

Understanding the Determinants of Smallholder Farmers' Adaptive Behaviour to Strengthen Climate Resilience

Presented by: Dr Nosisa Zaca

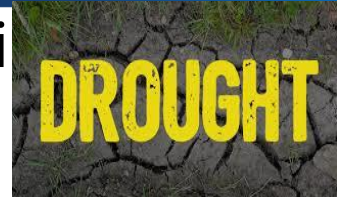
13 October 2026 | ANEW Resort White River, Mbombela, Mpumalanga
Province

PRESENTATION OUTLINE

- Introduction
- Research Objectives
- Data Collection
- Conceptual Framework
- Results and Discussion
- Recommendations

INTRODUCTION

- Climate change + its adverse impacts = Most critical environmental challenges facing the world today
- South Africa is also highly vulnerable to the impact of climate change
 - Recorded more than 90 climate-related disasters in the past three decades
 - More than 22 million people have been impacted
 - Damaged infrastructure of over ZAR 113 billion



RESEARCH OBJECTIVES

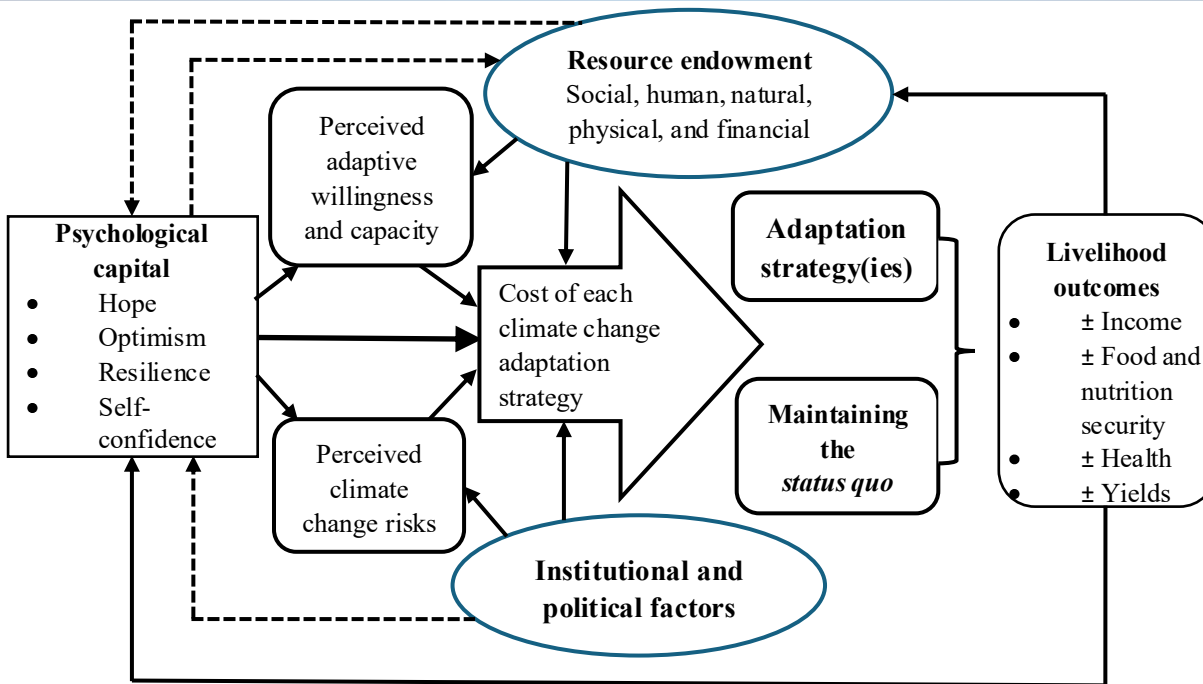
1. Examine smallholder farmers' perceptions of climate change
2. Examine the climate change adaptation strategies adopted by smallholder farmers
3. Evaluate the determinants of the adoption of climate change adaptation strategies among smallholder farmers

A better understanding of how smallholder farmers perceive climate change and which adaptation strategies they adopt is essential for designing policies and programs that promote effective climate change adaptation in the agricultural sector.

