

REPORT SUMMARY

Exploring climate-related challenges and potential IT-based solutions for small-scale farmers in the region of the Eastern Cape Province





Report compiled by:

**Department of Agricultural
Sciences, Mandela University**

Mr Xolisile Dingiswayo,
Dr Musa Khapayi

Field Workers

Mr Xolisile Dingiswayo, Mr Yonela
Mashalaba, Ms Fezeka Majiki and
Dr Musa Khapayi

**Centre for Community
Technologies,
Mandela University**

Dr Phumla Dlamini, Mr Tinashe
Chizema, Ms Swelihle Msomi,
Prof Darelle Van Greunen

**Engagement Office,
Mandela University**

Dr Bruce Damons,
Ms Amy De Raedt

Cover Image:

by Lisa Blane, a second year
Photography student from the
2021 VAPA, HoC and Ikhala
Trust Collaboration

Preamble

Mandela University's Department of Agricultural Sciences, in collaboration with the Centre for Community Technologies, developed a report based on the following ask:

“to develop a strategy based on a) understanding and developing community-based responses to the impact of climate change on communities and b) developing multiple forms of community-based communication to educate and share mitigation strategies to influence policy discourses on climate change.”

The report contains fieldwork that can inform both theory and strategy, with the aim that it will pave the way for future research in the ever-growing field of climate change. The following pages are a brief summary of the consolidated report, with the full reports available online by scanning the QR codes below. Please email foodsystems@mandela.ac.za if you have any issues accessing them.

**Read the consolidated
report here:**



**Read the report by the
Department of
Agricultural Sciences:**



**Read the report by the
Centre for Community
Technologies:**



Summary and Recommendations

According to the empirical data from the farmers surveyed, no drought mitigation strategies are in place - only drought coping mechanisms. These coping mechanisms practised by small-scale vegetable farmers in the surveyed areas include **cultivating drought-tolerant crops, zero-tillage, mulching, reducing irrigation water and early or late planting**. These are the primary drought coping mechanisms the respondents use. However, not all respondents are aware of these coping mechanisms. The data also shows that farmers are not sufficiently informed about and do not receive specific training on drought or climate change mitigation strategies. Farmers rely on drought alleviation methods but lack the adaptive strategies and timely, long-term state interventions required. Being resource-poor, these small-scale producers rely on natural resources - notably water for irrigating crops. Cabbage, spinach, potatoes and sweet potatoes were considered drought-tolerant vegetables by some of the respondents. According to respondents, these crops can cope with drought and have a short growth period. Respondents also discussed zero-tillage as a good practice since the soil structure is not disturbed, and the moisture remains in the soil. The respondents also practised mulching to reduce weed growth and prevent soil moisture content evaporation. The respondents explained that not all farmers practised mulching as the mulching material was not readily available.

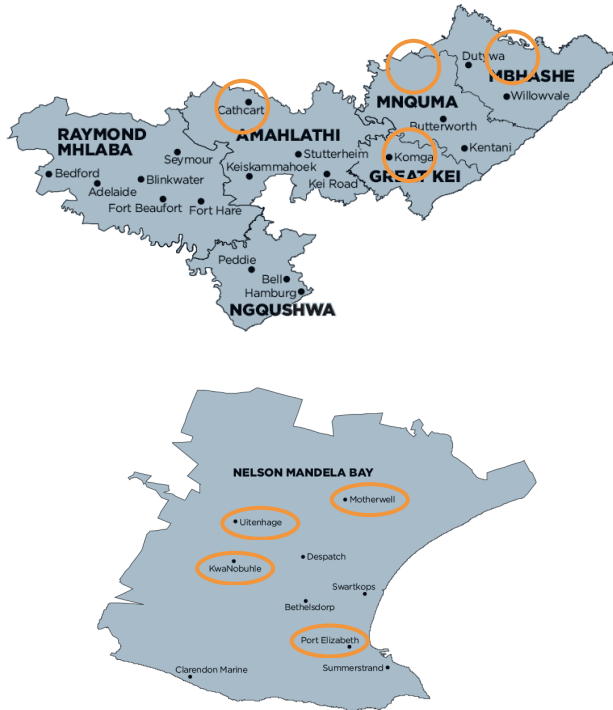
The study further established that there are neither resources nor sufficient training nor the involvement of the extension services. Farmers, therefore, rely on using drought coping mechanisms and mitigation techniques and adapting their production systems. **The information-sharing sessions recommended can assist in improving rural livelihoods and the productivity of small-scale vegetable farmers.**

Small-scale vegetable farmers should be encouraged to have consistent meetings facilitated by agricultural extension officers to improve their skills and access to updated information on agricultural trends and information. Frequent imbizos and information-sharing sessions can assist in improving rural livelihoods and the productivity of small-scale vegetable farmers. However, small-scale farmers need to come together and work in unity and develop a cooperative community with practice sessions to share ideas on which strategies work best for some farmers and what do not in this era of climate change.

