



Understanding the forestry value chain and livelihoods: A case of timber farming in KwaNgwanase

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A dissertation submitted in partial fulfilment of the requirements for the degree of Master of Business Administration

Graduate School of Business & Leadership

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November 2021



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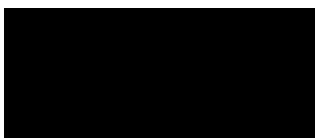
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ACKNOWLEDGEMENTS

I wish to express my sincere appreciation and gratitude to the following individuals, without whose assistance, this study would not have been possible:

- My supervisor, Dr Simon Taylor, for always pushing me and giving me guidance throughout the completion of this thesis.
- All study participants in KwaNgwanase including timber growers, harvesting contractors and seedling producers for affording me their time to participate in the research.
- People of Mnyayisa and Nsukumbili villages for allowing me in their households during the data collection period.
- The Ward 4 Councillor, under Umhlabuyalingana Municipality, for allowing me access to the village.
- Last, but not least, my family for moral support.

ABSTRACT

The forestry value chain plays a significant role in impacting livelihoods in rural communities. This can either be through creation of job opportunities or through development of small forestry businesses. However, small-scale timber growers and contractors frequently find themselves excluded in the forestry industry value chain. Their voices are not represented, and they often have no bargaining power when selling their timber products. In this study, an assessment of the small-scale commercial timber farming value chain was undertaken in two villages in KwaNgwanase with an aim of evaluating its impact on livelihoods. The research was conducted through evaluating coordination of the value chain stakeholders, determining the challenges facing value chain actors, identifying the economic benefits and contribution of value chain activities to value chain actors, and assessing the impact of value chain activities on actors' livelihoods. The value chain participants were confined to four (4) harvesting contractors, one (1) seedling nursery operator and seventeen (17) timber growers.

The case study approach, in conjunction with quantitative survey were used to execute the study. The methodological choice for the research was a mixed method approach that combined quantitative and qualitative data collection for quantifiable as well as descriptive data analysis. A non-probability sampling approach was used firstly in the form of a purposive sampling technique in order to select the harvesting contractors and seedling producer included in the study and the snowball sampling technique was used to determine the final sample size of timber growers included. Structured interviews including dominated by closed-ended questions and some open-ended questions were used as a data collection technique.

The study findings revealed that the forestry value chain activities do contribute to sustainable livelihoods in KwaNgwanase. However, these contributions were minimal owing to disjointed organisation of value chain stakeholders and various challenges facing participants. Value chain integration, both horizontal and vertical, was found to be weak. Despite the positive financial benefits obtained by value chain actors, the value chain activities in KwaNgwanase have little impact to deal with vulnerabilities. Despite having access to all livelihood assets, the use of all resources is unsustainable and thus does not entirely translate to overall positive sustainable livelihood outcomes. Unless all stakeholders, including government, organise themselves more effectively, small-scale timber farming will not be a long-term sustainable livelihood contributor in KwaNgwanase.

Key words: Forestry value chain, KwaNgwanase, livelihoods, small-scale timber growers, timber farming

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LIST OF ABBREVIATIONS

APAP -	Agricultural Policy Action Plan
DAFF -	Department of Agriculture, Forestry and Fisheries
DFFE -	Department of Forestry, Fisheries and the Environment
DFID -	Department for International Development
DTI -	Department of Trade and Industry
DWAF -	Department of Water Affairs and Forestry
FSA -	Forestry South Africa
FSC -	Forestry Stewardship Council
GDP -	Gross Domestic Product
KZN -	KwaZulu-Natal
PGDS -	Provincial Growth Development Strategy
PTO -	Permit to Occupy
SADC -	Southern African Development Community
SLF -	Sustainable Livelihood Framework
SMME -	Small, Medium and Micro-Enterprise
Stats SA -	Statistics South Africa

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

There is a general global consensus amongst agricultural economists that the forestry value chain is one of the main drivers of economic growth and poverty alleviation for rural communities. According to Cubbage, Davis, Paredez, Elsin, Mollenhauer and Frey (2015), most first world countries have developed sustainable interventions that support and enhance the forestry value chains in their regions. These interventions have not only contributed to better livelihoods but have also resulted in the growth of the forestry industry (Cubbage *et al.*, 2015). According to the Department for International Development (DFID) (1999), a livelihood is made up of up of competencies, resources and any other activities necessary for a means of living. It is said to be sustainable when it can support its competencies, resources and activities without degrading its natural resource base (DFID, 1999). Livelihood is critical when an individual is able to turn natural, physical, human, social and financial resources to advance their standard of living (Ellis, 1999).

Within the African continent, the Southern African Development Community (SADC) is said to have vast and varied forest areas, including both tropical forest in the southeast and temperate forest in the southwest of the continent (Ledger, 2017). In the past two decades, there has been a significant increase in timber plantation in the region, more specifically in South Africa (Clarke, 2018). However, an increase in competition for timber cultivation land has created tensions between established commercial timber companies and local communities (Ledger, 2017). These tensions are negatively impacting the forestry industry and creating uncertainties with respect to access to markets and the achievement of full benefits by different stakeholders. To address these issues and capitalise on the industry growth, SADC still faces the challenge of establishing viable and sustainable interventions for the forestry industry in the region (Ledger, 2017).

Clarke (2018) reported that timber is the second most planted agricultural product in South Africa, after maize. The forestry industry is well-established and depends largely on exports as approximately 80% of its revenue is said to be generated from export consignments (Ledger, 2017). Although the South African forestry industry has shown immense growth in the past three decades, emerging timber growers have been overlooked from participating meaningfully

in some segments of the forestry value chain (Mahlangu & Mubangizi, 2015). The forestry industry therefore faces transformational challenges (Mtengu & Green, 2016). These difficulties are also highlighted in the Agricultural Policy Action Plan (APAP) developed by the then Department of Agriculture, Forestry and Fisheries (DAFF) in 2014 (Department of Agriculture, Forestry and Fisheries [DAFF], 2014), which in April 2021 was renamed the Department of Forestry, Fisheries, and the Environment (DFFE). The APAP highlighted that poor access to information results in emerging timber growers being bought out by big, well-established corporates. The big corporates dominate the forestry industry and have even replaced small-scale timber growers in some rural areas as main timber producers, through partnership growing schemes (Jele, 2012). Government efforts to intervene and transform the industry have proved to be inadequate, as big corporates continue to dominate the forestry value chain despite various interventions (Jele, 2012).

According to the KwaZulu-Natal (KZN) Provincial Growth Development Strategy (PGDS), the Umkhanyakude District Municipality is one of the most poverty-stricken municipalities in South Africa with the majority of households living in extremely unbearable conditions (KZN Provincial Planning Commission, 2019). The KwaNgwanase area which falls under Umkhanyakude District Municipality and Umhlabuyalingana Local Municipality has undetermined employment classification since the majority of people in the area are unemployed (Umhlabuyalingana Local Municipality, 2019). The few economic activities taking place in the area include cattle grazing, timber farming and fishing (FSA, 2021). Mtengu and Green (2016) determined that timber farming in KwaNgwanase does have a positive impact on the livelihoods of growers, albeit the industry still has glitches in the area such as price of timber and not being organised.

The KZN provincial government has targeted the unleashing of agricultural potential as one of the key strategic goals for the agriculture, forestry and fisheries sector (KZN Provincial Planning Commission, 2019). In the 2019 Final Integrated Development Plan Review, the Umkhanyakude District Municipality also prioritised the agriculture and forestry sectors for the purposes of growing the district's economy and increasing new job opportunities (Umkhanyakude District Municipality, 2019).

Several studies have been undertaken to assess the performance of the small-scale timber value chain in Umkhanyakude District Municipality in light of government policy frameworks that

have been developed and forestry industry best practices that have been implemented. Although small-scale timber farming has impacted the livelihoods of Umkhanyakude District Municipality residents, it is evident that it has not fulfilled government's objective of converting the industry into a sustainable economic driver (Jele, 2012). Define briefly the concept of livelihoods

In a study to evaluate the impact of the Forestry Stewardship Council (FSC) on timber market accessibility and price determination in KwaNgwanase, Mtengu and Green (2016) found that the small-scale timber growers did not have a voice as their interests were not being represented within the forestry industry. The forestry industry in KwaNgwanase is complex, thus for the small-scale timber growers considered in Mtengu and Green's (2016) study it was difficult to access the markets and they did not have any influence on price determination. Therefore, the location presents a prime opportunity for further research, such as the current study, to be conducted which would assess the potential of the forestry value chain in KwaNgwanase with a view to evaluate its broader economic and livelihood impacts in the area.

1.2 Statement of research problem

The forestry industry has been a backbone for livelihoods of some communities in South Africa, especially in northern KZN (Jele, 2012). Although there is a severe lack of data, it is estimated that small-scale timber growers contribute approximately 40,000 direct jobs in South Africa (Clarke, 2018). Despite this, the forestry value chain is still controlled by big corporates, including state-owned companies, which has resulted in a monopoly and thus creates a barrier to entry for small-scale commercial timber growers and contractors.

According to DAFF (2016), approximately 62% of timber plantations in South Africa at that time were owned by well-established companies compared to only 3.7% of plantations that were in the hands of small-scale growers who are located in rural areas. The existing literature indicates that in the past decade efforts have been made by the South African government, learning institutions and the forestry industry to engage in timber cultivation research (Seboa, 2018). However, this literature is focused on improving current timber production practices for big timber companies, maximising export potential for the industry and the creation of low-skill job opportunities for rural communities (Mahlangu & Mubangizi, 2015). The existing knowledge base is also skewed towards improving production yields that can be obtained on limited land resources (Seboa, 2018). There are therefore limited studies that focus on

sustainability of small-scale timber growers and contractors within the forestry value chain in South Africa.

Another challenge facing existing and prospective small-scale growers is the unavailability of land for plantations, which has only been given limited attention by government (Jele, 2012; Mahlangu & Mubangizi, 2015). This systematic exclusion of emerging role players from participation in the forestry industry translates to stagnation of emerging timber growers and contractors, and thus negatively affects local economic growth as a result of sluggish forestry value chains in rural areas.

Numerous studies that evaluate Sappi's Project Grow and Mondi's Khulanathi out-grower schemes were conducted in the 1990's and early 2000's. However, from a review of the existing literature, it appears that very little attention has been given to these schemes since then and especially in the last decade because there are limited empirical studies that have recently been conducted to assess the performance of these partnerships.

An investigation of the potential of the forestry value chain as a means of sustainable livelihoods in KwaNgwanase is worth being explored with a view of understanding the current forestry value chain in the study area. The study area of KwaNgwanase consists of a number of villages and for the purpose of this research is specifically located in the villages of Mnyayisa and Nsukumbili. It is evident, even though there is limited literature, that the forestry industry in the study area involves several role players, which makes it a complex location that presents challenges in terms of the industry contributing meaningfully to the broader economy and livelihoods in the area (Mtengu & Green, 2016). As a result, the main intent of this study is to assess the factors that impede the potential of the forestry industry in KwaNgwanase. The intention is to investigate the economic and livelihood impact, in addition to challenges, of timber production in KwaNgwanase and to determine whether it is a sustainable alternative farming option.

1.3 Aim and objectives of the study

The primary purpose of the study is to assess the forestry value chain in KwaNgwanase with an aim of evaluating its contribution to sustainable livelihoods for the communities residing in the villages of Mnyayisa and Nsukumbili. The specific objectives guiding the study are:

- i. To identify the actors of the commercial forestry value chain and their roles in KwaNgwanase;
- ii. To examine the challenges faced by forestry value chain actors in KwaNgwanase;
- iii. To assess the high-level economic efficiency (costs and profit margins) for different actors in the forestry value chain in KwaNgwanase; and
- iv. To evaluate the contribution of commercial timber activities to actors' livelihoods in KwaNgwanase.

1.4 Research questions

The research questions derived from the objectives guiding the study are:

- i. Who are the key actors within the commercial forestry value chain in KwaNgwanase, what are their roles and how are they organised?
- ii. What are the main challenges faced by forestry value chain actors in KwaNgwanase?
- iii. What is the high-level economic efficiency (costs and profit margins) for different actors in the forestry value chain in KwaNgwanase?
- iv. To what extent do commercial timber activities impact the livelihoods of forestry value chain actors in KwaNgwanase?

1.5 Justification of the study

The findings of the study will provide guidance to respective authorities by informing the drafting of a forestry value chain development framework that is inclusive of all role players, in particular small-scale timber growers and contractors. Most importantly, the research will add value to the forestry industry within KwaNgwanase, especially for subsistence timber growers and other role players who are interested in fully commercialising their timber plantations and who want to participate in the forestry value chain.

1.6 Scope of the study

The research was conducted in two villages in KwaNgwanase which fall under the Umhlabuyalingana Local Municipality, namely Mnyayisa and Nsukumbili villages. The data collection for the research took two months to complete and was undertaken in December 2020 and January 2021. Additional data was also collected during April 2021. The case study approach, in conjunction with quantitative survey were used to execute the study. The methodological choice for the research was a mixed method approach that combined quantitative and qualitative data collection for quantifiable as well as descriptive data analysis. The participants interviewed in the study include the operator of a timber seedling nursery, small-scale timber growers and forest harvesting contractors within the forestry value chain in KwaNgwanase.

1.7 Structure of the dissertation

This dissertation comprises five chapters.

Chapter One

This covers the introduction to the research and has outlined the background to the study, statement of research problem, aim and objectives of the study, justification of the study and scope of the study.

Chapter Two

The purpose of this chapter is to provide a review of relevant literature where various concepts pertinent to the study will be discussed. A conceptual review is provided to unpack relevant frameworks to understand value chains sustainable livelihoods concept. The review which examines the findings of previously completed studies that focus on the forestry industry and livelihoods is also undertaken.

Chapter Three

The third chapter is the methodology, which explores the practical experiences of growers and harvesters in the timber value chain. The chapter outlines the data collection processes chosen

to guide the study and the specific methods to select the participants for inclusion in the study will be explored in some depth. The data collection instruments and the method of data analysis will be outlined. The ethical procedures followed as well as the limitations of the study will also be considered.

Chapter Four

This chapter offers a presentation of the research findings as they relate to each of the objectives of the study.

Chapter Five

Chapter Five covers the final summation of the research findings, the conclusions that can be drawn and the recommendations to be made for improved participation and access to the value chain for rural communities in KwaNgwanase.

1.8 Conclusion

This chapter has explored the pivotal role of the forestry industry in rural communities in KZN, particularly its impact on improving livelihoods in these communities through increased participation in the forestry value chain. Studies of this nature are necessary to inform policy and practice regarding the increased participation of small-scale timber growers and other role players who may be interested in commercialising their timber plantations and who want to participate more fully in the forestry value chain. The justification for the current study and the research objectives and questions guiding the study were presented in Chapter One. Chapter Two to follow focuses on a review of the existing literature that was considered relevant in developing an understanding of the theoretical and conceptual underpinnings of the study, as well as the findings of previous studies that have been conducted on the forestry value chain and its impact on livelihoods.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

In this chapter, theoretical and conceptual understandings pertinent to the topics investigated in the current study will be reviewed. The objective of a literature review is to gather relevant information already researched regarding a phenomena (Sekaran, 2003). The approach is to give an account and analysis of previously investigated topics and theories and to discuss contested arguments. Identification of gaps during a research is done at literature review stage (Walliman, 2011). Similarly, the purpose of literature review in this research is to create a fuller overview of the context of the study and the current thinking around the topic of the forestry value chain and its effects on livelihoods.

An overview of forestry; internationally, nationally, in KZN and in KwaNgwanase will be discussed in the early sections of this chapter. The theory of value chain analysis will also be discussed, particularly as it pertains to the forestry industry. This chapter will then focus on a review of the findings of previously conducted studies with the aim of identifying and explaining the actors within the forestry value chain, challenges facing timber growers and any gaps in literature. Lastly, the concept of sustainable livelihoods in relation to small-scale timber farming and the gross and profit margin analysis applicable to the sector will also be explored.

2.2 An overview of forestry and timber farming

2.2.1 International context

As a result of global population growth, the world's natural forests remain under severe pressure as humans and animals have been competing for limited forest resources over the past four centuries (Food and Agriculture Organisation [FAO], 2005). According to FAO (2016), the world's forest area is dominated by natural forests totalling approximately 93% of global forest footprint. However, a decrease of natural forest area at a rate of 6.5 million ha per year from year 2010 to year 2015 is very alarming (FAO, 2016). Most of these forests have been modified by man-made activities, thus converting them into other unsustainable forms of forests (Cubbage *et al.*, 2015). The largest loses are reported to be in Africa and South America

(FOA, 2005). To respond to these challenges, approximately 105 million ha of commercial forest has been planted worldwide since 1990 (FAO, 2016).

