

Reducing Loss and Waste in South Africa's Agricultural Supply Chains,

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1. Background and Objectives

The reduction of food loss and waste (FLW) across global food supply chains has become a critical issue, particularly as it aligns with the United Nations Sustainable Development Goal 12 (SDG 12). Despite concerted efforts worldwide, many African countries, including South Africa, face significant challenges in implementing effective FLW strategies. Most interventions have focused on the retail-consumer interface, neglecting substantial losses that occur throughout the supply chain, especially at the stages of harvesting, storage, and transportation (Gustafson, 2016; Luo et al., 2022).

The 2015 FAO Regional Strategic Framework for Reducing Food Losses and Waste in the Near East & North Africa Region is an example of a globally proposed intervention. It addresses FLW at all stages of the supply chain and highlights four key pillars:

- Data gathering, analytical research, and knowledge generation;
- Awareness raising and promotion of good practices at all levels of the supply chain;
- Developing policies, regulations, and strengthening collaboration and networking;
- Promoting investment and specific projects (FAO, 2014).

In our previous research, we have focused on data collection and analysis (first pillar), but this project aims to explore the remaining pillars as they relate to small-scale farmers in South Africa. The project specifically investigates how these farmers preserve fresh produce, the barriers they face in utilizing data to reduce FLW, and opportunities for collaborative data-driven solutions.

2. Key Project Objectives:

- Map the fresh food supply chain to identify key interactions and causes of waste.
- Examine indigenous and contemporary food preservation methods and assess their effectiveness.
- Evaluate barriers to data use and sharing for FLW reduction.
- Explore opportunities for collaboration in data-driven waste reduction.
- Develop a comprehensive framework for collaborative, data-driven decision-making to reduce food waste.

3. Dr. Temidayo Akenroye's Visit to University of the Western Cape (June 05 – 13, 2024)

During Prof. Temidayo Akenroye's visit to the University of the Western Cape (June 05 – 13, 2024), our team conducted site visits to three smallholder farming areas in the Western Cape region: Philippi Horticultural Area, Khayelitsha township, and Riversonderend farming

community. Over several days, we engaged with farmers, workers, and stakeholders to gain deeper insights into their agricultural practices and challenges in reducing food loss and waste.



- **Farming Site Visits:** At each site, the team observed farm operations and engaged in direct conversations with the farmers, learning about their daily challenges. Workers involved in various stages—harvesting, sorting, and transporting fresh produce—shared details of their processes. We noted that farmers often struggled to maintain produce quality due to a lack of cold chain infrastructure and proper logistics. Data recording was generally done manually, making it difficult to track losses or identify points for improvement. For example, farmers in the Philippi Horticultural Area highlighted the challenges of accessing formal markets. Unsold products often result in high waste levels, while formal buyers, such as supermarkets, operate post-supply payment systems with long delays. Farmers in Riversonderend described how pruning and sorting result in "ugly food" being discarded despite it being fit for consumption, with some used for animal feed. These insights, gathered through open-ended discussions and on-site observations, form the foundation for understanding the constraints smallholder farmers face in South Africa.

4. Literature Context and Challenges Identified:

In line with existing research (Gustafson, 2016; FAO, 2019; Luo et al., 2022), our findings reflect the broader challenges smallholder farmers encounter in curbing food waste. Previous studies have shown that the private sector is reluctant to share business data, hindering transparency and collaboration (Goedhals-Gerber et al., 2017; Lalendle et al., 2021). Farmers also struggle with limited access to food preservation technologies due to costs, lack of awareness, and inadequate support structures.

Summary of Challenges and Causes of Waste:

Challenge	Description
Market Access	Small-scale farmers face difficulties accessing formal markets due to unsustainable payment systems from supermarkets, leading to unsold produce and high on-farm waste.
Product Grading	Premium quality produce is sold to regular buyers, while lower-grade products, including "ugly" food, are left unsold or used for animal feed, contributing to waste.
Lack of Data Systems	Many farms lack proper data collection and management systems, preventing quantification of losses and hindering efforts to improve productivity and reduce waste.
Limited Preservation Methods	Small-scale farmers often lack resources or knowledge to adopt adequate food preservation methods. Alternative methods like drying could be more accessible and effective.

5. Barriers to Data Utilization

One of the significant findings is the reluctance of the private sector to share business data, which aligns with existing literature that highlights transparency issues in the industry (Goedhals-Gerber et al., 2017). The farmers we spoke with acknowledged that improved data collection systems would help them reduce waste, but many lack the technical expertise and affordable technology to implement such systems. Additionally, concerns around data privacy and the high costs of advanced technologies are barriers, particularly in the food export market.

6. Conclusion and Future Work

Our research underscores the need for enhanced data-driven strategies and collaborative frameworks to address food loss and waste in South Africa’s small-scale agricultural sector. The findings indicate that inadequate market access, insufficient data management, and a lack of affordable preservation methods are key contributors to food waste at the farm level.

Moving forward, we propose to investigate in-depth how small-scale farmers preserve their fresh produce and the barriers they face in using data to inform FLW reduction decisions. This future research will culminate in the development of a low-cost, collaborative framework to support data utilization and waste reduction in food supply chains.

6.1. Future Directions:

This report summarizes the initial findings and outlines the next steps toward achieving meaningful reductions in food loss and waste in South Africa. Further engagement with stakeholders, expanded data collection, and collaboration are key to unlocking new opportunities for improving the food supply chain.

- **Collaborative Framework Development:** Develop a framework for small-scale farmers and stakeholders to share data and collaborate on reducing food waste.
- **Comprehensive Data Collection:** Conduct further research to gather detailed data across various stages of the food value chain, including farming, storage, and transportation.

- **External Funding Proposal:** Create a research proposal to seek external funding for continued investigation into FLW reduction strategies, focusing on small-scale operations in low-income countries.