry (CAWT)
- Rangeland management
- The use of drought-tolerant germplasm
- Targeted fertilizer application
- Improved cattle feeding
- ….

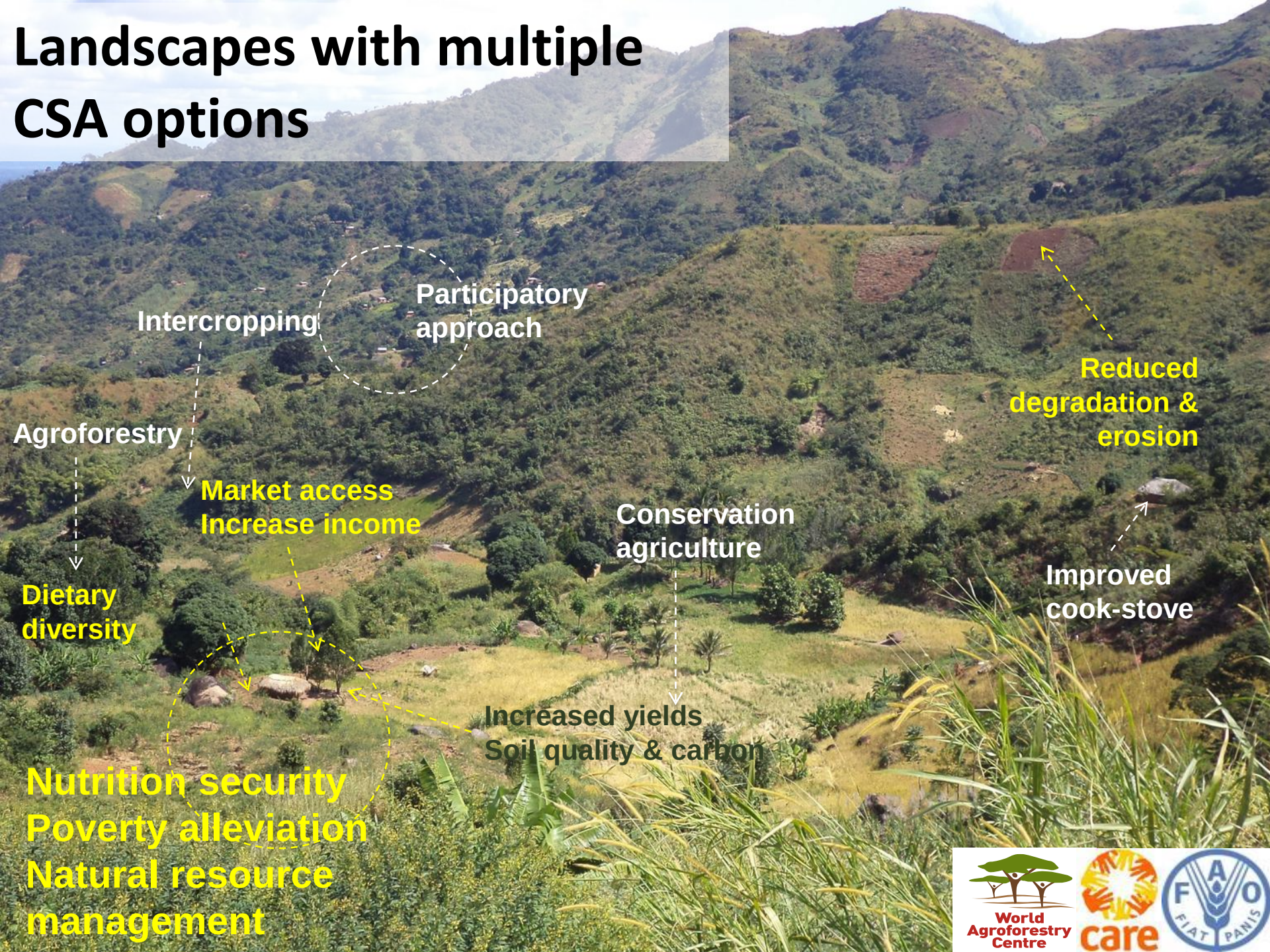


There is not one CSA practice….

but different and complimentary combinations of practices to achieve the greatest CSA potential in a landscape.

CA provides a good foundation for CSA!

Landscapes with multiple CSA options



Why focus on Conservation Agriculture?

- CA reduces **soil and land degradation**
- CA can help to **adapt production** to climate variability and change ….!
- CA is more **water-, nutrient-, and energy-use-efficient**
- CA improves the **productivity** of current farming systems

CA - a flexible system….

•*Jab-planter*

•*Dibble stick*

•*AT Direct seeder*

•*Hoe-planter*

•*Basin planting*

•*Magoye ripper*

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New Developments for Africa....