The first of these information sharing sessions was hosted on 25-26 January 2024, with small-scale farmers who participated in the study, as well as the extension officers they work with on the ground, along with academics from Mandela University.

The **absence of youth engagement** in farming means that modern conservation and innovative farming techniques and systems are not implemented to reduce the impacts of climate change and revitalise rural areas such as Amathole. Access to education about drought, improved drought coping mechanisms, and adaptive strategies should be created to facilitate an exchange of traditional and modern agricultural information. **Infrastructure development** in rural communities and farming areas is another factor crucial to improving farming systems and operations.

Study Areas: Amathole District Municipality and Nelson Mandela Bay Metropolitan Municipality



Source: municipalities.co.za

IT-Based Summary and Recommendations

This report outlines a brief overview of the climate-related challenges faced by small-scale farmers in the Nelson Mandela Bay region of the Eastern Cape Province and explores potential Information Technology (IT)-based solutions to mitigate these challenges. The report emphasizes the significance of addressing climate change impacts on agriculture and highlights the role of IT in providing adaptive measures for sustainable farming practices.

The Eastern Cape region is characterized by a diverse agricultural landscape, with small-scale farmers playing a crucial role in local food production. However, these farmers are increasingly vulnerable to the adverse effects of climate change, including unpredictable weather patterns, water scarcity, and temperature extremes.

Climate-related challenges in the region include:

- **Erratic Weather Patterns:** Farmers face challenges due to unpredictable rainfall, leading to difficulties in planning planting and harvesting schedules.
- **Water Scarcity:** Increasing water scarcity affects crop irrigation, impacting yields and crop quality.
- **Temperature Extremes:** Rising temperatures can result in heat stress for crops and livestock.

IT-based solutions hold promise of assisting small-scale farmers in managing climate-related challenges. These include:

- **Weather Forecasting Apps:** Implementing IT solutions that provide real-time weather forecasts enables farmers to make informed decisions regarding planting, harvesting, and irrigation.

- **Precision Agriculture Technologies:** IoT-based sensors and drones can monitor soil moisture levels, crop health, and nutrient content, allowing for precise resource management.
- **Mobile Applications for Crop Management:** Customized mobile apps can assist farmers in managing crops, providing guidance on planting times, fertilization schedules, and pest control measures.
- **Water Management Systems:** Smart irrigation systems, coupled with IT, can optimize water usage by automating irrigation based on real-time data and weather forecasts.

Capacity building and training initiatives to enhance digital literacy among farmers can facilitate the effective use of IT solutions. Workshops on IT applications and climate-smart agricultural practices can empower farmers to adopt and adapt to new technologies.

There are **challenges and considerations** with regards to infrastructure limitations in specific areas that may result in poor internet connectivity and limited access to technology. These challenges may hinder the adoption of IT solutions. It is necessary to ensure the affordability of IT solutions for widespread adoption among small-scale farmers. Designing and developing IT solutions that consider local languages and cultural contexts will enhance usability and acceptance.

The integration of IT-based solutions holds promise for enhancing the resilience of small-scale farmers in the Eastern Cape Province region against climate-related challenges. However, concerted efforts are needed to address infrastructure limitations, ensure affordability, and provide adequate training to promote the successful adoption of these solutions.

Collaborative initiatives involving government, NGOs, and the private sector can contribute to sustainable agricultural practices in the face of climate change.

Targeted recommendations include:

1. Develop targeted programs to improve digital literacy among small-scale farmers.
 2. Establish public-private partnerships to provide affordable access to IT infrastructure.
 3. Conduct outreach and awareness campaigns to promote the benefits of IT-based solutions.
 4. Implement pilot projects to assess the feasibility and effectiveness of different IT applications in the local context.
 5. Continuously monitor and evaluate the impact of IT interventions, making adjustments based on feedback from farmers and stakeholders.
-

