Evaluating social effects of arable field abandonment in communal areas of South Africa

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By

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Abstract

The phenomenon of arable field abandonment, a complex and multifaceted aspect of land use dynamics, has become a subject of increasing significance in rural landscapes. Across diverse geographic contexts, the abandonment of once-cultivated fields is indicative of transformative shifts in agricultural practices, reflecting the interplay of numerous socio-economic, environmental, and cultural factors. The abandonment of arable fields in the former homelands of the Eastern Cape and KwaZulu-Natal poses a multifaceted challenge with significant social implications. Historically, agriculture has been central to these regions, yet recent trends show a shift from traditional field cultivation to alternative practices such as garden cultivation or complete cessation. This shift has heightened vulnerability to food insecurity, hunger, and poverty, particularly as high unemployment levels exacerbate the situation. Moreover, the intricate relationships between humans and their surrounding ecosystems is also affected. Therefore, understanding the drivers of arable field abandonment at the community or household level can reveal localised factors that differ from broader, generalised drivers identified in previous studies. Additionally, examining the diverse impacts on these communities is crucial for developing targeted interventions that address their specific needs and enhance resilience.

This study investigates arable field abandonment in specific villages of Gotyibeni and Melani in the Eastern Cape and Manqorholweni and Mawane, in KwaZulu-Natal. Using the Driving forces, Pressures, State, Impacts, and Responses (DPSIR) framework as a conceptual framework uncovers the driving factors, pressures, state, impacts and responses of this phenomenon in these rural villages. The study's main aim was to assess the social effects of arable field abandonment in the selected study areas. The main objective is to determine how livelihoods, social relationships, and living conditions within and between households have changed following the cessation of field cultivation. The study also employed several specific objectives: first, to identify trends in field cultivation within the study areas; second, to analyse the drivers contributing to arable field abandonment in the villages; third, to examine the impact of field abandonment on the elderly population over the past 50 years; and fourth, to investigate the level of youth engagement in agriculture, including how the abandonment of arable fields affects their participation and perceptions of agriculture as a livelihood.

To achieve the objectives the study employed mixed research methods that combine satellite imagery analysis, household surveys, oral history interviews with elders, most of whom had stopped farming, and youth focus group discussions. Landsat 7 Satellite imagery with a 15-meter spatial resolution was sourced from the South African Space Agency (SANSA) for the four study areas. The temporal coverage spanned from 1972 to 2020, with considerations for image usability based on resolution. Unfortunately, many earlier images were deemed unusable due to low resolution, particularly affecting Gotyibeni, where clear images only became available from 2013, therefore for this village the focus was on two decades. Arable fields, residential areas, homestead gardens, grasslands, and shrublands were classified.

Change detection utilised a post-classification approach, comparing land cover categories between the early and late 2000s. A change detection matrix and statistics were generated using a ha/year formula, enabling the quantification of land cover changes. Image analysis employed ArcGIS 10.8.1 software for mapping and classification, involving georeferencing, signature file creation, maximum likelihood classification, and conversion from raster to vector formats for area calculations. For the LULC change matrix, an intersection analysis in ArcGIS overlaid data from different time points, and a pivot table in Excel organised resulting data. A focus on arable land changes, particularly conversions to other land uses, was crucial, as the study is investigating the level of arable field abandonment in these areas, understanding how much arable land has been converted or remained unchanged provides a clear indication of the extent of abandonment

To understand driving forces of arable field abandonment, a semi-structured questionnaire was developed based on the Driving forces, Pressures, States, Impacts, and Responses (DPSIR) framework. The questionnaires were administered through household interviews conducted in the four study villages. Sections of the questionnaire covered household involvement in cropping, perceptions of land use change, abandonment of field cultivation, and socio-economic demographics. Sampling involved a random selection of 20% of total households in each village, with data analysis performed using Statistical Package for Social Sciences (SPSS). Chi-square tests and Kruskal-Wallis analysis were employed to assess differences between villages. A second questionnaire specifically targeting households that had abandoned field cultivation was also done. Ninety-seven interviews were conducted to evaluate economic, health, socio-cultural and environmental impacts from respondents that indicated to have

ceased field cultivation. Data analysis through SPSS utilised descriptive statistics and chi-square tests to identify statistically significant differences between villages.

Oral histories were collected from elderly individuals in each village from a sample size of 15 individuals who were previous cultivators of fields, selected with the assistance of a village leader. The selected elders provided qualitative insights into historical and contemporary experiential aspects of village life. The focus was on changes in village relations, the environment, generational values, and traditional farming practices in each village. Youth-focused group discussions were organised with 30 young people in the village between the ages of 18-35, covering topics such as youth goals, the importance of field cultivation, and perceptions of the future. Both the oral histories and focus group discussions conducted in the local languages, were tape-recorded, transcribed, and subjected to content analysis to identify and interpret themes and patterns. The approach involved coding sentences, grouping codes into sub-themes, and further organising them into categories and subcategories.

The LULC change results showed a consistent trend of significant arable land reduction across all villages, accompanied by a notable increase in grassland cover. Manqorholweni experienced the most significant loss of these arable fields. This finding was further supported by the household interviews which revealed 100% abandonment of fields in this village. Grasslands emerged as the dominant land cover in all villages, overtaking arable fields and homestead gardens.

Regarding field abandonment, 76% of households across villages left fields unused for over 19 years due to reasons including lack of fencing, animal damage to crops, and financial constraints, despite recognising the socio-economic importance of field cultivation. Respondents expressed interest in returning to cultivation if the state would assist with fencing materials and costs. Concerns such as loss of cultural identity due to field abandonment were raised, especially in Manqorholweni, Mawane, and Melani. Homestead gardens were identified as a compensating strategy, with 78% of respondents actively maintaining them, although LULC change results indicated a decline, except in Mawane. Field cultivation revealed gender, age, and educational disparities, with non-cropping households having more female heads, individuals above 55, and higher proportions with only primary education.

Households that abandoned field cultivation reported a decline in economic stability, with 97% experiencing less stable household economic circumstances. Unemployment was prevalent,

with over 70% relying on social grants, creating financial challenges for 76% lacking sufficient cash. Limited off-farm formal employment (20%) was observed, while remittances played a minor role, this resulted in insufficient monthly income, affecting 94% of respondents. Dietary diversity declined, and reliance on store-bought food led to health concerns. Field abandonment impacted family dynamics, altering power relationships and reducing interaction, also heightened by COVID-19, affecting cultural identity and community cohesion.

Youth across villages were not currently engaged in field cultivation or farming but expressed interest in revitalising agriculture. They recognised the socio-economic significance of agriculture and highlighted the importance of capital, resources, and government support. Challenges for youth involvement included lack of information, absence of agricultural advisors, and disparities in access to credit. Lack of support from elders and limited sharing of agricultural knowledge further hindered youth's ability to initiate farming projects.

In conclusion, this study highlights the significant issue of arable field abandonment in rural areas of the Eastern Cape and KwaZulu-Natal, reflecting broader socio-economic and environmental transformations. The consistent reduction in arable land across the studied villages, coupled with the rise in grassland cover, underscores a critical shift from traditional agricultural practices to alternative land uses. The abandonment of fields has had profound impacts on community livelihoods, leading to decreased economic stability, reduced dietary diversity, and weakened social and cultural ties. The findings reveal a clear need for targeted interventions to address the specific challenges faced by these communities, particularly regarding food security and economic resilience.

To address the challenges of arable field abandonment, it is crucial to implement a multi-faceted support program. This should include providing essential resources such as fencing, irrigation systems, and agricultural tools to facilitate field cultivation. Additionally, engaging and supporting youth in agriculture through training, access to advisors, and financial aid is vital to revitalise interest in farming. Strengthening social safety nets by enhancing financial support systems can mitigate economic challenges faced by affected households. Furthermore, initiating cultural and educational programs to preserve traditional farming knowledge while integrating modern practices will help maintain cultural identity and community cohesion. These measures are key to improving resilience and livelihoods in the context of field abandonment.

Declaration

I, Sihle Pokwana (20P6921), affirm that this thesis is entirely my own work, and I have duly acknowledged all sources consulted within the text and the reference list. I am submitting this thesis to fulfil the requirements for the degree of Doctor of Philosophy at Rhodes University. I also declare that this thesis has not been presented for a degree at any other institution besides Rhodes University.

Dedication

This thesis is a dedication to my late father, Xolile Magqeku, who passed away during my first year of pursuing this degree. It is a poignant moment for me as I am unable to share with him the joy of completing years of this work. He would have been immensely proud, being the one person who always believed in my ability to conquer challenges and succeed. I am profoundly grateful for the love, support, and care he provided throughout our 26 years together. Navigating this journey, which was often challenging, I have drawn strength from the memories we shared. I choose to dedicate this work to him as a way of honouring our shared experiences, as I cannot celebrate its completion with him. His belief in my capabilities continues to inspire me, and I carry his legacy with me as I reach this significant milestone.

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Finally, I give thanks to God, the only wise God our Saviour, for providing strength to accomplish all things. May glory and majesty, dominion, and power, be ascribed through Jesus Christ, both now and forever. Amen.

Chapter 1: Introduction

1.1.Rural livelihoods

Rural livelihoods are shaped by a range of factors, including biophysical and socio-economic conditions, as noted by Tittonell et al. (2010) and Gautam and Andersen (2016). According to Mishi et al. (2020) and Ezeanyika (2023), rural populations adopt diverse livelihood strategies depending on the availability or scarcity of resources in their specific regions. Therefore, as noted by Hadju et al. (2020) and Patel et al. (2023), people in rural areas around the world are no longer solely dependent on agriculture. Instead, as acknowledged by Alemu (2012), Bilali et al. (2017), Hadju et al. (2020), Mishi et al. (2020) and Ezeanyika (2023), they are engaged in various occupations, diversifying their sources of livelihood. For instance, Mishi et al. (2020) and Patel et al. (2023) observe that households integrate a variety of activities, including agriculture, trade, informal employment, entrepreneurship, and migration to attain their livelihood goals. Thus, as Ellis (2000) and Qwabe and Pittaway (2023) describe, rural livelihoods are the means by which individuals or households sustain themselves by utilising a mix of resources. According to Scoones (2009), for a livelihood to be considered sustainable, it must have the capacity to endure and recover from various pressures and unexpected disruptions while also preserving the natural environment.

Ellis (2000) and Patel et al. (2023) note that different circumstances lead households to adopt a range of livelihood strategies, and these choices are often influenced by multiple factors. For instance, by variations in household resources, entitlements, production goals, ethnicity, education, and management capabilities that exist both within and between households, as noted by Crowley and Carter (2000). It is important to acknowledge this diversity in rural livelihoods within and between villages, as it helps in identifying the factors that either encourage or discourage the pursuit of specific livelihood strategies. Nonetheless, UNEP (2010), FAO (2017) and Qwabe and Pittaway (2023) state that agriculture continues to maintain a significant influence on the rural economy. Aliber and Hart (2009), Patel et al. (2023) and Qwabe and Pittaway (2023) argue that without farming, the food security of rural households would be reduced, particularly the extremely poor. Bilali et al. (2017) support this by stating that the agricultural sector serves as a source of livelihood for 40% of the world's population.

According to Sandika and Dushani (2011) agriculture plays a significant role in supporting livelihoods worldwide. For instance, Vedeld et al. (2007) drawing from a synthesis of 54 studies conducted in Africa, Asia, and Latin America, estimated that agriculture, encompassing crop production and livestock, contributes an average of 37% of cash income to rural livelihoods. Off-farm cash income contributes an average of 38%, while forests, particularly through non-timber forest products (NTFPs), represent the third most important source of cash income for rural areas, with an estimated average contribution of 22% (Vedeld et al., 2007).

In rural Naryn, Kyrgyzstan, Sagynbekova (2017) observed a heavy dependence on agriculture to sustain livelihoods, as 71% of his respondents reported taking out bank loans, and using these loans for managing or expanding their cropping or livestock operations. Sandika and Dushani (2011) reported that in Sri Lanka agriculture is relied on as a significant economic backbone, with 25% of the rural population being dependent on it, and it accounts for up to 31% of total employment. Senaratne and Scarborough (2011) added that the livelihoods of over 1.8 million farmers in Sri Lanka are tied to agriculture. In the Zambezi Region of Namibia, Kamwi et al. (2015) found that income from agriculture was ranked as the second highest source of income. Notably, 71% of females considered agriculture as a priority source of income, compared to 29% of males (Kamwi et al., 2015). In India, where 70% of the total population resides in rural areas, agriculture was noted by Akoijam (2013) to play a crucial role in rural livelihoods as it is heavily relied upon.

However, as important as agriculture is, Sagynbekova (2017) and Matsuura-Kannari et al. (2023) note that farmers in rural areas are particularly vulnerable to environmental changes such as drought, unusual rainfall patterns and increased temperatures. They also face economic shocks, such as reduction in prices of agricultural products as noted by Sagynbekova (2017), Nakamura et al. (2020) and Matsuura-Kannari et al. (2023) and limited access to markets as noted by Nakamura et al. (2020). These factors have a negative impact on both the cash and non-cash incomes of rural residents, particularly those relying on their local environment (Sagynbekova, 2017).

1.2. Rural livelihoods in South Africa

Rural communities in South Africa often experience underdevelopment in terms of infrastructure, access to government services, and employment opportunities, as pointed out by Naidoo et al. (2013), Turpie and Visser (2013) and Ofoegbu and Chirwa (2016). Ofoegbu and

Chirwa (2016) specifically highlight that 69% of those living in poverty in South Africa are located in rural areas. Consequently, many rural households rely on a mix of income sources, including natural resources, wage labour, migration to urban areas, and government support such as social grants as observed by Rogan (2017), Blair et al. (2018), Shackleton and Hebinck (2018), Hadju et al. (2020) and Ragie et al. (2020).

This observation is consistent with the findings of Neves and Du Toit (2013), who noted that rural communities in South Africa engage in various productive activities based on their land resources. As Akinyemi et al. (2019) stress that access to land is vital for efficient agricultural production, food security, and poverty alleviation. However, as Patel et al. (2023) state, rural communities often have connections to urban areas through migration and remittances and receive government social grants. It is worth noting that rural households in South Africa are increasingly dependent on off-farm cash incomes rather than income derived from crop and livestock activities (see Kuiper, 2006; Shackleton and Luckert, 2015; Ragie et al., 2020). Ragie et al. (2020) observed that off-farm cash incomes now contribute significantly to rural household incomes, accounting for 38% to 47% of household cash income in South Africa. Shackleton et al. (2019) attribute the shift of rural households increasingly relying on off-farm cash incomes to the declining trend in crop-based livelihoods in South Africa's rural areas.

For example, Partridge et al. (2018) observed that in several rural communities, including Mashishimale in Limpopo, Momphela in KwaZulu-Natal, and Ebenhaeser in the Western Cape, there has been a noticeable decline in the contribution of agriculture to households' livelihood strategies, even though these communities were beneficiaries of the post 1994 land restitution process and were located in areas suitable for agriculture. Partridge et al. (2018) noted that the beneficiaries faced challenges such as a lack of capital, limited access to reliable water sources, insufficient labour, or proper fencing. Consequently, the beneficiaries often preferred seeking employment over engaging in smallholder agriculture (Partridge et al., 2018). Puttergill et al. (2011) suggest that one reason for this shift is that the preferences of rural communities are moving toward a more consumer-based lifestyle, which may be contributing to the reduced focus on traditional agricultural activities.

Shackleton and Luckert (2015), Njwaxu and Shackleton (2019) and Qwabe and Pittaway (2023) state that those who choose to remain in rural areas utilise a diverse range of resources from their environment to sustain their livelihoods and enhance food security. It is worth noting that a significant portion of the rural population in South Africa identify as farmers, even if

agriculture contributes relatively small proportions of their total cash and non-cash incomes as noted by Shackleton and Luckert (2015). Furthermore, national policies categorise rural communities as agrarian, and as a result, current agricultural policies recognise them as potential commercial farmers who could produce goods for sale in formal markets (Shackleton et al., 2019). Many rural households engage in various agricultural practices such as crop cultivation, livestock raising, and marketing of their agricultural produce as observed by Shackleton and Luckert (2015), Mzuyanda et al. (2020) and Akinyemi et al. (2019). Despite the modest income generated from agriculture, Akinyemi et al. (2019) acknowledges that these practices remain integral to the livelihoods of many rural communities.

Farming has been established as a means to enhance the food security of households, particularly in the absence or low levels of wage income as noted by Shackleton and Hebinck, (2018) and Akinyemi et al. (2019). Akinyemi et al. (2019) add that contrary to conventional wisdom, land-based livelihoods make a more substantial contribution to rural livelihoods than is often acknowledged. For example, Ragie et al. (2020) showed that in Bushbuckridge, South Africa, households in this area had low cash income levels and a high unemployment rate, with 50% of the population unemployed, and 17% reporting no cash income at all. In this area, crop cultivation was a popular strategy, with 97% of households maintaining gardens where a variety of crops, including maize (95%), peanuts (85%), and pumpkin leaves (77%), were grown (Ragie et al., 2020). As supported by Pokwana et al. (2020) and Mdiya and Mdoda (2021) home gardens are a means for rural households to grow a variety of vegetables and crops to alleviate poverty. Additionally, home gardens are recognised as important social and economic units within rural family structures as noted by Pokwana et al. (2020).

However, Andrew and Fox (2004) argue that there has been a decline in farming, particularly in crop production, and rural communities have shifted towards cultivating home gardens or have even abandoned farming altogether. As a result, Shackleton et al. (2019) have observed that farming in these rural communities now constitutes just one part of a diverse portfolio of livelihood strategies. For instance, Shackleton and Luckert (2015) revealed that land-based livelihoods contributed to 15% of cash income in Lesseyton and 25% in Gatyana. In contrast, cash income from off-farm employment contributed to 25% in Lesseyton and 15% in Gatyana. It is worth noting that Lesseyton is less rural than Gatyana, Lesseyton is situated 20 km from Komani, which exposes it to employment opportunities in the town, including small businesses

and casual labour, while Gatyana, being in a more rural setting, depends more on land-based resources (Shackleton and Luckert, 2015).

1.3 Arable field abandonment: A global phenomenon

Several researchers, including Cramer et al. (2008), Yan et al. (2016), Leal et al. (2017), Njwaxu and Shackleton (2019) and Rajpar et al. (2019), have observed a significant decline in arable land cultivation in agricultural landscapes across rural areas worldwide. This is occurring despite the crucial role that small-scale farmers play in global food production (Cramer et al., 2008; Li and Li, 2017; Lever et al., 2018). This phenomenon of reduced cultivation is often referred to as "arable land abandonment". Keenleyside (2010) defines arable land abandonment as the deactivation of farming in a landscape, which subsequently leads to changes in ecosystem services and rural livelihoods.

Researchers such as Campbell et al. (2008), Lana-Renault et al. (2020), and Chaudhary et al. (2020) estimate that between 385 and 472 million hectares of arable land were abandoned globally between 1700 and 2000, with the most significant portion of this occurring during the 1900s. For instance, Fuchs et al. (2013) and Lana-Renault et al. (2020) found that agricultural landscapes in Europe decreased by nearly 19% between 1950 and 2010. This process has been particularly pronounced in mountainous regions, such as the Spanish Pyrenees and Eastern Alps, where more than 80% and 70% of arable fields, respectively, have been abandoned (Tasser et al., 2007; Lana-Renault et al., 2020). Furthermore, in Wuhan, China, Zhou et al. (2020) reported an average of 9% of agricultural land abandonment at the household level in this region.

In Japan, Su et al. (2018) observed that historical statistics indicate agricultural land abandonment began in the early 1900s, with cultivated fields decreasing from 6.09 million hectares in 1962 to 4.52 million hectares in 2014. Additionally, in 2015 alone, 423,064 hectares of arable land were abandoned in Japan, according to Su et al. (2018). High levels of arable land abandonment are also observed in other regions, including Australia, South America, India, and Africa. Because of its significant implications, arable land abandonment has garnered substantial attention from researchers and policymakers as noted by Van der Zanden et al. (2016) and Zhou et al. (2020).

The impact of agricultural land abandonment is widely debated, as highlighted by Benayas et al. (2007) and Shackleton et al. (2019). Its consequences vary depending on the scale, whether at the national, regional, community, or household level (Benayas et al., 2007; Shackleton et al., 2019). Assessing the impact of land abandonment in relation to its scale is crucial for informing policies aimed at mitigating its negative effects and promoting sustainable land use, as noted by Sang et al. (2014), Löw et al. (2015), and Su et al. (2018).

Zhou et al. (2020) point out that some researchers argue that the process of arable land abandonment can have positive outcomes in terms of supplying ecological services. For instance, soil recovery as noted by Benayas et al. (2007) and water retention as noted by Sileika et al. (2006), are cited as potential benefits. Furthermore, Benayas et al. (2007) and Su et al. (2018) note that agricultural abandonment provides opportunities for re-vegetation, potentially leading to the re-establishment of forests and grasslands, which can be beneficial for the environment, especially as forests have been declining. Moreover, this process can enhance ecosystem services and habitats as argued by Gashaw et al. (2018) and Xie et al. (2018). In addition, Osawa et al. (2013) note that agricultural land abandonment can create habitats that support threatened species, as demonstrated by Ikegami et al. (2011) in abandoned rice fields in Japan. This highlights the potential for arable land abandonment to positively influence ecological services and support biodiversity and conservation efforts in re-vegetated environments. However, it also suggests that agro-ecosystems may suffer due to reduced agricultural activity, leading to less biodiversity within agricultural landscapes.

Biodiversity is fundamental for maintaining ecosystem stability, while agriculture is crucial for sustaining rural lands as noted by Scherr and McNeely (2007) and Diaz et al. (2011). Sustainable Development Goal (SDG) 15 aims to address biodiversity loss and safeguard life on Earth to support the sustainable use of ecosystems (Su et al., 2018). However, Su et al. (2018) argue that arable land abandonment threatens these goals by undermining sustainable agriculture. Plieninger et al. (2016) and Zhou et al. (2020) add that the abandonment of arable land can result in the deterioration of agro-ecosystems and a decline in biodiversity within agricultural landscapes. This, in turn, poses a risk to food security, as highlighted by Meyfroidt et al. (2016), and may lead to economic challenges for rural communities, according to Renwick et al. (2013). Peco et al. (2012) and Osawa et al. (2013) further argue that the functional diversity of agro-biodiversity is also at risk due to reduced human activity.

1.4 Arable field abandonment in South Africa

Various parts of South Africa's communal areas have been observed by researchers, including Shackleton et al. (2013), Shackleton and Luckert (2015), De la Hey and Beinart (2017), Blair et al. (2018), Hadju et al. (2020) and Mzuyanda et al. (2020), to be experiencing a decline in arable field cultivation. For example, in four villages within the Tyume Valley in the Nkonkobe municipality, Manyevere et al. (2014) reported that 50-80% of previously cultivated lands had been abandoned. The abandoned arable fields in this municipality exhibited severe gully erosion and are considered gully erosion hotspots (Manyevere et al., 2014). Manyevere et al. (2014) state that patterns of agricultural land use and abandonment vary across different regions in South Africa, influenced by factors such as environmental conditions and land quality. Figure 1.1 below illustrates arable land abandonment in South Africa and its consequences for the natural environment (Prishchepov et al., 2021).

Figure 1.1: Example of field abandonment in South Africa, illustrating the consequences of agricultural land abandonment. The provided image captures the transformation of landscapes over time: A and B are photos of Gawukeni location in the former Ciskei. Image A, taken in 1956, shows the landscape under active agricultural production, while image B, photographed in 2011, demonstrates re-vegetation and re-wilding that has occurred due to the abandonment of cultivation in the fields (Prishchepov et al., 2021).

In Nkonkobe municipality, agriculture serves as the second-largest contributor to the GDP, accounting for 17% of the total as noted by Manyevere et al. (2014). However, despite its

economic significance, Manyevere et al. (2014) discovered that in Tyume Valley, a village within the municipality, smallholder communal farmers do not fully utilise their land for crop production. About 46% of these farmers indicated that more than half of their land had been abandoned. In Middledrift, another area in the municipality, only 10% of farmers reported fully utilising their land, while approximately 61% were using just 25% of their fields (Manyevere et al., 2014).

In other regions, such as the Wild Coast, Shackleton et al. (2013) showed that arable field cultivation had declined from 13% in 1961 to 3% in 2007. In Hobeni village, located in the coastal district of Xhora in the former Transkei homeland, Fay (2015) observed that there were fewer households cultivating fields in 2009 compared to 1998. A case study by De la Hey and Beinart (2017) of a village in Mbotyi in Mpondoland in the former Transkei, showed that most fields had been abandoned, despite the area having high rainfall. In another village with fertile soil, about 80 hectares of land were abandoned, even though many households had arable plots (De la Hey and Beinart, 2017). Mfono et al. (2008) estimated that around 71% of arable fields in the Eastern Cape were abandoned by 2008. These findings highlight a common trend of declining agricultural land use and abandonment in various parts of South Africa, influenced by factors like land access, environmental conditions, and economic opportunities.

1.5. A shift from arable field cultivation to home gardens in South Africa's former homelands

De la Hey and Beinart (2017) note that, in the Eastern Cape, smallholder farmers traditionally focused on both arable fields (larger areas of land located further from the homestead) and gardens (smaller plots on or near the homestead) for cultivation. As mentioned earlier, there was an observed trend of abandoning arable fields in rural areas. However, Andrew and Fox (2004) and Shackleton et al. (2019) argue that the decline in arable field cultivation doesn't necessarily equate to a decline in overall agricultural production, as it has often been replaced by intensive cultivation of home gardens. For instance, in Nompa and Shixini, Andrew and Fox (2004) observed a 51% decrease in the area of maize fields being cultivated, while the number of gardens created and planted increased more than fourfold. A later study in the same area found that 82% of people were actively engaged in garden cultivation, whereas active field cultivation ranged from 11% to 37% (Fay, 2009). Research by McAllister (2000), as cited by Andrew and Fox (2004), found that yields per unit area from home gardens were significantly higher than those from fields. Andrew and Fox (2004) therefore suggested that, this meant the

shift towards home garden cultivation allowed for a process of intensification, enabling farmers to maintain or even improve yields and resource efficiency.

Furthermore, Connor and Mtwana (2018) note that the decline in agriculture in certain regions, particularly in the former Transkei districts, appears to be less severe compared to areas in the former Ciskei, such as Middledrift and Kat River. This is because people in these areas have embraced household gardening as an alternative to field cultivation. Similarly, Shackleton et al. (2019) have shown that, in places like Guquka and Koloni in the central Eastern Cape, despite the decrease in field cultivation, some households maintain home gardens for domestic purposes, with only a few households selling their produce. Aliber and Hart (2009) and Connor and Mtwana (2018) acknowledge that garden cultivation allows farmers to maintain yields with fewer resources. However, De la Hey and Beinart (2017) showed that in Mbotyi, gardens are considerably smaller in size, and while people are actively planting gardens, the yields do not match those from field cultivation.

Aliber and Hart (2009) note that, home gardens offer several advantages compared to distant rain-fed fields. They are considered more manageable, provide increased cropping intensity and diversity, and tend to be more fertile due to their proximity to cattle kraal manure and domestic water supply as noted by Van Averbeke et al. (2008) and Connor and Mtwana (2018). Home gardens are also smaller and easier to fence compared to larger fields located farther from the homestead as noted by Aliber and Hart (2009). They can be more easily integrated with other household tasks and guarded against livestock disturbance as noted by Shackleton et al. (2019). In some cases, these gardens can be as large as the distant fields, but they are generally closer to the homestead.

Connor and Mtwana (2018) found that a high percentage of farmers, particularly in areas like Lutengele in Mpondoland, heavily relied on household gardens, either in combination with distant fields or as the primary source of cultivation. For instance, 98% of households in Lutengele, 80% in Sirhosheni, and 68% in Mbekwini used household gardens for agricultural purposes. In many rural areas, household gardens were predominantly used for growing food crops, including potatoes, tomatoes, spinach, onions, carrots, maize, cabbage, and butternut as noted by Ogundiran (2013), Pokwana et al. (2020) and Mdiya and Mdoda (2021). Connor and Mtwana (2018) also revealed that only about 10% of households continued to use their distant fields for crop production, with most of these fields left for livestock grazing.

1.6. Drivers of arable field abandonment

Globally, the primary factors contributing to the abandonment of agricultural land fall into two major categories: ecological and socio-economic drivers as noted by Su et al. (2018). Benayas et al. (2007) and Goga et al. (2019) note that ecological drivers encompass conditions such as high elevation, steep slopes, decreasing soil fertility, soil erosion, and the impacts of climate change. On the other hand, socio-economic drivers involve factors like migration, rural depopulation, competition for land use, land tenure systems, and issues related to land security as noted by Benayas et al. (2007) and Goga et al. (2019). While extensive research has been conducted on the drivers of arable field abandonment, this study aims to briefly outline and discuss the main abandonment factors across various scales. Subsequently, it will delve into the effects of arable field abandonment which is still largely unexplored as noted by Shackleton et al. (2019) and is the main objective of the study.

1.6.1. Ecological drivers of arable field abandonment

1.6.1.1. Influence of climate change on arable field abandonment

Various environmental factors, such as water scarcity, and the effects of climate change, can drive the abandonment of agricultural fields as highlighted by Ramankutty et al. (2008), Garcia-Ruiz and Lana-Renault (2011), Blair et al. (2018), Winkler et al. (2021) and Qwabe and Pittaway (2023). Moyo and Ravhuhali (2020) state that the selection of crops suitable for a particular region should ideally be based on its specific climate conditions. However, as indicated by Manyevere et al. (2014) the ongoing global trend of climate change has led to elevated temperatures and increased aridity in numerous rural areas of South Africa. Additionally, other regions have become vulnerable to frequent floods due to the impacts of climate change as noted by Shackleton and Luckert (2015) and Shackleton et al. (2019). Climate change as a driver of arable field abandonment was also alluded to by Winkler et al. (2021) in West and Eastern Africa, and Pawlewicz and Pawlewicz (2023) in Europe, while KC and Race (2020) supported this by alluding to erratic rainfall, drought and hailstorms as environmental drivers of arable field abandonment in Lamjung District, in western Nepal.

In specific regions such as KwaZulu-Natal and Transkei, Blair et al. (2018) reported that 92% and 29% of respondents, respectively, attributed the decline in crop farming to recent droughts. In KwaZulu-Natal, 55% also identified the impact of rainfall variability, while in Transkei, a

lack of access to water was highlighted as a major limitation to crop production in arable fields as reported by Blair et al. (2018). A comparable situation was observed in Kyrgyzstan, where Sagynbekova (2017) indicated that a wheat crop failure resulting from early cold and snowfall prompted farmers to abandon wheat cultivation permanently as they migrated to Russia in search of work. These environmental factors significantly impact rural livelihoods, underscoring the need to explore alternative livelihood strategies as noted by Sagynbekova (2017).

1.6.1.2. Wildlife and livestock as drivers of arable land abandonment

Wildlife and livestock damage are significant constraints to arable land cultivation in the rural areas of the Eastern Cape, as noted by De la Hey and Beinart (2017) and Herd-Hoare and Shackleton (2020), and in some parts of Nepal as noted by KC and Race (2020). De la Hey and Beinart (2017), Shackleton et al. (2019), Herd-Hoare and Shackleton (2020) and KC and Race (2020) reported that the decline in field cultivation has increased the intensity of crop pests like birds, monkeys, and bush pigs in the remaining fields, further exacerbating field abandonment. De la Hey and Beinart (2017) add that many arable fields are affected by wildlife and livestock damage because they lack proper fencing, and in areas especially those close to forests, wildlife like bush pigs and monkeys can quickly ravage the crops, as also noted by KC and Race (2020) in Nepal. For example, at Mbotyi, De la Hey and Beinart (2017) noted that bushpigs unearth potatoes and carry off maize, which discourages people from cultivating fields. While in Lamjung District, KC and Race (2020) showed that damage to maize by monkeys has been increasing over the years discouraging farmers from continuing with cultivation. The threat from wildlife is less problematic in homesteads, where people and dogs can scare away the monkeys and bush pigs (De la Hey and Beinart, 2017). As a result, many individuals prefer to cultivate home gardens (De la Hey and Beinart, 2017). Traditionally, livestock would be taken to distant pastures during the growing season. However, due to concerns about stock theft and the unavailability of herders, as boys who used to look after the livestock now attend school, livestock are kept closer to homesteads, which increases the risk of damage to the fields and potential loss of crops (Shackleton et al., 2013; De la Hey and Beinart, 2017; Shackleton et al., 2019).

1.6.2. Socio-economic drivers of arable land abandonment

1.6.2.1. Role of betterment planning in arable land abandonment

The rise in arable field abandonment in South Africa is closely linked to the peak of betterment planning in the 1970s and 1980s as noted by Andrew and Fox (2004), Hebinck and van Averbeke (2007), Blair et al. (2018) and Shackleton and Hebinck (2018). Betterment planning, which began in 1936, aimed to discontinue farming on land considered unsuitable for agriculture and designate new arable plots (Blair et al., 2018). McAllister (1991) and Blair et al. (2018) state that the goal of betterment planning was to promote ecological and agricultural sustainability. However, Andrew and Fox (2004) noted that this planning led to a reduction in zoned arable lands that were located far from homesteads.

Furthermore, betterment planning reduced investments in the agricultural sector. The newly demarcated fields required initial labour and financial investments for clearing, which many rural people lacked (Hebinck and van Averbeke, 2007). Additionally, Andrew and Fox (2004) highlighted that they required increased investments in terms of time and effort to manage, given the greater distance to and from the fields. To support this, Jaquet et al. (2015) pointed out that in Nepal, lands that are far from homesteads are typically abandoned first, with the main cultivated areas located around the homestead. Moreover, Chaudhary et al. (2018) also noted that a greater distance between the field and the farmer's homestead is positively related to the abandonment of crop fields. Crop cultivation and management demand regular attention, making it difficult to properly maintain fields that are far from the homestead (Chaudhary et al., 2018).

1.6.2.2. Influence of remittances and the lack of agricultural machinery and inputs on arable land abandonment

Off-farm cash incomes, including remittances, have become a significant component of rural households' livelihoods in Sub-Saharan Africa as noted by Shackleton et al. (2019). Remittances are often allocated to cover essential needs such as education, healthcare, and food (Maduekwe et al., 2017). Nonetheless, Shackleton and Luckert (2015) state that it is important to note that remittances can be inconsistent, leading to increased vulnerability of rural communities to global socio-economic forces. Moreover, Aliber and Hart (2009) and Shackleton and Luckert (2015) indicate that cultivating fields has high costs associated with low agricultural productivity. Consequently, Jaquet et al. (2016) suggest that it is considered

more economical to use remittance money to purchase necessities instead of cultivating the land.

Therefore, remittances have not helped rural communities prevent the abandonment of cultivated fields, as they do not provide sufficient funds for purchasing agricultural inputs or hiring labour. Many small-scale farmers in South Africa face significant challenges related to access to essential agricultural inputs, which often act as barriers to field cultivation as reported by Blair et al. (2018) and Shackleton et al. (2019), even when they receive remittances. Key agricultural inputs often cited as constraints to cultivation include traction sources (such as oxen and tractors), as noted by Manyevere et al. (2014), Blair et al. (2018) and Shackleton and Ntshudu (2023); as well as labour, fencing materials, and fertilisers, as highlighted by Blair et al. (2018) and Shackleton et al. (2019). Blair et al. (2018) and Shackleton and Ntshudu (2023) also point out that these inputs are costly and often unaffordable for these farmers.

However, these remittances have allowed rural communities to access modern amenities like televisions, refrigerators, cooling fans, and urban food and beverages, which has reduced the reliance on fresh produce and traditional foods as noted by Hadju et al. (2020). As Maharjan et al. (2013) state, as migrants send money to the families they left behind in rural areas, these remittances have become a crucial source of livelihood security for hundreds of thousands globally, helping to stave off the effects of poverty. Consequently, as recognised by Chaudhary et al. (2018) remittances have played a vital role in influencing the abandonment of fields in rural areas. This increasing dependence on modern, purchased foods exposes rural populations to market fluctuations, growing food demand, and the anticipated impacts of climate change on food prices, rendering them more vulnerable to economic instability and food insecurity as highlighted by Shackleton and Luckert (2015). Musunungure and Shackleton (2018) indicate that in South African rural households, there is an increasing dependence on commercially produced food and off-farm cash incomes, which often come from the state or urban areas. While a decline in field cultivation results in reduced agricultural income, Blair et al. (2018) and Shackleton et al. (2019) allude that it also means that people are no longer engaged in working in the fields, freeing up labour. Those who were previously occupied in the fields may now have the opportunity to seek employment elsewhere (Shackleton et al., 2019). However, given the high levels of unemployment in South Africa, a decrease in field cultivation does not guarantee that people will find alternative employment (Shackleton et al., 2019). The surplus

labour may remain unemployed, leading to increased reliance on government social grants as noted by De la Hey and Beinart (2017).

1.6.2.3. Role of social grants in arable land abandonment

Social grants in South Africa constitute a significant source of cash income for many rural households as noted by Patel et al. (2023) and, in some cases, are the sole source of cash income (Shackleton and Luckert, 2015; Shackleton et al., 2019). For instance, in Gatyana and Lesseyton, social grants were reported by Shackleton and Luckert (2015) to contribute the largest portion of household cash income, making up 60% in Gatyana and 56% in Lesseyton. Shackleton and Luckert (2015) state that this contribution has gained importance as other income sources have declined. The reliance on social grants has become a critical aspect of livelihoods in rural areas due to high youth unemployment as indicated by Aliber and Hart (2009), Shackleton and Hebinck (2018) and Patel et al. (2023). Some elderly people in Gatyana and Lesseyton mentioned the challenges they face, as their children and grandchildren depend solely on their pension for household needs (Shackleton and Luckert, 2015). The youth also noted their dependence on their grandmother's old age grant and expressed uncertainty about their survival if she were to pass away (Shackleton and Luckert, 2015).

Research by Fay (2009) has shown that households receiving social grants are less likely to engage in field cultivation. In Flagstaff, De la Hey and Beinart (2017) showed that 70% of households reported social grants as their primary source of cash income. Rural residents receiving social grants have indicated a preference for using the money to purchase food rather than cultivating fields (De la Hey and Beinart, 2017). Purchasing food is perceived as less risky and time-consuming compared to investing in field cultivation, where outcomes can be uncertain, particularly given climate variability (Shackleton and Luckert, 2015). However, relying solely on social grants is also unpredictable, as they are neither permanent nor secure. Shackleton and Luckert (2015) state that if the pensioner passes away or the child grows up, there is a high likelihood that the household could fall back into poverty and vulnerability.

1.6.2.4. Urbanisation as a driver of arable land abandonment

Jaquet et al. (2016) and Shackleton et al. (2019) state that an increasing number of rural residents worldwide, especially young people, are opting to migrate to urban areas in pursuit of improved or secure livelihoods. This migration is often driven by a combination of push and

pull factors. Push factors typically involve conditions like poverty, conflicts, and natural disasters that compel people to leave their rural homes as noted by Jaquet et al. (2016). In contrast, pull factors include the promise of better job opportunities and access to essential services such as education, healthcare, and safety in urban areas as noted by Jaquet et al. (2016).

Andrew and Fox (2004) and Shackleton et al. (2013) note that the extent of arable field abandonment in South Africa has significantly increased along with growing rural-urban connections. Young people, in particular, are drawn to urban areas and often choose to settle there, visiting their rural homes infrequently, this makes it challenging for them to commit to field cultivation (Shackleton and Luckert, 2015). Consequently, Rigg et al. (2016) and Mzuyanda et al. (2020) acknowledge that the rural population is increasingly composed of elderly individuals who may have limited physical capacity for agricultural work. For instance, in Nkonkobe, a significant proportion of smallholder farmers were over the age of 55, which Manyevere et al. (2014) stated that may have contributed to the decline in field cultivation in that area.

A study in Nepal by Chaudhary et al. (2018) also revealed that over 80% of households had only elderly residents at home who were not involved in field cultivation. This shortage of labour ultimately leads to the abandonment of arable land (Shackleton and Luckert, 2015). Essentially, Manyevere et al. (2014) note that as the few remaining farmers in rural areas retire or become unable to work, there will be a lack of people available to replace them. For example, Jaquet et al. (2016) reported that a local resident from Mankanpur, Nepal, shared how, in earlier years, people cultivated extensive areas with crops such as wheat, barley, mustard, and others. However, in recent times, people have stopped cultivating these areas due to the migration of young people to urban areas, leaving behind older individuals who are not physically capable of farming extensive areas (Jaquet et al., 2016).

1.6.2.5. Influence of societal changes on arable land abandonment

De la Hey and Beinart (2017) and Shackleton et al. (2019) report that rural areas in South Africa are experiencing continuous shifts in generational and gender roles. The younger generation, increasingly educated and independent, is challenging traditional hierarchical family dynamics, as observed by Tafere and Woldehanna (2012) and De la Hey and Beinart (2017). This shift makes it difficult for fathers to exert some level of control over their sons and for men to maintain authority over women within households (De la Hey and Beinart,

2017). Consequently, these changes have significant implications for rural households, as older men and women, who traditionally oversaw household production, can no longer rely on the labour of younger family members (De la Hey and Beinart, 2017). Many young children aspire to become professionals and have little interest in pursuing agriculture, even in their educational endeavours (Hebinck, 2007; Tafere and Woldehanna, 2012).

In many rural areas, Hebinck (2007), Hadju et al. (2020) and Qwabe and Pittaway (2023) indicate that unemployment rates are high. However, as Hebinck (2007) notes, the youth are often unmotivated to engage in agricultural activities, even for minimal wages, as De la Hey and Beinart (2017) add. They perceive agricultural work as physically demanding, outdated, and unattractive, as highlighted by Cheteni (2016), De la Hey and Beinart (2017), Shackleton and Hebinck (2018) and Kodom (2022). The elderly often describe the younger generation as lazy, as many young people would prefer to do nothing rather than work in the arable fields or herd cattle (see Cheteni, 2016; De la Hey and Beinart, 2017; Shackleton and Hebinck, 2018, Kodom, 2022). Additionally, even when there are individuals available to perform these agricultural tasks for wages, landowners are sometimes unwilling to pay, citing concerns that labour costs are too expensive (De la Hey and Beinart, 2017).

1.6.2.6. Influence of competing land-uses on arable land abandonment

Competing land-uses in rural areas encompass various activities and development initiatives, including the construction of infrastructure, industrial projects, residential housing (which is driven by population growth), and other diverse land uses (Bren d'Amour et al., 2017). These competing land-uses have the potential to encroach upon and diminish the availability of land that is suitable for agricultural production as noted by Keenleyside and Tucker (2010) and Hatna and Bakker (2011). In fact, Bren d'Amour et al. (2017) indicated that estimates suggest that up to 80% of land that is well-suited for agriculture in Africa and Asia may experience a reduction in its agricultural usability due to these competing land-uses. This encroachment can place significant pressures on the agricultural sector, which is essential for food production and livelihoods in these regions (Bren d'Amour et al., 2017).

1.6.2.7. Land tenure systems and security: Implications for arable land management

Land is a fundamental and paramount resource for rural communities, particularly for those who rely on agriculture as their primary livelihood (Bogale and Shimelis, 2009; Akinyemi et al., 2019). However, in some instances, rural residents may lack secure land tenure rights, which can have significant repercussions, including land degradation and a lack of investment in the land (Bogale and Shimelis, 2009). When individuals do not possess secure tenure rights, they often have limited incentive to invest in or maximise the productivity of the land (Bogale and Shimelis, 2009).

For example, in communal areas of South Africa, the absence of secure land rights has hindered the government's plans to implement agricultural programs because landowners may be unwilling to relinquish the land for use by others without the assurance of secure tenure (Kepe and Tessaro, 2014). However, in other rural regions, like Mbotyi in Mpondoland, the lack of tenure security does not appear to be a barrier to production (De la Hey and Beinart, 2017). In such areas, residential sites and arable fields can be inherited or allocated through a community process, which involves seeking permission from village headmen, paying a small fee, and gaining approval from neighbours, often culminating in a community celebration (De la Hey and Beinart, 2017).

Conversely, in Kuiredanda, Nepal, some residents do not sell their land, even if they are not actively cultivating it, as they are reluctant to allow others to use it for fear that it might prevent them from reclaiming and cultivating it in the future (Jaquet et al., 2016). The nature of land tenure and its impact on land use varies among regions and communities, reflecting the complex interplay of cultural, social, and economic factors.

1.6.2.8. COVID-19 as a driver of arable field abandonment

In 2019, the world was struck by the coronavirus disease (COVID-19), with the first case reported in Wuhan, China, in December of that year. By March 2020, South Africa had reported its first case as indicated by Khowa et al. (2022). According to Bista et al. (2022) COVID-19 is the most significant global health crisis in over a century, severely impacting all economic sectors worldwide (World Bank, 2020; D. Gupta et al., 2021; Wunder et al., 2021; Wang et al., 2021). Numerous countries experienced economic setbacks, including job losses and salary

reductions during lockdowns (Kang et al., 2021). In South Africa, Devereux (2021) and Fischer et al. (2023) report that during the pandemic's first six months, 2.2 million jobs were lost nationwide. For example, in Good Hope in the Eastern Cape, Khowa et al. (2022) reported significant job losses among households, with some breadwinners having succumbed to the virus, resulting in increased poverty. Several studies (see Casale and Shepherd, 2022; Schotte and Zizzamia, 2023; Fischer et al., 2023) have shown that the poorest and most vulnerable groups in South Africa, such as rural residents and the previously disadvantaged, suffered the most from economic hardship and food insecurity following the government-imposed lockdown aimed at curbing the virus's spread.

COVID-19 created a state of socio-economic instability, halting people's lives and suspending economic activities globally and in South Africa (Rogan and Skinner, 2019; Khowa et al., 2022). According to FAO (2021) these impacts are expected to be long-lasting. Various sectors, including remittances and agriculture, were severely affected by the pandemic (Bista et al., 2022). For example, in China, Gatto and Islam (2021) observed declines in employment and income, coupled with only partially effective government support programs, leading to widespread food insecurity and income losses. Job losses reduced remittance flows, already low in South Africa, further impacting smallholder agriculture. The lockdowns also led to the closure or downsizing of several companies, halting wage labour (Arndt et al., 2020; Zantsi and Nengovhela, 2024). Smallholder farmers, who rely on remittances to purchase agricultural inputs, were forced to stop farming (Zantsi and Nengovhela, 2024). Some farmers who engaged in off-farm wage employment to buy inputs for field cultivation also faced difficulties as wage employment was affected. Thus, COVID-19 became another driver of arable field abandonment in rural areas of South Africa, further exacerbating poverty and inequality (Spaull et al., 2021; Fischer et al., 2023).

Wang et al. (2022) supports that the pandemic disproportionately affected the poor, including landless labourers, wage earners, and small-scale farmers, due to their high livelihood vulnerability. Furthermore, COVID-19 was observed by many researchers such as Adhikari et al. (2021), Babu et al. (2021), Kumar et al. (2021), Singh et al. (2021) and Thapa et al. (2021) to have disrupted supply chains, including fertilisers and agricultural extension services, negatively impacting agricultural practices, especially for small-holder rural farmers. Lukhalo (2017) and Wang et al. (2022) state that most smallholders rely on public agricultural extension services, which were disrupted during this time. However, Zantsi and Nengovhela (2024) state

that the extension services for rural areas in South Africa are poor even under normal circumstances therefore their impact during this time might have been minimal. Although agriculture was classified as an essential service, the elderly small-holders, considered high-risk, were encouraged to stay indoors, limiting movement of going to the fields and going to buy inputs, which lead to more abandonment of cultivation. Conversely, Bista et al. (2022) noted that return migrants in rural areas turned to agriculture due to limited non-agricultural opportunities. Angelsen et al. (2020) supported this by reporting that return migrants increased labour availability for agriculture and forestry-related work, making households more dependent on agricultural incomes due to reduced remittances.

1.7. Effects of arable field abandonment

Arable field abandonment has important consequences at various scales including for households, local communities, and wider scales as noted by Shackleton et al. (2019). Blair et al. (2018) state that the consequences of arable field abandonment significantly influence livelihood strategies of rural communities. Rural communities used to be characterised by a lifestyle centered around livestock and crop activities. However, Shackleton and Luckert (2015), Shackleton et al. (2019) and Zantsi and Bester (2020) note that there has been a drastic decline in these agricultural practices, especially crop production. This reduction in agricultural activities, particularly in crop production, has led to limited access to food for these communities, which also face high levels of unemployment, poverty, and inequality (Qwabe and Pittaway, 2023). This section will discuss the effects of arable field abandonment on both household and community scales.

1.7.1. Economic impacts arable field abandonment

Arable field abandonment can result in diminished self-sufficiency and reduced cash income for households as noted by Blair et al. (2018). This, in turn, can weaken a household's safety net and its ability to weather economic shocks such as unemployment or the loss of the family's primary breadwinner (Shackleton and Luckert, 2015; Blair et al., 2018). Palmer and Sender (2006) and Ezeanyika (2023) report that farming households often have diversified income sources.

The economic consequences of arable field abandonment depend on several factors, including the composition of a household's or community's livelihood strategies (Shackleton et al., 2019).

For instance, Sagynbekova (2017) found that in Naryn province, a significant drop in livestock and crop prices led households to abandon farming activities. This abandonment had a profound impact on their economic well-being, increasing their vulnerability.

1.7.2. Social dynamics and community impacts of arable land abandonment

There have been noticeable changes in social relations, especially concerning household and community-level activities associated with agriculture (Shackleton et al., 2019). Interactions between households in a community, such as collaborative ploughing and harvesting, have changed (Shackleton and Luckert, 2015; Shackleton et al., 2019). With the decline in field cultivation and the shift towards home gardens, farming has become a more individualistic endeavour, leading to increased disconnections between neighbours (Shackleton and Luckert, 2015). This shift can also create conflicts between neighbours, particularly in cases where one neighbour's cattle may trespass and damage another household's field or garden (Shackleton et al., 2019). The reduced mutual assistance among neighbours can exacerbate such disputes (Shackleton et al., 2019). Furthermore, many villagers have noted that abandoned fields can become overgrown with woody plants, which may serve as hiding places for criminals (Shackleton et al., 2013).

1.7.3. Social and cultural implications of arable land abandonment

Rural areas in the Eastern Cape are currently undergoing significant social and cultural changes. New values, goals, and ambitions are taking root among the youth, resulting in a shift away from traditional local production systems (Shackleton and Luckert, 2015; Qwabe and Pittaway, 2023). The youth are seen as challenging family and community values, rules, and norms, which has contributed to social and cultural change in these rural areas (Shackleton and Luckert, 2015). In Nepal, various social events, and traditions, including cultural and festive occasions such as births, marriages, and deaths, rely on day-to-day neighbourhood relationships (Chaudhary et al., 2018). However, Chaudhary et al. (2018) has shown that as more farmers abandon their arable fields, it has become increasingly challenging to find ritual leaders and to gather the community together for these events, resulting in a decline in ritualistic and festive gatherings.

Nevertheless, agricultural production has been deeply embedded in the local identity of rural areas in South Africa. For instance, in the Eastern Cape, a Xhosa landscape is traditionally

viewed as productive and cultivated, with natural vegetation and grazing lands interspersed (Shackleton and Hebinck, 2018). Cultivating fields and home gardens is considered an integral part of local identity for many households (Shackleton and Hebinck, 2018). Despite the decline in field cultivation, the connection between people and the land remains strong, and farming continues to be a crucial aspect of the local culture (Shackleton and Luckert, 2015). This is reflected in the increased cultivation of home gardens in some areas as a way of preserving this cultural connection (Shackleton and Luckert, 2015).

1.7.4. Nutritional impacts of arable land abandonment and the role of home gardens

The global nutrition report emphasises the critical role of nutrition in promoting health and well-being (Johnsen et al., 2020). As the global population continues to grow, there is an increasing demand for healthy diets sourced from sustainable food systems (Willett et al., 2019). However, Shackleton et al. (2019) and Zantsi and Bester (2020) note that in rural South Africa, the diets of many households are characterised by a lack of diversity, with a heavy reliance on starchy staples and limited protein sources. This is due to the increase in the area of arable fields abandoned in these rural communities (Zantsi and Bester, 2020). For example, in rural areas of KwaZulu-Natal and Free State, diets often consist of maize-based products, sugary items, beverages, oil, butter, and poultry, resulting in imbalanced nutrient intake (Cheteni et al., 2020).

To address this issue, there is a growing recognition of the importance of producing nutrient-dense foods such as vegetables, fruits, and dairy products (Ruel et al., 2018). However, the reduction in arable land cultivated limits rural communities' access to a variety of vegetables, while high levels of unemployment restrict their ability to purchase them. As a result, these communities face diminished potential for accessing a diverse range of vegetables (Qwabe and Pittaway, 2023). Therefore, researchers and agricultural advisors should promote the production of diverse and nutritious foods at the household and community levels (Hendriks et al., 2020). It is important to note that households in rural areas of South Africa that cultivate their arable fields generally experience lower levels of hunger and better nutrition compared to those that do not engage in cultivation (Aliber and Hart, 2009; Shackleton et al., 2013; Rogan, 2018; Shackleton et al., 2019). This underscores the crucial role that arable field cultivation

plays in addressing nutrition challenges in these areas (Aliber and Hart, 2009; Shackleton et al., 2013; Rogan, 2018; Shackleton et al., 2019).

Both fields and home gardens play a crucial role in providing indigenous and domesticated vegetables that are rich in essential vitamins and micro-nutrients (Aliber and Hart, 2009; Shackleton et al., 2019). In the rural areas of the Eastern Cape, when a household cultivates their fields, maize is commonly intercropped with a variety of vegetables such as pumpkins, sugar beans, potatoes, and wild spinaches (Pokwana et al., 2020; Shackleton et al., 2019). Some farmers allocate a small section of their fields or gardens to grow spinach, cabbage, carrots, tomatoes, and onions (Shackleton et al., 2019). This diversified cultivation approach allows rural households involved in cultivation to enjoy a broader range of foods in their diets and experience reduced levels of hunger, even if they lack cash income to purchase food from stores (Rogan, 2018). However, the decline in field cultivation in rural households means losing these benefits, which must be compensated for by promoting the cultivation of home gardens or purchasing foods. Without these alternatives, individuals become vulnerable to health issues due to a decrease in dietary diversity, reduced intake of essential micro-nutrients, and declining food security (Shackleton et al., 2019).

Even if cultivated crops are substituted with store-bought foods, it's important to note that purchased foods are often less healthy than freshly produced items (Shackleton et al., 2019; Otterbach et al., 2021). Foods in stores may be genetically modified and energy-dense, with high levels of fatty acids (Otterbach et al., 2021). While purchasing food from stores is more common in urban areas, supermarkets are gradually making their way into rural regions as well (Pereira et al., 2014). While having sufficient income to afford store-bought food can improve household food security and stability, there may also be an increase in the incidence of non-communicable diseases associated with diets rich in calories and refined foods at the community level (Shackleton et al., 2019).

Producing one's own food not only enhances access to nutritious food but also provides an opportunity to generate income for purchasing other essential items, both food and non-food (Ruel et al., 2018; Hendriks et al., 2020). For instance, research conducted by Hendriks et al. (2020) found that in areas like Ingquza Hill, Jozini, Maruleng, and Ratlou, income generated from agricultural production, whether from irrigated or dryland farming, led to increased consumption of a variety of foods, including fruits, vegetables, meat, eggs, fish, and milk. This demonstrates that there's potential for improving dietary diversity and quality when households

cultivate their fields and engage in selling their produce (Hendriks et al., 2020). Furthermore, home gardening in these areas contributed to an enhanced intake of foods such as white roots and tubers, dark green leafy vegetables, orange-coloured fruits, and other fruits (Hendriks et al., 2020).

1.8. Ecological impacts of arable field abandonment

Abandonment of previously cultivated fields has consequences for the environment too.

1.8.1. Ecological impacts of arable field abandonment: Secondary succession and its effects

Arable field abandonment typically triggers a natural vegetation change process known as secondary succession (Sluiter and De Jong, 2007; Shackleton et al., 2013; Blair et al., 2018; Hebinck et al., 2018; Njwaxu and Shackleton, 2019; KC and Race, 2020). The re-colonisation of deserted fields is influenced by a combination of natural factors such as climate, topography, soil conditions, adjacent vegetation's disturbance and floristic composition, and human-induced factors such as the period of abandonment, post-agricultural management, livestock grazing, and the occurrence of fires (Shackleton et al., 2013; Gomez et al., 2019; Njwaxu and Shackleton, 2019). For example, Chaudhary et al. (2018) showed that in Nepal, an assessment of 38 arable fields abandoned for 10 years revealed that 16% had progressed to a dominant forest stage, a natural succession process in abandoned agricultural land. Additionally, 53% of these abandoned farmlands were in advanced stages of tree development, indicating their transformation into forests over time (Chaudhary et al., 2018). Benayas et al. (2007), Garcia-Ruiz and Lana-Renault (2011) and Lasanta et al. (2017) state that the re-establishment of vegetation in abandoned fields has far-reaching consequences for landscapes, such as water resources, soil erosion, and biodiversity. This demonstrates the ecological significance of secondary succession in these areas.

The expansion of natural vegetation in an area significantly alters the water cycle and the distribution of precipitation among evapotranspiration, runoff, and groundwater flow (Lana-Renault et al., 2020). This leads to a decrease in water yields due to increased interception of rainfall and higher transpiration rates by forests and shrubs, particularly in dry conditions or arid environments (Llorens et al., 2010; Lana-Renault et al., 2020). The re-establishment of vegetation following arable land abandonment reduces runoff coefficients and plays a pivotal

role in flood control (Cosandey et al., 2005; Fortesa et al., 2020). Abandoned arable fields exhibit minimal or no overland flow in comparison to fields covered with cereal crops or fallow land (Ries and Langer, 2001).

Furthermore, the expansion of natural vegetation can have implications for snow accumulation and distribution (Lana-Renault et al., 2020). Trees, for instance, reduce the accumulation of snow beneath their canopies and alter snow melting rates, primarily through processes such as interception and subsequent sublimation (Lana-Renault et al., 2020). These alterations in hydrological processes demonstrate the environmental effects of changes in land use and vegetation patterns (Lana-Renault et al., 2020).

A reduction in field cultivation has notable consequences for biodiversity and species interactions (Njwaxu and Shackleton, 2019; Shackleton et al., 2019). It results in increased habitat availability, facilitates species movement, and allows for the dispersal of animals, including small mammals and birds (Njwaxu and Shackleton, 2019; Shackleton et al., 2019). This, in turn, enhances species richness and abundance in abandoned fields, contributing to increased ecosystem resilience against disturbances (Njwaxu and Shackleton, 2019; Shackleton et al., 2019).

When arable fields are left to undergo natural succession and transform into forests due to discontinued cultivation, they provide a natural habitat that encourages the proliferation of various wildlife species, including snakes and jackals in proximity to human settlements (Zhang et al., 2016; Shackleton et al., 2019). Additionally, species known to raid crops, such as monkeys, birds, and rats, may also experience population growth, exacerbating their impact on the remaining cultivated fields (De la Hey and Beinart, 2017; Shackleton et al., 2019; Lana-Renault et al., 2020). However, this succession of species may also lead to the emergence of species that could be beneficial as a source of bushmeat in the diet of rural communities (Njwaxu and Shackleton, 2019).