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Maize-soybean rotation

Groundnuts under CA

Cowpeas under CA

Maize under CA

Maize-Gliricidia intercropping

Maize-groundnut rotation

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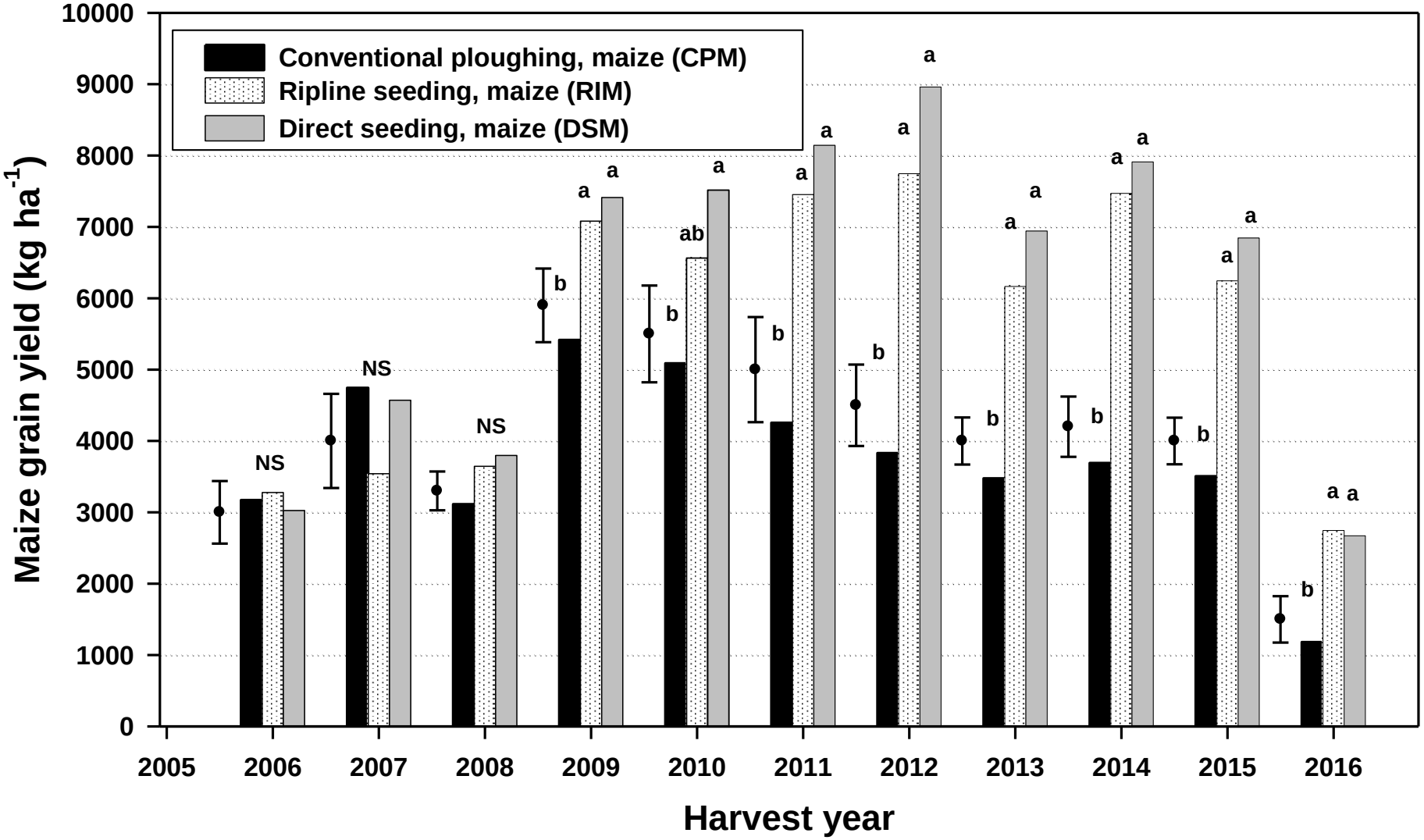
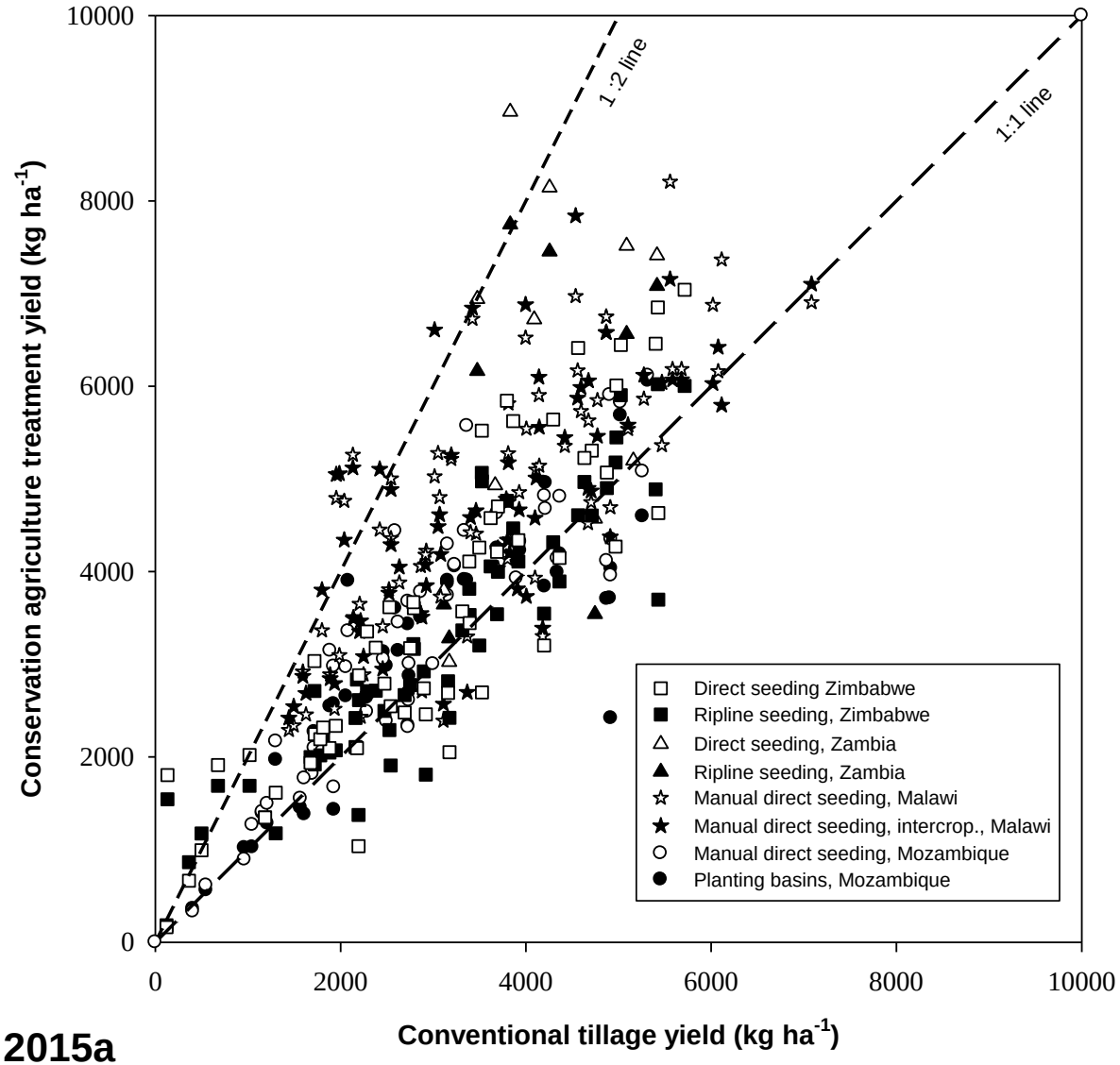
Longer term maize grain yields on farmers fields in Zambia – Monze, 2006-2016

