



Future Proofing the Grass-Fed Beef Value Chain (GFBVC): A Case Study in the Matatiele area of the uMzimvubu Water Source Area in the Easter Cape province, South Africa

Summary Report
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Introduction

The Institute of Social and Economic Research (ISER) at Rhodes University undertook a project to conduct and report on research aimed at enhancing future planning and land-use decision making for improved sustainability and resilience of the grass-fed beef value chain in the Matatiele area of the Umzimvubu Water Source Area in the Eastern Cape province of South Africa.

The project had five main research objectives which include providing an overview of the grass-fed beef value chain, and its environmental impacts, in the Matatiele area (objective one), identifying future climate change and socioeconomic threats to, and impacts on, this beef value chain in the Eastern Cape in 2050 (objective two), identifying scalable mitigation, adaptation and regenerative solutions, and their respective barriers and enablers, to future climate change and socioeconomic threats to the value chain (objective three), to develop a framework for future proofing this and other grass-fed beef value chains in various other regions and contexts (objective four) and lastly, to engage with key stakeholders in the Matatiele area to discuss and strengthen research findings from the above mentioned four research objectives and to promote the uptake of identified scalable mitigation, adaptation and regenerative solutions across the grass-fed beef value chain in the Eastern Cape (objective five).

The research findings from these objectives were to be presented through the following outputs: a technical research report was to be developed and published to disseminate findings from objectives one to five (output one). Output two focused on objective three and required for the development and publication of a policy brief which outlined policy gaps, barriers and enablers for scalable mitigation, adaptation and regenerative solutions and relevant policy recommendations. A business case study was to be developed and published as the third output which identified one or two scalable mitigation, adaptation and regenerative solutions as identified in objective three. Output four required the hosting of a stakeholder workshop to

disseminate findings and lastly, output five required the development of a stakeholder engagement report detailing the various stakeholder engagements which took place across objectives one to four.

The ISER, as the lead researchers on this project, engaged closely with various non-governmental organisations (NGOs) who are active in the Matatiele area. This collaboration was imperative as the NGOs have spent many years within the community, building close relations and developing trust networks with community members and traditional authority chiefs. In particular, the Environmental and Rural Solutions (ERS) was the primary NGO who was contracted to provide on-the-ground support for the project as they have embedded themselves within the area by developing trusted relationships with chiefs and community members of the different traditional areas, over time. Conservation South Africa (CSA) is another NGO that is active in the area and members of this NGO were interviewed as part of the research project. Lastly, these NGOs work very closely with Meat Naturally PTY (MNP) to provide various agricultural services to the community as part of a broader conservation agenda focused on rangeland restoration. As a result, a representative from MNP was also interviewed as part of the research proceedings for the project.

In light of the objectives, research outputs and the various networks developed in Matatiele, as mentioned above, objectives one and two were completed and had been submitted for review. The reports based on these objectives, were to comprise the initial parts of the technical report which was output one of the broader research project. Additionally, fieldwork had taken place, and data was gathered which would have formed the basis of objective three. Drawing from this, research objective three to five have not been completed and thus, need to be met, including all of the research output. In the way of a conclusion, this report provides a summary of the research findings linked to objectives one and two.

Summary of the main discussion points, findings, and conclusions in the first report

The aim report one was to provide an overview of the grass-fed beef value chain and the chain's associated socio-economic, cultural, and environmental impacts. Among many sources, the report used data from publicly available datasets, consultancy research reports, data from field observations and interviews with selected stakeholders like non-governmental organisations (NGO's), private business partner(s), community members, and other strategic partners of the Umzimvubu Catchment Partnership (UCP) in the Matatiele area of the Eastern Cape.

A key feature of the Matatiele landscape is that approximately 10% of the land surface area consists of water sources, this underscores its strategic value as a key water source for Southern Africa. Threatening this rangeland and water source is the presence of two alien wattle species which have infested land equivalent to the size of the land area that is occupied by wetlands, in the Matatiele area. The presence of these woody aliens negatively impacts the rangeland biodiversity under the wattle canopy, resulting in a reduction of the grassland varieties (Palmer, et al., 2022). In addition to the presence of these alien plants, there has been extensive degradation of various parts of the land resulting from overgrazing, and the unrestricted removal of substantial amounts of soil and vegetative cover. These factors have contributed to extensive soil erosion and has made the land vulnerable to climate extremities.

Matatiele, with a rich and diverse socio-cultural landscape is home to six traditional authority areas, covering approximately 100 000 ha of the land. Crop and livestock farming are the primary livelihoods practiced by the villagers. Data from 2016 showed that around 51% of households in Matatiele engage in livestock production or land cultivation, compared to 20% of South African households and 65% in the other Umzimvubu municipalities. Interestingly, 30% of households in Matatiele engage in livestock production while only 17% report owning cattle. The demographic profile of Matatiele is characteristic of high unemployment and

poverty rates. Data from the 2011 population census shows that the average annual per capita and household income in Matatiele is approximately R15 000, suggesting that there is often only one employed person per household. In addition to these high rates of unemployment, the municipality is peppered with socioeconomic challenges including poor service delivery. Recent data shows that 72% of the Matatiele population have access to a pit toilet while only 11% have access to a flush toilet. The high number of people dependant on a pit toilet raises safety concerns, especially for young people and within schools. Additionally, sanitation, the spread of diseases and environmental cleanliness in the area are at risk as 6% of the population do not have access to any form of toilet and 72% dump their own refuse. Furthermore, data reveals that 29% of the Matatiele population do not have access to electricity while just over 40% do not have any formal water supply and rely on rivers and unprotected springs to access water (Eastern Cape Socioeconomic Consultative Council, 2017). Given the large farming community in the area, social grants remain the key income source for many of the village residents