1.9. Study rationale

Cultivation in rural areas plays a crucial role in ensuring agricultural stability, food security, and the preservation of diverse rural landscapes as supported by Scherr et al. (2007) and Diaz et al. (2011). Beyond its agricultural significance, cultivation fosters a sense of community, belonging, and identity among rural populations, promoting socio-economic stability and

productivity as noted by Shackleton and Luckert (2015). However, the decline in field cultivation in rural areas, both globally and in South Africa, is becoming increasingly evident driven by various factors. This decline poses considerable challenges to the future food and livelihood security of rural areas, as well as threats to the natural environment and local well-being. Thus, there is a need for research to comprehensively understand the processes and implications of this trend. Rogan (2017) argues that encouraging increased field cultivation in South African rural areas could be a strategy to alleviate high levels of poverty and food insecurity.

Addressing or mitigating field abandonment is essential for achieving sustainable development goals related to poverty reduction and the protection of terrestrial life. Sustainable development goals emphasise the eradication of poverty in all its forms and for all people, along with the need to protect biodiversity and stabilise ecosystems. Promoting agriculture through maintaining field cultivation can enhance agricultural productivity and contribute to the elimination of extreme poverty in rural communities. Therefore, it is crucial to conduct research that delves into the reasons behind the declining trend in field cropping in the rural areas of South Africa, despite national pro-agricultural policies (Shackleton et al., 2019). This research should be conducted at appropriate spatial and temporal scales, incorporating on-the-ground knowledge and long-term analyses (Shackleton et al., 2019). Furthermore, it is important to assess which stakeholders are most affected by agricultural field abandonment, be it small-scale farmers who have ceased farming, their households, agricultural supply companies, or local institutions. Such an understanding will provide valuable insights for policymakers and institutions to develop more targeted responses (Shackleton et al., 2019).

This study aimed to investigate the extent and underlying drivers of arable land abandonment in South African rural areas, with a particular focus on evaluating its impact on rural livelihoods. Recognising that land abandonment is a long-term phenomenon in South Africa's communal areas also known as former homelands, with some abandoned fields being reactivated while others transition to other land uses, with some households moving to more intensive cultivation of home gardens (Shackleton et al., 2013; Shackleton and Hebinck, 2018), this research also explored what these changes mean for local livelihoods.

1.10. Aim, objective, and research questions

The aim of the study was to identify, analyse and determine the social effects of arable field abandonment in the study areas. The main objective of the study was as follows:

Main objective: To determine how livelihoods and the changes in social relationships and living conditions within and between households have evolved after they had ceased cultivation.

Research question

a) How have livelihood strategies and community identity, social roles, relationships, and daily practices evolved due to field abandonment?

The specific objectives to address the aim were as follows:

Objective 1: To identify any trends in field cultivation in the study areas.

Research question

a) How has land use/land cover changed over the last 20 years?

Objective 2: To analyse and understand the various drivers contributing to the abandonment of arable fields in the study villages.

Research question

a) What are the key drivers that lead to the abandonment of arable fields in the villages, and how do these factors vary between villages?

Objective 3: To examine the effects of arable field abandonment on the elderly population over the past 50 years.

Research question

a) How has the participation rate in field cultivation changed over 50 years?

Objective 4: To investigate the level of youth engagement in agriculture, exploring how the abandonment of arable fields affects their participation and perceptions of agriculture as a livelihood.

Research question

a) How does the abandonment of arable fields impact youth perceptions of agriculture as a viable livelihood?

1.11. Conceptual framework

Conceptual frameworks are valuable tools for organising, visualising, and understanding the intricate connections among essential variables within complex systems (Joffe and Mindell, 2006; Knol et al., 2010; Yee et al., 2011). Analysing problems within a system necessitates a comprehension of how its components interact with one another and with other systems (Yee et al., 2012). Developing a conceptual model early in research is crucial for planning, gathering information, identifying knowledge gaps, and prioritising research needs and opportunities (Yee et al., 2012).

The conceptual framework for this study was constructed to identify the significant environmental, social, and economic drivers behind arable field abandonment. It also aimed to assess the consequences of this abandonment on rural livelihoods. The study seeks to contribute to a broader understanding of response mechanisms that can alleviate the negative impacts of the identified drivers and pressures on livelihoods. To achieve this, the research utilised the Drivers-Pressures-States-Impacts-Responses (DPSIR) framework, which facilitates the analysis of cause-effect relationships between various components of social, economic, and ecological systems (Binimelis et al., 2009; Gomez et al., 2017; Kyriazopoulos et al., 2017; Pagan et al., 2020). Kyriazopoulos et al. (2017) and Kristiadi et al. (2022) supports that the fundamental principle of the DPSIR framework is that any condition or change within a socio-ecological system is connected to its driving forces, pressures, state and impact through a number of feedback mechanisms. Thus, the DPSIR framework can be applied in a number of social-ecological systems change (e.g. Bruno et al., 2020; H. Gupta et al., 2021; Kristiadi et al., 2022). Additionally, the DPSIR framework simplifies the identification and description of processes and interactions between human and ecological systems (Svarstad et al., 2008; Mandic et al., 2020 Kristiadi et al., 2022).

However, despite its utility, Maxim et al. (2009) have argued that the DPSIR framework lacks the complexity to fully represent the real world as an analytical tool. Furthermore, Svarstad et al. (2008) contend that the framework exhibits bias by primarily focusing on conservationist perspectives while disregarding the concerns of other stakeholders. For instance, it predominantly addresses negative environmental impacts of human origin and overlooks non-

human-induced impacts (Svarstad et al., 2008; Kelbe et al., 2013). Nevertheless, the framework offers the advantage of facilitating the analysis of controlled processes, encompassing socio-economic and natural science dimensions (Zhou et al., 2013; EEA, 2015; Mandic et al., 2020). It assists in identifying the driving forces affecting the management and status of a given environment, encouraging the identification of potential responses for desired system regulation (Zhou et al., 2013; EEA, 2015; Kyriazopoulos et al., 2017; Pagan et al., 2020; Yussif et al., 2023).

In this framework, "drivers" encompass social, cultural, and economic forces rooted in human needs that lead to human actions which cause environmental problems (Maxim et al., 2009 Kristiadi et al., 2022). These actions, in turn, create "pressures" that induce changes in the natural environment's state (Maxim et al., 2009; Kyriazopoulos et al., 2017; Pagan et al., 2020). The changes to the state can subsequently impact human well-being by influencing ecosystem composition, structure, and function (Maxim et al., 2009; Elliott et al., 2017). Decision-makers may implement a "response" to mitigate the impacts on environmental resources through education, regulations, public information, policies, and alternative opportunities (Waheed et al., 2009; Kyriazopoulos et al., 2017; Pagan et al., 2020). All these variables interact and mutually influence each other as seen in (Figure 1.2).

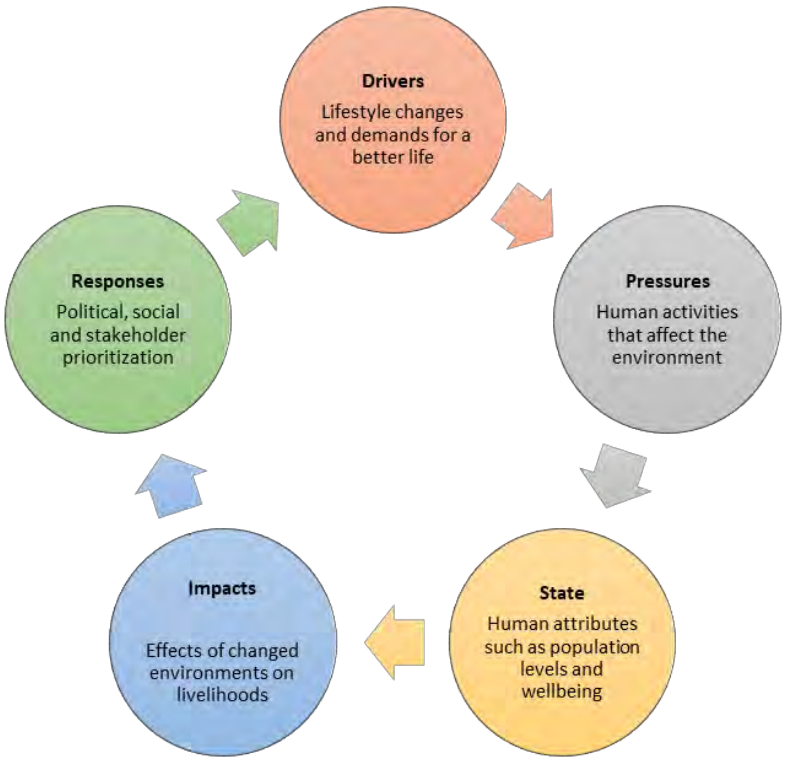

Figure 1.2: DPSIR framework scheme. (Source: Sekovski et al. 2012).

The DPSIR framework was originally designed for environmental resource applications (Mangi et al., 2007; Ojeda-Martinez et al., 2009). In this framework, the human condition is not explicitly considered as part of the "state" but is instead viewed as an impact that the state of the environment has on human livelihoods (Mangi et al., 2007; Ojeda-Martinez et al., 2009). Concerning field abandonment, various ecological drivers such as climate change, wildlife and livestock damage, as well as socio-economic drivers like old age, social grants, urbanisation, and societal changes, can act as triggers for field abandonment. Consequently, field abandonment becomes the "pressure" exerted on both the environment and human livelihoods. Changes in the condition of the natural environment resulting from these drivers and the pressure of field abandonment, leads to a state of trees, shrubs and grasslands, soil erosion and land degradation in the abandoned fields, which can lead to adverse impacts, including increased poverty in rural areas and the loss of ecosystem services. A study conducted by Zhang et al. (2020) aimed to predict the crop water footprint under climate change in the Lake Dianchi Basin, China. In their view, climate change is considered a pressure rather than a driver, influenced by factors such as land use changes and agricultural production. However, for this research, climate change will be regarded as a driver leading to land use change. As noted earlier, climate change has been identified as a key reason for the abandonment of arable fields in some rural communities in South Africa.

The DPSIR framework serves as a valuable tool for communication among stakeholders at larger scales, such as national and regional levels (Ehara et al., 2018; Pagan et al., 2020). However, Ehara et al. (2018) underscores the importance of examining the impacts of drivers, pressures, states and impacts at local scales where individuals are directly affected. They argue that it is essential to pay more attention to the informal responses of local actors to these impacts, as this can provide insights into the intricate relationships between field abandonment and local communities (Ehara et al., 2018). Such insights can support the development of inclusive, logical, and evidence-based decisions, which is a key objective of this study concerning the consequences of arable land abandonment.

1.12. DPSIR theoretical framework

1.12.1. Driving forces

Drivers are the primary factors causing changes in the ecosystem as noted by Pagan et al. (2020), Zhang et al. (2020) and Kristiadi et al. (2022). Narayan (2000), MEA (2005) and

Kristiadi et al. (2022) further note that these factors emanate from social and economic needs within a society. According to Mandic (2020) driving forces are independent, external influences that propel movement toward or away from desired targets. For instance, primary driving forces are associated with fundamental requirements like shelter, food, and water, while secondary driving forces encompass aspects such as mobility, entertainment, and culture (Kristensen, 2004). These driving forces can originate at various levels, including global, regional, or local scales (Pagan et al., 2020). Driving forces encompass the diverse influences and factors that can induce changes, either positive or negative, in the overall functioning of a system (Yee et al., 2012).

These driving forces can be categorised into two groups: (i) direct and (ii) indirect (Apostolaki et al., 2019). Direct drivers have an immediate and explicit impact on a system. In the context of this study, a typical example is human demand for stable and secure livelihoods, particularly food security through diversified incomes. This demand can lead to the abandonment of arable fields, which in turn disrupts the socio-ecological system as people cease cultivating these lands. In contrast, indirect drivers exert their influence through their impact on direct drivers. For instance, changes in the socio-economic conditions of a community can shift from a positive to a negative attitude, such as farmers transitioning from cropland cultivation to abandonment due to access to social grants. The suitability of a driver depends on its potential to explain a phenomenon closely tied to socio-economic conditions since these drivers define the current situation and patterns, forming the basis for assessing the pressure on the system (Apostolaki et al., 2019).

1.12.2. Pressures

Pressures are the effects of drivers that induce changes in the environment and/or human behaviour (EEA, 2005; Maxim et al., 2009; Yussif et al., 2023). Kelble et al. (2013) and Pagan et al. (2020) note that pressures can reflect the mechanisms of change caused by drivers. Buckhard and Muller (2008) emphasise that pressures are outcomes of human-induced actions. For instance, Kyriazopoulos et al. (2017) observed that in some mountain regions in Europe, land abandonment was identified as the major pressure arising from land-use change. This pressure manifests through the abandonment of traditional pastoral activities, mirroring the socio-economic changes in mountainous areas (Kyriazopoulos et al., 2017). Additionally, Buckhard and Muller (2008) also showed that the most common pressure observed was the

abandonment of pastures due to a decrease in livestock, accounting for 54% of cases. Pressures can be considered both positive and negative, although most conceptualisations focus on the negative (Mandic, 2020).

When humans interact with ecosystems, they often generate demands, which can take the form of requests for the spatial utilisation of arable land (Ehara et al., 2018). These demands constitute classic examples of pressures in human ecosystems (Ehara et al., 2018). Pressures can be categorised into two primary classes: environmental pressures and human behaviour pressures (Maxim et al., 2009). Environmental pressures encompass factors like land use changes, where the integrity of environmental factors depends on the extent and scale of driving forces, and these can vary across different geographic and spatial scales (Rogers, 2003; Pagan et al., 2023). Human behaviour pressures, on the other hand, are associated with human activities that can exacerbate issues related to hunger and poverty (EEA, 2005).

1.12.3. State

State refers to the condition of systems and their components, such as natural and built-up land, and social systems (Yussif et al., 2023). According to Mandic (2020), state variables describe these conditions and changes within the system. For example, Kyriazopoulos et al. (2017) demonstrated that land abandonment in the Pindos Mountain treeline ecotones (northern Greece) led to shrub encroachment by junipers (Juniperus spp.) in formerly grazed grasslands. Bakaloudis (2016) noted that further decreases in livestock grazing could negatively affect both floristic and faunistic diversity, particularly raptor populations. Yee et al. (2012) supported these observations, noting that within the biological component of the state, plants and animals play a crucial role in providing a living habitat and forming the foundation of the food web that supports higher trophic levels. It is also worth noting that microorganisms and invasive species are significant biological components relevant to both society and the environment (Yee et al., 2012).

To fully represent the state of the environment and its effects on human conditions, it is important to introduce the concept of a "human state" as an additional variable (Yee et al., 2012). Metrics of the human state may include attributes at the population level, such as demographics, as well as individual-level attributes like personal characteristics (e.g., age, gender) and individual well-being (Yee et al., 2012).

1.12.4. Impact

Changes in the physical, chemical, or biological state of the environment play a pivotal role in determining the quality of ecosystems and the well-being of humans (Gabrielsen and Bosch, 2003; Kristensen, 2004). Ecosystem goods and services, which are the valuable products resulting from the structure and functioning of the environment, directly benefit humans. These services encompass provisioning services, such as the production of food, water, and raw materials; regulating services, including the maintenance of air and water quality, and climate regulation; and cultural services, which encompass spiritual enrichment, recreation, the creation of a sense of place, and aesthetic value (MEA, 2005; Munns et al., 2015).

Therefore, any changes in the state of the environment can have substantial impacts, whether environmentally or economically, on the functioning of ecosystems and, ultimately, on the economic and social well-being of society (Kristensen, 2004). Assessing human well-being can be quantified using various metrics that reflect the extent to which human needs are met (MEA, 2005). These needs encompass basic materials, social relations, good health, security, and freedom (Narayan, 2000; MEA, 2005). It is worth noting that some critics, such as Kelble et al. (2013), argue that the DPSIR framework primarily focuses on negative impacts and, as a result, emphasises responses to these adverse impacts. For example, Gutzler et al. (2015) note that the degradation of arable croplands can result in poor crop performance, leading to decreased yields and reduced provision of ecosystem services, which in turn diminishes both social and economic values. However, Kyriazopoulos et al. (2017) observe that impacts can also be positive, as an upward shift of the ecotone was interpreted positively by some local people in their study.

1.12.5. Response

Nassl and Loffler (2015), Renner et al. (2020) and Pagan et al. (2020) note that response interventions may target the driving forces, pressures, state, or impacts themselves. Kristiadi et al. (2022) support this and note that a response addressing driving forces is a form of prevention. If the response controls the pressure on the environment, it is considered mitigation. Furthermore, if the response maintains the state of the environment, it is classified as restoration. Finally, if the response helps overcome the impact, it is termed adaptation. Kristensen (2004) adds that a response by society or policymakers is initiated in reaction to undesirable impacts and aims to adjust any part of the pathway between driving forces and

impacts. Yee et al. (2012), Kyriazopoulos et al. (2017) and Kristiadi et al. (2022) acknowledge that these responses can encompass various strategies, such as changing social or economic drivers, limiting pressures by modifying human activities, or directly altering the state of the environment through restoration or remediation efforts. Undesired impacts that affect human well-being serve as triggers for societal responses, leading to human actions aimed at intervening in the process (Kyriazopoulos et al., 2017; Kristiadi et al., 2022). In essence, responses play a crucial role in mitigating the negative consequences of environmental changes and working towards improved well-being for both society and the environment.

Smith et al. (2012) and Munns et al. (2015) suggest that society and government can employ various types of responses to address environmental challenges, including: (i) Driving-forces-based response: This type of response aims to control the driving forces behind environmental changes. It involves implementing policies or making economic decisions that directly influence the sectors responsible for these driving forces. For example, introducing regulations that encourage more sustainable practices in agriculture or resource management. (ii) Pressure-based responses: These responses target the environmental pressures resulting from human activities. They typically involve regulatory measures that limit certain human activities and modify behaviours to reduce the impact on the environment. For instance, implementing restrictions on land use changes to protect ecosystems. (iii) State-based responses: State-based responses focus on directly influencing the state of the environment. This can be achieved through scientific research, restoration efforts, remediation projects, and revitalisation initiatives. For example, re-cultivating abandoned fields or restoring degraded ecosystems to improve their condition. (iv) Impact-based responses: These responses are designed to quantify or compensate for the social and economic impacts on human well-being resulting from environmental changes. This may involve monitoring through surveys and field observations to assess the effects. Additionally, the development of a human well-being index is a means to quantify the condition of human beings and society in terms of basic materials, natural resource needs for a good life, freedom, social relations, and personal security. These different response strategies can be employed based on the specific environmental challenges and their underlying causes, and they play a crucial role in mitigating negative impacts on both the environment and human well-being.

1.13. Ethical considerations and approvals

An application for human ethics was submitted to the Rhodes University Human Research Ethics Committee (5116) on 04 June 2021 and after evaluation it was subsequently approved on 18 August 2021. A yearly renewal of the ethics for the research was applied for and approved in 2022 and 2023 respectively with reference 2022-5116-7021. The application of ethical clearance during data collection in the field included several key practices to ensure the integrity and respectfulness of the research process. Respondents were informed that participation was entirely voluntary and that their responses would be used exclusively for research purposes, with the possibility of publication. Clear and concise information about the research objectives and methods to participants was provided to ensure participants fully understand what their involvement entails.

Informed consent was obtained from all participants before starting the interviews. For oral histories with the elderly and focus group discussions with the youth, explicit permission was requested to record the interviews. All responses were anonymised and personal identifiers were removed to protect participant privacy. Participants were assured that they could withdraw from the study at any time if they felt uncomfortable, and they were encouraged to request the cessation of recording or the skipping of any questions they found distressing. To accommodate the participants' schedules and minimise fatigue, interview duration was capped at 90 minutes, as outlined in the ethical clearance application.

1.14. Methods

The study utilised mixed methods for data collection and analysis. Figure 1.3 below outlines the methodology used in each evidence-based chapter, from chapters 2 to 6. Detailed explanations of each methodology and analysis can be found in the respective chapters.

Chapter 2: Assessing land use and land cover changes and the driving forces in the Eastern Cape and Kwazulu-Natal provinces Addresses specific object 1	Employed satellite imagery analysis using ArcGIS 10.8.1 software to generate maps and delineating LULC.
Chapter 3: Arable field abandonment and its drivers in Eastern Cape and KwaZulu-Natal rural areas Addresses specific 2	Data was collected using questionnaire interviews – SPSS was used for data analysis. For continuous, non-normally distributed variables a Kruskal-Wallis analysis test was used.
Chapter 4: Evaluating social effects of arable field abandonment in rural communities of ECP and KZN Addresses main objective	Data collection was done using questionnaire interviews - SPSS was used for data analysis. The data was mostly categorical, so chi-squares tests were done.
Chapter 5: Drivers and impact of field abandonment: Oral history perspective Addresses specific objective 3	Data was collected through oral interviews with the elderly – the collected data was analysed through content analysis.
Chapter 6: Evaluating perspective of youth on the field abandonment in the ECP and KZN Addresses specific objective 4	Data was collected through focus group discussions – collected data was analysed through content analysis.

Figure 1.3: Methodology and analysis for evidence-based chapters

1.14.1 Study sites

Study areas were purposefully selected from the Eastern Cape and KwaZulu-Natal provinces. The Eastern Cape study areas, Gotyibeni village under King Sabata Dalidyebo local municipality in the former Transkei and Melani village under Raymond Mhlaba local municipality in the former Ciskei were selected after consultation with an agricultural adviser and researcher from University of Fort Hare who advised on villages that previously cultivated fields, but their levels of field cultivation have now declined. The KwaZulu-Natal study areas, Manqorholweni village in Umzimkhulu local municipality and Mawane village in Umuziwabantu local municipality were selected after consulting a community forester in the Harding area of KwaZulu-Natal who advised on areas that used to actively cultivate their fields but have recently abandoned them (Figure 1.4).

These traditional, communal areas are characterised by mean annual rainfall exceeding 500 mm (Table 1.1). While all the sites share high unemployment rates, they differ in terms of population size, with Mawane being the largest and Manqorholweni the smallest. These villages primarily consist of Black African populations, with IsiXhosa and IsiZulu being the

predominant languages spoken. Climate-wise, Mawane stands out with the highest mean maximum temperature, while Manqorholweni has the lowest. Rainfall patterns demonstrate similar divergence, with Gotyibeni experiencing the highest mean annual rainfall and Melani the lowest. Moreover, the vegetation types vary, encompassing grasslands, forests, and savannas, reflecting the ecological diversity within the villages (Table 1.1). These variations suggest a complex socio-environmental landscape in these traditional areas, with unique challenges and opportunities shaped by both natural and societal factors.

Table 1.1: Climate, demographics, and vegetation for the study villages

Variable	**Gotyib**	**Manqor**	**Mawane**	**Melani**
Latitude	-31.467715°	-30.437159°	-30.661973°	-32.722392°
Longitude	28.850192°	29.651365°	29.754546°	26.869953°
Altitude	984 m	1169 m	904 m	601 m
Village area (ha)	369.1 ha	573.8 ha	556.5 ha	241.0 ha
Village population	753[2]	608[2]	1,090[2]	783[2]
Number of households	155	111	220	279
Population group	Black African[2]	Black African[2]	Black African[2]	Black African[2]
First language spoken	IsiXhosa[3]	IsiZulu[3]	IsiZulu[3]	IsiXhosa[3]
Average household size (people per household)	4.2	4.4	4.5	3.9
Unemployment rate (%)	46	63	56	59
Mean temp				
Max (◦C)	20°C[1]	18°C[5]	25°C[4]	23ºC[1]
Min (◦C)	13°C[1]	-1°C[5]	0.6°C[4]	10.97ºC[1]
Mean Annual rainfall	1044 mm[1]	850 mm[5]	800mm[4]	500 mm[1]
Vegetation	Eragrostis[1] plana and Sporobolus africanus, Themeda triandra.	Grassland with[5] scattered areas of scarp forest.	Drakensberg[4] foothill grassland.	Open savannas[1] dominated by Acacia Karoo bush clumps or individuals.

[1]Mucina and Rutherford, 2006; [2]StatsSA, 2011; [3]Community Survey, 2016; [4]Umuziwabantu 2019/20 Integrated Development Plan Review; [5]Umzimkhulu Spatial Development Framework, 2021

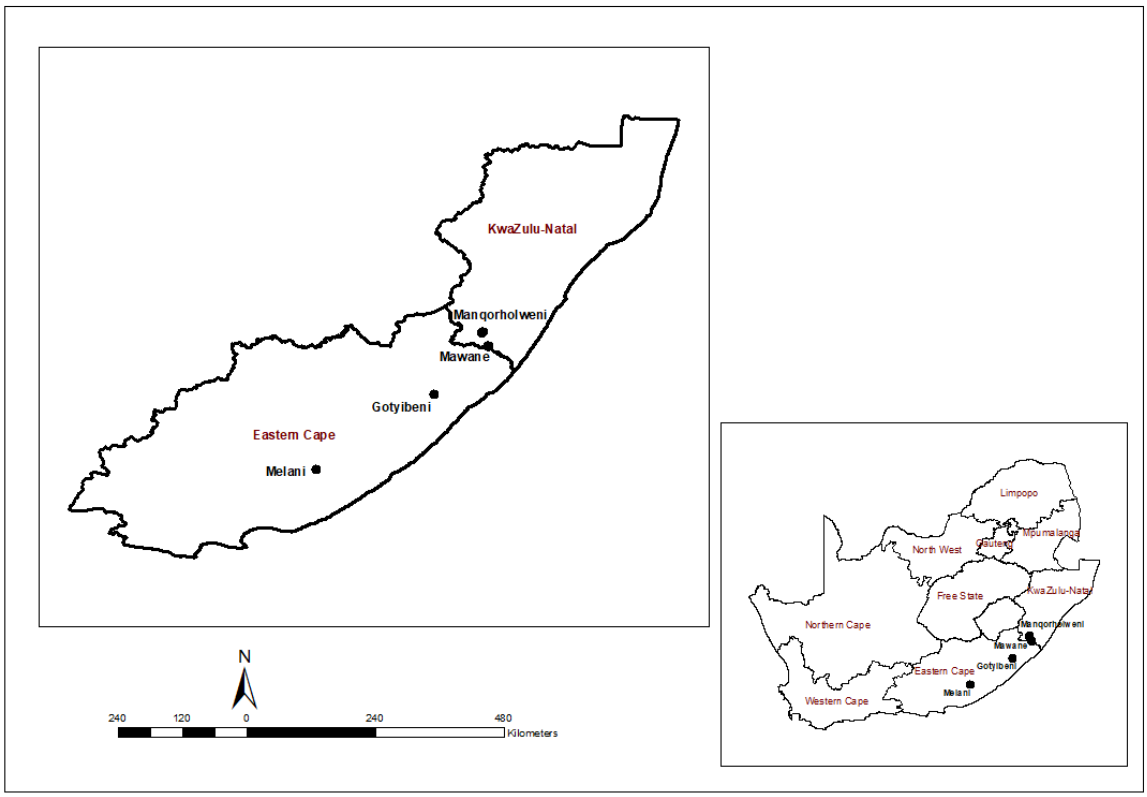

Figure 1.4: Location of the four study villages in the South African map. Gotyibeni and Melani are located in the Eastern Cape province, while Mawane and Manqorholweni are situated in the KwaZulu-Natal province.

1.15. Structure of the thesis

This thesis consists of seven chapters, with Chapter 1 serving as the introduction and Chapter 7 as the synthesis. The five evidence-based chapters (Chapters 2 to 6) are organised in a paper-based format to facilitate future publication of the research findings, although they have not yet been submitted for publication.

Chapter 1 offers a comprehensive overview of research on rural livelihoods and field abandonment in both global and South African contexts, presenting the study's rationale, aim, objectives, and conceptual framework, along with detailed descriptions of the study sites. **Chapter 2** analyses changing land use and land cover patterns in the study villages, examining the impact of arable field abandonment on landscape transformation. **Chapter 3** investigates the reasons for field abandonment and the factors motivating continued farming. **Chapter 4** delves into the social consequences of arable field abandonment, examining shifts in livelihoods, economic structures, social cohesion, and cultural practices, while also identifying

the environmental aftermath of abandonment. **Chapter 5** employs oral histories to provide a human-centric view of the drivers and impacts of field abandonment, capturing personal narratives and the tangible consequences on the villages. **Chapter 6** explores the perspectives of the youth on field abandonment. Finally, **Chapter 7** synthesises findings from previous chapters, discusses research implications and limitations, and contextualises the analysis within the DPSIR framework.

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Chapter 2: Assessing land use and land cover changes and the driving forces in the Eastern Cape and Kwazulu-Natal provinces

Abstract

This chapter investigates land use and land cover (LULC) changes in the villages of Gotyibeni, Manqorholweni, Mawane, and Melani over a 20-year period. The goal is to understand the dynamics of LULC change and its impact on local communities, which is crucial for developing sustainable development interventions. The analysis focuses on changes between two periods: 2000-2010 and 2010-2020. Landsat 7 satellite imagery with 15-meter spatial resolution was used, with clear images available from 2013 for Gotyibeni, 2006 for Manqorholweni and Mawane, and 2000 for Melani due to earlier low resolution. Land cover classes such as arable fields, residential areas, homestead gardens, grasslands, and shrublands were identified. Post-classification change detection was employed to compare land cover across time periods and calculate the rate of change. Results reveal a consistent decrease in arable fields, which have been replaced by grasslands, shrubs, and residential areas. The study highlights the ecological and cultural implications of these changes and recommends policies to promote homestead gardens and provide resources and training for their establishment.

Keywords: land cover change, land use, rural landscapes, arable fields, aerial images

2.1. Introduction

Arable land abandonment is a global occurrence (Goga et al., 2019; Kabadayi et al., 2022). It pertains to the abandonment of areas previously used for farming, particularly for cultivating crops (Queiroz et al., 2014; Goga et al., 2019; Castillo et al., 2021), where active agricultural management has not taken place for at least four years (Castillo et al., 2021; Prishchepov et al., 2021). In its most extreme form, land abandonment involves a complete cessation of agricultural activities on the land, such that the agricultural land transitions to various non-agricultural land uses (Keenleyside and Tucker, 2010).

Multiple factors contribute to this phenomenon, including unfavourable soil and climatic conditions for agriculture (Goga et al., 2019; Castillo et al., 2021). Socio-economic factors also play a significant role, such as rural-to-urban migration in pursuit of new economic opportunities (Goga et al., 2019; Mzuyanda et al., 2020; Castillo et al., 2021; Moyo and

Ravhuhali, 2022; Quintas-Soriano et al., 2022). Urbanisation and industrialisation, which offer improved economic prospects, an aging farming workforce, rural youth seeking more secure and better-paying opportunities in urban settings, the diminishing status of farming as an occupation, and the decline in local agricultural incomes, etc., all contribute to this trend (Gillson et al., 2012; Li and Li, 2017; Goga et al., 2019; Castillo et al., 2021; Moyo and Ravhuhali, 2022; Shackleton and Ntshudu, 2023). At the household level, the decision to engage or disengage from agricultural livelihood strategies over time depends on the available livelihood assets of individual families (Gillson et al., 2012; Shackleton and Ntshudu, 2023). Additionally, political dynamics and responses (Gillson et al., 2012; Shackleton et al., 2013; Goga et al., 2019; Castillo et al., 2021; Moyo and Ravhuhali, 2022), or inefficient farm structures can further accelerate the process of land abandonment (Van der Zanden et al., 2017; Castillo et al., 2021).

This trend is not only pronounced in well-developed regions where intensive agriculture contends with urbanisation (Castillo et al., 2020; Quintas-Soriano et al., 2022), such as Europe (Castillo et al., 2021). But it is also observed in less developed areas, particularly in mountainous or remote rural areas where the loss of agricultural income can exacerbate already fragile economic and social structures (Goga et al., 2019; Castillo et al., 2021). For example, in the rural homelands in South Africa (Shackleton et al., 2013; Blair et al., 2018; Shackleton et al., 2019; Mzuyanda et al., 2020; Moyo and Ravhuhali, 2022), as well as in mountainous pastures and hilly territories characterised by extensive farming as seen in China and Spain, for example (Poyatos et al., 2003; Castillo et al., 2020; Quintas-Soriano et al., 2022).

Moreover, at these different locations, abandonment of arable land occurs at varying rates (Winkler et al., 2021), as noted by Shackleton et al. (2013), Blair et al. (2018) and Winkler et al. (2021) that global agricultural land use change is not constant over time. For example, Kgaphola et al. (2023) showed that at Sekhukhune District Municipality, in Limpopo, the rate of change for subsistence cultivation was (-15.50%/yr), while residential areas, and shrublands increased by 15.2%/yr, and 10.66%/yr, respectively, between 1990 and 2019. Shackleton et al. (2013) showed that between 1961 and 2009 the annual rate of change for arable land cultivation in Willowvale was -0.1%/yr. However, Abdurahman (2023) showed that in Koore, Ethiopia, over the course of three decades between 1990 and 2020, agricultural land experienced a cumulative increase of 17.49%, with an average annual growth rate of +1.17%, while change transition matrix showed that a significant conversion to this agricultural land came from a

substantial number of hectares of grazing land, forest, shrublands, and woodlands. Similarly, Obiahu and Elias (2020) showed that cultivated land increased to 45.20% in 2016, while forested area decreased by 18.86% corresponding to a rate of change of -430.

The decision to abandon arable land can yield both positive and negative effects on the environment, contingent on the capacity to either bolster or undermine the benefits that nature bestows upon people and their quality of life (Corbelle and Crecente, 2008; Gillson et al., 2012; Briassoulis, 2019; Huang et al., 2020; Quintas-Soriano et al., 2022). These outcomes closely depend on the preceding landscape structure (Rey Benayas et al., 2007; Munroe et al., 2013; van der Zanden et al., 2017; Ustaoglu and Collier, 2018; Quintas-Soriano et al., 2022). Furthermore, these resulting effects are subject to diverse interpretations among various stakeholders (Gillson et al., 2012).

Arable land abandonment can be examined at various scales and through different methods (Beilin et al., 2014; Shackleton et al., 2019; Castillo et al., 2021). Recent studies have employed remote sensing techniques (Alcantara et al., 2013; Estel et al., 2018; Castillo et al., 2021; Lidzhegu and Kabanda, 2022) to differentiate between productive, fallow, and recultivated farmland (Castillo et al., 2021), and assess rates of change. Such studies have been conducted at both local and global scales, involving the calculation of NDVI time series using various high-resolution satellite sensors (Castillo et al., 2021; Lidzhegu and Kabanda, 2022). Remote sensing (RS) and Geographic Information Systems (GIS) prove to be effective tools for obtaining precise and up-to-date information about changes in land cover across extensive areas (Efrem, 2010; Lidzhegu and Kabanda, 2022; Paz Errea et al., 2023). RS plays a vital role in the field of land-change science since it enables the observation of larger areas of the Earth's surface compared to what can be achieved through ground-based observations (Roy and Roy, 2010; Castillo et al., 2021; Lidzhegu and Kabanda, 2022). In this regard, satellite-based remote sensing holds significant promise in providing a comprehensive perspective of the environment, encompassing various scales from the local to the global level (Roy and Roy, 2010; Lidzhegu and Kabanda, 2022).

These established methods primarily aim to analyse trends and changes in landscape and spatial patterns over time (Castillo et al., 2021; Lidzhegu and Kabanda, 2022). For instance, as emphasised by Errea et al. (2023) the accurate assessment of land cover changes over the past 50 years is of paramount importance for comprehending the general trends of arable land abandonment in a region and recognising how terraced landscapes influence land cover change

processes. Additionally, GIS and RS technologies have found a wide range of applications within the agricultural domain (Shoukat and Kiran, 2021). Numerous methodologies have been developed and implemented to identify changes, using remotely sensed data to monitor shifts in land cover (Roy and Roy, 2010). These techniques encompass image differencing, post-classification comparison, and variations in vegetation indices (Lu et al., 2004; Shoukat and Kiran, 2021; Lidzhegu and Kabanda, 2022). These indices provide numerical values that yield insights into how a specific landscape has evolved and changed (Shoukat and Kiran, 2021). GIS methods have consistently demonstrated their reliability, accuracy, and efficiency (Shoukat and Kiran, 2021).

In this chapter, I investigate the changes in land use and land cover in the four study villages of Gotyibeni, Manqorholweni, Mawane, and Melani over a 20-year period. This analysis is based on the mapping of Land Use/Land Cover (LULC) and the computation of spatial metrics and landscape geometry indices. The aim of the chapter is to analyse LULC change between the early and late 2000s (especially by comparing variations in landscape between two periods i.e., 2000-2010 and 2010-2020). The dearth of knowledge and understanding regarding the rate at which LULC change occur at particular regions, and the associated implications for ecosystems and ecosystem services, is a subject of concern (Juanita et al., 2019; Musetsho et al., 2021). This concern underscores the necessity for gaining a deeper comprehension of the rate of LULC change stemming from the abandonment of arable fields (Musetsho et al., 2021). Furthermore, as posited by Adger et al. (2005), Munthali et al. (2019) and Lidzhegu and Kabanda (2022) it is imperative to understand the dynamics of LULC change and how these dynamics impact local communities. Such understanding is pivotal for the development of interventions for sustainable development that can benefit the broader community (Munthali et al., 2019).

2.2. Methodology

2.2.1 Study sites

Please refer to chapter one, section 1.4.1 for detailed information on study sites.

2.2.2 Data collection

Landsat 7 Satellite imagery with 15-meter spatial resolution for the four study areas (Gotyibeni, Manqorholweni, Mawane, and Melani) was obtained from the South African Space Agency

(SANSA) and Google Earth Pro. These images spanned from 1972 to 2020, but many of the earlier years' images were not usable due to their low resolution, resulting in blurry images that could not be effectively analysed for land cover. The low resolution was particularly severe for Gotyibeni, with the first clear images available only from 2013 after checking multiple image sources. In contrast, clear images were available for Manqorholweni and Mawane starting from 2006, and for Melani from 2000. For the three study areas with clear images from the early 2000s, comparisons were made between three time points: the early 2000s, mid-2000s, and late 2000s. For Gotyibeni, comparisons were only possible for two time points, mid-2000s and late 2000s due to the inability to analyse the low-resolution images from the early 2000s.

However, the exact year point for a specific village was determined by availability of images. The following classes: arable field, residential area, homestead gardens, grassland, and shrublands, were classified. Arable fields were defined by land cover that contained visible, linear (i.e., human-made) boundaries (Blair et al., 2018), while grasslands were defined by land cover where there were no discernible field boundaries around the vegetated areas (Blair et al., 2018). Trees and shrublands and residential areas were clearly visible for classification.

The change detection in the study areas was done using post-classification. Post-classification is a simple technique used to identify changes in land cover (Musetsho et al., 2021). It involves comparing the extent and areas of land cover categories between two different periods or points in time (Musetsho et al., 2021). This method is also referred to as "bitemporal change detection" (Chand, 2014; Musetsho et al., 2021). Post-classification allows for the determination of the direction of change, which means understanding how land cover has changed from one time to another. In the context of this study, the comparison was made between the early and late 2000s. The change detection matrix and statistics were generated using a ha/year formula, described by Meshesha et al. (2016) and Musetsho et al. (2021) as follows:

$$R\Delta = (t2 - t1)/z$$

where $R\Delta$ is the rate of change and t is the time in years. The amount of change in an area of land-cover class from an initial time (t1) to a later time (t2), z, is measured as the time interval between t1 and t2 in years.

2.2.3. Image analysis

The analysis of the images was carried out using ArcGIS 10.8.1 software to generate maps, delineating the five distinct LULC classes, i.e., arable field, residential area, homestead gardens, grassland, and shrublands derived from the satellite imagery. The following steps were followed to obtain the five LULC classes as presented on the maps: (i) The images received from SANSA were imported into the ArcGIS and georeferenced to align with the South African projection Haartebeeshoek 94. (ii) A signature file was created for each land use class. These signature files were later used in a supervised classification process to categorise the required classes accurately. (iii) A maximum likelihood classification was conducted using the signature files generated in the previous step within the ArcGIS to define the five predetermined land use classes. (iv) A map displaying the five land use classes was produced, which remained in raster (image) format and later converted into a vector (polygon) format. This conversion was necessary for area calculations and further analysis of the classes. (v) The map was customised to the study area by using a clipping function in ArcGIS to the study area layer. This function allows for the map elements to be only confined within the study area as it cuts out other information that is not relevant to the study area. (vi) The image was converted from a raster to a vector format, as explained in step (iv). (vii) The map was assigned a legend by altering the default colours to custom ones that cartographically represented the identified land use classes. (viii) The area of each land use class was calculated in ha (ha). These area measurements were recorded in an Excel spreadsheet for subsequent analysis and representation. Final maps were created based on the processed data and results of the land use analysis and post-classification.

For determining LULC change matrix, (i) An intersection analysis was conducted in ArcGIS 10.8.1 by overlaying data from the time point with data from the subsequent point. This process helped identify which land use categories from the second time point occupied the same geographic areas as those from the previous time point. (ii) After the intersection, the attribute table was exported to Excel. (iii) The resulting data was then organised into a pivot table in Excel for better analysis. (iv) Filters were then applied to isolate and focus on arable land, as the primary area of interest in the study. This step aimed to determine which specific land use types from the previous time point were converted to other land uses. (v) To quantify these changes, a percentage count was calculated to better understand the extent of arable land change due to different land uses from the previous year.

2.3. Results

2.3.1 Local scale

The examination of LULC change at the village scale revealed distinct spatial and temporal differences in LULC change patterns. These variations were contingent on the specific village, the time period under consideration, and the LULC change category in question. At Gotyibeni, the changes in land use between 2013 and 2022 are indicative of substantial transformations (Figure 2.1, A and B). Specifically, there was a significant decrease of 44 ha in arable fields (Table 2.1) during this nine-year period at an annual rate of -4.9 ha (Table 2.2). Concurrently, homestead gardens also experienced a noteworthy reduction, losing 11.8 ha in the same period (Table 2.1).

A) B)

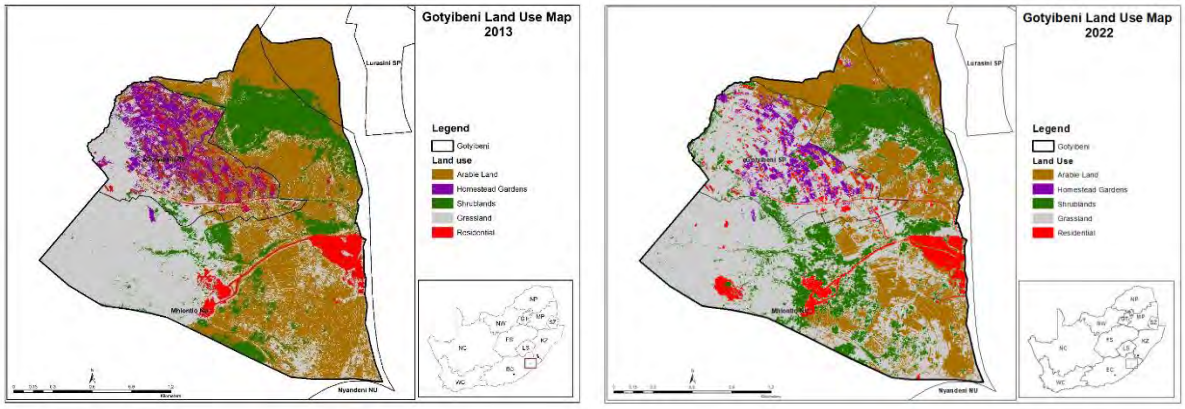
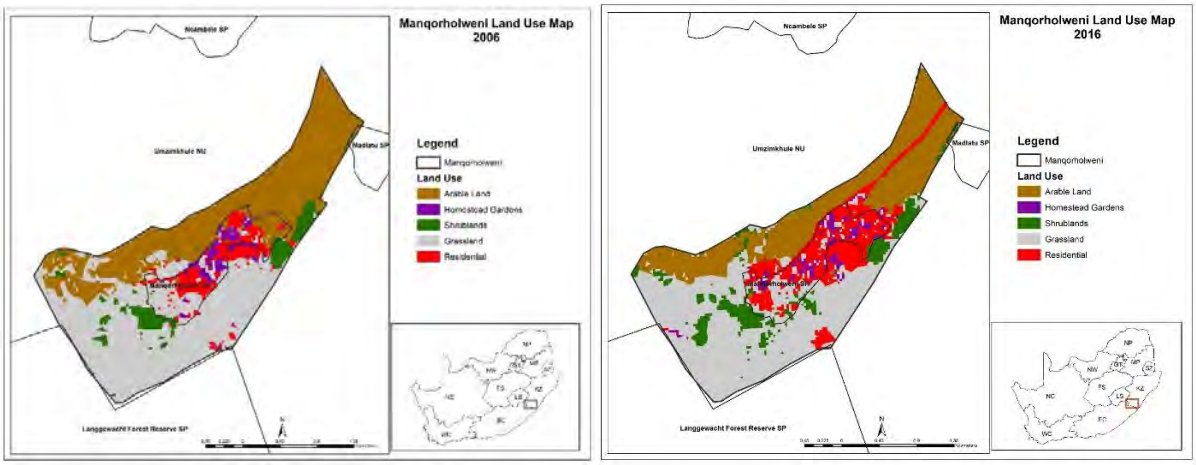


Figure 2.1: This map shows land use changes in Gotyibeni between 2013 and 2022. A (2013) highlights more arable land and homestead gardens, whereas B (2022) shows an increase in grasslands and residential areas. Different land uses, including arable land, homestead gardens, shrublands, grasslands, and residential areas, are depicted for comparison.

The shifting patterns of land cover in Manqorholweni between the years 2006, 2016, and 2023 provide a clear picture of the primary changes in land use (Figure 2.2, A, B and C). Notably, there was a substantial decrease in arable fields, which plummeted from 225.5 ha to 36.9 ha, marking a considerable loss of 188.6 ha in arable land (Table 2.1) over the 17-year period spanning from 2006 to 2023. Simultaneously, grasslands and residential areas saw a consistent increase during the same period (Table 2.1).

A) B)



C)

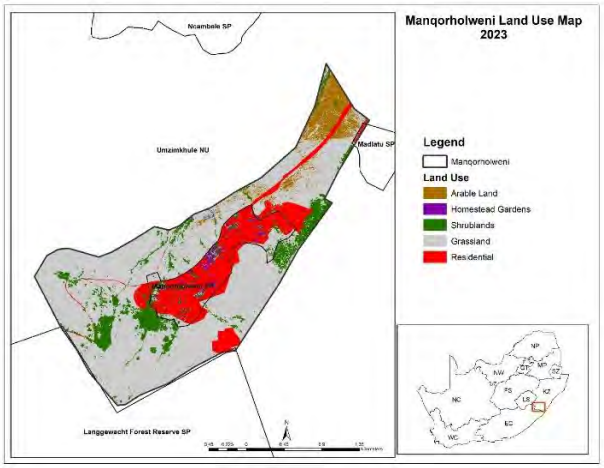
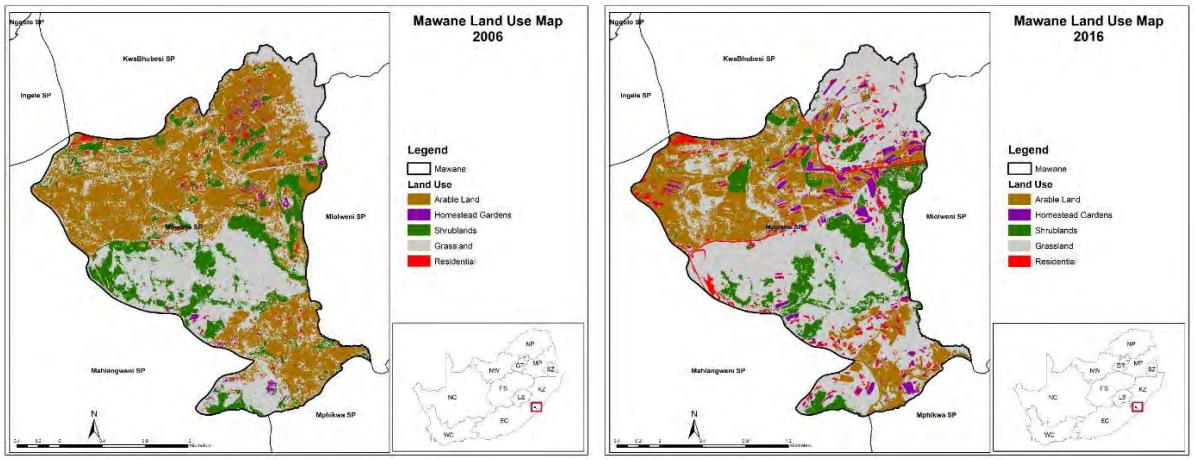


Figure 2.2: This map illustrates land use changes in Manqorholweni over three periods: 2006 (A), 2016 (B), and 2023 (C). Over the years, arable lands have consistently decreased, while residential areas and grasslands have increased. By 2023, homestead gardens have become almost invisible. The map highlights these transitions for better understanding.

At Mawane, an analysis of land use changes was conducted across three distinct time points: 2006, 2016, and 2023. In 2006, arable land constituted the predominant land use, accounting for 43% of the total land use in the village (Table 2.1). However, by 2016, their dominance began to diminish, with arable fields making up only 24% of the total land area (Table 2.1). In 2023 their presence further dwindled to a mere 12% of the total land area. While arable fields decreased significantly over these years, other land uses such as grasslands, homestead gardens, and residential areas experienced increases over the years (Figure 2.3, A, B and C). Shrublands on the other hand experienced a decrease in 2016 and an increase by 2023 (Table 2.1).

A) B)



C)

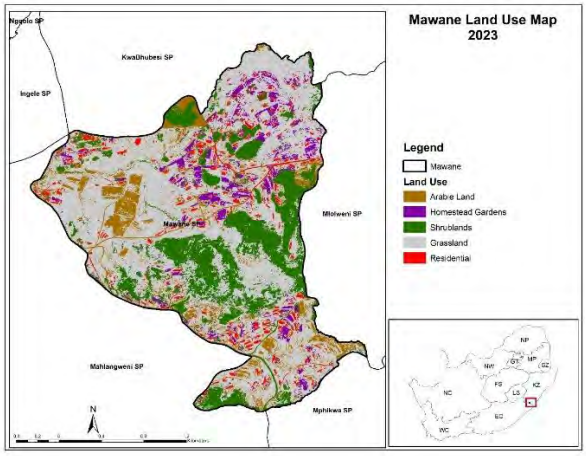
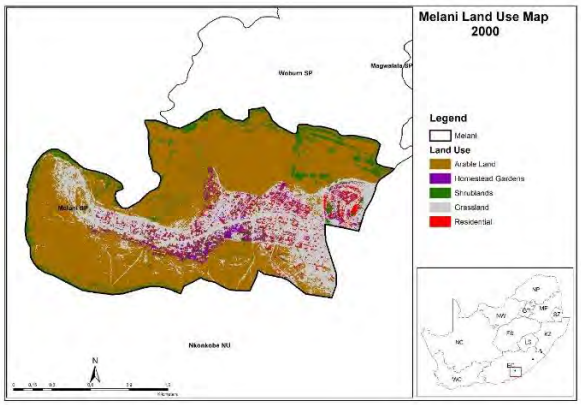


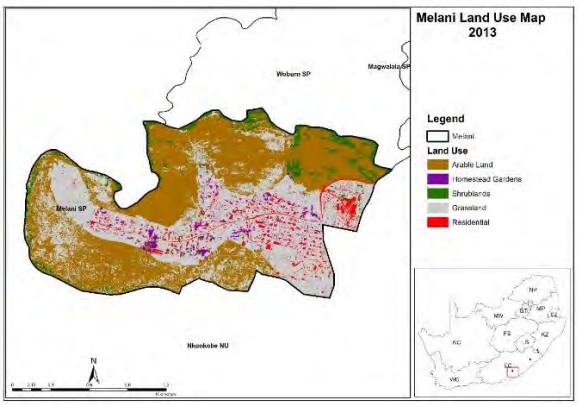
Figure 2.3: This map shows the land use changes in Mawane over three periods: 2006 (A), 2016 (B), and 2023 (C). Arable fields have significantly decreased over these years, while grasslands, homestead gardens, and residential areas have increased. Shrublands experienced a decrease in 2016 but increased again by 2023.

The changes observed in Melani over the years highlight a notable decline in arable fields, with a reduction of 103.4 ha, along with a decrease of 6.9 ha in homestead gardens. Conversely, other land use categories exhibited growth, with grasslands expanding by 76.4 ha, shrublands by 32.5 ha, and residential areas by 4.4 ha over the three distinct time periods of 2000, 2013, and 2022 (Table 2.1). The changes in LULC in this village are also depicted in figures 2.4, A,B and C.

A)



B)



C)

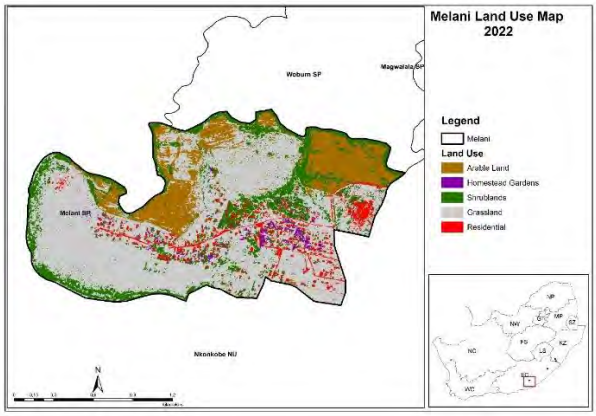


Figure 2.4: This map depicts the land use changes in Melani over three distinct periods: 2000, 2013, and 2022, A, B and C respectively. There has been a decline in arable fields and homestead gardens. Conversely, grasslands, shrublands, and residential areas have shown growth over these years.

2.3.2. Comparison between villages

When comparing various villages, it becomes evident that changes in LULC exhibited similar trends. Specifically, there were reductions in arable land cover across the villages, occurring in conjunction with significant increases in grassland cover during corresponding time periods. For instance, in Gotyibeni, arable lands decreased from 39% in 2013 to 27% in 2022, while in Manqorholweni, this shift went from 39% in 2006 to 6% in 2023. Mawane saw a decrease from 43% in 2006 to 12% in 2016, and Melani experienced a change from 67% in 2000 to 24% in 2022 (Table 2.1). The average rate of arable land decline per time period indicates that Manqorholweni experienced a more significant loss (-12.4 ±10.1), followed by Mawane (-10.2 ±0.6), whereas Melani (-5.4 ±5.4) encountered a comparatively smaller reduction in arable land.

Notably, Mawane had the most land cover dedicated to arable land in the early 2000s compared to the other villages. In contrast, Manqorholweni had a larger proportion of arable land overtaken by other land uses in the late 2000s. This could be attributed to the highest annual rate of change (19.5 ha/yr.) in relation to arable land experienced in this village between 2016 and 2023 compared to other villages. On the contrary, Melani had the lowest annual rate of change (-1.6 ha/yr.) in relation to arable fields between 2000 and 2013 (Table 2.2). Gotyibeni experienced the least loss of arable land by the late 2000s, although it represented the most significant land use loss within the village. This difference from other villages is because Gotyibeni was compared across only two time points (mid-2000s and late-2000s) while the other villages were analysed across three time points.

Across all villages, grasslands emerged as the dominant land cover overtaking arable fields and homestead gardens, albeit to varying degrees. Residential areas and shrublands also made small inroads (Table 2.3). Notably, home gardens decreased in all villages except Mawane, and shrublands increased in all villages, while they fluctuated in Mawane (Table 2.1). For instance, in Mawane, between 2006 and 2016, shrublands decreased from 78.1 ha to 71.8 ha (Table 2.1), while between 2016 and 2023, they increased from 12.9% to 18.4% (Table 2.1).

Table 2.1: Changes in LULC classes in the villages over different time periods (in ha) and (%)

	Gotyibeni			Manqorholweni						Mawane						Melani					
	2013	2022	Change	2006	2016	2023	Change (2006-2016)	Change (2016-2023)	Change (2006-2023)	2006	2016	2023	Change (2006-2016)	Change (2016-2023)	Change (2006-2023)	2000	2013	2022	Change (2000-2013)	Change (2013-2022)	Change (2000-2022)
LULC class	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**	**ha**
Arable fields	142.9	98.9	-44.0	225.5	173.6	36.9	-51.9	-136.7	-188.6	238.6	132.8	64.5	-105.8	-68.4	-174.1	161.7	141.1	58.3	-20.6	-82.8	-103.4
Residential	10.4	18.0	7.6	37.1	69.9	73.0	32.8	3.1	35.9	6.9	31.5	40.8	24.6	9.3	33.9	8.7	9.8	10.1	1.1	0.3	1.4
Homestead Gardens	23.8	12.0	-11.8	16.6	14.0	10.1	-2.6	-3.8	-6.5	5.9	21.6	28.2	15.6	6.6	22.3	8.2	2.1	1.3	-6.1	-0.8	-6.9
Grasslands	137.9	170.5	32.6	261.8	266.4	390.6	4.7	124.2	128.8	226.4	298.9	320.7	60.3	21.8	94.3	50.8	66.7	127.2	15.9	60.5	76.4
Shrubs	54.1	69.7	15.6	32.8	49.9	63.1	17.1	13.2	30.3	78.6	71.8	102.4	-6.8	30.7	23.8	11.6	21.3	44.1	9.7	22.8	32.5
LULC class	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Arable fields	39	27	-12	39	30	6	-9	-29	-33	43	24	12	-19	-12	-31	67	59	24	-9	-34	43
Residential	3	5	2	7	12	13	5	0.5	6	1	6	7	4	2	6	4	4	4	0.5	0.1	0.6
Homestead Gardens	6	3	-3	3	2	2	-0.5	-0.7	-1	1	4	5	3	1	4	3	1	1	-3	-0.3	3
Grasslands	37	46	9	46	47	68	0.8	22	22	41	54	58	11	4	17	21	27	53	7	25	32
Shrubs	15	19	4	5	9	11	6	2	5	14	12	18	-1	6	4	5	9	18	4	9	13

Table 2.2: Annual rate of change in LULC in the villages over the years

	Gotyibeni						Manqorholweni						Mawane				Melani			
	RΔ (2013-2022)		RΔ (2006-2016)		RΔ (2016-2023)		RΔ (2006-2023)		RΔ (2006-2016)		RΔ (2016-2023)		RΔ (2006-2023)		RΔ (2000-2013)		RΔ (2013-2022)		RΔ (2000-2022)	
LULC class	**ha/yr**	**%/yr**	**ha/yr**	**%/yr**	**ha/yr**	**%/yr**	**ha/yr**	**%/yr**	**ha/yr**	**%/yr**	**ha/yr**	**%/yr**	**ha/yr**	**%/yr**	**ha/yr**	**%/yr**	**ha/yr**	**%/yr**	**ha/yr**	**%/yr**
Arable fields	-4.9	-1.3	-5.2	-0.9	-19.5	-4.1	-11.1	-1.9	-10.6	-1.9	-9.8	-1.7	-10.2	-1.8	-1.6	0.7	-9.2	-3.8	-4.7	-2.0
Residential	0.8	0.2	3.3	0.5	0.4	0.1	2.1	0.4	2.5	0.4	1.4	0.3	2	0.4	0.1	0.03	0.03	0.01	0.1	0.03
Homestead Gardens	-1.3	-0.3	-0.3	-0.1	-0.5	-0.1	-0.4	-0.1	1.6	0.3	0.9	0.1	1.3	0.2	-0.5	0.2	-0.08	-0.03	-0.3	0.1
Grasslands	3.6	1	0.5	0.1	17.7	3.1	7.6	1.3	6.0	1.1	3.1	0.6	5.5	1	1.2	0.5	6.72	2.8	3.4	1.5
Shrublands	-3.9	0.4	1.7	0.6	1.9	0.3	1.8	0.1	-0.7	-0.1	4.4	0.9	1.4	0.2	0.8	0.3	2.53	1	1.5	0.6

2.3.3. Proportion of LULC transition

The shift in LULC change from one category to another was particularly more for arable land, but comparatively smaller for other land use types as arable land decreased significantly as other land uses increased (Table 2.1). In many instances, the proportion of land cover remaining in its initial category and increasing was notably higher for grasslands, residential and shrublands, as they experienced minimal losses to other land uses (Table 2.1). For example, in Manqorholweni, 136.7 ha of arable fields present in 2016 transitioned to other land uses by 2023. Of this, 2% were converted to residential areas, 42% to grasslands, and 3% to shrublands (Table 2.3). Moreover, in Melani, between 2013 and 2022, there was a significant loss of 34% of arable land (Table 2.1), reducing it from 141.1 ha in 2013 to 58.3 ha in 2022 (Table 2.1). Of these changed ha, 2% was converted to residential, 48% to grasslands and 26% to shrublands (Table 2.3).