Szulecka, Pretzsch, and Secco (2014) reported that although cultivation of commercial forest started as far back as the seventeenth century, large-scale forest plantation began in the 1960s after the Second World War. The main drivers during the seventeenth to nineteenth centuries was the use of forest biomass as fuel during the beginning of industrialisation (McEwan, Marchi, Spinelli & Brink, 2019). During the twentieth century, there was an increase in reliance on commercial forest resources worldwide in order to meet demands for sustaining current and future needs for timber products (McEwan, *et.al.*, 2019). FOA (2016) reports that most countries began to move towards promoting sustainable forest management practices as approximately 96% of commercial forests worldwide were reported to be managed within regulated policies and frameworks during the first decade of the twenty-first century.

The main driver of commercial forestry in Africa during the twentieth century was a high demand resulting from development of the rail, mining and settlement infrastructure (FOA, 2005). However, in twenty-first century the large demand for commercial forestry is driven by improvement in the standard of living for African, Asian and South American countries, in addition to the demand for biofuels and print media requirements in North America and Europe (McEwan, *et.al.*, 2019).

FOA (2016) reported that in 2015, the total area under commercial forest was approximately 291 million ha. Planted forests have been growing at a growth rate of approximately 1.84% since year 1990, with Asia, South America and North America recording a higher growth rate of at least 2.1% per annum. Globally, commercial forest ownership is skewed towards public ownership as approximately. The dominant planted species include *Pinus*, *Eucalyptus*, *Populus* and *Acacia* (FAO 2016). The current expansion of Eucalyptus and Acacia plantations is primarily linked to global demand for pulp and paper (FAO 2016).

2.2.2 South African context

Before the arrival of settlers in both the Cape Colony and Eastern Cape, South Africa only relied on timber from indigenous forests (DAFF, 2020). Since there were no legislations governing and regulating the use and management of natural forests, there was an increase in deforestation and degradation of natural forests during the middle of the nineteenth century (DAFF, 2020). However, implementation of policies and regulations were delayed until year

1875 when real afforestation began due to a high demand of timber logs to support the needs of the growing rail and mining industries (King, 1938).

At the beginning of the twentieth century, Clarke (2018) reported that the commercial forestry industry grew exponentially as approximately 60,000 hectares (ha) of land had been planted under black wattle trees by year 1910. Before the World War II, forestry was mainly government's responsibility (King, 1938). However, after World War II, commercial forestry grew further as the total area under plantation surpassed a 1 million ha by year 1975. DAFF (2020) reported that there was a change in forestry ownership in South Africa since approximately 70% of timber plantations were in the hands of private growers and only 30% was owned and managed by the Department of Forestry. In 1990, all government owned forestry plantations, approximately 263,000 ha, were transferred to a newly formed state-owned company, the South African Forestry Company Limited (SAFCOL) (DAFF, 2020). SAFCOL is now a public entity under the Department of Public Enterprises (Forestry and Wood product Sector [FWS], 2014).

2.2.2.1 Production trends and type of species planted

When compared to other economies, South Africa is the 13th largest timber producer in the world, where the Asian countries dominate the global forestry industry (Ledger, 2017). Countrywide, timber plantations cover a total footprint of approximately 1.27 million ha in area (Clarke, 2018; DAFF, 2016 and Ledger 2017). This is equivalent to approximately 1.1% of the country's land (DAFF, 2016). The South African plantations comprise of both softwood and hardwood trees (Ledger, 2017).

A pick of area under timber plantations was observed in the late 1990s where more than 1.5 million ha were afforested due to a high demand of hardwood because of its shorter growing cycle of approximately 6 to 8 years (Ledger, 2017). This peak was however short-lived as the total planted area was reduced by approximately 7.7% as government implemented new regulations against commercial forestry along the wetland zones and there was phasing out of some state-owned plantations in the Western Cape province (Clarke, 2018). The chances of expanding plantation area was thus limited due to stringent regulations that protect against plantations on riparian zones in accordance to the South African National Water Act no. 37 of 1998 (Clarke, 2018).

According to Clarke (2018), commercial forestry plantations in South African are concentrated in Mpumalanga province at 40.5% and KwaZulu-Natal province with 39.9% of the plantations. The remainder of plantations are found in the Eastern Cape, Limpopo and Western Cape provinces. DFFE (2019) also reported almost similar information for year 2018 and year 2019. The distribution of forest plantations in South Africa is exhibited in Table 2.1 (DFFE, 2019).

Table 2.1 Comparison of forest plantation area in 2018 and 2019 (Source: DFFE, 2019).

Province	2019		2018	
	Afforested Area		Afforested Area	
	Hectares	%	Hectares	%
Limpopo Province	51 047	4.3	50 859	4.3
Mpumalanga	491 891	41.2	488 769	41.0
North West Province	304	0.0	304	0.0
Free State	-	0.0	-	0.0
KwaZulu-Natal	478 318	40.0	472 425	39.6
Eastern Cape	141 905	11.9	141 820	11.9
Western Cape	31 197	2.6	37 462	3.1
TOTAL	1 194 663	100.0	1 191 638	100.0

Growth in afforestation is evident for both Mpumalanga and KwaZulu-Natal from year 2018 to year 2019 as both provinces continue to dominate in terms of areas under forest plantations. Overall, an upward trend in total afforested area in South Africa was report for year 2019 (DFFE, 2019).

According to Ledger (2017), the South African forest plantations are dominated by pine tree species that cover 52% of the land, followed by eucalyptus species at 42%. The remainder of the plantations comprise of the black wattle species that cover approximately 7% of the total exotic forestry in the country (Ledger, 2017). DAFF (2016) also reported similar figures except that a negligible 0.4% for other forestry species is also recorded. Hardwood such as eucalyptus and black wattle are said to have a shorter growing cycle of 8 to 10 years before harvest, while softwood pine has a longer rotation cycle of between 12 to 15 years (Ledger, 2017). In the South African timber market, softwood is used mostly for pulpwood while hardwood is used as construction poles, mining poles and saw logs (Mtengu and Green, 2016). Timber yields in South Africa depend on various factors such as soil conditions, rainfall, climate, type of tree species, management practices and harvesting age (Ledger, 2017).

2.2.2.2 Forestry ownership in South Africa

Until 1975, the large portion of forest plantations were owned by the state (Clarke, 2018). However, during the last decade of the twentieth century, the private sector started to dominate the industry as the state assumed a new role of being a forestry authority through the Department of Water Affairs and Forestry. Privatisation of state forests took place in early 2000s as most land was transferred to SAFCOL, with other land parcels leased out to private growers (Clarke, 2018). Figure 2.1 exhibits forestry ownership in South Africa in 2015, with approximately 83% of forestry plantations owned by private sector that include corporate, commercial farmers and small-scale timber growers (DAFF, 2016). Approximately 17% of forest plantations are owned by the public sector, which includes SAFCOL and state/municipalities (DFFE, 2016).

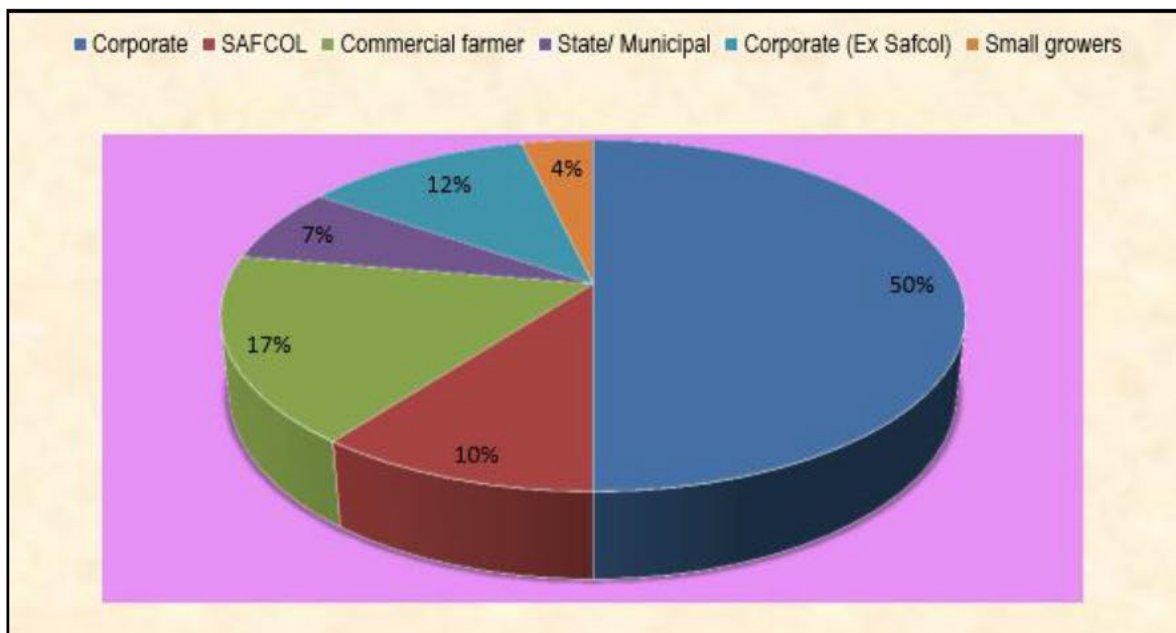


Figure 2.1 Forest plantations in South Africa by ownership (Source: DAFF, 2016)

In addition to the above, the latest data published by DFFE (2019) indicates a slight drop of plantations owned by private sector at 82%, whilst 18% is owned by the state. Although the private sector owns 82% of commercial forest in South Africa, Clarke (2018) reported that the majority of plantations are owned by big corporates. Clarke (2018) categorised the timber growers into three categories comprising large, medium and small growers. Large growers own approximately 69% of plantations compared to 16.1% and 7% that is owned by medium and

small growers respectively (Clarke, 2018). This data is presented in Table 2.2 below and is similar to the latest figures reported by DFFE in 2019.

Table 2.2 Forest plantations in South Africa by ownership (Source: Clarke, 2018)

Ownership category	No. of entities	Area (ha)	% Area
Large growers - private land	13	641 497	52,6%
Large growers - leasing state land	4	131 464	10,8%
Large grower - state owned (Komatiland Forests (KLF))	1	122 578	10,0%
Large Total		895 539	69%
Medium Growers* (Commercial farmers)	1300	19 6543	16,1%
Small Growers - communal land*	31500	45100	3,7%
State owned and managed		83544	7%
Total		1277245	

The skewness of ownership towards the private sector translates into 82% of certified forests in the country, making South Africa to have the highest number of certified plantations globally (Ledger, 2017) when compare to international certification of 42% (FOA, 2016). South African plantations are certified by the Forest Stewardship Council (FSC), which is the certification body that promotes the sustainable growth and management of forest plantations globally (Mtengu and Green, 2016).

Clarke (2018) highlighted that the dominance of big corporates emanates from the fact that these companies are mostly interested in securing sustainable feed stock for their mills. The big corporates include the two Southern African timber powerhouses, Sappi and Mondi in addition to Komatiland, a subsidiary of SAFCOL (Ledger, 2017 and FWS, 2014). These companies are vertically integrated, and they participate in most activities of timber industry value chain. Their strategy is to produce high volumes of low cost timber through either partnering with small-scale growers or by means of other economies of scale (Clarke, 2018).

In 2005, both Sappi and Mondi controlled approximately 50% of plantations. Their combined forestry resources have however shrunk since Mondi sold approximately 50% of its plantations. South African government has also privatised some of its forest assets, thereby allowing participation of new commercial timber entrants in to the industry (Clarke, 2018). Clarke (2018) also reported that there has been a rise in the number of plantations by independent

commercial timber growers as they currently own 20% of the forestry industry. These growers are not vertically integrated when compared to Sappi, Mondi and Komatiland, since they are only interested in accessing markets with good prices.

2.2.3 Contribution of forestry to the South African economy

The activities of the forestry industry include propagation of timber seedlings in the upstream, and harvesting and logistics downstream of the value chain. Ledger (2017) argued that the grower schemes by Sappi and Mondi have opened up some opportunities for harvesting and logistics contractors, especially in KZN.

In the timber manufacturing industry value chain, the wood products manufactured in South Africa include pulp and paper, sawmilling, mining logs and fencing/industrial poles. In order to feed the timber manufacturing industry, the forestry industry contributes an estimated 56% to pulp and paper production (Clarke, 2018). About 70% of the feed stock for the pulp and paper industry is produced in KZN in the form of eucalyptus trees, mainly from northern KZN (Ledger, 2017). Ledger (2017) further mentioned that this represents the fact that there is a concentration of most pulp and paper processors along the east coast of South Africa which translates to easier exporting via sea. The rest of the products from the timber manufacturing value chain include 37% sawmilling, 4% mining logs, 2% poles and 1% for other products (Clarke, 2018). Most of these value chains are concentrated inland in Mpumalanga province, reflecting a need to support the Gauteng province which is the economic hub of South Africa.

Approximately 1% to 2% of South Africa's gross domestic product (GDP) emanates from the forestry industry, while 10 to 12% of GDP is generated from the timber manufacturing industry. Ledger (2017) emphasised that the timber manufacturing sector is of critical importance to South Africa's economy as it contributes immensely to job creation for rural areas as well as to export earnings. Although South Africa's timber plantations constitute only 0.3% of global timber production, the sector contributes an estimated 2.5% of the global saw log and pulpwood products (Clarke, 2018). These figures indicate that the South African timber sector is well established as it competes within the global space. The forestry industry as a whole contributes approximately 72,000 jobs in South Africa (Clarke, 2018). Despite these figures, Ledger (2017) argues that the majority of these jobs are unskilled positions, thus underscoring the value of the industry.

2.2.4 Forestry in KwaZulu-Natal and KwaNgwanase

According to DFFE (2019), the KZN province has the second largest afforested area, at 40%, in South Africa after the Mpumalanga province which has 41.2% based on 2018/2019 report. The dominant forest species grown in the province include mainly eucalyptus at 56.9% and pine and other soft woods at 38.5% (DFFE, 2019). Forest cultivation areas in KZN is divided in to five afforestation zones, namely Maputaland, Zululand, Southern Natal, Northern Natal and the Midlands (DFFE, 2019).

According to the Department of Transport (DOT) (2019), the KZN forestry industry played a pivotal role in contributing 12.2% to the provincial GDP in 2004/2005 financial year through forestry plantation activities and timber products. In 2005, there were approximately 10,000 small-scale timber growers in KZN, owning approximately 14,000 ha combined (DOT, 2005).

Cultivation of commercial forest in KwaNgwanase area can be traced as far back as early 1960s with plantations established by the then KwaZulu Department of Forestry in Manzengwenya village (SA Forestry (SAF), 2021). Approximately 19,000 ha of softwood pine trees were planted from 1960s to 1970s in order to boost the local development within the region, including creating of job opportunities for the locals. The intention was to create a plantation ecosystem for production of both wood and wood products. However, these state-owned plantations did not perform well under pine, thus some areas were partially replaced by eucalyptus in 1980s and 1990s (SAF, 2021). Some of these plantations were leased to the DAFF (formerly Department of Water and Forestry) in 1994. Since 2012, DAFF has been in negotiations with TMM Development Trust which is formed by three traditional councils in the area for the trust to take over the lease agreement (SAF, 2021). Some unplanted areas were handed over to TMM Development trust in 2015 (The Water wheel, 2020) and approximately 1000ha had been planted by year 2019 (SAF, 2021).

Although Manzengwenya plantations have good prospects of contributing positively to the lives of the communities, water experts determined that the plantations have a negative effect on the drying up of a fresh water Sibaya lake (The Water Wheel, 2020). The new management are in the process of replacing some forest planted areas with macadamia crops along the lake (The Water Wheel, 2021).

Although there is no imperial data available regarding total area under afforestation in KwaNgwanase, SAF (2017) estimates that afforested area is about 28,000 ha, with 9,000 ha being owned by small-scale growers in the area. According to Cairns (2000), small-scale timber farming in KwaNgwanase was introduced in the late 1980s by Sappi through partnering with community members in a form of contract farming. Sappi provided small-scale farmers with physical assets such as seedlings, loans and extension services for management of eucalyptus plantations (Cairns, 2000). Since the early 2000s, small-scale private growers and contractors have been established using knowledge transferred to them by Sappi (The Water Wheel, 2021).

2.3 Conceptual review

2.3.1 Value chain analysis concept

A value chain is defined by Kaplinsky (2000) as a range of activities required to bring a product or service to final consumption. The theory of value chain analysis has been used by most disciplines in order to understand linkages, both horizontal and vertical, between different nodes and actors along a value chain, and to understand constraints and benefits among the value chain participants (Sanga, 2016). Horizontal linkages are interactions among the competing organisations at the same level of the value chain, and these organisations are able to reduce costs through economies of scale such as bulk buying which results in increased efficiency and competition in an industry. The vertical linkages involve interaction among different organisations at different levels of the value chain. The market is the initial point of the value chain analysis and within that chain the end users often have a bargaining power that shapes the changes that may occur within a value chain (Sanga, 2016).

