Understanding Conservation Agriculture Farming Practices in Laikipia, Kenya: Technology Adoption and Adaptation

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Introduction

- Low adoption of Conservation Agriculture (CA) after many years of interventions practices and inadequate information on CA technology adoption evaluation (Giller *et al*., 2009).
- Dryland farming has shown declining crop yields to under 1 ton/hectare under current farming practices (Ndah *et al*, 2019).
- Climate change, vulnerability to droughts (Sonwa *et al*., 2017), erratic rainfall patterns with prolonged dry spells between rainfall seasons, (Corbeels *et al*., 2014).

The study will:

- Generate information on CA for promotion of CA practices amidst declining productivity from effects of climate change and unsustainable farming practices
- Identify CA adoption capacity and use farmer experiences in policy decision and in development of farmers' training material
- Provide recommendations for further research

Background

The study will:

- Generate information establishing the status and practice of CA among farmers useful for the promotion of CA practice amidst declining productivity from effects of climate change and unsustainable farming practices in the study area
- Identify CA adoption capacity and use farmer experiences in policy decision and in development of farmers' training materials in Laikipia.
- Develop Research Publications and provide recommendations for further research

Objectives of the Study

General objective

To determine adoption And Practice of Conservation Agriculture (CA) farming systems among farmers in Laikipia County.