Table 2.3: LULC transition proportions from arable field to other land uses (%)

LULC class	**Gotyibeni**	**Manqorholweni**		**Mawane**		**Melani**	
Change period	**2013-2023**	**2006-2016**	**2016-2023**	**2006-2016**	**2016-2023**	**2000-2013**	**2013-2023**
Unchanged arable land	**39**	**88**	**53**	**63**	**67**	**77**	**24**
Arable land to residential	2	6	2	6	13	0	2
Arable land to gardens	0	0	0	0	10	0	0
Arable land to grasslands	24	5	42	23	15	23	48
Arable land to shrubland	35	1	3	8	10	0	26

2.4. Discussion

The analysis of the satellite images for the study villages provided valuable insights into the changing landscapes, including both land use and land cover patterns. While the specific characteristics of each village varied, several common trends and similarities emerged. Similarly, GIS studies conducted by Fonji and Taff (2014) in Latvia; Blair et al. (2018) in Transkei, KwaZulu, Lebowa, and Venda regions of South Africa; Meyer and Früh-Müller (2020) in Nuremberg, Germany; Kabadayi et al. (2022) in Bulgaria and Plovdiv; Lidzhegu and Kabanda (2022) in Thulamela Local Municipality in South Africa; and Nadal-Romero et al. (2023) in Araguas in the Central Spanish Pyrenees, all showed that the landscape had changed substantially over the recent past.

2.4.1. Abandonment of arable fields and home gardens

A common finding across the four sites was the decline in arable land. This trend indicates that arable fields are being abandoned and replaced primarily by grasslands, followed by shrublands and residential areas. These changes reflect a reduction in agricultural activities and an increase in alternative land uses. The shift in the state of the environment is attributed to the abandonment of field cultivation by local people. This aligns with Kyriazopoulos et al. (2017), who note that human activities play a determining role in shaping social-ecological systems. Moreover, Keenleyside and Tucker (2010) and Hatna and Bakker (2011) also note that, evidence that fields are abandoned is represented by land cover types that eventually appear on lands that were agricultural fields (for example, natural grasslands and shrublands) after land abandonment. This demonstrates that when arable fields are abandoned for an extended period, the environment undergoes a transition to a new state, as supported by the DPSIR framework. Yussif et al. (2023) note that in the DPSIR framework the "state" refers to the condition of urban systems and their components (such as natural or built-up land and social systems) as a result of the pressures. This concept is also applicable to rural systems. For example, in some European mountain regions, arable field abandonment in 1990 led to conversions from arable land to grasslands and shrublands in 2006 (Hatna and Bakker, 2011). The reduction in agricultural fields and replacement by other land uses is observed as long-term abandonment, as often considerable time has to elapse before a new land cover can develop (Keenleyside and Tucker, 2010; Hatna and Bakker, 2011).

While the data from the villages shows a shift away from traditional agricultural practices, which Hebinck (2007) described for the Eastern Cape as landscapes where each household once had a distant cultivated field, a garden with a variety of vegetables planted year-round, and a kraal for livestock within the homestead, this traditional setup is no longer prevalent. Traditionally, arable fields in these villages represented a mosaic of cultivated fields, reflecting a diverse range of crops and land management practices. The pressure of arable land abandonment has changed this landscape structure. As identified by Yussif et al. (2023), environmental and human behaviour pressures include factors such as land use changes, landscape modifications, and shifts in lifestyle, among others. Therefore, arable land abandonment is considered a pressure, as it falls under the categories of land use and landscape change. According to Antrop (2005), Lasanta-Martínez et al. (2005) Palang et al. (2005) Agnoletti (2014) and Nadal-Romero et al. (2023) the process of arable field abandonment shifts

the landscape from a diverse, mosaic-like landscape characterised by a high degree of diversity and numerous patches to a more uniform landscape dominated by natural features. As this land is repurposed for grasslands and shrubs, there is a possibility that the landscape's once distinctive and heterogeneous character is giving way to a more homogenous appearance. This shift may affect ecosystem functioning in these landscapes, as Hatna and Bakker (2011) note that ecosystem functioning is strongly determined by agricultural land use. This transition may signify not only changing land use priorities but also alterations in the cultural and ecological tapestry of these areas.

The findings of significant declines in arable land of an average of 29.7% across the villages is corroborated by findings of other studies such as by Blair et al. (2018) regarding long-term analysis of land cover changes in former South African homeland sites. Blair et al. (2018) pointed out a widespread increase in the abandonment of cropland from the 1950s to the 2010s. Similar trends were evident in several studies in other countries as well, indicating rapid declines in arable lands, with rates exceeding 10% per decade, as observed by Van Dijk et al. (2005) in Europe, Fonji and Taff (2014) in Latvia, Meyer and Früh-Müller (2020) in Germany, and Nadal-Romero et al. (2023) and Errea et al. (2023) in the Central Spanish Pyrenees. However, Fonji and Taff (2014) demonstrated that during the same period when old fields were abandoned, new fields, comprising 8.6%, were gained. Which was in contrast to observations of the study as the LULC analysis did not show any new fields in any of the villages.

The trend of arable field abandonment and its subsequent conversion to other land uses raises important questions about how landscape dynamics are evolving in these villages. Grove and Rackham (2000) argue that human activities altered the vegetation and landscape in Europe over 7 000 years ago through deforestation and cultivation to support agriculture and livestock. However, a reversal of this trend began in the mid-20th century, with some earlier signs in the 19th century, leading to the abandonment of significant arable areas across Europe (MacDonald et al., 2000; Serra et al., 2008; García-Ruiz and Lana-Renault, 2011). This process is expected to continue in the coming decades (Rounsevell et al., 2006; Pointereau et al., 2008).

Paralleling the decline in arable fields was that homestead gardens in the analysed villages, except Mawane, also decreased in area over the years. On average, these gardens experienced a reduction of 4.0 ha during the study periods. This is similar with findings from Shackleton et al. (2013) who observed an increasing abandonment of home gardens in the Wild Coast, albeit not to the same extent as fields. However, these results contradict the observations of numerous

studies (see Andrew and Fox, 2004; Fay, 2009; Fay, 2013; Shackleton and Hebinck, 2018; Shackleton et al., 2019). For instance, Fay (2009) and Shackleton and Hebinck (2018) indicated that rates of garden cultivation in Dwesa, Cwebe, and Willowvale increased to over 80% after field abandonment. These researchers' observations are similar to those from Mawane, that have shown a simultaneous increase in homestead garden cultivation by households cultivating them, as field cultivation decreases.

Furthermore, in Mawane it was also observed that 10% of previous arable land were converted to homestead gardens, this phenomenon occurred concurrently with 13% of the arable land being absorbed by residential areas. Homestead gardens typically accompany residential developments, and as individuals began to convert previous arable lands into homesteads, they simultaneously established gardens in this area between 2016 and 2023. This was a response strategy by people in Mawane as they compensated for the loss of arable fields by cultivating and expanding homestead gardens. As Yussif et al. (2023) explain, responses are the actions taken by individuals or groups to address adverse changes. Pagan et al. (2020) further note that when drivers, pressures, and impacts reach undesired levels, they often trigger responses from society. The abandonment of arable land has reached such critical levels in rural areas, as the area of land abandoned have significantly increased each year, accompanied by rising levels of poverty. Therefore, communities implement responses like garden cultivation to mitigate the negative consequences of these pressures. This aligns with Kyriazopoulos et al. (2017) who assert that societal responses can alleviate pressure and enhance the resilience of social-ecological systems, as described in the DPSIR framework. Andrew and Fox (2004) emphasise that home gardens are used as a strategy of "compensating intensification" for abandoned arable fields. They proposed that home gardens achieved higher yields, enabling smaller plots to produce as much as larger fields (Andrew and Fox 2004).

2.4.2. Expansion of grasslands

As shown in the LULC change matrix, arable fields across all villages were replaced primarily by grasslands. In Gotyibeni, grassland expanded by 11.9 ha from 2013 to 2022, in Manqorholweni, grassland increased by 4.7 ha over a decade from 2006 to 2016, and this trend continued with a further expansion of 124.2 ha by 2023, while in Mawane, a substantial growth of 60.3 ha in grasslands was observed from 2006 to 2023. According to Lasanta et al. (2015) it usually takes a few years, typically within 3 to 5 years, depending on factors like soil fertility

and climate, for abandoned plots to become covered with herbaceous vegetation. This is especially common in wet and sub-humid regions, leading to the formation of grazing or pasture meadows. Sluiter and de Jong (2007) note that when cultivation ceases, the arable fields may eventually be recolonised by plants from the surrounding areas. However, this may also be a result of the seed banks present in or on the soil, which can facilitate the re-vegetation of abandoned land, as noted by Shiferaw et al. (2018).

The abandoned fields in the villages may have transformed into grasslands due to the biome types in these areas. As noted in Chapter One, the predominant biome in these villages, particularly at Gotyibeni, Manqorholweni and Mawane, is grassland. Additionally, livestock, particularly cattle, were frequently taken to these abandoned fields for grazing, as cultivation was no longer taking place. This may have contributed to the dominance of grasslands in these areas. As Lasanta et al. (2015) point out, relatively high grazing pressure in former fields can cause them to serve as pasture for several decades, depending on the local biome. In Melani, although livestock also grazed in the abandoned fields, my observations during data collection revealed that these fields were largely covered with shrubs. This could be attributed to the local biome, which is open savanna, dominated by Acacia karoo bush clumps, a mix of grasslands and shrublands. Shackleton et al. (2013) and Lasanta et al. (2015) note that the encroachment of shrublands in abandoned fields can be caused by reduced grazing pressure. Therefore, it is possible that the livestock population in Melani was relatively low, leading to the dominance of shrubs over grasslands that I observed.

In contrast to these findings, Shackleton et al. (2013), Blair et al. (2018), Meyer and Früh-Müller (2020), and Errea et al. (2023) reported a decrease in grassland of more than 20% in various regions, including the Wild Coast in South Africa, Venda in South Africa, Nuremberg in Germany, and the Central Spanish Pyrenees in Spain, respectably. Chalmers and Fabricius (2007) and Shackleton et al. (2013) proposed that the reduction in grassland might be attributed to a decline in cattle numbers, which, in turn, results in reduced browsing and trampling, thereby promoting the recruitment of woody plants. This was recently shown by Shackleton and Ntshudu (2023) who reported marked declines in livestock numbers especially cattle.

2.4.3. Expansion of shrublands

Shrublands also saw increases, in Manqorholweni, it increased by 17.1 ha during the decade from 2006 to 2016, in Mawane, shrublands expanded by 30.7 ha over the analysed time periods

from 2006 to 2023, and in Melani, there was a notable increase of 22.8 ha from 2000 to 2022. Similarly, in the Cal Rodo catchment on the southern margin of the Pyrenees (Poyatos et al., 2003) and the Central Spanish Pyrenees (Errea et al., 2013; Nadal-Romero et al., 2023), there was a significant increase in forested areas, rising to above 20% of the initial forested area. Similarly, in South Africa in Venda (Blair et al., 2018) and the Wild Coast (Shackleton et al., 2013), wooded areas increased between 5% to 15% by 2010, primarily due to reduced agricultural activity.

However, at a national level in South Africa, the analysis of vegetation cover trends shows decreases (Skowno et al., 2021). For instance, Skowno et al. (2021) revealed that South Africa lost 0.12% of its natural vegetation annually between 1990 and 2018, with varying rates of loss among different biomes and vegetation types. The conversion of land for crop fields, human settlements, and plantation forestry emerged as the primary drivers of this decrease (Skowno et al., 2021). Likewise, Maitima et al. (2010) illustrated that in the Sango Bay area in Uganda, forests underwent conversion to subsistence farming, with 1.3% being transformed between 1955 and 1985, and a larger portion (2.0%) being converted between 1955 and 2000. Nevertheless, as discussed earlier, site-specific studies indicate increases in natural vegetation cover when arable lands are abandoned. The process of farmland abandonment involves vegetation succession with different temporal phases, including herbaceous cover and shrublands as noted by Shackleton et al. (2013), Blair et al. (2018) and Nadal-Romero et al. (2023), resulting in changes in landscape structure from a mosaic landscape with a high degree of diversity and numerous patches to a more homogeneous landscape where natural features dominate (Nadal-Romero et al., 2023). These areas can hold significant biological and aesthetic value and offer recreational potential (Shackleton et al., 2013). These forested areas can also provide local people with access to building materials, fuelwood, wood for various purposes, medicinal plants, wild foods, grazing areas, bushmeat and crafts (Shackleton et al., 2013).

The abandonment of arable fields in the villages may be attributed to changing livelihoods, economic factors, or shifts in land use and land cover priorities, as also suggested by MacDonald et al. (2000), Lasanta et al. (2006), Sluiter and De Jong (2007), Pasakarmis and Maliene (2009), Bell et al. (2010), and Lasanta et al. (2015) in their land use studies. Agricultural abandonment is more likely to occur in areas with low economic activity. Factors such as farmers migrating to urban areas, lacking financial resources to initiate agricultural enterprises, the collapse of collective farming, farmer retirements, and the migration of young individuals to urban centers have accelerated the abandonment of arable land (Pasakarmis and

Maliene, 2009). Kozak et al. (2004) and Rey Benayas et al. (2007) add that socio-economic factors, including the availability of alternative occupations for farmers, also contribute to land use and land cover changes related to field abandonment.

2.4.5. Expansion of residential areas

Residential expansion was a common trend across the villages, affecting both land use and land cover. This growth is supported by StatsSA (2022), which reported increases in household numbers within the local municipalities. For instance, in Raymond Mhlaba, where Melani is located, households grew from 42,065 in 2011 to 53,047 in 2022, with a population growth rate of 1.8%. In King Sabata Dalindyebo, where Gotyibeni falls under, households increased from 104,878 to 114,580 during the same period, with a population growth rate of 0.6%. Similarly, in Umuziwabantu, where Mawane is located, households rose from 21,619 to 23,319, with a 1.8% growth rate. In contrast, Umzimkhulu, where Manqorholweni is situated, saw a decrease in households from 42,907 in 2011 to 40,064 in 2022 (StatsSA, 2022). Despite the decrease in the number of households, Umzimkhulu saw an increase in average household size, growing from 4.2 in 2011 to 5.0 in 2022, alongside a population growth rate of 2% (Stats, 2022). Riadi (2018), Putri et al. (2019), and Musetsho et al. (2021) emphasise that rapid population growth can lead to increased land demand within communities. The population growth increase suggests ongoing population growth for these villages. This speaks to the pressure element of the DPSIR framework. As arable field abandonment progressed and land lay fallow, the growing population increased the pressure to convert this unused land into residential areas. Alawamy et al. (2020), Akinyemi and Speranza (2022), and Lidzhegu and Kabanda (2022) point out that the growing global population and urbanisation are significant factors contributing to the loss of productive agricultural lands, as also highlighted in the work of Creutzig et al. (2018). This trend is evident in various regions, including parts of China (Li et al., 2018), Europe (Toth, 2012), Africa (Jayne et al., 2014) and South Africa (Lidzhegu and Kabanda, 2022).

Conversions of arable land to residential areas can potentially lead to food insufficiency within villages. Putri et al. (2019) note that food shortages resulting from the conversion of arable fields to residential areas can be categorised under the impact element of the DPSIR framework. For instance, in West Kalimantan Province, Indonesia, the area dedicated to paddy production,

which constituted 1.33% of the total agricultural land in 2013, experienced continuous conversion due to population pressure, dwindling to 0.9% by 2016 (Putri et al., 2019).

The conversion of cropland into other land uses, particularly human settlements, is a universal challenge. For example, Akinyemi and Speranza (2022) noted that between 2000 and 2018 in Africa, approximately 28% of land that now includes human settlements and infrastructure was formerly cropland, while 8% was formerly grassland. Among the study villages, Gotyibeni experienced the highest rate of change to residential areas, with an annual growth rate of 0.5%. Munthali et al. (2019) reported even more significant changes compared to the study, with built-up areas increasing annually by 1.93% and while agricultural land decreased at an annual rate of -1.89% from 1991 to 2015. Lidzhegu and Kabanda (2022) noted that the transformation of arable land into built up areas can be ascribed to the inefficacy of land use management practices and policies within the rural regions.

2.5. Conclusion

The findings of the study underscored a consistent and intriguing trend, the abandonment of arable fields and its subsequent replacement by other land uses. This transition reflects a substantial shift away from traditional agricultural practices, with arable fields becoming a focal point for transformation. The results reveal the magnitude of this transformation, with the area/extent of arable fields gradually diminishing over the years. While arable fields have been developed primarily for grasslands, shrublands, and residential areas, it is crucial to note the ecological and cultural implications of these changes. The study would recommend a policy recommendation to encourage the establishment of homestead gardens through community-based programs and partnerships. Provide resources and training to help communities implement these strategies effectively. As this chapter has demonstrated that arable field abandonment occurs in these rural villages, the next chapter will focus on identifying the drivers behind this abandonment in these communities.

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Chapter 3: Arable field abandonment and its drivers in Eastern Cape and KwaZulu-Natal rural areas

Abstract

This chapter addresses a critical gap in understanding the complex interplay of socio-economic factors leading to the abandonment of field cultivation by smallholder farmers in the former homelands of Eastern Cape and KwaZulu-Natal. Although extensive research exists on agricultural land abandonment, patterns vary significantly across regions, necessitating site-specific studies. This research aims to evaluate how socio-economic and environmental factors influence decisions to abandon field cultivation in these areas. Household interviews using questionnaires were conducted to gather data. To determine the sample size, the total number of households in each village was obtained from StatsSA (2011) and cross-referenced with a manual count on Google Earth. A sample of 20% of the total households was selected, resulting in 168 questionnaires distributed across four villages: 39 in Gotyibeni, 30 in Manqorholweni, 41 in Mawane, and 58 in Melani. Households were randomly chosen using a grid overlay on Google Earth. The findings revealed that major drivers of arable field abandonment included socio-economic and environmental factors such as fencing issues, animal raids, aging farmers, distance to fields, and financial constraints for machinery, seeds, and fertilisers. Village-specific drivers also emerged: Gotyibeni cited fencing, older farmers, and lack of machinery; Manqorholweni noted fencing, animal raids, and distance to fields; Mawane highlighted aging farmers and machinery shortages; and Melani reported fencing, animal raids, distance, financial constraints, drought, and water access issues. Recommendations include financial support, infrastructure improvements, and incentives for youth engagement in agriculture.

Keywords: arable field abandonment, food security, financial constraints, home gardening, fencing

3.1. Introduction

Arable field abandonment is a major driver of landscape changes in rural areas around the world (Fayet et al., 2022; Wang et al., 2022). It can be defined as the cessation of agricultural activities and the complete withdrawal of agricultural management on land (Pointereau et al., 2008; Fayet et al., 2022). Globally, arable land abandonment emerged in the early 20th century and has increased since the 1950s (Wang et al., 2022). Approximately 1.47 million square kilometres

of agricultural land have been abandoned globally between 1700 to 1992 (Moyo and Rhavuhali, 2022). For example, in Europe, approximately 129 million hectares were recorded abandoned between 2001 and 2012 (Subedi et al., 2022). In the mountainous areas of China, 28% of arable fields were recorded abandoned between 2000 and 2010 (Li et al., 2018). Between 1980 and 2004, about 47% of land had been abandoned in Nepal (Khanal and Watabe, 2005).

In South Africa, several studies have also indicated high rates of arable land abandonment as well as a reduction in the land area dedicated to field cropping, especially in the former homelands (Shackleton et al., 2019). For instance, Andrew and Fox (2004) showed a 49% decline in the area of field cultivated in Nompa village between 1962 and 1982. Fay (2015) observed a decrease in the number of households cultivating fields in Hobeni village between 1998 and 2009. Connor and Ntwana (2018) found that 90% of respondents in Lutengele, Sirhosheni, and Mbekwini areas had abandoned their fields. Blair et al. (2018) note that in the former homelands of South Africa, annual rates of field abandonment from 1950 to 2010 ranged from 0.08% to 0.28%. Shackleton and Hebinck (2018) added that agricultural production has been declining since the 1940s in South Africa.

The reasons for arable land abandonment are multifaceted and interconnected and hence complex (Blair et al., 2018). They include economic, social, environmental, and policy-related factors (Plieninger et al., 2014; Blair et al., 2018; Shackleton et al., 2019). For instance, in Europe and North America, decline in market demand, institutional change, declining soil fertility, and climate change have been identified as reasons for arable land abandonment (Prishchepov et al., 2013; Lieskovský et al., 2015; Plieninger et al., 2016; Levers et al., 2018). In Japan, an aging population was regarded as a main reason for cessation of cultivation (Osawa et al., 2016). While in developing countries such as the Philippines, Nepal, and Thailand, which are experiencing rapid industrialisation and urbanisation, arable land abandonment is linked to increasing opportunity costs of agricultural labour, labour distance, and insufficient labour force (Jaquet et al., 2016).

In South Africa, the country's land reform processes have also influenced arable field abandonment (Mafongoya et al., 2017). Similar to other countries, the political system is an additional factor influencing the abandonment of agricultural land. For example, in regions like Eastern Europe and the former Soviet Union, there was a substantial reduction in land utilisation intensity following the dissolution of the Union of Soviet Socialist (USS) (Schierhorn et al., 2018). This led to widespread instances of cropland being left unused and

forests expanding (Schierhorn et al., 2018). In South Africa, the implementation of promised land reform policies with regards to tenure security, adequate support for emerging farmers, and access to credit and resources, have been slow and this has led to land abandonment by some land reform beneficiaries (Mafongoya et al., 2017). Additionally, economic factors such as declining profitability, rising input costs, and limited market access have also played a role in arable land abandonment, as small-scale farmers struggle to compete in markets and sustain their farming operations (Kirsten et al., 2016; Blair et al., 2018). Other reasons for arable land abandonment in South Africa include urbanisation, climate change, crime and security, extensive distance between household and the field, declining agricultural labour force, limited water for irrigation and the physical and mental health of farmers (Shackleton and Luckert, 2015; Blair et al., 2018; Shackleton et al., 2019).

Urbanisation, which has been prominent and transformative in South Africa, has led to rural depopulation in some regions as individuals migrate to urban areas in search of better employment opportunities, services, and living conditions (Mafongoya et al., 2017). Moreover, the impact of globalisation and industrialisation has further fuelled urbanisation in South Africa (Mabin, 2012). Maharjan et al. (2020) note that there has been a growing disparity between the high wages offered by non-agricultural employment and the low income generated from small-scale agricultural labour operations. This has led to a significant number of agricultural labourers shifting to non-agricultural employment (Maharjan et al., 2020). This process of urbanisation has profound implications for the spatial distribution of the population, the provision of infrastructure and services, and the overall development of the country (Mabin, 2012). This demographic shift has contributed to the abandonment of agricultural land, as fewer people are interested or able to engage in farming practices.

Environmental factors such as the climate change, including increased droughts and erratic rainfall, and rising temperatures which South Africa is experiencing more frequently have influenced some farmers to cease cropping (Manyevere et al., 2014; Ncube et al., 2014; Blair et al., 2018; Shackleton et al., 2019). Soil erosion and land degradation have made some agricultural land less productive and viable for farming, leading to abandonment (Blair et al., 2018; Mavengahama et al., 2018 Shackleton et al., 2019). Additionally, water scarcity, particularly in arid and semi-arid areas of the country, poses a significant challenge, making farming unsustainable and prompting many farmers to abandon arable land (Blair et al., 2018).

This research addresses a critical gap in understanding the complex interplay of socio-economic and environmental factors leading to the abandonment of field cultivation by smallholder farmers in the former homelands of Eastern Cape and KwaZulu-Natal. While extensive research on agricultural land abandonment exists, findings by Hou et al. (2021) and Pawlewicz and Pawlewicz (2023) show that indicators and patterns vary significantly across regions. For instance, in Eastern Europe, abandonment is driven by location, whereas in Western Europe, it is influenced by land quality (Van Dijk et al., 2005; Xie et al., 2014). In Slovakia, the possibility of abandonment increases with the increasing distance (Pazur et al., 2020; Li and Song, 2021). Site-specific research is therefore necessary to understand these variations.

In South Africa, despite several studies on field abandonment (see Andrew and Fox, 2004; Shackleton et al., 2013; Blair et al., 2018; Shackleton and Hebinck, 2018; Shackleton et al., 2019), there is a lack of research focusing on specific villages such as Gotyibeni, Manqorholweni, Mawane, and Melani. This research aims to evaluate how socio-economic and environmental factors influence decisions to abandon field cultivation in these former homeland villages. The findings will provide valuable insights for policymakers, practitioners, and stakeholders to design context-specific interventions that promote agricultural resilience, alleviate poverty, and support sustainable rural development.

3.2. Methodology

3.2.1. Study sites

Please refer to chapter one, section 1.4.1 for detailed information on study sites.

3.2.2. Data collection

The key research question, what are the key drivers that lead to the abandonment of arable fields in the villages, and how do these factors vary between villages?, was answered using interviews that were conducted in the four study villages, based on a semi-structured questionnaire containing a combination of closed and open-ended questions in the local language. The questionnaire was first written in English and then later translated to the relevant language (Isixhosa in the Eastern Cape and IsiZulu in KwaZulu-Natal). To determine how many households to visit in each village, the total number of households in each village was obtained from StatsSA (2011) and crossed referenced with a manual count on Google Earth. After determining the total number of households, 20 percent of this number was selected as

the sample size. For each village, this 20 percent translated to 31 households in Gotyibeni, 22 in Manqorholweni, 44 in Mawane, and 56 in Melani. However, to enhance the accuracy of the data and due to availability of time, additional questionnaires were administered in Gotyibeni, Manqorholweni, and Melani. Unfortunately, some households in Mawane were unavailable. Consequently, the final number of completed questionnaires for each village was 39 in Gotyibeni, 30 in Manqorholweni, 41 in Mawane, and 58 in Melani, resulting in a total of 168 questionnaires across the four villages. The households to visit in each community after determination of sample size was randomly selected using a superimposed grid on Google Earth. When there was no one available for an interview on the selected household the next household was visited. One research assistant attended a household at a time. The head of the household was interviewed. Approximately, 60 minutes were spent per household while conducting the interview. The researcher and research assistants also used weekends for conducting interviews.

3.2.3. Data analysis

Data was captured into an Excel worksheet and then imported to the Statistical Package for Social Sciences (SPSS) for data analysis. For continuous, non-normally distributed variables a Kruskal-Wallis analysis test was used to determine if there were significant differences between the four villages. The Kruskal-Wallis test, is a non-parametric method for comparing more than two groups. The test is used to determine if there are statistically significant differences between the distributions of the groups. The equation for the Kruskal-Wallis H statistic:

$$H = 12\, n(n+1) \sum i = 1\, k\, R\, i\, 2\, n\, i - 3\,(n+1)$$

where:

- N is the total number of observations across all groups.
- k is the number of groups.
- R_i is the sum of the ranks for the i-th group.
- n_i is the number of observations in the i-th group.

Chi-square tests were done to determine whether the results from categorical variables were significantly different between villages. The Chi-square test of independence is used to determine if there is a significant association between two categorical variables. The formula for the Chi-square statistic ($\chi 2$) is:

$$\chi^2 = \sum (Oi - Ei)^2/Ei$$

where:

- O_i = observed frequency in each category
- E_i = expected frequency in each category

3.3. Results

3.3.1. Characteristics of respondents

The average proportion of female and male respondents was 68% and 32% respectively, ranging between 41% to 83% females and 17% to 59% males (Table 3.1). Close to 40% or more of participants were in the age category >55 years in all villages, except at Mawane (Table 3.1). Most respondents had primary or secondary education, while very few (3%) had tertiary education. There were no respondents without education at Melani and Manqorholweni, while though a small number, there were at Gotyibeni (8%) and Mawane (17%). Over 50% of respondents across the villages were unemployed, and of those employed, most were employed off-farm with over 88% of respondents, with no significant differences between villages (χ^2 = 2.35; $p > 0.05$) (Table 3.1). The average household members in the villages were two adults while those who were 15 years old and younger were three per household.

Table 3.1: Characteristics of respondents per village

Attribute		Proportion of respondents per village (%)				
		Gotyib (n=39)	Manqor (n=30)	Mawane (n=41)	Melani (n=58)	Mean
Gender	Male	59	23	17	29	**32**
	Female	41	77	83	71	**68**
Age category (years)	≤ 25	15	7	0	3	**6**
	26 - 35	8	7	12	7	**9**
	36 - 45	15	13	22	14	**16**
	46 - 55	23	20	34	16	**23**
	> 55	39	53	32	60	**46**
Highest education	None	8	0	17	0	**6**
	Primary	20	64	44	42	**43**
	Secondary	69	33	39	53	**49**
	Tertiary	3	3	0	5	**3**
Employment status	Unemployment	46	63	56	59	**56**
	Off-farm	90	79	92	92	**88**
	On-farm	10	21	8	8	**12**

3.3.2. Abandonment of fields

Every household in the four villages had fields. Most fields were 4 - 5 ha in extent, with a mean of 4.5 ±2.6 ha, ranging from 3.7 ±1.4 ha at Melani to 5.6 ±3.2 ha at Manqorholweni; the difference was significant between these two villages, but not the others ($F = 3.03$; $p < 0.05$). However, 76% of fields had been abandoned for an average of 19 ±4.8 years across the four villages. In this regard, at Gotyibeni 18 ±5.9 years, Manqorholweni 19 ±4.6 years, Mawane 18 ±4.5 years and Melani 20 ±4.3 years, with no significant differences between villages ($F= 1.16$; $p > 0.05$). This shows that participation in field cultivation was decreasing significantly in the villages as indicated by over 90% of respondents in all villages except Mawane ($\chi^2 =100.24$; $p < 0.05$).

3.3.3. Land-use and land cover changes

Most respondents (83%) across the three villages of Gotyibeni, Manqorholweni and Melani noted that the state of cultivation in the villages in the last five years had been decreasing. This is because during the same period, over 70% of respondents had observed a lot of households that were previously cropping their fields but have since ceased. On the contrary, Mawane was different from the other villages ($\chi^2 =80.57$; $p < 0.05$) in that 80% of respondents had indicated they had observed that the state of field cultivation was increasing in their village. Additionally, 51% of respondents in Mawane observed that households which used to cultivate fields have ceased doing so in the last five years from 2017 to 2021. This proportion is slightly lower than that observed in the other three villages. The decrease in the state of cultivation was also supported by the fact that the respondents at Gotyibeni (81%), Manqorholweni (80%) and Melani (93%) had not observed any new fields opened in the villages in the last five years, while at Mawane 50% of respondents had observed a few new fields opened ($\chi^2 =23.55$; $p < 0.05$). The abandoned fields in the villages, were not used for any other purposes specifically at Manqorholweni (100%), Mawane (73%) and Melani (96%). Gotyibeni was different from the other villages ($\chi^2 =42.21$; $p < 0.05$) as most respondents (51%) indicated that some fields were used for other land uses.

At Gotyibeni 33% of respondents indicated that the land use that had replaced fields was built houses, while only 3% of respondents at Manqorholweni and Melani and 6% at Mawane had indicated that built houses had replaced fields. Grazing area as a land use practice that was occurring in the abandoned fields was only indicated by 2% of respondents at Melani, and not

mentioned at all in the other villages. Collection of wild plants was alluded to by only 3% of respondents at Mawane and Melani and none in the other villages, the differences were between all villages (χ^2 =29.64; $p < 0.05$).

The intensity of garden cultivation had increased in the last five years (2017 -2021) in three villages except Melani. This was as respondents observed that village participation in garden cultivation in the last five years had been increasing more especially at Mawane (90%), followed by Manqorholweni (73%), then Gotyibeni (68%). At Melani, 79% of respondents indicated that village participation in garden cultivation had decreased in the last five years, this village was significantly different from the other villages (χ^2 =54.87; $p < 0.05$). Similarly, the household's participation in garden cultivation had also increased in the three villages (70%) while at Melani it had decreased (83%) (χ^2 =49.61; $p < 0.05$).

3.3.4. Reasons for field abandonment

As the large fields were abandoned for several years and some in the other villages like Gotyibeni were starting to be replaced by other land uses. Respondents expressed several reasons why the fields were left abandoned (Table 3.2). Averaged across the villages the most commonly mentioned reasons for field abandonment were that fields were unfenced (59%), fields were raided by animals particularly livestock (53%), farmers were older (51%), fields were at a far distance from the households (48%), there was no oxen and machinery to plough the fields (46%), and respondents had no money to purchase seeds and fertilisers (46%). At the village scale, Melani differed from the other villages, with drought (62%) and lack of access to water (59%) being among the most frequently mentioned reasons for ceasing field cultivation. Although these reasons were also mentioned in two other villages (excluding Manqorholweni), they were not the most commonly cited. The differences between all the villages were statistically significant ($\chi 2 = 127.5$; $p < 0.05$).

Table 3.2: Reasons for field abandonment

Reasons	Proportion of responses (%)					
	Gotyib (n=39)	Manqor (n=30)	Mawane (n=41)	Melani (n=58)	Mean	SD
Fields are unfenced	72[a]	91[a]	18[b]	56[a]	**59**	**31**
Animal raiding (Livestock)	46[a]	63[b]	40[a]	62[b]	**53**	**12**
Farmers are older	59[a]	40[a]	56[a]	49[a]	**51**	**8**
Fields are far	38[a]	50[a]	45[a]	59[a]	**48**	**9**
No machinery or oxen to work fields	50[a]	46[a]	53[a]	35[a]	**46**	**8**
No money for seeds and fertiliser	41[a]	61[a]	30[b]	52[a]	**46**	**13**
Drought	22[a]	0[b]	12[a,b]	62[c]	**24**	**27**
Theft	28[a]	23[a]	18[a]	21[a]	**22**	**4**
Lack of access to water	17[a]	0[b]	12[a,b]	59[c]	**22**	**25**
Crop diseases	11[a]	0[b]	6[b]	15[a]	**8**	**6**
The field size is too small	12[a]	0[b]	0[b]	18[a]	**8**	**9**
Household members have other jobs no time for cultivation	6[a]	5[a]	12[b]	3[a]	**7**	**4**
Land redistribution	17[a]	0[b]	6[b]	6[b]	**7**	**7**
The household prefers purchasing their food	6[a]	5[a]	0[a]	9[a]	**5**	**4**
Resettlement of land	6[a]	0[a]	6[a]	9[a]	**5**	**4**
No markets for buying and selling	6[a]	0[a]	0[a]	9[a]	**4**	**5**
social grants/pensions	0[a]	0[a]	6[a]	9[a]	**4**	**4**
The land is degraded	6[a]	0[a]	0[a]	6[a]	**3**	**3**
Increase in population	6[a]	0[a]	0[a]	0[a]	**2**	**3**

Superscript 'a' indicates that villages sharing this superscript have statistically similar reasons for field abandonment. Superscript 'b' denotes that the villages with this superscript have significantly different reasons for abandonment compared to those with 'a' but are similar to each other. Superscript 'c' is used for additional proportions, which may also show specific patterns of abandonment that differ from those with superscripts 'a' and 'b'. Thus, villages with the same superscript are comparable in terms of their reasons for abandonment, while different superscripts signify significant differences between the villages' reasons for abandonment.

3.3.5. Concerns over field abandonment and group of people most affected

The high levels of field abandonment in the villages led to an extreme concern over field abandonment especially at Manqorholweni, Mawane and Melani, while respondents at Gotyibeni were mostly only slightly concerned ($\chi^2 = 13.10$; $p > 0.05$). The elders, as well as the community at large, were the most affected by field abandonment (Table 3.3), which is why the elders were hopeful that one day the youth would take up field cultivation, however only 3-14% of the youth were affected by the fact that fields were abandoned, with Gotyibeni and Melani significantly different from Manqorholweni and Mawane ($\chi^2 = 21.65$; $p < 0.05$).

Table 3.3: Perception of who is most affected by field abandonment (proportion of respondents)

Variable	Proportion of responses (%)					
	Gotyib (n=39)	**Manqor (n=30)**	**Mawane (n=41)**	**Melani (n=58)**	**Mean**	**SD**
Elders	49[a]	57[a]	68[a]	36[a]	**52**	**13**
Community at large	49[a]	21[b]	25[b]	50[a]	**36**	**15**
Youth	3[a]	14[b]	3[a]	5[a]	**6**	**6**
Few houses with no employment	0[a]	7[a]	5[a]	9[a]	**5**	**4**

Superscript 'a' indicates that the villages sharing this superscript are statistically similar in their perception of who is most affected by field abandonment. In contrast, superscript 'b' denotes that the villages with this superscript have a significantly different perception compared to those with 'a', but are similar to each other. Thus, villages with the same superscript are comparable, while different superscripts denote significant differences in perceptions between villages.

3.3.6. Areas of support for continued field cultivation

Respondents expressed that if they could be provided with support, they could then be able to return to field cultivation, as they were passionate about farming but had abandoned it because of constraints as mentioned above. The area of support needed that was most prominent in three of the four villages was fencing (63%), which matches the most mentioned reason for abandoning (Table 3.4). While other requirements varied per village ($\chi^2 = 102.52$; $p < 0.05$). At Gotyibeni it included, cheap and accessible inputs (50%), adequate access to water (43%) and community working together (43%). At Manqorholweni they mentioned cheap and accessible inputs (35), and visibility of agricultural advisers (31%). At Mawane, needs were awareness campaigns (43%) and visibility of agricultural advisers (36%). While at Melani they require adequate access to water (76%), more visibility of agricultural advisers (41%), and awareness campaigns (38%) (Table 3.4).

Table 3.4: Proportion of respondents per village indicating areas of assistance for continued cultivation

Areas of assistance	Proportion of responses %					
	Gotyib (n=39)	Manqor (n=30)	Mawane (n=41)	Melani (n=58)	Mean	SD
Support with fencing of the field	64[a]	89[a]	36[b]	62[a]	**63**	**22**
More visibility of agricultural advisers to disseminate knowledge and support	29[a]	31[a]	36[a]	41[a]	**34**	**6**
Adequate access to water	43[a]	0[b]	7[b]	76[a]	**32**	**35**
Cheap and accessible inputs	50[a]	35[a]	21[a,b]	17[b]	**31**	**15**
Disseminate knowledge of new technologies that will maximise yields	14[a]	27[a,b]	43[b]	38[b]	**31**	**13**
Community working together in terms of labour	43[a]	0[b]	29[c]	17[c]	**22**	**18**
Access to formal markets so that the HH produce to sell	29[a]	4[b]	0[b]	21[a]	**13**	**14**
Access to disease and climate change resistant cultivars	7[a]	12[b]	0[a]	14[b]	**8**	**6**
Access to more land to allow for maximum production	0[a]	4[a]	0[a]	7[a]	**3**	**3**

Superscript 'a' indicates that the villages sharing this superscript are statistically similar in their proportion of respondents indicating areas of assistance for continued cultivation. Superscript 'b' denotes that the villages with this superscript have a significantly different proportion compared to those with 'a', but are similar to each other. Superscript 'c' denotes another distinct group that differs significantly from both 'a' and 'b'. Villages carrying both 'b' and 'c' share similarities with each of those groups. Thus, villages with the same superscript are comparable, while different superscripts denote significant differences in the proportions between villages.

3.3.7. Use of fields

Although all households had a field, less than 20%, on average, actually cultivated their field, either fully or partially (Table 3.5), ranging from none at Manqorholweni to one-third at Gotyibeni and Mawane with significant differences between all villages ($\chi 2 = 31.2$; $p < 0.05$). A small proportion ($0 \leq 10\%$) allowed their field to be used by another family in the village. Such rental agreements were relatively rare because of anxieties that the original users of the field might lose their claim if another family used the field for an extended period. These households did not want to lose their claim to the land as they were hopeful that in future the youth of the household might be interested in recultivating the field. The worries that a household might lose their field if used by another household for too long resulted from the fact that for most households (71%) their basic right to a field was granted by the village headman and it was through sole occupation. Because the land right was by sole occupation, households were worried that if the field was not used for too long while others were interested the headman could change user rights of the land to a household that would use it. Others stated that their right to a particular field had been inherited from their parents, which was significantly greater at Manqorholweni and Melani than at the other two villages ($\chi 2 = 21.23$; $p < 0.05$) (Table 3.5).

Amongst the minority that still cultivated, most did not cultivate the full area of their field, thus representing a form in intra-field abandonment. On average, one-quarter of a field remained unused, but it was as high as 85% at Gotyibeni. Reasons for not cultivating the whole field typically followed a more local context, however the reasons all related to a lack of financial resources and the prohibitive costs of inputs (such as not having capital to fence the fields to protect crops from livestock damage) and the costs of ploughing being too high (i.e., having to hire tractors to plough fields as there were very few oxen in the villages). Most households had to hire a tractor to plough their land, which the respondents claimed was expensive, although between 3% (Melani) and 18% (Gotyibeni) used oxen (Table 3.5), either their own or hired. In addition to the costs of inputs most households purchased seeds in the nearest town, while historically households used to save a portion of seed from one year to the next from their harvest, but this was negligible nowadays (only 3 % amongst the three villages with some field cultivation activities). However, there was also a small percentage that accessed seeds via a community cooperative (Table 3.5).

Table 3.5: Field usage, ownership rights, ploughing methods, and seed sources per village

Variable		Proportion of responses (%)					
		Gotyib (n=39)	**Manqor (n=30)**	**Mawane (n=41)**	**Melani (n=58)**	**Mean**	**SD**
Use of fields	Abandoned	62[a]	100[a]	56[a]	85[a]	**76**	**20**
	Used by household member	33[a]	0[b]	34[a]	12[c]	**20**	**17**
	Used by a village member	5[a]	0[a]	10[b]	3[a]	**5**	**4**
Rights to field	By succession	3[a]	47[b]	26[b]	40[b]	**29**	**20**
	Sole occupation	97[a]	53[b]	74[a]	60[b]	**71**	**20**
Means of ploughing	Tractor	82[a]	0[b]	87[a]	97[a]	**67**	**45**
	Oxen	18[a]	0[b]	13[a]	3[b]	**9**	**8**
Source of seeds	Purchased from town	97[a]	0[b]	94[a]	95[a]	**72**	**48**
	Community cooperatives	0[a]	0[a]	3[a]	2[a]	**1**	**1**
	Preserved by household	3[a]	0[a]	3[a]	3[a]	**3**	**1**

Superscript 'a' indicates that the villages sharing this superscript are statistically similar in their responses regarding field usage, ownership rights, ploughing methods, and seed sources. In contrast, superscript 'b' denotes that the villages with this superscript have significantly different responses compared to those with 'a', but are similar to each other. Thus, villages with the same superscript are comparable, while different superscripts denote significant differences in responses between villages.

3.3.8. Reasons for cultivation of fields

Although most households did not cultivate all the land available to them, those who did cultivate a field provided one or more reasons why they thought it was still a worthwhile or necessary livelihood activity (Table 3.6). Averaged across the three villages where field cultivation still occurred, the most commonly mentioned motivation was that the soils were

fertile and therefore conducive to good yields (55%). This was followed by easy access to inputs (44%), which somewhat counters the claims that a lack of inputs or their high cost was a widespread reason not to cultivate. At a village scale, there was a great deal of variation across all villages ($\chi 2 = 38.1$; $p < 0.05$) in the reasons underpinning cultivation by some households, reflecting the importance of local context. For example, at Gotyibeni it was good soils and access to inputs, but at Mawane it was good soils, the need to earn an income and that the food produced improved the household diet. In contrast, the most common reason provided by respondents in Melani (50%) was the availability of agricultural advisors (Table 3.6). Indeed, 11 different reasons were mentioned in Melani compared to only seven at Gotyibeni.

Table 3.6: Reasons for cultivation of fields in the villages

Reasons	Proportion of responses (%)				
	Gotyib (n=39)	Mawane (n=41)	Melani (n=58)	Mean	SD
Soils are fertile	60[a]	62[a]	43[a]	**55**	**10**
Easy access to inputs	80[a]	8[b]	43[c]	**44**	**36**
Agricultural advisers are visible and work with farmers	40[a]	8[b]	50[a]	**33**	**22**
The youth enjoy working the fields	40[a]	31[a]	29[a]	**33**	**6**
Lack of employment, cultivation is source of income for HH	20[a]	54[b]	21[a]	**32**	**19**
Rainfall is good and reliable	40[a]	31[a]	14[b]	**28**	**13**
There is capital to support cultivation	20[a]	15[a]	29[a]	**21**	**7**
Cultivation improves diets	0[a]	31[b]	14[a]	**15**	**16**
Active community cooperatives provide inputs	0[a]	0[a]	43[b]	**14**	**25**
Farming has been in the family for decades	0[a]	8[a]	14[b]	**7**	**7**
Labour is available	0[a]	0[a]	14[b]	**5**	**8**

Significant differences between villages are denoted by different superscripts. Superscript 'a' indicates that the villages sharing this superscript are statistically similar in their reasons for cultivating fields. In contrast, superscript 'b' denotes that the villages with this superscript have significantly different reasons compared to those with 'a', but are similar to each other. Thus, villages with the same superscript are comparable, while different superscripts denote significant differences in reasons for cultivation between villages.

3.3.9. Importance and contribution of fields to households

Despite the high levels of field abandonment recorded across the villages, respondents recognised the importance of cultivating fields. All respondents, including those who were not actively cultivating, affirmed the significance of maintaining fields. There were no significant differences in these views across the villages (Table 3.7) ($\chi 2 = 6.26$; $p > 0.05$).They further alluded to the socio-economic contribution cultivating fields brings to the household, particularly in those villages where some levels of field cultivation were still occurring (Table 3.7) ($\chi^2 = 15.94$; $p < 0.05$). This was because respondents indicated they know fields to mainly

contribute food (70% ±10.4) and saving money (52% ±12.9) for a household. The benefits of food and saving money including other benefits such as income generation are benefits that those few households cultivating fields would like to maintain and those that have ceased cultivating fields would like to start receiving again, there were no differences across all villages ($\chi^2 = 6.26$; $p > 0.05$).

Table 3.7: Importance and contribution of fields to households

Statement		Proportion of responses (%)					
		Gotyib (n=39)	**Manqor (n=30)**	**Mawane (n=41)**	**Melani (n=58)**	**Mean**	**SD**
Importance of fields to households	Strongly agree	20[a]	43[a]	33[a]	43[a]	**35**	**11**
	Agree	80[a]	57[a]	67[a]	57[a]	**65**	**11**
Cultivating fields contributed to HH socio-economic status	Strongly agree	18[a]	0[b]	33[a]	33[a]	**21**	**16**
	Agree	80[a]	0[b]	63[a]	53[a]	**49**	**34**
	Disagree	2[a]	0[b]	4[a]	14[a]	**5**	**6**
Field cultivation benefits to HH	Provides food	70[a]	70[a]	59[a]	80[a]	**70**	**10**
	Saves money	49[a]	30[a]	67[a]	42[a]	**52**	**13**
	Income generation	27[a]	40[a]	41[a]	35[a]	**34**	**7**
	Farming skills	33[a]	30[a]	26[a]	18[a]	**26**	**8**

Superscript 'a' indicates that villages sharing this superscript have statistically similar proportions regarding the importance and contribution of fields to households. Superscript 'b' denotes that villages with this superscript have significantly different proportions compared to those with 'a', but are similar to each other. Thus, villages with the same superscript are comparable in terms of their proportions of field importance and contribution, while different superscripts signify significant variations in these aspects between villages.

3.3.10. Comparison of cropping and non-cropping households

There was a marked difference in gender between cropping and non-cropping households, with more female heads in the latter (Table 3.8), this shows that female headed households are less involved in field cultivation in the villages and this may be due to other competing household chores. Additionally, non-cropping households showed a higher proportion of individuals aged above 55 (51%) compared to cropping households (37%) (Table 3.8), usually households with elderly are less involved in cropping due to limitations in physical abilities. Moreover, the education levels between the two groups although relatively similar, however there was a slightly higher mean proportion of individuals with primary education in non-cropping households (47%) compared to cropping households (35%) (Table 3.8). Non-cropping households had a higher proportion of households with no employed members (57%), while cropping households showed higher proportions for the number of employed members, particularly four or five. This suggests that cropping households may have a slightly higher rate of employment within the household to be able to afford agricultural inputs and support cultivation compared to non-cropping households mainly dependent on social grants (74%).

The perception of whether household income was enough showed only slight differences, with slightly more cropping households (94%) perceiving their income as not enough compared to non-cropping households (92%) (Table 3.8).

Table 3.8: Comparing of abandoned and cropping household demographic

Attribute		Proportion of respondents per village %								
		Non-cropping households					Cropping households			
		Gotyib (n=21)	Manqor (n=28)	Mawane (n=25)	Melani (n=23)	Mean	Gotyib (n=15)	Mawane (n=16)	Melani (n=15)	Mean
Gender	Male	48^{a}	21^{b}	12^{b}	35^{a}	**29**	67^{a}	25^{b}	40^{a}	**44**
	Female	52^{a}	79^{a}	88^{a}	65^{a}	**71**	33^{a}	75^{b}	60^{b}	**56**
Age category (Years)	≤ 25	14^{a}	7^{b}	0^{b}	4^{b}	**6**	20^{a}	0^{b}	0^{b}	**7**
	26 - 35	10^{a}	7^{a,b}	16^{a}	4^{b}	**9**	7^{a}	19^{b}	0^{a}	**9**
	36 - 45	0^{a}	7^{a}	16^{b}	22^{b}	**11**	20^{a}	25^{a}	10^{b}	**18**
	46 - 55	19^{a}	25^{a}	32^{a}	13^{b}	**23**	33^{a}	25^{a}	30^{a}	**30**
	> 55	57^{a}	54^{a}	36^{b}	57^{a}	**51**	20^{a}	31^{a}	60^{b}	**37**
Highest education	None	10^{a}	0^{b}	20^{a}	0^{b}	**8**	7^{a}	13^{a}	0^{b}	**7**
	Primary	24^{a}	64^{b}	56^{b}	44^{b}	**47**	20^{a}	44^{b}	40^{b}	**35**
	Secondary	64^{a}	32^{b}	24^{b}	48^{a}	**42**	73^{a}	44^{b}	50^{b}	**55**
	Tertiary	2^{a}	4^{a}	0^{a}	8^{a}	**3**	0^{a}	0^{a}	10^{b}	**3**
Number of HH members employed	None	38^{a}	57^{b}	60^{b}	74^{b}	**57**	53^{a}	50^{a}	40^{a}	**48**
	One	57^{a}	36^{b}	32^{a}	26^{a}	**38**	33^{a}	38^{a}	20^{a}	**30**
	Two	5^{a}	4^{a}	8^{a}	0^{a}	**4**	0^{a}	6^{a}	10^{a}	**5**
	Three	0^{a}	3^{a}	0^{a}	0^{a}	**1**	0^{a}	0^{a}	0^{a}	**0**
	Four	0^{a}	0^{a}	0^{a}	0^{a}	**0**	7^{a}	6^{a}	20^{b}	**11**
	Five	0^{a}	0^{a}	0^{a}	0^{a}	**0**	7^{a}	0^{a}	10^{a}	**6**
HH main source of income	Off-farm	29^{a}	21^{a}	12^{b}	17^{b}	**20**	33^{a}	31^{a}	10^{b}	**25**
	Social grants	71^{a}	68^{a}	84^{a}	74^{a}	**74**	67^{a}	63^{a}	70^{a}	**66**
	Sell produce	0^{a}	0^{a}	0^{a}	4^{a}	**1**	0^{a}	6^{a}	10^{a}	**5**
	Farm employment	0^{a}	4^{a}	4^{a}	0^{a}	**2**	0^{a}	0^{a}	0^{a}	**0**
	Remittances	0^{a}	7^{a}	0^{a}	5^{a}	**3**	0^{a}	0^{a}	10^{a}	**3**
HH income enough	Yes	19^{a}	7^{b}	0^{b}	4^{b}	**8**	0^{a}	13^{a}	0^{a}	**4**
	No	81^{a}	93^{a}	100^{a}	96^{a}	**92**	100^{a}	81^{a}	100^{a}	**94**
	Not sure	0^{a}	0^{a}	0^{a}	0^{a}	**0**	0^{a}	6^{a}	0^{a}	**2**

Superscript 'a' indicates that there are no significant statistical differences in demographics between cropping and non-cropping households. Superscript 'b' signifies that while there are significant statistical differences between households with 'a' and those with 'b', the demographics within the 'b' group are similar to each other. Therefore, villages with the same superscript are comparable in terms of their demographic characteristics, whereas different superscripts reveal significant statistical differences between the demographic profiles of cropping and non-cropping households.

3.3.11. Cultivation of home gardens

Most respondents (78% ±8.2) across the four villages had home gardens ($\chi^2 = 5.01$; $p > 0.05$). The garden sizes ranged on average from 0.9 ±0.6 ha at Mawane to 1.2 ±0.7 ha at Gotyibeni (F= 1.59; $p > 0.05$). Home gardens were actively cultivated for their supplementary benefits to that of a field, as most respondents at Gotyibeni, Mawane and Melani indicated that the field was to produce food for selling, while the garden was mainly for household use. However, respondents at Manqorholweni had a different motivation for home garden cultivation ($\chi^2 = 13.73$; $p < 0.05$), in that all the fields in the village were abandoned, so they used their home gardens for both selling produce and household use (Table 3.9). For these reasons the garden was regarded important by respondents as it played a major role in improving household diets ($\chi^2 = 13.03$; $p < 0.05$), with significant differences between Manqorholweni and all the other villages and moreover it significantly contributed to improving household dietary diversity ($\chi^2 = 12.39$; $p < 0.05$) (Table 3.9).

A garden was also preferred by over 60% of respondents across villages because it was more manageable (91%), it allowed for garden work to be included with household chores (77%) and it was easier to protect against theft and being raided by animals (74%) (Table 3.9), which were challenges experienced when cultivating fields. However, with all the above-mentioned benefits of home gardens, there was little agreement amongst respondents with regards to their yields compared to that of the fields. Approximately one-third of respondents said home garden yields were higher, one-third said garden yields were lower, and one-third said the yields were the same, with the differences were between all villages ($\chi^2 = 14.28$; $p < 0.05$).

Table 3.9: Benefits of home gardens

Statement		Proportion of responses (%)					
		Gotyib (n=39)	**Manqor (n=30)**	**Mawane (n=41)**	**Melani (n=58)**	**Mean**	**SD**
Benefits of gardens	Garden is more manageable	96[a]	77[a]	100[a]	91[a]	**91**	**10**
	Garden work can be included with HH chores	78[a]	73[a]	83[a]	73[a]	**77**	**5**
	The garden is easier to protect from theft and being raided by animals	85[a]	73[a]	61[a]	76[a]	**74**	**10**
	Field is for selling and garden for HH use	54[a]	0[b]	66[a]	67[a]	**47**	**32**
	Garden is for HH use and selling	31[a]	100[b]	26[a]	25[a]	**46**	**36**
	Gardens can be irrigated during drought season	63[a]	32[b]	52[a]	30[b]	**44**	**16**
	The field is not large enough	15[a]	0[b]	9[a]	9[a]	**8**	**6**
	Garden cultivation allows for more intensive farming	59[a]	18[b]	52[a]	21[b]	**38**	**21**
Gardens for improving dietary quality	Strongly agree	74[a]	100[a]	73[a]	66[a]	**78**	**15**
	Agree	26[a]	0[b]	27[a]	35[a]	**22**	**15**
Gardens for improving dietary diversity yield	Strongly agree	72[a]	97[a]	76[a]	62[a]	**77**	**15**
	Agree	28[a]	3[b]	24[a]	38[a]	**23**	**15**
Comparison of produce from the garden to that of the field	Lower	24[a]	0	43[b]	37[b]	**35**	**10**
	The same	49[b]	0	41[b]	21[b]	**37**	**14**
	Higher	27[a]	0	16[a]	42[a]	**28**	**13**

Superscript 'a' indicates that villages sharing this superscript have statistically similar benefits of home gardens. Superscript 'b' denotes that villages with this superscript have statistically significant differences in the benefits of home gardens compared to those with 'a,' but are similar to each other. Thus, villages with the same superscript are comparable in terms of the benefits of home gardens, while different superscripts highlight significant differences between the villages.

3.3.11.1. Crops grown in household gardens

Respondents were growing several crops in their gardens which supplemented the household's diets and ensured dietary diversity across villages. Spinach emerged as a popular crop, with a high proportion of respondents cultivating it in Gotyibeni (90%) and Melani (87%) (Table 3.10). Similarly, potato, cabbage and carrot had relatively high proportions in Gotyibeni and Melani. Interestingly, maize cultivation differed significantly among the villages, with a high proportion in Manqorholweni (91%) and Mawane (76%), but notably lower in Melani (10%) (Table 3.10). This was because, most respondents at Melani were cultivating maize in plot projects. Beans were a prevalent crop in Manqorholweni (57%), while Melani had the lowest proportion (10%). Other crops, such as beetroot, pumpkin, tomato, sweet potato, and traditional crops like imifino, amadumbe, sorghum, and chilli, showed varying levels of cultivation across

the villages (Table 3.10). These findings highlight the diversity of crops grown in the villages and provide insights into the agricultural practices and preferences within each village. Furthermore, it should be emphasised that the Eastern Cape villages cultivated comparable crops, as did the villages in KwaZulu-Natal. This observation suggests that food preferences within a province may exhibit similarities, although variations still existed among all the villages ($\chi^2 = 219.11$; $p < 0.05$).

Table 3.10: Crops grown in household gardens

Areas of assistance	Proportion of responses %					
	Gotyib (n=39)	**Manqor (n=30)**	**Mawane (n=41)**	**Melani (n=58)**	**Mean**	**SD**
Spinach	90[a]	30[b]	41[b]	87[a]	**62**	**31**
Potato	67[a]	48[a]	55[b]	77[a]	**62**	**13**
Cabbage	93[a]	30[b]	52[a]	67[a]	**61**	**26**
Maize	60[a]	91[a]	76[a]	10[b]	**60**	**35**
Carrot	60[a]	9[b]	24[c]	56[a]	**37**	**25**
Beans	20[a]	57[b]	35[a,b]	10[c]	**31**	**20**
Beetroot	33[a]	9[b]	7[b]	54[a]	**26**	**22**
Pumpkin	23[a]	35[a]	10[b]	31[a]	**25**	**11**
Tomato	13[a]	4[b]	3[b]	28[a]	**12**	**12**
Sweet potato	7[a]	0[a]	3[a]	18[b]	**7**	**8**
Imifino	0[a]	0[a]	7[a]	10[a]	**4**	**5**
Amadumbe	0[a]	0[a]	3[a]	3[a]	**2**	**2**
Sorghum	3[a]	0[a]	0[a]	5[a]	**2**	**2**
Chilli	0[a]	0[a]	3[a]	5[a]	**2**	**2**

Superscript 'a' indicates that villages sharing this superscript have statistically similar crops grown in household gardens. Superscript 'b' denotes that villages with this superscript have statistically significant differences in the crops grown compared to those with 'a,' but are similar to each other. Thus, villages with the same superscript are comparable in terms of the types of crops grown in household gardens, while different superscripts highlight significant differences between the villages.

3.3.11.2. Benefits of home gardens over fields

Majority of respondents 78% were cultivating home gardens instead of fields because respondents no longer had physical capabilities to walk to the fields or to work a large area. Respondents also could not cultivate a large area of land because of financial constraints, so the focus became more on home gardens instead because they did not want to cease cultivation completely. The physical incapacity was due to the age of household members still interested to work the fields, which led to approximately 70% of respondents at Gotyibeni (69%) and Melani (71%) indicating that they were not planning to recultivate their fields in the next five years. In contrast, at Manqorholweni and Mawane over 60% indicated they were planning to return to field cultivation ($\chi^2 = 16.13$; $p < 0.05$).

3.4. Discussion

The study revealed that, on average, approximately 80% of fields across the villages had been abandoned for 19 years or more. This finding is consistent with results from other studies conducted in the former homelands (see Shackleton et al., 2013; Shackleton and Luckert, 2015; Fay, 2015; De la Hey and Beinart, 2017; Blair et al., 2018; Connor and Mtwana, 2018; Shackleton et al., 2019; Mzuyanda et al., 2020). This section examines the reasons behind this prolonged field abandonment in the study villages, considering social, economic, and environmental factors. Other researchers, for example, Blair et al. (2018), Shackleton and Hebinck (2018) and Shackleton et al. (2019) have similarly categorised the reasons for field abandonment into these categories. Social drivers may include factors such as age, gender, and education; economic drivers may involve a lack of resources and high production costs; while environmental drivers may encompass climatic effects such as drought, water scarcity, and pest issues (see Figure 3.2). The subsequent analysis explores the motivations of the 20% of households that remain engaged in cultivation despite the prevailing trend of abandonment. As shown by other researchers, such as Shackleton et al. (2013) and Shackleton and Hebinck (2018), even in areas with high levels of arable field abandonment, there are still some farmers who continue to cultivate their fields, as observed in Willowvale.

The discussions also underscore the support needed by villagers to sustain their cultivation practices. Respondents who had completely ceased cultivation expressed a desire to return to field cultivation within the next five years, provided they receive the necessary support. This finding is consistent with the results reported by Shackleton et al. (2013) in Willowvale. The discussion extends to homestead garden cultivation, exploring whether those abandoning distant fields transitioned to homestead gardens, as some researchers such as Fay (2009; 2013), Connor and Mtwana (2018), Shackleton and Hebinck (2018) and Shackleton et al. (2019) argue that as fields are abandoned some farmers move to intensive cultivation of homestead gardens and if so, the reasons behind this shift and the advantages it offers over field cultivation.

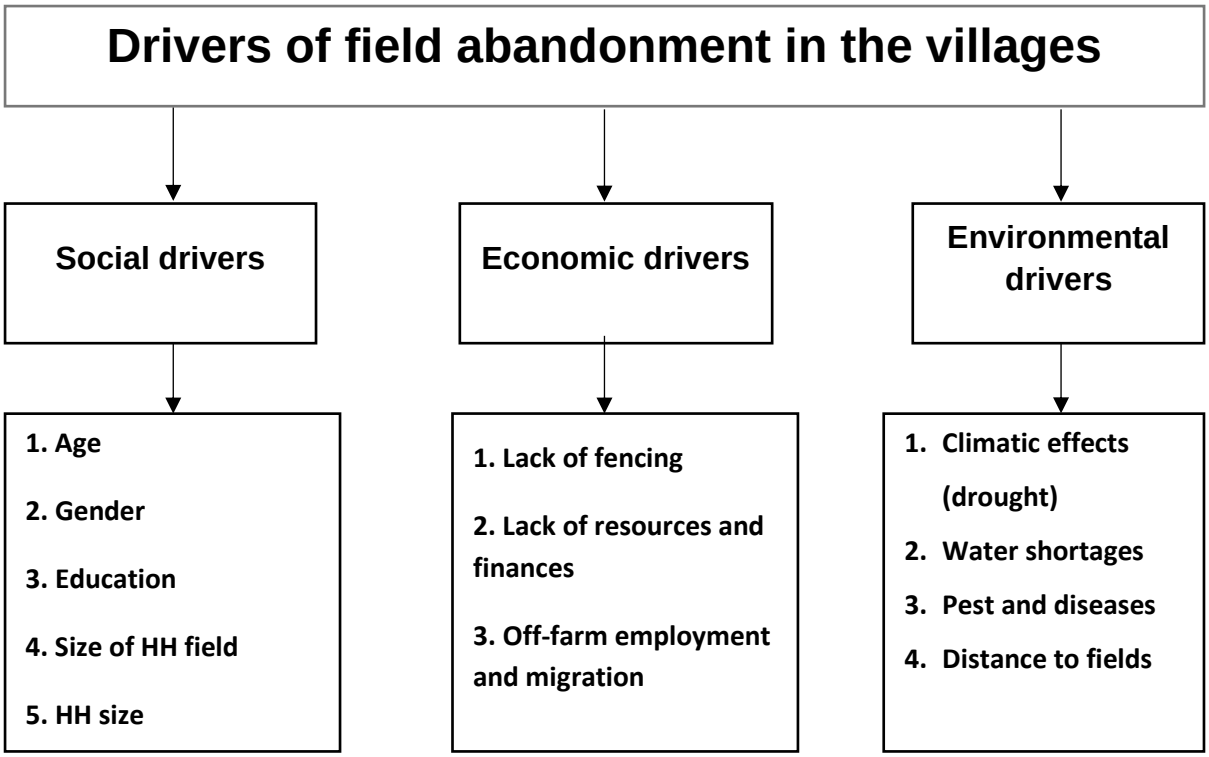

Figure 3.2: Drivers of field abandonment in the study villages

3.4.1. Drivers of field abandonment

As the study employed the DPSIR framework to conceptualise the research, this chapter focuses on the driver component of the framework to identify the factors leading to arable field abandonment in the study areas. According to Pagan et al. (2020), drivers are the ultimate causes of change in an ecosystem. Yussif et al. (2023) categorise drivers in the DPSIR framework into four: (a) socio-demographic (b) economic (c) environmental/geographic and (d) institutional. This study will focus into three categories: social (which includes demographics), economic and environmental.

While some studies, such as Zhang et al. (2020) consider climate change as a pressure and Kristiadi et al. (2022) regard it as an impact, this study will, in line with Kyriazopoulos et al. (2017) and Mandic (2020), treat climate change as a driver within the DPSIR framework. Furthermore, Hall (2008) and Weaver (2011) argue that climate change exerts some of the most visible pressures on fragile environments. Blair et al. (2018) and Shackleton et al. (2019) also indicate that driving forces behind arable field abandonment in rural areas often stem from external factors like climate change.

Drivers of field abandonment vary across spatial and temporal scales (see Zhang et al., 2014; Terres et al., 2015; Nguyen et al., 2018; Njwaxu and Shackleton, 2019; Shackleton et al., 2019). They can also differ depending on the scale of analysis as noted by Munroe et al. (2013), Njwaxu and Shackleton (2019) and Shackleton et al. (2019). Yee et al. (2012) and Pagan et al. (2020) support this by noting that drivers in the DPSIR framework can originate at various levels, including global, regional, or local, and can encompass social, demographic, and economic factors. Subedi et al. (2022) add that while some drivers may be common across different scales, others are site-specific.

Benayas et al. (2007), Shackleton et al. (2013), Yan et al. (2016), Ustaoglu and Collier (2018), Shackleton et al. (2019) and Li and Song (2021) note that globally field abandonment is mostly driven by socio-economic factors more than ecological ones. Shackleton et al. (2019) state that, at times there are no clear boundaries between the drivers, as one driver could be a result of another, for example, lack of availability of labour may be a result of rural out migration or inability to pay the labours which speaks to economic constraints or lack of availability of inputs.

3.4.2. Social drivers

3.4.2.1. Age of household head

In the villages, the results indicated that non-cropping households had a higher proportion of individuals aged over 55 (51%). This suggests that as the age of the household head increased, involvement in field cultivation decreased. Similar observations have been made by other researchers such as Shackleton et al. (2019), Moyo and Ravhuhali (2020), Mzuyanda et al. (2020) and Zantsi and Bester (2020). Given that many household heads in the villages are nearing retirement age and some are already retired, it is possible that they lack the physical capacity to engage in field cultivation. This is consistent with arguments presented by Shackleton et al. (2019) and Mzuyanda et al. (2020) in Eastern Cape.

Additionally, Kristensen et al. (2004) highlight that, all other factors being equal, field abandonment is more likely when the farmer is elderly and approaching retirement. Most respondents indicated that if they had the physical capability, they would still be cultivating the fields. However, they noted that even if they could cultivate now, they would not be able to produce much due to reduced physical strength, endurance, and potential age-related health

issues that impair their efficiency. Terres et al. (2015) support this observation, noting that beyond the age of 65, even if farmers choose to continue farming, their level of activity is likely to decrease. For example, Wang et al. (2020) showed in Xiantao city that some older farmers had poor health and were unable to engage in agricultural activities. Therefore as Wang et al. (2022) argues impaired health among older farmers results in decreased time spent on farming activities, consequently leading to a reduction in their overall work capacity.

Several studies conducted in different villages of South Africa have highlighted this relationship between aging and reduced participation in agricultural activities. For instance, Shackleton et al. (2013) conducted research in Willowvale, where they found that the majority of household heads in households that had abandoned field cultivation were older than 55 years. Similarly, Manyevere et al. (2014) examined the situation in Nkonkobe and reported that older household heads were less likely to be actively engaged in field cultivation. These findings are consistent with studies conducted by Blair et al. (2018) in Transkei and KwaZulu, Shackleton et al. (2019) in Paulshoek, Guquka, Koloni, and Dwesa-Cwebe, and Mujuru and Obi (2020) in Emalahleni, Intsika Yethu, and Ngqushwa. The consistent findings across these studies suggest that the physical decline associated with ageing limits the ability of older households to actively engage in field cultivation. Therefore old age is a driver of field abandonment. Ustaoglu and Collier (2018) and Wang et al. (2022) add that especially if the older farmers are not replaced by the next generation.

3.4.2.2. Gender of household head

The results showed that households were predominantly headed by females (68%), and these female-headed households were less involved in field cultivation. This finding is consistent with Blair et al. (2018) and Mzuyanda et al. (2020), who reported a similar pattern in the Transkei, KwaZulu, and Amathole Districts, where most households who had abandoned field cultivation were also headed by females. Additionally, Garutsa and Nekhwevha (2016), Moyo and Ravhuhali (2020) and Mzuyanda et al. (2020) identified female-headed households as a key driver of arable field abandonment in rural areas. For instance, a study by Chepape and Maoba (2020) in Bronkhorstspruit showed that male participation in agricultural development programs was more prominent, with males representing 63% compared to 37% of females. Oluwatayo and Rachoene (2017) suggest that this disparity might arise from females having greater engagement in household chores.

In three of the four villages, most female-headed households indicated that they had abandoned their fields after their husbands died or moved to work in town. This left no one to manage and make decisions regarding the arable field. Moyo and Ravhuhali (2020) highlight that gender plays a significant role in household decision-making, particularly in tasks related to farming. In most households, these decisions are primarily the responsibility of men. Farming requires substantial physical effort, for instance in the villages this effort includes traveling long distances to the fields, organising tractor and labour for ploughing and planting, and transporting manure from the household kraal to distant fields. These challenges are also noted by Garutsa and Nekhwevha (2016), which limit female involvement in farming. This situation supports StatsSA (2014) and De la Hey and Beinart (2017) observation that female-headed households in rural areas are often poorer than male-headed households because their members are less able to engage in the physically demanding farming activities.

In some households, the respondents had noted that the fields had been abandoned after the male of the household had lost their job and so could not afford to buy production inputs. Similarly, Andrew and Fox (2004) stated that at Nompa village the abandonment of arable fields had often correlated with significant life events or challenging circumstances within a household, which includes loss of employment.

3.4.2.3. Education level of a household

Most respondents had only primary or secondary schooling, which limits their employment opportunities in other sectors. Blair et al. (2020) observed similar educational levels in Transkei and KwaZulu, while Mujuru and Obi (2020) found the same in Emalahleni, Intsika Yethu, and Ngqushwa. Kepe and Tessaro (2014), Shackleton and Luckert (2015), and Mujuru and Obi (2020) note that these low levels of education make farming a crucial means of securing livelihoods in rural areas. However, Mokgadi (2012) reported that lower education levels among farmers impact the sustainability of agricultural projects, as less educated individuals take longer to adapt to changes in the marketing landscape. Mokgadi (2012) further notes that more educated farmers are better able to grasp essential concepts of farm management, financial management, agricultural marketing principles, and the skills needed to establish business networks with ease.

However, smallholder farmers with limited formal education can rely on indigenous skills, traditional knowledge and practices passed down through generations, which are essential for

managing their farms. These skills include local crop varieties, traditional pest control methods, and community-based resource management. Although these farmers might lack formal training, their practical experience and traditional knowledge enable them to navigate the challenges of agriculture effectively. With limited formal employment opportunities due to low education levels, focusing on agriculture allows farmers to utilise their indigenous skills and resources in a sector that is more accessible to them. Additionally, Schneider and Geoghegan (2006) note that higher education levels lead to a higher chance of finding off-farm employment, therefore higher levels of education increase the chances of field abandonment. For example, in Nepal, better educated farmers were more inclined to keep their fields abandoned because they have occupations in other sectors which generate more income than farming (Khanal, 2018). Therefore, although field cultivation may be abandoned in these villages, it is highly unlikely that education played a significant role in this, assuming other factors remain constant. This is because these farmers relied on cultivation in the absence of formal off-farm employment due to their limited education levels.

3.4.2.4. Size of field

The size of the fields in the villages ranged between 4 and 5 hectares. Helfand and Levine (2004), Barrett et al. (2010) and Fan and Rue (2020) lament that large field sizes provide an opportunity for increased production and the ability to meet the needs of the household while also generating surplus for income generation. However, in the villages, these large field sizes played a significant role in arable field abandonment. This was because the respondents were restricted in terms of being able to afford cultivation inputs, as large field sizes require more resources, including seeds, fertilisers, pesticides, and labour, to effectively cultivate and manage. Similarly, at Willowvale, Shackleton and Hebinck (2018) found that arable fields were occasionally not fully cultivated each year, often due to insufficient cash caused by competing expenses. Blair et al. (2018), Shackleton et al. (2019) and Shackleton and Ntshudu (2023) reported that rural communities frequently faced limitations in affording farm resources. Fan and Rue (2020) further noted that these affordability issues are particularly pronounced when field sizes are large.

On the contrary to the study's findings, Mzuyanda et al. (2020) suggest that small farm size leads to abandonment of cultivation because it impedes the effectiveness of farm machinery and labour, leading to increased production costs and decreased production outputs. Terres et al. (2015) support that large field sizes allow for efficient machinery usage and optimised input

utilisation. However, Shackleton et al. (2019) note that a small farm means that households are not producing enough to even meet subsistence needs.

3.4.2.5. Household size

The average number of adults per household was two. Respondents indicated that the primary reasons for the small household size were that young children were attending school, often in nearby towns, and other family members had migrated to urban areas. This resulted in shortage of family members available for active field cultivation, a situation also noted by De la Hey and Beinart (2017) and Zantsi and Bester (2020). The limited number of household members significantly impacts arable field abandonment in the villages and other rural areas. With fewer people available to contribute to agricultural labour, maintaining and cultivating arable land becomes increasingly challenging. This scarcity of labour often leads to arable fields being left abandoned as households struggle to manage competing demands and resources effectively. For example, Li et el. (2012) in Poyang Lake Plain, discovered that 30.9% of grain-producers who had abandoned field cultivation in this region attributed their decision to a deficiency in available labour. Blair et al. (2018) and Khanal (2018) found that farming households typically had larger household sizes compared to non-farming households, as they had more family labour to handle agricultural tasks, making abandonment less likely.

Supporting these findings, researchers such as Andrew and Fox (2004), Shackleton et al. (2013), Fischer and Hajdu (2015), De la Hey and Beinart (2017), and Shackleton and Ntshudu (2023) observed that as more children began attending school, their participation in herding animals decreased. Children are often sent to schools in towns because parents believe these schools offer better education compared to those in the villages. As a result, even if children stay in the village with their grandparents, they leave very early for school and return late, waiting for school transportation. In some cases, children are relocated to urban areas to attend schools that are perceived to provide a superior education. Khanal and Watabe (2006) and Shackleton and Ntshudu (2023) noted that, in the past, children aged five to fourteen were directly or indirectly involved in agricultural labour, but now the majority are enrolled in school. Consequently, as fewer individuals are available for field cultivation, it has become increasingly challenging for the remaining farmers to protect their fields and secure support from family and neighbours to prevent livestock from straying onto their cultivated land (Andrew and Fox, 2004).

3.4.3. Economic drivers

3.4.3.1. Lack of fencing

The absence of fencing around fields significantly impacts cultivation, particularly in Gotyibeni, Manqorholweni, and Melani. Respondents reported frequent raids by livestock, which destroyed their crops and rendered their cultivation efforts ineffective. They indicated that they could not afford fencing due to the large size of their fields. Fencing extensive areas can be prohibitively expensive, especially for smallholder farmers with limited financial resources, as noted by several researchers such as Aliber and Hart (2009), De la Hey and Beinart (2017), Blair et al. (2018), Shackleton and Hebinck (2018), Shackleton et al. (2019) and Hadju et al. (2020).

These findings align with observations by Andrew and Fox (2004), Khanal (2018), Shackleton and Hebinck (2018), Zantsi and Bester (2020) and Moyo and Ravhuhali (2022), who noted that unmanaged livestock are a significant deterrent to cropping in communal areas. For instance, reduced control over livestock was identified by Shackleton and Hebinck (2018) and Shackleton and Ntshudu (2023) as a major factor limiting field cultivation in Eastern Cape. Fencing not only protects crops from livestock but also offers other benefits such as reducing the risk of theft note Shackleton and Ntshudu (2023).

In Manqorholweni and Melani, the government had previously provided fencing for the fields. However, it was noted that these government-installed fences were vandalised. This suggests a breakdown in community cooperation and responsibility for the maintenance of infrastructure. The vandalism of government-provided fencing further exacerbated the challenges faced by the farmers and led to abandonment of fields for several years. The issue of unfenced fields highlights the need for collaborative solutions involving both the community and the government. A cost-effective alternative to fencing large fields is to move cultivation to smaller homestead gardens. Researchers such as Andrew and Fox (2004), Chalmers and Fabricius (2007), Aliber and Hart (2009), Fay (2013), Herd-Hoare and Shackleton (2020) and Shackleton and Ntshudu (2023) have suggested this approach. Homesteads are typically already fenced, as they are smaller and thus more affordable to enclose (Shackleton and Ntshudu, 2023).

Khanal and Watabe (2006) acknowledge that addressing the fencing problem requires not only financial support but also community engagement and awareness of the importance of maintaining and respecting shared resources. Community involvement in the planning and

implementation of fencing initiatives, along with support from the government, can contribute to more sustainable solutions. In addition to fencing, exploring alternative strategies for protecting crops from livestock could be considered. This may include exploring community-based herding practices, where livestock are managed collectively or implementing innovative deterrent measures to keep livestock away from cultivated areas as noted by Shackleton and Ntshudu (2023) and Khanal and Watabe (2006). These were in place in the villages, but not all the households could afford them because they didn't have money to pay the herders.

3.4.3.2. Lack of resources and finances

The decision not to cultivate fields, whether partially or entirely, across the villages stemmed from various interconnected factors, primarily related to the lack of financial resources and the costs associated with essential agricultural inputs. These constraints to farming are also recognised by other researchers (see Andrew and Fox, 2004; Shackleton et al., 2013; Manyevere et al., 2014; Ncube et al., 2014; Fay, 2015; De la Hey and Beinart, 2017; Blair et al., 2018; Connor and Mtwana, 2018; Khanal, 2018; Shackleton et al., 2019). Financial constraints played a significant role in discouraging rural communities from engaging in farming activities. For instance, Shackleton and Hebinck (2018) found that financial constraints were significant at 40% at Willowvale. In the villages due to lack of sufficient capital to afford fencing, farmers were unable to protect their crops from damage caused by livestock, leading them to abandon the fields, this was also noted by Shackleton and Ntshudu (2023) in the Eastern Cape. Additionally, Herd-Hoare and Shackleton (2020) demonstrated that, on average, two-thirds of production was lost to pests and raiding animals.

Additionally, the high costs of ploughing proved to be a significant deterrent for many. Given the scarcity of oxen in the villages, hiring tractors became the primary means for field ploughing (as also noted by Shackleton and Ntshudu, 2023 in the Eastern Cape). The expenses associated with tractor rentals were considered burdensome by the respondents. The need to rely on external services for such essential tasks further strained their limited financial resources and discouraged them from actively tending to their fields (see also Shackleton and Ntshudu, 2023). This means that as Shackleton et al. (2013) and Shackleton et al. (2019) suggest, economic factors such as lack of capital and lack of funds to pay for inputs form the core drivers of field abandonment. Furthermore, the requirement to hire labour for assistance with planting and weeding added to the overall expenses. These labour-related expenses, combined with the already high costs of inputs, rendered the practice of cultivation

economically unfeasible for many households. Similarly, at Willowvale, Shackleton et al. (2013) show that wealthier households with higher cash incomes have continued farming while poorer households have abandoned, because wealthier households could pay for labour related costs.

Another contributing factor to the financial strain was the need to purchase seeds from the nearest town. As mentioned by Aliber and Hart (2009) and Shackleton and Luckert (2015) that rural residents in South Africa are mainly dependent on social grants, it is usually not enough to cover household needs as well as agricultural inputs. Therefore, this financially constrains rural residents as noted by Shackleton and Luckert (2015) and Gutura and Tanga (2017). Historically, the villagers used to save and preserve their own seeds, ensuring a sustainable supply for subsequent planting seasons. However, by 2021, this practice had significantly declined, and only a few households managed to maintain their own seed reserves. Consequently, most households had to purchase seeds from external sources, which proved to be an expensive endeavour. The additional expenditure on seeds further increased the overall cost of farming for the respondents.

3.4.3.3. Off-farm employment and migration

The results revealed that over 80% of employed household members in the villages were engaged in off-farm work. This indicates that non-agricultural sectors are crucial for providing employment opportunities in rural areas. Wang et al. (2022) argue that the rapid pace of industrialisation and urbanisation has intensified the disparity between the substantial earnings from non-agricultural jobs and the modest income from small-scale agricultural labour. Consequently, Maharjan et al. (2020), Fan and Rue (2020), and Ragie et al. (2020) observe that many arable landholders have been driven to seek non-agricultural employment opportunities. Terres et al. (2015) note that the risk of arable field abandonment increases when agricultural income significantly lags behind that of the broader economy, whether at the regional or national level. Additionally, Fan and Rue (2020) argue that securing off-farm employment to diversify livelihoods can contribute to the growth of rural communities and help break cycles of poverty, hunger, and malnutrition.

Only a small percentage (12%) of employed household members were engaged in on-farm employment. This indicates that such jobs are less available compared to off-farm employment. Terres et al. (2015) argue that the trend of rural communities favouring off-farm employment

over farm work is reinforced as alternative opportunities beyond agriculture become increasingly accessible. Furthermore, Li and Song (2018) contend that industries outside agriculture offer substantial income prospects, which can exacerbate the disparity between urban and rural lifestyles, ultimately driving migration from rural areas.

As discussed in Section 3.4.2.5, some household members migrated to urban areas due to better employment prospects compared to farming or other income-generating opportunities in the villages. This trend is supported by studies by Ncube et al. (2014) in Msobomvu in the Eastern Cape Province and Ngema et al. (2017) in Maphumulo Local Municipality in KwaZulu-Natal Province. Sagynbekova (2017) notes that while migration may offer improved employment opportunities, it also presents challenges for rural villages. The outflow of working-age individuals can result in a loss of agricultural knowledge and skills, as elderly individuals may lack successors to pass on this information. This, in turn, threatens a decline in agricultural productivity and increases dependence on external sources for food and income, as highlighted by Shackleton et al. (2019).

Despite the dominance of off-farm employment, respondents emphasised that farming remains vital to them. They indicated that if they had better opportunities in other sectors, they would prefer to invest their income into cultivating fields rather than abandoning them. Aliber and Hart (2009) and Ragie et al. (2020) also note that the availability of off-farm employment can positively impact agricultural activities. Stable incomes from non-agricultural jobs enable villagers to purchase inputs and adopt modern farming techniques. Sagynbekova (2017) adds that this can contribute to increased agricultural productivity and overall rural development. Furthermore, Sagynbekova (2017) specifies that labour migration can have positive effects on households, such as increased income and reduced socio-economic challenges, with remittances being used for farming inputs. This investment of remittances can extend beyond individual households to enhance the social and economic infrastructure of the local community. Conversely, Yan (2016), Shackleton et al. (2019), Moyo and Rhavuhali (2022) and Mzuyanda et al. (2020) argue that wage incomes from off-farm sources, such as remittances, can increase the likelihood of field abandonment. This is because they tend to attract younger individuals away from agricultural activities, leaving elderly members to manage farming alone (Yan, 2016).

3.4.4. Environmental drivers

3.4.4.1. Drought

Across the villages, 29% of respondents cited drought as the primary reason for field abandonment. This issue was particularly significant in Melani, where over 60% of respondents attributed field abandonment to drought. This high percentage is likely because, as Yan et al. (2016) and Moyo and Ravhuhali (2022) note, fields in rural areas are predominantly rainfed. Similarly, Blair et al. (2018) reported drought as a significant reason for abandoning fields in KwaZulu (90%) and Transkei (29%). In addition to drought conditions, 28% of respondents across the villages reported a lack of access to water for irrigation. As argued by Aliber and Hart (2009) and Terres et al. (2015), insufficient water during the growing season leads to water stress, adversely affecting essential physiological processes in crops. The amount and distribution of rainfall are crucial environmental factors controlling successful germination and subsequent crop establishment (Ngetich et al., 2014). Ngetich et al. (2014) further emphasises that high rainfall variability combined with low adaptive capacity makes farmers particularly vulnerable, especially given their reliance on rainfed agriculture.

These persistent drought conditions in South Africa were so severe that in 2015, the government declared a National State of Disaster, as many provinces, including the Eastern Cape, were severely affected. The drought persisted for such a prolonged period that in 2020, the National State of Drought Disaster was reclassified. The impact of drought is also experienced in other African countries. For example, Pauw et al. (2010) demonstrated that smallholder farmers in Malawi suffered significant economic losses during droughts, partly because they grew more drought-sensitive crops. Similarly, some parts of Asia are experiencing similar challenges. Sagynbekova (2017) showed that the 2014 drought in Naryn reduced the yield of fodder crops due to inadequate water infrastructure for irrigation.

The issue of field abandonment due to drought and water shortages, reflecting the impacts of climate change in the villages, is supported by other scholars. For example, Yan et al. (2016) and Li and Song (2021) note that adverse effects of climate change, such as drought, result in decreased crop yields and increased farming expenses, which subsequently raise the likelihood of cropland abandonment among small-scale farmers. Harvey et al. (2014) and Zseleczky and Yosef (2014) state that small-scale farms are especially susceptible to these frequent extreme weather events because they heavily rely on climate-dependent agriculture and have limited

resources and capacity to counteract and adapt to the impacts of climate change. Therefore, it is crucial for the villages to adopt adaptive strategies, such as water conservation techniques and drought-resistant crop varieties, as suggested by Aliber and Hart (2009) and Moyo and Ravhuhali (2020), to mitigate the impacts of drought. The World Bank (2013) estimates that if current practices persist and the world warms by 3-4°C by 2050, crop yields could plummet by 15-20%.

As climate change effects intensify, individuals will need to enhance their adaptability to continue cultivating fields and producing food under these challenging conditions. As Niang et al. (2014) and Kom et al. (2022) lament, the severity of future climate change impacts is largely dependent on people's current ability and actions to adapt. For example, Kom et al. (2022) showed that rural farmers in Limpopo adopted several adaptive strategies in response to erratic rainfall. These included engaging in off-farm activities, though limited opportunities made this unsustainable, potentially leading to rural-urban migration. Shifting crop planting periods to align with the onset of rains was common, especially in drier areas. Rainwater harvesting was widely practiced, but its effectiveness was limited by small storage capacities and housing types. Planting drought-resistant crops and using dug-out wells for irrigation were also key strategies, though their success depended on financial resources. Retaining trees around homes and farms provided shade and mitigated high temperatures (Kom et al., 2022). Makurira et al. (2009) add that farmers can mitigate the impacts of climate change by understanding the nature and occurrence of dry spells, especially for those reliant on rainfed agriculture with less access to irrigation facilities. These are some strategies the study areas could adopt to become resilient to drought. Overall, promoting socio-economic development and access to climate information and financial resources is crucial for enhancing these adaptive strategies (Kom et al., 2022).

3.4.4.2. Pests and diseases

Less than 15% of respondents indicated they were affected by pest and diseases which may reduce yields and potentially encourage smallholder farmers to stop field cultivation. While less than a quarter of respondents indicated they were driven by animals such as wild rats and birds to stop cultivating fields. These, however, may affect the respondents in the future as many of them have abandoned cultivation, such that those interested in cultivation in future may be limited in doing so due to being affected by wild animals, pests, and diseases. As Herd-Hoare (2018) states, a decline in cropping area increases crop pests like birds, monkeys and

bushpigs in the remaining fields, which prompts those remaining to also abandon. Biophysical constraints such as pests were identified at Willowvale (Shackleton and Hebinck, 2018).

3.4.4.3. Distance of the field from the homestead

The average distance between the homesteads and the fields across the villages was 4 km. As noted above, the villages were dominated by old and elderly household heads. Respondents suggested that walking such a distance discouraged them from engaging in agricultural activities. Yan et al. (2016), Khanal (2018), Moyo and Ravhuhali (2020) and Wang et al. (2022) also state that when arable land is situated farther away from residential areas, there's an increased chance of it being left unused. This heightened distance substantially raises the time and effort required for tending to the land, thereby enhancing the likelihood of its abandonment, Yan et al. (2016) and Wang et al. (2022) also note this. For example, Yan et al. (2016) showed that field abandonment increases with distance from 10% at 0.4 km to 76% at 3 km.

In South Africa Betterment Planning led to fields being far from homesteads, which increased field abandonment between 1970 and 1990 (Blair et al., 2019). However, due to the long distance between the fields and homesteads, some respondents made a strategic shift from field cultivation to home garden cultivation. Similar observations were made by Andrew and Fox (2004), Trefry et al. (2014), Hebinck et al. (2018) and Shackleton et al. (2019). Moreover, home gardens are typically located closer to the homestead, making them more accessible (see Hebinck et al., 2018; Shackleton and Hebinck, 2018; Shackleton et al., 2019). This adaptive strategy allowed elderly villagers to continue some level of agricultural activity without the burden of traveling long distances. Andrew and Fox (2004) shared similar sentiments that shifting to homestead garden cultivation eliminates resource constraints and reduces risks associated with cultivation.

3.4.5. Importance of cultivating fields

Although 80% of the households had stopped field cultivation, they were aware of the importance and contributions field cultivation makes to livelihoods. Similarly, Blair et al. (2018) reported that in Transkei, there was a unanimous belief in the substantial role of field cultivation in supporting livelihoods, regardless of whether fields were actively cultivated or not. Respondents from the villages recognised that field cultivation plays a crucial role in one’s ability to sustain themselves economically. This awareness suggests that the villagers

understand the value of agriculture as a means of income generation and meeting their basic needs (see also Shackleton et al., 2005; McCusker and Carr, 2006; Aliber and Hart, 2009; Shackleton et al., 2013 who noted similar sentiments elsewhere). The respondents were able to recognise the importance of field cultivation because, despite having abandoned it, they grew up with it as a way of life and understood its significant role in preventing poverty within the villages. As noted by Blair et al. (2018) in Transkei and KwaZulu field cultivation is a traditional activity for rural residents.

Respondents highlighted that formal employment opportunities, even in nearby towns, such as in retail, are scarce. Kepe and Tessaro (2014) and Shackleton and Luckert (2015) have also indicated that formal employment is low in towns closer to rural areas. This scarcity reinforces the importance of field cultivation as a primary or supplementary source of income as noted by Aliber and Hart (2009).

Respondents recognised that cultivating fields plays a crucial role in household food security, with about 70% acknowledging this importance and noting the role of cultivated fields in providing food. West et al. (2014) and Li and Song (2021) emphasise that maintaining stable cultivated arable land is vital for ensuring a sustainable food supply to meet the needs of a growing population. Sibhatu et al. (2015) and Shackleton et al. (2019) further highlight that production of cultivated fields is essential for meeting the dietary needs of rural populations. Supporting this view, Aliber and Hart (2009), Blair et al. (2018) and Shackleton et al. (2019) note that cultivating fields enables households to grow a variety of crops, ensuring a steady supply of fresh produce and reducing dependence on external food sources. Therefore, cultivation not only provides an avenue for livelihood diversification but also contributes to local food security. Shackleton et al. (2019) add that this is especially important in areas with limited access to markets or affordable food.

Respondents also recognised that cultivating fields can lead to financial savings. In the villages, approximately 52% of respondents noted that field cultivation helps save money. Aliber and Hart (2009), Shackleton et al. (2013) and Shackleton and Hebinck (2018) indicate that growing their own food allows households to reduce expenses on purchased food items, which can be costly. Additionally, surplus agricultural produce can be sold, generating extra income for the household. For instance, Shackleton et al. (2013) found that in the Wild Coast, more farmers were producing crops for sale rather than for home consumption. Fan and Rue (2020) further suggest that when integrated effectively into a diversified rural economy and agri-food value

chains, small-scale agriculture can enhance inclusive growth and generate employment. This potential holds true even for impoverished subsistence farmers, who can be empowered to practice sustainable resource management (Fan and Rue, 2020). The emphasis on cultivating fields reflects a desire for self-sufficiency among respondents. This sentiment is supported by Aliber and Hall (2012), Pienaar and Traub (2015), Chepape and Maoba (2020) and Fan and Rue (2020), who highlight the value of growing one's own food for achieving self-sufficiency. These researchers further argue that small-scale farming can help achieve the goals of poverty alleviation and rural growth.

3.4.6. Support required for continued field cultivation

Respondents expressed a strong desire to engage in farming activities to their full potential if they were granted the necessary support and assistance. As stated by Aliber and Hall (2012), Chepape and Maoba (2020) and Fan and Rue (2020) small-scale farmers encounter a range of limitations that hinder their growth and capacity to effectively contribute to food security. Respondents believed that with the right resources and assistance, they would be able to shift from partial cultivation, where only a portion of their fields was utilised, to cultivating all their land. Since the advent of democracy in South Africa, the government has introduced and executed numerous policies and initiatives designed to foster the development of smallholder agriculture and address historical inequities (Chepape and Maoba, 2020). The allocation of funds to these initiatives has grown over time, encompassing measures such as infrastructure grants, support for production inputs, facilitation of loan access, and extension services (Chaminuka et al., 2008; Chepape and Maoba, 2020). However, Aliber and Hall (2012) allude that a contributing factor as to why so few of black farmers receive assistance from agricultural departments seems to be the lack of awareness about their existence.

Respondents who had completely abandoned cultivation due to various reasons also showed a keen interest in restarting their agricultural activities. Similarly, Shackleton et al. (2013), Khanal (2018) and Blair et al. (2018) found in their study areas that there was interest in recultivation, provided that the necessary support was received. However, Aliber and Hall (2012) state that there have been multiple efforts, both historical and present, to implement programs aimed at providing assistance to small-scale farmers. For example, the Farmer Support Programmes, which from the late 1980s attempted to provide holistic support to farmers in the various homelands, and the Massive Food Production Programme, initiated in

the Eastern Cape in 2003 in an attempt to dramatically increase land use and agricultural production there (Aliber and Hall, 2012). However, Everatt and Zulu (2001) and Mabaso (2014) showed that these government efforts have had limited impact on the livelihoods of emerging farmers and have been ineffective in stimulating rural growth and alleviating poverty in South Africa.

3.4.6.1. Support with fencing

The primary area of support identified by the respondents was fencing. De la Hey and Beinart (2017) and Shackleton and Ntshudu (2023) have shown that fencing is crucial for protecting crops from damage caused by livestock and wildlife. Shackleton and Ntshudu (2023) add that without proper fencing, the efforts put into cultivation can be undermined, leading to potential losses and discouragement among farmers. For instance, Khanal (2018) in Nepal reported that local people voiced a need for fencing to protect fields from animal damage.

Respondents recognised that investing time and resources in farming without adequate protection is not a viable option. This observation is supported by Shackleton and Hebinck (2018), who found that at Willowvale, two out of three fields that were cultivated but unfenced in 2011 were abandoned by 2013. The farmers reported abandoning these fields because they were not fenced and were therefore raided by livestock (Shackleton and Hebinck, 2018). Farmers that had their fields fenced in the same area were continuing with cultivation (Shackleton and Hebinck, 2018). The expressed need for fencing highlights the importance of providing resources to support agricultural activities in the villages. Rather than policy makers selecting specific sectors for preferential treatment among small-scale farmers, an approach centred around small-scale farming could offer general support and establish infrastructure in the areas where these farmers are clustered such as the homelands as noted by Aliber and Hall (2012). Moreover, a strategy that focuses on specific geographical areas could offer farmers more opportunities to adjust and broaden their production methods, by establishing conditions conducive to overall success (Aliber and Hall, 2012).

3.4.6.2. Other areas of support

Respondents highlighted the importance of having knowledgeable experts who can offer advice on best practices, pest and disease management, and crop selection. The need for awareness campaigns was also mentioned, this indicates the importance of disseminating information and

knowledge about modern farming techniques, new technologies, market opportunities and government support programs. Such areas of support were also identified by Khanal (2018) in Nepal. Chepape and Maoba (2020) emphasise that, extension practitioners play a critical role in the planning, implementation and monitoring of agricultural developmental programmes. This support is essential for the revival of arable field cultivation in these rural communities, highlighting the need for targeted interventions to effectively reintegrate and sustain farming practices.

The respondents emphasised the importance of having access to affordable fertilisers, high-quality seeds, and tractors. These inputs play a critical role in enhancing agricultural productivity. These areas of support were also mentioned at Transkei and KwaZulu by Blair et al. (2018). Poulton et al. (2005) demonstrates the significance of the involvement of the public sector in reducing the expenses associated with coordination for small-scale farmers. This is accomplished by offering initial funds for producer associations and extending support to service providers to deliver products and services, as well as aiding traders in creating accessible markets for minor surpluses (Poulton et al., 2005). Government assistance or the subsidisation of service providers, such as tractor services, can empower small-scale farmers to overcome the challenges stemming from their limited scale and coordination issues as noted by Shackleton et al. (2013) and Shackleton and Ntshudu (2023). This support also facilitates collective action to overcome the substantial transaction costs involved (Aliber and Hall, 2012). Chepape and Maoba (2020) note that improving initiatives provided to small-scale farmers enable these farmers to purchase production inputs independently. For example, in Bronkhorstspruit farmers that received support from the Gauteng Department of Agriculture and Rural Development (GDARD) acquired adequate agricultural infrastructure, and independently participated in training and capacity building programmes (Chepape and Maoba, 2020).

3.4.7. Planned return to field cultivation

At Gotyibeni and Melani, over 60% of respondents indicated that they did not plan to return to field cultivation, primarily because they felt too old and lacked the physical capability for farming activities. Similar findings were reported by Shackleton et al. (2013) in Willowvale, South Africa, and KC and Race (2020) in Lamjung District, Nepal, although KC and Race (2020) found this view at 15%.

In contrast, at Manqorholweni and Mawane, over 60% of respondents expressed plans to return to field cultivation, accompanied by optimism about involving the younger generation in farming in the future. Similarly, Blair et al. (2018) observed an 80% level of optimism about returning to field cultivation in Transkei and KwaZulu. However, they also noted that 44% of previous farmers in KwaZulu felt that a return to field cultivation was unlikely due to age and the high costs associated with cultivating fields. At Willowvale, Shackleton et al. (2013) reported that 60% of former field cultivators expressed interest in resuming field cultivation. In Lamjung District, Nepal, KC and Race (2020) reported 74% of farmers indicated a willingness to engage in subsistence cultivation as long as they are physically able.

Respondents who were optimistic about returning to field cultivation cited reasons such as financial gain and improved food security, aligning with the benefits noted by Shackleton et al. (2019). They believed that their younger family members had witnessed their farming practices and maintained a connection to their agricultural heritage. This confidence suggests that the younger generation will eventually embrace and continue the family farming tradition. This highlights the importance of passing down farming knowledge through generations and reflects the cultural and family values associated with agriculture. Blair et al. (2018) and Shackleton et al. (2019) share that for rural households, farming represents more than just an economic activity; it is a crucial aspect of their identity and heritage. Shackleton and Luckert (2015) add that rural people view the continuation of farming as a means to preserve their traditions, maintain a connection to the land, and sustain their livelihoods.

3.4.8. Home Gardens

A significant majority of respondents (over 70%) reported engaging in home gardening activities. Similarly, Mdiya and Mdoda (2021) reported 72% of rural households in the Eastern Cape maintained a homestead garden. While some respondents in the villages admitted to occasionally skipping a year without cultivating their gardens, others indicated that they consistently had a few vegetables planted throughout the year. Regardless of whether they missed a planting season or not, garden cultivation emerged as a prevalent and popular activity among the villagers. Shackleton and Hebinck (2018) and Mdiya and Mdoda (2021) reported similar findings. Furthermore, Shackleton and Hebinck (2018) note that at Willowvale garden cultivation continues to be an important part of production and in some cases, it may even replace field cultivation. Similarly, Connor and Ntwana (2018) stated that in the rural areas of

Lutengele, Sirhosheni and Mbekweni in the Eastern Cape growing food gardens were common at all sites with 92%, 67% and 82%, respectively. Trefry et al. (2014) state that home gardens had increasingly become important as source of food production for households since the 1950s.

3.4.8.1. Size of the gardens in the villages

The size of the gardens maintained by the villagers was relatively small, typically less than one hectare. Similarly, Fay (2009) reported that garden sizes at Dwesa and Cwebe were 0.28 and 0.17 hectares, respectively. This highlights that the cultivated spaces were of a modest scale, reflecting the limited available land and the nature of home gardening practices (see also Hebinck et al., 2018). The small size of these gardens can be attributed to villagers often relying on the land immediately surrounding their homes or within proximity for establishing gardens. These spaces were typically small in size as also the kraal and the houses shared the same piece of land, also noted by Fay (2009). On the contrary to the study villages, Shackleton and Hebinck (2018) reported that the size of the home gardens at Willowvale were one hectare or larger. Moreover, Andrew and Fox (2004) state that, in some areas home gardens may have been small but the size of the home gardens may sometimes increase with the decrease in field cultivation. For example, they showed that in Nompa village the size of the home gardens was 0.19 ha in 1942 but increased to 0.36 ha in 1998 (Andrew and Fox, 2004). Importantly is that the size of the gardens vary from household to household and the average size is usually significantly less than that of the arable field.

Moreover, cultivating small gardens enabled more efficient use of available resources, addressing respondents' concerns about limitations when working with larger fields. Shackleton et al. (2019) note that the choice to cultivate gardens aligns with the practicality and sustainability of home gardening. Given that the respondents were elderly, faced time constraints due to other household activities, and had limited labour as children were at school, focusing on small, manageable garden areas proved more feasible. These sentiments echo those of Fay (2009). Similarly, Andrew and Fox (2004) highlight that garden cultivation is advantageous as it mitigates the constraints and risks associated with field farming, which can lead to low yields. Fay (2009) also notes that garden cultivation allows for intercropping, accommodating dietary preferences and increasing the proportion of cultivated area. Furthermore, respondents across the villages and Andrew and Fox (2004) observed that gardens situated near kraals benefit from better manure application, enhancing soil fertility. The

approach of moving to garden cultivation therefore allows for focused attention on optimal growth conditions, plant care, and pest management.

3.4.8.2. Comparison of garden yields to field yields

In the villages, home gardens were productive despite their smaller size, similar to findings by Aliber and Hart (2009) and Shackleton et al. (2019). In some villages, such as Melani, the respondents reported that the yields obtained from their home gardens surpassed the yields previously achieved from the larger fields. Andrew and Fox (2004) reported similar results in Nompa and Shixini. This suggests that the intensive cultivation and focused attention given to the home gardens resulted in higher productivity as Hebinck et al. (2018) found in Guquka and Koloni. According to the respondents the small size of the gardens allowed for careful monitoring and care, efficient resource allocation, thereby improving their yields (see similar findings by Hebinck et al., 2018).

Similarly, in Gotyibeni village, the respondents indicated that the yields obtained from their home gardens were comparable to the yields previously obtained from the larger fields. This suggests that, despite the disparity in size, the home gardens matched the productivity levels of the abandoned fields for some households. Similar observations were made by Andrew and Fox (2004) in Nompa and Shixini. This outcome further underscores the effectiveness of small-scale cultivation in maximising output within limited spaces. On the contrary, De la Hey and Beinart (2017) in Mbotyi in the Eastern Cape stated that gardens were smaller than the abandoned fields and they were not perceived to compensate for them.

3.4.8.3. Household members responsible for home garden

The cultivation and maintenance of the gardens in the villages predominantly fell to the women within the households. Likewise, Ogundiran, (2013), Shackleton and Hebinck (2018) and Mdiya and Mdoda (2021) indicated that women were responsible for handling the home gardens. The women took on the role of nurturing and managing the home gardens, dedicating their time and efforts to optimise growth and productivity. Females in the villages played a crucial role in overseeing various activities, such as planting, watering, weeding, and harvesting. Ogundiran (2013) also suggests that females are more dominant in homestead garden cultivation because they stay at home and conduct household activities while males go to urban areas to look for opportunities in other sectors. This is also supported by Kehler (2001)

who suggests that women play a critical role in agricultural activities in rural areas of South Africa compared to their male counterparts.

In addition to the women's involvement, children also contributed to the gardening process by assisting in specific tasks. For instance, after school hours, children would often help with the tasks of irrigating the vegetables, ensuring that the plants received adequate water. On weekends, when they had more free time, children would also participate in weeding, removing unwanted plants that could potentially hinder the growth of the cultivated vegetables. The elderly respondents reported being assisted by an average of two children per household in managing their gardens. This is fewer than the five individuals per household suggested by Mdiya and Mdoda (2021) for supporting the elderly in garden maintenance. By involving multiple family members, the workload was distributed, contributing to the successful management of the gardens while also allowing for shared learning experiences and the strengthening of family bonds. As Kumar and Nair (2004) supports that interactions in and around the homestead garden can create and reinforce social status and family ties between the household and the community that have been lost due to the abandonment of communal fields. Therefore, home gardens assist in preserving culture and identity of communities as they consist of a variety of components and species that represent social and traditional aspects of different communities. Rodrigue et al. (2015) add that home gardens are also known for their agro-biodiversity conservation, ecosystem service provision and culture prevention.

The engagement of children in these gardening activities served multiple purposes. Firstly, it provided an opportunity for them to learn about agriculture, develop practical skills, and gain a deeper understanding of the natural world. Through their involvement, children acquired knowledge about plant care, the importance of irrigation, and the role of weeding in maintaining the health and productivity of the garden. Similarly, Kumar and Nair (2004) suggest that home gardens serve as valuable repository for preserving and transferring indigenous crops and livestock species, including production knowledge and skills from one generation to the other. The division of responsibilities, with women primarily overseeing the gardens and children assisting in specific tasks, exemplified the collective effort and collaboration within the household.

3.4.8.4. Age of household head influence on garden cultivation

The majority of respondents in the villages were between the ages of 46 to over 55 years. Despite being in the elderly category, these respondents expressed their active involvement in maintaining the gardens. On the contrary, Adhikari (2005) and Mdiya and Mdoda (2021) note that older people are generally unable to maintain homestead gardens, due to limitations of physical capabilities, so they found that in households with older household heads homestead gardens are usually abandoned. On the contrary to this, in the study villages, due to factors such as distance and age-related limitations, respondents in the villages were unable to cultivate the larger fields located farther away so they preferred cultivating home gardens. Moreover, Ogundiran (2013) support this as they suggested gardening activities do not require intensive physical work and are therefore adapted to the declining capacity of the elderly. Therefore, their passion for farming and their strong connection to the land motivated them to ensure the cultivation and care of their home gardens. Similarly, Rodrigue et al. (2015) in Benin, found that the probability of home garden ownership increases with age. This suggests that as Ogundiran (2013) also found, older respondents tend to be more involved in garden cultivation than young ones. Ogundiran (2013) state that older people are more experienced with agricultural production practices including agriculture as they inherited this knowledge from their forefathers. So, Muchara (2010) and Ngema et al. (2017) argue that a household with older people is likely to be more food secure.

3.4.8.5. Benefits of garden cultivation

The primary motivating factors for maintaining home gardens in the villages except Manqorholweni were centered around supplementing household food needs and ensuring an ample and consistent food supply. As Shackleton et al. (2019) support, gardens play a role in addressing food security concerns by providing fresh produce directly to the households. Similarly, Galhena et al. (2013), Trefry et al. (2014), Shackleton and Hebinck (2018) and Mdiya and Mdoda (2021) state that home gardens are an essential source of food and are important for conservation of on-farm resources. At Willowvale, the motivation for garden cultivation was fuelled by the need for food (64%) or the desire to save money (23%), which are both reasons for self-sustenance and less reliance on purchased food (Shackleton and Hebinck, 2018).

In addition to meeting household food needs, the home gardens in Manqorholweni were also for selling some of the produce to other households within the village. Similarly, at Willowvale Shackleton and Hebinck (2018) showed that produce from home gardens could also be exchanged or sold in the neighbourhoods and at the schools for feeding schemes or taken to informal markets at Willowvale town. As observed by Connor and Ntwana (2018) in Lungele, local sales of garden producers amounted to 57%, while 7% were produced for distant markets. This entrepreneurial approach allowed rural people to generate income by selling the surplus harvest with their neighbours, thereby contributing to the local economy, and enhancing the overall well-being of the village. The practice of selling produce from the home gardens within the village showcased the resourcefulness and community-driven mindset of some villagers. It created a system of mutual support and cooperation, where surplus harvests were exchanged, and the availability of fresh produce was increased for all members of in the village. This local trade within the village not only provided economic benefits but also fostered a sense of interconnectedness. This implies that, as Mdiya and Mdoda (2021) allude local food production can assist in mitigating the adverse effects of global food shocks and prices to assist the rural poor.

The dominating crops grown in home gardens, based on the proportion of respondents who indicated they were cultivating them, were maize (59%), potato (62%), cabbage (61%), spinach (62%), green pepper (50%), and onion (65%). Similarly, the crops that were mostly grown in the home gardens in the rural areas of the Eastern Cape and KwaZulu-Natal were potatoes, tomatoes, spinach, onion, carrot, maize cabbage, and butternut as noted by Ogundiran (2013), Pokwana et al. (2020) and Mdiya and Mdoda (2021). This diversity of crops in the village home gardens improved household diets and promoted dietary diversity as noted by Aliber and Hart (2009), Shackleton and Hebinck (2018) and Shackleton et al. (2019). The cultivation of maize provided a staple food source, cabbage and spinach contributed to the availability of leafy vegetables, rich in vitamins and minerals. Onions added flavour and nutritional value to various dishes. Galhena et al. (2013) and Shackleton et al. (2019) support that gardens provide vital dietary diversity and health benefits, because they provide day-to-day access to a variety of fresh vegetables, tubers, and yams. Talukder (2000) stated that in Bangladesh home gardens improved the intake of vitamin A through national home gardening projects.

3.5. Conclusion

The study identifies key factors contributing to field abandonment in the villages, such as the age and gender of household heads, economic constraints, and environmental challenges. Older and female-headed households are more likely to abandon fields due to physical limitations and the absence of a male figure. Economic factors like job loss, high costs of inputs, and limited rural job opportunities also drive abandonment. Environmental issues include the distance to fields, lack of fencing leading to livestock damage, and impacts of drought. Despite recognising cultivation's importance for food security, many villagers, especially the elderly, need support to farm. Home gardening, managed mainly by women, successfully provides fresh produce. Policy recommendations include financial support, infrastructure improvements like fencing. The next chapter will examine the consequences of the drivers of arable field abandonment identified in this chapter. It will focus on understanding the impact on and the state of human wellbeing and environmental conditions, as conceptualised by the DPSIR framework, which links drivers and pressures to state and impact.

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Chapter 4: Evaluating social effects of arable field abandonment in rural communities of ECP and KZN

Abstract

As field abandonment increases, researchers have observed growing economic vulnerability and food insecurity among affected rural households, raising concerns about its potential negative impacts on overall well-being. This chapter aims to investigate how rural livelihoods, social relationships, and living conditions within and between households have evolved following the cessation of field cultivation. From an initial sample of 168 questionnaires on arable field abandonment and its drivers, 97 were selected from respondents who had ceased cultivation, including 21 from Gotyibeni, 28 from Manqorholweni, 25 from Mawane, and 23 from Melani. Targeted household interviews were conducted as follow-ups. Interviews were conducted with household heads or available adults, using open-ended questions to allow detailed responses. The findings reveal significant impacts on household economics and food security, with over three-quarters of respondents reporting insufficient cash and increased spending on essentials. Households increasingly relied on social grants, and the abandonment of communal farming led to weakened social connections and altered cultural practices. Off-farm income sources, including small businesses and local services, became vital, though conventional job opportunities remained limited. Revitalising agricultural activities could enhance food security and income, while fostering community-building could restore social connections and cultural practices.

Keywords: field abandonment, economic instability, food insecurity, agricultural income, rural livelihoods

4.1. Introduction

The abandonment of arable land is a multifaceted process characterised by intertwined economic, environmental, and social factors that drive its dynamics as noted by Lambin and Meyfroidt (2010), Yan et al. (2016) Khanal (2018) and Prishchepov (2020), posing significant challenges to sustainable development. The process of arable land abandonment typically yields a combination of outcomes impacting economic, social, and ecological systems at both regional and local scales (Yan et al., 2016; Jiang and Song, 2022). While there are instances of positive effects, particularly in ecological terms, such as re-vegetation and soil rejuvenation,

improved water retention, and heightened biodiversity (Sileika et al., 2006; Kamp, 2014), a larger body of research has highlighted negative consequences (Jiang and Song, 2022), including socio-economic consequences. At the household level, these factors encompass a decrease in self-provisioning capacity, a drop in income, diminished variety in diet, heightened levels of food insecurity, vulnerability, and poverty particularly for those households in rural areas (Shackleton et al., 2001; Blair et al., 2018; Khanal, 2018). These consequences also manifest as erosion of traditional agricultural landscapes and cultural and aesthetic values, among various other outcomes (Song and Pijanowski, 2014; Lieskovský et al., 2015; Yan et al., 2016; Chaudhary et al., 2018; Khanal, 2018; Paudel et al., 2020). Consequences relating to economy include increases in poverty and food insecurity within rural communities (Schoch et al., 2010; Ncube et al., 2014; Sagynbekova, 2017; Khanal, 2018; Shackleton et al., 2019).

The economic repercussions intertwine with social impacts, eroding social cohesion and community resilience (Shackleton et al., 2019). Vulnerable populations, such as women and children, are particularly affected, necessitating inclusive development approaches that aim to increase their resilience (Shackleton and Luckert, 2015; Chaudhary et al., 2018). Such approaches have been found to enhance community cohesion, foster local empowerment, and contribute to the overall sustainability of communities (Hickey and du Toit, 2007; UNDP, 2017). In addition to economic and social consequences, arable field abandonment disrupts traditional knowledge and practices associated with agriculture, resulting in the loss of cultural heritage and identity (Fox, 2005; Elbakidze and Angelstam, 2007; Shackleton and Luckert, 2015). The loss of traditional practices and local knowledge also hampers the potential for sustainable land management and adaptation strategies, which could otherwise contribute to the continued well-being of communities (Reyes-García et al., 2016; Fernández-Llamazares et al., 2017).

These cultural repercussions, in turn, intersect with pressing health concerns. Notably, reduced access to diverse and nutritious food due to land abandonment contributing to increased instances of malnutrition and associated health issues, particularly among marginalised populations (Sibhatu et al., 2015; Willett et al., 2019; Johnsen et al., 2020). Ruel et al. (2018) and Hendriks et al. (2020) emphasise that arable field abandonment exacerbates existing public health challenges, including the prevalence of non-communicable diseases. This suggests the need for comprehensive policy interventions that bridge the gap between agricultural

development, health systems, and community well-being (Remans et al., 2011; Sibhatu et al., 2015; Grace et al., 2018).

As the abandonment of fields gains momentum, researchers have noticed signs of economic vulnerability and food insecurity among affected rural households (see Shackleton et al., 2001; Pereira et al., 2014; Sibhatu et al., 2015; Blair et al., 2018; Moyo and Ravhuhali, 2020; Jiang and Song, 2022). This has sparked concerns about the potential negative impacts on rural communities' overall well-being (Altman et al., 2009; Pereira et al., 2014). Thus, as arable field abandonment keeps expanding, it means households are getting more vulnerable. The Food and Agriculture Organization (FAO, 2010) states that "food security exists when all people at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life". However, with the absence of cultivated fields, and in the context of high unemployment rates, it is highly unlikely that rural households mainly dependent on social grants are able meet their food security needs (Pereira et al., 2014; Chakona and Shackleton, 2020).

While existing studies have explored specific aspects of field abandonment, such as household drivers (see Prishchepov et al., 2013; Lieskovský et al., 2015; Plieninger et al., 2016; Osawa et al., 2016; Blair et al., 2018; Levers et al., 2018; Shackleton et al., 2019), they often lack a holistic view of its wide-ranging effects on households. This fragmented understanding limits our ability to fully grasp the socio-economic, cultural, and environmental impacts of arable field abandonment. Consequently, there is a pressing need for a more comprehensive investigation that integrates these diverse aspects to inform effective policy and intervention strategies. The aim of this chapter was to determine how rural livelihoods and the changes in social relationships and living conditions within and between households have evolved after they had ceased cultivation.

4.2. Methodology

4.2.1. Study sites

Please refer to chapter one, section 1.4.1 for detailed information on study sites.

4.2.2. Data collection

From the initial sample of 168 questionnaires on arable field abandonment and its drivers, a purposeful selection was made of all the questionnaires with respondents who indicated they

had ceased cultivation. This resulted in a total of ninety-seven questionnaires across the villages, including 21 from Gotyibeni, 28 from Manqorholweni, 25 from Mawane, and 23 from Melani. Targeted household interviews were then conducted as follow-ups in the four villages. The questionnaire was first written in English and then later translated to the relevant language (IsiXhosa in the Eastern Cape and IsiZulu in KwaZulu-Natal). The questionnaire was developed to survey respondents' household economic status, household health status, and the social and cultural impacts on households and communities after the abandonment of field cultivation. The interview was conducted with the head of the household or any adult that was available at the time. The questionnaire was open-ended; a question was asked and then the respondents were allowed to answer while the researcher took notes and discussed with the respondent. One research assistant attended a household at a time. Approximately, 60 minutes were spent per household. Weekends were also used for conducting interviews to accommodate potential respondents who worked during the week.

4.2.3. Data analysis

Primary data was captured in an Excel worksheet, which was then transferred to Statistical Package for Social Sciences (SPSS) for analysis using descriptive statistics such as frequencies and cross-tabulations. The data was mostly categorical, so chi-squares tests were done to determine whether the results were statistically different between villages.

4.3. Results

The demographics of non-cropping households in the villages highlights notable variations across different categories. In terms of gender, there are more females than males in these households, ranging from 52% to 88% for females compared to 12% to 48% for males. Age distribution shows that individuals over 55 years old have the highest representation, with percentages ranging from 36% to 57%, while those aged 25 and under have the lowest, ranging from 0% to 14%. Educational attainment varies, with primary education being the most common (Table 4.1). Employment status within households indicates that a significant portion, ranging from 38% to 74%, have no employed members, whereas households with one employed member range from 26% to 57%. The primary source of income for many households is social grants, which range from 68% to 84%, while off-farm income varies between 12% and 29%. Regarding income sufficiency, a majority of households feel their income is insufficient (Table 4.1).

Table 4.1: Demographics of non-cropping households in the villages

Attribute		Proportion of respondents per village % Non-cropping households				
		Gotyib (n=21)	**Manqor (n=28)**	**Mawane (n=25)**	**Melani (n=23)**	**Mean**
Gender	Male	48	21	12	35	**29**
	Female	52	79	88	65	**71**
Age category (Years)	≤ 25	14	7	0	4	**6**
	26 - 35	10	7	16	4	**9**
	36 - 45	0	7	16	22	**11**
	46 - 55	19	25	32	13	**23**
	> 55	57	54	36	57	**51**
Highest education	None	10	0	20	0	**8**
	Primary	24	64	56	44	**47**
	Secondary	64	32	24	48	**42**
	Tertiary	2	4	0	8	**3**
Number of HH members employed	None	38	57	60	74	**57**
	One	57	36	32	26	**38**
	Two	5	4	8	0	**4**
	Three	0	3	0	0	**1**
	Four	0	0	0	0	**0**
	Five	0	0	0	0	**0**
HH main source of income	Off-farm	29	21	12	17	**20**
	Social grants	71	68	84	74	**74**
	Sell produce	0	0	0	4	**1**
	Farm employment	0	4	4	0	**2**
	Remittances	0	7	0	5	**3**
HH income enough	Yes	19	7	0	4	**8**
	No	81	93	100	96	**92**
	Not sure	0	0	0	0	**0**

4.3.1. Impact of field abandonment on household economic status

The mean duration of field abandonment was 19 ±4.8 years across the four villages. Ninety-seven percent of those who had abandoned fields indicated that the household economic status after abandoning fields became less stable (χ^2 = 5.69; p > 0.05). This was because most household members were unemployed, with over 70% depending on social grants, with Gotyibeni having less respondent's dependent on social grants compared to other villages (χ^2 = 21.71; p < 0.05). The social grants identified in the villages included child support grants, pensions for the elderly and the newly introduced social relief of distress grant (SRD). The social grants were taking care of the needs of an average of 4 ±2.8 people per household, ranging from 3 ±1.8 people at Melani to 5 ±4 people at Manqorholweni (Table 4.2). This led to over three-quarters of respondents in all villages indicating that their households did not have sufficient cash to meet all their needs, with Gotyibeni being slightly better off from the other villages (χ^2 = 4.92; p < 0.05). Abandoning fields meant that adult household members were free to work in other sectors. However, many respondents indicated that they view being free

to work in other sectors negatively because they were not finding employment in those sectors. For example, the mean for off-farm employment across the villages was low at 0.4 ±0.6 members per household. Therefore, monthly income from employment was not enough, as indicated by most respondents (94% ±3) across villages, with no significant differences between villages ($\chi^2 = 1.92$; $p > 0.05$). Therefore, to assist in meeting their food needs most respondents (77% ±10.7) were undertaking home garden cultivation (Table 4.2) ($\chi^2 = 4.13$; $p > 0.05$).

To assist in meeting their households cash needs some respondents (less than 20%) were partaking in off-farm formal employment. This employment was in supermarkets or hair salons. There were also those that were working within the villages doing laundry in other households and being paid R70 a day for a load of clothes, and others who looked after the small children of those working in town. There were also taverns and spaza shops in the villages that some households established to earn an income.

Only 3% of respondents were involved in off-farm self-employment across the villages. This included selling fruits, sweets, and cigarettes in town on a stand or walking around town as street vendors. Some of those selling in town indicated that they only went at peak times such as during times of payment of social grants as people stand in long queues for most of the day, so are highly likely to buy. Additionally, during school tournaments, when many schools are gathered at a stadium for sports, also these times are peak times for selling fruits, sweets, and bread with russian sausages or polony normally referred to as (ikota), etc. Those who went at peak times did so because on other days people do not buy much and so going every day is not worth the time and money for transport to get to town. However, it is important to note that the impact of COVID-19 led to widespread job losses, and small businesses such as spaza shops and street vendors suffered significantly. The pandemic caused many individuals to lose their jobs as businesses shuttered or downsized. Small enterprises, such as spaza shops and street vendors, were particularly hard hit, leading to a decline in income for those reliant on these businesses. With many breadwinners and primary earners losing their livelihoods, the capacity to send money to family members in rural areas was severely diminished. This had a lasting negative effect on people, who continue to discuss and lament the onset of COVID-19, as they have not yet recovered from the losses incurred.

Although the remittances contributed very little in the villages (less than 5%), the respondents noted that they assist a lot especially in times when a household runs out of food midmonth.

Respondents indicated they could always call on the other household members working in cities, and they would send some money for them to top up the household food until the month end. However, this was significantly reduced now, as COVID-19 had led to some losing their jobs or being paid less as some companies could no longer afford to pay full salaries. The loss of employment meant that urban workers, who typically send money back home, were unable to do so. This reduction in remittances exacerbated the economic challenges faced by rural households, compounding issues of food insecurity and limiting access to essential services.

Table 4.2: Reported household economic and food security status after field abandonment

Variable		Proportion of responses (%)					
		Gotyib (n=21)	**Manqor (n=28)**	**Mawane (n=25)**	**Melani (n=23)**	**Mean**	**SD**
HH economic status after field abandonment	Less stable	95[a]	96[a]	100[a]	96[a]	97	2.2
	Stable	0[a]	4[a]	0[a]	0[a]	1	1.8
	More stable	5[a]	0[a]	0[a]	4[a]	2	2.6
Household source of monthly income	Social grants	60[a]	80[a]	87[a]	70[a]	74	12.2
	Off-farm employment	35[a]	8[b]	13[b]	13[b]	17	12.2
	Employment on commercial farm	0[a]	4[a]	0[a]	4[a]	2	2.4
	Remittances	5[a]	8[a]	0[a]	0[a]	3	3.8
	Off-farm self-employment	0[a]	0[a]	0[a]	13[a]	3	6.5
Not cultivating has freed HH members to work in other sectors	Yes	71[a]	79[a]	64[a]	91[a]	76.3	11.6
Household cash income	Has enough cash income to cover needs for everyone	24[a]	7[b]	4[b]	13[b]	12	8.7
Home garden cultivation	Has a garden	86[a]	79[a]	80[a]	61[a]	77	10.7

Superscript 'a' indicates that villages with this superscript have statistically similar household economic and food security statuses. Superscript 'b' denotes that villages with this superscript have statistically significant differences in their economic and food security statuses compared to those with 'a,' but are similar to each other. Therefore, villages with the same superscript are comparable in terms of household economic and food security status, while different superscripts highlight significant differences between the villages.

4.3.2. Impacts on household diets and health

The abandonment of arable fields also contributed to most households (76% ±6.5) ($\chi^2 = 1.56$; $p > 0.05$) claiming they did not have sufficient good and healthy food because they lacked the money to buy and pay attention to a diversity of foods (65% ±15) (Table 4.3). Consequently, after cessation of field cropping the diets of most households were becoming less diverse and more monotonous ($\chi^2 = 7.71$; $p > 0.05$).

Most respondents claimed that with the absence of fields they were purchasing food from supermarkets. Access to supermarkets was associated with lower consumption of fresh fruits and vegetables and higher consumptions of fatty foods and sugars. This led to most respondents indicating that they were worried about their health because they felt that there was a greater prevalence of diseases amongst adults compared to those who were cultivating fields and regularly eating fresh vegetables. Most respondents claimed that purchased food was not good for their nutritional needs and health (71% ±6.8) ($\chi^2 = 1.67$; $p > 0.05$) (Table 4.3). The spaza shops that are in the villages mostly sold staples like maize meal, rice, and flour. Respondents alluded that fruits were not sold because they were not bought by customers, as village people could not afford to buy them. The only vegetables that were sold at the spaza shops were mostly onions, tomatoes, and cabbages. The people who run the shops in the villages indicated that when they stock fruits and a variety of vegetables, they rot without being bought and because they needed to make a profit, they could only stock what they knew the villagers would buy, which is energy dense staples. People in the villages mostly eat maize porridge in the morning, bread during the day, and maize pap for supper. Therefore, spaza shops stock according to the needs of the villagers.

The respondents noted that relying on store-bought food has made them vulnerable. After purchasing groceries and other goods in town following social grant payouts, they must cover the cost of these items, which adds financial strain. Across the villages respondents noted in 2021 that each 10 kg or 12.5 kg of rice, meal mealie, flour, and a case of beer, etc. was R5. They added that for heavier bags, for example a bag of cement, costs R20 each. Moreover, when someone has many items, they could ask the transport to bring them closer to their homestead gate and pay double the fare and at the same time pay for their items. Whatever was in the plastic bags was not paid for. Respondents stated that, although this lifestyle was expensive, they were unable to farm because they could not afford to buy seeds. They acknowledge that if they were to buy seeds for cultivation with the little money they have, they would be able to generate more income and supply supermarkets with vegetables and maize and be able to make a good living. However, the opportunity cost of buying seeds is starving because with seeds one must wait for the harvest to be ready unlike buying food and cooking immediately. However, 61% of respondents indicated that they were planning to return to field cultivation in the next five years, the differences were not significant between villages ($\chi^2 = 2.18$; $p > 0.05$). Many of the respondents planning to return to field cultivation wanted to do so to diversify their diets and improve their health (88% ±5.9) ($\chi^2 = 2.74$; $p > 0.05$) (Table 4.3).

During the early 2000s an influx of foreigners was observed in the villages. Initially, these foreigners were selling blankets, steel bowels, brooms made of grass, and some clothes. Some were renting property in some homes in the villages, and eventually they opened shops where they sold food items. Over the years the number of these shops in the villages has increased, with some village members also opening their own shops, including taverns. Some foreigners have left the villages; however, a few village people have taken up opening supermarkets.

Table 4.3: Percentage of respondents reporting effect of cultivation on household's diets and health

Variable	Proportion (%)					
	Gotyib (n=21)	Manqor (n=28)	Mawane (n=25)	Melani (n=23)	Mean	SD
HH eating patterns changed over years	95[a]	96[a]	76[a]	78[a]	86.3	9.3
HH has enough good and healthy food	29[a]	15[a]	28[a]	26[a]	24.5	7.2
Purchased foods good for nutritional needs and health	33[a]	21[a]	36[a]	26[a]	29	6.8
Plans to return to cultivation in next 5 years	67[a]	64[a]	64[a]	48[a]	61	7.5
Interested in cultivation to improve health	95[a]	89[a]	88[a]	78[a]	88	5.9

Superscript 'a' indicates that villages with this superscript have statistically similar percentages of respondents reporting the effect of cultivation on household diets and health. Superscript 'b' denotes that villages with this superscript have statistically significant differences in these reported effects compared to those with 'a,' but are similar to each other. Thus, villages with the same superscript show comparable impacts of cultivation on diets and health, while different superscripts highlight significant differences between villages.

4.3.4. Impact on social relations, culture, and identity

A majority of respondents (82%) indicated that cessation of field cropping had negative implications on how people now interact and connect with each other within the household and between households in the village ($\chi^2 = 2.63$; $p > 0.05$) (Table 4.4). Within households, a majority of respondents (70% ±14.8) indicated that the decline in field cultivation had weakened traditional power dynamics. Parents could no longer command their children to participate in field cultivation, which had historically reinforced their authority. Respect from the youth had declined, more so at Melani than the other villages ($\chi^2 = 13.17$; $p < 0.05$).

Almost three-quarters of respondents (70% ±11.4) further indicated that social connections between households had also declined (Table 4.4). Households previously used to work together in the fields and share produce and go to sell together during harvesting times, the relations between households were good. This was no longer the case, with Gotyibeni and Melani significantly different from Manqorholweni and Mawane ($\chi^2 = 16.35$; $p < 0.05$). People now keep to themselves, and they no longer work together as a community. People even became

less involved in community groups (81% ±12.9), with Manqorholweni significantly different from Melani (χ^2 = 16.28; $p < 0.05$). Most respondents also noted that the decline in social relationships was exacerbated by the effects of COVID-19 in an already affected community. After the onset of COVID-19, things never returned to normal, as people became accustomed to staying indoors and remained skeptical about the virus's end, particularly during the data collection period in 2021. It was considered safer to take precautions, such as sanitising hands before entering homes and ensuring that masks were worn. This cautious approach further hindered the restoration of pre-pandemic social interactions.

Most respondents alluded that field cultivation used to be a central part of the culture and identity in their villages, ranging from 78% in Manqorholweni to 91% in Gotyibeni, the differences were not significant (χ^2 = 1.86; $p > 0.05$) (Table 4.4). It was part of culture and identity because the wealth of a household was previously determined by how much they could produce and sell from their fields and also certain foods they were producing. However, the cessation of cropping fields had led to a decline in the feeling of an agricultural identity amongst households (70% ±10.3) (χ^2 = 10.50; $p > 0.05$) and a decline in feeling of connection to the land (65% ±9.3), with no differences between villages (χ^2 = 11.36; $p > 0.05$) (Table 4.4). Respondents noted that even though cessation of cultivating fields had been gradually increasing over time, but this trend accelerated significantly during COVID-19. Even the few who still engaged in cultivation ceased their activities, further weakening the connection of local rural people to the land. As the loss of connection to the land has now become even more pronounced, it further erodes their sense of identity tied to agricultural practices.

Table 4.4: Percentage of respondents affirming statements regarding the effect of field abandonment on social relations, culture, and identity

Variable	Proportion of respondent's responses (%)					
	Gotyib (n=21)	Manqor (n=28)	Mawane (n=25)	Melani (n=23)	Mean	SD
Has field abandonment affected village social relations	86[a]	86[a]	84[a]	70[a]	82	7.7
Decline power relationships in household	67[a]	57[a]	64[a]	91[b]	70	14.8
Decline in social relations	81[a]	57[b]	64[b]	78[a]	70	11.4
Decline in membership of groups in the community	86[a,b]	68[b]	72[a,b]	96[a]	81	12.9
Cultivation as part of culture and identity	91[a]	78[a]	80[a]	87[a]	84	5.9
Decline in feeling of identity	62[a]	61[a]	72[a]	83[a]	70	10.3
Decline in feeling of connection to the land	57[a]	64[a]	60[a]	78[a]	65	9.3

Superscript 'a' indicates that villages with this superscript have statistically similar percentages of respondents affirming statements about the effect of field abandonment on social relations, culture, and identity. Superscript 'b' denotes that villages with this superscript have statistically significant differences in these affirmations compared to those with 'a,' but are similar to each other. Therefore, villages with the same superscript have comparable responses regarding the impact of field abandonment, while different superscripts highlight significant differences between villages.

4.3.5. State of the environment after field abandonment

Most of the fields had been abandoned and left unattended for many years, such that majority of respondents (93% ±5.1) had started to observe overgrowth of trees and shrubs covering the fields (Table 4.5). It was now even difficult to determine where a certain household field started and ended ($\chi^2 = 7.22$; $p > 0.05$). Most respondents (74% ±17.5) in all villages had also observed some soil erosion in the abandoned fields, with more respondents in Gotyibeni than the other villages ($\chi^2 = 16.86$; $p < 0.05$) (Table 4.5). However, the extent of this observed soil erosion was slight (31% ±12.9) to mild (36% ±3.9) across the villages, with Gotyibeni significantly different from other villages ($\chi^2 = 23.28$; $p < 0.05$). Most respondents were highly concerned that the extensive overgrowth and some erosion at some areas would negatively affect recultivation in the future, Gotyibeni (69%), Manqorholweni (63%), Mawane (57%) and Melani (88%), Melani was different from Mawane (Table 4.5) ($\chi^2 = 12.46$; $p < 0.05$).

Table 4.5: State of the environment after field abandonment

Variable		Proportion of respondents (%)					
		Gotyib (n=21)	**Manqor (n=28)**	**Mawane (n=25)**	**Melani (n=23)**	**Mean**	**SD**
Abandoned fields have revegetated	Yes	100[a]	93[a]	91[a]	88[a]	**93**	**5**
Erosion in abandoned fields	Yes	100[a]	62[b]	65[b]	71[b]	**74**	**18**
Extent of erosion	Slight	31[a]	24[a]	49[a]	19[b]	**31**	**13**
	Mild	33[a]	38[a]	31[a]	40[a]	**36**	**4**
	Moderate	3[a]	6.9[a]	9[b]	17[c]	**9**	**6**
	Severe	18[a]	10[a]	0[b]	12[a]	**10**	**8**
	Extreme	15[a]	21[b]	11[a]	12[a]	**15**	**4**
Extent of concern over field abandonment	Slight	37[a]	23[a]	31[a]	14[a]	**27**	**10**
	Mild	29[a]	23[a]	26[a]	27[a]	**26**	**2**
	Moderate	3[a]	3[a]	9[a]	11[a]	**6**	**4**
	Severe	3[a]	3[a]	3[a]	9[a]	**4**	**3**
	Extreme	29[a]	47[a]	31[a]	39[a]	**37**	**8**

Superscript 'a' indicates that villages sharing this superscript have statistically similar conditions regarding the state of the environment after field abandonment. Superscript 'b' denotes that villages with this superscript have significantly different environmental conditions compared to those with 'a', but are similar to each other. Superscript 'c' is used for additional patterns of significant differences that are distinct from those with superscripts 'a' and 'b'. Thus, villages with the same superscript are comparable in terms of their post-abandonment environmental conditions, while different superscripts reveal significant variations in these conditions between villages.

4.4. Discussion

The results show that field abandonment can catalyse multiple changes in rural livelihoods and identity, which span a variety of themes (Figure 4.1). I have grouped them into economic, social and health for discussion. The DPSIR framework illustrates that drivers and pressures can alter both human well-being and the environment, with subsequent effects on livelihoods (Pagan et al., 2020; Yussif et al., 2023). This chapter explores how the drivers leading to the pressure of field abandonment have impacted the villages in the study areas.

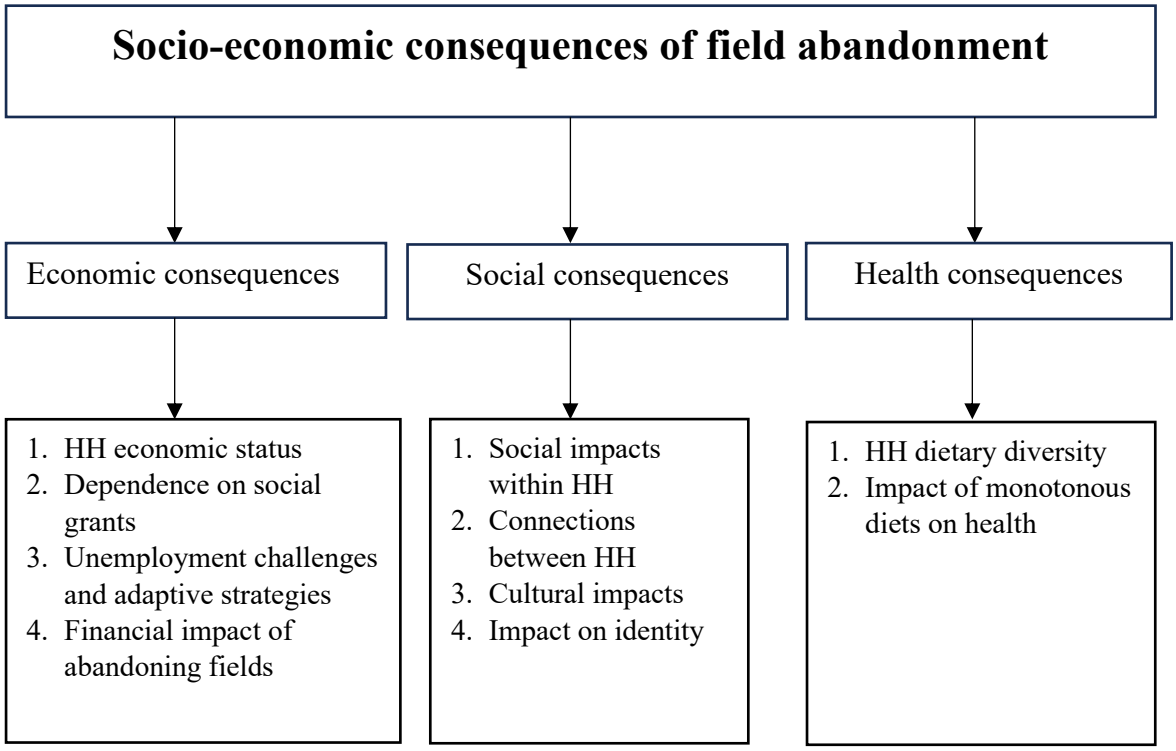

Figure 4.1: Socio-economic consequences of field abandonment

4.4.1. Economic consequences

4.4.1.1. Household economic status in the absence of field cultivation

Household economic status and food security in the villages became less stable after abandoning field cultivation. Research by Ramankutty et al. (2018) and Appiah et al. (2019) support the notion that a reduction in arable land usage reduces community food security. Pawlewicz and Pawlewicz (2023) also highlight that abandoning arable land can undermine local livelihoods by decreasing local incomes, a finding also echoed by Zhang et al. (2023). Without income from farming, whether in the form of food or cash, rural areas experience increased food insecurity as they become more reliant on markets and external sources for their food needs, as noted by Khanal (2018) in Nepal. For instance, Schierhorn et al. (2019) demonstrated that in Brazil and Russia, food security was severely compromised following the collapse of the Soviet Union, which led to a decrease in agricultural land use and production.

Over three-quarters of respondents in all villages indicated that their household did not have sufficient cash to meet all their needs. Households might have struggled with cash to meet all their needs prior to field abandonment, but after abandonment it was worse. Similarly, Zhang et al. (2023) showed that a 1% increase in arable land abandonment rate leads to a 2.89%

increase in rural unemployment and therefore decrease in family income. Moreover, Hadju et al. (2020) showed that households at Cutwini and Manteku struggled to have sufficient cash due to declining field cultivation and employment. Furthermore, NPC (2012) reported that many South African households struggle to maintain a reasonable income, with the estimated average income of the impoverished falling below R524 per person per month in 2012. Similarly, Rickebusch et al. (2007), Terres et al. (2015) and Pawlewicz and Pawlewicz (2023) showed that in Europe, the financial stability of the household's dependent on agricultural sector was reduced, as the rural population declined in engaging in farming activities.

Not having enough cash underscored the growing struggle that families faced in ensuring their basic requirements were met. For example, Chakona and Shackleton (2017) stated that given the widespread poverty in South Africa, it is challenging for most households to afford an adequate amount of food for their entire family. The decline in economic stability and the ensuing shortage of cash had profound implications on various aspects of daily life in the villages, from nutrition and healthcare to education and other essential expenditures. Appelt (2022) made similar observations in Southeast Asia. This echoes previous work showing that field abandonment leads to declines in farm income, shortages in food and increased dependency on the off-farm economy thereby leading to heightened vulnerability and poverty (see Khanal et al., 2006; De la Hey and Beinart, 2017; Blair et al., 2018; Shackleton et al., 2019; Pawlewicz and Pawlewicz, 2023).

Growing food locally could reduce food insecurity as employment for village people is scarce. Increasing arable land use production can offer direct benefits to cultivators, including higher incomes, poverty alleviation, enhanced food security, and overall improvements in human well-being, see similar findings by Ehrensperger et al. (2019), Abraham and Pingali (2020), and Appelt et al. (2022).

Farming households have more diversified incomes that stretches beyond what is covered by the off-farm incomes, that frequently are not enough (See Blair et al., 2018). Decreased cultivation activity decreases the capacity of households to withstand shocks such as death or unemployment of the household breadwinner as noted by Shackleton and Luckert (2015) and Blair et al. (2018). Moreover, Sobczak-Szelc and Fekih (2020) note that when the agricultural sector experiences reductions, it leads to a decline in income sources within this sector. Rickebusch et al. (2007), Terres et al. (2015) and Pawlewicz and Pawlewicz (2023) add that

then this leads to a potential threat to the survival of the local economy, and the agricultural economy may face the risk of collapse (Sobczak-Szelc and Fekih, 2020).

4.4.1.2. Dependence on social grants

Abandoning field cultivation in the villages led to more households becoming dependent on social welfare grants as their primary source of cash income. The increased dependence on social grants after abandoning arable fields has been observed in other villages in South Africa. For example, at Lesseyton and Gatyana in the Eastern Cape, Shackleton and Luckert (2015) observed above 60% of dependence on social grants in the absence of farming. Additionally, Chakona and Shackleton (2019) note that at Harrismith and Dundee most of the households that receive a social grant do not have any additional source of cash income. As these fields lie fallow, villages have lost their primary source of sustenance and income which has led to the state of increased poverty and food insecurity in these villages. Following the state of heightened poverty and food insecurity, the government of South Africa introduced social welfare grants as a response strategy supporting the elements DPSIR framework. However, these grants have inadvertently become a crutch for the villages, providing temporary relief but failing to address the broader issue of a state of deteriorating human well-being. While the grants help keep households afloat, they are not a long-term solution to improving overall health and economic stability.

In the villages, social grants were highly appreciated as they helped mitigate poverty in the absence of farming and low employment levels. This was especially true with the addition of the Social Relief of Distress Grant (SRD), introduced during the COVID-19 pandemic. Some respondents noted that their households were entirely reliant on this newly introduced social welfare grant, which supported unemployed members who were not receiving any other form of social assistance.

The South African government, through the Department of Social Development, introduced the Social Relief of Distress Grant of R350 in May 2020 to alleviate unemployment and combat hunger among vulnerable groups during the pandemic (see also Goodell, 2020; Khowa et al., 2022). Although initially intended to last for three months, the grant continued beyond its original term, with some respondents still receiving it as of November 2021 during data collection. The grant could be extended for individuals who continued to need assistance. In his 2023 State of the Nation Address, the President announced that the grant would continue

until March 2024. In April 2024 it was further extended and raised from R350 to R370. The President during SONA 2024 emphasised that social assistance not only meets immediate needs but also invests in the future, improving school enrolment and attendance, reducing drop-out rates, and enhancing pass rates, hence the extension of the SRD.

The SRD grant also had a notable positive impact on households headed by males. Male-headed households in the villages reported that the grant helped them combat poverty similarly to female-headed households. Men typically have less access to social grants other than pensions, as child and disability grants are often directed to female guardians as noted by Dubbled (2013). This has left men in a disadvantaged position, as Shackleton and Luckert (2015) noted that male-headed households are often food insecure. Dubbled (2013), Chakona and Shackleton (2019) and Hadju et al. (2020) pointed out that social grants have reduced the poverty levels of many households. Furthermore, in households where the male head is unemployed and the family relies on social grants, the grant has provided men with a greater sense of financial influence and standing within the household. Although the amount was modest, recipients acknowledged its importance.

The villagers noted that without social grants they would be extremely poor, same sentiments were echoed at Harrismith and Dundee (see Chakona and Shackleton, 2019). The respondents who were in their 50s could not wait to reach 60 years so they could receive a pension as well. They indicated that their household will be better in terms of access to food when they start receiving pension grants. Shackleton and Luckert (2015), Devereux (2017) and Chakona and Shackleton (2019) supported that social grants are critical in contributing to food security.

However, social grants are not enough to make sure the household is food secure for the whole month, although they made the situation better than if social grants were not available, as also noted by Chakona and Shackleton (2019). Respondents indicated that if they had a broken window, or a leaking roof, they could not buy materials to fix the damages with the money from the social grants because it only affords them to buy food. Similarly, Hendriks et al. (2020) showed that in KwaZulu-Natal, Eastern Cape, Limpopo, and Northwest provinces, social grants only cover the costs of essential monthly staples such as maize meal, white flour, samp, oil, and sugar, as well as transportation to the nearest town. As Dubbled (2013) demonstrated in Glendale, the cash from social grants is insufficient, often resulting in a persistent deficit rather than a surplus.

Thus, social grants cannot be used as basis for investments in the future of the household. As demonstrated by the SRD grant, while extensions may occur, these grants always have an expiration date, and there is no guarantee that they will be renewed indefinitely. In the villages, social welfare grants were primarily dominated by child support grants, with some households receiving up to five such grants. These were followed by pensions for the elderly. Similar findings have been reported in other studies, including those by Dubbled (2013), Fay (2015), Chakona and Shackleton (2019) and Hadju et al. (2020), which also highlight child support grants as the most common form of social welfare assistance. However, this reliance on child support grants underscores their unsustainability, as these grants end when a child reaches 19 years of age (or 21 if still in school) or if an elderly recipient passes away. Such events can potentially revert households to highly vulnerable states, as noted by Shackleton and Luckert (2015), Blair et al. (2018) and Shackleton et al. (2019). Therefore, as Shackleton and Luckert (2015) state, social grants alone are unable to change rural people lives. Shackleton et al. (2019) further argue that the South African social grant system is not designed to take rural people out of poverty because for that to occur social grants need to coexist with other complementary transformations such as education. Moreover, Devereux (2017) and Chakona and Shackleton (2019) add that even in the case of increases social grants have not kept pace with inflation. This is exacerbated by the fact that food prices in South Africa have been steadily increasing, by around ten percent or more in recent years, while the social grants have been experiencing sluggish growth (Chakona and Shackleton, 2019).

4.4.1.3. Unemployment challenges and adaptive strategies for off-farm income sources

With the abandonment of agricultural fields, there was an initial expectation that freed-up labour could be redirected towards exploring employment opportunities in other sectors, potentially diversifying household income sources. As Blair et al. (2018) and Shackleton et al. (2019) suggest that at household level, the deactivation of fields could free up labour that used to work the arable fields. Despite the theoretical opportunity for diversification, respondents reported significant difficulties in securing alternative formal employment. The prevailing job landscape in the villages and surrounding areas was insufficient to absorb the influx of labour now available due to the abandonment of fields. Similarly, Shackleton et al. (2019) state that with very high unemployment in the former homelands of South Africa, few people are able to

find local employment or other casual work opportunities, also supported by Khanal (2018) in Nepal.

Despite these challenges, the resilience of the villagers became evident as they adapted their strategies to ensure survival. As part of the response element in the DPSIR framework, the study reveals that households developed a range of multifaceted strategies to cope with the economic constraints arising from the loss of agricultural activities. Decreases in agricultural incomes forces farmers to look for alternative sources of income as alluded by Pawlewicz and Pawlewicz (2023). Although formal employment opportunities were limited and primarily found in sectors like supermarkets and hair salons, households engaged in various alternative activities, including self-employment ventures and social support networks that collectively contribute to sustaining livelihoods and ensuring a degree of financial stability. These multifaceted strategies highlight the resourcefulness and adaptability of the households in seeking alternative income sources despite challenging circumstances, as noted by Berdegué et al. (2014) Mulia et al. (2021) Pawlewicz and Pawlewicz (2023).

4.4.1.3.1. Economic strategies in response to arable field abandonment

Local employment opportunities in the villages include employment attached to local schools, particularly as assistant teachers, and in the school feeding programme, similar to those identified by Hadju et al. (2020) in Cutwini and Manteku. Village-based off-farm opportunities included roles like laundry services for other households. Others cared for young children of individuals working in town, providing a form of informal childcare service. This shows that off-farm sources of income are important even in rural areas, as noted by Kuiper et al. (2006), Ncube et al. (2014), Shackleton and Luckert (2015) and Sagynbekova (2017). Village-based entrepreneurship emerged as another avenue for income generation, with some households operating taverns and spaza shops, catering to the local needs and thereby contributing to the local economy. This shows that these small enterprise activities, such as selling of alcoholic beverages, and cigarettes, yielded some profit for local businesspeople as echoed before by Dubbled (2013). Moreover, village-based self-employment enabled villagers to sell goods within their villages and generate income without the need to travel to town. This responds to sentiments by Shackleton et al. (2019) that unless rural people are able to develop their own income generating activities, the abandonment of fields will increase the number of people that are unemployed and depend on social grants.

The practice of off-farm self-employment extended to selling items like fruits, sweets, and cigarettes in town. Respondents engaged in this form of business, either through stands or as street vendors. Similarly, Hadju et al. (2020) observed that in the villages of Cutwini and Manteku, small-scale vending and local income-generating activities like driving a rural taxi are key livelihood strategies for some villagers. The timing of the off-farm self-employment activities by the villagers was strategic, focusing on peak periods such as the disbursement of social grants or during school tournaments when large gatherings of people provided a likelihood of higher sales. This highlighted their understanding of market dynamics and the importance of targeting times when potential customers were more numerous. These sorts of activities are also highlighted in literature of other studies, for example, Hendriks et al. (2020) state that on social grant pay-out days there are many informal traders selling live chickens, eggs, freshly butchered meat, as well as fresh produce. Moreover, Sagynbekova (2017) noted that at Naryn, due to abandonment of farming, unemployment, and low salaries, some villagers undertook activities like handcrafts, others worked on a for-hire basis, building and renovating houses (mainly men), doing farm work for wealthy households and for migrant households that need extra help during the peak labour season. Shackleton et al. (2001) and Hendriks et al. (2020) state that women sometimes sell craft and cultural resources only when they require cash for a specific purpose, such as school fees, while others have built sophisticated micro-enterprises.

However, the COVID-19 pandemic severely disrupted these livelihoods, as evidenced by reports from respondents in the villages. The closure of spaza shops was widespread, and many individuals were unable to assist in the households of others due to lockdown restrictions confining people to their homes. Similarly, Wang et al. (2022) noted that those engaged in informal services, such as small grocery store owners, day labourers, and housekeepers, experienced some of the most severe impacts, facing significant unemployment. Khowa et al. (2022) further highlight that businesses in the informal sector, such as spaza shop owners, street vendors, hairdressers, and taxi drivers, were hit hard by the lockdown. These businesses, which rely on public spaces for their operations, suffered immense losses as they were forced to shut down to comply with government regulations as noted by Khowa et al (2022). Kang et al. (2021) add that the income losses during the pandemic were profound, and many have yet to recover from the financial damage inflicted by the outbreak and subsequent restrictions.

4.4.1.3.2. Reliance on reduced remittances

Remittances from household members living in cities emerged as another support mechanism for households. Although the contribution of remittances to the overall income was less than 5% across villages, the respondents emphasised their significance, especially during times when the household faced food shortages before the end of the month. This highlighted the importance of social networks and the role family members in urban areas play as a safety net for addressing short-term economic challenges in the villages in the absence of field cultivation although for some households the remittances were irregular. Fay (2015) and Shackleton and Luckert (2015) suggest that the rates and real value of remittances have been declining steadily since the 1980s in South Africa. For example, Fay (2015) reported that the number of households receiving remittances dropped from over 40% in 1998 to 13% in 2003. The decline in remittances was further exacerbated by COVID-19 in recent years, which resulted in significant job losses, as noted by Fischer et al. (2023). Furthermore, Kuiper et al. (2006) and Sagynbekova (2017) state that most of the cash from remittances were mostly used for household expenses like food and other consumer goods like school fees and family events and social networking and not necessarily invested in farming.

4.4.1.4. Financial impact on household spending and food costs

Most respondents (87%) noted that the abandonment of fields did not free up cash that was used to purchase cultivation inputs. This is because there was now increased spending on food items as without cultivation people have to buy food from supermarkets, this was also observed by Khanal (2018) in Nepal. Similarly, Shackleton and Luckert (2015) state that rural villages now depend more on purchased food than in the past, which has increased the hardship for these households, as observed in Lesseyton and Gatyana. As stated by Baiphethi and Jacobs (2009), Chakona and Shackleton (2017) and Chakona and Shackleton (2019) in many instances, purchased food accounts for a significant portion, ranging from 60% to 80% of households overall spending. This is contrary by Blair et al. (2018) and Shackleton et al. (2019) who stated that the abandoning of fields could free up cash for other investments.

The reason behind high levels of store purchased food is that when they were cultivating fields, they could produce some of their own food, which helped save money. For example, Herd-Hoare and Shackleton (2020) report that mean value of production from fields (excluding home gardens) ranged between R5 400 to R 29 000 per year, for three villages in Transkei. But after

they stopped farming, they had to buy all their food from the market, which can be quite expensive. Similarly, Altman et al. (2009), Drimie and Ruysenaar (2010) and Chakona and Shackleton (2019) noted that the increasing prices of essential food items, such as maize and wheat, which serve as staples for impoverished South Africans, present significant challenges for those with limited resources. In fact, the money villagers received from social grants was mostly used to buy food, leaving very little extra money for other things (see also Kuiper et al., 2006; Shackleton and Luckert, 2015; Chakona and Shackleton, 2019; Shackleton et al., 2019). This means that there is likely to be less disposable income even with the freed-up cash from agricultural inputs as noted by Shackleton and Luckert (2015) and Shackleton et al. (2019). Moreover, because transport to the shops to buy the food in town was expensive and one has to pay for the load in the transport. Shackleton and Luckert (2015) shared that this dynamic could become more detrimental as food prices rise with the impacts of climate change.

4.4.2. Social consequences

4.4.2.1. Social consequences within households

Cessation of field cropping had played a negative role on how family members now interact and connect with each other within the households across the villages. Similarly, in Vietnam, Mulia (2021) showed that abandonment of arable land has resulted in rural people seeking off-farm employment which has decreased communication and cohesiveness within families and has significantly affected social bonding of rural households. Thus, the findings of the study are similar to global patterns. In the villages many respondents indicated that the decline in field cultivation led to a change in power relationships, as parents now could no longer command their children to do chores within the household or help in the garden. Older respondents claimed respect from the youth had declined.

There is a belief across the villages that field abandonment has decreased the time the youth and their parents spend together because each person does their own thing. Mulia et al. (2021) found that decreased field cultivation in Vietnam forced rural households to seek employment outside their villages, resulting in longer working hours, increased travel distances, and weakened family and community ties. This is unlike when fields were active, and parents would take their children to the field and build strong family relationships with their children. This lack of working together as a household has led to the deterioration of control and teaching of parents to their children. De la Hey and Beinart (2017) found that in Mbotyi, the elderly recalled

a time when children used to follow parental requests more readily, whereas today, due to children's rights laws prohibiting physical punishment, it is harder for parents to enforce chores and activities.

The loss of parental authority and control over their children has also been linked to substance abuse, particularly drugs and alcohol, among some of the youth remaining in the villages. Many young people spend their time in taverns, which has contributed to a rise in crime. With unemployment rampant, some resort to theft, breaking into homes or even stealing within their own households to fund their drug and alcohol habits. Elders have expressed concerns that crime, once rare in rural areas, is now on the rise due to increasing substance abuse, making villages unsafe. As respondents also noted, "You are even scared of your own child these days." Similarly, Sagynbekova (2017) shared that in Naryn province in Kyrgyzstan, children are deprived of their parent's care and control. At Lesseyton and Gatyana, Shackleton and Luckert (2015) observed that the youth had lost respect for traditional ways of life, as well as the authority of their elders, and no longer adhered to community values, rules, or norms. This suggests that cultivation of fields played a significant role in building relationships within a household. However, with little or no cultivation of fields a divide has emerged between the elderly and the young in the villages, causing tensions.

4.4.2.2. Social connections between households

Over half of respondents indicated that social connections between households had declined. The decreased field cultivation activities has increased off-farm reliance and this has increased economic disparities between impoverished and more affluent households, and this has created social tensions within rural communities. Tuyen et al. (2016), World Bank (2016), Singhal and Beck (2017) and Nguyen et al. (2017) noted the same. People previously used to work together in the fields and share produce and go to sell together during harvesting time. Relations between households were viewed as good. However, the abandonment of fields in rural areas can impact trade relations with neighbours, signalling a shift in tradition and lifestyle, as observed in these villages (see also Ge et al., 2019; Zhang et al., 2023). For example, Khanal et al. (2006) state that agricultural activities in Nepal were mostly practiced at community level, with local rules and regulations regarding the use and management of farmland, pasture, and forests. There was strong social cohesion, and it was feasible to use labour within the village in farming activities even with activities that included assisting individual households (Khanal et al., 2006).

However, as in the study villages, Khanal et al. (2006) state that people keep to themselves now, and they no longer work together as a community.

Respondents noted that they were communicating regularly when most of their fields were active. They were always together in the field, they used to share a lot of experiences in the field, they supported each other. Similarly, Fay (2013) reports on the steady decline in the proportion of households holding agricultural work parties because people now are poor and hungry and therefore, they are always fighting. Shackleton and Luckert (2015), De la Hey and Beinart (2017), Blair et al. (2018), Hendrik et al. (2020) and Shackleton et al. (2019) state that disengagement in farming leads to changes in social relations with respect to family and community level activities associated with agriculture. Previously, when fields were actively cultivated, families would assist each other in times of destitution, however, they do not do much anymore because of lack of resources (Shackleton and Luckert, 2015). Moreover, the COVID-19 pandemic, by confining people to their homes and limiting their attendance at ceremonies such as funerals and other cultural events, significantly disrupted social relations even more. As Fischer et al. (2023) note, the scaling down of these events led people to adapt to new ways of living, further straining social connections.

Respondents had noted that people previously had farming skills, and they also used to share these skills amongst each other. But now people have even become less involved in community groups, echoing observations by De la Hey and Beinart (2017) in Mbotyi in the Eastern Cape. Moreover, this could result in the erosion of local agricultural practices and the loss of valuable agricultural knowledge as noted by Gellrich et al. (2007) and Pawlewicz and Pawlewicz (2023). Farming can contribute to building social capital and contribute to community development through enhanced networks and cooperation (Hendriks et al., 2020). Similarly, at Naryn, Sagynbekova (2017) noted that households (42%) were no longer farming, and it was now difficult to participate in social events because they did not have money. While in Nepal, Chaudhary et al. (2018) observed that the abandonment of arable fields had reduced the practice of interactive and dynamic social systems, such as exchanging labour for planting, harvesting crops, building, and roofing houses, which were previously common among farmers.

In the villages and other villages of the Eastern Cape and KwaZulu-Natal, people have abandoned large fields and concentrated on cultivating home gardens (see Andrew and Fox, 2004; Fay, 2013). The home gardens do not require the household to hire outside assistance, one person in the household can manage the garden. Home garden cultivation has become a

very individualistic activity that does not encourage social cohesion. Shackleton and Luckert (2015) reported that in Lesseyton and Gatyana no households that cultivated a home garden mentioned making use of work parties.

This shows that when villages are cultivating fields and doing activities that encourage villagers to work together, social relationships are built and maintained. The activities of working together and exchanging labour in villages brought the community closer and made it easier to perform agricultural practices (see similar findings by Chaudhary et al., 2018; Mulia et al., 2021). The social practices are important for shaping everyday community life while making it familiar to all members of the community as noted by Chaudhary et al. (2018) and Mulia et al. (2021). Relationships of trust among farmers, common rules, and connectedness amongst social groups, which were necessary for shaping individual farm activities and creating a unified rural landscape have declined because individuals do not work together anymore as also noted by Chaudhary et al. (2018).

Decline in cultivation has destroyed other village resources. For instance, at Manqorholweni, there were rangeland camps that were fenced, but with fewer people engaged in field cultivation, the fences were destroyed, such that those that were still cultivating were forced to stop. Livestock were no longer kept in camps but raided fields. When activities like cultivation of fields, management of rangelands and natural forests in or around the village deteriorate, then mutual assistance amongst neighbours also deteriorate, as also argued by Shackleton et al. (2013) and Shackleton et al. (2019). Moreover, this potentially increases divisions during times of conflicts as noted by Zhang et al. (2023), such as when somebody's cattle invade another person's cropped field as noted by Shackleton et al. (2019). Whyte et al. (2019) noted that abandonment of farming in the rural areas of Denmark leads to conflicts and subsequent destruction, such as damage to equipment. Similarly, Chaudhary et al. (2018) observed that the declining in participation of village members in community activities resulted in the mismanagement of the community irrigation system.

4.4.2.3. Cultural consequences

Respondents noted that they used to compete and brag about their harvest in a healthy way, as part of cultural practice and to motivate others to work harder the following season. The wealth of a family was determined by how much they could produce. However, with an increasing number of households abandoning their farmland, rural populations find it challenging to

uphold their traditional, social and cultural customs and practices. Furthermore, the decline in field cultivation carries the risk of losing valuable agricultural knowledge and skills held by the older generation, as noted by Manyevere et al. (2014), Connor and Mtwana (2018), Shackleton et al. (2019) and Qwabe and Pittaway (2023). This cultural erosion is particularly concerning because the younger generation may not have the opportunity to work alongside their elders in the fields. As a result, Qwabe and Pittaway (2023) argue that critical knowledge about local environments, soil conditions, crop varieties, and effective farming systems knowledge that is crucial for adapting to climate change may be at risk of being lost.

Respondents indicated that it is part of Zulu and Xhosa culture to produce food for the family (see also Hebinck, 2007). However, now people are more focused on Western culture, shared respondents; there is lack of identity and people are no longer involved in cultural activities, especially those that connect people to the land. Mulia et al. (2021) also showed that in Vietnam people expressed a significant concern for the preservation of local culture due to the growing number of individuals, particularly young people, who have disregarded their village identities.

The cultural importance of traditional agricultural landscapes has been recognised as important across the world as noted by Navarro and Pereira (2012). Daugstad et al. (2006) and Navarro and Pereira (2012) highlight that the multifunctionality of a cultural landscape includes not only food and fibre but also cultural heritage, biodiversity, recreation, rural settlements. Shackleton and Luckert (2015) note that the declines in farming leads to a potential loss of communal ethics relating to farming and other social and cultural beliefs.

In the villages there were no cultural festivities relating to farming that were being practised in 2021, because people were no longer engaging in high levels of farming but keeping to themselves. Field abandonment had taken away the practices of culture that local people had identified with for decades, which included celebration of harvests to enjoy hard work at the end of each season. Andrew and Fox (2004), Sagynbekova (2017), Chaudhary et al. (2018), Blair et al. (2018) and Shackleton et al. (2019) note this as they observed that field cultivation does not only provide self-sufficiency but is also an important means of establishing and maintaining social ties among kin and neighbours, e.g., through celebration of life-cycle feasts. Festive events are a key part of public life in rural areas and are usually open to all members of the society, they usually take place at special times and remind farmers about the community's place in the world and perception of its own history and memory as noted by Chaudhary et al. (2018).

4.4.2.4. Cultivation as part of identity

Although many villagers were not cultivating fields, they indicated that they identify themselves as farmers because they grew up with farming practiced in their homes. In fact, they indicated that they were raised by farming, it is one thing they know more than anything else. Moreover, a villager's connection to farming doesn't end with the cessation of field cultivation, because when financial resources permit, they actively maintain home gardens as noted by Aliber and Hart (2009). These gardens not only serve as a continuation of their agricultural traditions but also provide a practical outlet for their farming expertise (Hebinck et al., 2018; Shackleton et al., 2019). This demonstrates a resilience in holding onto their agricultural roots, even as circumstances change. Daugstad et al. (2006) state that the best way to uphold the cultural landscape connected to agriculture is to be active in farming. Hebinck et al. (2018) and Akinyemi et al. (2019) argue that for rural households, land is more than just an asset or input production process, but it has both historical and cultural values also. The decline in fields poses a significant challenge to the core of local identity, as many farmers typically associate themselves with their agricultural practices. However, with the absence of cropping or any form of farming, this fundamental aspect of identity may face uncertainty and potential displacement (see Hebinck et al., 2018; Shackleton et al., 2019). The question of what will replace this traditional identity remains unknown note Shackleton et al. (2019).

4.4.3. Health consequences

4.4.3.1. Household dietary diversity

Most households in the villages claimed they did not have enough good and healthy food because they did not have enough money to buy and pay attention to a diversity of foods. This aligns with findings that approximately 20% of households in South Africa are believed to have limited access to food, as noted by StatsSA (2014) and Chakona and Shackleton (2019). The situation these households described underscores a crucial link between economic constraints and dietary limitations (see also Chopra et al., 2009; Chakona and Shackleton, 2019 who echo similar sentiments). With limited financial means and no cultivation of fields, the food options in the households were limited, often leading to a lack of diversity in their diets.

Due to limited cultivation and financial constraints, these households have struggled to afford a wide range of food items, affecting both the quality and nutritional value of their meals.

Arable land abandonment has been identified as a significant impact of this issue, as observed by Khanal (2018) and Cheteni et al. (2020). A balanced and healthy diet requires a variety of foods to provide essential nutrients, vitamins, and minerals, which can either be grown or purchased (Cheteni et al., 2020; Hendriks et al., 2020). However, in these villages, fields are often abandoned, and unemployment remains high. This situation supports the observation by Cheteni et al. (2020) that low dietary diversity is common in rural areas due to unemployment. The observations further support observations made by Shackleton et al. (2019) and Cheteni et al. (2020) that many rural households in South Africa have diets dominated by starchy staples, particularly maize, with limited protein and overall dietary diversity. Overall, these observations align with the statement that over 13.8 million people in South Africa are reported to have inadequate access to food and nutrition (Cheteni et al., 2020).

Respondents in the villages were aware of the importance of dietary diversity, and that cultivation offers these benefits. Many of them indicated they were planning to return to field cultivation because they wanted to diversify their diets and improve their health. This awareness of dietary diversity's importance highlights the knowledge these individuals possess about the connection between a diverse diet and their well-being. They acknowledged that growing a variety of crops through cultivation could empower them to access different types of nutrients essential for good health, this is further supported by studies by other researchers, (see Pereira et al., 2014; Sibhatu et al., 2015; Shackleton et al., 2019). Villager's expressed intent to return to field cultivation underscores a collective aspiration within the villages to harness the benefits of a diverse diet. However, longer term studies by other researchers such as Fay (2013) and Hebinck et al. (2018) show that this almost never happens, although this may be something that they wish for, the reality is different.

4.4.3.2. Impact of monotonous diets to health

Most respondents indicated that they perceived a greater prevalence of diseases among adults in non-cropping households compared to adults in households that were cultivating their fields and eating fresh vegetables straight from the ground. This perception sheds light on a potential link between agricultural practices and health outcomes (see Ncube et al., 2014). The respondents seemed to connect the act of cultivating fields and consuming freshly harvested vegetables with improved health among adults. Ncube et al. (2014) highlight this further by stating that poor nutrition increases due to the unavailability of healthy food, posing a significant risk to health. In rural areas with decreased field cultivation, diets are increasingly

dominated by the consumption of meat, processed commercial snacks, sweets, and carbonated soft drinks, as noted by Hadju et al. (2020).

Therefore, declines in field cultivation may lead to rural individuals being vulnerable to ill health resulting from declines in dietary diversity, micronutrient intake, and food security (see Blair et al., 2018; Shackleton et al., 2019; Cheteni et al., 2020). They will lack the nutritional benefits of fresh produce that cultivated fields would offer, as vegetables are known to be rich in essential vitamins, minerals, and antioxidants that contribute to overall well-being as noted by Zantsi and Bester (2020). Furthermore, this perception underscores the intricate relationship between lifestyle choices, dietary habits, and health status. By engaging in arable field cultivation and directly partaking in the consumption of homegrown vegetables, individuals may inadvertently adopt a lifestyle that promotes healthier eating patterns as noted by Zantsi and Bester (2020). Such a lifestyle could have a positive impact on their immune systems, energy levels, and overall resilience against illnesses.

4.4.4. State of the environment after field abandonment

Most of the respondents (93%) observed trees and shrubs had grown in the abandoned fields. Similarly, Blair et al. (2018) observed increased woody vegetation densities in KwaZulu (90%) and Transkei (100%) following abandonment of croplands. Moreover, Chalmers and Fabricius (2007) showed that in Nqabara about 75% of local people alluded that forest size increases were due to changes in cultivation. Shackleton et al. (2013), Njwaxu and Shackleton (2019) and Shackleton et al. (2019) note that, with time abandoned fields become dominated by woody herbs, shrubs and trees, although the rate and nature are subject to local fire frequencies, harvesting practices and browsing pressures and shaped by climatic and edaphic factors.

Over 50% of respondents in the villages were concerned that the extensive overgrowth would negatively affect recultivation in the future. This also meant that they will never have a landscape that offers them food like when they were cultivating fields. Blair et al. (2018) state that the overgrowth of weeds in abandoned fields are perceived as a loss of traditional landscapes. Moreover, Elands et al. (2004) showed that, in Europe expansion of forests was viewed in a negative light as it was against the wishes of local people and created a sense of isolation between households, represented a loss and threat to cultivation and decreased the beauty of the area. However, Shackleton et al. (2013) and Njwaxu and Shackleton (2019) showed that in other areas, like Willowvale in the Eastern Cape, South Africa, the expansion

of forests and woodlands was viewed positively because it increases aesthetics of the local landscapes and increases availability of NTFPs. Similarly, Elands (2004) stated that some people in Europe appreciated reforestation of shrublands and woodlands because it provided income for locals, it increased cultural values and improves ecosystem services and improved beauty of the area.

4.5. Conclusions

The decision to abandon fields has had a substantial impact on household economics and food security. Over three-quarters of respondents reported insufficient cash to meet their needs, highlighting their struggle to provide for basic requirements. Contrary to expectations, the end of field cultivation did not result in increased disposable income; instead, households had to spend more on essential food items, which affected nutrition, healthcare, and education. Respondents increasingly relied on social grants, particularly child support and were appreciative of the new SRD grant, to alleviate financial strain. Despite this, the abandonment of communal farming activities led to diminished social connections and altered cultural practices, especially also due to re-vegetation that occurred in these abandoned areas. Off-farm income sources, including small businesses and local services, became crucial, though conventional job opportunities remained scarce. Revitalising agricultural activities could improve food security and income, while supporting off-farm ventures through resources and training can create sustainable income opportunities. The next chapter will examine the impacts of arable field abandonment on the elderly in these villages, particularly those who experienced field cultivation in their youth. It will explore how the abandonment has affected them and how their perspectives reflect changes associated with the decline in arable fields.

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Chapter 5: Drivers and impact of field abandonment: Oral history perspective

Abstract

Declines in agricultural production have diminished the reliance of local communities on cultivated fields. Despite this reduction, agrarian culture remains a core component of local identities, with many considering crop cultivation essential to their way of life, even if they are no longer actively engaged in it. This contradiction highlights the persistence of attachment to farming traditions despite the decline in agricultural practices, particularly field cultivation. This chapter examines how participation in field cultivation has evolved over the past 50 years, particularly focusing on its impact on the elderly. It captures their lived experiences and perspectives through oral history interviews, emphasizing socio-cultural influences and the interaction between traditional and contemporary practices. Participants, aged 60 to 90, were selected with the assistance of village leaders. Data collection was planned for four interviews per village, though only three were conducted in Melani due to participant availability resulting is a sample size of 15. Content analysis of the interviews revealed significant changes in education, spirituality, social relationships, and lifestyle. Findings include a shift towards more individualistic lifestyles, diminished community support, increased reliance on social grants, and conflicts within villages, all affecting traditional farming knowledge and dietary patterns. Despite these changes, traditional knowledge of wild foods endures. Modernisation has brought some improvements but has also exacerbated poverty and eroded traditional practices, underscoring the complex dynamics of rural transformation.

Keywords: field abandonment, social relationships, economic landscape, societal changes, rural communities

5.1. Introduction

The global processes of urbanisation and industrialisation have led to swift economic development (Deng et al., 2018; Long et al., 2018; Mkhongi and Musakwa, 2022). Consequently, the income disparity between the agricultural sector and the non-agricultural sector has steadily grown, resulting in significant transformations in the income and composition of rural households in many countries (Rigg et al., 2016, 2017; Shirai et al., 2017; Nguyen et al., 2017; Shirai and Rambo, 2017; Singhal and Beck, 2017; Mulia et al., 2021;

Mkhongi and Musakwa, 2022). These changes have led to significant landscape changes in rural areas around the world (Cheteni, 2016; Yan et al., 2016; Mkhongi and Musakwa, 2022). For example, in the rural areas of China cropland abandonment has become a prominent and noticeable phenomenon (Yan et al., 2016). According to Li et al. (2018) approximately 28% of croplands in the mountainous regions of China were abandoned during the period from 2000 to 2010. These changes have led to significant transformations in the income and composition of rural households in various countries such as East and Southeast Asia (Rigg et al., 2017; Shirai and Rambo, 2017), Thailand (Shirai et al., 2017) and South Africa (Hebinck, 2007). These changes can also be termed de-agrarianisation (Mkhongi and Musakwa, 2022), and they encompass various aspects of rural life, including shifts in livelihood strategies, living conditions, dietary patterns, agricultural practices, and aspirations of the youth (Rye, 2006, Hebinck, 2007; De la Hey and Beinart, 2017; Hadju et al., 2020; Muñoz-Rios et al., 2020; Zantsi and Bester, 2020).

Rye (2006) and Nag et al. (2018) note that rural activities, including farming, can contribute to a sense of stability in life leading to rural settings that are peaceful, harmonious, and idyllic, a place where people enjoy a close connection with nature, traditional values, and a simpler way of life. Rye (2006) suggests that farming activities in rural areas offer a sense of tranquillity, community, and well-being that is perceived to be lacking in urban settings. Moreover, it also encompasses cultural heritage, social acceptability, environmental health, and food security as important aspects of rural life (Marzban et al., 2016). However, farming is deemed inadequate to keep smallholders committed to agriculture (Mkhongi and Musakwa, 2022). This inadequacy has led to its declines in rural settings, leading to changes which include changes that relate to village values, and social and cultural beliefs (Daugstad et al., 2006; Fay, 2009; Munroe et al., 2013; Ncube et al., 2014; Shackleton and Luckert, 2015; Blair et al., 2018; Shackleton et al., 2019). The changes have been accompanied by marked declines in many, but not all, rural households' agricultural production of both livestock and crops, although the decline is more pronounced in crop production (see Fay, 2009; Fay, 2015; Shackleton et al., 2015; Shackleton et al., 2018; Shackleton et al., 2019; Zantsi and Bester, 2020). Shackleton and Luckert (2015) argue that these rapid changes in rural areas bring about many uncertainties.

Historically, rural households in South Africa relied on farming activities for sustenance, cultivating crops and raising livestock to meet their daily needs (Hebinck, 2007). Thus, growing something whether in fields, home gardens, or plots remains part of identity for many (Trefry

et al., 2014; Shackleton and Hebinck, 2018, Shackleton et al., 2019). For example, a Xhosa landscape is regarded as one which is productive and cropped, together with natural vegetation (Hebinck, 2007; Shackleton et al., 2019). Yet, rural livelihoods have shifted from being mainly agrarian to embrace other livelihood strategies which include migratory labour, remittances, wage incomes and social pensions (Hebinck, 2007; Shackleton et al., 2013; Fay, 2015; Cocks et al., 2017; Shackleton and Hebinck, 2018; Shackleton et al., 2019; Zantsi and Bester, 2020). This can be attributed to urbanisation, market economy integration, democratic transition, increases in social grants, and lack of opportunities in the formal job market in rural areas (Hebinck, 2007; Dubbled, 2013; Kepe and Tessaro, 2014).

Although declines in agricultural production and the shift away from agrarian livelihoods in many rural areas have been highlighted in literature (Hadju et al., 2020; Mkhongi and Musakwa, 2022). With many rural households in South Africa becoming more dependent government social grants which have emerged as a significant financial resource for numerous households, providing cash income (Hebinck and van Averbeke, 2007; Dubbled, 2013; Shackleton and Luckert, 2015). Resulting in many households becoming less reliant on their fields as a means of supplementary income or homegrown food (Shackleton et al., 2013; Fay, 2015; De la Hey and Beinart, 2017; Ncube et al., 2017). Literature also mentions that agrarian culture endures and is firmly embedded in local identities (see Shackleton and Luckert, 2015; Shackleton et al., 2019). Such that many households perceive growing crops, whether in fields or home gardens, as an integral part of their identity (Trefry et al., 2014; Shackleton and Hebinck, 2018; Shackleton et al., 2019). This presents a potential contradiction in the narrative. On one hand, there is evidence of declining agricultural practices as a result of declines in the number of households involved in cropping, which poses a significant challenge to the fundamental aspects of local identity (Shackleton et al., 2019), while uncertainty lingers regarding what might replace this traditional practice. On the other hand, the persistence of agrarian culture suggests a continued attachment to farming traditions (Shackleton et al., 2019).

This chapter aimed to identify trends in field cultivation in the study areas, to answer how has the participation rate in field cultivation changed over 50 years. To achieve this the chapter allowed for capturing the lived experiences, perspectives, and narratives of individuals directly affected by field abandonment. By interviewing these elderly village members, a comprehensive understanding was gained regarding the underlying reasons for field abandonment, the socio-cultural factors influencing decision-making processes, and the

interplay between traditional farming practices and contemporary livelihood strategies. This approach provides valuable insights into the complexities surrounding field abandonment and contribute to the development of context-specific interventions and policies aimed at revitalising agricultural practices and promoting sustainable rural development in South Africa.

5.2. Methodology

5.2.1 Study sites

Please refer to chapter one, section 1.4.1 for detailed information on study sites.

5.2.2. Data collection

For data collection for the chapter, participants were selected with the assistance of a village leader, who identified households with elderly members aged 60 to 90 who are previous cultivators of fields. The target sample size was 16 across the villages, with four participants in each of the four villages. Village leaders were requested to identify at least six households in each village, although I had planned to visit only four. The additional households were identified in case any participant was unwilling to participate or was unavailable on the day of the interview. I believed that conducting four oral history interviews per village would be sufficient, given that there were no structured questions. Participants were given a theme and allowed to share their thoughts on it, which provided ample information for analysis. Following the identification, in Gotyibeni, I conducted four oral histories with males aged 65, 67, 79, and 80 years. In Manqorholweni, I conducted four oral histories with female participants aged 73, 75, 78, and 78 years. In Mawane, I conducted four oral histories with female participants aged 67, 73, 75, and 77 years. In Melani, I conducted oral histories with two females aged 65 and 83 years, and one male aged 89 years. I conducted only three interviews in Melani because the other identified elderly individuals were not available for the interview. The participants were all receiving pensions from the government.

I visited the elderly at their homes for the interview. I conducted the interviews myself in the local language, which was IsiXhosa in Gotyibeni and Melani and IsiZulu in Manqorholweni and Mawane. The elderly were requested to give their individual experiences of the village life, giving historical recollection, as well as experiences through time, and what had changed leading to the present situation. They were encouraged to shape their narrative as much as they wished, talking about subjects, activities, and life episodes they regard important and

meaningful in relation to experienced changes in village relations, changes in the environment and landscapes, changing generational values, goals, and ambitions, changing consumption patterns, and changes in traditional farming practices. I asked for permission to record the interviews to which all respondents agreed. The meetings were recorded while I was also taking notes. It is important to note that this chapter combines results and discussion, unlike the previous three chapters, which separated them.

5.2.3. Data analysis

The data was analysed using content analysis. Content analysis is a method of research that aims to generate reliable and accurate conclusions by analysing texts or audio and connecting them to their specific usage contexts, with the objective to establish a connection between the findings and the environment in which they originated (Bengtsson, 2016). Content analysis can be conducted on diverse sources such as in-depth interviews (Wann-Hansson et al., 2005), focus group interviews (Golsäter et al., 2011), single written questions (Bengtsson et al., 2007), open-ended questions in a questionnaire (Donath et al., 2011), observations of situations (Eastwood et al., 2011), as well as images and films (Krippendorff, 2004). However, it is important to note that the choice of data collection method influences the depth of the analysis (Bengtsson, 2016).

Content analysis involves four primary stages: decontextualisation, recontextualisation, categorisation, and compilation (Bengtsson, 2016). The first stage, decontextualisation, entails extracting the relevant content from its original context. This involves isolating and separating the text or material of interest from its surrounding circumstances. Before isolating and separating the text or material of interest, it is essential for the researcher to become acquainted with the content (Bengtsson, 2016). This involves reading through the transcribed text and gaining an overall understanding of its essence (Bengtsson, 2016). The primary objective at this stage is to grasp "what is going on?" in the text as a whole (Graneheim and Lundman, 2004; Bengtsson, 2016).

This initial familiarity allows for developing a holistic perspective before proceeding with the analysis. It enables the researcher to comprehend the content's narrative, identify key concepts or topics, and discern potential patterns or connections within the data (Bengtsson, 2016). The second stage, recontextualisation, comes into play. During this stage, the content is examined and analysed within the new context established by the research objectives (Graneheim and

Lundman, 2004). The goal is to understand how the content relates to specific research questions or hypotheses (Graneheim and Lundman, 2004). Next is the categorisation stage, where the content is systematically organised into meaningful categories (Graneheim and Lundman, 2004). This process involves identifying themes, patterns, or concepts that emerge from the data and grouping them together based on their shared characteristics or properties (Graneheim and Lundman, 2004). Categorisation helps to make sense of the content and facilitates further analysis. Lastly, is the compilation stage, the categorised content is summarised and synthesised (Patton, 2002). This stage involves condensing the data and presenting the findings in a coherent and meaningful way (Patton, 2002). It may involve statistical analyses, textual summaries, or visual representations to present the results of the content analysis (Patton, 2002), example shown in (Table 5.1).

Table 5.1: An example of an analysis schedule. Transcribed oral histories with the elderly

Meaning unit	Condensed meaning	Code	Sub-headings	Category
Social relations have changed, we used to help each other as women after we have harvested and we were doing that willingly, for free of charge. Now that cultivation of fields has declined, we no longer to anything together. Nothing has changed for the better because our grandchildren still travel long distances to and from school by feet as we used to do.	Social relations have changed, we used to help each other as women after we have harvested, and we were doing that willingly.	Changes in village connections.	People no longer assist each other.	Social connections.
Consumption patterns have changed. We grew up not eating meat, it was only eaten by elders during our time. As children we were only eating pap and cabbage. We did not know the cooking oils that are used these days. Nowadays we eat very much better. We eat what we want we want to eat and when we want to eat it. Fridges remain full of meat.	Consumption patterns have changed for the better, we eat what we want compared to before.	Positive changes in consumption patterns.	People eat much better now.	Consumption patterns.

Interviews from the oral histories were labelled accordingly, i.e., with the name of the village where the oral histories were conducted. I listened to the recordings and transcribed what the participants were saying, this was also compared with the notes I wrote down during the interview. After transcription, I coded sentences, for example ideas or themes as well as new or unexpected ideas that the participants said were coded as quotes. After coding all sentences

these were grouped into sub-themes where all quotes with similar meaning were grouped, then after the sub-themes were translated to one theme of clear meaning reflecting the aim and objective of the study.

5.3. Findings and discussion

The way of life in rural villages has undergone significant transformations, as highlighted by the respondents' recollections and observations. In their youth, the majority of households in these villages cultivated fields annually, a practice that has diminished in present times. Previously, households relied heavily on agriculture and livestock, with farming being the primary source of sustenance. One male participant aged 78-years from Gotyibeni emphasised this shift, stating, "*Before, we did not even need money as much because we did not have much use for it."* Similar changes to those in the villages were observed by other researchers elsewhere in South Africa, for example Cocks et al. (2017), Du Toit (2017) and Mkhongi and Musakwa (2022) noted that before colonisation African societies were dependent on agriculture and relied on their family labour. Hebinck (2007) added that there was little evidence of famine and widespread impoverishment during the pre-colonial era. The Xhosa wellbeing revolved around cattle, hunting, cropping, and gathering, and if one of these activities failed another could be relied upon even under extreme conditions (Hebinck, 2007). Rural areas were self-sufficient before colonisation and apartheid; however, the period of colonisation and post-colonisation left widespread poverty, especially in rural areas notes Wessell (2017). Historical legislation transformed the livelihoods of African people from production to consumption as noted by Hebinck and van Averbeke (2007) and Hebinck et al. (2018).

Various changes have occurred in village life, affecting different aspects of daily existence. For example, access to water has transformed with villagers across all the villages now investing in water tanks to harvest rainwater due to the shift from relying on rivers. At villages like Melani, government water taps have been installed, supplementing the rainwater tanks, although an 83-year old female participant reported some cases of vandalism of these taps in the village. Similar changes for rural areas in the Eastern Cape were also noted by StatsSA (2009) and Zantsi and Bester (2020). The sense of community within villages has shifted from cohesive and collaborative relations to more individualistic behaviour, exacerbated by the effects of the COVID-19 pandemic.

As the practice of field cultivation has diminished, instances of livestock raiding by neighbours have emerged as a concerning issue in the villages (see studies with similar findings by Blair et al., 2018; Shackleton et al., 2019; Shackleton and Ntshudu, 2023). Previously, cultural events were intimately tied to agricultural activities, such as lobola (bride wealth), which used to involve cattle but has now shifted to monetary transactions (Parker, 2015; Shackleton and Ntshudu, 2023 noted similar findings in the Eastern Cape). Similarly, Hebinck et al. (2018) also stated that in Guquka and Koloni, the level of commoditisation is minimal when it comes to cattle sold and slaughtered for lobola and rites of passage purposes. Celebrations of harvest at the end of planting seasons have also undergone changes. The dependency on social grants has increased among villagers, while the migration of employable youth to urban centers, despite limited job prospects and low wages, has become a noticeable trend (see Hebinck, 2007). Substantial lifestyle changes have occurred, including shifts in consumption patterns, generational values, and ambitions. Unlike the previous generation, today's youth are less inclined to heed parental advice regarding agricultural work.

Furthermore, there have been changes in dietary habits, with a decrease in the consumption of leafy vegetables and a shift from fuelwood to electricity for cooking and heating, also noted by StatsSA (2009) and Zantsi and Bester (2020). Farming practices have transitioned from traditional methods to modern techniques. Spatial changes in village setups are apparent, with scattered homesteads giving way to more centralised nuclear villages. Landscapes that were once dedicated to food production now feature re-vegetated fallow areas with trees, shrubs, and grasses. These transformations have brought about changes in the local biodiversity, with the presence of new bird species and an increase in snake populations.

The village populations have expanded, with an influx of new households. Climate change has also made its mark, leading to more frequent droughts and floods, further affecting agricultural practices. As field cultivation has declined, villagers have shifted maize cultivation to smaller garden plots alongside other vegetables (similar findings were made by Connor and Mtwana, 2018; Shackleton et al., 2019). The villages have witnessed substantial social, economic, lifestyle, and environmental changes, impacting various aspects of life including agriculture, water access, social relations, cultural practices, employment patterns, consumption habits, and the overall landscape. These transformations reflect the evolving dynamics of rural communities in response to historical, economic, and climatic factors. Figure 5.1 provides a summary of the topics in relation to social changes, economic changes, lifestyle changes and

environmental changes that had occurred in the villages and subsequently discussed in detail in the sections that follow.

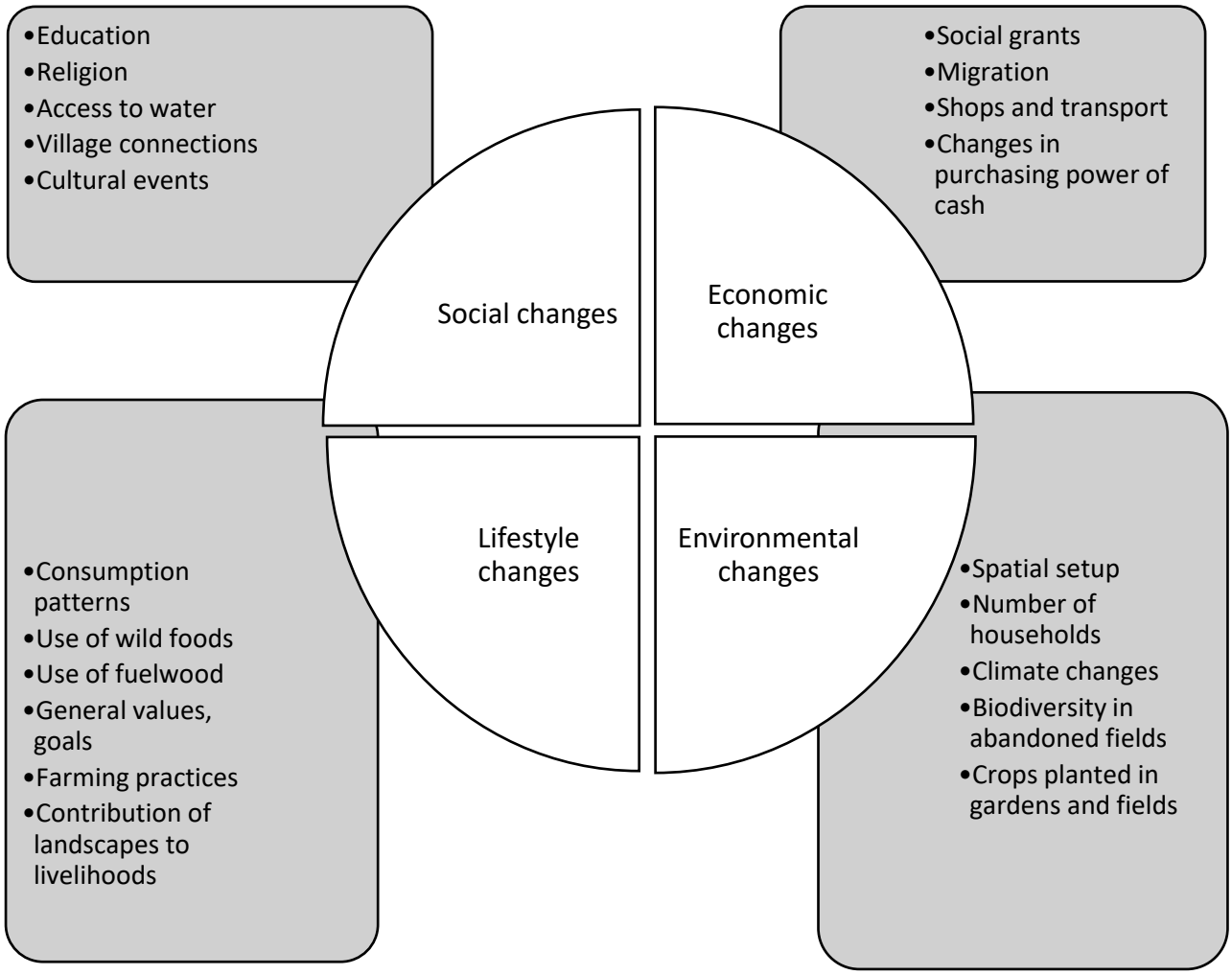

Figure 5.1: Changes experienced in the villages

5.3.1. Social changes

5.3.1.1. Education

Respondents recalled the presence of schools in their villages throughout their lives. During their teenage years, the highest level of education available was standard six. Once a child completed this level, societal expectations differed based on gender. Females were typically encouraged to pursue marriage, while males were expected to find work in the mines. At Gotyibeni and Melani respondents also indicated that young boys also seeked employment at Grabouw. However, for boys seeking employment at Grabouw, a weighing scale played a

determining role. In order to determine whether the person would be strong enough to handle the duties they were to carry out at Grabouw. Those who met the required weight were selected and transported via truck, while those falling short would return home to assist their parents until they attained the desired weight. A 65-year old male respondent at Gotyibeni said, "*they didn't care about age back then, they only wanted you to pass the scale, so even if a young boy was 15 years of age if they were of the right weight they would go*".

For those interested in working in the mines, it was important that they knew how to read, write, and count. A 67-year old female respondent at Mawane shared "*the people that were recruiting for mines wanted to make sure that you would be able to count your wages, write letters to your family since you would be gone for a long time, and read if you were sent a letter*". The respondent further added "*writing letters was the main form of communication at that time as cell phones were scarce*". Respondent further stated that unlike today, when they were young schools did not care about age, a boy could go to school even if he was old, so that he could learn the basic skills and go to the mines. This supports the driving forces of the DPSIR framework mentioned in chapter one, the societal expectations, gender roles, educational opportunities, and employment prospects in the villages are factors that drive the choices and opportunities available to the individuals in the community, particularly regarding education and employment in the mines and other occupations like working at Grabouw.

During the time when the respondents were young, parental preference leaned heavily towards their children getting married rather than pursuing education. It was common for parents to express concern if a girl child had not entered wedlock by the age of 20. A 79-year old female respondent at Gotyibeni shared "*when a girl child got close to 20-years without hope for marriage, the mother would bathe her with traditional medicine that would make her attractive to men that would want to marry her*". Those who did go to school only pursued teaching and nursing as careers, no other careers that involved education were known. An 83-year old female respondent at Melani noted "*you were a big deal if you become a teacher, most people that had an opportunity to go to school back then become teachers*" Another 67-year old female respondent at Mawane added, "*if you wanted to become something after finishing standard six then you did form two up to form four and you become a teacher. We didn't have colleges and universities, those come with you the current youth*". Females were often compelled to enter into marriage, and once married, they were expected to work in the fields of their husband's home. This parental preference for children getting married was a societal pressure as described

in the DPSIR framework, these pressures represent the societal expectations and practices that influenced the behaviour and decisions of individuals in the community during that time. Meanwhile, their husbands would venture out to urban areas to work and provide financial support for acquiring cattle and other agricultural necessities. The women carried the responsibility of tending to the agricultural labour, while their husbands fulfilled their duties financially away from home.

5.3.1.2. Religion

The respondents noted the changing religious landscape within village life. When the respondents were younger, churches were already part of the village community, coexisting with the prevalent belief in ancestral worship. However, they spoke of a noticeable shift that has occurred in recent times, with a greater inclination towards Christianity compared to the past, while belief in ancestral worship has reduced significantly. The respondents noted that during their youth, while Christianity existed within the villages, ancestral worship was the dominant spiritual practice. A 80-year old male respondent at Gotyibeni shared "*there used to be cultural festivities all the time when I was young, people slaughtered cows to give thanks and sometimes to ask for blessings from their ancestors*" Another 67-year old male respondent added at Gotyibeni "*almost all households did a ceremony called "uqinisa umzi" (protecting the homestead against evil spirits), this was to make sure that the household was protected by the ancestors of the home*". At Mawane, a 77-year old female respondent noted "*every child born in our time, and even our kids, the child's grandmother would do "imbeleko" (dedicating a baby to ancestors), however that is not done a lot for our grandchildren*". Churches primarily served as a means to acquire baptismal certificates for village members, which proved valuable for establishing one's age. However, it is important to note that not all churches followed this practice uniformly. Back then birth certificates were scarce, so individuals often relied on their baptismal certificates to ascertain their age. The belief in ancestors held deep cultural and traditional significance, influencing various aspects of daily life and community rituals. Churches coexisted alongside these traditional beliefs, but their influence was not as widespread as it is today.

In the present day, a significant transformation has taken place, with respondents noting that the majority of people have embraced Christianity to a greater extent, with fewer people still practicing ancestral beliefs. This shift towards Christianity can be seen as a reflection of wider

societal changes, such as increased exposure to external influences, urbanisation, and globalisation. The expanding presence of churches, along with the spread of Christian teachings, has played a significant role in reshaping spiritual practices within the villages. This provides insight into the current state of the religious landscape in the village, with a shift from ancestral worship to a greater prevalence of Christianity. It reflects the changes and transformations that have occurred over time in the spiritual and cultural practices of the community. Which supports the "State" component of the DPSIR framework which refers to the current condition of the environment or the society, including the prevailing cultural, social, and spiritual aspects (Yee et al., 2012). A 73-year old female respondent at Mawane commented "*the church would be one in a village, but now more people have opened churches, some people come erect a church for a month, do a crusade, village people would attend, by the time they leave, you find the wife at a certain household starting to speak ill of ancestorial activities and embracing the Christianity*". The respondent further added, *the churches have ended marriages especially in families where the man would be stubborn to join the Christian ways and stop practicing ancestral worships, however people like them*".

It is worth noting that this shift in religious beliefs can have profound effects on the social dynamics, cultural practices, and community cohesion within the villages. The transition towards Christianity may introduce new values, rituals, and modes of worship, potentially influencing individual behaviour and community interactions. A female respondent aged 75-years at Manqorholweni noted, "*less people believe in ancestors these days because the churches bash those who believe in ancestors*". Another 67-year old female respondent at Mawane added "*most people now speak ill of ancestorial worship, but it really works when you do those ancestorial activities things start working well for you*".

5.3.1.3. Changes in access to water

When the respondents were in their youth, they used to fetch water from the rivers, which were at a distance from the household, as also noted by Hebinck (2007) and Zantsi and Bester (2020) elsewhere in the Eastern Cape. A 77-year old female respondent at Mawane shared "*I fetched water a lot from the river growing up, I was the only girl child at home, and we had no water tank, every day I had to take a 20-liter bucket to go fetch water from the river that was about one to two km in distance and I had to go twice or three times in one day. I would put the bucket on my head. If I wanted to go less to the river that day, I would use a wheelbarrow and put two 20-liter bottle containers on it and push them by the wheelbarrow*". Hebinck and van Averbeke

(2007) supported that fetching water from the rivers for domestic purposes involved a considerable amount of labour, which was the responsibility of female members of households. After 1994, the government attempted to install taps to bring water closer to homesteads as noted by StatsSA (2009). However, some of the taps were no longer working, for example at Melani, some taps were vandalised, so residents invested in water tanks to harvest rainwater, and they still use rivers (across the villages) in times where rain was scarce mostly for doing laundry. A 73-year old female respondent at Manqorholweni noted, "*we take laundry to the river, and wash it there, wait for it to dry and carry it back home. At times we fetch water a day before filling a 80- or 100-liter drum and use it the next day for doing laundry*".

Vandalism of communal taps was not the case for all the taps installed in the villages. For example, a 65-year old female respondent at Melani indicated that they now obtained water from a communal tap in their street that was installed by the government, although some in other streets were not working. Other households had invested in rainwater tanks, therefore respondents in this village were no longer collecting water from the rivers. Similarly, Hebinck (2007) stated that at Koloni in the Eastern Cape there were communal taps, and water was available for free.

5.3.1.4. Changes in village connections

The changes that had occurred in Gotyibeni, Manqorholweni, Mawane and Melani affected social interactions and connections within the villages. The sense of belonging of village members and the relationships among members within the community had changed. In the absence of field cultivation respondents described how people now live for themselves, affecting how, as neighbours, they interact and connect with each other. Respondents across villages continuously mentioned how life was better "back in the days" when they were teenagers compared to currently. This was because people back then worked together in the fields, they had a cohesive community. People assisted each other on working in the fields and even in times of harvest, people also used to share a lot of harvested produce. Similarly, Shackleton et al. (2019) reported that when field abandonment occurs it leads to reduced intra- and inter-household cooperation, which could lead to decreased mutual assistance amongst neighbours in a village. The cessation of cultivation of fields has limited interaction between people. And it has led to hunger and poverty in the villages. An 89-year old male respondent at Melani stated, "*social relations were stronger when I was younger, people used to harvest together and cook together*. Another 75-year old female at Manqorholweni also lamented "*it is*

the last days, you can never ask for anything from your neighbour, no one gives to the other person if you need something you rather borrow from the shops, whereas back then you could ask for sugar from your neighbour". An 80-year old female respondent at Gotyibeni lamented "*there is no longer humanity".* Another 65-year old female from Melani added, *"I also don't give people food or my harvest for free, I sell to them. I only give for free to those who ask for seeds*". From the DPSIR framework, this highlights the social impacts of the changes in agricultural practices and community dynamics within the villages. These changes have influenced social relationships, cooperation, and the overall sense of community in the villages.

Respondents mentioned that conflicts in the villages started during the initial stages of field abandonment, when some had stopped cultivating while some continued. People with livestock that were not cultivating fields were not herding their livestock, which led to livestock raiding fields and damaging crops. This forced some of those still cultivating to also cease. This further illustrates the pressure component of the DPSIR framework. Pressure was exerted on the villages as a result of changes in agricultural practices as this led to conflicts and tensions among villagers, particularly regarding livestock activities and field cultivation, pressuring even those that wanted to continue with cultivation to cease. At Manqorholweni a 78-year old female respondent acknowledged "*People did not care about other people and the damage their livestock were doing to other people's fields*". While another 75-year old female respondent still at Manqorholweni said "*the cattle in the village used to have a camp where they were kept when we were all cultivating our fields to ensure that the cultivated fields were not disturbed, and they were looked after. But after some abandoned fields the fence was destroyed, and the livestock started to raid the fields that were still active*". Shackleton et al. (2013) and Shackleton et al. (2019) support that arable field abandonment may increase divisions when conflicts occur such as when one household's livestock destroys their neighbour's crops. Furthermore, Shackleton et al. (2013) showed that at Willowvale in the Eastern Cape, 22% of past farmers had noted that the damaging of fields by livestock was an important factor in driving some households to abandon field cultivation.

Respondents also discussed how COVID-19 impacted social relations in the villages. The pandemic significantly altered social interactions and gatherings, including funerals as noted by Fischer et al. (2023). Previously, funerals would last the entire day, starting around 9 a.m. and ending around 3 p.m. However, due to COVID-19 restrictions, attendance was limited to close family members, and ceremonies had to be completed by 9 a.m. This is also supported by

Fischer et al. (2023), who note that as social gatherings were prohibited, funerals were significantly scaled down. The once extensive cooking and communal meals after funerals were replaced with takeaways. Many people no longer attend funerals unless they were close to the deceased. While large funerals still occur, they are now rare compared to before COVID-19.

Additionally, respondents noted that COVID-19 prevented them from attending church services due to restrictions on social gatherings, and many continue to avoid church today. Other social events and traditional ceremonies, such as *imigidi* (celebration of coming back of a boy child from the mountain after initiation), also saw a decline in attendance. Previously, people would travel from distant villages to participate, but this practice diminished during the pandemic. Event procedures have also changed. Attendees now bring their own small bottles to ceremonies to avoid sharing, a practice that began with COVID-19. Traditionally, Xhosa events involved sharing a communal container of traditional beer called "Ibhekile," but now people prefer to use their own containers. A 67-year old female respondent from Mawane observed that neighbourly relations, which once extended to five houses away, are now limited to interactions with just the two immediate neighbours, these changes are also noted by Khowa et al. (2022).

Furthermore, although some individuals returned home after losing jobs during the pandemic, as noted by Kang et al. (2021) that most people were severely affected by COVID-19 through loss of jobs. Some households are now vacant due to the deaths of elderly residents from COVID-19 as noted by Khowa et al. (2022). In some cases, only one elderly person remains in a household, with their children in urban areas taking them in. A 78-year old female respondent from Manqorholweni shared that, after his neighbour's wife died, their children came to fetch the father. Unfortunately, he died shortly after arriving in Gauteng, leaving their home abandoned. The children, now working in Gauteng, no longer return for holidays as they did when their parents were alive.

5.3.1.5. Cultural events related to agriculture

A 67-year old male respondent in Gotyibeni indicated that when they were teenagers there used to be a celebration at the end of the harvesting season at the great place in the village (Chief residence). All village members would bring 10% of whatever they had harvested that season and there would be a celebration, using some of the maize and wheat fermented into African beer (umqombothi) to be used during the celebration. Respondents mentioned that African beer

has always played an important role in relation to festivities in the villages in the past and presently. For example, an 83-year old female respondent at Melani noted that when someone dies in the village, the male youth in the village gather at the bereaved family's home to dig a grave and in return, they would be given African beer and a cooked lunch. Similarly, Hebinck (2007) stated that beer made from sorghum played a critical role in the festivities of the Xhosa people and also was a means of exchange of labour and a tribute to the king. During the harvest celebration other village members would bring bags of maize, beans, calabash, pumpkins, watermelons, wheat, etc., that would be used as the next season's seeds to exchange with other village members so that they would get a variety they did not have. Some would also sell for cash rather than exchange for goods. This event ceased in the last ten years because people no longer had harvests to celebrate or share.

Respondents further identified that another major cultural change had to do with bride price (*lobola*) and how it is paid in the 21st century compared to when people had a lot of livestock during the 19th and 20th century. When people kept a lot of livestock, lobola was mainly paid for by cattle (see similar sentiments by Shackleton and Ntshudu, 2023). An 80-year old male respondent at Gotyibeni noted, "*a boy child after finishing standard six and could read and write and count, would go to work in the mines or Grabouw and then come back with money to cover initiation school costs. So, after they come back the first time they would then go for initiation and then when they go back again now as a man, they would buy cattle to add to his father's herd and this was a big deal*". The parents would be so proud when the boy starts buying cattle, they would see that now their child is really a man. Another 67-year old male respondent at Gotyibeni added "*back then there was no time for buying cars, a man would collect enough cattle so that they could start paying lobola with it now that they were a man. The next step after initiation was getting a wife, even if the father would supplement but the man worked for the cattle, they would use for lobola*".

Sometimes a girl child would be coming along well with school, and then a certain family would notice her for their son, and they would take her against her will for forced marriage and then that family would notify the girl's family that they will come with lobola. An 80-year old male respondent at Gotyibeni noted "*sometimes the girl's family would know about this arrangement that the girl would be taken but sometimes they wouldn't, but even if they didn't know the parents wouldn't see it as a problem as long as they will get cattle for lobola"*. The respondent added, "*most times this family wouldn't even take this girl child to school she would*

be responsible for wife duties like ploughing, but some would get lucky to be married into a family that would take them to school". However, people now pay for lobola with cash instead of livestock, see also Shackleton and Ntshudu (2023). They only buy one beast that will be slaughtered during the day of the celebration. Lobola was also said to have occurred a lot when respondents were young as compared to now that they are in their 70s. One 83-year old female respondent at Melani started "*you are lucky if your child gets married these days, most of them have kids when they are still teenagers and never get married, we raise their children with them here at home*". Another 65-year old female respondent at Melani added "*we did not have children outside marriage back then, we got married young and started having children only when we were in our marriage unlike youth of today*".

5.3.2. Economic changes

5.3.2.1. Social grants

Respondents noted that households were mainly dependent on social grants now, which had divided the people in the community even further. Many life history interviews in other studies also acknowledged dependence on social grants although they did not meet all the needs of the household, and they could only be used for basic needs as echoed by Shackleton and Luckert (2015). When respondents were young, they noted that receiving social grants was not easy. A person only started to receive social grants when they started showing grey hair. A 80-year old male respondent at Gotyibeni noted "*back then they didn't consider age, especially because people were also not sure about their age, a person would just see someone whom they grew up with receiving social grant and then go to apply for it. However, the system back then you had to show grey hair to be considered old. Even though the whole head didn't have to be grey, but you had to have some even if few*". The respondent further added "*the child support grant was not there, if it was there, it was only for white people, and we did not know about it*".

This meant that people had to work hard using their hands ploughing their fields and keeping cattle to have food. This was a different time when people shared with each other. However now people are mostly dependent on social grants alone, which has affected the villages. A 73-year old female respondent at Mawane shared that "*before, people exchanged food, you could ask for food from your neighbour but now you have to wait until you have your own money from the social grant*". Policy makers who supported the introduction of social grants thought improving the living conditions of those in rural areas would avail extra time for agricultural

activities; however, this encouraged new aspirations and influenced field abandonment note Zantsi and Bester (2020). Respondents mentioned how life has become expensive without cultivation of fields, affecting the willingness of members in the village to assist each other with basic needs such as food when one is in need. It was now difficult to even ask for food from a neighbour. The head of the family will only eat with their family what they had at home even if it was insufficient for all of them. When times get extremely tough, they can only ask from a neighbour what they would be able to bring back, otherwise the neighbour will never help them again.

At Manqorholweni a 75-year old female respondent spoke on how their social grant money is doing more than it is supposed to "*we were supposed to be enjoying social grants money but instead we are using it to buy food that we could have got from the fields if we were still cultivating. We no longer share food with other village members because we all have so little*". Similarly, Sinyolo et al. (2016) stated that social grants generally benefit the whole household, although they were only received by vulnerable groups such as the young, old, and disabled. Hebinck (2007) add that by 2004 child support, pensions and remittances played a huge role in the way rural people make a living.

5.3.2.2. Migration

The participants indicated that most of their children, including those who went to schools, were now either in Cape Town or Johannesburg to seek employment as there was no employment in the towns close to the villages. Hebinck (2007), Cocks et al. (2017), Du Toit (2017) and Zantsi and Bester (2020) note that post-apartheid led to many poor people from rural areas migrating to urban areas to seek employment or look for better services. This migration was because they wanted a pathway out of poverty and wanted to improve their livelihoods as noted by Mathebula et al. (2016). One 73-year old female respondent at Mawane shared that "*they are in the cities, however they don't send money much because the piece jobs they get that side do not pay much, they give birth to kids that side and then send them to me here with their cards for child support grant, so I support the kids with their social grants and my pension from government*". Hebinck (2007), Shackleton et al. (2013), Fay (2015) and Shackleton et al. (2019) support that migration leads to homes in the villages to be dominated by the elderly and young children who are primarily dependent on welfare payments and social grants. Migration highlights the village's responses to the challenges posed by the declines in arable field cultivation and lack of employment opportunities. Response is a component of the

DPSIR framework. The "Response" represents the actions taken in response to the identified pressures (such as arable field abandonment) and impacts (such as poverty) on the environment or society.

5.3.2.3. Shops and transport

Respondents recalled a time when access to shops was scarce, with typically only one shop available in a village, often owned by a white person. This single shop would serve not only the village but also the surrounding two or three villages, becoming the central hub for people's supermarket needs. However now, the shops are owned by black village people, and also with the influx of foreigners in the early 2000s most shops are owned by them renting at a village homestead. A 77-year old female respondent at Mawane noted "*you don't have to go to town to buy a few households things, even meat you can get it at the shops in the village. There are two owned by foreigners, and one owned by a retired teacher who kicked out the foreigner that was renting the shop at her homestead while she was still working. She started selling herself with her eldest daughter after she come to stay home after losing her job because of COVID-19*".

Transportation, too, was a challenge in the earlier days. The dominant mode of transport was a bus, which operated on a fixed schedule and only made limited trips throughout the day. One 89-year old male respondent from Melani highlighted the inconvenience of relying on the bus, stating that if someone missed the designated bus time, they would have to wait until the next scheduled trip. Unlike the readily available transport options of today, getting around was much more restricted back then. For longer distances, the primary means of transportation was the train. However, the respondents noted that trains did not stop at every village. Instead, people had to travel to specific locations or neighbouring villages to catch a train. For instance, a 80-year old male respondent at Gotyibeni added, "*for long distances people mostly used a train, but you had to go to certain places to catch the train it didn't stop everywhere, for instance it didn't stop at our village we had to go to the next village*". The train primarily catered to those traveling to Gauteng, a province known for its economic opportunities.

5.3.2.4. Changes in purchasing power of cash

The respondents implied that there is more pronounced poverty nowadays compared to when they were teenagers. Respondents put the higher levels of poverty experienced in the villages

on the changing value of money. A 65-year old female respondent in Melani shared their memories of the past, emphasising the purchasing power that R2 held in their youth. She recounted how parents could confidently send their children to the shops with this amount, knowing it would suffice to buy valuable household necessities. It is worth noting that at that time, R2 consisted of four tickeys, smaller denomination coins that were part of the currency at the time. One 79-year old male respondent at Gotyibeni remarked, "*there is more poverty now, because of the big monies that are prevalent in the economy we must use. Whereas back when I was young R2 was a lot of money which you could use to buy sugar, mealie meal, and teabags, not to mention if you had R5, you had substantial amount of money*". Another 79-year old male respondent at Gotyibeni added, "*we used to have cents, that were called pennies, 5 pennies made a 5c which had value back then*".

The respondents noted that in the present economy, R2 no longer retains its previous value. They expressed a sense of longing for the smaller denomination coins, such as cents or pennies, which used to hold considerable value. Unfortunately, these smaller denominations have phased out of circulation, leaving only higher denomination notes and coins. Consequently, the respondents perceived these higher denominations as lacking value, primarily due to the steep rise in the prices of goods and services. The declines in the value of money have repercussions on poverty levels for the respondents as the economic shift to higher value notes and coins has contributed to financial hardships during a period when fields are abandoned for them to depend on.

5.3.3. Lifestyle changes

5.3.3.1. Changes in consumption patterns

The participants' views on consumption patterns were variable although they all agreed that consumption patterns had changed. At Manqorholweni and Melani respondents indicated that they had changed for the worse, while at Gotyibeni and Mawane respondents indicated they had improved with the abandonment of cultivation of arable fields. Similarly, Sharma et al. (2018) notes that considerable structural shifts have been observed across the globe when it comes to consumption patterns. A study by Hadju et al. (2020) conducted between Cutwini and Manteku revealed similar results to those from Gotyibeni and Mawane. In both villages more participants see the current consumption patterns and life after field abandonment as better,

with over 55%, compared to 10% who said the same and 35% who said worse (Hadju et al., 2020).

Respondents from Gotyibeni and Mawane indicated that food had become expensive compared to when they were young. Purchasing food might be more expensive than cultivating it, however, respondents said that they eat better now. Respondents indicated they eat more vegetables now because they know they are good for them, whereas decades ago certain foods were only given to adults and children missed out. A 65-year old male respondent from Gotyibeni said "*back in the day there was nothing called several colours where you eat different vegetables in one meal, we were only eating pap and cooking oil only*". At Mawane another 73-year old female respondent said, "*we grew up not eating meat, it was only eaten by elders during our time and as children we were only given pap and cabbage, now we eat what we want to eat whenever we want, there is always meat in every meal*". Those that were not cultivating fields were said to be buying the vegetables from the shops with the money they received from the social grants. Shackleton et al. (2013) note that people in rural areas have disposable cash income from remittances, and state social grants, so they would purchase food in urban markets rather than grow their own. The new patterns of consumption require cash and are difficult to maintain without field cultivation and livestock farming as noted by Hadju et al. (2020). Ronquest-Ross et al. (2014) stated that in South Africa the total food expenditure on fruit, vegetables and processed food had increased. The decline in field cultivation has led to an increase in reliance on purchased food which increases the need for cash and will likely lead to households being more vulnerable to increases in food prices (Shackleton and Luckert, 2015). Oral histories from a study reported by Shackleton et al. (2019) indicated community elders recalled a time when most, if not all, staple food requirements were produced by households and supplemented to a small extent by purchases made with money remitted by household members in urban areas.

The views from Manqorholweni and Melani were that people used to eat a variety of vegetables in one dish when they were cultivating fields, whereas now people mostly eat starchy, oily dishes with smaller portions. Similarly, Shackleton et al. (2019) state that the general diet of rural households in South Africa is dominated by starchy staples such as maize and limited protein and dietary diversity. Ronquest-Ross et al. (2014) shared similar views by stating that in South Africa consumption of starchy foods has increased. An 89-year old male respondent at Melani added, "*we eat smaller portions now because we need money to buy food and it is*

expensive, we cannot even offer visitors food". According to Hadju et al. (2020) by 2016 most households relied on purchased food even for previously cultivated staple foods like maize. Shackleton et al. (2019) add that the proportion of rural people buying food in recent years has significantly increased as the importance of local agriculture has decreased. Moreover, the reliance on supermarket purchased food is also encouraged by driving factors such as increased drought and floods to which smallholder farmers are vulnerable to, as noted by Shackleton et al. (2019).

Another 83-year old female respondent at Melani added "*now portions of food are smaller and are only starchy, whereas dishes in the olden days used to even have names to serve different kinds of food from the garden, now the plate is small, and full of oil, you don't even get full*". Similar findings are shared by Hadju et al. (2020) and Sharma et al. (2018) who note recently people's diets have changed significantly, to increased consumption of meat, processed snacks and carbonated drinks. Sharma et al. (2018) further noted that there is a visible shift towards more global food products, which are food items that are not part of the staple diet. Another 65-year old female respondent also in Melani added "*consumption patterns have changed because money is scarce, we used to have different vegetables from the fields but now we have to buy them in town, and they still finish before month end*". At Manqorholweni, a 78-year old female respondent shared "*we used to eat homemade mealie meal*". Another 75-year old female respondent at Manqorholweni added "*back when my husband was still alive and cultivating the field, we used to get maize, pumpkin, beans, and vegetables from the garden. We were also able to feed livestock from the harvest we got from the field and when the livestock was big enough, we would then slaughter and sell in the village*".

Respondents across the villages shared the same sentiment that there was a high frequency of anxiety and worrying about food before the month end because of how expensive the cost of living had become as now they must buy food from the shops with the little money they receive from social grants. Studies show that people receiving social grants would purchase food rather than buy inputs for cultivation as echoed by De la Hey and Beinart (2017). Fay (2015) also added that those receiving social grants are less likely to cultivate. However, living like this meant that the people were vulnerable as not all households were receiving social grants and there were many households without employment. An 89-year old male respondent from Melani conveyed "*we buy even the things we were not supposed to be buying like maize to feed chickens while back then we used to get maize from the fields*". Another respondent, a 75-year

old female from Manqorholweni shared "*we used to get vegetables from the fields but now we have to buy them in town, and they get finished before the end of the month, abandoning fields has brought us poverty*". At Manqorholweni, a 73-year old female respondent said, "*nowadays if you do not have money you will starve. We worry too much about food before it is the end of the month. We last had enough food when we were still cultivating fields*". Another 83-year old female from Melani shared "*we used to eat nutritious food and we raised healthy children and now all we do is worry about how we are going to get the next meal*".

An 80-year old male respondent from Gotyibeni said "*we eat vegetables from shops that are not fresh unlike ones from the garden or field. This is why we are suffering from chronic diseases like diabetes, that our parents never experienced. The sicknesses that we live with now were not there when people ate vegetables from the ground*". Another 77-year old female respondent from Mawane added "*we survive by buying, in the olden days people were not getting sick the way they do now, there were no chronic diseases which means we were eating healthy and fresh foods then*". The transformation in diets had led to a nutrition transition that leads to different health challenges relating to the spread of non-communicable diseases, such as heart diseases, diabetes, asthma, hypertension, etc. as noted by Dolislager (n.d). As mentioned by Njwaxu and Shackleton (2019) and Shackleton et al. (2019) indigenous and domesticated vegetables nurtured in the fields and gardens are important for providing vital vitamins and micro-nutrients. Hebinck et al. (2018) and Hadju et al. (2020) state that wild foods and agricultural produce are fresher and more nutritious compared to store bought food and are not expensive so one can easily afford them. So growing food locally could decrease vulnerability to unhealthy diets. Furthermore, income diversification could be an important means of improving access to food through non-farming generating activities together with farm activities to avoid reliance on purchased food which exposes poor groups to food price unpredictability (Shackleton and Luckert, 2015). Bourne et al. (2002) and Shackleton et al. (2019) note that given sufficient disposable income for households to afford store bought food, household food security and stability would improve, however incidence of non-communicable diseases associated with diets rich in calories and refined foods would increase.

5.3.3.2. Use of wild foods in the villages

Although the use of wild leafy vegetables (*imifino*) was minimal in the villages at the time of data collection, respondents noted that when they were young people would eat them a lot and enjoyed it as a daily meal. Respondents alluded that they ate imifino a lot during the time of

field cultivation because they were poor and could not afford to buy some of the food they eat and enjoy now. A 79-year old male respondent at Gotyibeni stated "*not that we really liked imifino back then, we didn't have a choice we were poor, now we take our social grants money and buy meat in town*". Now respondents across the villages only eat imifino occasionally when they feel like enjoying it. The respondent added "*sometimes you find yourself missing it, and you go to your garden and take Nomdlomboyi and call over your neighbour and have it, but only after a really long time*". Respondents also indicated that imifino were readily available during the time of field cultivation because most are weeds amongst the maize and other planted vegetables. So, whenever local people went for weeding, they would come back with imifino and cook the weeds as a meal mixed with mealie meal. As fields are now abandoned there is a lot less imifino. However, the respondents noted that some imifino still grow, in some newly abandoned fields, but people are no longer that interested in eating them.

Moreover, respondents also alluded that as the years since abandonment increase the imifino declines and the area ends up being dominated by grass and shrubs and eventually trees. For example, a 67-year old female respondent at Mawane noted that when a field has been abandoned for over five years then there is overgrowth of grass which replaces the leafy vegetables, making it hard to find them. A 83-year old female respondent at Melani stated, "*we no longer go to the forested area of old field unless we looking for fuelwood, then you also look if you can't find any imifino that is scarce in the garden you haven't ate in a while so you can cook it when you return*" Hebinck and van Averbeke (2007) state that successional processes associated with long-term fallowing led to loss of some of the resources such as thatch grass and increases in other resources such as fuelwood, as also shown empirically by Njwaxu and Shackleton (2019).

When someone wants imifino nowadays, they would mostly go to collect them from newly abandoned fields, while those cultivating home gardens would get them as part of the weeds in gardens. Shackleton et al. (2013) in Willowvale also found that non-timber forest products (NTFPs) are less commonly used nowadays compared to the past because people have cash incomes, mostly from social grants, to buy fuel for cooking (electricity, gas, and paraffin) and meat and vegetables. Hadju et al. (2020) noted that there are changes in people's preferences for food, such that people preferred store bought food over collecting and eating imifino.

5.3.3.3. Use of fuelwood

Respondents indicated that fuelwood was no longer collected as often as when they were young. All households in the villages were now connected to electricity and people used it for lighting their houses, refrigerators, and cooking. Fuelwood was now mainly collected when they were going to have an event that required prolonged cooking for many people, such as cultural celebrations like *imigidi* (celebration of coming back of a boy child from the mountain after initiation) and ceremonial activities like funerals. Fuelwood was also used when they experienced loadshedding, which was a common challenge in most of the villages at the time of data collection in 2021. However, those who could afford it used paraffin and gas stoves during loadshedding. A 67-year old female respondent at Mawane stated "*I haven't gone to collect fuelwood in over 10 years, I make sure I have money for paraffin when there is loadshedding, even if I don't have the money I ask from my children or ask from my neighbour and pay her later*". Another 83-year old female respondent at Melani shared, "*my older children hire the village ladies to go collect fuelwood for us, there are ladies who go collect fuelwood all the time because they mostly cook outside to save electricity as money can be scarce, sometimes they also collect for other households to get paid, especially a household that has a funeral or umgidi*". The respondent further added "*the is also a truck from one village household that helps with collecting fuelwood and water, some hire them, but they are more expensive than the ladies*". These changes were supported by Hebinck (2007), Hadju et al. (2020) and Zantsi and Bester (2020) who noted that people living in rural areas had replaced many of their old activities with modern activities like replacing collecting fuelwood for cooking, with using electricity. The use of electricity in the villages had expanded with all households having with electric lights, refrigerators, and cookers.

Hebinck (2007) further added that the use of mobile cell phones was also common by 2004. The shift to using electricity and the abandonment of arable fields had changed several activities village people used to do together to strengthen social connections. Respondents recounted how they used to harvest together and share the harvest, also how they would make a fire, sit around it while cooking together from the harvest and eating. They felt like these are practices that kept them together, especially as women and nurtured a more cohesive community, were long gone now. A 83-year old female respondent in Melani also mentioned how COVID-19 exacerbated the situation even further. The respondent indicated life has not returned to normal since the pandemic; people became accustomed to staying indoors and remained cautious about

the virus, especially during the data collection period in 2021. The emphasis on safety continued with rigorous precautions, including avoiding visitors altogether or, if a visit was necessary, ensuring that visitors were sanitised, wore masks, and did not stay long. These measures often made people seem unkind and unwelcoming. Before COVID-19, there was already a decline in field cultivation, but the situation worsened afterward, mentioned the respondent. The pandemic contributed to a decline in agricultural activity, with others stopping cultivation entirely even on plots that were still operating for many years in this village. Similarly, Hadju et al. (2020) reported that life between 2002 and 2016 had changed in villages of the Eastern Cape, in that people used to spend evenings sitting on mats by the fire, nowadays replaced by sitting on sofas in houses with electricity (Hadju et al., 2020).

5.3.3.4. Changes in generational values, goals, and ambitions

The respondents indicated that when they were children, they knew that during the ploughing and planting seasons they would wake up early around 4 a.m. and possibly spend the whole day in the field working, while one would remain at home cooking and then bring the food to those working in the fields. They stated that this is something that children nowadays do not experience as they are growing up with fields already abandoned. They recalled this worked well, especially for big families. The head of the household would use family labour. Working in the fields was enjoyed by the children at the time, it also played a huge part in bringing the family together. A 78-year old female respondent at Manqorholweni stated "*my mother had eight children, six boys and two girls, the boys would wake up very early and get the oxen ready for ploughing. Me and my sister would have to prepare the food, and when we brought it to my mother and siblings in the field that's when we would also help with planting, it was a nice time*". De la Hey and Beinart (2017) observed that there was a connection between household size and agricultural production capabilities of a household, as larger households tended to have greater potential to farm, whilst smaller households (often headed by women) tended to be the most vulnerable. On the contrary, results from Sinyolo et al. (2016) showed that in 2014 in KwaZulu-Natal there was a negative relationship between household size and the proportion of household field cultivated, because bigger households tend to be less dependent on agriculture compared to smaller households. At Gotyibeni, a 79-year old male respondent shared similar sentiments he stated, "*in the olden days we would wake up at 12 o'clock midnight to go work in the fields and come back around 5 am and prepare for school*". This respondent went on to share "*the youth of today has no interest in cultivation, they want to work in offices*".

The youth of today were said to view being woken up in the early hours of the morning as abuse.

A 65-year old female respondent at Melani also mentioned that even the home gardens were abandoned in households where elders had died, and thus the youth were neglecting how people used to live. A 73-year old female respondent at Manqorholweni mentioned "*we use to help our parents during ploughing and planting season, we got older, and our grandchildren cannot help us*". A 89-year old male respondent at Melani stated "*the youth from back in the day used to work in the fields, but youth today does not want to cultivate instead they destroy whatever you are trying to do as an elder in the household, they also use lot of drugs and are not focused on developing themselves through fields*" Another 80-year old male from Gotyibeni shared "*we used to be assisted by youth from other households and we would pay them by giving them some harvest*". Another 65-year old female from Melani also added, "*youth today does not want anything to do with the fields, only the older ones still pay attention to cultivation, we now have to hire tractors to assist us because the youth is not interested*". Respondents indicated that the current youth is not interested in cultivation. Those that were interested in partaking in field cultivation were said to only be willing to do the work on condition that they get paid. At Gotyibeni a 67-year old male respondent stated, "*when we were youth, we used to help our elders without expecting to get paid, fields are abandoned because we do not have money to pay the youth*". At Melani respondents stated that the youth viewed working the fields as hard work, especially because to go to the fields they need to wake up early. Woolard (2013) and Shackleton et al. (2019) suggested that in South Africa most of the youth afforded farming a low status and a less desirable occupation.

This means that interest in farming in the villages is currently dominated by elderly individuals who are less able to meet the physical demands of producing food. This was supported by a 65-year old female respondent at Melani who stated, "*back then we used to have a lot of harvest, people from town used to come with their bakkies to buy in bulk from us, but now we do not produce a lot because of physical incapability and the youth that are still physically able are not interested in cultivation, most of them are on drugs*". Similarly, De la Hey and Beinart (2017) and Shackleton et al. (2019) state that the socio-cultural values of youth have changed. The elders felt that the youth had ambitions and goals that were different from themselves when they were young. They pointed out that the youth of today valued education, while in contrast they had valued working in the fields because that was how they were raised. A 79-year old

male respondent at Gotyibeni noted "*they want to work in other sectors as long it is not farming, they do not want to work in the sun*". Another 73-year old female respondent from Manqorholweni added "*the youth has no interest in cultivation, they want to work in offices*". Hebinck (2007) and Tafere and Woldehanna (2012) shared the same sentiments as they stated young people are increasingly looking for salaried job opportunities and life beyond farming. They have high educational aspirations dissimilar to what they grew up seeing from their parents, which is farming (Tafere and Woldehanna, 2012).

Most of the educated youth were indicated to have left the villages. The youth that remained in the villages were mentioned to be engaged heavily in drugs and alcohol and were not interested in any activity that would help develop them like cultivating the fields. Those that were educated and remained in the villages, it was said that their education was not seen as making much contribution as many of the educated youth was still unemployed in the villages, as alluded by a 77-year old female respondent in Mawane, "*life was better back then though we were doing hard labour, these days you can still take a child to school, and they still don't get a job*." Even in cases where unemployment was not the case, the graduates who had studied different aspects of agriculture were looking for employment for scarce white-collar jobs in the government or corporate sector. This meant that they were not taking back the knowledge they had learnt to uplift their communities, thereby abandoning what they spent several years studying in universities. As the educated youth were finding it hard to get employment, this made village dwellers criticise the government for their lack of development for rural areas as also noted by Hadju et al. (2020).

Elders expected the youth to be actively engaged in productive agricultural activities like field cultivation that would lead to food sufficiency and also offer economic benefits by selling some produce. A 75-year old female respondent at Mawane noted "*it would be good if the children would get involved in farming, it would take them away from drugs, and they also become pregnant as early as 14 years, this would not happen if they worked the fields because they would have something that keeps them busy*". At Melani a 83-year old female respondent noted, "*even if we can work fields, we cannot do much we don't have the energy for it, only the youth would be able to work large areas of land that can produce good harvest*" however, another 73-year old female respondent at Manqorholweni added "*today's youth is lazy, they are always tired it is not easy for them to get involved in farming activities*".

However, one could argue that since respondents stated that fields had been abandoned for a while, the youth were not motivated to work in the fields because that was not something they grew up observing around them. So, the abandonment of fields likely plays a major role in youth not taking up farming as argued by Shackleton and Luckert (2015). Their interests may be influenced by other things (Shackleton and Luckert, 2015), driven by increased exposure to social media and popular culture.

5.3.3.5. Changes in farming practices

The respondents felt the villagers were using modern farming methods, while traditional methods of cultivation were disappearing. Traditional farming methods represent the experiences of local farmers accumulated over centuries (Singh and Singh, 2017). These indigenous methods of planting are of cultural and biological evolution that occurred over centuries and are locally adapted to complex farming systems that have assisted local farmers to manage a variety of environments to meet their local needs (Rankoana, 2017). In traditional planting systems, crop yields depend on internal resources such as recycling organic matter, rainfall patterns and built-in biological controls (Altieri, 1999). Modern farming systems are mainly dependent on technology and access to resources like equipment and information throughout the production system (Malthus, 2018). Modern farming systems include development of new crop varieties using molecular breeding technologies and genetically modified crop systems, and the construction of large irrigation systems (Kale and Chavan, 2020).

One of the common sentiments mentioned by respondents in all villages was the current reliance on tractors over oxen for ploughing, which speaks to the increased use of machinery as part of technological development in modern farming systems. Respondents indicated that the oxen had drastically decreased in the villages because they had died, or they had been stolen, slaughtered, or sold. Similar observations of declines in oxen which compromised the ability of many households to plough fields were also made by Shackleton and Ntshudu (2023) in the Eastern Cape. The use of tractors had increased the cost of cultivation. At Mawane 73-year old female respondent shared "*we used to cultivate with oxen but now we are cultivating with tractors, cultivation is no longer hard labour as it used to be*". At Melani an 83-year old female respondent shared "*we are now using tractors instead of using oxen, and we need money to hire the tractors, our children have no skills of ploughing with oxen, they were never taught*".

Another common sentiment was the use of purchased fertiliser over manure from the kraal. At Gotyibeni a 67-year old male respondent noted "*back then we used to get manure from the kraal, and we were getting a lot of harvest but now we have to use fertilisers bought from the shops, so now cultivation is only for those who have money because it is expensive*". A75-year old female respondent at Mawane further added "*if you want to get good harvest these days you must use fertilisers during planting whereas back then we were just planting without it*". Rankoana (2017) mentions that traditional farming systems use kraal and poultry manure to maintain soil fertility, retain moisture and avoid pests. Modern farming on the other hand is chemical fertiliser and pesticide-based, which raises concerns over their toxicity on the environment and hazardous nature on humans as well as animals and micro-flora (Kale and Chavan, 2020).

At Gotyibeni, a 79-year old male respondent compared the yields of modern methods of cultivation to that of traditional methods and stated, "*we were getting much harvest when we were using the traditional farming methods for household consumption and selling, the modern methods give us harvest for household use*". On the contrary, Rankoana (2017) stated that many traditional crop farming systems are characterised by low productivity and instability of production. At this present time, traditional farming techniques are said to be unfruitful and unable to meet the needs of an ever-growing population, as it has many drawbacks like diseases and pest management therefore making it less economically beneficial (Kale and Chavan, 2020).

At Melani those that were working at the projects where they were cultivating, they removed weeds by hands and hand-hoe as I observed during data collection when I visited the projects, this was done to remove weeds so that they do not compete with the crops for water and sunlight and disturb the growth of the main crop. During the 17th century Hebinck (2007) mentions that women used digging sticks to prepare the land. The use of iron hoes in crop production only become common after the Europeans arrived (Hebinck, 2007). Indigenous knowledge of local people is therefore important in farm decision-making to respond to anticipated poor yields.

The respondents were worried that all the traditional knowledge they had would be lost to the youth as most modern methods are taking over. At Gotyibeni a 80-year old male respondent went on to share "*traditional farming skills have not been transferred to the youth and that worries me as an elder*". At Melani a 89-year old male respondent alluded "*the traditional knowledge is disappearing; we are worried that we will die and leave our children not knowing*

valuable knowledge regarding farming skills". Respondents were heavily worried that farming skills had not been transferred to grandchildren, that it had ended with their children, and therefore poverty would never end.

Traditional knowledge of farming is still valuable as noted by Rankoana (2017), especially because modern methods are expensive for rural communities. These are methods they could use to ensure food security at low costs. Traditional farming practices improve soil structure, maintenance of crops and the selection and storage of seeds for replanting as noted by Rankoana (2017). Traditional agricultural systems are diverse, adaptable, and often nature friendly (Singh and Singh, 2017). FAO (2009) estimated that 75% of the world's crop diversity will be lost in the 21st century due to replacement of local varieties by genetically modified varieties. Modern agriculture is known to increase yields, but it does that while leading to several environmental problems such as climate change, food unsafety, biodiversity loss, soil degradation and environmental pollution (Singh and Singh, 2017; Zhang et al., 2017). The use of new varieties in crops is a threat to traditional crop knowledge, modern agriculture is a major driver of loss of crop genetic resources (Singh and Singh, 2017).

The productivity of traditional agriculture systems is not high enough to meet current food demands, though they may support a variety of societal and ecosystem services (Herath et al., 2013). Modern agricultural systems are highly productive and effective though vulnerable to climate changes and markets due to their optimised nature (Herath et al., 2013). Therefore, to sustain and enhance the rural agriculture production systems, there is a need for integration of traditional agriculture with modern agriculture, so as to combine the resilience of traditional systems with the efficiency of modern systems.

5.3.3.6. Contribution of landscapes to livelihoods

Respondents at Melani and Gotyibeni indicated that they collected wild leafy vegetables (*imifino*) from the rewilded areas, mostly *Amaranthus hybridus (nomdlomboyi)*, *Sonchus asper (irwabe)*, *Solanum retroflexum* (*umsobo)*, *Senecio inornatus (inkanga)* and *Barleria sp (nzinziniba)*. Most preferred was *nomdlomboyi*. For Xhosa people food needs can also be supplemented from the surrounding natural environment such as the gathering of fruits, and other edible plants, the collection of honey and the hunting of wildlife, these all can contribute to the diet of the Xhosa people as noted by Hebinck (2007) and Hebinck and van Averbeke (2007). Therefore, it can be argued that local people have always combined growing, grazing,

and gathering even when most arable land was still cultivated (Hebinck, 2007; Hebinck and van Averbeke, 2007). For example, several of the companion weeds of maize were collected for use as *imifino* and they still are.

Respondents however indicated that the rewilded areas did not benefit their cattle; they were not palatable for cattle grazing. However, those who had goats indicated that they were benefiting from the overgrown shrubs as the goats would browse them. The rewilded area would also benefit cattle during times of cold rainy weather as they would seek shelter there, while sheep benefited from the shade when the temperatures were too high. Rural communities rely on great diversity of ecosystem services. A 65-year old female respondent at Melani stated "*The rewilded areas do not benefit our cattle for grazing they are not palatable*" however, the same respondent added "*during times of cold rainy weather the cattle goes next to the trees to seek shelter and the herders struggle to get them home in the evenings when the weather is bad because they know there is no protection for them at the kraal. The sheep go there for shade when it is too hot, especially when shearing of the wool has not been done.* Another 73-year old female respondent at Manqorholweni stated *"the trees and shrubs in the abandoned area is good for browsing goats*". Fallow fields may be used for grazing livestock, particularly cattle, and for the gathering of herbs, grass, and woody plants for various purposes (see Hebinck and van Averbeke, 2007; Shackleton et al., 2013; Njwanxu and Shackleton, 2019). These patterns may go unnoticed; however, they are important alternative uses of abandoned arable land because they have environmental and economic benefits as noted by Hebinck and van Averbeke (2007).

An 83-year old female respondent at Melani stated, '*the landscape in the village used to be green with food, but now it is full of gumtree, and although gumtree helps with flue and COVID-19, but it has taken away from people because instead of food now there are weeds*". Respondents indicated that the overgrowth of gumtrees in the landscapes was beneficial as they also provide medicines and were significantly beneficial during COVID-19 pandemic as people used it for steaming. Njwaxu and Shackleton (2019) note that provisioning services are particularly important for communities and households with limited financial or physical access to markets and non-land-based livelihoods options. An 89-year old male respondent at Melani noted "*we were scared of COVID-19 because we are old, but we steamed everyday with gumtree leaves, and we didn't get sick at all*". Before and after COVID-19 it was generally used for steaming by people who had flu. The gumtree bark was also used from time to time

by people as a first aid splint when an animal had a fractured leg. A 77-year old female respondent at Mawane noted, "*the male in the village use gumtree bark a lot to heal injured animals, we have adapted to using the gumtree to benefit us as it is all around*". Parul et al. (2021) state that the oil extracted from the different parts of gumtrees (leaves, stem, fruits, and buds) has anti-bacterial, anti-septic, anti-oxidant, anti-inflammatory and anti-cancer properties. These properties can be used in the treatment of respiratory diseases, flu, sinus and congestion, pain in joints, analgesic, etc. as noted by Parul et al. (2021). Gumtrees also provided poles to build kraals and for roofing when building houses. Respondents indicated that some people made money from harvesting the poles and selling to those building a house or kraal. At Gotyibeni a 79-year old male respondent added "*there are people who make business in the village by collecting gumtree poles with their trucks and selling them to people building a house or doing roofing on a house, sometimes the people from that household if they are male, they go collect it themselves*" Fahad et al. (2020) concur with the uses of gumtrees. Farmers also used gumtrees for fuelwood, Fahad et al. (2020) added. Hebinck and van Averbeke (2007) support the idea that fallow fields provide medicinal and edible plants, thatch grass and fuelwood.

The roofing of the great house (indl'enkulu) in the homestead was mostly done with thatch grass collected in the abandoned fields. The thatch grass was also used during cultural ceremonies to cover the floor of indl'enkulu, so that the person doing the ceremony and a few elderly family members can sleep in this house on top of the grass with umqombothi in front and centre of the house. A 75-year old female respondent at Manqorholweni stated "*we used to get grass to make roofing and sell to other people as well, now the livestock eat the grass before it becomes longer*". Hebinck and van Averbeke (2007) and Shackleton et al. (2019) also suggest that abandoned arable land can have hidden patterns that may contribute to the livelihoods of the rural people such as gathering, and cultural and spiritual needs.

The significance of landscape changes varied according to the observations of the respondents as at Gotyibeni a 65-year old male respondent said, "*our household field is as green as it was back in the days because we have always been cultivating*". While another 67-year old male at Gotyibeni stated "*there are now buildings and re-vegetation where it used to be people's fields, so the environment and landscape have changed"*. The use of locally collected wild resources, contribute to all facets of rural life, including for energy, construction, food, health (via medicines) as well as cultural products and a sense of identity as noted by Shackleton et al.

(2013) and Njwaxu and Shackleton (2019). A global synthesis concluded that NTFPs contribute on average 28% of household cash and non-cash income, and often exceeds agricultural income (Angelsen et al. 2014). For Example, Shackleton et al. (2013) showed that past (44%) and present (48%) cultivators at Willowvale used re-vegetated old fields as their primary source of NTFPs. The availability of NTFPs is vital for many rural households (Njwaxu and Shackleton, 2019). The variety of plant species gathered and used by people in rural villages of Koloni and Guquka was about the same from arable fields and communal rangelands (Hebinck, 2007).

5.3.4. Environmental changes

5.3.4.1. Changes in village spatial arrangement

The changes that had occurred in the villages had further led to a growing disconnect between people and the land. The respondents opined that fields were often quite a distance from the homestead. The homesteads were located together, and fields were on the other side. This spatial disconnect had contributed to field abandonment in the villages because the respondents indicated that they were older now and were unable to walk such a distance. They would get there already tired while still required to work, so they preferred to cultivate their gardens instead of fields. For example, a 65-year old female respondent at Melani attributed the abandonment of fields to distance "*the fields and plots are far now as I got older to walk a long distance, so I stopped cultivating the field and focused on the home garden because I have a passion for cultivation*". Shackleton et al. (2013) and Hebinck et al. (2018) commented that the forced relocations that occurred from 1960 to 1983 of formerly dispersed households into nuclear villages resulted in increased distances between homesteads and fields. Fay (2015) noted that the proportion of households at Hobeni cultivating distant fields had dropped from 65% in 1998 to 22% in 2009.

The spatial separation of fields from homesteads in the rural areas of the Eastern Cape was termed betterment planning, and it was largely shaped by the recommendations of the TomLinson Commission (Van Rooyen, 2000). In the 1950s, the South African government appointed a commission led by TomLinson to address the challenges of land use and rural development in the country (Van Rooyen, 2000). The commission's findings and subsequent policy proposals heavily influenced the implementation of betterment planning in the Eastern Cape and other regions. The TomLinson Commission advocated for the consolidation of

fragmented land holdings into larger, more productive units, and the relocation of rural homesteads to designated settlements (Van Rooyen, 2000). The aim was to create more efficient agricultural systems, enhance productivity, and provide improved infrastructure and services to rural communities (Van Rooyen, 2000).

However, the implementation of betterment planning was not without controversy. Critics argued that it undermined traditional land rights, disrupted social structures, and failed to adequately consider the needs and aspirations of local communities. Despite the debates surrounding its efficacy and social implications, the influence of the TomLinson Commission on betterment planning in the Eastern Cape cannot be overlooked, as it laid the groundwork for significant changes in land and community planning approaches in the region (Van Rooyen, 2000). The betterment planning programme further contributed to the decline in field cultivation and other agricultural production activities (see Fay, 2009; Fay, 2015; Shackleton and Luckert, 2015; Cocks et al., 2017; Hebinck and Shackleton, 2018; Shackleton et al., 2019). As communities were uprooted and restricted, the consequences included disintegration of the established economy as noted by Mgushelo (2019). This impacted social structures and farming systems that had been in place for generations (Andrews, 1992; Hebinck, 2007).

5.3.4.2. Changes in the number of households

A major change in the rural landscape of the villages was the growth in population which led to increases in the number of homesteads per village. Similarly, Hadju et al. (2020) showed that between 2002 and 2016, in Cutwini and Manteku the number of households in both villages grew, by 19% and 14% respectively. All respondents in the villages indicated that new families had come into the villages and were given sites by the village headmen to build their homes. Some of the new homes were the offspring from the households that had been in the villages, starting their own families. Similarly, in Cutwini, Hadju et al. (2020) showed a tendency for young people to start their own households at an earlier age. Only respondents at Gotyibeni indicated that some of the housing sites allocated to people were previously fields. At the other villages the replacement of fields with homesteads was minimal, the new homesteads were mainly replacing grasslands, though respondents feared the replacement of fields by human settlements would eventually increase as the fields had been abandoned for many years. Similarly, Akinyemi and Speranza (2022) noted that between 2000 and 2018, 28% of arable fields and 8% of rangelands were replaced by human settlements and infrastructure in around Africa. A 83-year old female respondent at Melani stated, "*we have more houses now in the*

village, it's not like when there was a huge space between homesteads, two of my sons have homes as well here in the village they have wives and were given stands to build".

The number of homesteads per village had increased significantly across all the villages. This change is notwithstanding the labour migration of some of the village youth to urban areas, resulting in rural populations being dominated by aging populations. At Gotyibeni, a 65-year old male respondent noted, "*they took the land where most of our fields were placed and build a company that produces bricks, this takes away a chance for us to even go back to field cultivation, as that company keeps expanding*". As stated by Jaszczak et al. (2018) the changes in traditional rural landscapes include an increase in the number of people concentrated in the same area and the change in the activities they do. For example, Hebinck and van Averbeke (2007) showed a similar trend in Koloni and Guquka wherein both villages' parts of the natural landscapes had been converted to residential land to accommodate growth in the population.

5.3.4.3. Climate changes

Respondents at Manqorholweni, Mawane, and Melani, stated that rainfall was scarce and had been for over 20 years, indicating that drought and perhaps climate change had played a significant role in cessation of field cultivation in these areas. KC and Race (2020) and Subedi et al. (2022) noted that climate change, a worldwide occurrence, has contributed to rising uncertainty in agriculture, resulting in the abandonment of farmland. Moreover, when rains did come, the respondents noted that it would rain heavily for a short period, sometimes leading to localised flooding. Therefore, rainfall was unreliable for village people to depend on it. Similarly, KC and Race (2020) reported that in Lamjung District in western Nepal, erratic rainfall patterns and extreme weather events, such as drought and hailstorms, had become more frequent and had increased the incidence of crop failures which subsequently reduced crop production.

A 89-year old male respondent at Melani stated, "*There is shortage of water in the village, we haven't received good rains in a long time*". A 73-year old female respondent Manqorholweni stated "*it has been dry for too long in our village, summer rains are just drizzles now, it doesn't even fill up a 2000 liter tank most of the times, that also encouraged people to stop cultivating because fields were rainfed and no rain means no harvest*". Another 65-year old female respondent at Melani stated, "*to cultivate the fields with this drought we have these days one would need an irrigation system like the one they are using at the plots, but no one can afford*

it". Thus, it seems that climate change has also played a role in forcing some households to cease cultivation of fields as they have experienced more frequent droughts and more floods. The respondents indicated that this was intensifying and therefore in order to cultivate the fields one would need an irrigation system. Those at Melani cultivating the home gardens indicated that they could irritate the crops with water from the rainwater tanks which would not be possible on a large field. Shackleton and Luckert (2015) state that under global climate change the southern African region is projected to become hotter and drier, facing more droughts and more severe frequent floods, which will impact local livelihoods and human wellbeing.

5.3.4.4. Crops planted in the fields and gardens

Respondents noted that during the time fields were cultivated they would usually plant maize as the main crop, intercropped with beans, pumpkins, and watermelons. A 75-year old female respondent at Manqorholweni mentioned "*we use to plant huge areas of maize and beans; the harvest would be too much such that we even sold some*". At Melani an 83-year old female respondent noted "*we had huge harvest of maize, bakkies would come to buy from us in bulk, we also planted pumpkin, and beans, everything we planted in the fields was doing well the harvests were good*" Similar observations were made by Shackleton et al. (2019). During that time, in the homestead gardens they would plant potatoes, beans, and vegetables like green pepper, beetroot, cabbage, and spinach, etc. However, now that the fields were abandoned and they were mostly cultivating in home gardens, the dominating crop in the garden was maize, intercropped with vegetables.

The respondents were previous cultivators of fields, however they were cultivating gardens at the time, though not all of them cultivated their gardens annually. It was mainly in Melani where the two female respondents cultivated their gardens annually, even at the time of data collection. They showed me their gardens as we were having the interview, the gardens were planted with spinach, cabbage, carrot, peppers, green onion, beetroot, potatoes, and maize; both gardens were intercropped. The other respondents indicated that they sometimes skip a season or two due to financial constraints. A 65-year old female respondent in Melani said "*I plant everything in my garden, maize, spinach, cabbage, carrots, green peppers, and potatoes. I plant everything in the garden because I cannot plant the field because I am old. When my son is around, we even borrow our neighbours garden and put more maize and potatoes there, but we always plant green leafy vegetables here in our garden*. Hebinck (2007) acknowledged that previously the Xhosa people cultivated grains, roots and other vegetables in the fields and

gardens. Historically, sorghum was the predominant grain in the Eastern Cape until the introduction of maize in the 17th century and by the 19th century it was widespread in the Xhosa gardens and fields. Hebinck (2007) further supported the statements from respondents when he stated that in the late 18th century the Xhosa fields would mainly be planted with maize, and the rest of the field would be planted with vegetables.

5.3.4.5. Biodiversity in abandoned fields

Respondents at Melani and Gotyibeni noted new bird species with the re-vegetation of abandoned fields. Similarly, Zakkak et al. (2015), Kamp et al. (2018), Salaverri et al. (2019) and Subedi et al. (2022) state that rewilding after field abandonment can create favourable environments for bird species to expand. Though this impact on bird communities is tangible, how big it is depends on the type of bird, where they come from, and the kind of habitat they need (Subedi et al., 2022). An increase in wildlife such as snakes and bees were observed in the abandoned fields across all villages. Blair et al. (2018) and Subedi et al. (2022) state that bush encroachment may create a favourable space for pests and wild animals to come closer to where people live. A 75-year old female respondent at Manqorholweni noted "*it is scary going close to the fields now, we are sure that the area is full of snakes, as it has turned to trees and grass. Ever since fields become abandoned, we started seeing more snakes in our yards especially when its summer, they are coming from the old fields*". Another 79-year old male respondent at Gotyibeni stated "*children who go play by the fields always come back with honey, the are many beehives within the abandoned fields that have now turned into forests, but we always worry they will be bitten by snakes, since you can't stop kids, we always tell them to be careful*".

At Melani a 89-year old male respondent mentioned "*we have seen many new birds that were not there when fields were cultivated, these birds now affect the ones cultivating in the plot projects, they go there and damage their crops. If you are cultivating in the plots, you now have to stay the whole day in the fields so you can keep the birds away. This means that if someone wanted to recultivate the fields now, they would have the problem of the birds which would interfere with yields*". Shackleton et al. (2019) and Subedi et al. (2022) state that any change in vegetation structure can have an influence on the vegetation characteristics and animal populations, which may alter the abundance of avifauna and invertebrates, which in turn can affect the few remaining fields (Herd-Hoare and Shackleton, 2020).

5.4. Conclusion

In conclusion, the abandonment of field cultivation has led to profound transformations in village life, affecting education, spirituality, social relationships, agricultural practices, food consumption, and lifestyle. The shift from communal support to individualism, coupled with conflicts between those who continued cultivating and those who stopped, has fractured community cohesion. The increasing reliance on social grants and the decline in traditional spiritual practices, replaced largely by Christianity, reflect broader changes influenced by urbanisation and globalisation. These changes have also contributed to economic divisions and a loss of traditional farming knowledge as many young people migrate to cities. While modernisation has improved access to resources like shops and electricity, it has also exacerbated poverty and altered dietary patterns, leading to health challenges. Additionally, the decline in the availability of wild leafy vegetables and the loss of traditional farming practices are notable concerns. To address these issues, it is recommended that targeted initiatives be implemented to preserve traditional knowledge and practices while promoting sustainable agricultural methods. This will help bridge the knowledge gap and enhance community resilience. The next chapter will explore the impact of field abandonment on the youth and assess their perspectives on this issue.

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Chapter 6: Evaluating perspective of youth on the field abandonment in the ECP and KZN

Abstract

The decline in youth interest in agriculture and the migration of rural labourers to other sectors have led to a shortage of agricultural workers and an aging rural population in South Africa. This shift has resulted in a rise in abandoned arable fields and a predominance of older farmers. While some view agriculture as a potential solution to youth unemployment and poverty, understanding youth aspirations is crucial for engaging them in the sector. A focus group discussion (FGD) with 30 participants from each of four villages highlighted constraints such as lack of capital, resources, information, and land access, which contribute to a perception of farming as unviable. To counteract these trends, it is essential to introduce targeted funding, public awareness, land access policies, and agricultural education. Recognising the diverse aspirations of youth and providing tailored support can help enhance their participation in agriculture, ensuring its future viability and contributing to food security.

Keywords: field abandonment, youth aspirations, financial constraints, smallholder agriculture, rural development

6.1. Introduction

Agricultural land abandonment is an increasingly prevalent trend observed in rural regions worldwide (Cheteni, 2016; Yan et al., 2016; Subedi et al., 2022). In West Europe, it was noted since the 19th century (Gellrich et al., 2007) and recently, it is also observed in Eastern Europe (Baumann et al., 2011; Prishchepov et al., 2013). For example, a total of 128.7 million hectares of farmland was abandoned in Europe, during the period from 2001 to 2012, which accounted for approximately 25.4% of the entire farmland in the region. Some occurrences were observed in parts of America from the early 20th century, and later in Southeast Asia (Fox et al., 2009; Rhemtulla et al., 2009). This phenomenon has also been observed in the former Soviet Union (Baumann et al., 2011; Prishchepov et al., 2013). For example, following the dissolution of the Soviet Union in 1990, a significant area of agricultural lands, totalling more than 40 million hectares, was observed to have been abandoned over the course of 20 years (Prishchepov et al., 2012). In South Africa, cropland abandonment emerged during the early 20th century (Mkhongi and Musakwa, 2022), and rates vary widely between sites (Blair et al., 2018). For example, at

Willowvale in Transkei, the rate was 0.1% per annum from 1961 to 2009, while near Lebowa, it ranged from 1.6% to 2.6% between 1989 and 2000 (Blair et al., 2018).

One of the primary socio-cultural factors contributing to this phenomenon is the waning interest of the younger generation in engaging in farming activities (Blair et al., 2018; Shackleton and Hebinck, 2018; Onyima, 2020; Kodom et al., 2022). And the migration of numerous rural labourers to work in other sectors which has resulted in a shortage of agricultural labourers and has contributed to the ageing rural population structure in rural areas (Xu et al., 2017; Xu et al., 2019; Murtagh et al., 2023). Concerns have been raised by elders in rural areas regarding the disinterest of youth in farming, often labelling them as lacking motivation due to their aversion to physical labour (Shackleton et al., 2013; De la Hey and Beinart, 2017; Shackleton and Hebinck, 2018). For example, in Ethiopia, only 9% of the rural youth were interested in getting involved in agricultural activities (Bezu and Holden, 2014; Chipfupa and Tagwi, 2021). This issue of youth disinterest in rural farming is particularly noticeable in South Africa, where it has resulted in a rise in abandoned arable fields (Cheteni, 2016). Consequently, in such regions farming communities are predominantly comprised of older farmers, with only a limited number of young individuals involved (Heide-Ottosen et al., 2014; Murtagh et al., 2023). For example, a significant number of farmers in Europe are nearing retirement age (Murtagh et al., 2023), while in Ghana, aging cocoa farmers, with an average age of around 55 years and a life expectancy of 55 to 60 years, contribute to low cocoa production (Kodom, 2022), in South Africa most farmers have an average age of 61 years (Mujuri and Obi, 2022).

According to Geza et al. (2021), Osabohien et al. (2021), and Zegeye et al. (2022) approximately 60% of the sub-Saharan region population is under 35 years of age and most of them are unemployed and living in rural areas. In Kenya, Njeru et al. (2015) reported that approximately 64% of unemployed people are the youth. In Ghana the population is dominated by youth, with 38.2% falling under the age category (15-35), of these, 27% (15-24 years) are out of school, and 30% are unemployed (Kodom, 2022). The lack of involvement of youth in farming is a challenge in South Africa, where youth unemployment rates are as high as 43% for those between 15 and 34 years old, and young individuals often harbour diverse aspirations and career goals that may not align with traditional perceptions of farming (Haruna et al., 2019; StatsSA, 2020; Mthi et al., 2021; Zegeye et al., 2022). The unemployment levels are reported to be even worse for youth residing in rural areas (Filmer and Fox, 2014; Sumberg and Hunt, 2019).

Agriculture is viewed by some as the possible saviour for South African youth trapped in a cycle of poverty and unemployment (Swarts and Aliber, 2013). Thus, involvement of youth in agriculture holds potential significance for ensuring food security, promoting sustainable development, and addressing a variety of rural challenges (Mthi et al., 2021). Therefore, understanding the aspirations of youth in relation to agriculture is crucial for developing strategies to attract and engage them in the sector (Haruna et al., 2019; Murtagh et al., 2023). By examining their aspirations, which may include desires for social impact, entrepreneurship, or sustainable practices, it becomes possible to align agricultural opportunities with the evolving interests of young individuals (Mthi et al., 2021; Swarts and Aliber, 2013; Murtagh et al., 2023), and thereby perhaps slow or reverse de-agrarianisation trends.

Agriculture plays a significant role in employment creation, food provision, nutritional security, and reducing social inequalities and poverty in Africa (Geza et al., 2021) and elsewhere. It has the potential to create close to one million new jobs in South Africa alone by 2030, of which half would be in the smallholder sector, meaning self-employment (Swartz and Aliber, 2013; Geza et al., 2021). The youth can play a vital role in agricultural and rural development (Midgley and Bradshaw, 2006, Cheteni, 2016; Mthi et al., 2021; Murtagh et al., 2023). Through agricultural generational renewal which refers to having an adequate number of young individuals who are willing and capable of choosing farming as a business, thus enabling agriculture to positively contribute to the local economy and community (Murtagh et al., 2023). This renewal aims to address the age imbalance in the profession by attracting more young farmers and making farming a more appealing and sustainable livelihood, which, in turn, enhances the overall well-being of rural areas (Murtagh et al., 2023). This is because engaging youth is crucial for fostering a vibrant rural entrepreneurship sector, which is essential for the sustainability and resilience of rural areas (De Guzman et al., 2020; Licciardo et al., 2022; Murtagh et al., 2023). Moreover, the youth are more adaptable to change, which is an important factor for agricultural development as they are more willing to adopt new ideas, concepts and technologies which are critical to transforming the agricultural sector (Afande et al., 2015; Cheteni 2016; Mthi et al., 2021; Murtagh et al., 2023). Thus, youth participation presents any nation with an opportunity to expand the agricultural sector and reduce unemployment (Cheteni, 2016).

If more youth could take up agriculture it would promote continuity of a sector dominated by an aging population of farmers (Swarts and Aliber, 2013; Chipfupa and Tagwi, 2021). Rural

farmer populations across the developing world are aging (Heide-Ottosen et al., 2014; Mthi et al., 2021). Therefore, involving young people would provide a succession plan in the sector (Zegeye et al., 2022). However, Swarts and Aliber (2013), Bernsen et al. (2022) and Murtagh et al. (2023) note that the youth in the rural areas are more educated than their parents' generation, making them less inclined towards envisioning a future life in rural areas, this prompting aspirations amongst many for secure employment in non-farming sectors.

The above-mentioned contradiction from literature highlights the need for a comprehensive understanding of the contextual factors influencing youth involvement or aspirations for agriculture and the importance of identifying and supporting those youth who are interested in farming. Noting that, youth participation in agriculture could lead to economic independence of the youth themselves and ensure the future of agriculture and food security (Kidido et al., 2017). Agriculture is known for bringing many opportunities that could develop the youth (Kidido et al., 2017). However, the youth may be less interested in field cultivation or to identify themselves with activities of farming in rural areas as they want to experience what seems appealing to them from those living in cities (De la Hey and Beinart, 2017; Shackleton et al., 2019).

The primary objective of this chapter is to explore the perceptions and aspirations of rural youth, in relation to farming, given the prevalence of fallow fields, specifically focusing on the study villages where male youth dominate the population, however, fields are abandoned despite their physical ability to engage in agricultural labour. The study aims to uncover the underlying reasons behind their lack of engagement to improve their lives, even in the face of significant unemployment rates and limited opportunities. As in South Africa even the educated youth were finding it hard to get employment. This means that it is important to come up with strategies that market and promote the farming sector in a way that is attractive to the youth the same way other sectors are marketed and promoted (Zegeye et al., 2022). This way the youth would be attracted to farming like they are interested in the other sectors. Additionally, the research aims to identify any potential future cultivators within these villages and evaluate their inclinations towards alternative sectors. By examining the factors contributing to the neglect of agricultural activities, the research can provide insights and potential solutions to encourage the youth in these areas to actively participate in farming and enhance their livelihoods.

6.2. Methodology

6.2.1. Study sites

Please refer to chapter one, section 1.4.1 for detailed information on study sites.

6.2.2. Data collection

A focus group discussion (FGD) was conducted with 30 participants in each of the four villages. This was done during the second visit of household interviews on impacts. I organised the youth, (anyone between the ages of 18 to 35 in the household) from the households where youths were available for the focus group discussion. The youth that joined the focus group discussions were unemployed and staying full-time at the village in their family homes. Each FGDs took about 45 minutes to one hour per session. The FGDs were conducted in the local language relevant for each study area, thus, in IsiXhosa at Gotyibeni and Melani, and IsiZulu at Manqorholweni and Mawane. The meetings were tape recorded and I also took notes. I was the main facilitator, while research assistants were also present and assisted in stimulating discussions. A set of discussion topics were prepared as a guide for the FGDs. The points covered during the discussions included what are the goals and ambitions of the youth, and what contribution do those goals play in your village? Is field cultivation important in your village? In what way is it important (socially, economically, culturally, environmentally)? Do you think that the youth of the village imagine a future for themselves as being a farmer, or farming being part of their lives? What do you think the village and the surrounding lands will look like in 30 years' time? Do you think the youth is losing interest in agriculture? This chapter combines results and discussion.

6.2.3. Data analysis

The data was analysed using content analysis. Content analysis is used to interpret the content of messages, including texts, images, symbols, and audio data. It aims to determine the meaning within the text (Gheyle and Jacobs, 2017). Content analysis is characterised as a research technique that allows for replicable and valid inferences from texts or meaningful material to the contexts in which they are used (Krippendorff, 2004; Gheyle and Jacobs, 2017). It aims to identify similarities and differences within the text, offering opportunities to analyse both manifest and descriptive content, as well as latent and interpretative content (Graneheim and Lundman, 2004; Graneheim et al., 2017). This approach, also known as an inductive or data-

driven approach (Schreier, 2012; Krippendorff, 2013; Graneheim et al., 2017), involves searching for themes and patterns in the data. The researcher identifies and describes these patterns using categories and themes at different levels of abstraction and interpretation, moving from the specific to the general (Graneheim et al., 2017). Furthermore, content analysis assumes that groups of words reveal underlying themes, and the co-occurrence of keywords can indicate associations between concepts (Duriau et al., 2007). First impressions, thoughts, and initial analysis are noted, leading to the emergence of labels for codes, which form the initial coding scheme (Duriau et al., 2007). Codes are then categorised based on relationships and linked together to form meaningful clusters. These clusters are further organised into categories, and a tree diagram can be created to establish a hierarchical structure. Definitions are developed for each category, subcategory, and code, and exemplars are identified from the data to support the findings (Duriau et al., 2007). Depending on a study's purpose, researchers may explore the relationship between categories and subcategories further by examining their concurrence, antecedents, or consequences (Hsieh and Shannon, 2005). This methodology provides a replicable approach to accessing deep individual or collective structures such as values, intentions, attitudes, and cognitions (Duriau et al., 2007).

With this research the FGDs were labelled accordingly, i.e., with the name of the village where the meeting took place. I listened to the recordings and wrote down word for word what the participants said, this was also compared with the notes I wrote down during the FGDs. After transcription, I coded sentences, for example ideas or themes as well as new or unexpected ideas that the participants said were coded. After coding all sentences these were grouped into sub-themes where all quotes with similar meaning were grouped, then after the sub-themes were translated to one theme of clear meaning reflecting the aim and objective of the study. Figure 6.1 gives an example of how the focus group data was analysed.

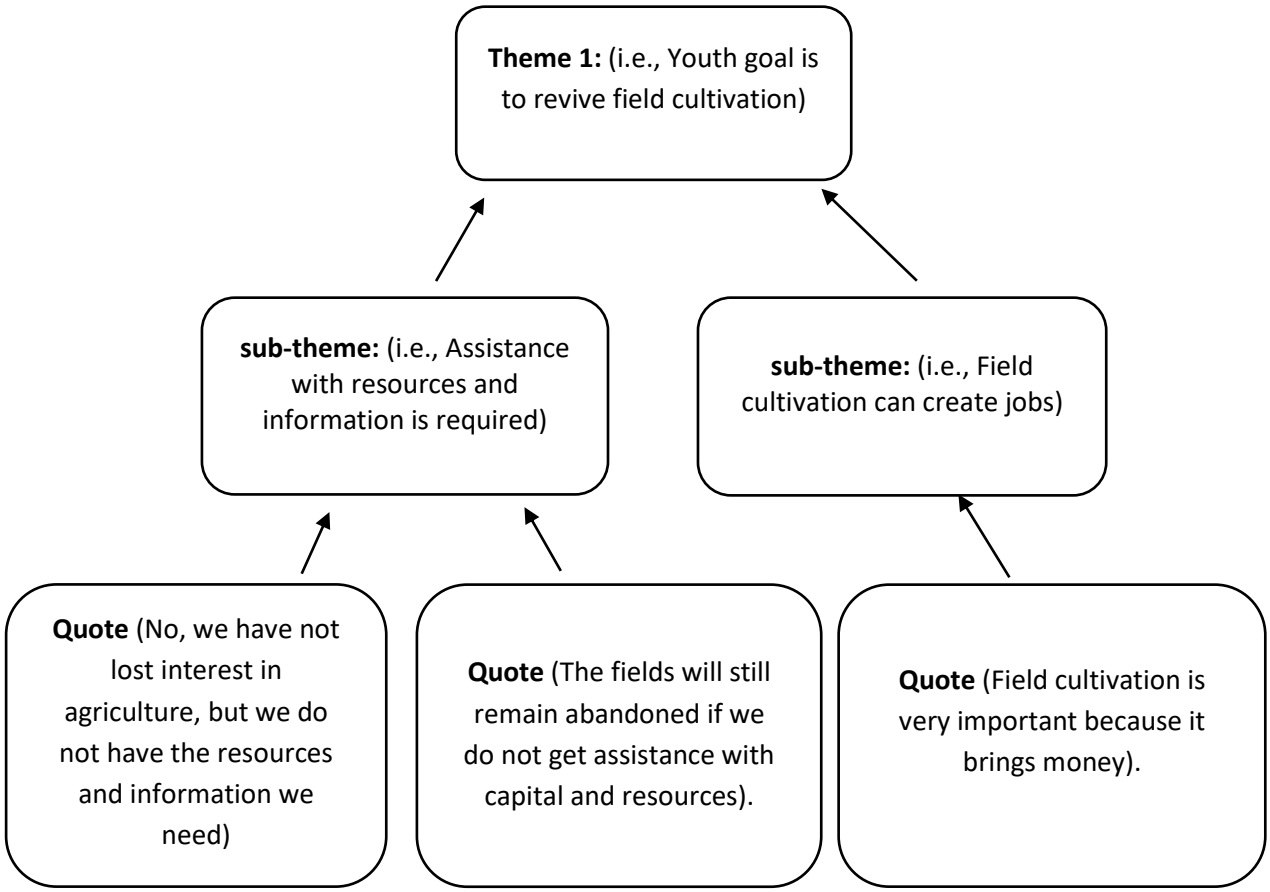

Figure 6.1: A flow chart showing content analysis of focus group discussions

6.3. Results and discussion

In this section, the DPSIR (Driving forces-Pressures-State-Impacts-Responses) framework is evident in its analysis of the youth's involvement in agriculture across villages. The driving forces influencing their participation include their interest in farming, which is evident from their aspirations and acknowledgment of the importance of agriculture for livelihoods. However, several pressures hinder their engagement, such as limited access to capital and resources, lack of information on starting and sustaining agricultural projects, and land tenure issues. These pressures result in the current state where none of the youth are currently involved in farming, despite their interest. Instead, they rely mainly on social grants for their livelihoods. The impacts of this disengagement are seen in limited economic opportunities and decreased agricultural productivity, leading to food insecurity in the villages. To address these challenges, the proposed responses involve the formation of cooperatives and youth organisations, seeking government support for capital, resources, and land, and improving knowledge-sharing and training opportunities. By understanding and addressing these components of the DPSIR

framework, potential pathways to reviving agricultural involvement among the youth and fostering rural development can be explored.

6.3.1 Profile of participants

The groups consisted mostly of males, such that at Melani and Manqorholweni it was 70% males and 30% females, while at Gotyibeni and Mawane it was 100% males. A 31-year old male participant at Mawane stated "*we wish there was something that we could do as the youth that will open job opportunities in the village especially for men. The number of us male youth in the village is more than the number of females*". Most of the participants had secondary education as their highest level of education. All respondents expressed that they were unemployed, although some were actively looking for employment though it was difficult because they did not have post-matric education. Similarly, Mthi et al. (2021) showed that over 78% of the youth in the Eastern Cape was unemployed. Zegeye et al. (2022) further reported that 52% of the youth in rural areas of South Africa were unemployed but were actively seeking employment. Moreover, the study villages were located far from towns, making it difficult and costly for these youth to seek employment. However, even if employment opportunities were available the limited education could be linked to lack of skills beyond secondary school which could limit the employability of these youth in the formal sector as noted by Chipfupa and Tagwi (2021). As Zegeye et al. (2022) states, most of the youth in rural areas have never been employed and their poverty levels are very high, and hence promoting agriculture in the rural areas is an important option.

The males were more concerned about unemployment compared to females. A 29-year old male participant at Mawane stated "*most of us have completed matric, a long time ago but we are still unemployed. There are only a few who got the privilege of going to universities*". Cheteni (2016), Mbah et al. (2017), Chipfupa and Tagwi (2021) and Mthi et al. (2021) also found that most of their respondents had secondary education.

6.3.2. Lack of involvement of the youth in farming

The FGDs showed that currently, none of the youth across the villages were involved in field cultivation or any form of farming, although many were interested in it. Similarly, Cheteni (2016) showed that over 60% of the youth at Nkonkobe were not participating in any agricultural programmes. A 33-year old male participant at Gotyibeni shared "*we not involved*

in field cultivation or any form of farming currently, but one of the goals we have as the youth of Gotyibeni is to go back to cultivation of fields". This is in contrary to Nigeria, where Onyima et al. (2020) showed that more than 60% of Nigerian youth derive their livelihood from various activities within the agricultural value chain. The participants across the villages were mainly dependent on their parents' social grants for sustenance. Similarly, at Nkonkobe, Cheteni (2016) showed that 60% of the youth were dependent on social grants for their livelihoods. Zegeye et al. (2022) showed similar findings that the youth in South Africa were the biggest beneficiaries of social grants and remittances whether directly or in directly.

6.3.3. Youth aspirations in relation to agriculture

The youth's aspirations in relation to agriculture were heterogenous, but dominated by those with high interest in farming, whether directly or indirectly. For example, participants at Mawane stated that for them agriculture is not hard labour, it is an activity for the youth as they are still young and have the energy for the physical work required in fields. These sentiments are contrary to common views in the literature that youth is not interested in agriculture such as those by Shackleton et al. (2013), Cheteni (2016), De la Hey and Beinart (2017), Blair et al. (2018), Shackleton and Hebinck (2018) and Shackleton et al. (2019). Similarly, results of other studies show that the youth in rural areas have a negative perception about agriculture and that they are regarded as lazy and not interested in the sector because it requires physical work, while some see it as a dirty job (see Cheteni, 2016; De la Hey and Beinart, 2017; Shackleton and Hebinck, 2018, Kodom, 2022). Although most of the youth in the villages grew up when fields were already abandoned and only the practice of home gardening and keeping of limited number of livestock was taking place, both male and female participants were aware of the importance of farming, particularly field cultivation.

A 33-year old male participant at Mawane noted "*cultivation and forestry are few of the job opportunities that can be a success in our village if we can get capital*". Another 30-year old male added at Mawane "*we see our village as one of the places where its wealth is in the land we have around us*". The youth across the villages regarded agriculture as a source of livelihood. Moreover, they were informed by the elders of the previous wealth of their villages based on agriculture, as they were coming from previously farming households. Similarly, Mthi et al. (2021) also observed that 80% of the youth in the Eastern Cape came from families with a farming background. They were told that this wealth came from keeping livestock and

cultivating fields. A group of 10 male participants between 25 and 30 years old at Gotyibeni stated "*we see ourselves as future farmers of Gotyibeni location because job opportunities are scarce, nothing can change that we are unemployed except farming and wealth comes from the land. We are a hungry generation for land".* However, this wealth in the villages was lost due to abandonment of fields together with declines in livestock, which had led to food insecurity within many villages.

Although they grew up observing limited agricultural activities, the youth were aware of the importance of cultivation and wanted to revive it. Most participants noted that recultivation of fields was their main goal as they were ambitious about farming, this was the dominating view across all villages. At Melani a 34-year old female participant noted "*we wish to revive field cultivation but with the assistance of capital and resources from the government*". Another 30-year old male at Melani added "*we see ourselves utilising the land of our forefathers, we live in poverty now because fields are abandoned*". They aspired to run their farms and cultivate large fields. Another 27-year old female participant at Melani noted "*we see ourselves as farmers in the village employing other people*". However, Geza et al. (2021) and Zegeye et al. (2022) state that rural youth involvement in farming activities may be circumstantial and not necessarily driven by aspirations. The circumstances could be lack of employment, or wanting to ensure that they inherit the land from the parents as noted by Geza et al. (2021).

Participants at all villages except Melani, and a few participants at Manqorholweni, wished to be hands-on in working in the fields. They stated that they are aware that elders think they are lazy, but this was not the case. Similarly, Naamwintome and Bagson (2013) showed that in Sissala area of Ghana, 69% of the youth that remained as others migrated, were willing to participate in agriculture within the districts. The participants were all unemployed and indicated that not doing anything had led to some of them getting involved in drugs and alcohol. At Gotyibeni a 25-year old male participant noted "*if we can cultivate the fields many people can get jobs, and the rate of drug use could decrease because we will all be concentrating on making money*". However, other participants at Manqorholweni indicated that their goals and ambitions, of being involved in agriculture, especially livestock production and field cultivation, had no place in the village because of lack of resources to realise them. A 20-year old male participant at Manqorholweni noted "*our goals and ambitions have no role in the village because we are sitting with them, there is nothing we are doing about them*".

In contrast, some participants from Manqorholweni especially females shared different sentiments, indicating that to them cultivation is not that important, and they do not see themselves as farmers in the future. They would rather work in other sectors. They stated that working in the fields requires too much energy and is difficult. They further stated that cultivation is old-fashioned, it is something to be done by older people and not the youth. Cheteni (2016) and Kodom (2022) note that some youth see farming as a dirty job, hence most of them shunned it. These participants did not associate having a good life with agriculture. Kodom (2022) states that the negative perception of agriculture in the public eye plays a significant role in discouraging young individuals from pursuing farming as a livelihood activity. This group of five female participants aged 19, 25, 27, 28 and 30 years noted "*we don't see why the youth should waste their time on cultivation, the elders should do it, unless we can be assisted with tractors so that we don't work too hard ourselves*".

The participants who were not interested in agriculture indicated that their preferred employment is in an office rather than in the fields. This view is supported by Cheteni (2016) who observed that 48% of youth in Nkonkobe had no interest in farming, they saw farming as an undesirable career; they wanted to work in cities like some of their siblings. Moreover, there were those who indicated that farming is laborious, unattractive, unprofitable and a job for the uneducated. Similar sentiments were shared by Onyima et al. (2020) Chipfupa and Tagwi (2021) and Zegeye et al. (2022) about youth perception for agriculture. This means that some of the youth do not partake in agricultural activities because their mindset and perception about smallholder agriculture is generally negative as noted by Kodom (2022), Zegeye et al. (2022) and Murtagh et al. (2023). Therefore, it is important to publicise success stories of smallholder agriculture as highlighted by Kodom (2022) and Zegeye et al. (2022). Success stories could be shared through social media, mainstream media, policy briefs, and packaged in a way that will be appealing to the youth (Zegeye et al., 2022). It is important that farming is marketed and promoted the same way other sectors are marketed and promoted, note Zegeye et al. (2022); this way the youth may be attracted to farming.

6.3.4. Youth agricultural cooperatives

The youth that were interested in agriculture indicated that they would prefer to work in groups as cooperatives so that they can all benefit. Unemployment has affected all of them, so a cooperative approach would ensure no one would be left to remain poor while others are doing

well. In support of these views, Haruna et al. (2019) state that youth organisations could promote and facilitate youth participation in rural areas. The youth could come together to understand issues affecting them as the rural youth. Moreover, such youth organisations would help young people in rural areas develop ideas for better farming, better home making, and rural community development, and conduct for themselves informal agricultural training that would capacitate them as noted by Haruna et al. (2019). A 27-year old male participant at Mawane stated "*if we could be given a project like the ones the other people have who get support from department of agriculture have, we would come together and work as the youth and we take charge, we are poor together and it worries all of us so we would want to work together so that we change poverty for all of us*". An example of a success story of youth working together was shown by Kodom (2022) during FGDs conducted with the youth in Ghana, which revealed that, some young individuals formed self-help groups to provide support to farmers, enabling them to manage their farms more effectively with the knowledge and skills they had acquired. In contrast, Chipfupa and Tagwi (2021) showed that youth at Amajuba and uMzinyathi in KwaZulu-Natal would prefer to work as individuals, although if the work becomes too much they would prefer to hire and delegate tasks and responsibilities to other people.

6.3.5. Importance and benefits of participation in cultivation

Cultivation was acknowledged as important in all villages because of its socio-economic contribution. However, at Gotyibeni and Manqorholweni some participants indicated that it is no longer important to everyone as some have long ago adapted to living without engaging in agriculture. Participants at Gotyibeni indicated that field cultivation could bring income to the village during harvesting season; and moreover, the youth would get jobs within the village, and it would also improve village social relations. Similarly, Cheteni (2016) and Chipfupa and Tagwi (2021) showed that the youth strongly believed that participation in agriculture could bring employment and business opportunities for young people. A 33-year old male participant at Gotyibeni noted "*field cultivation used to be important, to some it is still important because there are few households doing cropping projects so obviously to them it is still important, though majority of households do not cultivate*". Similar views were shared at Manqorholweni by male participants aged 30 and 32 years, who added that social relations would be improved because people work together when they are cultivating fields, so if field cultivation could be revived people would work together again. The 30-year old male participant noted "*field*

cultivation used to be important to everyone, but not anymore" he further added "*socially people used to work together, people had a lot of harvest that required one to ask for help from other village members*". While the 32-year old male participant supported and stated, "*field cultivation was important back then and people were able to sell their harvest to village members, village to village and also in town*".

At Melani participants indicated that field cultivation is very important because it brings money from sales in the village, in town and surrounding schools. Cheteni (2016) found that youth in Nkonkobe shared similar views, stating that farming could generate income by allowing local people to sell agricultural products, ultimately alleviating poverty in their families. Additionally, Cheteni (2016) argued that youth involvement in farming would promote self-employment, as agriculture provides opportunities for entrepreneurship. Supporting what the youth in the villages envision when they mention selling produce in and around the village. A 28-year old female participant at Melani also added "*field cultivation is important because the harvest brings healthy food to the households*". They further stated that the schools now have feeding schemes of cooked food, and a balanced diet is needed for the school children, so cultivating fields would mean they could be the suppliers to the schools, and they could be paid by the Department of Basic Education. Male participants saw reviving fields as making a difference in the village in terms of alleviating poverty. Cultivated fields could become a source of food security for the village as it would ensure the village has enough food before they could sell elsewhere.

6.3.6. Involvement in cultivation projects in the villages

Participants at Gotyibeni and Mawane started that in the villages there were projects that were happening but as the youth they were not involved. At Gotyibeni these projects were done by people with money because they were owners of tractors and they had contracts with the Department of Agriculture for other inputs. Yet, these village people were not hiring the youth to assist, so those households were noted to be the only ones benefiting from field cultivation, while the other households in the village were poor. A 30-year old male participant at Gotyibeni noted "*people are cultivating plots and projects, those people do not hire us as the youth, they do all the work themselves and they are also owners of tractors. People plough projects individually meaning only one household is benefitting from the project*". Projects at Mawane were happening with the support of inputs like tractors and seeds from the Department of

Agriculture. Mkhonto and Musundire (2019) supports that the Department of Agriculture Forestry and Fisheries spends billions of Rands to assist smallholder farmers with inputs to improve production and enable the rural households to generate income and enhance food security. However, in the villages these did not benefit everyone in the community.

During the discussions, the participants expressed their concern that the benefits of various developmental initiatives implemented in villages were not evenly distributed among village members. They pointed out that these initiatives seemed to favour a select group of elites rather than benefiting the entire village. Similarly, Fischer and Hajdu (2015) and Shackleton and Ntshudu (2023) state that government interventions of providing supporting such as tractors to rural farmers have been unsuccessful due to hijacking of the tractor services by local elites. In particular, the participants highlighted their belief that the process of land distribution and land reform in South Africa had primarily benefited individuals who had political connections or influence. The participants argued that this skewed distribution of benefits was indicative of a broader problem within the system, where political affiliations played a significant role in determining who would receive the advantages of land redistribution and reform. They believed that such a situation undermined the principles of fairness and equality that should be at the core of these initiatives.

They felt that there were no proper checks and balances done by the government, to try and limit favouritism and corruption seeping into the system, and therefore, many deserving people especially the youth are excluded. A 31-year old male participant at Mawane noted, "*if those people who distribute the inputs could do site visits, to check how many people have benefitted in the programme of distributing inputs and check how many young people were involved it would limit the exclusion, but it's like they don't care, as long they have given to their friends*". Another 27-year old male participant still at Mawane added "*it is not about community development to them, although that was the reason for initiation of these programs, because if it was, everyone especially the youth would be involved because we are the future*". Moreover, the participants expressed their frustration at the limited opportunities for community members especially the youth who were not politically connected. They argued that those who lacked such connections faced significant barriers to accessing resources, economic opportunities, and social mobility. This, in turn, perpetuated inequality and hindered the overall development of the community as a whole.

At Melani there were also active projects that I observed, the participants indicated that they were initiated in the early 1990s by the Department of Agriculture. This was after a white farmer that was previously practicing crop farming in the area left. Officials from the Department of Agriculture came and gave access to the community to cultivate the farmers lands. This area had access to irrigation water compared to the area where their fields were located which were only rainfed. The Department of Agriculture only supported the village people cultivating this area for a short period then they stopped. After the support from the Department of Agriculture ceased some people stopped cultivating their plots and gave the plots to others who had the means to cultivate using their own resources.

I visited the projects, where all the plots were actively cultivated and the irrigation system was functioning, with some areas being irrigated during my visit. Most plots had people ploughing with hand hoes for their crops. One young man was using donkeys to plough. All the workers in the fields were older individuals, except for the young man with the donkeys, who indicated that the plot he was working on was his. Some households who were there during the initiation of the project still continued. The ones that continued cultivating the plots were now hiring tractors using their own money, while some used their own oxen to plough; and they used their own seeds which they bought from towns or have been saving in the households. The projects in this village were being operated by older people. The youth indicated they were not assisting because the elders did not want to pay them for their services. A 33-year old female participant at Melani noted "*the projects make us angry at the elderly village members, who operate the plots because we feel like they employ only the ones they love the most and leave the rest of us unemployed*".

The participants coming from households that were cultivating in the plots indicated that because they were unemployed, they had gone to offer assistance at the plots, but their parents would rather hire people from outside as they expect family members to provide labour for free. A 27-year old female participant stated "*we also need to get paid although we are their children. We go to the plots to offer our help, but we do not get a cent, parents claim that they pay us with the food we get at home*". Some further indicated that not being paid meant they would never have their own money to afford toiletries and other necessities for themselves. Moreover, working at other farmers fields pays low wages hence most young people are discouraged in partaking in farming employment as noted by Cheteni (2016). For example, at Melani a 25-year old male participant noted "*if you happen to assist in the plot belonging to*

another household for a day, you get R50, and it is too little". Therefore, they indicated they would rather get jobs in other sectors so that they can have stable incomes. They alluded that with stable incomes they would be able to assist their parents continue cultivation by contributing money for seeds and other inputs so that they can get improved harvests and sell.

Other agricultural interests for the youth were livestock, the raising of livestock using modern methods, they wished they could get camps for the livestock where the young villagers would be taught and trained. Youth that participate in training could learn various skills and encourage the majority of them to open their own farms as noted by Haruna et al. (2019). Because most of the youth showed a high interest in participating in agricultural activities, relevant stakeholders should therefore embark on mass education to empower these youth as noted Haruna et al. (2019).

6.3.7. Youth involvement in farming

Most of the youth at Melani did want to cultivate fields, however, they indicated they do not want to do it themselves; this was especially expressed by female participants. They had also observed that cultivation cannot become a success without capital, hence they insist on getting jobs and making money so they can invest in cultivation. A 33-year old female participant at Melani indicated "*as the youth of Melani we once had a vision of using one of the abandoned fields, fence it and utilise it so that we can have money, the vision did not go into action because others lost interest along the way due to the lack of capital and resources*". A 26-year old male participant still at Melani, however, noted that he was assisting his grandfather at the family plot for free, he noted "*I wake up every morning to open the water for irrigation in the plot as a way to assist my grandfather because he is old to wake up too early*".

A 28-year old male participant at Gotyibeni narrated that, "*in 2019, I registered a cooperative company, where I was cultivating vegetables and supplying two schools at Ngqeleni with vegetables. I had gone to the Department of Agriculture to seek assistance; however, I did not receive it. My aim was to empower the village youth, but due to lack of resources and lack of support from the Department of Agriculture it failed*". This speaks to the lack of government support for youth. Elder farmers are able to get assistance if they ask for it, but the youth are regarded as a risk and are not usually given support. For example, Mkhonto and Musundire (2019) showed that in Limpopo, farmers received agricultural production inputs from the

Limpopo Department of Agriculture and Rural Development farmer support programme, the farmers who received this support were predominantly in the above-60-years age group, which constituted 42%. The 50-59-years age group made up 22%, while the 30-34-years age group accounted for only 5%. There were no recipients younger than 30-years who received this support. Moreover, Zegeye et al. (2022) state that credit tailored towards the rural youth is non-existent and needs to be addressed. Additionally, as availability of credit to the youth is addressed, the youth must be mentored to ensure that the funds received are used for the intended purpose as noted by Zegeye et al. (2022).

6.3.8. Constraints to youth participation in farming

Although most participants, especially males wished to revive field cultivation, they indicated various constraints that were limiting their ability to do so. At Gotyibeni a 27-year male participant noted "*in order to make our goal of reviving field cultivation become a success we will need assistance from the department of agriculture with capital and resources*". On the village scale these constraints include lack of information and poor rural and agricultural development at Gotyibeni and Manqorholweni. Lack of information at Mawane and lack of water and visibility of agricultural advisors at Melani. Moreover, it should be noted that black youth are restricted in terms of access to credit as compared to their white counterparts as they often do not have surety for the loans they would need to start farming. A 25-year old male participant at Mawane stated that "*I lack capital and information, and people who have the information are the elders in the village. I once approached the ones that are cultivating projects to source information on how I could also be able to start a project as I dream of becoming a farmer, but I did not get the information I needed, the older farmers are not always keen to assist and educate us the youth, especially when you don't come from their families*". Participants noted that the elders have experience and skills in farming that they would like to inherit. Mkhonto and Musundire (2019) showed that majority of smallholder farmers in Limpopo who are older than 60 years have many years of experience in farming, and they also attend farmer study groups to share information about improving farming techniques. However, this information does not reach the youth as they do not share it with them. It is important to avail information to young emerging farmers to raise interest, change their mindsets and increase knowledge and skills in farming as noted by Zegeye et al. (2022). Another 23-year old male participant at Mawane noted "*there are only two projects in the village, and we wish to*

have more of those projects where as the youth we can be part and be groomed by the elders who have experience and skills in farming".

A 28-year old male participant at Gotyibeni noted "*as the youth we see farming as important, we just wish the government can help us with capital, resources and land, so that we can do something for ourselves*". A 23-year old male participant at Mawane noted that "*we were taught agriculture at high school, so if we can be given an opportunity to open our own projects, we would share information of what we had leant with the elders as we know about "greenhouses" which older people don't know about*". They believe that once the elders can see them introducing these, they would also want to do them which would improve and modernise agricultural production in the village. They believed that the only hope to help develop their village and make it self-sufficient would be to revive cultivation. However, for that to happen they indicated they would need support with capital and resources. Swarts and Aliber (2013), Afange et al. (2015), Kwenye et al. (2018), Geza et al. (2021), Mthi et al. (2021) and Zegeye et al. (2022) showed that the youth were limited in their participation in agriculture due to lack of access to capital, expensive inputs, and lack of information due to limited agricultural extension services. For example, Kwenye (2018) showed that the youth in Kitwe district in Zambia lacked access to capital, which was the reason why in that district the youth were only able to cultivate less than a hectare.

6.3.9. Lack of information as a constraint to field cultivation

The participants were highly vocal about the lack of information. A 26-year old male participant at Mawane noted "*the people that are supported with inputs from the Department of Agriculture do not want to share the information on the process of application of these inputs so that we can also be able to apply*". Because the information was not readily available as the people who have it don't share, there is lack information on what steps to follow to receive assistance and on what crops would be best suited to be cultivated in the villages and these were all concerns the young people had. Mkhonto and Musundire (2019) and Zegeye et al. (2022) support that training provides valuable information, skills, and knowledge for farmers. Moreover, Mkhonto and Musundire (2019) add that knowledge sharing is important for social, economic, and environmental development support, and extension is a vital knowledge-sharing institution.

As a 30-year old male participant at Gotyibeni stated "*we need this information so that we don't start something only for it to not become a success, for example we plant a wrong crop that would not grow well in the area, so we need to be taught on those things*". They note that extension officers were not visible in most villages, and even in areas where they were visible, they would only engage with people who are already cultivating and do not have time to engage with people enquiring about starting a project. Therefore, hiring more extension officers and training them to be more visible to farmers and respond effectively to the needs of smallholder farmers is essential for effective and efficient advice that will improve farming in rural areas of South Africa as noted by Mkhonto and Musundire (2019).

A 27-year old male participant at Gotyibeni stated "*some youths are losing interest in agriculture because of lack of information and poor rural and agricultural development*". Another 22-year old male at Mawane added "*we don't have role models who are willing to teach us how to work the land*". At Manqorholweni a 25-year old female participant shared "*we need strong leadership, that will tell us where and how to start looking for all the information that can help us*". While another 19-year old male participant still at Manqorholweni supported her and added "*If the Department of Agriculture could meet with us for an information session, that could also help us be aware of what steps we need to take if we want to revive field cultivation*". At Mawane a 25-year old male participant stated, "*I need guidance from people who have information on what steps I can take to fulfil my dream of becoming a farmer as I did agricultural Science at high school*". However, Zegeye et al. (2022) note that customarily, agricultural extension advisory services are designed for elder farmers, this may be because the elder farmers may be the primary stakeholders with a vested interest in maintaining and improving their agricultural productivity as they are the ones who usually have rights of use to land. While young people's engagement in farming is very minimal. Consequently, extension services might primarily focus on meeting the needs and addressing the challenges faced by the elder active farmers.