According to Ncube, Mkhonjera, Paremoer and Zengeni (2016), the agricultural value chain is defined as an integrated approach to movement and conversion of agricultural commodities from farm to consumer. It comprises primary production, secondary production and tertiary production. Primary production focuses on the farm production activities, secondary production includes high level processing of raw material from the field and packaging, and tertiary production involves conversion of semi-finished agricultural products into consumable goods (Dube, das Nair, Nkhonjera & Tempia, 2018). As reported by Kaplinsky (2000), the forestry/timber value chain is unique and is different from other conventional or cash crop agricultural value chains. The structure of the forestry value chain includes industries that are

governed by a completely different set of regulations. A unique element of the forestry value chain is that the actors are mostly connected through the transaction of goods and services.

Figure 2.2 below exhibits Pulhin and Ramirez's (2016) representation of a value chain for the forestry industry. This representation is substantiated by the findings that were obtained in a study by Sanga (2016) where it was shown that the value chain participants for a forestry value chain include producers (timber growers), collectors/harvesting contractors, and those involved in the storage, transportation and sale of timber.

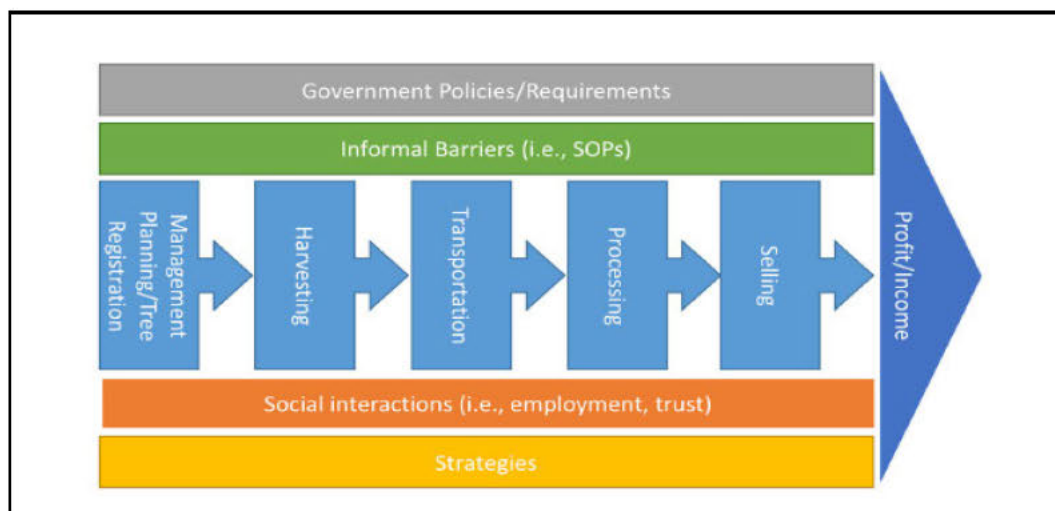


Figure 2.2 Representation of the forestry value chain (Source: Pulhin & Ramirez, 2016)

According to Pulhin and Ramirez (2016), the forestry value chain is regulated by government through policies, regulations and standard operating procedures. These are in place to ensure that forestry is undertaken in a sustainable manner. Management planning involves growing and management of forest plantations or natural forests by timber growers and it is an upstream node of the value chain. The downstream nodes include harvesting, transportation, processing and selling of timber and timber products. These activities are done by different actors in the value chain that are either vertically or horizontally aligned (Sanga, 2016). The objective of all actors in the value chain is to generate a desired profit/income in order to enhance their standard of living, which is the tail end of the value chain process. For each actor to make profit and survive in the value chain, it is important to develop strategies that are underpinnings of their operations. These normally include forming relations with other value chains, be part of timber grower associations or partner with big companies already participating in different nodes of the value chain. These strategic relations help the value chain actors to navigate strive within

the timber value chain, especially in countries where timber farming is highly regulated (Pulhin & Ramirez, 2016).

Frequent interaction among the vertical and horizontal participants along the forestry value chain is critical for achieving the goals of small-scale timber growers and contractors, whilst uncertainties and ‘arms-length’ relationships affect the overall performance of the actors (Sanga, 2016). Small-scale timber growers and contractors thus have to adjust to political, environmental, social and economic uncertainties. This adjustment places these value chain actors at a disadvantage as some of these factors are normally beyond their control (Pulhin & Ramirez, 2016).

Pulhin and Ramirez (2016) also highlighted that trust is of paramount importance among the actors as it reduces the transactional costs on different levels of the value chain. Trust between both vertical and horizontal participants reduces uncertainties and improves overall performance of small-scale growers and harvesting contractors (Pulhin & Ramirez, 2016). Trust also builds long-term business relationships that shape the forestry value chain. In so doing, value chain analysis provides crucial insights into policy formulation and implementation (Kaplinsky, 2000).

However, value chain analysis, most of the time, focuses on how the participants incorporate themselves in the respective chain while overlooking the social and policy interaction of the actors involved (Pulhin & Ramirez, 2016). For purposes of understanding the position of small-scale timber growers and contractors in KwaNgwanase, it is necessary to investigate the forestry industry as a whole in the area, hence the need for a study such as this current undertaking which aims to identify the actors in the area and to better understand the contribution of the industry to actors’ livelihoods.

2.3.2 Small-scale timber farming

Small-scale timber farming have been in existence since 1600s (FAO, 2005). Mizaras, Doftarte, Lukmin, and Silingien, (2020) undertaken a study in Lithuania to assess sustainability of small-scale timber farmers and to assess factors that influence sustainability of small-scale timber farming in the country. The results obtained indicate below average sustainability levels when compared to private commercial timber farming. Small-scale timber grower’s perception about the importance of timber farming and income per ha were found to be the strongest factors that influence sustainability of small-scale timber farming in the region. Unavailability

of monitoring systems and challenges faced by small-scale growers were found to be the contributing factors due to unavailability of policy framework from government that monitors sustainability of timber farming activity (Mizaras *et al.*, 2020). The findings obtained by Mizaras *et al.* (2020) are in line with the argument reported by Jafari, Kaji, Azodi, Gebrehiwot, Aghamir, and Passel (2018) that a collaborative effort between the government forestry department and small-scale growers is required to support sustainability of small-scale timber farming. Jafari *et al.* (2018) further reported that a collaboration between government and other forestry stakeholders could enable development of policy framework that could be used as guiding principles for sustainable of small-scale timber farming.

In the South African context, a small-scale timber grower is defined by Howard *et al.* (2005) as a timber grower who owns less than 100ha of timber plantations and has no title deed for the land on which the plantations are grown. Mtengu and Green (2016) and Clarke (2018) suggest that small-scale timber growers operate informally in rural areas and very few groundbreaking studies have been conducted to assess their forestry resources.

Clarke (2018) however highlighted that there has been a rapid growth of small-scale timber growers in the past 30 years as a result of out-grower support schemes provided by large corporates, such as Sappi and Mondi. An out-grower scheme can be defined as a contractual partnership between landholders or growers and a larger company for the production of commercial timber products (Race & Desmond, 2001). The rise in these growers is also linked to government initiatives to support emerging timber growers in South Africa (Clarke, 2018). It is estimated that there are approximately 31,500 small-scale timber growers in South Africa who own a combined 45,000ha of plantations (Clarke, 2018).

Ledger (2017) emphasised that, although small, the out-grower programmes play a significant role for the forestry industry and South Africa is known as a world leader for such initiatives. Sappi and Mondi, in particular, have established out-grower schemes for the upliftment of small-scale growers in areas where these large companies operate. In 1983, Sappi established a corporate social investment scheme called Project Grow as part of the company's enterprise development initiative around its operational areas in KZN communities. The intention of the scheme was to give back to the communities in order to address social and economic issues within households (Sappi, 2015). In 1989, Mondi also started an out-grower scheme similar to Sappi's called Khulanathi which means 'grow with us' in IsiZulu (Howard *et al.*, 2005).

Howard *et al.* (2005) argue however that the main intention of these schemes was to secure sustainable timber raw material for expanding pulp mills in KZN, and not necessarily the upliftment of communities as purported by the companies. Both Sappi and Mondi identified potential timber growers with access to land ranging between 1ha and 20ha, and provided an initial growing capital outlay for inputs such as seedlings and fertiliser, and for ploughing and planting (Ndlovu, 2018; Sappi, 2015). The small-scale growers thus locked themselves in long-term partnerships with the large corporates. Nevertheless, these partnerships offer the small-scale growers guaranteed markets with flexible profit margins depending on the capital outlay, operational costs, harvesting costs, logistic costs and yields obtained (Howard *et al.*, 2005; Sappi, 2015).

The corporates see this partnership model as a way of introducing previously disadvantaged communities into the timber cultivation value chain (Sappi, 2015). In addition, these out-grower initiatives create job opportunities for rural people and allow for the transfer of skills to emerging timber growers, but most importantly they contribute to household income for the rural families involved in the schemes (Jele, 2012). Sappi estimates that approximately 27,080ha of timber plantations are managed under the Project Grow scheme for approximately 4000 grower partners in KZN (Sappi, 2015).

2.3.3 Challenges facing small-scale timber growers

In a study conducted by Jele (2012) in the Sokhulu area in northern KZN, it was found that forestry played a fundamental role in bettering the livelihoods of the communities in the area, although the majority of residents depended on income from pensions and child grants for survival. The Sokhulu community is a rural area which falls under the traditional tribal authority and the KwaNgwanase area resembles Sokhulu in many respects. In Sanga's (2016) study in rural Tanzania, the findings revealed that the forestry value chain is a key source of income and livelihood in Tanzanian villages. The industry has improved the livelihoods of the residents, particularly in terms of household income, and has resulted in the upliftment of communities' wellbeing in the districts, reduced vulnerability to poverty and improved sustainable use of natural resources (Sanga, 2016).

All three spheres of South African government, that is, local, provincial and national, also recognise the importance of the forestry industry in the creation of job opportunities for rural communities. This is evident as the industry is considered to be one of the strategic sectors

targeted in the Umkhanyakude District's Growth and Development Plan, KZN's Provincial Growth and Development Plan and government's National Development Plan. Although being recognised by the DFFE as one of the critical industries contributing to the alleviation of poverty in rural areas, small-scale timber growers in the forestry industry in South Africa still find themselves facing a myriad of challenges that hinder their sustainable growth within the sector.

Based on the findings of the previously undertaken studies considered above, various challenges that are faced by small-scale timber growers have been identified. These challenges impede timber growers' development and thus their progression from small-scale/ communal timber growers to commercial timber growers. These challenges are discussed in the subsections to follow.

2.3.3.1 Registration with FSC

In the aforementioned study by Howard *et al.* (2005) it was found that timber growers' inability to register with the FSC could have been attributed to the fact that the small-scale growers did not have water use licences for cultivation of timber. In South Africa, forestry is the only activity listed as a stream flow reduction activity by the Department of Water Affairs and Forestry (DWAF) (Howard *et al.*, 2005). Mtengu and Green (2016) engaged in research to evaluate the impact of registration with the FSC on market accessibility and price determination in the KwaZibi community, which falls under the KwaNgwanase area. They found that the small-scale timber growers were still not registered with the FSC when the research was conducted a few years ago. As a result, small-scale growers had no voice as their interests were not being represented within the industry.

Mahlangu and Mubangizi (2015) indicated that small-scale growers also did not have measures to deal with risks such as damage to their plantations due to fire, storms and theft as their plantations were not insured. Their dependence on hoping that these natural disasters would not occur placed them at risk and they therefore had less likelihood of getting their plantations certified by FSC. Mahlangu and Mubangizi (2015) recommended that small-scale timber growers must consider forming a body that would represent them at lower level since the FSC is too broad to consider small-scale grower affairs.

2.3.3.2 Lack of funding and business skills

Mahlangu and Mubangizi (2015) also found that while some small-scale timber growers do possess knowledge of how to farm timber, they lack entrepreneurial skills, land and funding for them to effectively run sustainable timber production businesses. Mwale (2000) also established similar findings in a study conducted in Richmond, KZN. Due to the lack of a holistic approach to small-scale timber farming in rural areas, challenges were encountered in government's ability to allocate sufficient grant funding for communal forestry. It was also found that that corporate companies had implemented policies that only allow them to expand through small-scale growers (Mwale, 2000).

2.3.3.3 *Lack of market*

According to Mtengu and Green (2016), the forestry industry in rural communities is very complex, it is difficult to access the markets and small-scale timber growers do not have any influence on price determination. The findings of Mtengu and Green's (2016) study are also in line with those from the research conducted by Jele (2012) on small-scale timber growers in Sokhulu. The small-scale growers in Jele's (2012) study tended to sell their timber either to contractors or suppliers in order to minimise harvesting and logistic costs.

In a study conducted by Pulhin and Ramirez (2016) in Philippines to examine timber regulation and value chain in community-based timber businesses, it was found that the market is over regulated with informal practices and stringent policies. These restrictions are beyond timber grower capabilities, thus resulting in small-scale growers not to make any profit even if they can sell their timber (Pulhin & Ramirez, 2016).

2.3.3.4 *Land ownership*

The profits from the sale of timber were also found to increase proportionally with sales volume per hectare, meaning that the more land a communal farmer had, the higher the profits earned (Cubbage *et al.*, 2015). The total area under production also influenced the value chain as it had a directly proportional relationship to the returns received (Sanga, 2016). These findings are in agreement with the findings obtained by Mahlangu and Mubangizi (2015) in their research at Entembeni community where the majority of small-scale growers indicated that their main hindrance was lack of land for expansion. Mahlangu and Mubangizi (2015) further established that land size limitation was based on individuals' social status.

2.3.3.5 *Small-scale growers are not organised*

The study conducted by Sanga (2016) revealed that the timber value chain is a key source of income and livelihood in Tanzanian villages. However, lack of coordination, both horizontal and vertical, within the value chain was evident as the participants were not organised. Mtengu and Green (2016) reported that there are limited extension services from various spheres of government that are supposed to support forestry activities in rural communities, thus inadequate coordination of small-scale growers and emerging value chain contractors. As a result, small-scale timber growers lack crucial information that could positively influence their businesses (Mtengu & Green, 2016).

2.3.3.6 *Participation in one activity only*

In the study conducted by Mahlangu and Mubangizi (2015) it was found that the success of small-scale timber growers is hindered or enhanced by the business systems, processes and policies of their timber production businesses. Their study deduced that the current method of introducing timber cultivation to rural farmers did not yield positive results in the Entembeni community since timber cultivation became the sole activity within the value chain. This conclusion is substantiated by the fact that most small-scale timber farmers enter into partnerships with private corporate companies such as Sappi and Mondi; thus, they lose out on opportunities to supply their harvest to alternative markets.

Mahlangu and Mubangizi (2015) also found that the production cost of timber becomes expensive for small-scale timber growers and only benefits the commercial farmers who are grower partners and logistic contractors. A holistic approach to the timber business that includes alternative land use planning and management could therefore benefit the small-scale timber farmers. Participation within other value chain activities such as harvesting and transportation, according to Mahlangu and Mubangizi (2015), could also yield substantial gains for small-scale timber growers.

Cubbage *et al.* (2015) examined the factors that influence timber production costs and returns for communal timber growers in their study undertaken in Mexico. It was found that in order to make profits and become sustainable, it is essential for communal growers to participate in different activities of the timber value chain such as operating a sawmill. This finding is congruent with the findings from the study conducted by Mahlangu and Mubangizi (2015).

Sanga (2016) also indicated the same in his study where he found that timber farmers who were mixing their forestry businesses with other farming operations such as livestock keeping and small-scale vegetable gardens had better livelihoods compared to farmers who were concentrating on the forestry value chain alone.

2.3.3.7 Long growing cycle of timber

The study by Jele (2012) also found that the biggest drawback to improving the livelihood of small-scale growers is that the growing cycle of timber takes approximately six years before harvest. This is disadvantageous to the growers as there is discontinuity in income generation (Jele, 2012) while waiting for the forest to mature. Mahlangu and Mubangazi (2015) reported the same finding, but further recommended that there is a need for a different approach if small-scale timber farming is to be made sustainable. An integrated land use plan that considers different land use alternatives within the forests, such as leisure and tourism activities, was recommended (Mahlangu & Mubangazi, 2015).

2.3.4 Concept of sustainable livelihoods in relation to timber farming

The concept of livelihoods has gained some attention in the past two decades and the Department for International Development (DFID) has been at the centre of the discussion around the concept. According to DFID (1999), livelihood is made up of competencies, resources and any other activities necessary for a means of living. A livelihood is said to be sustainable when it can support its competencies, resources and activities without degrading its natural resource base (DFID, 1999). Ellis (1999) elaborated that livelihood involves the capability of an individual or household to convert natural, physical, human, social and financial resources to advance their standard of living. One of the most important elements of livelihood includes the ability to tolerate harsh vulnerabilities in order to survive (Ellis, 1999).