DATA COLLECTION

- KwaZulu-Natal Province **(305 smallholder farmers)**
- Identified municipalities negatively affected by climate change
 - uMgungundlovu District Municipality (Swayimane and Richmond)
 - eThekweni Metropolitan Municipality (Umbumbulu)
- Aligned the study with the South African government's climate change adaptation and resilience agenda
- Structured questionnaire

CONCEPTUAL FRAMEWORK



Smallholder farmers who:

- Are **concerned** about the **negative effects of climate change**
- Are endowed with **high positive psychological capital**
- Perceive **low adaptation costs**
- Have **access to livelihood assets**
- Operate in a **supportive institutional and political environment**
- Are more **likely to make effective adaptation decisions**
- Thus **improving their livelihood outcomes**

The higher the costs (e.g., financial, time, health, and emotional risks) associated with adopting climate change adaptation strategy(ies), the lower the motivation to adopt adaptation strategy(ies).

RESULTS AND DISCUSSION



science, technology
& innovation

Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA



HSRC
Human Sciences
Research Council

PERCEPTIONS OF CLIMATE CHANGE

	Total (%)
Climate change is a challenge	93.1
Climate change has affected agricultural production	86.6
Rainfall patterns have changed over the past 20 years	94.8
<i>Increasing</i>	48.1
<i>Decreasing</i>	27.0
<i>Variable</i>	24.9
Temperature patterns have changed over the past 20 years	90.8
<i>Increasing</i>	66.1
<i>Decreasing</i>	10.5
<i>Variable</i>	23.5