Cattle farming is one of the main agricultural activities undertaken in Matatiele and thus, NGO's rangeland conservation efforts are essential for environmental sustainability and climate change mitigation. In particular, the Economic and Rural Solutions (ERS), Conservation South Africa (CSA) and Meat Naturally PTY (MNP) have been instrumental in developing and spearheading projects like the 'Landscapes for Livelihoods' initiative which looks at communal rangelands and livelihoods restoration best practices. Another project implemented by local NGO's addresses environmental degradation by focusing on the negative effects of non-edible invasive plants and poor grazing management on the rangelands. A major part of this project is to make meat markets/auctions and abattoir services more accessible to local farmers in exchange for better grazing practices by these farmers. These efforts have resulted in desired rangeland conservation and better quality of cattle available for purchase at the auctions.

Global studies have linked cattle farming with a high carbon footprint compared to any other livestock. Due to the healthier organic meat and greater animal welfare, grass-fed beef farming is assumed to have a lower carbon emission however this is a misunderstanding. Grass-fed cattle contribute higher carbon emissions than commercially farmed cattle due to its longer lifespan. Overall, animal production is a key contributor of total income in the national farming community and the agricultural industry, where the red meat industry is seen as a driver for food security and an overall improvement in socioeconomic conditions. International and regional consumers prefer South African meat as it is much leaner, more tender and has less fat due to younger cattle being used for meat. Although access to food in South Africa is linked to socio-economic status, South Africa has the highest meat consumption, in comparison to other African countries which is exacerbated by the braai culture prevalent in the country.

Summary of main discussion points, findings and conclusions in the second report

The aim of report two was to provide an overview of the climatic impacts on the future of the beef value-chain in Matatiele and in South Africa, overall. The effects of climate change on this value chain is a primary concern as global warming and extreme weather events are increasingly experienced worldwide. The beef sector has been identified as the second fastest-growing commodity in South Africa's agricultural sector (DALRRD, 2021) and therefore, it is essential to future proof these interests. The various sources of data that were used in report two include relevant reports and related studies, the 2016 Community Survey (StatsSA, 2016), field observations, personal communication and interviews with NGO representatives and various stakeholders in the Matatiele region. Drawing from these sources, report two shared findings on issues related to climate change in South Africa with a special focus on the availability of water and the effects on biomass and biodiversity in Matatiele.

Carbon dioxide (CO₂) and methane emissions remain the main contributors to greenhouse gasses which continue to drive global climate change. Several global circulation models predict that there are likely to be significant, rapid changes in atmospheric conditions throughout southern Africa which are linked to three large scale climate systems affecting climate and weather patterns across the sub-continent. Particularly, heavier downpours are predicted for the summer months in the Matatiele region resulting in an increase in rainfall over the area. These short bursts of heavy rainfall will lead to widespread flooding and increased soil erosion. The increase in air temperature in the region will contribute to greater evapotranspiration and lastly, the storms will lead to greater water yields in rivers and dams. Siltation remains a major concern in the Matatiele area which needs to be considered in future planning.

With regards to the projected growth of the remaining native grasslands in the Matatiele area, it is still predicted to be able to cater for the region's livestock carrying capacity for at least the short (5yr) and medium (15yr) terms. However, the growth of silver and black wattle which has dominated the area poses a threat as it dries up natural springs used by local communities and animals. Consideration should be given to the threat of reduced grassland areas associated with the growth of indigenous woody invasion, increase in unpalatable species and clearing of land for residences. Furthermore, soil carbon stores have been depleted due to ploughing of the land without the use of fertilizers.

Market systems play an important role in the meat industry in Matatiele where three main market systems operate: old markets, mobile markets and formal markets. The older markets are very informal and cattle sales at this market are usually for traditional ceremonies. Participation in the mobile auctions are linked with rangeland conservation efforts which minimise the costs linked to cattle sales. The formal auctions are more structured compared to old and mobile auctions and yield a higher price per kilo for cattle sold. Underpinning these markets is the support from the community and the integration of rangeland science and management, water conservation efforts and climate change mitigation behaviours. The supply

and demand for beef is driven by local and international markets and is characterised by an increase in price and demand for beef and an overall, reduced regulatory environment.

Climate change policies, in the form of adaption and mitigation policies, that come into effect will impact the lives of all South Africans. Mitigation policies are aimed at reducing the release of green-house gases, while adaptation policies aim to help communities and individuals deal with a changing climate. Noteworthy, within the policy space is the absence of the inclusion of the beef industry in current national policy aimed at mitigating for and reducing global greenhouse gases. Additionally, the challenges in basic education in South Africa contribute to a lack of readiness to tackle climate change threats and opportunities as many citizens lack solid foundations in literacy and numeracy. This is at the national level and the situation becomes significantly dire at the provincial level, given the basic education challenges experienced in the Eastern Cape. Another policy consideration is the adaptability of social grants to address unanticipated climate-related calamities like droughts and floods.

A concluding note

The research findings associated with objectives one and two provide a detailed account of the landscape of the grass-fed beef value chain in the Matatiele area and furthermore, paves the way for the findings from the remainder of the research objectives. These reports have presented important questions for consideration when evaluating and deciding on various ways of future proofing the grass-fed beef value chain in this and various other contexts. It will be valuable for future research on this topic to consider the various socioeconomic factors at play and how these influence environmental conditions linked to grass-fed agricultural activity. The concept of future proofing the grass-fed beef value chain has various far reaching impacts on livelihoods and the environment and therefore, the research that has already been conducted should be carefully considered when further research is being planned and developed.