According to the livelihood framework developed by DFID (1999), a livelihood should be a dynamic process that changes with time in order for an individual or household to adapt to vulnerabilities. Figure 2.3 below depicts the sustainable livelihood framework (SLF) formulated by the DFID.

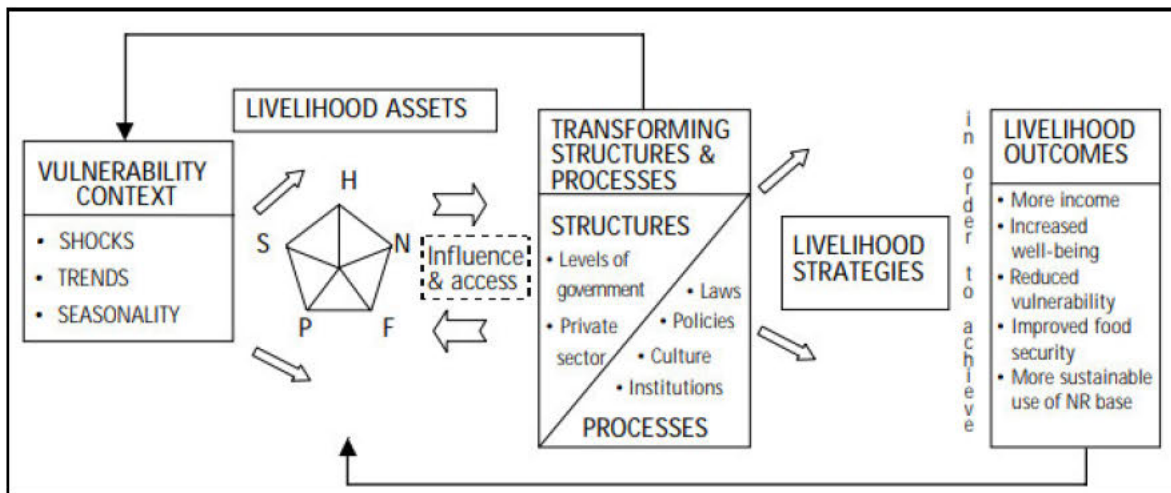


Figure 2.3 Representation of sustainable livelihood framework (Source: DFID, 1999)

Having access to and sustainable use of livelihood resources/assets creates a positive impact on forestry cultivation, harvesting, storage, marketing and utilisation of forestry products. This in turn translates to livelihood outcomes such as increased income, increased well-being, reduced vulnerability and improved food security (Sanga, 2016). For this study which was undertaken in the KwaNgwanase area, one of the objectives is to understand how small-scale timber growers and contractors convert their livelihood assets into livelihood outcomes.

2.3.4.1 Previous studies on livelihoods in forestry industry

In a study undertaken by Barney and van der Meer Simo (2019) in Lao PDR and Vietnam to evaluate the impact of forest plantations on smallholder livelihoods, it was found that commercial timber business has very encouraging attributes in terms of contributing positively to the livelihoods of a community. However, Barney and van der Meer Simo's (2019) argument was based on the condition that the participants in the forestry industry must ensure an effective balance of land use and extensive sharing of benefits from the plantations through employment of local labour and improvements made to local infrastructure for their communities. If these were not taken into consideration, timber plantation would not yield sustainable/competitive livelihoods as compared with other land use options.

Barney and van der Meer Simo's (2019) findings are similar to the outcome of the study that was undertaken in the community of Sokhulu as Jele (2012) also found that forestry plantations have a positive impact on bettering livelihoods of a community. However, Jele's (2012) research found that timber suppliers, who are downstream of the value chain, were the groups

who benefited the most as their total income and per capita income was highest when compared to timber growers (Jele, 2012).

Jele (2012) further established that forestry business had a ripple effect on livelihoods of members of the Sokhulu community. Although the forestry business has a long rotational length and farmers would receive their profits only once every five to seven years, the forestry plantation business provided diversified income as some growers would use their forestry earnings to start other business ventures. This would in turn create other income sources and job opportunities (Jele, 2012).

In the abovementioned study undertaken by Sanga (2016) in Tanzania, a positive impact of timber plantations on the livelihoods of the growers was observed. It was found that forest plantations did not only contribute financially to communities and livelihoods, but also socially. The activity was found to have contributed more to basic needs such as use of timber logs as building material and main source of energy. Sanga (2016) found that forestry cultivation contributed only 19.6% to the source of income/capital, whilst 30.7% and 49.7% were attributed to basic needs and main source of energy respectively.

Mahlangu and Mubangazi (2015) reported that the small-scale growers in Entembeni lacked business skills. They argued that dependence on indigenous farming knowledge was not sufficient for the growers to run their businesses productively and sustainably. Therefore, there was a lack of translating human capital into a sustainable means of living in Entembeni. The study also indicated that the small-scale growers lacked physical capital such as roads connecting forest plantations to loading zones, and thus found it difficult to translate their businesses into sustainable means of living.

The small-scale growers in Entembeni also could not convert their social capital into meaningful livelihoods as they were unable to organise themselves and negotiate with the markets (Mahlangu & Mubangazi, 2015). This finding is in congruence with those of the study undertaken by Mtengu and Green (2016) in the KwaZibi community. However, Mtengu and Green's (2016) findings were based on the small-scale growers who are part of Sappi and Mondi out-grower schemes as the market and price are dictated by these corporates.

In a study undertaken by Cairns (2000) to establish if the timber out-grower schemes in KwaZulu-Natal do build sustainable rural livelihoods, it was found that the schemes do

contribute to natural, human, social, physical and financial assets. They do assist households to have access to communal land, to obtain training on forest establishment and management, to capacitate growers to form partnerships, to have access to road infrastructure and to gain access to loans. However, Cairns (2000) also found that all livelihood assists have a negative impact on the small-scale growers. Some of the negatives include that there are weak small-scale grower associations as they more administrative instead of being strategic. The other negative includes that growers were not able to negotiate the terms of that relates to loans and prices, thus the financial assets could not be converted into livelihood outcome (Cairns, 2000).

2.3.5 Gross and profit margin analysis

Assessment of any business' performance is normally measured by profitability of that business, and this sometimes is extended to business asset utilisation (Aerts & Walton, 2017). Earning above average profit is a desired goal for any business venture and the same is applicable to any agribusiness (Choumbou, Odoemenem & Oben, 2015). Aerts and Walter (2017) defined profit margin as a profitability ratio that indicates how successful a business' management is in converting sales to profit. The profit margin is an ability for any business to convert operating income into net profits.

The profit margin is represented by Equation 1 below (Aerts & Walter, 2017):

$$\text{Profit Margin} = \text{Profit after tax} / \text{Sales} \dots\dots\dots(\text{Equation 1})$$

Where: Profit Margin is the return on sales from year to year or compared to another company and is measured in %;

Profit after tax is net income (measured in Rands); and

Sales is net sales (measured in Rands).

According to Ratnasari and Handayani (2013), gross margin can be defined as a ratio of gross profit of a business to sales obtained in the same period. It is a profitability ratio that gauges the percentage of gross profit that a business retains after deducting all costs of doing business. It represents the amount of profit that is left over once all production/operational costs have been accounted for (Aerts & Walter, 2017). Choumbou *et al.* (2015) argued that gross margin of a farm is revenue earned by a farm minus any variable costs incurred during farm operation.

The gross margin is represented by Equation 2 below (Aerts & Walter (2017):

$$\text{Gross Margin} = \text{Profit before interest and tax} / \text{Sales} \dots \dots \dots (\text{Equation 2})$$

Where: Gross Margin is profit retained after deducting all costs of production and is measured in %;

Profit before interest and tax is revenue minus cost of goods sold (measured in Rands);
and

Sales is sales obtained (measured in Rands).

Several studies that seek to analyse profitability of forestry businesses have previously been conducted. For example, Sanga (2016) used the gross margin analysis model to assess the economic efficiency of the main nodes of the black wattle forestry plantation value chain in Njombe and Lutsholo Districts in Tanzania. In his undertaking, it was found that the average gross margin for forestry producers was the lowest compared to the average gross margins of those nodes downstream of the value chain, such as timber processors and traders. Sanga's (2016) argument was based on the rationale that the forestry producers sell their timber in raw form and the lengthy rotational cycle of forestry plantation exacerbates the problem as most timber growers rely solely on timber sales. It was further found that raw timber is sold at a very low price which does not represent the waiting period for the forest to mature (Sanga, 2016).

The abovementioned findings in the study by Sanga (2016) are in congruence with an investigation conducted by Jele (2012) in the Sokhulu area of northern KZN. In Jele's (2012) study it was found that timber farmers felt that the income from forestry plantations alone was not sufficient to sustain their standard of living. The pressing need to sustain a certain standard of living resulted in the timber farmers harvesting the forest before it was completely mature, thus they obtained low yields and profits. In the aforementioned study undertaken in Tanzania, Sanga (2016) found that the black wattle trees' production yielded positive profit margins for the growers, although the profit margin was still lower compared to that of actors downstream of the value chain. The study revealed a profit margin of 52%, meaning that the farmers were able to obtain R0.52 per every R1.00 rand invested.

An earlier study was also conducted by Cairns (1995) which focused on the evaluation of costs and benefits associated with small-scale timber growing in KZN. The economic benefits of timber production for farmers who were in grower partnerships with Sappi and Mondi were

analysed (Cairns, 1995). Cairns (1995) reported that the KZN small-scale timber growers were obtaining gross margins of approximately 38.8%.

2.4 Conclusion

An overview of the forestry industry was presented looking at both macro and micro scales. The theory of value chain analysis was then discussed in this chapter. Conceptual review was presented with a focus on small-scale timber growers, and the numerous challenges that these growers face in the industry were examined. Lastly, the concepts of sustainable livelihoods as well as profit margin and gross margin analysis were reviewed.

An investigation of the forestry value chain in KwaNgwanase, such as the one undertaken in the current study, will therefore provide an opportunity to assess the contribution of the forestry industry to livelihoods. This is especially important as no similar studies have previously been undertaken in the study area. Furthermore, the impact of out-grower schemes will be assessed in this study as these schemes have been overlooked in the past few years.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, the research design and the mixed research methods employed to guide the study will first be presented. Thereafter, a brief overview of the KwaNgwanase area where the study was conducted, specifically its geographic description and prevalent economic activities in the study area will be offered. Following on from this overview, the non-probability sampling techniques that were used to select the participants from the broader study population will be justified. A motivation for the selection of the structured interview method used to gather data from participants will be presented, and the methods used to analyse the data collected, namely descriptive statistics and thematic analysis will be explored. Finally, the ethical considerations and how these were addressed in the research will be explained, and the limitations faced in conducting the research will be outlined.

3.2 Research design and approach

Saunders, Lewis and Thornhill (2016) define research as a systematic process undertaken by investigators and scholars in order to obtain findings about different phenomena, thus increasing their knowledge and contributing to the betterment of society. In a similar line of thought, Sekaran and Bougie (2016) indicate that research is about finding solutions to problems using logic. This means that a researcher aims to find solutions in order to bridge gaps where there is lack of or insufficient information. Walliman (2011) classifies research as an activity of finding new information that no one currently knows. Research can be used to predict, control, compare, correlate, explain and describe events within societies (Walliman, 2011). Research assists decision makers to make informed decisions when solving problems (Sekaran, 2003).

In order to ensure that a researcher arrives at a solution, there are three different research designs that can be used when planning a study namely quantitative, qualitative and mixed research methodology. Sekaran (2003) and Walliman (2011) both emphasise that research design provides a correct framework for selecting correct data collection and analysis techniques, thus leading to selection of a fitting research method.

Saunders *et al.* (2016) describe quantitative research as a deductive approach involving the use of data to test theory. Similarly, Sekaran (2003) and Sekaran and Bougie (2016) define quantitative research as a design that deals with collection and analysis of data and information that can be quantified. Quantitative research design normally involves numbers and measurements and deals with larger sample sizes. It surveys relationships between variables and objectively focuses the results on what the numbers say (Saunders *et al.*, 2016). The findings in studies using a quantitative design are also based on the empirical evidence stemming from examining relationships between variables, which are analysed graphically or through the use of statistical methods (Saunders *et al.*, 2016).

Qualitative research, on the other hand, is a design concerned with the interpretation of descriptive data. It involves the analysis of non-variable data in order for a researcher to obtain in-depth understanding and to explore the meaning of a phenomenon (Saunders *et al.*, 2016). Qualitative research deals with simple, descriptive data, which is usually non-quantifiable but can be interpreted descriptively (Sekaran, 2003). It aims to produce a holistic understanding and contextualisation of occurrences and considers sensitivity of social issues (Mason, 2002; Walliman, 2011). Data collection in a qualitative study is normally randomised to ensure that new information emerges during the research process (Saunders *et al.*, 2016).

A mixed method research design involves utilising both quantitative and qualitative methods in undertaking a study (Saunders *et al.*, 2016). Almalki (2016) reported that although mixed method designs are better suited to investigations that allow for proper conversation and debate, mixed method approaches do present certain challenges one of which involves the skill of a researcher and choosing whether it is the right method for a particular phenomenon being investigated. To apply this form of research, in most studies, a dominant method is used for data collection and analysis and findings are supported by the other method. Saunders *et al.* (2016) call this approach mixed method simple. In other instances, concurrent mixed method is deployed where both quantitative and qualitative approaches are used for data collection and analysis. Creswell and Clark (2007) refer to this approach as triangulation mixed method design since data is collected differently, but interpretation is combined. The sequential mixed method approach is characterised by at least two phases of data collection and analysis, with one phase supplementing another (Saunders *et al.*, 2016). Lastly, some researchers follow an explanatory design approach of mixed research method. Explanatory design uses the

quantitative approach to build up the context of the research and in the same token utilises qualitative data to analyse data (Creswell & Clark, 2007).

3.2.1 Selection of research design used for the study

The design chosen for the research in terms of data collection and analysis was a mixed methods approach that combined both quantitative and qualitative research methods. The mixed method approach was chosen because it allowed for the researcher to obtain quantitative analytical primary data from the stakeholders while also allowing for qualitative in-depth inputs to be gained from research participants (Saunders *et al.*, 2016). The research design deployed was such that data could be collected in a single-phase approach. The typology of the mixed research used can be described as explanatory design in accordance with Creswell and Clark's (2007) definition since there was a build up from quantitative to qualitative data collection and analysis. The intention was to utilise the quantitative method to analyse the characteristics of the value chain actors in the study area, in order to answer the first and third research questions, while also collecting further qualitative information which would provide greater insight into the challenges that may be faced by the participants, thus addressing the second and fourth research questions.

3.2.2 Selection of research approach used for the study

The aim of this study was to assess the forestry value chain in two villages in KwaNgwanase, with the goal of evaluating its contribution to sustainable livelihoods. Due to the complexity of the forestry industry, which emanates from the involvement of multiple role players in the study area (Mntengu & Green, 2016), the mixture of a case study and survey approach were used in executing the study.

A case study approach was selected because the focus was on a single study area with the intention of developing an in-depth understanding of the forestry value chain and the impacts on the actors involved. Yin (2014) defines the case study research method as an 'empirical enquiry' that assesses an in-depth case within its practical state where there is no clear separation between the case and context. The selection of a case study approach allowed the researcher to fulfil the aim of developing in-depth understanding and to thus address the research questions thoroughly.

The case study approach was used in conjunction with the survey strategy. A quantitative survey strategy was selected in order to enable collection of both quantitative and qualitative data. A survey strategy is a research methodology “associated with deductive research approach” (Saunders *et al.*, 2016). Its main intent is to answer questions such as how, who, what and when. According to Saunders (2016), a quantitative survey research allows a researcher to dictate a direction of a research, especially when survey questionnaires are used as a data collection method, as it was during for this study. This method allowed for structured interviews where a set of standardised questions were used for data collection from the study participants.

3.3 Location of the study

The study was conducted in KwaNgwanase in KZN, which is a small rural region under the jurisdiction of Umhlabuyalinga Local Municipality. The area falls under the Inkosi Mabhudu Tembe local traditional council. The Umhlabuyalingana Local Municipality is one of the five local municipalities in the Greater Umkhanyakude District Municipality which is located in the north-eastern part of KZN province (Umhlabuyalinga Local Municipality, 2017). KwaNgwanase is bordered in the north by the Mozambique border, in the east by the Indian Ocean, in the west by Ndumo Game Reserve and in the south by Manzengwenya forestry plantations (Umhlabuyalinga Local Municipality, 2017). A locality map of the study location is presented below in Figure 3.1.

