

**UNIVERSITY OF  
MPUMALANGA**

**Smallholder Farmers' Perception of  
Conservation Agriculture: Evidence  
From Nkomazi Local Municipality,  
South Africa**

**MZ SITHOLE & AI AGHOLOR**

**ONE HEALTH STUDENT INTERNATIONAL CONFERENCE**

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# PRESENTATION OUTLINE



**This presentation covers the following areas:**

- Introduction
- Conceptual Framework
- Methodology
- Results and Discussion
- Conclusion and Recommendations
- References, and Acknowledgements



# INTRODUCTION



- The production of food in a more sustainable way has been threatened in recent years by the realities of climate change (Muzangwa *et al.*, 2017).
- However, there are sustainable agriculture approaches for improved farming resilience, especially, among smallholder farmers.
- Conservation Agriculture (CA) is one of the sustainable agricultural systems with great potentials towards farmers' adaptation to the effects of climate change and promote sustainable agriculture or farming practices (FAO, 2018).
- The aim of CA is to ensure improved farming resilience, improved soil health, increased farm profitability (productivity), food security worldwide, adaptation to climate change (Jug *et al.*, 2018).
- Studies have shown low adoption rate of CA, especially, in developing countries (Mango *et al.*, 2017; Ngoma *et al.*, and Tufa *et al.*, 2023).
- Hence, this project, examined smallholder farmers' perceptions of CA with an assumption that the farmers' perceptions contributes to the low CA adoption rate.