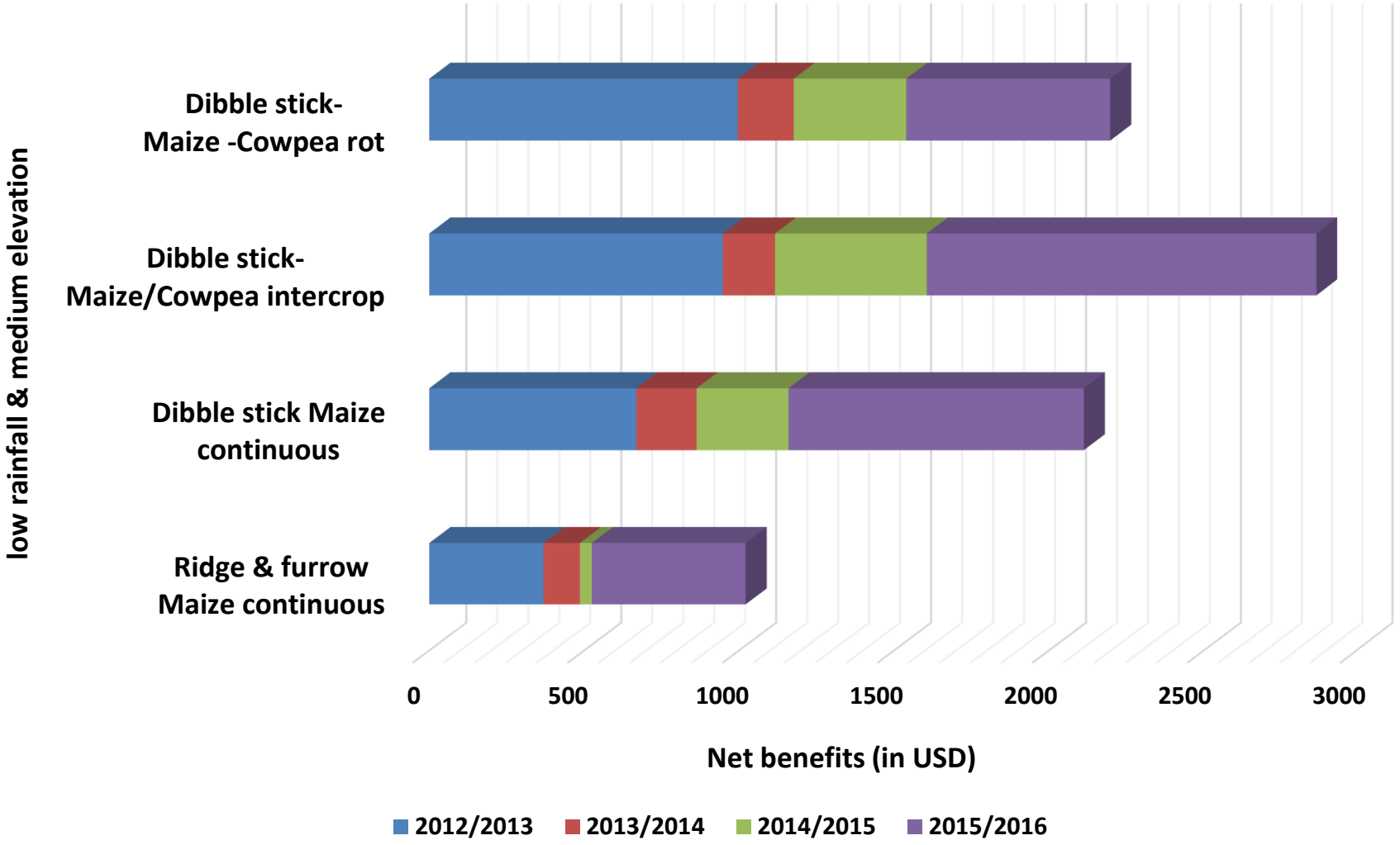


Regional yield response to CA in southern Africa from 2005-2016



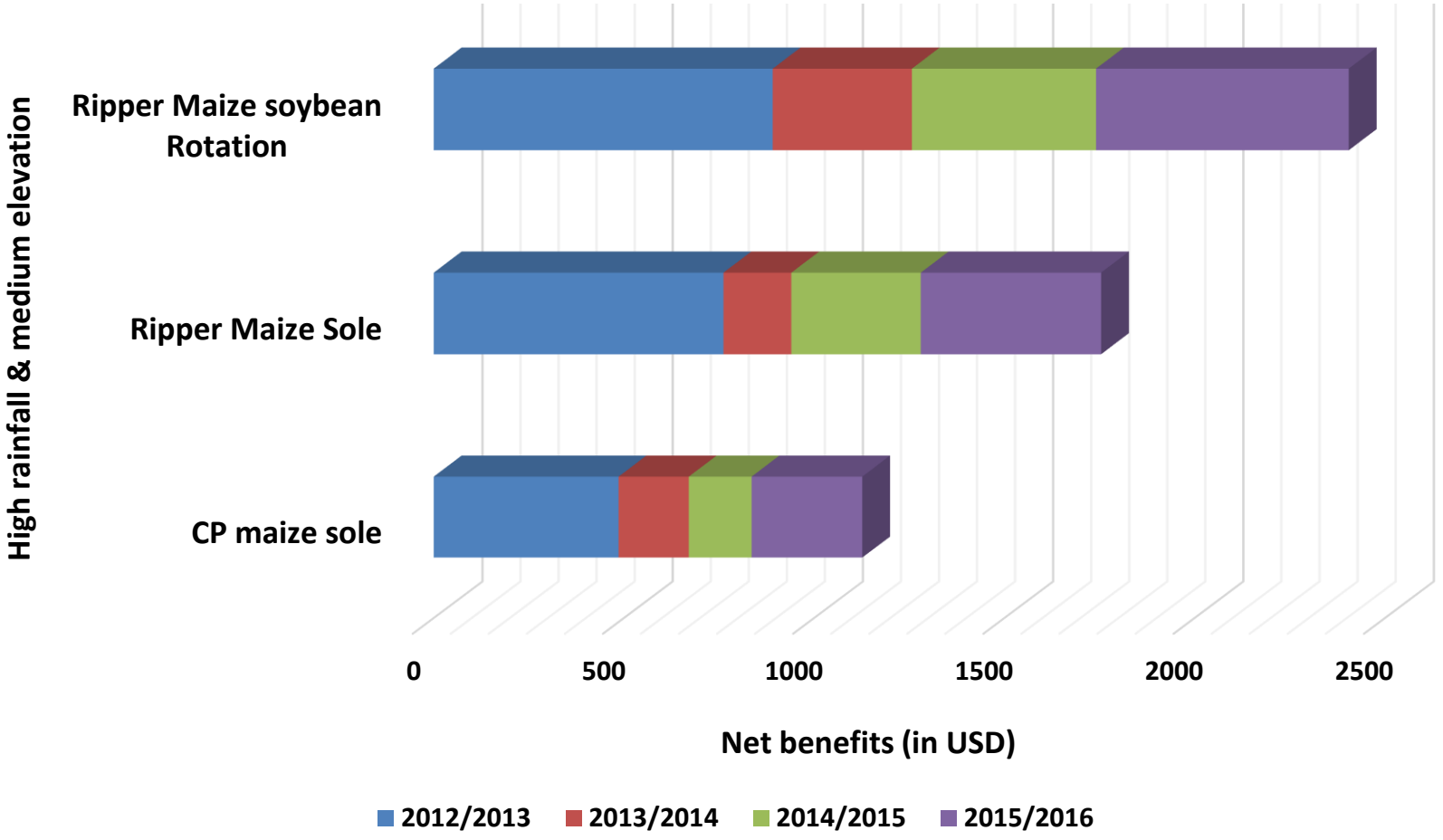
Thierfelder et al. 2015a

Manual Sustainable Intensification Practices - Net Benefits (2012-2016), Eastern Zambia