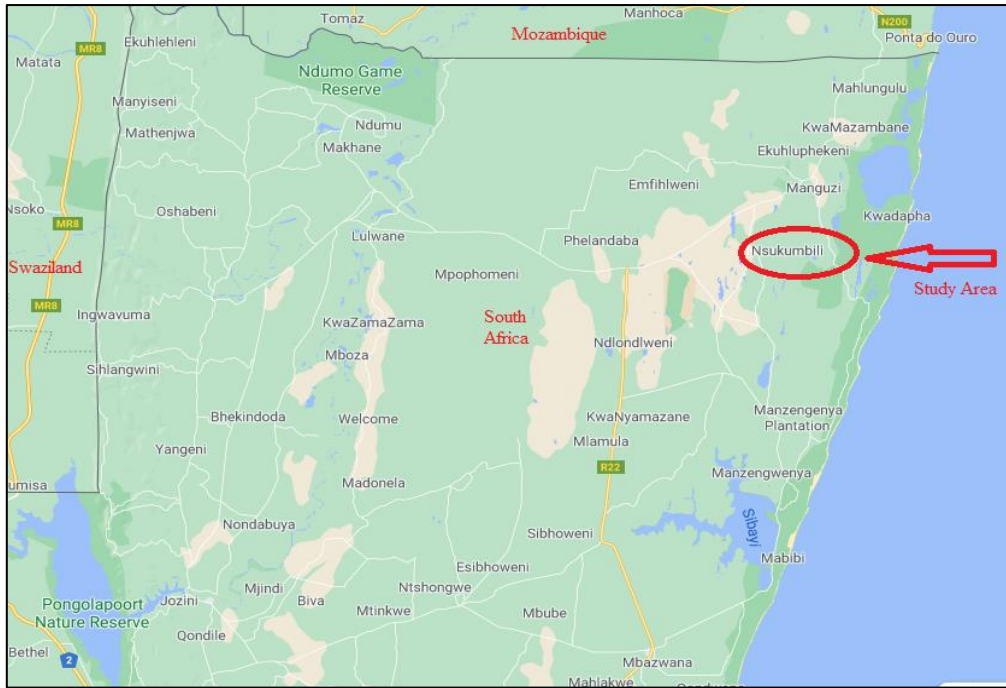


Figure 3.1: Locality map of the study area (Source: Google Maps, 2021)

Umhlabuyalingana Local Municipality is one of the most deprived municipalities in South Africa. Approximately 99% of the area is classified as rural (Umhlabuyalingana Local Municipality, 2019). According to Umhlabuyalingana Local Municipality (2017), the population in the study area is largely illiterate. The Statistics South Africa (Stats SA) (2016) Community Survey found that the municipality has an average household size of five people per household. In the 2018/2019 Umhlabuyalingana Local Municipality Integrated Development Plan it was reported that the overall employment classification of KwaNgwanase is unknown since approximately 95% of the local economy is classified as undetermined (Umhlabuyalingana Local Municipality, 2019). There are few economic activities within the area and the majority of residents depend on social and child grants for household basic needs (Umhlabuyalingana Local Municipality, 2017). Agricultural economic activities include livestock farming, small-scale timber farming, fishing, groundnuts farming and other field crop farming for home consumption. Harsh socio-economic conditions have led to uncontrolled activities and developments in the area resulting in poor land use (Umhlabuyalingana Local Municipality, 2017).

The eastern part of KwaNgwanase is dominated by subtropical forest along the Indian Ocean and is a big attraction for tourists (Umhlabuyalingana Local Municipality, 2019). Other than

this, the larger extent of the area is characterised by loamy, sandy soils and is not conducive for most agricultural crops, except for groundnuts, which the locals cultivate twice a year. The challenges due to less fertile soil limit the residents from cultivating a wider variety of agricultural products, thus forcing them to rely on forestry and livestock farming as viable alternatives for household income generation (Umhlabuyalingana Local Municipality, 2017).

3.4 Study population

The population of KwaNgwanase includes all community members, businesses, local government institutions and practitioners. Although the total population of the study area is not certain, it was reported that the population for Ward 4, where two villages are located, was approximately 9041 people in 2016 (Stats SA, 2016). The targeted population in this study were role players in the forestry industry as they are best positioned to offer insight into the topics addressed in the research questions. The target population in this study was therefore confined to the following actors of the forestry value chain within the study area:

- Eucalyptus seedling nursery owners;
- Eucalyptus timber growers; and
- Eucalyptus timber harvesting contractors.

3.5 Sample size determination and procedures

It must be acknowledged that the researcher grew up in KwaNgwanase and is also a new entrant timber grower in the study area since 2016. The researcher owns approximately 12,5ha of forestry plantations in Nsukumbili and Mnyayisa villages. Although the researcher has not harvested any of these owned plantations, he is familiar with the forestry value chain in the area and to a larger extent understands the network, including difficulties that arise due to being a timber grower. As a community member, the researcher also knows and has relationships with other small-scale timber growers in the village.

From the literature reviewed for the study, the target population, that is, the actors involved in the forestry value chain in KwaNgwanase, is dominated by small-scale timber growers, although the actual numbers of these growers are unknown. The number of forestry harvesting

contractors and seedling nursery producers is however known, with four contractors and one seedling producer in the area. A probability sampling method such as random sampling where every member of the target population has an equal chance of inclusion may not have yielded strong cases that would have been able to answer all the research questions. The participants selected may not have agreed to participate in the study or may have lacked the required knowledge of the research topic. Therefore, a non-probability sampling approach was considered in the form of a purposive sampling technique in order to select participants to include in the study, specifically those whom the researcher had access to and who would most likely agree to participate.

Saunders *et al.* (2016) describe purposive sampling as a non-probability sampling technique that is judgemental in nature and which researchers use to select cases that will best allow them to obtain data to answer the research questions and to address study objectives. Mason (2002) also refers to purposive sampling as a theoretical sampling strategy. According to Mason (2002), when using theoretical or purposive sampling strategy, a researcher need not worry about the size of the sample but the key is to ensure that the sample yields sufficient information to support the research analysis.

Based on the above brief discussion of purposive sampling, the participants who would best have allowed the researcher to obtain information to address the research questions in this study included harvesting contractors and seedling nursery operators. Thus, all four harvesting contractors were selected as well as the one seedling nursery owner who is based in the study area.

To determine the sample size for the timber growers, the purposive selection method was used in conjunction with the snowball sampling method. This approach allowed for manipulation of sampling as it was not possible to use statistical sampling (Mason, 2002). In this way, it made it possible to generate theoretical themes from collected data. Saunders *et al.* (2016) describe snowball sampling as a technique where existing study participants refer further participants with knowledge of the research topic to the researcher, until a point of data saturation is reached. At this point, any further data collection contributes too little to the research thus limiting the sample size. After applying a snowball sampling method from the initial selection of only a few small-scale timber growers, sample size for timber growers was limited to seventeen cases since no new themes or additional information was being obtained. The sample

size of seventeen timber growers is in line with Saunders *et al.* (2016) minimum suggested sample size of five to twenty-five cases if a researcher uses structured or semi-structured interviews, as was the case in this research study. Thus, the final sample comprised four (4) harvesting contractors, one (1) seedling nursery operator and seventeen (17) timber growers.

Sampling units for timber growers was households, but for nurseries and contractors sampling units were businesses. For the timber grower cases to be more informative, the following selection criteria were also considered:

- Participants who have been involved in the timber industry for at least 6 years;
- Participants who have either been independent growers or part of Sappi/Mondi out-grower schemes;
- Timber growers who have harvested and sold timber previously;
- Timber growers who own at least 1ha of timber plantation;
- All eucalyptus seedling nurseries in the two selected villages; and
- All eucalyptus harvesting contractors in the two selected villages.

3.6 Ethical considerations

Permission to conduct the study was first granted from the University of KwaZulu-Natal's Research Ethics Committee with certain conditions (Appendix A) as access to the study area had been negotiated through KwaNgwanase local authority representatives before the Ethics Committee permission was finalised. Since KwaNgwanase falls under tribal authority (Kloppers, 2003), negotiation for permission to conduct the study took place at the level of 'Izinduna' (local leaders) who are under the leadership of the 'Inkosi' (chief), Mr Mabhudu Tembe, and the local Ward Councillor, Mr Lucky Tembe. This process began by outlining the purpose of the study to the 'Induna' (local leader) and to the Ward Councillor and obtaining permission from them to proceed (Appendix B).

Thereafter, permission from the interviewees to participate in the study also had to be negotiated. Participants were informed about the nature and purpose of the study by the researcher, and that they could withdraw from the research at any point if they so wished. Informed consent letters (Appendix C) were signed by the participants if they agreed to

participate in the research. Participants were also allowed to stop participating in the research at any time during interviews, if they so wished. Participants were also assured that their personal information and identities would be kept completely anonymous and no actual names would be used in the dissemination of the findings of the study.

3.7 Data collection methods, instruments, and procedures

In this study, data was collected through quantitative research interviews that allowed a one-on-one dialogue with the participants. The main source of information was data collected from the value chain actors selected to participate in the study and the data collection method used was structured interviews. Saunders *et al.* (2016) describe structured interviews as a data collection method that uses prearranged questions for an interview, but also allows participants to answer open-ended questions towards the end of an interview in order to explore themes in more depth. Questions allow for collection of quantifiable data and are always developed by a researcher. Although they rarely allow for unexpected themes to evolve naturally, structured interviews allow for a topic-centred conversation between a researcher and participants as similar questions are asked to all participants in order to avoid biasness (Mason, 2002), as was the case in this research.

In this study all structured interviews were conducted in person by the researcher and in a one-on-one setting with participants. This method was chosen since it provided the researcher an opportunity to probe participants' responses more fully and to pose further questions where answers were not clear. Saunders *et al.* (2016) emphasise that normally, participants prefer to answer questions verbally instead of filling in a questionnaire. In the case of the target population of this study, verbal interviews were also preferred as many of the participants, as mentioned previously, are illiterate and would not have been able to fill in a written questionnaire.

The structured interviews allowed both qualitative and quantitative data to be collected in the same interview sessions. The qualitative approach included interview questions that were open-ended and permitted the participants to express themselves freely about the topics being discussed. The quantitative portion of the interview questions were developed to be leading questions where participants were also allowed to choose some answers. This approach was used to allow for smooth transition between qualitative data and quantitative data collection

and to strike a balance between descriptive and quantifiable information. Again, other quantitative data collection instruments such as questionnaires would not have been possible noting the educational level of some participants and time constraints to complete the research.

In order to avoid bias, similar questions were posed to all the participants using the same tone of voice (Saunders *et al.*, 2016). The researcher took extensive notes on the interview question sheet and all interviews were also recorded during the interview sessions. The structured interview questions developed for the timber growers, harvesting contractors and seedling nursery operator are attached as Appendices D, E and F. All interviews were conducted in IsiZulu, which is the most commonly spoken language in KwaNgwanase. After interview sessions, the recorded interviews were transcribed and the transcriptions were then translated into English.

3.8 Pre-testing (validity and reliability)

In order to ensure the validity of the interview questions, the questions for the initially developed interview schedules were piloted. Validity of a study refers to a level of accuracy to which data collection techniques deployed in the study yield answers for what a researcher intends to measure (Sekaran, 2003). Saunders *et al.* (2016) emphasise that a trial run must be performed to ensure that the interviewer asks questions that are relevant to what the researcher is investigating. To ensure the integrity of the questions that were to be asked, a trial run was undertaken in one of the villages in KwaNgwanase using similar data collection techniques and instruments to those that were later used for the actual research. The pilot sample was limited to four cases since a quantitative survey method was deployed, through use of structured interviews. This assisted in addressing issues that had to do with questions that were not yielding the intended results. The clarity of the questions and answers were tested, as well as time related factors. The majority of questions that were leading the respondents to a particular answer were trimmed down in order to allow for some open-ended interview questions to be included in the anticipated interview timeframe.

The same pilot study was also used to conduct the reliability test in order to ensure consistency of the interview questions. Reliability of a study refers to the extent to which a selected data collection instrument produces consistent results when used repeatedly (Sekaran & Bougie,

2016). Mason (2002) reported that the reliability of a study is more concerned about the stability of selected research methods, techniques and instruments in producing research data. In most quantitative studies, a researcher often standardises research instruments to ensure reliability. On the other hand, the reliability of qualitative research overlooks standardisation of research instruments but focuses on the repeatability and robustness of a method used (Mason, 2002). Piloting of the data collection instrument was therefore worth being conducted in order to ascertain that the prepared interview questions were going to yield consistent results when used during interviews of different cases. No major issues were found regarding the original interview questions as the cases were able to provide similar themes.

3.9 Data analysis

Data obtained from the participants during the structured interview sessions was verified for correctness. It was then coded and analysed. Data was cleaned up for any errors and anomalies to ensure that any human errors that may have occurred during recording were eliminated. Both qualitative and quantitative descriptive statistics were used to analyse data using the qualitative data analysis computer software package, NVivo.

Quantitative data was only used for descriptive analysis of the information obtained about the participants such as age distribution, gender distribution, level of education, household size and main source of income. This was because the quantitative data collected only allowed for nominal and descriptive data analysis.

The qualitative data analysis comprised a thematic analysis where data was sorted into themes and these themes were then interpreted in light of the literature reviewed for the study. Nowell, Norris, White and Moulds (2017) define thematic analysis as a qualitative data analysis method where a researcher organises the collected data into common themes that appear frequently from the respondents. Thematic analysis is narrative in nature and a researcher considers a number of topics or themes (Mason, 2002). Thematic analysis is ordinarily deployed to data collected via quantitative survey method for both quantitative and qualitative data (Nowell *et al.*, 2017), as was the case for this research. Once data was collected and coded, a list of different repetitive phrases were grouped together using the Nvivo computer software. These phrases were further reduced to themes that had connection to the research objectives. It was necessary to undertake this stage in order to ensure that during report writing, not only

descriptive data was presented in summarised patterns, but that themes could be interpreted into meaningful theories that connects the themes to the research questions.

3.9.1 Analysis of actors participating in commercial forestry and their roles in the value chain in KwaNgwanase

Data for all participants upstream and downstream of the value chain was obtained through one-on-one structured interviews. Stakeholders were ranked according to the node that they participate in and the role they play in the value chain. Information such as level of education, age distribution, gender distribution, main source of income and household size were considered. Both explanatory and descriptive data analysis approaches were used.

3.9.2 Analysis of challenges faced by the forestry industry actors in KwaNgwanase

A descriptive data analysis approach was used to analyse the data obtained related to this objective based on the challenges identified by the value chain participants. Key challenges facing the timber growers, forestry harvesters and the seedling nursery operator were considered.

3.9.3 Assessment of economic efficiency of commercial forestry business in KwaNgwanase

The profit and gross margin analysis concepts were used to determine average profit and gross margins for each node in the value chain. A comparative analysis of average profit and gross margins for all nodes was then undertaken.

3.9.4 Analysis of commercial forestry value chain to actors' livelihoods in KwaNgwanase

A descriptive data analysis approach was also used to analyse the findings related to this research objective. Different themes were considered in line with the SLF in order to address this research question.

3.10 Limitations of the study

The following are limitations of the study emanating from the research approach used:

- Due to the small sample size, it was not possible to undertake statistical probability tests such as a t-test and multiple linear regression. As a result, the quantitative data collected only allowed for nominal and descriptive data analysis.
- Efforts were made to obtain interviews with local representatives of private companies collaborating with small-scale timber growers. However, due to time constraints and a company representative being transferred to work in another region, these interviews were not conducted. Obtaining the private companies' points of view regarding the forestry value chain would be very important for future studies.
- There is limited available literature or studies regarding the small-scale timber farming in communal land such as in the KwaNgwanase area. As a result, the use of secondary qualitative data to substantiate and fully contextualise some of the study findings was not possible.
- The use of purposive and snowball method for determining sample size for the research did not yield enough cases for the Nsukumbili village in order to allow for comparative quantitative data collection and analysis between Nsukumbili and Mnyayisa villages. Out of twenty-one participants interviewed, only three were from Nsukumbili village which may not be a true representative of the value chain participants in that village.

3.11 Conclusion

In this chapter, different research approaches were discussed and the selected research design of a mixed methods in a form of a case study approach in conjunction with quantitative survey was presented. The geographic location of the study area was then discussed with the intention of developing an understanding of the economic activities taking place in KwaNgwanase and the economic status of communities living in the area. The study population, techniques used to determine the groups from which the final sample size was drawn and the purposive sampling procedures used to select participants were discussed. Next, the ethical processes followed to gain access to participants and to guarantee their confidentiality were briefly considered. Furthermore, an outline of the data collection techniques, namely the structured interview instrument used and the procedures followed during data collection was presented.

Lastly, a description of how data was analysed quantitatively and well as qualitatively was provided and the limitations of the research design used in the study were discussed.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

The data in this study was collected in two villages in KwaNgwanase from participants who are timber growers, forestry harvesting contractors and timber seedling producers. The two villages are Mnyayisa and Nsukumbili villages, which fall under Ward 4 of the Umhlabuyalingana Local Municipality. Structured, one-on-one interviews were conducted in December 2020 and January 2021, with some additional interviews being conducted in April 2021. Data was obtained from interviews with seventeen (17) timber growers, four (4) harvesting contractors and one (1) seedling producer. This chapter will present the quantitative statistical results and the qualitative thematic results obtained from the participants. The results will be analysed and discussed as they relate to each of the four research objectives, as the underpinnings of the discussion, in light of the literature reviewed in Chapter Two. Lastly, the chapter will conclude with an overall summary of the main findings presented.