Specific objectives

1. To analyze basic information of the participating farmers

2. To determine farmers' perceptions concerning CA farming in Laikipia.

3. To determine farmer adoption and practice of CA in Laikipia

Materials and Methods

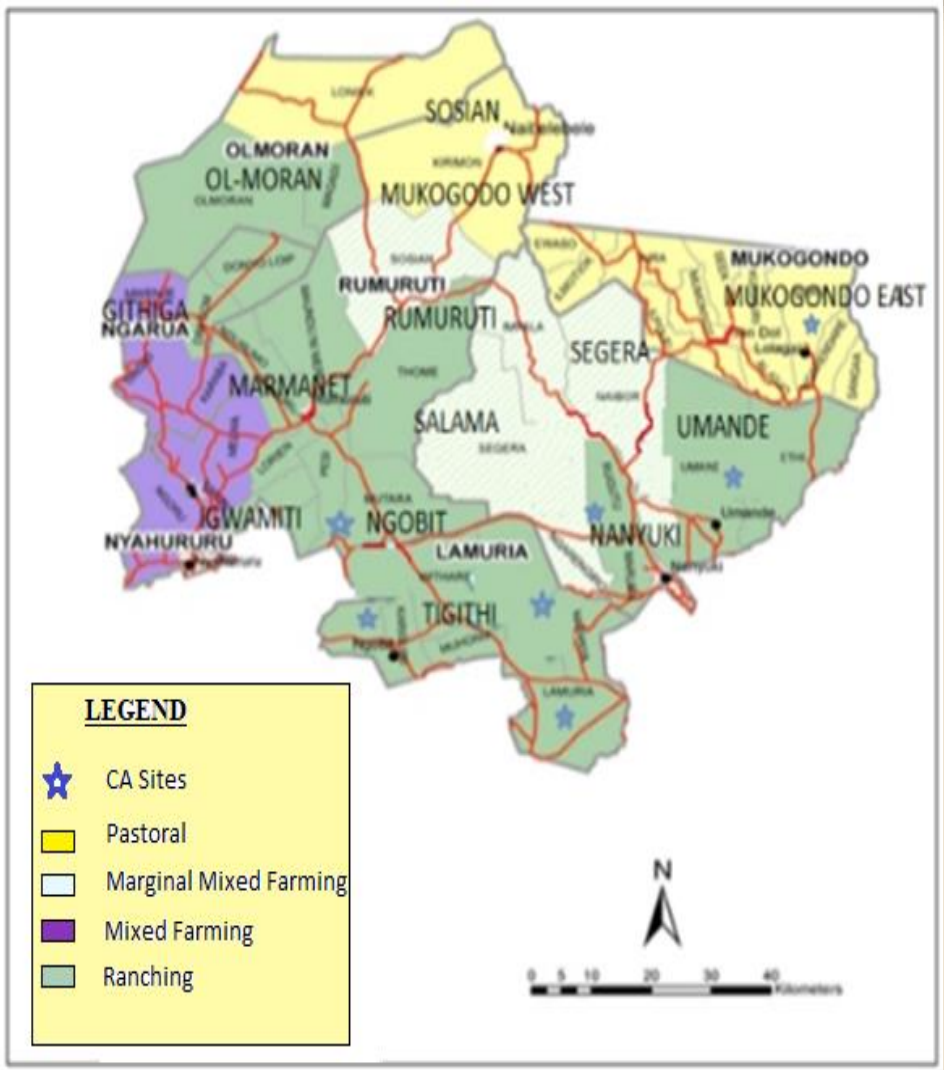


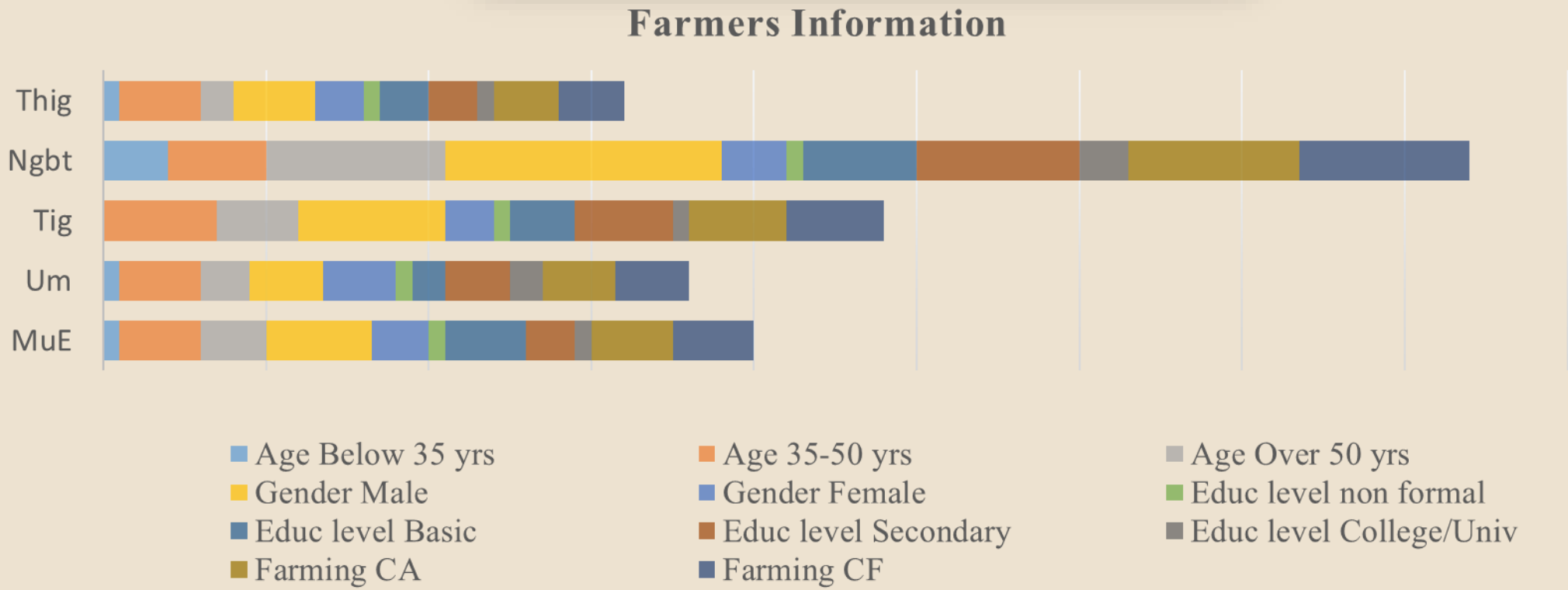
Fig 1. Map of Laikipia Showing CA sites

- The study area is located in Laikipia East and North sub-counties, starting from Mukogondo East ward in the eastern part at, N00.04423-N00.08516; E037.06823-E037.20538; to Ngobit ward in south-eastern part at, S00.07958-S00.13260; E036.57029-E036.946990 (Gitari *et al*., 2014).
- The area receives an average rainfall of 400mm - 850mm, with temperature ranging between 16 - 30° C (Jaetzold *et al*., 2006).
- Conservation agriculture (CA) is adopted by some farmers, majority of farmers practice conventional farming (CF) (Kaumbutho and Kienzle, 2007).