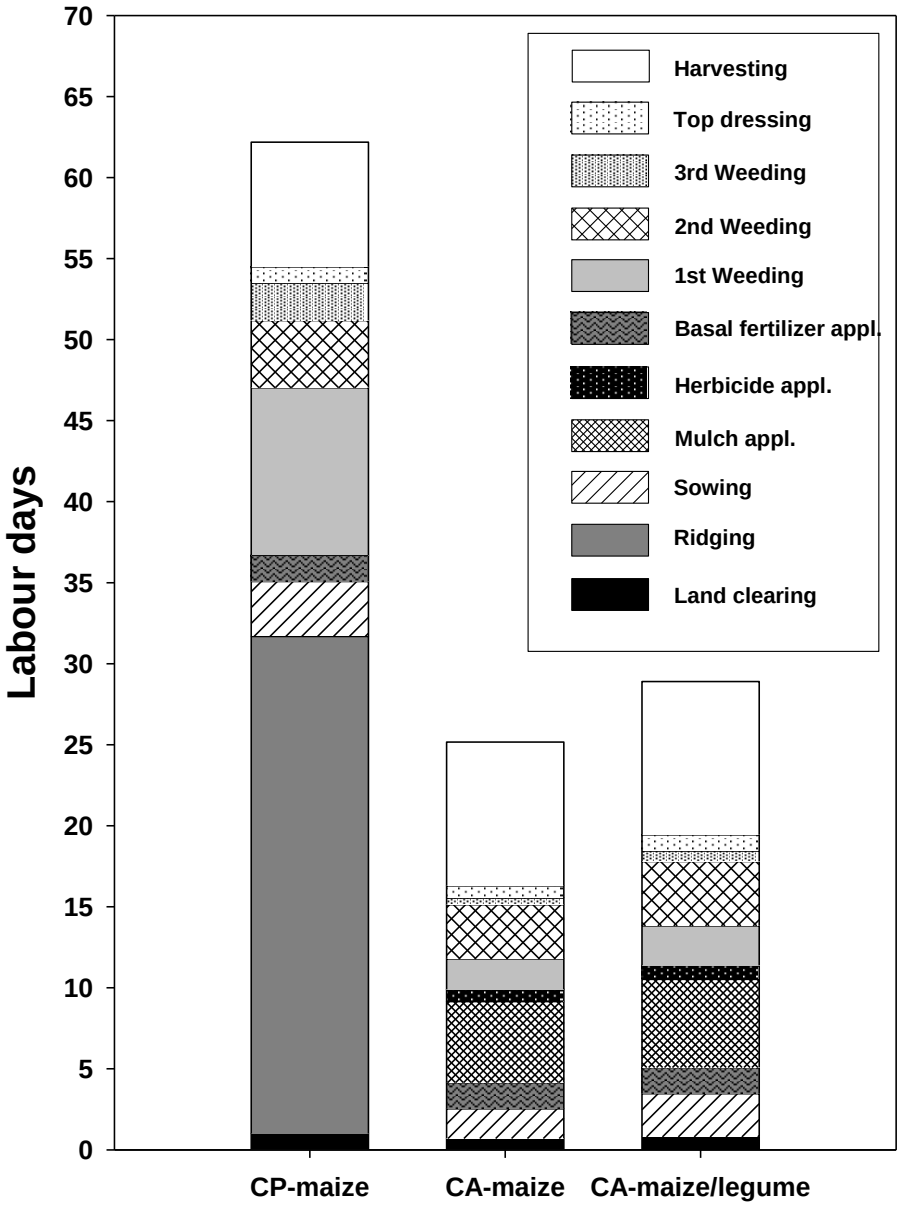
Mutenje et al. 2016

Mechanised Sustainable Intensification Practices Net Benefits (2012-2016) Eastern Zambia



Mutenje et al. 2016

CA in Malawi - key benefit is labour reduction



Thierfelder et al. 2015b

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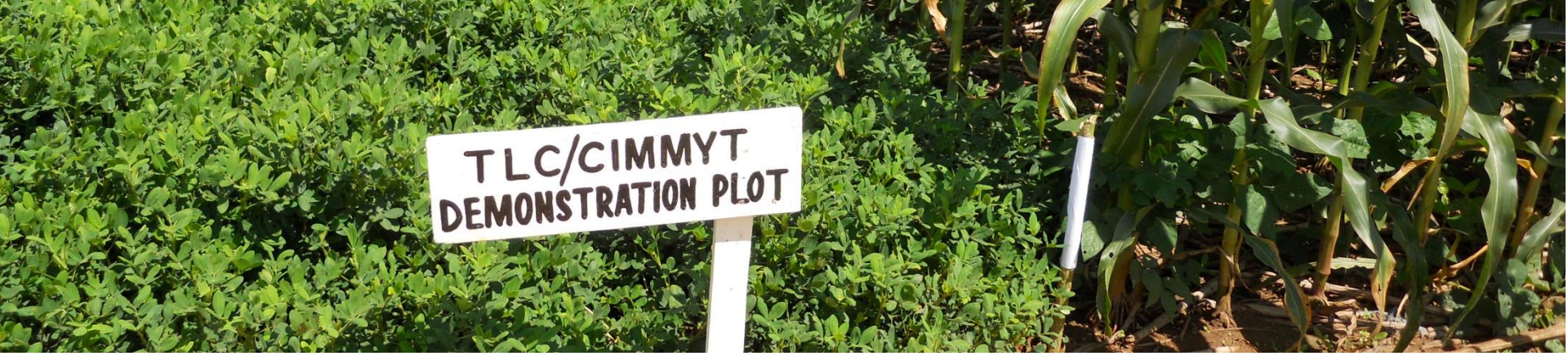

Some pertinent challenges ...

- **Residues:** How can we feed both livestock and crops?
- **Weeds** if no herbicides are used
- Lack of **fertilizer** – what are the alternatives?
- Donor driven **adoption** - one-size fits-all approaches
- (S)low adoption – **understanding** the issues