4.2 Research objective one: To identify the actors of the commercial forestry value chain and their roles in KwaNgwanase

Borrowing from the secondary data presented by Sanga (2016) and by Pulhim and Ramirez (2016) when analysing the forestry value chain, it was anticipated by the researcher that timber growers and harvesters would be the main actors in KwaNgwanase. These actors are directly involved in the production of timber from farm to market. The objective of identifying the main stakeholders in the KwaNgwanase forestry value chain was also based on this argument. Nominal, exploratory and descriptive data analysis techniques were used to interpret the data collected to address the first objective of the study and the results are presented in the subsections to follow.

4.2.1 Demographics of value chain actors in KwaNgwanase

4.2.1.1 *Age distribution*

The research findings revealed that elderly people who are aged 60 years or above dominate the forestry value chain in KwaNgwanase. This is depicted in Figure 4.1 below as the data collected indicates that 58.8% timber growers, 50% forestry harvesting contractors and 100%

seedling producers are more than 60 years old. It can be deduced that there are no forestry harvesting contractors and seedling producers who are aged below 45 since all harvesting contractors and seedling producers in KwaNgwanase were included in the study.

Although youths below the age of 30 do own forestry plantations in KwaNgwanase, they only account for 5.9% of the sampled population. The average age of timber growers in KwaNgwanase is 59 years. This finding is contrary to the finding obtained by Sanga (2016) in Tanzania where it was found that 50% of value chain participants are between the ages of 20 and 40 years. In the same study, it was found that people above 60 years old only contributed 22.5% to the forestry industry (Sanga, 2016).

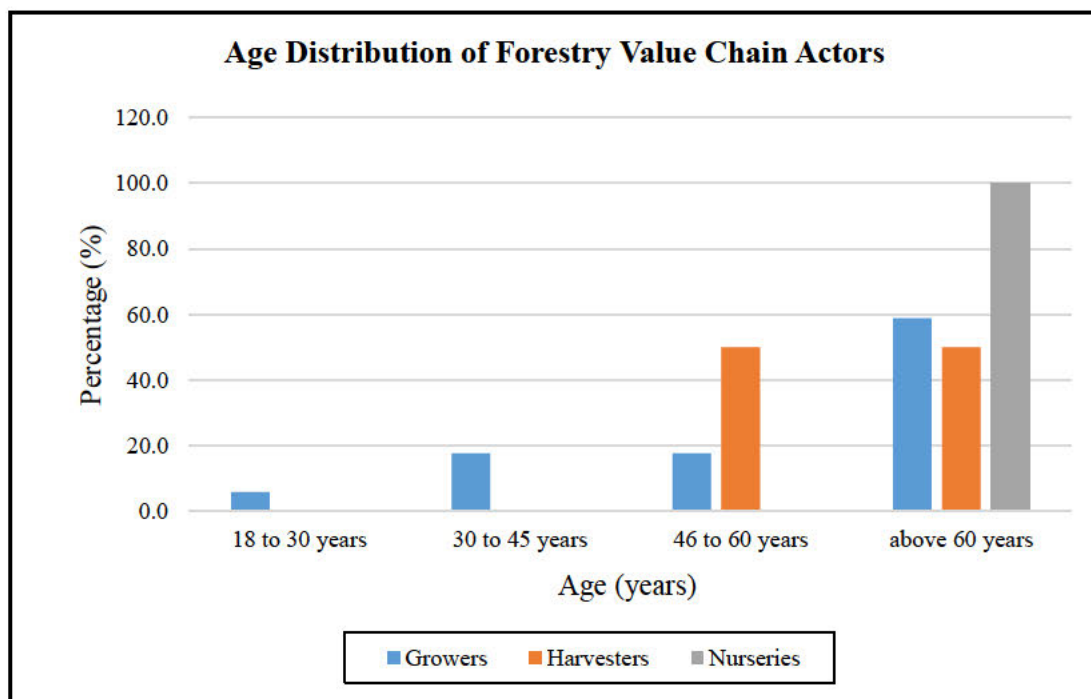


Figure 4.1: Age distribution of forestry value-chain actors in KwaNgwanase

When asked whether the youth is playing any role in the forestry industry, some participants responded as follows:

Timber grower 14 said that *“Indaba yokuthi asinawo umhlaba owanele kanye nokuthi umasipala akasinakile singabalimi bamahlathi KwaNgwanase, kwenza ukuthi intsha yethu ingabi nalo isasasa lokuba ingxenye yalomsebenzi. Intsha ifuna imali, uma imali ingekho abazimisele ukusebenza.”*

Translation by the Author: Timber Grower 14 said that *“The issue of land ownership, lack of support from the local municipality and lack of funding are the main causes for young people’s lack of participation in the value chain as small-scale forestry growers. Today’s youth is interested in money, if there is no money they will not participate in timber farming.”*

Timber Grower 13 said *“imisebenzi kumkhakha wezamazalathi kanye nezolimo awubahehi abantu abasha ngoba ubukeka ungumkhakha wabantu abadala”*

Translation by Author: Timber 13 said that “Forestry and agricultural jobs are not attractive to today’s youth since these jobs are seen as old-fashioned and conventional.”

4.2.1.2 Gender distribution

Figure 4.2 below indicates that male actors dominate the forestry value chain in KwaNgwanase, especially in seedling production and forestry harvesting nodes, and there are no female actors in these two nodes of the value chain. However, at timber growing activity, the scale is almost balanced between males and females at 53% and 47% respectively.

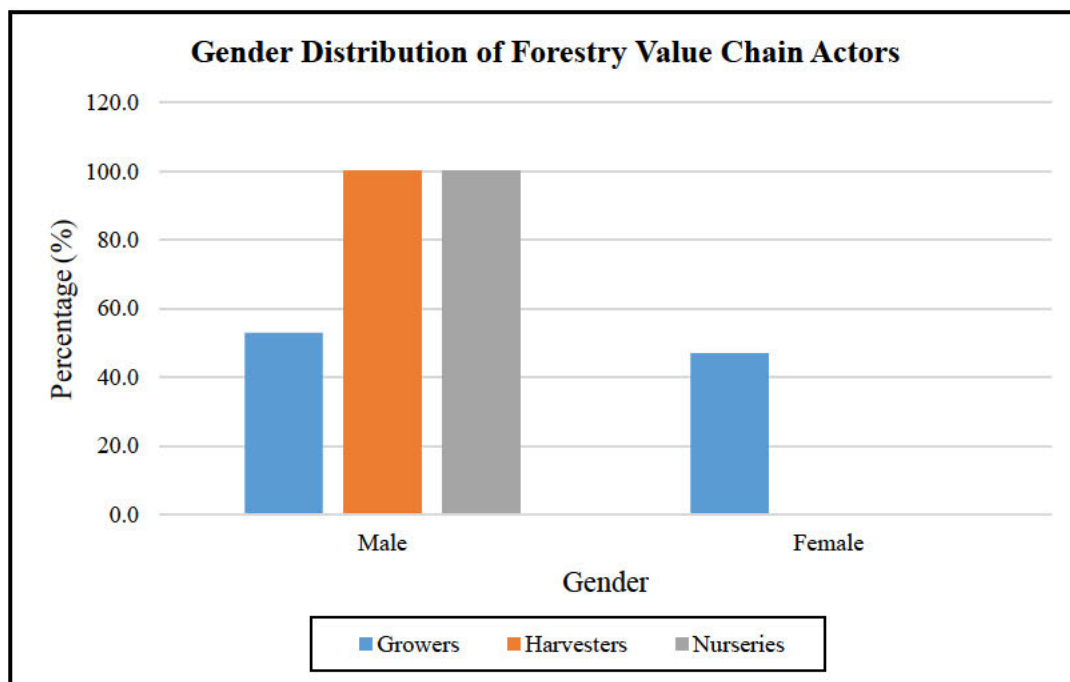


Figure 4.2: Gender distribution of forestry value-chain actors in KwaNgwanase

The forestry value chain gender distribution in KwaNgwanase is also different to gender distribution obtained for the forestry value chain study conducted by Sanga (2016) in Tanzania. Sanga (2016) found that 75% value chain participants were male and 25% were female. The participants in KwaNgwanase did not give any reasons why the value chain was dominated by males. However, the researcher's observation was that five out of nine female participants interviewed were female led households.

4.2.1.3 *Level of education*

The findings revealed that the majority of forestry value chain actors in KwaNgwanase have at least some level of formal education that allows them to read and write. When considering the timber growers, as exhibited in Figure 4.3 below, 5.9% of growers have no formal education, 41.2% have primary education, 11.8% have secondary education and 41.2% have tertiary education level. All harvesting contractors have formal education with 50% having primary education, 25% having secondary education and 25% having post-matric (tertiary) education level. The seedling producer in the area only has primary education level.

The education level analysis for the forestry value chain actors in KwaNgwanase is contrary to the findings of the 2017 Umhlabuyalingana Municipality Final Spatial Development Framework where it is stated that the majority of the population in the area is uneducated (Umhlabuyalingana Local Municipality, 2017). However, it must be noted that this framework examined the entire population of the municipality and did not segregate it according to different sectors.

When asked whether one has to have a certain level of education to participate in the forestry value chain in KwaNgwanase, Timber Grower 17 responded that *“Izinga lakho lezemfundo ayikho indima eliyidlalayo kulonkhakha ngoba abalimi abaningi basebenzisa ulwazi lwasemandulo lokutshala izihlahla njengoba bengaqeqeshiwe. Kodwa engikubonayo ukuthi abanye abantu abafundile baze bafinyelela emikhakheni ephezulu batshala amahlathi ngoba befuna inzuzo eseceleni, hhayi ngoba besuke befuna ukuziphilisa.”*

Translation by Author: Timber 17 said that *“The level of education is not a requirement for one to participate in forestry value chain in KwaNgwanase because many growers use their conventional knowledge of growing trees since they are not professionally trained. However, I have observed that the value chain participants with higher education level participate in the*

value chain for purposes of secondary income not because they are desperate to use timber farming as basic means of living.”

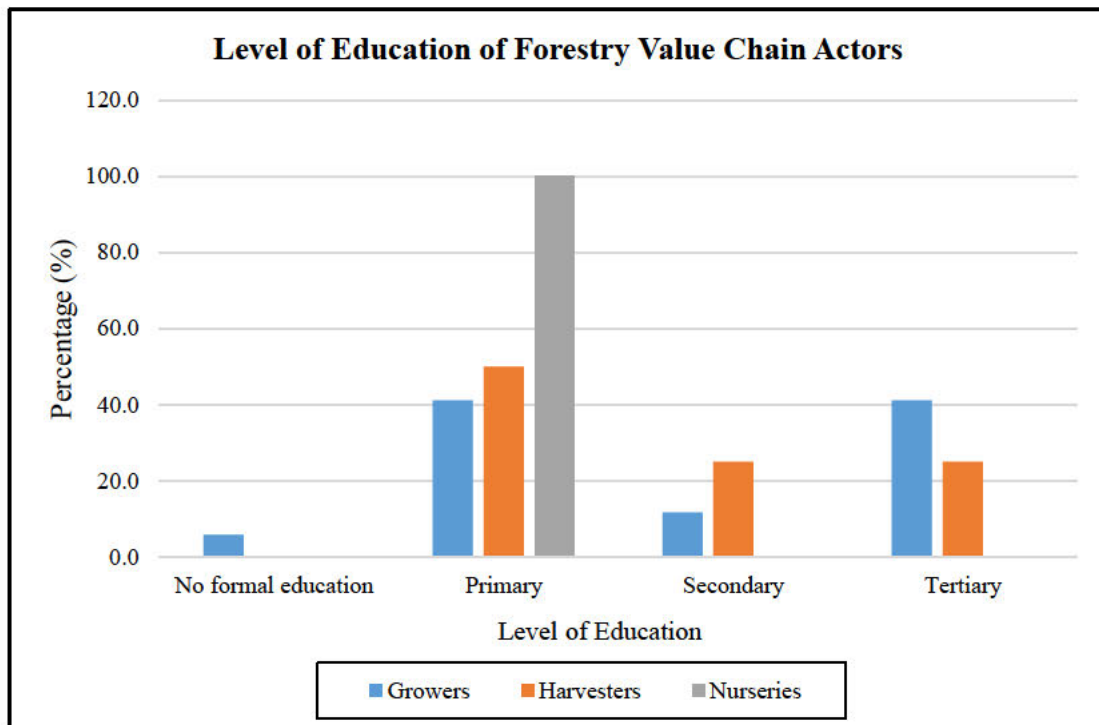


Figure 4.3: Level of education of forestry value-chain actors in KwaNgwanase

However, the education level analysis for the forestry value chain in KwaNgwanase takes a similar shape to the findings obtained by Sanga (2016) where it was found that approximately 90.6% have primary, 6.7% have secondary education level and only 2.5% of participants had no formal education.

4.2.1.4 Household size

As depicted in Figure 4.4 below, the majority of forestry value chain participants in KwaNgwanase support families of at least four people, while 50% of harvesting contractors and 100% of seedling producers support at least 10 people. This is in agreement with the study conducted by Jele (2012) in Sokhulu where it was found that harvesting and reselling businesses of the value chain are more sustainable since they generate monthly income that is able to support bigger families, compared to timber cultivation activity that generates income only after every six years.

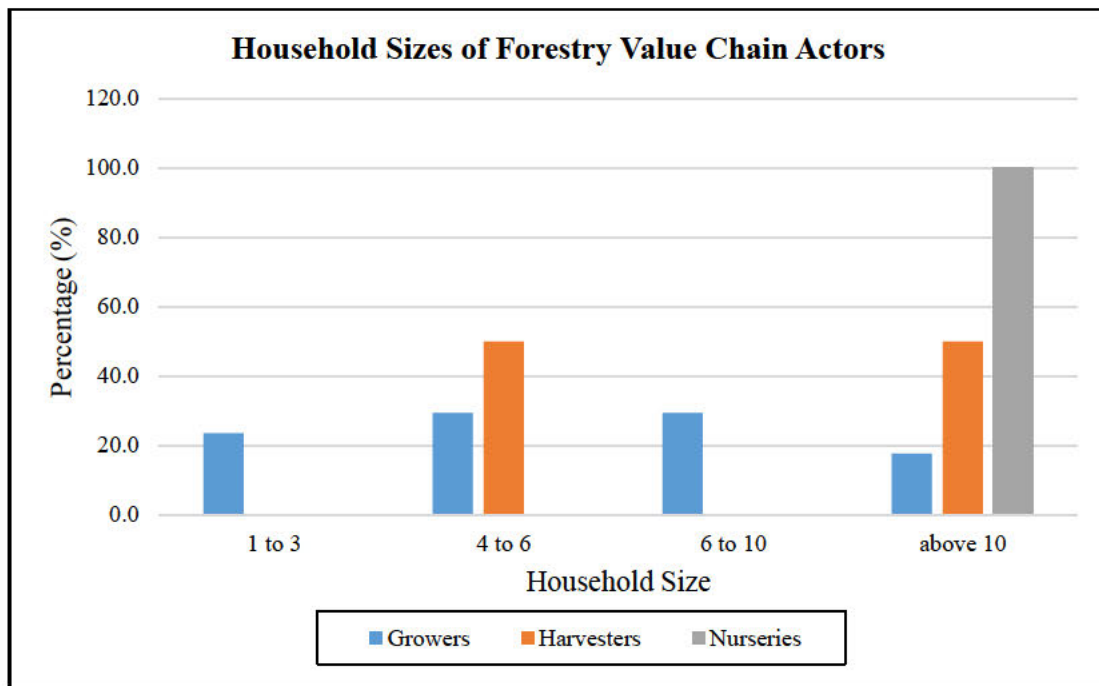


Figure 4.4: Household size of forestry value-chain actors in KwaNgwanase

4.2.1.5 *Main source of income*

The findings of the study indicated that the participants in the forestry value chain in KwaNgwanase rely on multiple sources of income to sustain their households. The findings revealed that 52.9% of timber growers, 100% of seedling producers and 25% of harvesting contractors depend on pension income either as their main source of income or as a secondary income for their households, as exhibited in Figure 4.5 below. Approximately a third (35.3%) of growers have permanent employment and this has a linkage with age distribution pattern where 41.1% of growers in the study area are aged less than 60 years.

Further to these findings, all 22 participants interviewed indicated that they were the main support structures for their households. It was also evident that the majority of participants with tertiary education have full time employment and they participate in the forestry value chain in order to earn secondary income. The data collected also showed that although some of the participants in the harvesting and seedling production nodes are earning pension income, they all depend on forestry value chain income as their main household income.