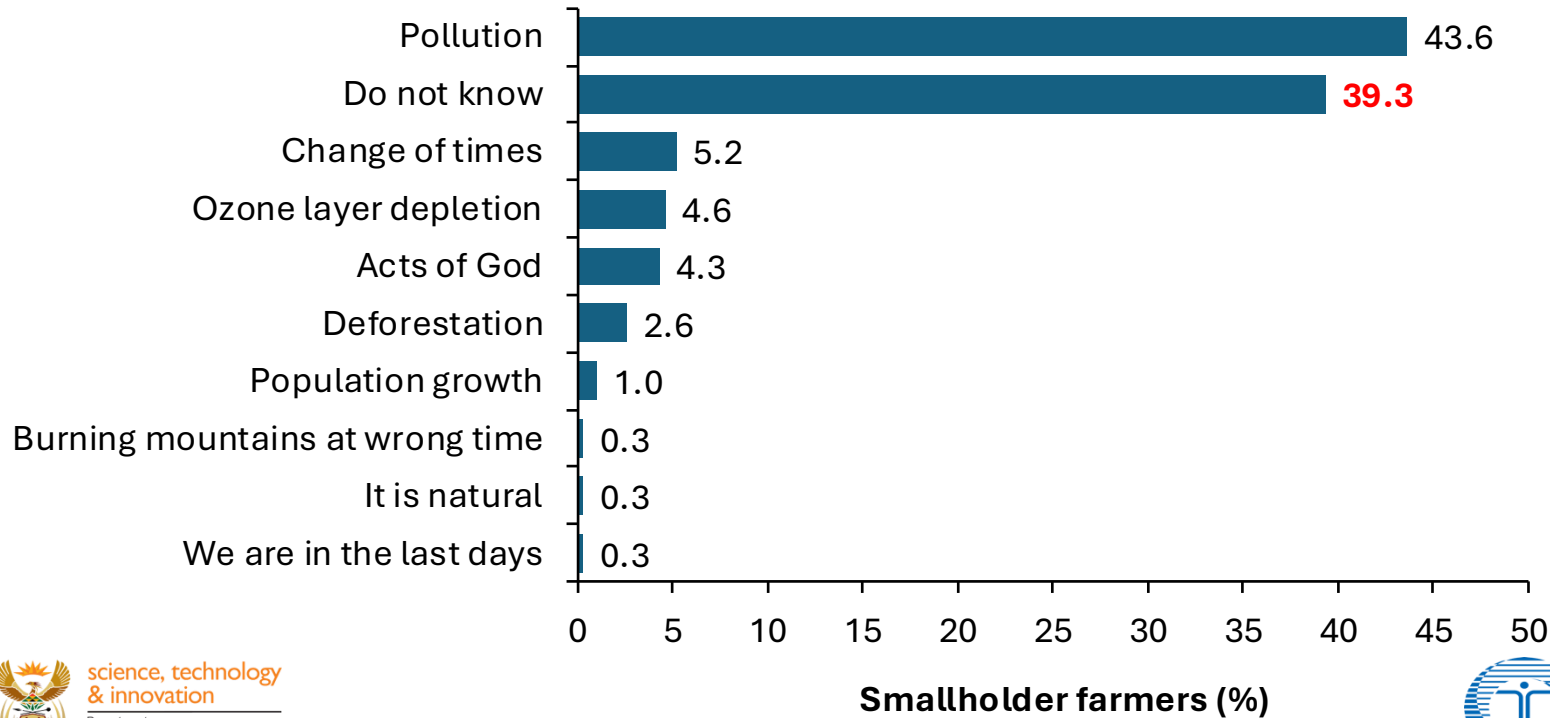
science, technology
& innovation

Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA

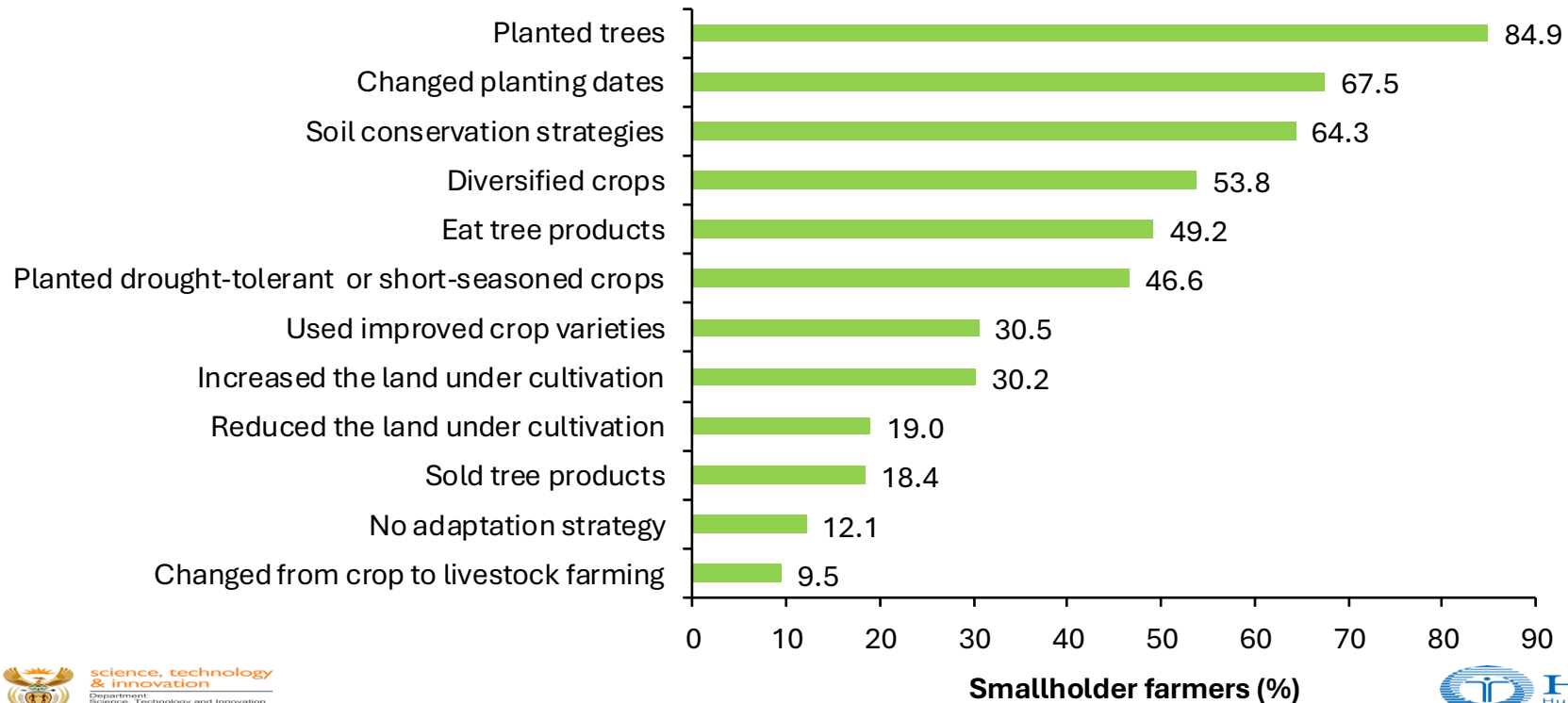


HSRC
Human Sciences
Research Council

PERCEIVED CAUSES OF CLIMATE CHANGE



CLIMATE CHANGE ADAPTATION STRATEGIES



DETERMINANTS OF ADOPTING CLIMATE CHANGE ADAPTATION STRATEGIES

Psychological Capital

Farmers' mental and emotional strength

- **Hopeful smallholder farmers:**
 - Perceive climate change as a manageable or temporary challenge
 - More inclined to adopt short-term adaptation strategies that provide relatively immediate benefits (e.g., soil conservation and crop diversification)
- **Resilient smallholder farmers:**
 - Have capabilities and access to productive assets
 - Invest in and sustain adaptation strategies that improve their long-term resilience

Smallholder farmers with similar resources and constraints may respond differently to a climate change threat because their willingness to adapt varies according to their level of psychological capital.

DETERMINANTS OF ADOPTING CLIMATE CHANGE ADAPTATION STRATEGIES

Age of the household head

- Smallholder farmers residing in households headed by older individuals were more likely to adopt traditional climate change adaptation strategies
- *Older household heads:*
 - Often possess greater farming indigenous knowledge and experience
 - Have been exposed to a wider range of climate-related events
 - Play an important role in transferring agricultural knowledge, farming experience, and indigenous adaptation strategies

DETERMINANTS OF ADOPTING CLIMATE CHANGE ADAPTATION STRATEGIES

Squared age term of the household head

- The likelihood of adopting traditional adaptation strategies increased with the age of the household head up to a certain point, after which it began to decline:
 - Very old household heads often become less actively involved in farming activities and knowledge sharing
 - Smallholder farmers residing in these households have fewer opportunities to benefit from the transfer of indigenous climate change adaptation strategies

DETERMINANTS OF ADOPTING CLIMATE CHANGE ADAPTATION STRATEGIES

Access to agricultural training

- Agricultural training plays an important role in promoting the adoption of climate change adaptation strategies by enhancing smallholder farmers' knowledge, skills, and awareness of the benefits of adaptive practices.

DETERMINANTS OF ADOPTING CLIMATE CHANGE ADAPTATION STRATEGIES

Group membership