# CONCEPTUAL FRAMEWORK

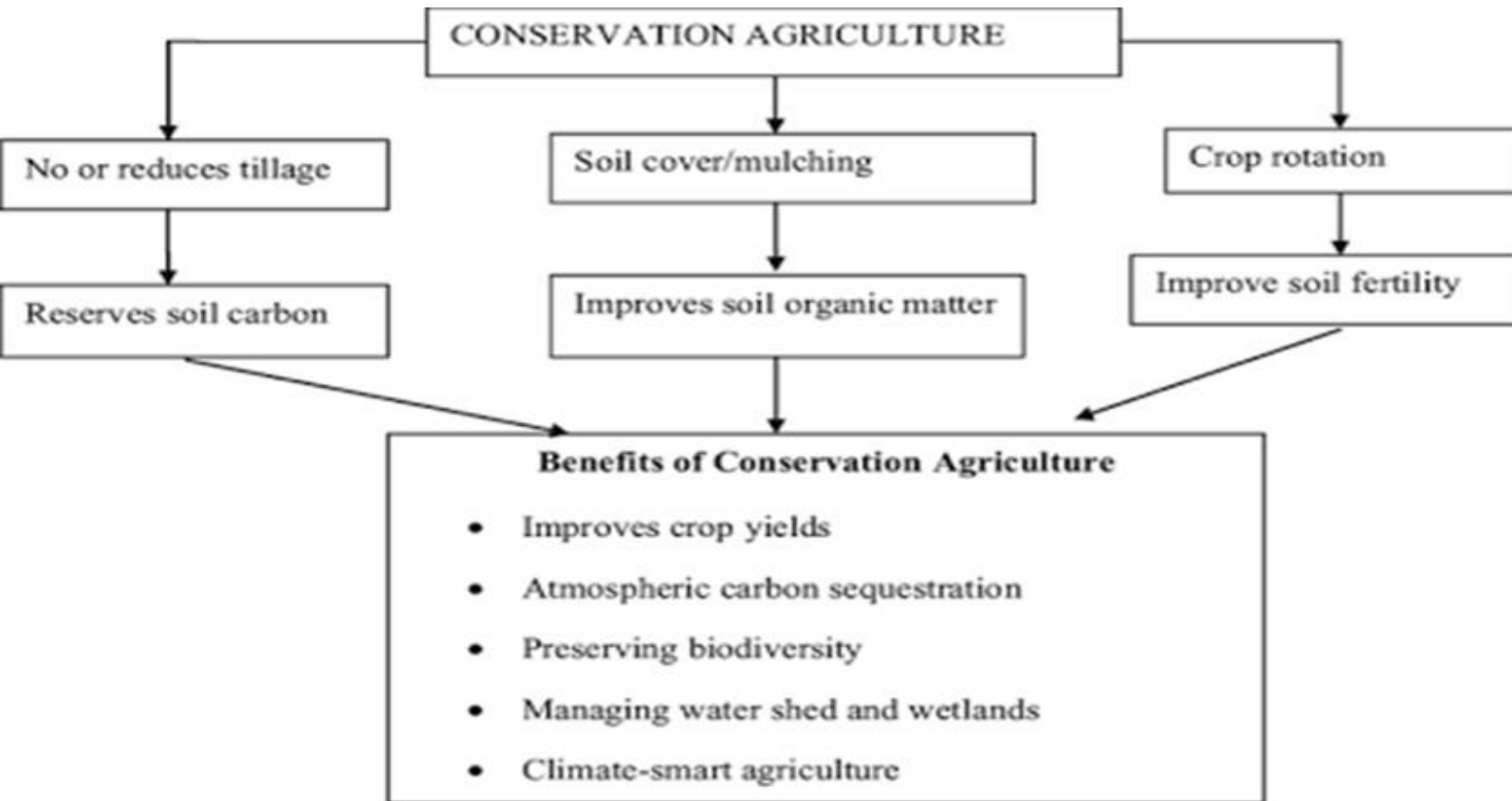


Figure 1: Conceptual Framework for the study



# METHODOLOGY

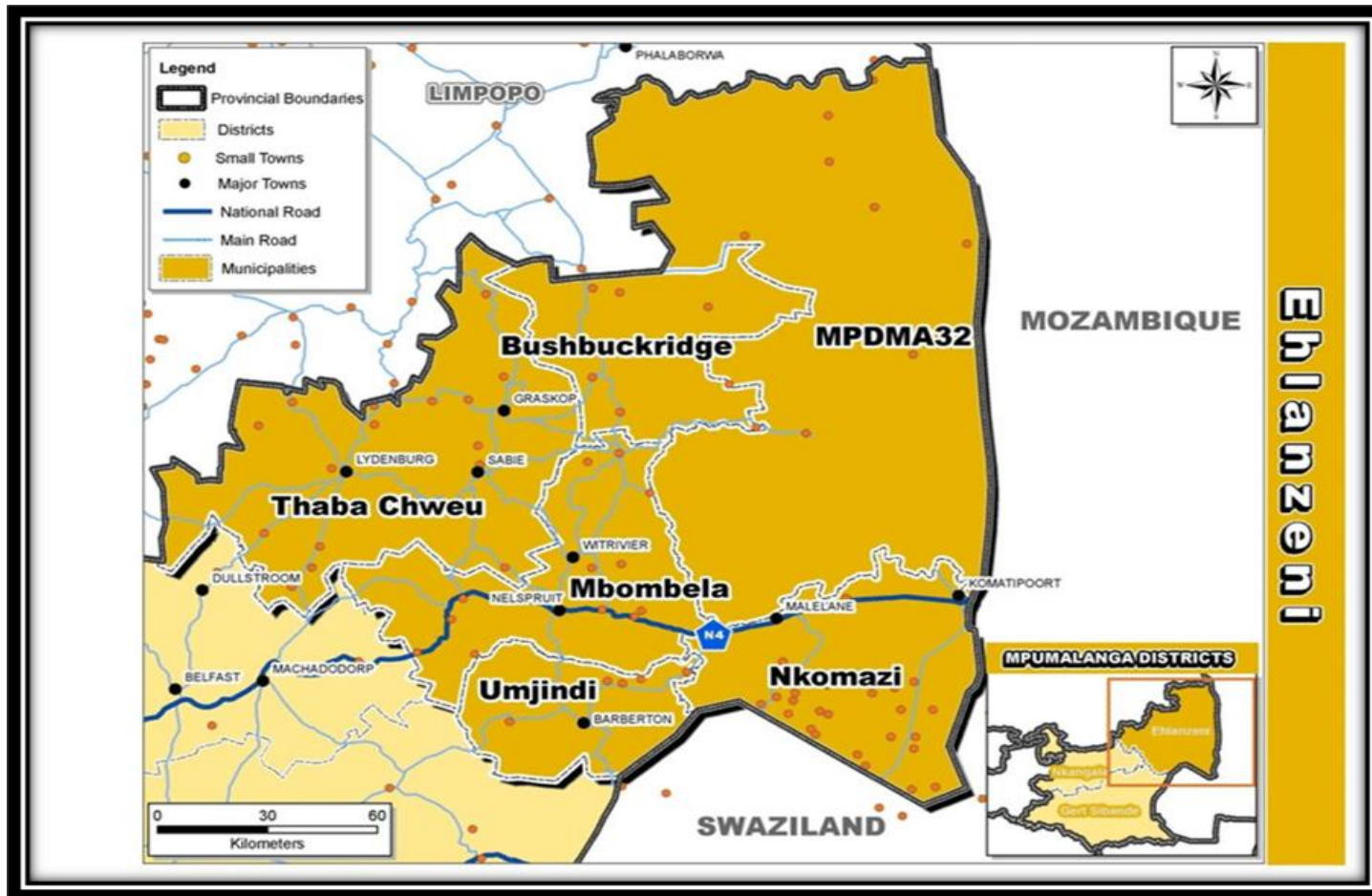


Figure 2: Map of Ehlanzeni District Municipality



# METHODOLOGY...



- The study employed the mixed method research approach.
- The study randomly sampled **366** smallholder farmers, after having determined the sample size through the Slovin's sample size formulae.

$$n = \frac{N}{(1 + Ne)^2} = \frac{1103}{(1 + 1103((0.05))^2)} = 293.546 = 294$$

- Structured questionnaires were used to collect quantitative data for the project and the Participatory Rural Appraisal (PRA) tools were also used to collect data for the survey.
- Descriptive statistics, mean and standard deviation were used to analyze the data collected using the IBM SPSS version 27.



# RESULTS AND DISCUSSION



**Table 1: Socio-economic characteristics of the smallholder farmers in Nkomazi Local Municipality**

Variable	Categories	Percentages (%)
<b>Gender</b>	Male	36.39%
	Female	63.70%
<b>Age</b>	18 – 35 years	17.50%
	36 – 55 years	38.50%
	56 – 75 years	39.30%
	> 75 years	4.60%
<b>Educational level</b>	No school	21.00%
	Adult school	1.60%
	Primary education	24.90%
	Secondary education	43.70%
	Tertiary education	8.70%



# RESULTS AND DISCUSSION...



<b>Marital status</b>	Married	47.27%
	Single	38.52%
	Divorced	0.82%
	Widowed	13.39%
<b>Household size</b>	1 – 5 persons	54.64%
	6 – 10 persons	32.24%
	More than 10 persons	13.11%
<b>Farmland size</b>	< 1 hectare	34.20%
	1 – 5 hectares	52.10%
	6 – 10 hectares	10.70%
	11 – 20 hectares	1.40%
	> 20 hectares	1.40%
<b>Water source</b>	Borehole	6.60%
	River	29.50%
	Dam	6.00%
	Other	57.90%





# RESULTS AND DISCUSSION...



**Table 2: The use of Conservation Agriculture among Smallholder Farmers in Nkomazi Local Municipality**

<b>PRACTICE OF CONSERVATION AGRICULTURE BY RESPONDENTS</b>			
		<b>Frequency</b>	<b>Percent</b>
	<b>YES</b>	341	93.2
	<b>NO</b>	25	6.8
	<b>Total</b>	<b>366</b>	<b>100.0</b>

NB: This result is in contrary to findings by Spear *et al.*, (2018), Taapopi *et al.*, (2018) and Pareek *et al.*, (2020).