Materials and Methods

- Sampling of 60 farmers' households from 5 wards was done through **proportionate stratified random sampling**
- Farmers' views on adoption and practice of CA among other farming practices were collected using open and close ended **questionnaires** and information ground truthing done by farm visits and use of key informant interviews
- Statistical **data analysis** was done using Ms. Excel and IBM SPSS ver.22 Statistics and results presented in descriptive statistics mainly, tables, histograms and graphs

Results and Discussion



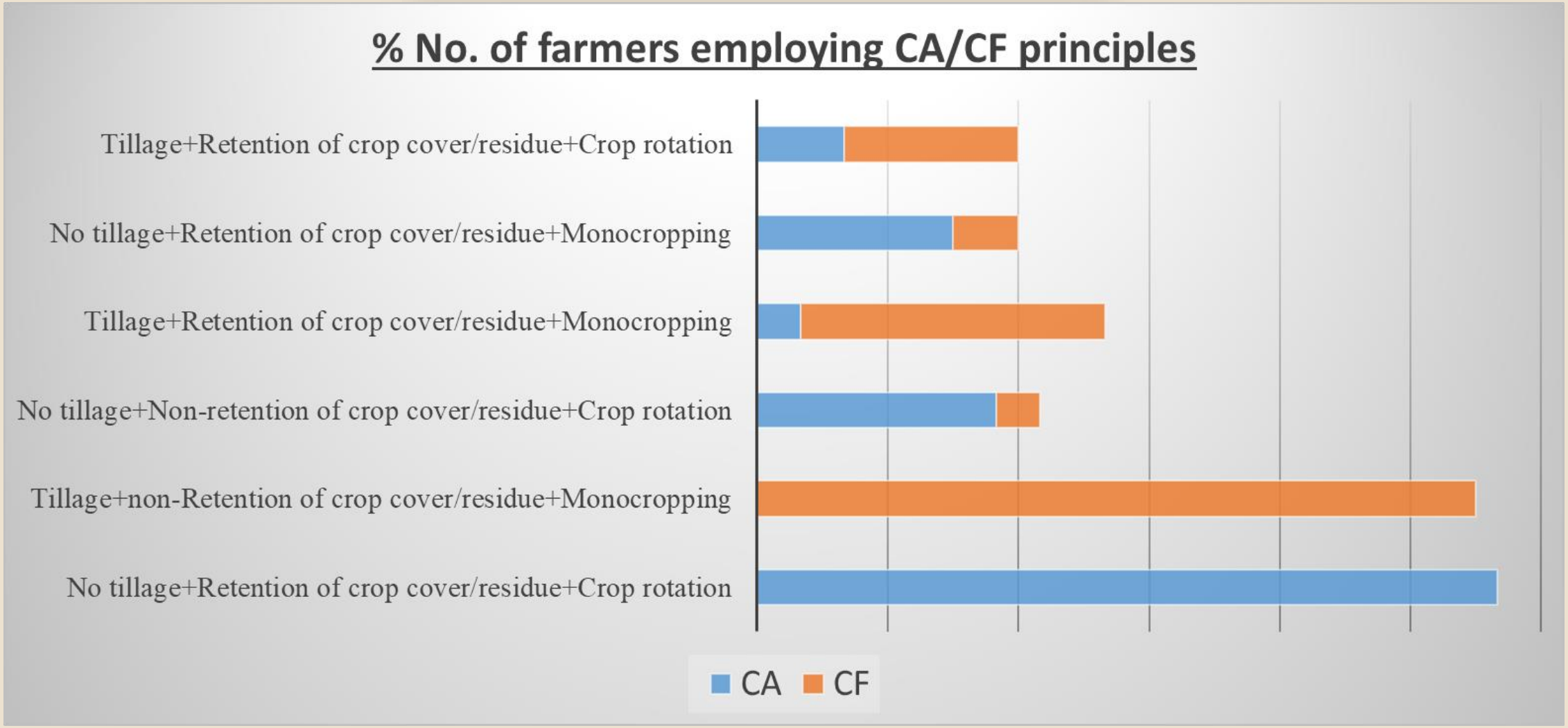
- ✓ Majority (36%) of farmers in this study based in Tigithi (Tig) Ward, of which 70% were male
- ✓ A majority of farmers (56%) were aged between 35-50 years, with 52% having at least secondary education and only 10% had non-formal education.