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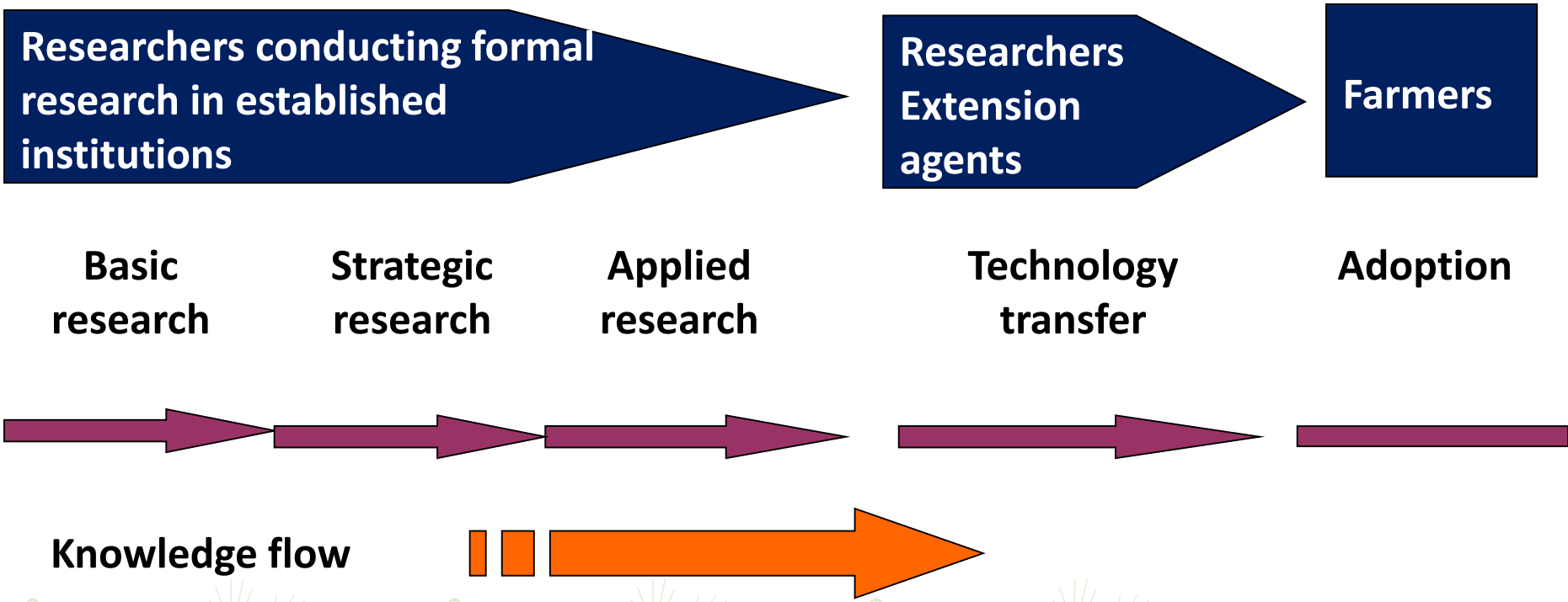
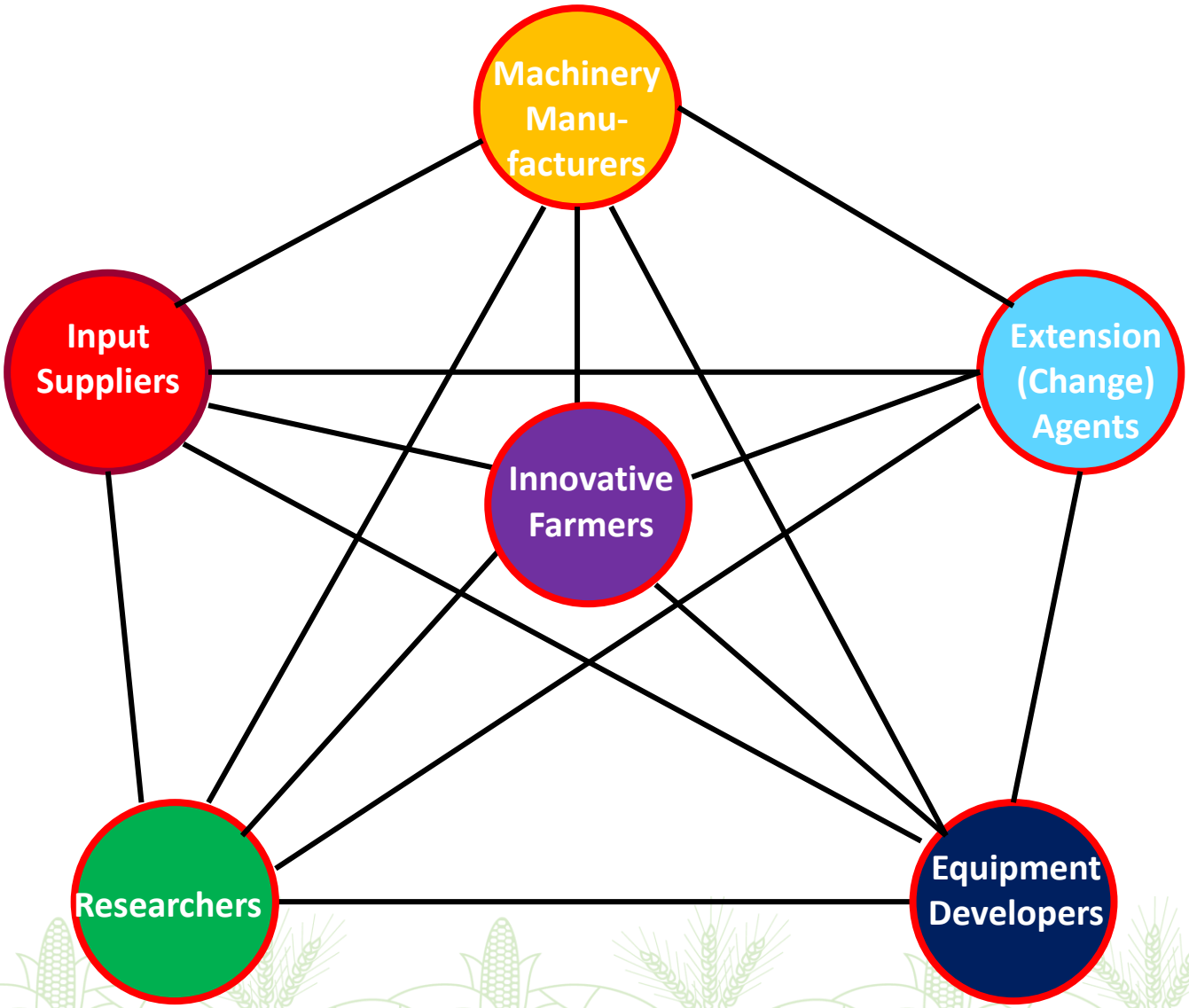
- **Knoweldge** gaps and perceptions amongst farmers
- Lack of **evidence** and data taking – believe in myths
- **Targeting** the wrong systems to the wrong farmers
- Ignoring farmers rationale and **decision making**
- The need for **co-development** of technologies

Scaling and adoption

The linear vision of research, extension and development



For CA, Multi-Agent *Innovation Systems* may be required



Other possible players:

- Agrochemical representatives
- Credit providers
- Output market
- Policy makers
- etc.

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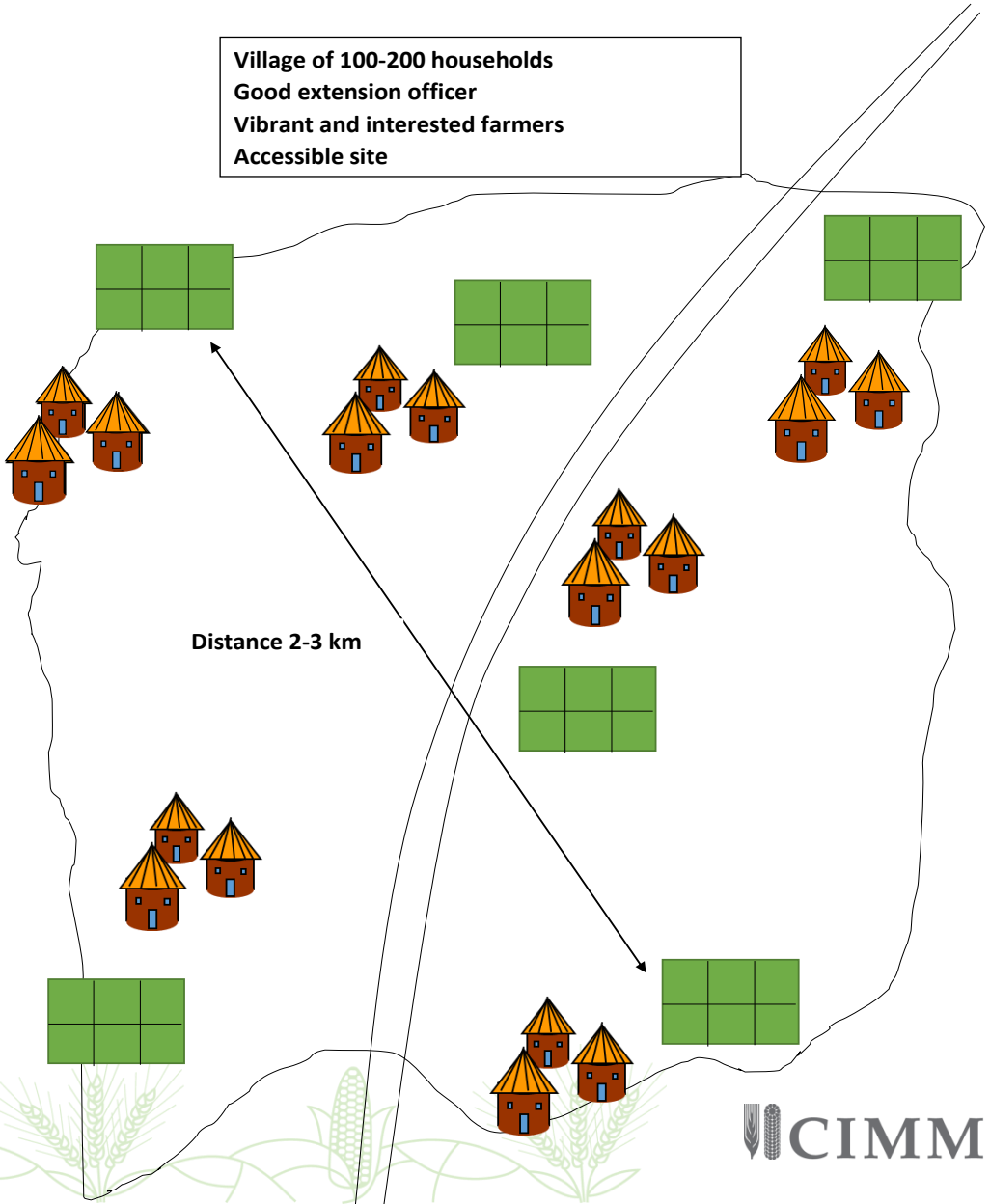
CIMMYT- CA extension in the past