# RESULTS AND DISCUSSION...



**Table 3: The Conservation Agriculture approaches used by smallholder farmers in Nkomazi Local Municipality**

## CONSERVATION AGRICULTURE APPROACHES USED BY RESPONDENTS IN THEIR FARMS

		Frequency	Percent
Valid	MINIMAL TILLAGE	29	7.9
	MULCHING	19	5.2
	CROP ROTATION	228	62.3
	RAINWATER HARVESTING	3	.8
	COVER CROPPING	4	1.1
	INTERCROPPING	39	10.7
	OTHER	44	12.0
	<b>Total</b>	<b>366</b>	<b>100.0</b>



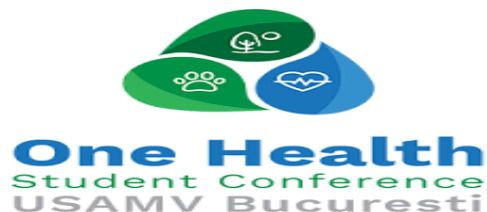
# RESULTS AND DISCUSSION...



**Table 4: Perceived effects of Conservation Agriculture among smallholder farmers in Nkomazi Local Municipality**

## PERCEIVED EFFECTS OF CA AMONG SMALLHOLDER FARMERS IN NKOMAZI

	Frequency	Percent
Valid		
INCREASED SOIL ORGANIC MATTER	106	29.0
WATER RENTETION ENHANCEMENT	14	3.8
IMPROVED ROOTING DEPTH	14	3.8
IMPROVED CROP YIELDS	24	6.6
REDUCED PESTS AND DISEASES OUTBREAK	114	31.1
WEEDS MANAGEABLE	27	7.4
INCREASED CROP YIELDS	2	.5
ENHANCED FARMING RESILIENCE	22	6.0
REDUCED SOIL EROSION	4	1.1
OTHER	39	10.7
<b>Total</b>	<b>366</b>	<b>100.0</b>



# RESULTS AND DISCUSSION...



**Table 5: The extent to which Conservation Agriculture is perceived beneficial on soil quality among smallholder farmers in Nkomazi Local Municipality**

The extent to which Conservation Agriculture is perceived beneficial on soil quality among smallholder farmers in Nkomazi Local Municipality

	Minimum	Maximum	Mean	Std. Deviation
IMPROVED LEVELS OF SOIL ORGANIC	1	5	1.32	.690
REDUCED LEVELS SOIL EROSION	1	5	4.26	.822
IMPROVED LEVELS OF ROOTING DEPTH	1	5	1.93	.867
IMPROVED LEVEL OF SOIL AERATION	1	4	1.92	.853
<b>TOTAL</b>				



# CONCLUSION AND RECOMMENDATION



- This study aimed at assessing smallholder farmers' perceptions of Conservation Agriculture.
- The results shows that majority of the smallholder farmers in Nkomazi have adopted CA.
- This findings are contrary to many authors who confirmed that CA adoption rate is low or below the expected. However, the perceived benefits of CA are similar.
- Therefore, it can be concluded that the adoption of CA varies from location to location, felt needs of individual farmers, financial, human and physical resources needed as well as the size of land.
- Since CA is perceived to be beneficial for sustainable agriculture and is environmentally friendly as we as climate change adaptation, it is recommended that future studies investigate the relationship between the adoption of CA and external support and/or economic factors.



# REFERENCES



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- Words of appreciation also goes to the NRF for funding the project.



The background features a large, light gray watermark of a university crest. The crest is shield-shaped and divided into four quadrants. The top-left quadrant has horizontal green and white stripes. The top-right quadrant is solid red. The bottom-left and bottom-right quadrants are white. A white cross is centered on the shield. The shield is surrounded by a laurel wreath. The text 'THANK YOU' is overlaid in red, and the phrase 'I am happy to take questions...' is overlaid in blue cursive script.

**THANK YOU**

*I am happy to take  
questions...*