Farmers' Perception of Current Farming Practice

		Farming System		%Total
		%CA	%CF	
What are the lessons/benefits of your current farming?	Reduces Labour demand	19	4	23
	Long-term practice reduces soil degradation and improves crop yields	27	3	30
	Benefits are fast and reduces competition between crop residues for farming and livestock feeds	4	18	22
	Loosens & reduces soil compaction & is easy to carry out seeding	3	22	25
Totals		53	47	100

- Nineteen percent (19%) of farmers practising CA felt that adopting CA is less labour intensive, while 27% of them felt that practising CA leads to long term reduction of soil degradation, hence improvement in crop yields.
- Among farmers practising CF farmers, 18% felt that, adopting CF would lead to fast benefits in crop yields and reduces competition between crop residues for farming and livestock feeds. Giller, (2001) and Guto, (2011), reported major competition between crop residues for mulch or for livestock feed.

Results & Discussion



Results & Discussion

- Results showed that 28% of farmers adopting CA, practised all the three principles of conservation agriculture (No tillage plus retention of crop cover/residue and combined with crop rotation), 20% used at least two principles of CA, (No tillage + non-retention of crop cover/residue + crop rotation) and only 112% used at least one principle of CA (Tillage + Retention of crop cover/residue + Mono-cropping)

Conclusion and Discussions

- ✓ Most farmers were middle aged and had at least secondary education. This implies that age and education level of a farmer may have influence on adoption of farming technologies as also found by Sitko and Jayne (2018)
- ✓ Farmers practicing CA implemented other practices
- ✓ Farmers experience indicated that combining crop cover/residues with tillage had better performance than combining crop cover/residue and no tillage as advocated for by FAO (2019). The results are in agreement with related studies by Gowing and Palmer, (2008) and Okeyo *et al*. (2016)
- ✓ Results reported competition between crop residues for farming and livestock feeds. Similar competing is reported by Giller, (2001) and Guto, (2011)

Recommendations

- Farmers' experience in this study can be used to promote innovations and management practices that enhance farmer resilience to climate risks and improve productivity in the study area. Study has shown that, farmer experience is key in policy decision, technical training and promotion of technologies Sonwa *et al*., (2017)
- Further studies across different agro-ecological and socio-economic conditions in the study area are required

Acknowledgement

1) **Sponsors-** World Bank through the KCSAP
2) **Participating farmers-** from Umande, Tigithi, Ngobit, Thingithu and Mukogodo wards
3) **County Government of Laikipia-** through; Human Resource Officer, Ward agricultural officers and support staff
4) **Karatina University-** through; Director of post-graduate studies, Dean, School of Agriculture and Biotechnology and university support staff.
5) **My family members-** for their moral support

THANK YOU