On-farm Research

Cluster approach



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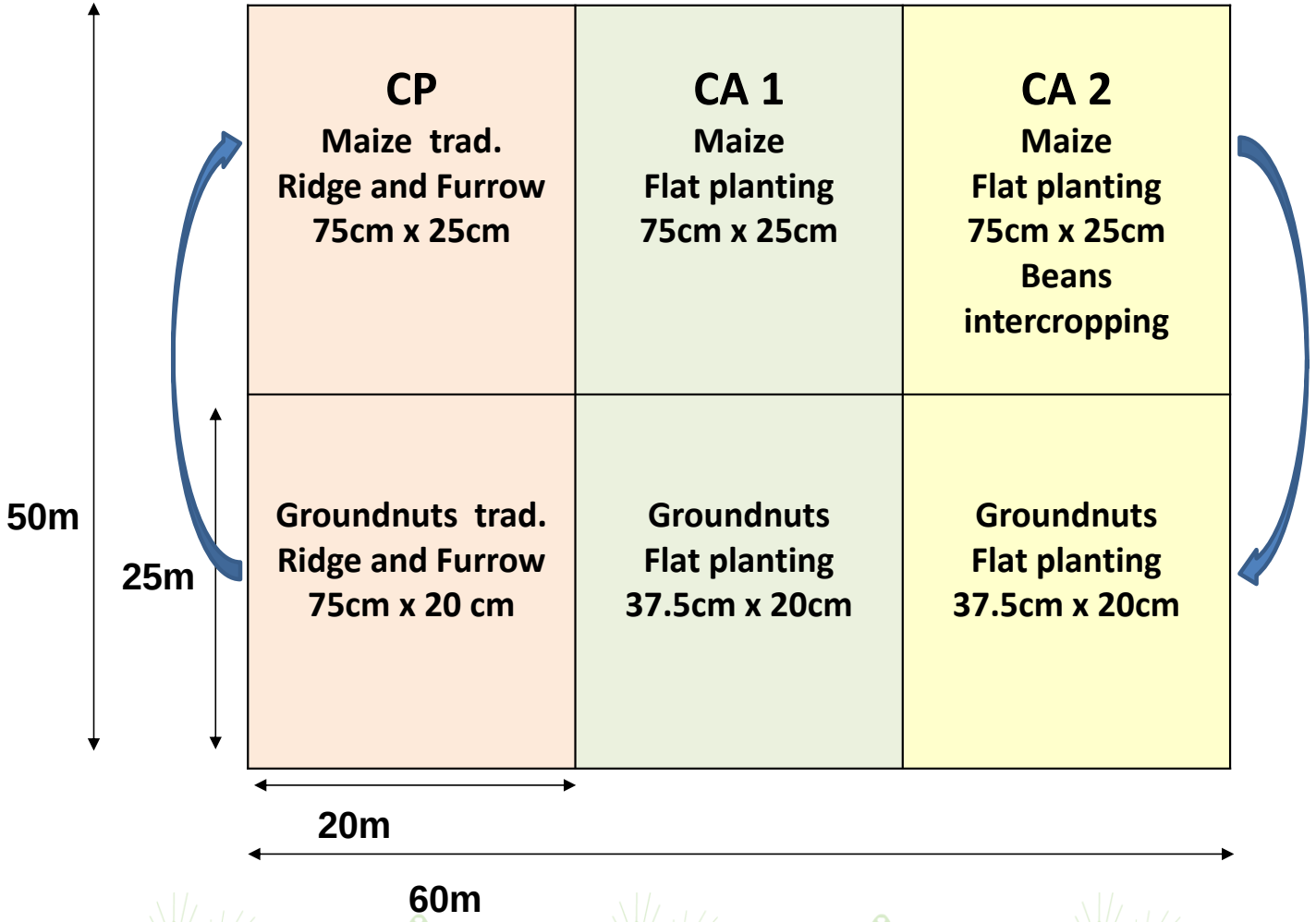
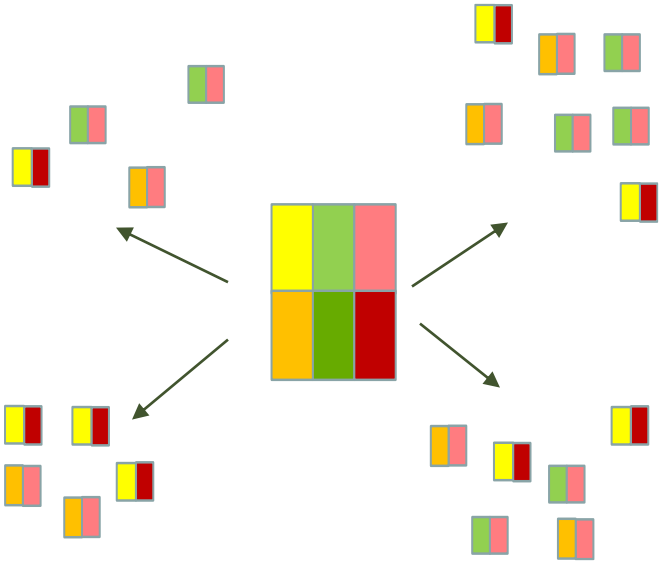
Maize- groundnut system (6 farmer reps)



Expanding the niche – through successful scaling



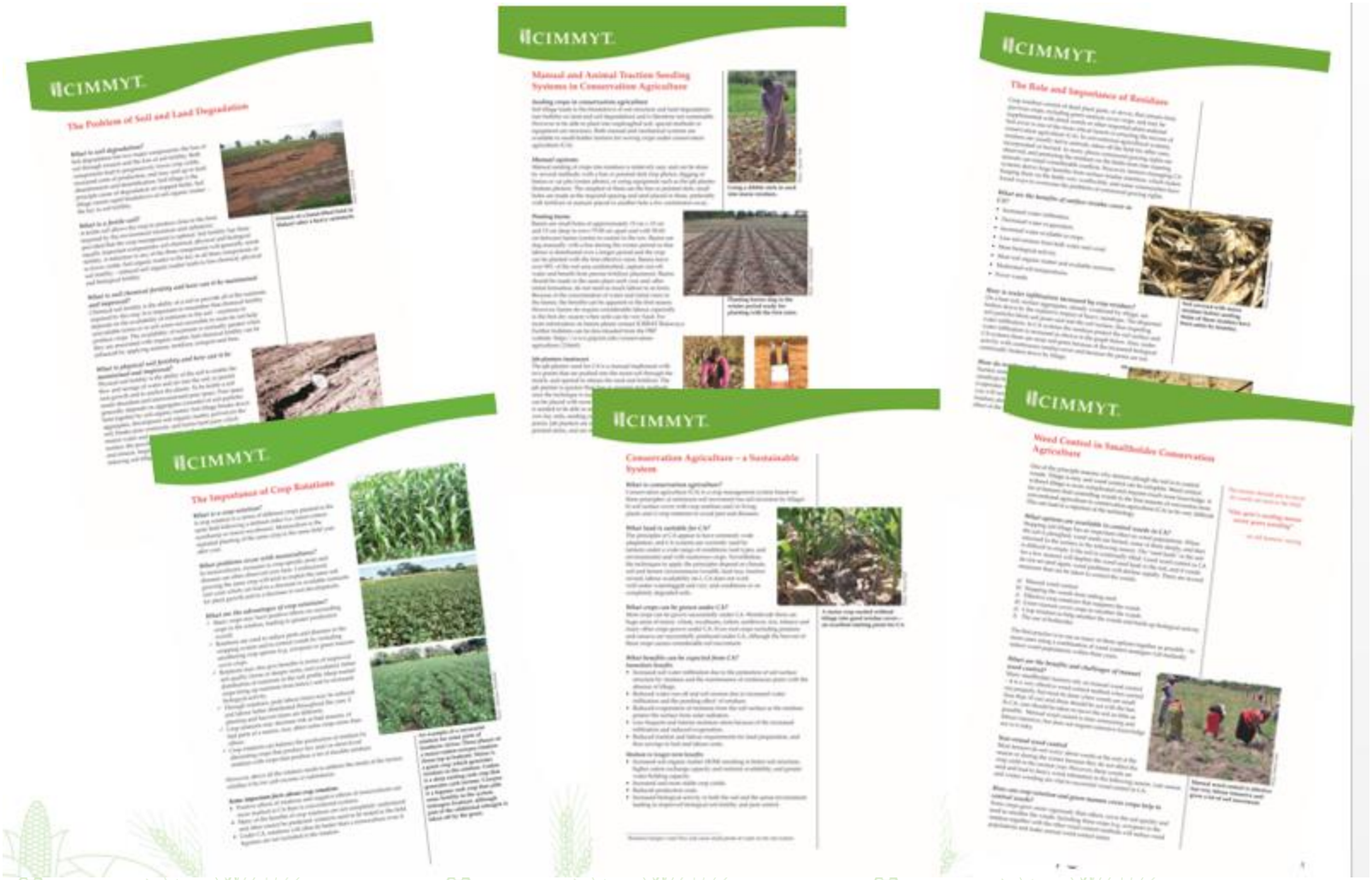
- ✓ Lead farmer approach
- ✓ Demonstration and field days
- ✓ Mother and baby trials
- ✓ Innovation systems approach
- ✓ Participatory extension approaches
- ✓ Farmer-to-farmer exchange
- ✓ Farmer field schools
- ✓ ICT

1. How to get started….?

Information:

- Stay **informed** (Get information from experienced farmers and technicians)
- Start **small** (about 10% of the property) with all principles
- Alternatively start with some **key principles**

Stay informed – technical bulletins and guidelines



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2. How to get started….?

Preparation:

- **Prepare** the field beforehand (get rid of compaction, unevenness, perennial weeds and acidity problems).
- Obtain the right **equipment** for seeding (and for weed control)
- Produce sufficient **ground cover**.

3. How to get started….?

Implementation:

- It is important to achieve good **weed control**.
- Start with a good **crop rotation** to provide nutrients, additional residues and weed control.
- If the soils are very sandy or degraded **apply extra nitrogen** fertilizers, manure or compost.

CA Adoption trends in sub-Saharan Africa

Country	Area under CA (ha)
Lesotho[2]	10,000
Sudan[2]	10,000
Madagascar[2]	6,000
Ghana[2]	30,000
Kenya[2]	32,000
Tanzania[2]	25,000
Malawi[1]	65,000
Mozambique[2]	152,000
Zambia[2]	200,000
Zimbabwe[1]	332,000
South Africa[2]	368,000
Total	**1,230,000**

Source: Kassam et al. 2015; [1]2013 estimates; [2]2009 estimates;