Zegeye et al. (2022) note that the youth are a group that thinks, reacts, and responds differently, therefore there is a need to train extension officers to introduce services and information sharing techniques that are inclusive of the rural youth. Moreover, Mthi et al. (2021) showed that additional limitations to youth participation in agriculture in South Africa include lack of access to markets, practical training and incentives, and strong cooperative organisations, which have contributed to the level of disinterest in agriculture from the youth. Geza et al. (2021) added

limited infrastructure as another driver of limited youth participation in farming. Chipfupa and Tagwi (2021) have noted that some of the limiting factors for youth discouragement to take up farming have been slow modernisation of the agricultural sector. Kwenye et al. (2018) also noted that the youth face constraints in purchasing agricultural inputs due to high costs.

6.3.10. Limited land access as a constraint

Participants at Manqorholweni expressed that land was taken by white people a long time ago and as the youth they wished they could get it back as they feel their forefathers failed in fighting for their land. However, huge areas of land in this village were laying fallow and not used by them as the village people and also no white people were using this land either. A 30-year old male participant at Manqorholweni stated "*we see wealth in the land, but we cannot do anything or benefit from it because it was taken by white people*". In the other villages the participants noted that the land belonged to the elders in the household, so it's not easy for them to work the land as the elders sometimes don't give them permission. Similarly, in Ghana, Kodom (2022) shared that although agricultural training programs have shown positive results in changing the youth's perceptions and attitudes towards farming, the major challenges they still face are related to accessing land and finance. A 24-year old male participant at Melani started, "*the fields belong to our parents so we can't use them even if we had the resources to cultivate, they could restrict permission*". To support this view, Swarts and Aliber (2013) and Zegeye et al. (2022) add that lack of access to or control over assets, especially land, are other drivers limiting participation of the youth in agriculture.

However, it is important to note that in the villages the youth assumed this, as none of them indicated they had requested permission to access or used arable land and were denied. A 33-year old male participant at Gotyibeni stated "*the land does not belong to us but our forefathers*". Similarly, Kwenye et al. (2018) noted the difficulties of the youth in obtaining land restricts their ability to expand the farming resource base. Lack of land tenure security also discourages the youth from considering agriculture as a worthwhile activity (Swarts and Aliber, 2013; Zegeye et al., 2022). The youth cannot invest in the land without permission from the owner (Zegeye et al., 2022).

This means that there is a need to improve land access for the rural youth regardless of their age, gender, and marital status (Kodom, 2022; Zegeye et al., 2022). The issue of land in South

Africa was attended to by the government. In 2001 the government launched a Land Redistribution Programme to return part of the land that was taken from black South Africans during the apartheid period, with a special emphasis on the inclusion of women and youth in the programme (Cheteni, 2016). Chipfupa and Tagwi (2021) showed that over 70% of the youth in Amajuba and uMzinyathi had access to agricultural land, however they did not hold the right to use it as their access is through their parents. This shows that there is a gap in the intergenerational transfer of land, and this potentially affects youth use of this land (Tadele and Gella, 2012). While the youth face these challenges, other challenges include parents discouraging youth against undertaking farming as a career, and encouraging them to opt for white collar professions, which are thought to have higher economic returns and fewer risks (Geza et al., 2021).

6.3.11. Village situation in the next 30 years

Participants across the villages did not see much hope for the future, especially in relation to agriculture and improved rural poverty. At Gotyibeni respondents noted that in the next 30 years there will still be selective and limited cultivation of fields and projects only for those who have money and resources while the rest of the village will remain poor. Participants noted "*in the next 30 years to come, the projects will still be operating depending on the contracts they signed with the Department of Agriculture, while the rest of us remain poor*". At Manqorholweni and Melani participants indicated that in the next 30 years fields will still be abandoned, the youth will still remain unemployed if the government doesn't assist with resources to improve village participation in farming. They indicated that poverty would get worse and as they grow up this poverty would be transferred to their children and grandchildren. At Melani participants noted "*in 30 years we will still be suffering and experiencing poverty. The fields will still be abandoned if we do not get assistance with capital and resources*". Moreover, at Manqorholweni participants noted "*houses will be built in the areas of fallow fields as the population increases*". At Mawane, participants shared similar sentiments that in the next 30 years there will be more hunger, poverty, and unemployment in the villages. Instead of things getting better they see them getting worse. For example, a 30-year old male participant noted *"we last had proper road infrastructure in the village in 2008, and although we keep voting no services come to us so there is no hope, we do not have a proper road. We keep voting for councillors with the hope that they will bring development, but they do not*". Another 27-year old male participant added "*as for us as the youth we will still be unemployed*". Similarly,

youth at Gatyana and Lesseyton in the Eastern Cape shared similar sentiments of a hopeless future (Shackleton and Luckert, 2015). Njeru et al. (2015), and Haruna et al.(2019) state that to address the issues of rural development and sustainable agricultural production, the government needs to pursue policy development in agriculture, while Shackleton and Luckert (2015) add that they need to involve the youth in community development and adaptation planning.

6.4. Conclusion

The FGDs revealed that the youth's limited interest in agriculture stems from several constraints, including lack of capital, resources, information, poor rural and agricultural development, and inadequate access to land. These barriers contribute to a perception of farming as unviable, compounded by the view that government-sponsored inputs primarily benefit a few elites, fostering pessimism about the future of agriculture and rural poverty. The association of small-holder agriculture with poverty in South Africa further discourages youth engagement, influenced by the poor performance of elderly farmers and a generation gap in land access. Despite some youth expressing interest in farming, their efforts are stymied by resource limitations. Therefore, it is crucial to introduce adequate funding, public awareness, land access policies, and agricultural education to effectively engage youth in farming. Additionally, recognising the heterogeneous nature of youth aspirations is essential; targeted research and support should address specific needs and interests to avoid the misconception that all youth are uninterested in agriculture. Supportive policies and frameworks must be developed to enhance youth participation by providing both physical and financial assistance, ensuring that agricultural projects and policies are well-informed about the youth's circumstances and challenges.

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Chapter 7: Synthesis, reflections, research implications and limitations

Summary

This study aimed to identify, analyse, and determine the social effects of arable field abandonment in the study areas. It pursued four specific objectives: to identify trends in field cultivation, analyse the factors contributing to abandonment, examine effects on the elderly population, and investigate youth engagement in agriculture. While the main objective was to assess the impact of arable field abandonment on livelihoods and social relationships linking to the title of the research.

The findings address these objectives as follows: First, the study identified a clear trend of decreasing arable fields, replaced by grasslands, shrubs, and residential areas, reflecting a shift in land use. This decline supports the first objective by revealing a reduction in cultivation over time. Second, the analysis of drivers revealed key factors such as aging farmers, lack of resources, and environmental challenges, including drought and COVID-19, which answered the second objective by categorising and understanding the primary reasons for field abandonment.

Regarding the main objective, the study demonstrated that arable field abandonment has led to reduced economic status, increased dependence on social grants, and deterioration in health and social relationships across all villages. This impact underscores the significant changes in livelihoods and living conditions post-abandonment.

The third objective was addressed by showing that the elderly have experienced a profound loss of connection to traditional agricultural practices and the land, highlighting the negative effects of this change over the past 50 years. For the fourth objective, the study found that youth engagement in agriculture is limited, with factors such as lack of resources and information hindering their participation. This disengagement has led to decreased agricultural productivity and increased reliance on social grants, highlighting the need for targeted interventions.

Overall, the DPSIR framework effectively structured the analysis. Figure 7.1 below provides insights into the drivers, pressures, state, impacts, and responses associated with arable field abandonment identified across the villages. Moving forward, addressing these findings through enhanced support for youth involvement, improved access to resources, and the promotion of

sustainable agricultural practices could help mitigate the negative impacts and support rural development.

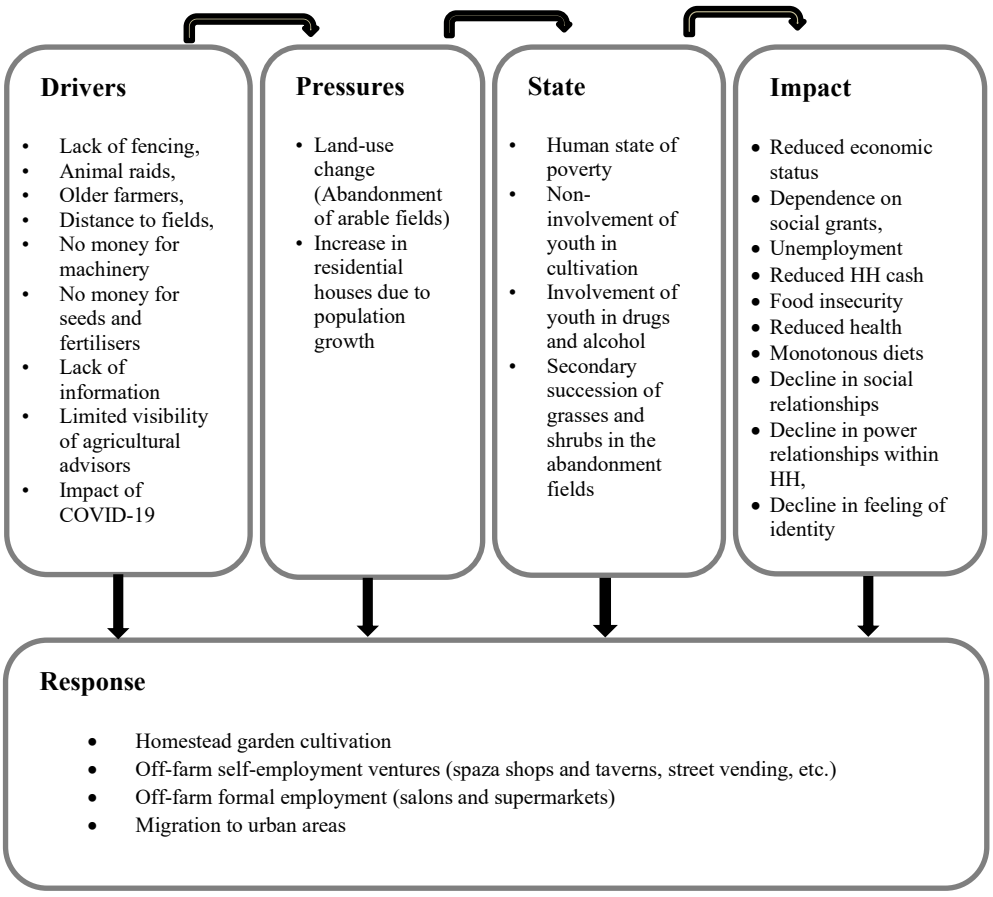

Figure 7.1: Drivers, pressures, state, impacts, and responses associated with arable field abandonment identified in the villages

7.1. Introduction

The study underscores the profound role that field cultivation has historically played in shaping the cultural, economic, and social fabric of rural villages in South Africa. Field cultivation not only served as a means of livelihood (see Hebinck et al., 2018; Shackleton and Hebinck, 2018) but also contributed significantly to the development of a unique cultural identity and the fostering of social cohesion within rural villages as noted by Shackleton and Luckert (2015) and Shackleton et al. (2019). The agricultural landscape was not just a source of sustenance; it was a repository of tradition and a symbol of communal identity and unity. However, the declining extent of cultivated land and its replacement by alternative land uses underscores a significant reduction in community involvement in field cultivation. Studies by Shackleton and Luckert (2015), Blair et al. (2018), Hebinck et al. (2018), Shackleton et al. (2019), Zantsi and

Bester (2020) and Moyo and Ravhuhali (2022) indicate that rural communal areas in South Africa are witnessing transformations accompanied by a pronounced decline in household agricultural production, particularly in crop cultivation. This study has supported the findings of these researchers. The cessation of field cultivation has brought about a complex set of challenges and consequences that extend far beyond the realms of agriculture and economics as noted by Blair et al. (2018) and Shackleton et al. (2019). In the face of declining field cultivation, this research has shown that former homelands have emerged as dynamic hubs of change, constantly adapting to an intricate interplay of macro-level and localised factors that exert their influence on land use, farming practices, income sources, and even the aspirations of the inhabitants, as was also observed by Hebinck (2007), Connor and Mtwana (2018) and Shackleton et al. (2019).

One remarkable aspect to note is that these rural villages have not merely succumbed to the decline of traditional agriculture. Instead, they have displayed remarkable resilience and adaptability by embracing a diverse array of off-farm activities. Similar observations were made by Hebinck et al. (2018), Shackleton and Hebinck (2018), Shackleton et al. (2019) and Moyo and Ravhuhali (2022) elsewhere in South Africa. Many villagers have turned to self-employment and sought employment opportunities outside the agricultural domain. While the ploughing of fields may no longer resonate with their daily lives, the collective memory of these practices serves as a testament to the enduring importance of cultivation as an intrinsic facet of rural existence (see Shackleton and Luckert, 2015; Hebinck et al., 2018). This highlights the fact that rural areas remain grounded in their historical identities, even as they transition to new modes of survival, as Hebinck et al. (2018) and Shackleton and Hebinck (2018) note that, an agrarian or rural way of life endures, although it has evolved into various forms and structures.

Andrews and Fox (2004), Connor and Mtwana (2018) and Shackleton et al. (2019) indicated that abandonment of larger fields is not a complete halt to crop cultivation but rather a shift toward intensification, as many farmers are now using gardens near their homes to practice intercropping, combining maize with other food crops. Shackleton and Hebinck (2018) also mentioned that with the abandonment of distant fields, homestead gardens located closer to the homestead are still being ploughed and sown, although this practice is limited to a minority of households. However, the results of LULC change for most of the villages in this study proved

that the abandonment of arable fields is now extending to abandonment of homestead gardens as well (see Chapter 2).

The transformation of erstwhile fields into shrublands or grasslands is a significant development that carries multiple implications as noted by Quintas-Soriano et al. (2022), Briassoulis (2019) and Huang et al. (2020). However, the rate and specific types of vegetation that thrive in these former fields are influenced by various factors, including harvesting methods, grazing pressures, and the environmental conditions related to climate and soil quality (Shackleton et al., 2013; van der Zanden et al., 2017; Ustaoglu and Collier, 2018; Njwaxu and Shackleton, 2019; Shackleton et al., 2019; Quintas-Soriano et al., 2022). These newly formed ecosystems offer numerous benefits, such as the restoration of their fertility and the growth of beneficial plants, thereby leading to an augmentation of biodiversity (Shackleton et al., 2013; Navarro and Pereira, 2015; Hebinck et al., 2018; Shackleton and Hebinck, 2018). However, the results of this study have shown that the use of overgrown shrubs and trees for non-timber forest products is limited in practice, as also observed by Shackleton et al. (2013) and Hebinck et al. (2018). This is because, as identified in the study areas and supported by Hebinck et al. (2018), welfare support and urban opportunities have become more accessible, leading people to no longer see the need to collect from these areas. Respondents further alluded to not even enjoying the food collected, preferring to have it only occasionally when they miss it. However, Njwaxu and Shackleton (2019) state that in more remote areas, former fields may still be valuable in providing a diversity of materials.

Some of the youth in these villages demonstrated an interest in reviving traditional field cultivation practices, even though they may not foresee a resurgence of agriculture as the primary economic activity in the foreseeable future. This desire to resurrect the old ways serves as a powerful testament to the enduring connection between these rural communities and their agricultural heritage. Ultimately, this study sheds light on how these households and villages have successfully adapted to a life without traditional agriculture, relying on new livelihood opportunities for survival. It illustrates the evolving nature of rural communities, their capacity to respond to change, and the importance of preserving their cultural and historical ties to the land while charting a path forward in an era of transformation.

7.2. Emergent themes and contextual framework

The DPSIR framework was a valuable tool in structuring the study as it enabled the pinpointing of the underlying factors contributing to field abandonment in these villages. It identified various elements within the framework, including Drivers, Pressures, States, Impacts, and Responses, which collectively influenced arable field abandonment. Notably, the villages exhibited a substantial decrease in field abandonment, signifying a complex interplay of drivers and impacts that operate at multiple scales, including regional, local, and household scales (see also Munroe et al., 2013; Shackleton et al., 2019).

The villages stand as dynamic landscapes, resilient in the face of transformative changes like the abandonment of fields. For example, the villagers, in response to field abandonment and its socio-economic implications, had to seek alternative income sources to sustain their livelihoods. The economic transition towards off-farm activities signals the adaptability of households, in the face of diminishing arable fields in all villages. Ellis (2000), Aliber and Hart (2009), Berdegué et al. (2014), Hebinck et al. (2018), Njwaxu and Shackleton (2019) and Mulia et al. (2021) acknowledge that rural transformation is characterised as a comprehensive societal shift wherein rural communities lessen dependence on agriculture and broaden their economies. This process has expanded possibilities for diversifying rural livelihoods through additional income from non-agricultural pursuits, including remittances as noted by Ellis (2000), Aliber and Hart (2009), Berdegué et al. (2014), Hebinck et al. (2018), Njwaxu and Shackleton (2019) and Mulia et al. (2021). This diversification contributes to the alleviation of rural poverty by becoming a strategy to mitigate risk, stabilising income, or as an opportunity-driven approach to enhance their living standards. To support this, Bilali et al. (2017) state that the non-agricultural economy in rural areas has experienced significant growth in middle and, to some extent, low-income countries over the past few decades, particularly during the 1990s and 2000s.

This shift away from farming, evident across all the villages, mirrors a broader trend with arable lands giving way to increased grassland cover, portraying a profound "Pressure" on traditional livelihoods and social connections. The decline in social connections and the transformation of power relationships within households echo broader societal shifts triggered by the cessation of field cropping (see also De la Hey and Beinart, 2017; Hadju et al., 2020 with similar findings). Traditional community dynamics are impacted, showcasing a "State" of changed

rural structures due to changing agricultural practices. The data reveals a shift from cohesive and collaborative community relations to more individualistic behaviour, heightened more recently by factors like the COVID-19 pandemic.

The LULC change data adds another layer, portraying changes in the physical landscape. Changes in the environment's physical state as experienced in the villages significantly affect the quality of ecosystems and, by extension, human well-being (see MEA, 2005; Njwaxu and Shackleton, 2019). For example, the landscapes in the villages were now becoming less diverse with grasslands, shrublands and residential areas taking over, which meant that villagers were losing food they previously received from their landscape when they were cultivating. According to MEA (2005) and Njwaxu and Shackleton (2019) ecosystem goods and services, derived from the structure and function of the environment, directly benefit human societies. Therefore, any changes in the environment's state can have far-reaching consequences on ecosystems' functioning and the well-being of human communities and observed in the study. Similar observations were made by Kristensen et al. (2004), Kamwi et al. (2015) and Njwaxu and Shackleton (2019). This is attributed to the fact that many smallholder communities and households in rural communal areas are heavily reliant on local landscapes and are connected to primary sector activities, including agriculture, forestry, and the extraction of wild resources as also supported by Kamwi et al. (2015), Hebinck et al. (2018), and Njwaxu and Shackleton (2019). Moreover, environmental changes, from shifts in bird species to concerns about snakes, highlight the interconnectedness of ecosystems and the consequences of land use changes. As Walentowski et al. (2018) and Njwaxu and Shackleton (2019) state that in certain contexts, there's a turnover of plant and animal species on old lands, often marked by an increase in species richness.

The examination of consumption patterns offers insights into the intricate relationship between agricultural practices, economic conditions, and cultural aspects within each village, (see also Aliber and Hart, 2009; Rogan, 2018). In the villages, some experienced positive shifts, while others faced negative changes, showcasing the varied “Impacts” on local diets and lifestyles in the absence of active field cultivation. This may have been increased by the heightened reliance on off-farm incomes that create a widening economic gap between households. Those with more access to off-farm opportunities may be better off while others are left poor, as noted by Mulia (2021) in rural villages of Vietnam. The data from this research paints a picture of constant change and resilience in rural livelihoods, with adaptive strategies, transformations in

land use, and shifting socio-environmental dynamics. The rate of change, particularly in land use patterns and settlement structures, provides insights into the pace of these transformations.

7.2.1. Decline in field cultivation and expansion of other land uses

Each household in the villages had fields, mostly 4 to 5 hectares in size. Similarly, Mzuyanda et al. (2020) showed that all households at Amathole District in Eastern Cape had access to 0.69 - 2.5 ha of land for crop production. However, 76% of the fields in the study villages had been abandoned for an average of 19 years or more. The level of engagement in field cultivation showed a pronounced and consistent decline across the surveyed villages. Similarly, Cramer et al. (2008), Aliber and Hart (2009), Blair et al. (2018), Hebinck et al. (2018), Levers et al. (2018), Shackleton and Hebinck (2018), Njwaxu and Shackleton (2019) and Shackleton et al. (2019) state that in various rural regions of South Africa there's a growing trend of declining small-scale farming as households are moving away from arable production.

Respondents from most villages reported that their fields had remained unused for several years. Notably, there was an interesting exception in the village of Mawane, where respondents indicated an increase in field participation over the past five years. Surprisingly, 50% of them mentioned that they had witnessed the opening of new fields in their village during this period. Similarly, Fonji and Taff (2014) showed that in Latvia, Eastern Europe, while some fields were being abandoned there was an opening of new fields, constituting 8.6% during the same period. In a similar vein, Shackleton and Hebinck (2018) in Willowvale, Transkei also identified that, as five farmers had stopped cultivating their fields, they discovered three young farmers who had taken up field cultivation in the same period. In contrast, the other three villages did not report any instances of new fields being opened.

The respondents consistently highlighted a marked lack of activity in the fields. Interestingly, a contradiction or inconsistency emerged in the responses from various villages regarding the alternative uses of these abandoned fields, indicating the importance of local perceptions. For example, in Gotyibeni, 33% of respondents mentioned that the fields had been replaced by residential areas, suggesting a shift towards housing development. Similarly, Hebinck et al. (2018) noted that in Guquka and Koloni the count of residential sites saw a slight increase between 1996 and 2014. This, however, sharply contrasted with the observations in the other villages, where less than 10% of respondents made similar claims.

The oral histories and LULC change analysis brought further inconsistencies to the fore. According to participants in oral histories, a significant transformation in the rural landscape was attributed to population growth, resulting in an increased number of homesteads in each village. This pattern of increased homesteads was evident across all villages, even in the face of some village youth migrating to urban areas, leading to a demographic shift towards an aging population. Similarly, LULC change satellite analysis indicated growth in residential areas across all the study villages. This was in agreement with the claims of some Gotyibeni respondents, yet it contradicted the perceptions in the other villages where residential land use seemed less prominent from household surveys. Similar observations of increased residential areas overtaking abandoned fields were made by Akinyemi and Speranza (2022) and Lidzhegu and Kabanda (2022). Hebinck et al. (2018) also showed an increase in residential areas in Koloni and Guquka, however, the expansion of residential areas in both these villages was mainly achieved by converting grazing land. The discrepancy in results concerning residential growth in the villages could be due to several factors. One possibility is that residents in these areas may not be concerned with the gradual expansion of residential areas, especially if the changes are subtle or dispersed. Additionally, other pressing issues such as economic opportunities or environmental changes might overshadow the perception of residential growth. Furthermore, localised experiences and priorities may influence how residents perceive and report land use changes, leading to variations in responses.

Despite the contradictions, the consistent theme in this research reveals changes occurring in the villages. This research effectively confirmed that fields are indeed shrinking, connecting these changes to the challenges faced by the villagers. Similarly, McCusker and Carr (2006) recognise that globally changes in LULC affect people's livelihood. For example, in Senegal, Hermann et al. (2014) showed that communities widely feel that the ongoing changes in LULC contribute to the degradation of natural landscapes.

Another source of inconsistency pertained to the state of the abandoned fields. While many respondents during household interviews described the encroachment of trees and shrubs onto abandoned fields, LULC change analysis revealed a dominant presence of grasslands. Similarly, Njwaxu and Shackleton (2019) noted that after arable land abandonment especially in the earlier years the abandoned fields are dominated by herbaceous cover. Though the analysis did confirm some shrub encroachment, it appeared to be of lesser extent compared to the prevalence of grasslands. Which could be attributed to the type of biome these villages

belong to, which is predominantly grasslands biome. Shackleton et al. (2013) showed that at Willowvale over the years, there had been a reduction (22.5%) in grassland and an increase (28.8%) in woodland between 1961 and 2009. These disparities between the household interviews, oral histories, and LULC change analysis may be attributed to various factors, including differences in individual perceptions and the timing of observations. The nature of field abandonment and land transformation can be complex and multifaceted as noted by Shackleton et al. (2019), which could lead to discrepancies in responses and analysis outcomes.

Moreover, respondents' varying levels of engagement with the land and the environment may also contribute to the divergent observations, as people stayed indoors more often especially following COVID-19. The increase in residential areas, coupled with concerns about biodiversity due to changes in vegetation cover, underscores that rural landscapes are evolving not only in terms of agricultural practices but also in settlement patterns and environmental compositions. In essence, the rural areas are dynamic ecosystems where economic, social, and environmental elements coalesce, challenging the simplistic perception of rural life solely centered around fields (see also Hebinck et al., 2018).

7.2.2. Decline in garden cultivation

Throughout the household interviews and oral history sessions, the respondents consistently highlighted a noticeable surge in the intensity and engagement in garden cultivation across all the villages, with the sole exception of Melani. At Melani some respondents noted a decline of home gardens, especially in households where the elderly had died and only the youth were staying there. However, when we contrasted these qualitative findings with the substantial changes in LULC change patterns determined through GIS analysis, a notable inconsistency emerged. The qualitative data revealed a prevailing sense of optimism and progress regarding the heightened participation in garden cultivation in these villages. In contrast, the GIS analysis, grounded in objective spatial data, only validated the reported increase in Mawane, aligning with the participants' perceptions, and showed a significant decline in garden cultivation activities over various time periods in all the other villages.

Several factors may contribute to this inconsistency. Firstly, qualitative methods, such as household interviews and oral histories, are inherently subjective and can be influenced by a range of individual factors, including personal biases, memory, and subjective interpretations. Additionally, due to the COVID-19 lockdown, many households might not be aware of what is

happening around them as people kept to themselves and stopped visiting other households. As a result, they might not be aware of who is still keeping their garden active or not. For example, Trefry et al. (2014) characterised garden cultivation as a form of cultural expression and a means of connecting with what individuals perceive as an integral aspect of their identity. This perspective might make it challenging for them to accurately assess the actual decline in gardens, as they remember a time when most households actively cultivated gardens, making it difficult for them to envision a shift in this situation. On the other hand, the GIS analysis offers an objective and data-driven view, potentially unveiling long-term trends and patterns not immediately evident through qualitative research as noted by Castillo et al. (2021) and Lidzhegu and Kabanda (2022). Efrem (2010), Lidzhegu and Kabanda (2022) and Errea et al. (2023) note that GIS are proven effective tools for acquiring accurate and current information on land cover changes across vast areas. Therefore, it is possible that the GIS analysis offers a more accurate depiction of the actual changes in land use over time as noted by Errea et al. (2023). Moreover, this disparity in the data underscores the importance of using multiple research methods to form a comprehensive understanding of complex phenomena. Qualitative research captures the nuanced perspectives and experiences of individuals, while quantitative analysis provides an objective perspective on changes occurring in the physical environment.

7.2.3. Drivers of field abandonment

The pressure of the decline in field cultivation, created a deeper state of poverty and vulnerability for some households in the villages, as active fields provide sustenance offering both food and non-food products, additional financial support and serve as a safety net during challenging periods or unexpected events, as noted by Shackleton and Luckert (2015), Hebinck et al. (2018) and Shackleton et al. (2019). However, this decline in field cultivation is driven by numerous factors as observed in Chapter 3. Respondents provided insights into the primary reasons for field abandonment in both local and regional context. These reasons encompassed several common factors that cut across various villages. These included issues like the absence of proper fencing also observed by Shackleton et al. (2013), De la Hey and Beinart (2017), which left fields vulnerable to animal damage as also noted by Blair et al. (2018), the aging of farmers who faced physical limitations (see also Blair et al., 2016, Mzuyanda et al., 2020), the considerable distance of fields from households (see also Blair et al., 2018), the lack of access to agricultural machinery, and financial constraints as also noted by Aliber and Hart (2009) and Blair et al. (2018).

It is crucial to emphasise the importance of the local context, as there were village-specific reasons for field abandonment. For instance, at Gotyibeni, the reasons for field abandonment were linked to factors such as the presence of older farmers and the absence of oxen and machinery for ploughing fields. In Manqorholweni, the absence of fencing was a prevalent concern, and virtually all respondents expressed their frustration with this issue, as it often resulted in destructive animal trespassing that undermined their cultivation efforts. In Mawane, common reasons included the aging of farmers and the lack of capital to invest in inputs like machinery and oxen. These challenges were strikingly similar to those observed in Gotyibeni. In Melani, the main reasons for field abandonment were drought, water scarcity, and the considerable distance of fields from households. These diverse reasons for field abandonment underscore the intricate interplay of local factors, demonstrating the nuanced challenges faced by each village. The impact of climate-related issues and the importance of addressing local context emerge as central themes in understanding the complex dynamics of field abandonment. These factors collectively contributed to the decision to cease field cultivation.

The above drivers are similar to reasons stated by Akinyemi et al. (2019), who noted that reasons why small-scale farmers who have access to land abandon their fields in South Africa include lack of funds, limited agricultural knowledge, a shortage of available labour, insufficient farming equipment, water scarcity, and the land being situated far away. Kozak et al. (2004), Rey Benayas et al. (2007) and Hatna and Bakker (2011), Blair et al. (2018) added that socio-economic factors, such as alternative occupations for farmers also influence field abandonment. However, there were no alternative sources of employment in the villages although the fields were abandoned. Several commentators advocate that the primary driver of the decline in field cultivation is the increase in disposable cash income from migrant labour and state social grants and pensions so that rural people now purchase food in urban markets rather than grow their own (see McAllister, 2001; Hebinck and Lent, 2007; Aliber and Hart, 2009; Shackleton et al., 2013; Blair et al., 2018). This was contrary to the findings from the villages, as respondents alluded that if they had adequate access to alternative sources of cash income, they would invest it in farming, particularly in field cultivation.

These drivers originate from diverse sources, ranging from human needs, influence of social, demographic, and economic dynamics within the villages to external factors like global climate change (drought), that are multifaceted and are unique to each location (see similar findings by Gabrielisen and Bosch, 2003; Shackleton et al., 2019). For example, respondents in specific

villages, namely Manqorholweni and Melani, highlighted the persistent challenge of scarce rainfall over a span of more than two decades. While at Melani, in addition to this response, respondents stressed the scarcity of water in this village. Moreover, when rain did occur, respondents noted that it often came in heavy but brief episodes, occasionally leading to localised flooding. This supports sentiments by Aliber and Hart (2009) who noted that household food production in Molati takes place in challenging conditions characterised by unpredictable rainfall and diminishing soil fertility. Similarly, Gioli et al. (2014), Roy and Basu (2020) state that factors propelling rural transformation may also involve climate uncertainties or the adverse effects of climate-related hazards on crop productivity or losses. This unpredictability rendered rainfall an unreliable resource for the villagers to depend on for consistent field cultivation.

7.2.4. Alternative sources of income

For households that abandoned field cultivation, alternative employment strategies became essential for survival (as Aliber and Hart, 2009; Hebinck et al., 2018 have shown elsewhere). Yet, less than 20% of respondents had transitioned to off-farm formal employment, including work in supermarkets, hair salons, household laundry services, and childcare. Moreover, a strikingly low 3% ventured into off-farm self-employment, primarily involving the sale of items like fruits, sweets, and cigarettes; and opening village supermarkets. Some entrepreneurs adopted a targeted approach, capitalising on peak times such as social grant payouts and school tournaments to maximise sales (see also Hendriks et al., 2020). This shows the adaptability of these rural households in the absence of farming. Similarly, Hadju et al. (2020) showed growing importance and contribution of off-farm, informal employment in Cutwini, as the number of villagers involved in informal work was higher in 2016 than in 2002, and they earned incomes that were, on average, higher than those from formal employment. Diversifying livelihoods is increasingly recognised as a pathway for reducing poverty and fostering economic growth in rural areas in sub-Saharan Africa as noted by Shackleton et al. (2013), Trefry et al. (2014), Mathebula et al. (2016), IFAD (2016) and FAO (2017).

Households engage in diversifying their livelihoods and income to effectively handle risks against poverty in the absence of farming (Aliber and Hart, 2009; Mathebula et al., 2016). Therefore, seeking off-farm income has become integral to the identity of subsistence farmers in South Africa (see Aliber and Hart, 2009; Shackleton et al., 2013; Trefry et al., 2014; Hebinck

et al., 2018; Shackleton and Hebinck, 2018). According to Reardon et al. (2007) non-agricultural incomes contribute roughly 50% in Latin America and Asia, and around 35% in Africa. Rogan (2017), Blair et al. (2018), Shackleton and Hebinck (2018) and Hadju et al. (2020) note that South African rural livelihoods often rely on social grants, pensions, remittances, and income from sources outside their local communities. For example, over 70% of local people in the villages were dependent on social grants for their financial sustenance, as indicated in the impact household interviews (see Chapter 4).

The low levels of alternative incomes in the study villages, suggests that a revitalised focus on cultivating fields could serve to alleviate economic challenges and reduce dependence on scarce alternative sources of income for some households in these villages. Hebinck et al. (2018), Shackleton et al. (2019) and Zantsi and Bester (2020) note that a reduction in cultivated land leads to a growing disparity between food demand and resource availability. Shackleton and Hebinck (2018) add that when farming households rely on their crops instead of wage income, hunger levels tend to be lower. Moreover, despite the challenges, respondents also emphasised the socio-economic contributions of field cultivation, particularly in areas where it still persisted. Both current cultivators and those who had discontinued recognised the benefits, including food provision and cost savings, similar to results by Blair et al. (2018). Aliber and Hart (2009) shared the same sentiments with the results of the study as they stated that cultivation provides food for the household's own consumption, enhances the availability of vegetables, and increases micronutrient intake for households. Secondly, it generates income savings (see also Aliber and Hart, 2009; Blair et al., 2018), which can then be used to purchase even more nutritious food that the household may be unable to produce internally or other household needs as noted by Aliber and Hart (2009).

Findings from the initial household survey interviews (Chapter 3) were harmonious with the results from subsequent interviews (Chapter 4) that explored the consequences of field abandonment including oral histories (Chapter 5). They collectively emphasised the economic challenges that had arisen following the abandonment of fields. An astonishing 97% of those who had relinquished field cultivation reported a decline in household economic stability (Chapter 4). These findings are in line with sentiments by Blair et al. (2018) that consequences of field abandonment at household level include a reduction in self-provisioning capacity and income and increased food insecurity, vulnerability, and poverty. At a regional scale, despite the widespread field abandonment across the villages, respondents universally acknowledged

the paramount importance of cultivating fields. They overwhelmingly expressed strong agreement on the significance of field cultivation, regardless of whether they were actively engaged in it, as it was also observed by Blair et al. (2018).

This consensus was consistent across all the villages, reflecting a shared understanding of the value fields brought to their lives. This suggests that policymakers should recognise the significance of family cropping in supporting food security among impoverished rural households as noted by Rogan (2017) and Shackleton and Hebinck (2018). Moreover, ILO (2019) state that while roughly 20 to 50% of the rural population in Africa, Asia, and Latin America is engaged in non-farm employment, a significant portion still relies on agriculture for their livelihoods. Furthermore, Shackleton and Hebinck (2018) demonstrated that farming households experience lower hunger levels in the absence of wage income. Therefore, a vibrant agricultural sector should be a focal point in rural development strategies, generating improved job opportunities within the sector while simultaneously facilitating the expansion of non-farm activities in the rural economy. Therefore, rural people should be encouraged to include family cropping together with these other sources of income so as to increase their resilience to poverty and overall health and well-being as also noted by Aliber and Hart (2009). ILO (2019) state that this approach is crucial for harnessing the potential of economic diversification to reduce poverty. For example, Van Averbeke and Khosa (2007) found that while external cash income is crucial for household food security in the Waterberg District Municipality in Limpopo, however, food cultivated from fields significantly contributes to nutrition. Moreover, small-scale irrigated vegetable production has the potential to increase Vitamins A and C availability in these households (Van Averbeke and Khosa, 2007).

7.2.5. Social grants

Household interviews and oral histories consistently revealed a growing reliance on social grants as the primary income source for households. Shackleton and Luckert (2015) and Shackleton and Hebinck (2018) similarly found that most households in former homelands relied heavily on state welfare grants and pensions. The absence of field cultivation has led to increased living costs, reducing the community's ability to support each other with basic necessities like food. In contrast, Aliber and Hart (2009) reported that respondents in Molati, Limpopo, shared dried leaves from their fields with neighbours and family members. However, this study, conducted in a different cultural region and before the COVID-19 pandemic, might

not fully reflect current conditions. The pandemic has further strained economic and social dynamics, increasing individualism and potentially impacting mutual support.

Despite the essential support from social grants, they have proven insufficient to meet households' diverse needs. Aliber and Hart (2009) found that 49% of households experienced hunger and lacked sufficient income for food. In the villages, social grants typically support an average of four individuals per household, yet they remain inadequate, similar to findings by Aliber and Hart (2009) in Molati, Limpopo, where 83% of households receiving grants struggled to cover the needs of their nearly five-member households. Shackleton and Luckert (2015) also noted that these grants are stretched across various expenses, including groceries, health, and education.

Furthermore, an illuminating comparison between cropping and non-cropping households in the villages underscored the prominence of social grants as a crucial alternative income source in the absence of active field cultivation (Chapter 3). Non-cropping households exhibited a higher mean proportion relying on social grants compared to cropping households. In contrast, cropping households leaned more towards off-farm income and the sale of resources such as groceries from opening spaza shops as sources of income. Shackleton et al. (2013) showed that on the Wild Coast cropping households exhibited considerably higher employment rates per household compared to former cultivators. On the contrary, Bezu et al. (2012), Davis et al. (2017), and FAO (2017) suggest that rural households participating in off-farm activities tend to have higher incomes. This could be because they have more time to pursue and explore these opportunities. However, Shackleton et al. (2013) found that households engaged in cultivation received higher remittances per household compared to those that had ceased cultivation. Moreover, Rogan (2018) compared farming and non-farming households in the Eastern Cape and found that hunger levels are lower among farming households. These findings suggest that cultivating households were more affluent than non-cultivators, given their higher off-farm employment rates, increased remittances, and more assets.

7.2.6. Differing perspectives on youth and field abandonment

This research uncovered the contrasting views of the older generation and the youth about the youth's role in and views on agriculture. This highlights a gap in the relationship between these two groups. The elders expressed a consistent sentiment across villages, reflecting on their past experiences when they cherished the time spent working in the fields. They highlighted how

cultivation not only provided sustenance but also served as a unifying family activity, fostering strong bonds. They bemoaned the fact that now contemporary children seem disinterested in the hard work of farming, viewing them as lazy and lacking the motivation to engage in agricultural activities (similar findings were echoed by Aliber and Hart, 2009; De la Hey and Beinart, 2017; Blair et al., 2018 in the Eastern Cape and Limpopo). The elders firmly expected the youth to participate in productive agricultural activities such as field cultivation, emphasising the importance of self-sufficiency and the economic benefits derived from selling produce.

In stark contrast to the elders' perspective, focus group discussions with the youth revealed a more diverse range of views. The youth's aspirations concerning agriculture were multifaceted, with a significant number expressing a keen interest in farming, either directly or indirectly, although due to limitations were not participating. Aliber and Hart (2009) noted that more young people participate in subsistence farming than older individuals, although the proportion of youth engaged in farming is smaller (12%) within their age group, compared to older individuals (24%). Across all villages, youth participants emphasised that their disengagement from cultivation was not due to laziness but rather stemmed from various constraints beyond their control. Across the villages, most youths recognised agriculture as a viable source of livelihood and displayed a strong desire to revive field cultivation. Their dominant ambition was to reintroduce this practice in their villages, perceiving it as an opportunity to escape poverty and unemployment. Similarly, Shackleton and Hebinck (2018) found in Willowvale that children of field farmers were notably involved in farming. This involvement was attributed to their continuous exposure to and active participation in tasks such as ploughing and planting crops, highlighting the generational continuity of agricultural practices.

In view of local contexts, in some villages, particularly Mawane, youth participants acknowledged that they had the physical energy required for fieldwork. Despite growing up in communities where agriculture had been abandoned, both male and female youths comprehended the importance of farming and aimed to revive it. They envisioned themselves as farmers, aspiring to use the untapped potential of their forefathers' fallow lands. Similarly, Hadju et al. (2020) showed that in the villages of Cutwini and Manteku there was a noticeable group of young people who did not intend to move to urban areas. Instead, they expressed a desire to stay in the villages and enhance their quality of life and create their own households (Hadju et al., 2020). This was contrary to the views from De la Hey and Beinart (2017) who

alluded that, younger people express that with increased access to education, their aspirations, views on modernity, and notions of a fulfilling life no longer commonly involve traditional activities like ploughing. However, in the villages not all participants shared this enthusiasm. Some individuals, especially females from Manqorholweni, were less inclined toward agriculture. They viewed farming as laborious and old-fashioned, considering it a pursuit better suited for older generations (see similar findings by De la Hey and Beinart, 2017; Blair et al., 2018; Shackleton et al., 2019; Hadju et al., 2020). Their aspirations lay in alternative sectors, and they did not associate agriculture with a prosperous life, which are views supported by other researchers (see De la Hey and Beinart, 2017; Blair et al., 2018; Shackleton et al., 2019; Hadju et al., 2020). Moreover, it is worth noting that parents have made a concerted effort to provide rural children with better education than they themselves received, aiming for them to succeed beyond agriculture as noted by Rigg et al. (2016).

While the majority of youths aspired to engage in field cultivation, others from Gotyibeni and Manqorholweni seemed to have adapted to life without agriculture. They felt that field cultivation was no longer universally important. Nevertheless, in these villages, there was an acknowledgment that resuming field cultivation could bring economic benefits during the harvest season, create job opportunities within the community (see similar sentiments echoed by Cheteni, 2016; Chipfupa and Tagwi, 2021), and enhance social relations. The youth raised concerns about their limited involvement in ongoing agricultural projects within the villages, especially at Gotyibeni. The youth in this village felt excluded from these initiatives, leaving other households impoverished.

Despite the aspirations of many youth participants, they collectively foresaw a challenging future, particularly in relation to agriculture and rural poverty. Similar views on hopelessness were shared by Shackleton and Luckert (2015). Responding youth believed that without substantial government intervention to provide resources and support, the cycle of poverty, unemployment, and agricultural abandonment would persist and even worsen. This pessimistic outlook extended to issues such as poor infrastructure, lack of opportunities, and insufficient leadership, which participants felt hindered the prospects for positive change in their communities. The contrasting perspectives between the older generation and the youth regarding the value of field cultivation highlight the need for generational dialogue.

7.2.7. More than just fields

The transformation of abandoned arable fields into overgrown shrublands has brought about a multitude of unexpected benefits for some communities, extending far beyond their former agricultural purposes. This evolving rural livelihood now prioritises a consumptive use of the landscape over a productive one as noted by Hebinck et al. (2018). For example, abandoned fields, now covered by trees and shrubs, serve various purposes such as providing firewood, wood for rituals, medicinal plants, and fodder for goats, as observed in other parts of the Eastern Cape (see Fox, 2013; Shackleton et al., 2013; Falayi, 2017; Hebinck et al., 2018; Shackleton and Hebinck, 2018). Hebinck et al. (2018) note that landscape uses play a role in influencing and being influenced by the livelihoods of the people involved. Through oral histories (Chapter 5), it becomes evident that the abandoned fields have become hubs for a variety of resources that contribute significantly to the villagers' well-being including from collecting material for building kraals, firewood heavy cooking particularly on days of events, and collecting some medicinal plants. Hebinck et al. (2018) observed the same in Guquka and Koloni. One of the notable advantages of these transformed spaces as observed by the villagers and other researchers (Shackleton et al., 2013; Hebinck et al., 2018), was the abundance of medicinal plants and valuable building materials (Njwaxu and Shackleton, 2009). Additionally, the shrubs provide materials for constructing roofs for houses and kraals, showcasing the resourcefulness of utilising the land in multiple ways. Over time, traditional rural livelihood practices have shifted to a modified form as noted by Hebinck et al. (2018).

While the need for fuelwood had reduced with the advent of electricity. In the study villages fuelwood still played a role during times of heavy cooking especially for cultural events. The resilience of utilising fuelwood during specific circumstances underscores the adaptability of the community. However, Falayi et al. (2019) noted that the use of fuelwood has not disappeared, as they showed that in Fairbairn, in the Eastern Cape, even with the introduction of electricity, the amount of fuelwood consumed had risen by 15% between 2000 and 2015. These findings indicate that the availability of electricity has had minimal impact on the demand for fuelwood (Vasicek and Gaugris, 2014; Falayi et al., 2019). However, the shift towards more use of electricity hints at changing energy dynamics. This proves that the significance of gathering as a safety net is diminishing as ties to urban opportunities and the influx of benefits grow (see Hebinck et al., 2018). However, it continues to be crucial for

impoverished households as noted by Hebinck et al. (2018). The continued use of fuelwood highlights its persistent importance in certain cultural and practical contexts.

The presence of bees, drawn to the flourishing shrubs in the former fields, has resulted in the production of honey, which possible opens up economic opportunities through the potential sale of honey products. The introduction of new bird species adds to the richness of the ecosystem, enhancing the villagers' connection with nature, although this affects their prospects for cultivation in the future as this birds might damage crops planted in fields. Beyond the tangible benefits, the shift in the landscape could spark a deeper connection between the community and their surroundings. Similarly, Shackleton and Hebinck (2018) share the perspective that, even amid the decline, farming remains deeply ingrained in everyday identity, forming strong connections between people and the landscape, as well as contributing to their overall ‘sense of place’. The adaptability demonstrated in finding new uses for the abandoned fields reflects the resilience of these villages. The reliance on the land for various needs has fostered the villagers to actively engage with and derive sustenance from these transformed areas. It shows that the emerging landscape is not unproductive; instead, it persists in providing other goods and services as noted by Hebinck et al. (2018).

7.2.8. Impact of field abandonment on diets

The findings from both the household questionnaires and oral histories shed light on the consequences of households shifting away from field cultivation, particularly in terms of dietary changes and their impact on health (Chapter 4). It became evident that as households moved away from field cultivation, their diets were reported to have gradually became more monotonous, also noted by Shackleton et al. (2019) and Zantsi and Bester (2020). For example, Shackleton et al. (2019) and Zantsi and Bester (2020) noted that rural households in the Eastern Cape primarily rely on starchy foods like maize meal, as a significant part of their diets. This shift was closely linked to increased reliance on supermarket-bought foods as echoed by Blair et al. (2018), which, in turn, contributed to a decline in the consumption of fresh fruits and vegetables and an uptick in the consumption of processed and energy-dense foods.

Similarly, Baiphethi and Jacobs (2009), Blair et al. (2018) and Zantsi and Bester (2020) found that rural households tend to buy most of their food from supermarkets instead of producing it themselves. Moreover, these items are generally more costly than producing one’s own food (Hadju et al., 2020; Zantsi and Bester, 2020). Consequently, many households found

themselves trapped in a cycle of dependency on social grants, unable to invest in agricultural seeds that could have offered long-term financial relief through cultivation as noted by Aliber and Hart (2009). Farming, while typically not the sole provider of a household's food needs, remains a crucial potential source of nutrition and food security (see Aliber and Hart, 2009; Shackleton et al., 2013; Shackleton et al., 2019). It also serves as a valuable means of generating income for some and acts as a safety net during periods of vulnerability, particularly for rural populations (see McCusker and Carr, 2006; Van Averbeke and Khosa, 2007; Aliber and Hart, 2009; Shackleton et al., 2013; Shackleton and Luckert, 2015; Blair et al., 2018).

7.2.9. Field cultivation as part of culture and identity

The findings from the first household interviews (Chapter 3), impact interviews (Chapter 4), and oral histories (Chapter 5) underscore the profound impact of field cultivation on the cultural identity and social dynamics of the sample villages. Field cultivation, deeply embedded in the cultural fabric of these communities, was historically a cornerstone of their wealth and self-sufficiency. Further advantages can be found in its role of building social capital and maintaining traditions. However, the discontinuation of field cropping had far-reaching consequences on how people interacted and connected within and between households. Agrarian rural settings result in landscapes that encompasses cultural, emotional, psychological, and community values (see Cocks et al., 2012; Trefry et al., 2014; Connor and Mtwana, 2017; Hebinck et al., 2018). Many people live in a rural area that is deeply rooted in cultural values, history, memories, and a sense of home to which they can always return as noted by Fay (2015) and Hebinck et al. (2018).

However, a decline in field cultivation has not only impacted livelihoods but also strained social connections and family dynamics (as also echoed by Hoang, 2009; Shackleton et al., 2013; Mulia et al., 2021). For example, field cultivation had previously played a central role in shaping these household dynamics, but the abandonment of arable fields forced more households to become reliant on social grants, further altering family dynamics, as also stated by Hoang (2009) and Mulia et al. (2021), who shared that non-farm activities have impacted the social bonds within rural households in various ways. For example, in the villages traditionally, there was a well-defined division of roles within households, with women primarily responsible for duties like cooking, cleaning, and tending to the household garden, while men were valued for their contributions in terms of cash and resources. However, the

introduction of social grants disrupted this traditional setup. Women now had their own source of income through social welfare, causing men to feel less appreciated for their financial contributions. Moreover, most elderly respondents noted a decrease in the ability of parents to command their children to do chores or assist in the gardens (De la Hey and Beinart, 2017), as respect from the youth toward their elders had diminished. Mulia et al. (2021) add that, alterations in working hours or commuting distances, especially in the case of migration, may significantly diminish communication and cohesion within a household; and this creates a gap between the elders and youth within a household. The influence of COVID-19 also affected interpersonal relationships within households. Many young people who lost their jobs returned home and found themselves with little to do. In the community, the pandemic altered interactions as people became accustomed to isolation and social distancing, impacting how they engaged with one another.

Moreover, the decline in field cultivation experienced in the villages resulted in a lack of consensus and kinship of households preventing their livestock from entering a neighbour's field as noted by Blair et al. (2018). At the community-scale cropland abandonment also contributes to a loss of the traditional landscape, erosion of cultural heritage, lifestyle, identity and values, and a reduction in social cohesion (as also echoed by Daugstad et al., 2006; Munroe et al., 2013; Blair et al., 2018). For example, in the study villages people could afford to purchase only a limited amount of food with the absence if field cultivation, making it challenging to share resources with neighbours, as they had been able to do when fields were under active cultivation. The sense of community and shared resources that was once a cornerstone of village life had eroded. Moreover, the overall decrease in farming has led to the reduction of community ethics and identity related to farming. The youth in these communities, though largely detached from farming because of constraints, aspire to revive this heritage.

7.2.10. Planned return to field cultivation

Despite the challenges posed by field abandonment, a compelling narrative of resilience emerges from the study. A majority of respondents expressed a strong desire to return to field cultivation within the next five years, primarily motivated by the need to diversify their diets and improve overall health. Shackleton and Hebinck (2018) noted that in Willowvale although five farmers had stopped farming their fields, they also found three young farmers that had started cultivating their fields during the same time frame. This shows that when farmers are

interested and motivated it is possible for them to return to field cultivation, even though it might be at slow rates and still in the dynamic of more giving up than taking up. However, the elderly as well as the youth indicated that they could only return to field cultivation with support. The most prominent need noted by the elderly was fencing, which aligned with the main reason for abandonment. For the youth the main areas of support included access to information, agricultural advice, and access to credit.

The concerns expressed by the communities about abandoned fields indicate the importance of agriculture in these villages and the desire for its revival. Nevertheless, the findings of this research indicate a shift towards alternative activities for sustaining their livelihoods. Even young individuals in rural areas acknowledge that the revival of cultivation is unlikely in their villages. This suggests that rural residents are progressively embracing different means of supporting themselves. This trend is consistent with various studies, including those by Aliber and Hart (2009), Blair et al. (2018), Hebinck et al. (2018), Shackleton and Hebinck (2018), Shackelton et al. (2019) and Mzuyanda et al. (2020) which highlight the increasing abandonment of fields in South African rural areas, particularly in the former homelands. Therefore, even with support for farmers and some attempts at recultivation, the prevailing reality is that the majority are unlikely to return to traditional farming practices. In some cases, there has been a shift towards revitalising homestead gardens. This transformation has become significant in many former homelands, often financed through remittances. Today, in rural areas, the prestige of having an attractive homestead is often valued more than owning a large number of cattle, as noted by respondents in the study. Additionally, gardens enhance the appeal of homesteads by providing various resources.

7.3. Local contexts

Examining data across the villages of Gotyibeni, Manqorholweni, Mawane, and Melani reveals distinct socio-economic patterns, each presenting unique challenges and responses to field abandonment. Gotyibeni stands out with a notable report of less stable economic status, primarily dependent on social grants for monthly income. This economic instability is reflected in home garden cultivation and significant changes in eating patterns, highlighting the interconnected nature of economic and dietary shifts. Social relations in Gotyibeni have also been significantly affected, indicating potential strains within the community fabric. Gotyibeni showed the slowest rate of change from 2013 to 2022, decreasing by 1.3% per year.

In Manqorholweni, economic instability is also prevalent, but the sources of income differ. A substantial portion of households relied on social grants, yet off-farm employment plays a more significant role compared to other villages. Home garden cultivation is slightly less common, and there is a noteworthy impact on social relations. The reasons for field abandonment, particularly animal damage, and lack of machinery, unveil unique challenges faced by this community. This was also a village with the highest rate between 2016 and 2023 decreasing by 4.1 per year indicating a significant environmental or developmental change. This village, contrary to the other villages, had completely ceased field cultivation.

Mawane exhibits economic vulnerability, with a report of less stability and a predominant reliance on social grants. The impact on home garden cultivation is moderate, and social relations have been significantly affected. Interestingly, the reasons for field abandonment differ, with unfenced fields and animal raiding playing a more prominent role compared to other villages.

In Melani, there is a report of less stable economic conditions, relying on social grants, and experiencing a moderate impact on home garden cultivation. Noteworthy changes in eating patterns and social relations are observed. Reasons for field abandonment, particularly unfenced fields and animal raiding, align with challenges faced by neighbouring villages.

7.4. Research implications and limitations

The presented thesis on field abandonment and its multifaceted impacts on rural communities is a valuable contribution to the field of agriculture, rural development, rural livelihoods, and environmental studies. It sheds light on several significant aspects and offers insights that can inform policies, interventions, and future research. The study provides valuable insights into some key changes brought about by field abandonment in the surveyed villages. It highlights the significant decline in field cultivation. The research underscores the economic challenges faced by households due to field abandonment, with high levels of unemployment and reliance on social grants. It also reveals the impacts on food security and dietary diversity, as diets became less diverse and more reliant on processed foods.

It provides empirical evidence of the factors leading to field abandonment, highlighting the role of farmer age, distance to fields, gender, economic factors, and other socio-cultural variables, which can inform targeted interventions. The examination of how field abandonment affects

dietary patterns, economic stability, and social dynamics underscores the broader societal implications of this phenomenon. The study also highlights the importance of home gardening as an adaptive strategy, which is crucial in the context of changing agricultural practices.

The research presented a novel approach by combining both quantitative and qualitative data, incorporating GIS analysis, survey interviews, oral histories, focus group discussions, and literature reviews. This mixed-method approach enhances the depth and reliability of the findings. The inclusion of voices from both the elderly and youth within the community provides a more comprehensive understanding of the challenges and aspirations related to field abandonment. The exploration of the social, economic and cultural consequences of land use changes due to field abandonment is a unique aspect that enriches the study. The study could have benefited from a more in-depth analysis of the ecological implications of field abandonment, such as the impact on biodiversity, soil health, and ecosystem services. This would provide a holistic view of the environmental consequences.

While the study highlights the importance of youth engagement in agriculture, it could delve deeper into potential strategies and policies that can attract and support young farmers, considering the unique challenges they face. Moreover, the study's findings on dietary diversity might have been enhanced by using actual food diaries to assess perceptions of dietary diversity, food security, nutrition, and health, which could have yielded different results. Another limitation is the projection for the next 30 years, which lacks scenario analysis involving the community. COVID-19 may have also influenced the changes observed in the villages, potentially exacerbating the effects of arable field abandonment. The pandemic's disruptions to daily life, economic instability, and increased isolation could have intensified the social and economic impacts under study, making it challenging to isolate the effects of arable field abandonment from those induced or amplified by the pandemic.

The study's findings challenge some conventional wisdom, such as the idea that increased cash income from migrant labour and social grants directly leads to the decline in field cultivation. The thesis suggests that, in the studied villages, people are willing to invest in farming if they have access to alternative sources of cash income. The study's findings are based on specific rural communities, and while they offer valuable insights, they may not be entirely representative of all rural contexts. Generalising the findings should be done cautiously, However, the study highlights the importance of examining the similarities and differences that arise in various localities, including different drivers and responses, which lead to diverse

outcomes. The thesis could benefit from a more in-depth exploration of potential solutions and interventions to address field abandonment and its associated challenges.

7.5. Conclusion

This study highlights the complex factors contributing to arable field abandonment in rural villages, including the age and gender of household heads, economic challenges, lack of fencing, and alternative employment opportunities. The abandonment of fields, driven by financial constraints, the impact of drought, and the belief in sufficient social grants, has led to reduced food security and weakened community cohesion. The study also underscores the success of home gardening as an alternative to traditional farming and the need to address shifts in dietary patterns that impact health. To counter these challenges, the study recommends targeted policies to support youth engagement in agriculture, provide financial assistance for essential farming inputs, and encourage sustainable agricultural practices that enhance food security and preserve cultural identities.

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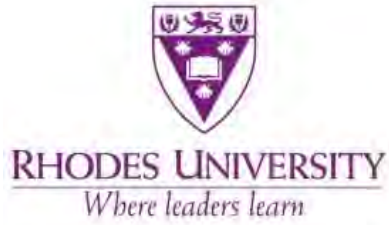
Appendices

Appendix 1: Ethical clearance approval letter



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21 July 2023

Ms Sihle Pokwana

Email: g20p6921@campus.ru.ac.za

Review Reference: 2023-5116-7839

Dear Ms Sihle Pokwana

Re: Human ethics renewal application: Evaluating social effects of arable field abandonment in communal areas

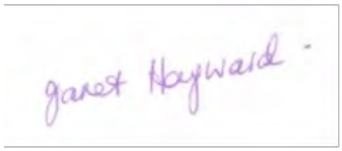
Researcher: Ms Sihle Pokwana

Supervisors: Professor Charlie Shackleton ,

This letter confirms that the above Annual Report has been reviewed and **APPROVED** by the Rhodes University Human Research Ethics Committee (RUHREC). Your Approval number is: 2023-5116-7839

Approval has been granted for 1 year. An annual progress report will be required in order to renew approval for an additional period.

Please ensure that the Human Research Ethics Committee is notified should any substantive change(s) be made, for whatever reason, during the research process. This includes changes in investigators. Please also ensure that a brief report is submitted to the ethics committee on the completion of the research. The purpose of this report is to indicate whether the research was conducted successfully, if any aspects could not be completed, or if any problems arose that the Human Research Ethics Committee should be aware of. If a thesis or dissertation arising from this research is submitted to the library's electronic theses and dissertations (ETD) repository, please notify the committee of the date of submission and/or any reference or cataloguing number allocated. Sincerely,



Dr Janet Hayward

Chair: Rhodes University Human Research Ethics Committee, RU-HREC

cc: Ethics Coordinator