- **Smallholder farmers who are members of farming groups or cooperatives are more likely to:**
 - Exchange information on coping with the impacts of climate change
 - Gain exposure to a wider range of adaptation strategies
 - Adopt climate change adaptation strategies when they observe others within their social networks doing the same

DETERMINANTS OF ADOPTING CLIMATE CHANGE ADAPTATION STRATEGIES

Access to climate change information

- **Smallholder farmers with access to reliable climate information services were more likely to adopt climate change adaptation strategies:**
 - The adoption of climate-smart agricultural practices such as agroforestry significantly increases among smallholder farmers who receive climate change information from reliable sources

DETERMINANTS OF ADOPTING CLIMATE CHANGE ADAPTATION STRATEGIES

Farmland size

- **Smallholder farmers with access to larger areas of farmland are more likely to adopt long-term adaptation strategies:**
 - Larger farmland size provides a greater flexibility to allocate land to various climate change adaptation strategies, including long-term investments such as **agroforestry (crops + livestock + trees)**

RECOMMENDATIONS

Psychological capital

Interventions aimed at strengthening smallholder farmers' psychological capital should be systematically integrated into agricultural extension services, climate change adaptation planning, and policy frameworks through training workshops, mentorship programs, and farmer-to-farmer learning initiatives

Practical training programs

Practical and context-specific programs should be delivered in accessible formats, including local languages, to accommodate illiterate and less experienced smallholder farmers and promote inclusive and equitable development

RECOMMENDATIONS CONT'D

Multi-stakeholder collaboration

Agricultural extension workers, non-governmental organizations, policymakers, and other stakeholders should continue working collaboratively with farming communities to strengthen local knowledge systems, improve access to reliable climate information, and translate both indigenous and scientific knowledge into effective and sustainable adaptation actions

Forestry extension services

Policies that promote tree planting alongside awareness of its environmental, agricultural, and livelihood benefits should be prioritized and effectively implemented in communities that are most vulnerable to climate change

ACKNOWLEDGMENTS



science, technology
& innovation

Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA