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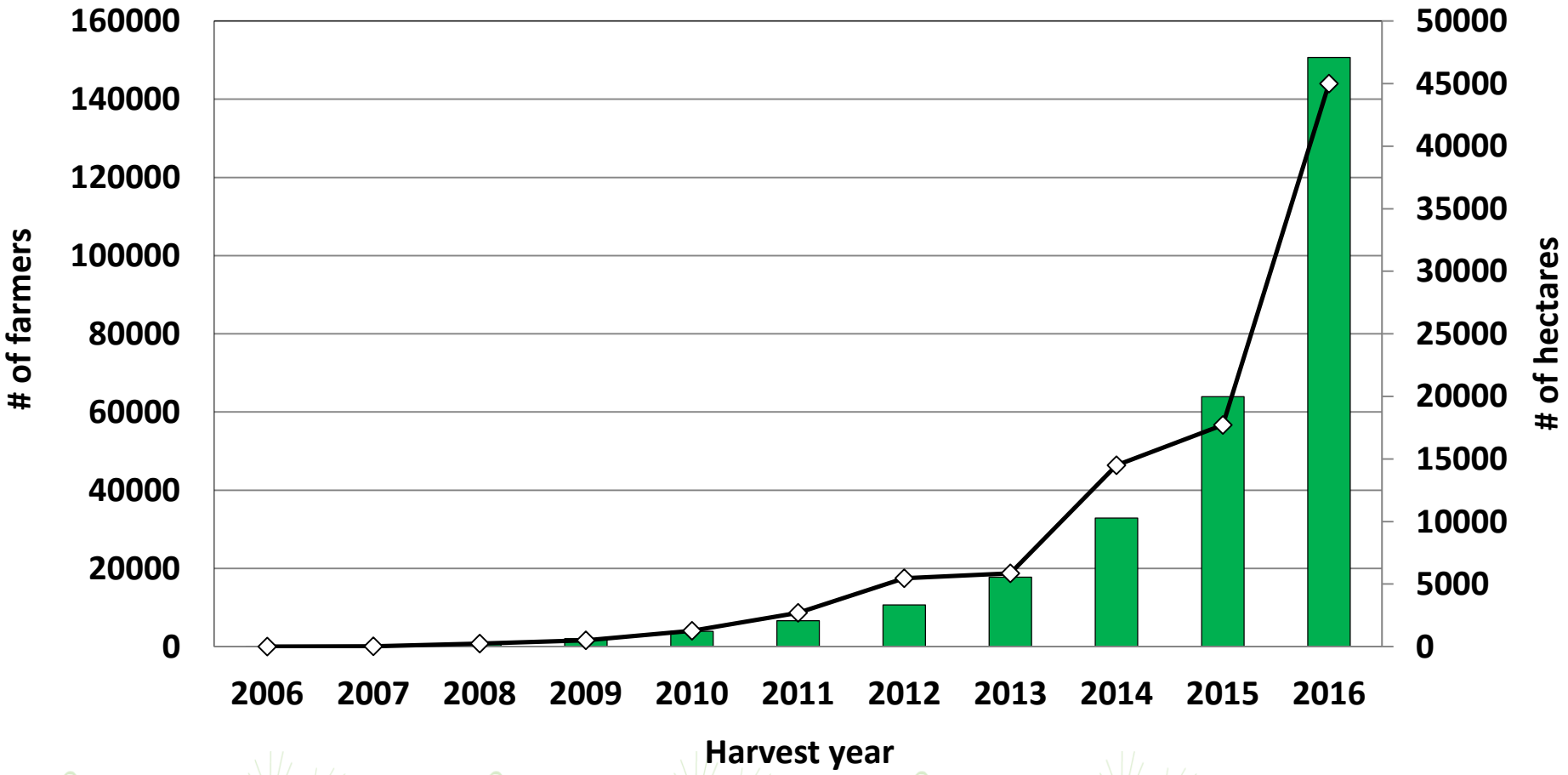
The Lead Farmer approach – Farmers practicing CA with TLC in Malawi



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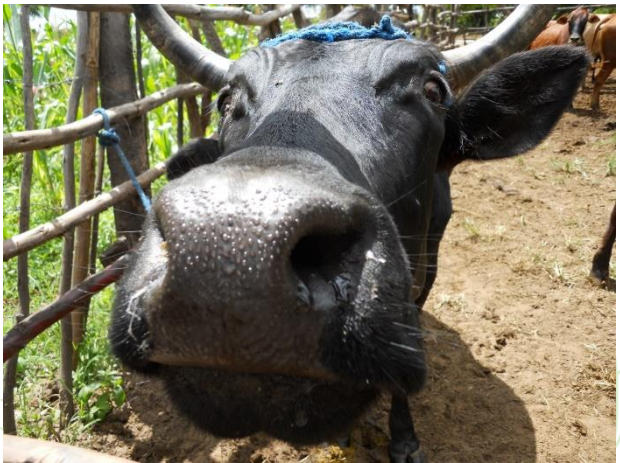
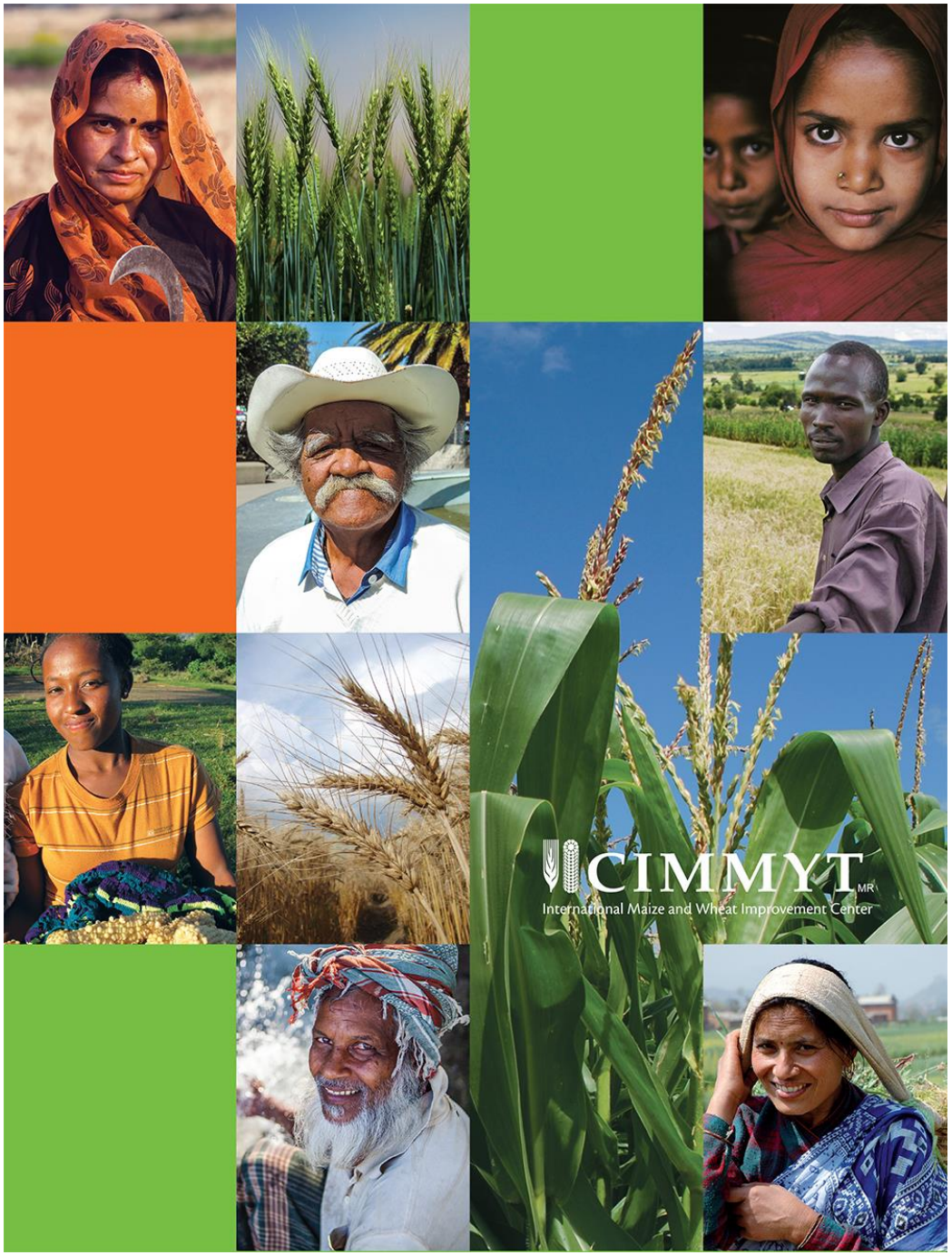
Reflexions and recommendations

- ✓ CA is **leading CSA system** and well adapted to southern Africa
- ✓ There is no **quick fix or remedy** that leads to 100% adoption CA in a very short time
- ✓ CA has to be promoted in a **flexible** approach – not one-size-fits all – based on good agriculture practices
- ✓ **"Research in Development"** projects can help in solving bio-physical and socio-economic constraints





Thank you for your interest!

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