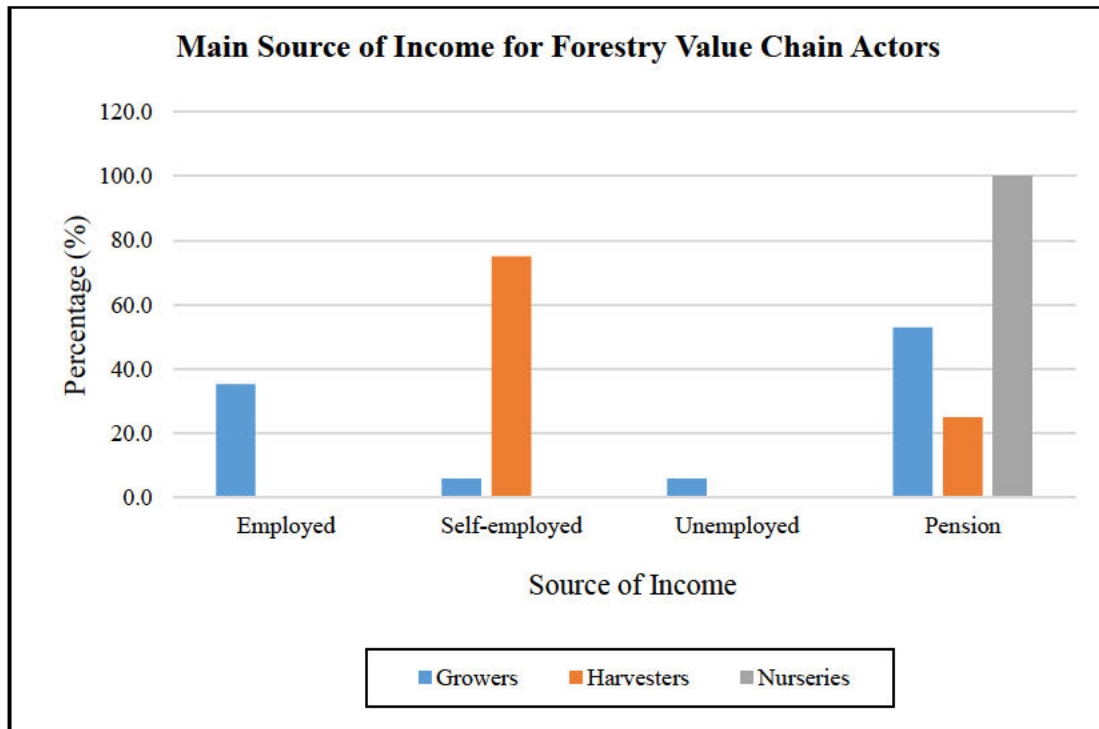


Figure 4.5: Main source of income for forestry value-chain actors in KwaNgwanase

4.2.2 Linkages with timber buyers

The research findings showed that out of 17 timber growers interviewed in KwaNgwanase, 53% of the growers are growing in partnership with Sappi. As a result, Sappi was automatically a buyer for their timber. The other 47% of growers, even though they were growing privately, also indicated that the buyers for their timber are Sappi and Mondi. Timber Grower 14 said that *“I sometimes sell my timber to NCT Forestry Agricultural Co-operative Ltd which is an organisation owned by timber growers in South Africa. By so doing, I am creating an alternative market for myself for instances when Sappi cannot buy my timber.”*

4.2.3 Organisation of stakeholders

Based on the responses from the interviews conducted with the participants, it is evident that actors upstream of the timber value chain dominate the forestry value chain in the study area. A flow diagram in Figure 4.6 below represents the forestry value chain in KwaNgwanase.

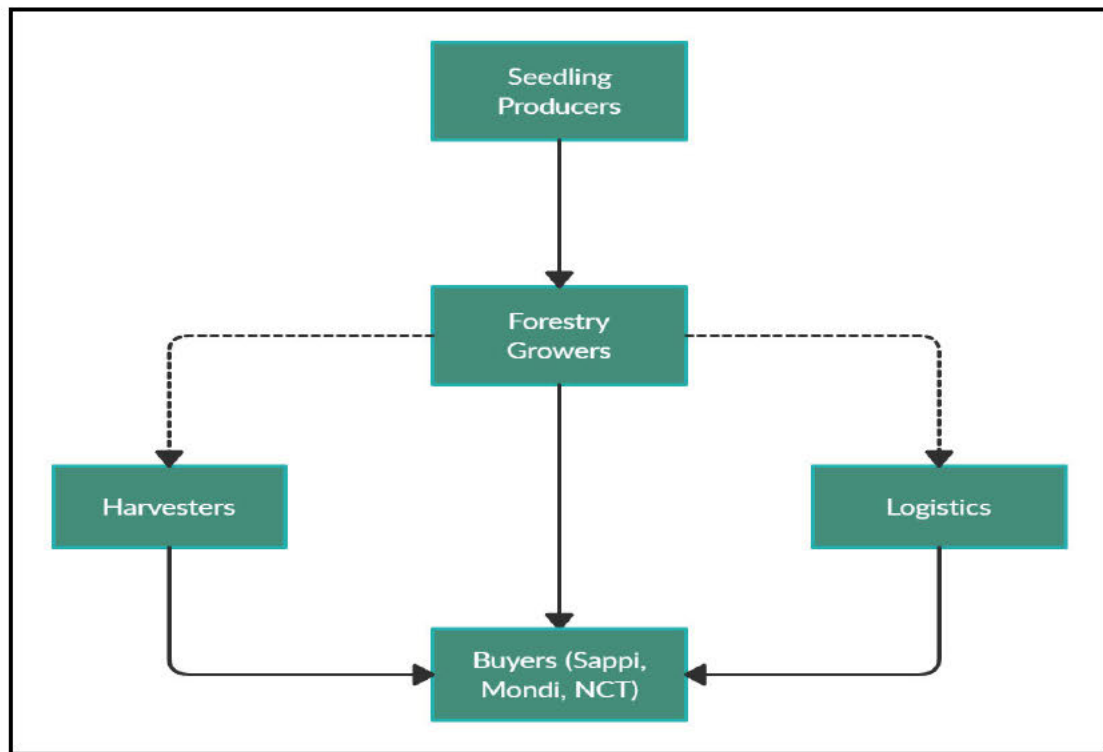


Figure 4.6: Representation of forestry value chain in KwaNgwanase

The value chain consists of seedling producers, small-scale timber growers, harvesting contractors, logistic contractors and timber buyers. Forestry seedling producers propagate seedlings and sell these to timber growers. Timber growers grow plantations for a period of 6 years and sell timber or logs to buyers. During the sale process, buyers appoint harvesting and logistic contractors to facilitate tree felling and haulage operations. Some growers indicated that they utilise some of their timber for their own domestic use and sometimes sell it to locals at low cost in order to gain immediate cash flow.

The representation of the forestry value chain in KwaNgwanase is similar to the forestry value chain representation by Jele (2012) in a study conducted in Sokhulu area, KZN. Both Sokhulu and KwaNgwanase value chain actors sell their timber to big forestry companies and through this approach, they obtain higher profits compared to selling only to local timber suppliers.

4.2.4 Value chain activities at seedling producer node

Within the two villages in KwaNgwanase considered in the study, only one forestry seedling producer was interviewed as they are the only producer operating in the area. This participant operates a seedling nursery that propagates forestry seedlings from cuttings. Their business is

to sell seedlings to local timber growers in the study area and thereby generate profit. The findings show that the only forestry trees that are planted in the study area are eucalyptus. There is thus no room for the forestry seedling producer to diversify their product offering other than offering eucalyptus seedlings of different cultivars. It was also found that the seedling producer in the study area does not get any market information. They sell seedlings at the nursery gate and customers are obtained via word of mouth. Despite the lack of solid marketing strategies, the seedling producer interviewed indicated that he has established a strong relationship with some local growers. However, the market is not sustainable since the growers seldom require seedlings for new plantations. The competition in the area is limited as there are no other seedling producers, and those who happen to try seedling production only produce in small quantities for their own small plantations and not for commercial purposes. The seedling producer also indicated that he has sustained his nursery through propagating seedlings for his own plantations since he is one of the main timber growers in the area.

Furthermore, another challenge highlighted by the seedling producer that he faces in the study area is indirect competition from large corporate companies that are grower partners with some local growers. During the interview, he said that *“These large corporates provide seedlings to small-scale timber growers with an agreement to buy timber once a plantation has reached its maturity stage. These relationships are good for the local forestry sector; however, they take away a large portion of my market share since these corporates bring seedlings from as far as 300km away from KwaNgwanase.”* (Seedling Producer 1).

The seedling producer interviewed is also participating in other forestry value chain activities. This participant is a forestry-harvesting contractor and is one of the main timber growers in the study area with more than 30 years’ experience of participating in the forestry industry.

4.2.5 Value chain activities at timber grower node

Timber growers in KwaNgwanase cultivate commercial forestry plantations of several eucalyptus tree types. The research results indicate that the forestry cultivation activity was introduced in the area by timber processing companies such as Sappi around 1989 in the form of partnerships between Sappi and subsistence timber farmers. The activity grew as the locals of KwaNgwanase realised that growing forestry trees could provide them with an additional household income.

For the growers, the most important asset for their operation is land because without access to land, their growing activity cannot continue. It was discovered that no timber grower in KwaNgwanase owns land, but instead they are farming on communal land. The majority of timber growers indicated that the land they are growing timber on belongs to the Ingonyama Trust Board and is managed by the local tribal authority via a Permit to Occupy (PTO). When questioned in this regard, some participants reported that they had never signed any PTO with the local authority; instead they are farming on land that was passed to them by their parents.

When considering access to forestry resources, small-scale timber growers (53%) in KwaNgwanase that are supported by large forestry companies indicated that they obtain seedlings from their grower partners, that is Sappi and Mondi. It was found that these corporate companies also offer extension services to small-scale growers. This setup is similar to Jele's (2012) finding in Sokhulu. All other growers that are growing privately purchase seedlings from the local nursery.

Regarding training of growers in the study area, the findings revealed that 23.5% of growers had obtained training on cultivation of eucalyptus trees from Sappi. Although training was obtained, it was not formal training to assist the growers to commercialise their forestry business. Instead, the training was based on tree production guidelines from transplanting to cultivating a mature plant. The remaining 76.5% of the growers revealed that they had not received any training even from their grower partners since the time that Sappi had begun providing seedlings and they had been growing for the company. Some participants highlighted that they learned how to grow forests from their relatives who are already participating in the activity.

All participants surveyed indicated that they do not get marketing information for their timber before and after harvesting. However, it was revealed that Sappi and Mondi are the main buyers. One participant indicated that they are not aware of how their harvests are sold, as it is the grower partner companies who arrange for harvesting and transportation of timber from farm to processing plants. She said that *"I am not aware of who determines the timing of when my plantation is to be harvested, and I am also not sure where my timber is taken to but all I know is that it goes to Sappi."* (Timber Grower 7). No competition was reported amongst the growers in the study area as all growers supply their timber to Sappi and Mondi and the majority of them are partnering with these companies. It was however discovered that the

growers end up being price takers, as they do not have a say on price per tonne for their harvests and must accept the price set by the companies.

4.2.6 Value chain activities at forestry-harvesting node

For the forestry-harvesting contractors, the findings revealed that the average number of years that the actors have been participating in the value chain is 14.5 years. The findings also showed that the main role of forestry harvesting contractors in the value chain is tree felling, removal of bark and short hauling of harvested timber from a plantation to the nearest main road for loading onto long distance trucks. Their customers are local timber growers; however, they enter into contracts with buyers who assist them to negotiate harvesting prices with timber growers.

All four forestry harvesting contractors who were interviewed revealed that they are also participating in other forestry value chain activities such as production of forestry seedlings and being timber growers. Three of the four harvesting contractors have also ventured into silviculture where they grow and manage young forests for timber growers. Silviculture, as defined by Mason (2004), is the science of cultivating and managing forests. It is evident that the actors in this node have vast knowledge of the forestry industry, which has been accumulated via participating in different nodes of the value chain.

The findings show that the actors in this node of the value chain have received training from timber buyers. Forestry Harvester 4 said that *“Sappi do train us because they are concerned about compliance issues that have to do with quality of harvested timber, logistics and safety. They cannot just ignore us as the risk is too high for this work.”* This includes training on how to fell trees safely, the correct equipment to be used when cutting and barking trees, health and safety issues and training regarding short hauling of timber.

The actors in this node of the value chain also do not receive market information. The agreements they sign with timber buyers secure them long-term contracts. However, it was revealed that sometimes the buyers sign excess contracts with harvesters, thus saturating this node with many role players and creating unsustainable competition amongst harvesting contractors.

4.2.7 Coordination of value chain actors in the study area

When asked about interaction with others involved in the forestry industry, 35% of timber growers indicated that they do not have any relationship with other value chain actors. A further 47% of timber growers indicated that the relationship with other value chain actors is there but is very weak, whilst 18% revealed that they have strong relationship with other value chain actors in the study area. These findings indicate a lack of organisation amongst the growers themselves as they do not have a collective voice as growers in the study area. Other growers highlighted the fact that the buyers have huge influence in the value chain, which has caused the value chain participants to be uncoordinated in the study area. Timber Grower 17 said that *“Sappi is trying to divide us, they do not want us to be coordinated because they know that we will be more powerfull. They have also discouraged us from combining our harvests so that we can attract higher selling price per ton.”* The study revealed that buyers prefer timber growers to work independently and not to consolidate harvests as this lack of coordination amongst growers allows buyers to have influence on price per tonne.

The findings regarding the coordination of timber growers in KwaNgwanase support the findings obtained by Mtengu and Green (2016) as these scholars also indicated that small-scale forestry in KwaZibi is still undertaken informally and involvement of corporate companies has yielded little results in uplifting the industry in rural areas. In a similar line of research, Sanga (2015) gathered that the small-scale forestry value chain in Tanzania still lacks vertical and horizontal integration.

Regarding the harvesting contractors, 50% reported that the relationship with other value chain actors is very strong since they have established long-term relations with some growers. However, the other 50% reported that although the relationship exists, it is not a structured or coordinated relationship, which then presents a cause for concern within the forestry-harvesting node.

However, generally, the relationship amongst the harvesting contractors can be described as strong. One reason for this is that there are no local suppliers for parts and consumables for harvesting equipment and machinery. As a result, the contractors sometimes share the supplies and lend one another spare parts for chainsaws and tractors, thus creating a coordinated approach for use of limited resources. The reasoning behind the sharing and lending of spare parts is based on the fact that contractors share access roads to the timber plantations, thus they

communicate frequently to ensure that access roads are not damaged during short hauling of timber and therefore have better relationships with each other.

The only seedling producer interviewed stated that if the forestry value chain is to be taken seriously in the study area, the participants need to play a bigger role than just being value chain actors. This participant emphasised the need for participants to be active and proactive compared to the current status where value chain actors are passive and are not coordinated.

The findings show that 59% of timber growers are part of the local timber growers' voluntary association whilst 100% of forestry harvesting contractors indicated that they are part of the harvesters' association. There were no associations or forums for seedling producers in the study area. Although the majority of timber growers are part of the growers' association, most of them reported that the association is not yielding benefits for them. Some growers indicated that they do not see the need to attend meetings for these forums. However, a few growers were positive about the existence of the growers' association since it provides them a platform to discuss common issues that affect them as growers. These issues include delays in transportation of timber by buyers once harvested, maintenance of firebreaks and theft of timber in the plantations and during transportation.

When questioned in this regard, 53% of timber growers indicated that they have considerable trust for other actors in the value chain while the remaining 47% have little or no trust for other value chain actors. All harvesting contractors and seedling producers indicated an average level of trust for other value chain actors. The findings revealed that about 77% of participants believe that timber buyers have more power in the value chain in the study area. The buyers are timber processors and they have more influence on the timber market and determination of timber price. The buyers determine the price per tonne for timber, negotiate prices for harvesting contractors and appoint the long-distance trucks for transportation of timber.

There appears to be no organisation between the value chain actors in the study area. The value chain actors are not coordinated, either horizontally or vertically. There is little or no communication amongst the actors at the timber grower node. There is also limited interaction between the value chain actors who are participating in different nodes. Forestry harvesting contractors are the only actors who collaborate with one another; however, they are not supported by either DFFE or by the buyers.

Although there is trust amongst the value chain actors, the participants indicated that they do not trust the buyers. The participants believe that the buyers have a great deal of influence in the industry which does not benefit the rest of the value chain actors. Mahlangu and Mubangizi (2015) reported a similar observation. This lack of trust results in actors having weak relationships with each other, they do not present a united front and therefore have little influence when it comes to the growth of the value chain in the study area.

4.3 Research objective two: To examine the challenges faced by forestry value chain actors in KwaNgwanase

The second objective of the study involved assessment of challenges faced by forestry value chain actors in KwaNgwanase. As reported by Jele (2012), commercial timber farming in rural areas plays an important role in improving livelihoods, even though various challenges are faced if the value chain participants are not organised. This creates risks, as most actors in the forestry value chain in rural areas are new entrants with limited industry experience.

Whilst exploring the forestry value chain in the interviews conducted with participants in KwaNgwanase, some challenges facing the actors were discovered. Although the industry has yielded positive gains for most of the value chain actors, it was established that several difficulties persist in the forestry industry. These challenges relate to the systematic exclusion of participants from some value chain activities, especially those downstream that offer higher margins. Other challenges faced are due to the value chain actors being inexperienced with limited capacity to run their forestry plantations commercially. These challenges are presented and discussed in the following subsections.

4.3.1 Challenges faced by timber growers

The dominant themes that were articulated as the main challenges at the timber grower node are exhibited below in Figure 4.7. These are ranked based on the percentage responses received from timber growers in KwaNgwanase. All themes for challenges were filtered using the NVivo computer software.

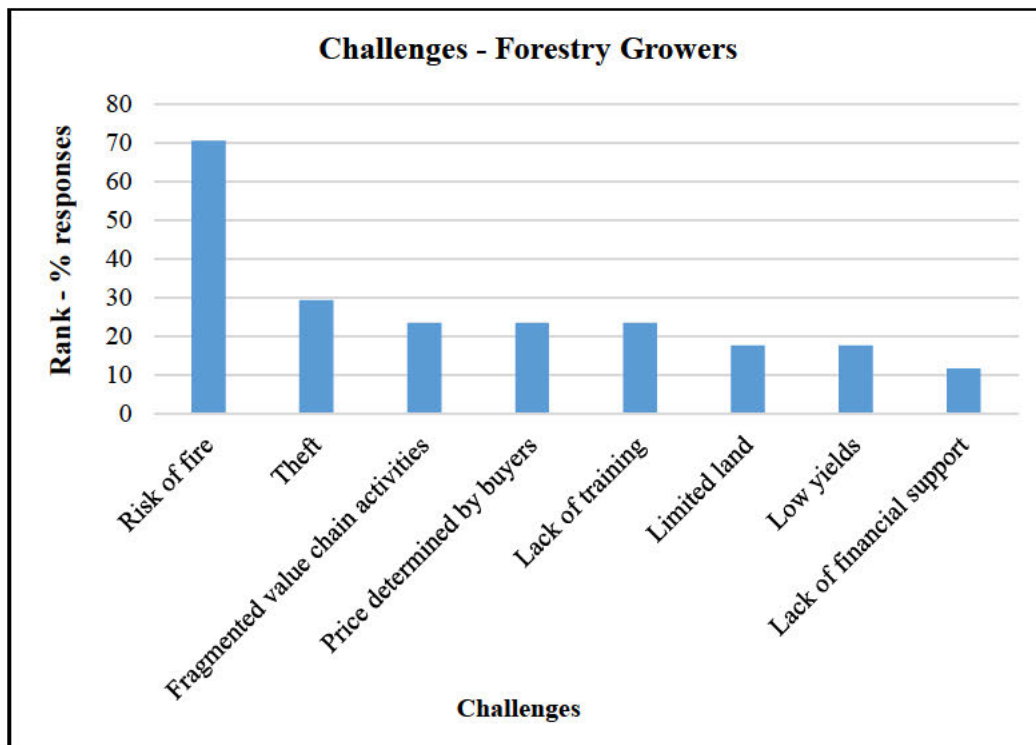


Figure 4.7: Dominant challenges faced by timber growers in KwaNgwanase

4.3.1.1 *Risk of fire*

When questioned about the challenges encountered in their business, 70% of timber growers interviewed reported that their main challenge is risk of fire to their plantations. It was revealed that the main cause of fire is locals who hunt for beehives and beekeepers who use plantations to keep bee boxes. These beekeeping practices require fire in order to remove hives for honey extraction. The majority of timber growers reported that it is challenging to police this activity as beekeeping is another source of income generation for the locals, and if they were to be restricted from bee hunting, it would negatively affect their livelihoods.

Furthermore, it was established that risk of fire was due to improper or lack of firebreaks maintenance by some growers. This was a concern for most growers since it made it easier for forestry fire, when it does occur, to spread from one plantation to the other. This contributing factor is also not being policed by the growers to ensure that all timber growers in the area are maintaining their firebreaks. Timber Grower 1 who is growing privately said that *“The timber growers in KwaNgwanase do not maintain fire breaks for their plantations. I live approximately 100km away from my plantations, but I always make sure that I maintain fire*

breaks every year. The heavy reliance to Sappi by their grower partners has been a problem for us since Sappi sometimes delay on maintaining fire breaks when there is no proper communication between a small-scale grower and Sappi.” A lack of coordination at the timber grower node was evident from the participants’ responses and is a factor that requires improvement. Although the majority of growers are part of the local growers’ association, the association is not improving timber growers’ affairs. Participating in the association also does not promote safety within the plantations as theft and fire still occur.

When asked about insurance for their plantations, one grower mentioned that they have never thought of it. Timber Grower 14 said that *“I have never thought of having risk insurance for my plantations. What we do as growers is that whenever there is fire in the plantations we support one another in fighting fire. It is unsustainable because when fire happens at night a lot of plantations get burnt.”* This grower further indicated that the risk would be too high as plantations are located in the rural areas where bush fires may occur naturally and that insurance companies would therefore charge high premiums. These high insurance premiums would also reduce their margins considering that they are operating upstream of the value chain where margins are already low.

Mahlangu and Mubangizi (2015) reported an incongruent finding in their study as the risk of fire was reported as one of the least concerning challenges facing small-scale growers at Entembeni as only 30% of the growers highlighted risk of fire as a concern. However, Mahlangu and Mubangizi (2015) considered all growers in the study area including established commercial timber companies who have measures in place to reduce risk of fire on their plantations, which explains why the risk of fire was only highlighted by a smaller proportion of participants in their study.

4.3.1.2 *Theft*

Theft of timber was reported by 29% of growers as the second main challenge faced in both villages in the KwaNgwanase. This is similar to what was found by Mahlangu and Mubangizi (2015) as 40% of growers in their study reported theft as one of their concerns. In the study conducted at KwaZibi, which is also a village in KwaNgwanase, growers were also concerned about high level of theft. Categories of theft in KwaNgwanase forestry value chain include theft in the plantations, at the loading zones and during transportation of timber to buyers’ processing plants. Theft in the plantations emanates from locals felling trees for their own

domestic use. Lack of patrols around the plantations by the growers and out-grower companies was reported as a concerning issue by some growers.

Timber growers also reported that theft of timber logs at the local timber loading zones is affecting their harvests since the harvesting contractors do not provide security for harvested timber. The locals thus help themselves to harvested timber, as there are always delays from long distance trucks to collect timber consignments. Theft of timber during transportation was also a common challenge for most growers because there is no weighbridge in KwaNgwanase where loads can be weighed before a truck leaves. Local timber growers seem to have no control over this since timber buyers appoint the transporting trucks.

Although no evidence was presented as to whether truckers are indeed stealing timber logs during transportation, several loopholes seem to exist within this node of the value chain. There is no data, either volume or weight or number of logs, that is recorded when a truck leaves the local loading zone. Trucks are however weighed when they enter buyers' processing plants. One of the more experienced timber growers in the area suggested that buyers should build a local central loading zone with weighbridges, so that once timber enters a local loading zone, the buyer takes ownership. Timber Grower 17 said that *"Until Sappi builds a local weighbridge in KwaNgwanase, our timber will continue to be stolen by truckers."* They thought that this could minimise the exposure level of growers' harvests to the possibility of theft at the hands of truckers. They further believed that a local central loading zone could also eliminate any losses during transportation since there would be a weighbridge in KwaNgwanase where load weights could be recorded.

4.3.1.3 Fragmented value chain activities

The findings from timber growers' responses revealed that the value chain is disjointed due to loopholes that exist within the value chain and amongst its various actors. The timber growers cited numerous operational and systematic challenges. One of these challenges relates to the limited number of seedling propagators in KwaNgwanase, because apart from the one who participated in this study there are no other seedling propagators in the area. The local seedling nursery supplies not only Mnyayisa and Nsukumbili villages, but also supplies the entire Umhlabuyalingana municipal region. For timber growers who can afford to purchase their own seedlings and grow privately, demand becomes high yet there is a limited supply of seedlings. There is no market equilibrium between the buyers and sellers of seedlings in the value chain.

There is no strong evidence as to whether this is the reason why the out-grower companies import seedlings from other regions. Experienced timber growers indicated that there is a need for out-grower companies to assist local seedling nurseries due to the overwhelming demand for seedlings. Assistance could be provided in the form of training or financial support which could lead to scales of economy production by local nurseries. This would keep the value chain activities local and would contribute to the development of the local economy as both small-scale growers and out-grower companies would be buying from the local nurseries.

A significant number of timber growers also reported timber transportation challenges in the KwaNgwanase forestry value chain. It was revealed that timber is transported by three modes of transport before it reaches its destination. Firstly, it is short-hauled by tractors from the plantations to a local informal loading zone, which is usually between 3km to 10km away from the respective plantation. Timber is then transported by trucks from KwaNgwanase to Hluhluwe loading zone, which is approximately 160km from KwaNgwanase. From Hluhluwe, timber is then transported by railway to Richards Bay timber processing plants, which is approximately 100km from Hluhluwe. This long chain of logistics raises uncertainties for the majority of timber growers as any number of things could go wrong along the way, considering that timber transportation and weighing are undertaken by buyers and contracted truckers.

One timber grower raised concern regarding a significant challenge facing the local forestry value chain, saying:

The value chain contributes too little to KwaNgwanase area since majority of seedlings are produced from outside the district through grower partnerships and harvested timber is processed outside of the district.” (Timber Grower 14).

This concern results in exclusion of local participants from the broader forestry value chain as the only activities that are undertaken in the study area are low earning activities. Although jobs are created these low skill jobs seldom require tertiary level education and are thus low earning.

A strong link seems to exist between these challenges and the fact that timber growers are not organised themselves. The forestry value chain in the study area is approximately 30 years old, but too little has been done by the growers in terms of organising themselves to reinforce their existence and maximise the benefits that they can reap in the value chain. The relationship

amongst the growers remains fragmented and is not cohesive where the growers unite to highlight their concerns, which creates loopholes for the majority of value chain nodes.

4.3.1.4 *Growers do not determine price*

Regarding price determination, all timber growers reported that they do not set the price for their timber; instead the buyers determine the pricing of timber. As a result, growers become price takers, that is, they have to accept the prices set by buyers. Approximately a quarter (24%) of the timber growers reported that they are not satisfied with the price per tonne offered by buyers. The majority of growers stated that the buyers ask for prices that are in their own favour without considering the operational costs of managing and maintaining a forest plantation. Although price setting is an issue for the growers, they do not have alternative markets to sell their timber.

The 17% of growers who expressed their satisfaction with prices offered by the buyers are all growers collaborating with out-grower companies. These participants indicated that grower partnership schemes have helped them to break into the forestry industry and they are comfortable to take whatever price is offered to them. Timber Grower 4 said that *“Although I do not determine price for my timber, I am happy with what I am getting from Sappi and this is how I have been surviving since my husband left us 20 years ago.”* Furthermore, the findings revealed that other growers in different areas who are registered with the FSC are being offered higher prices per tonne, since they supply continuous tonnage per year to buyers.

There is an opportunity for growers to collaborate in order to have bargaining power with respect to the selling price of their timber. However, due to a non-functional growers’ association, lack of trust and weak relationship amongst growers, it has become a challenge to negotiate better prices with buyers.

4.3.1.5 *Lack of training*

Approximately a quarter (24%) of the timber growers reported that they have received training on the cultivation and management of forestry plantation. There is a direct correlation between number of years participating in the industry and accumulation of knowledge since some growers have been participating in the value chain for approximately 30 years and these participants are the most knowledgeable about the forestry industry. Although they underwent training, the majority of these growers highlighted that this was only when Sappi introduced

commercial forestry to them in the late 1980's and that there has been little training provided since that time.

Again, lack of training could be associated with the fact that the growers are not organised and are not aware of training needs required to sustain commercial forestry. Training needs relate to both silviculture training, which deals with forestry management, and entrepreneurial training which deals with running a forestry operation as a business. This finding is in line with the argument presented by Mtengu and Green (2016) that a holistic training approach is necessary if timber growers in KwaNgwanase are to run their operations sustainably.

The findings also revealed that the participation of out-grower partners in training the emerging forestry growers in the area is non-existent. The growers who are farming in partnership with out-grower companies reported that they have limited experience in management of plantations, and were promised that the out-grower companies would oversee management of their plantations, including maintenance of firebreaks. The segregation of duties is not clear which leaves timber growers lacking in knowledge regarding management of their plantations due to lack of training. Although their study was conducted in a different village in the KwaNgwanase area, Mtengu and Green (2016) reported similar findings in their research.

When asked about registration with the FSC, the most experienced timber growers reported that this has become an obstacle for them to access new markets or negotiate better prices with current buyers. There is a strong correlation between lack of training in management of forestry and the inability to attain registration with the FSC. Had the growers obtained formal training, instead of farming as subsistence farmers they would stand a better chance of being able to register with the FSC. It would then be possible for growers' operational risks to be managed more effectively. However, Mtengu and Green (2016) reported that custody of control is the main hurdle, not lack of training, which prevents small-scale farmers from registering with the FSC. The custody of control ensures that timber supplied to the mills is not stolen, was not planted in environmentally sensitive areas, is not in violation of people's rights and does not contain timber indigenous trees (Mtengu & Green, 2016).

4.3.1.6 Limited land and below average yields

The lack of access to land was highlighted as one of the challenges facing timber growers as this impedes their ability to expand their forestry plantations. Of the 17 timber growers

interviewed, the average land size occupied by a small-scale grower is approximately 24.6ha. The minimum land size occupied is 2.5ha and the maximum land size occupied is 240ha. Although the average land size owned by growers is 24.6ha, the statistics derived from the participants' responses indicate that the majority of growers occupy less than 20ha of land. In line with the thought of Howard *et al.* (2005), the timber growers in KwaNgwanase can therefore be classified as small-scale growers since, on the whole, the majority each own less than 100ha of timber plantations.

As discussed in the preceding chapter, land in KwaNgwanase is communal land and is administered by the local tribal authority. Those who have access to land obtained it from historical inheritance that was passed to them by their grandparents or because they were born in the village. Other growers purchased the rights to utilise land from the local traditional council via the local '*Induna*'. It is evident that only those with larger areas of land are able to succeed as timber growers in KwaNgwanase due to the long growing cycle of 6 years for eucalyptus trees. Growers with more hectares are able to grow their plantations in a staggered pattern and this enables them to harvest almost every year, which gives them continuous household income. This finding is similar to the findings obtained by Jele (2012) in the study undertaken in Sokhulu village.

It appears that the issue of land, which is a finite natural resource, can never be resolved in KwaNgwanase as there will not be enough land available for all those who may want to enter the forestry business. This may deter new entrants from accessing the forestry value chain and only those who are already participating in forestry will benefit. The participants provided no alternate land solutions as they stated that the only land that is available is for cattle grazing.

However, the findings revealed that the timber growers felt that there is little association between growing in a small piece of land and low timber yields. Instead, growers stated that low timber yields were mainly due to external and internal challenges. The external challenges include climate, low germination rate and diseases, and the internal challenge was related to the poor management of plantations. It therefore appears that low production yields, according to the timber growers, are due to external and internal factors coupled with growing in a small footprint of land.

4.3.1.7 *Lack of support from government and banks*

The study results revealed that timber growers are unable to obtain formal financial assistance, either in the form of government grants or in the form of bank loans from private banks. All growers who are farming privately indicated that the majority of their plantations are financed by owners' equity. The lack of access to financial support thus forces some growers to enter into long-term grower partnerships with private forestry companies. The financial challenges experienced by small-scale timber growers make it difficult not only for new entrants to enter the forestry sector, but also for existing growers to sustain their forestry operations. Local and district municipalities also do not participate in the forestry industry nor do they assist actors in the value chain with the development of infrastructure such as access roads. The views expressed by the timber growers show that the strategic goal highlighted in the Umkhanyakude District Integrated Development Plan 2019 of supporting the agriculture and forestry businesses in the area has not been achieved as the growers indicated that there was no support from municipality in KwaNgwanase. As a result of the lack of finance and support from municipality, timber farming thus becomes an activity for those who are financially stable or who can afford to finance a new plantation.

4.3.2 Challenges faced by forestry harvesting contractors

Figure 4.8 below exhibits some of the dominant factors that were articulated as the main challenges that hinder day-to-day operations at the forestry-harvesting node. These are ranked based on the percentage of responses received from the contractors.

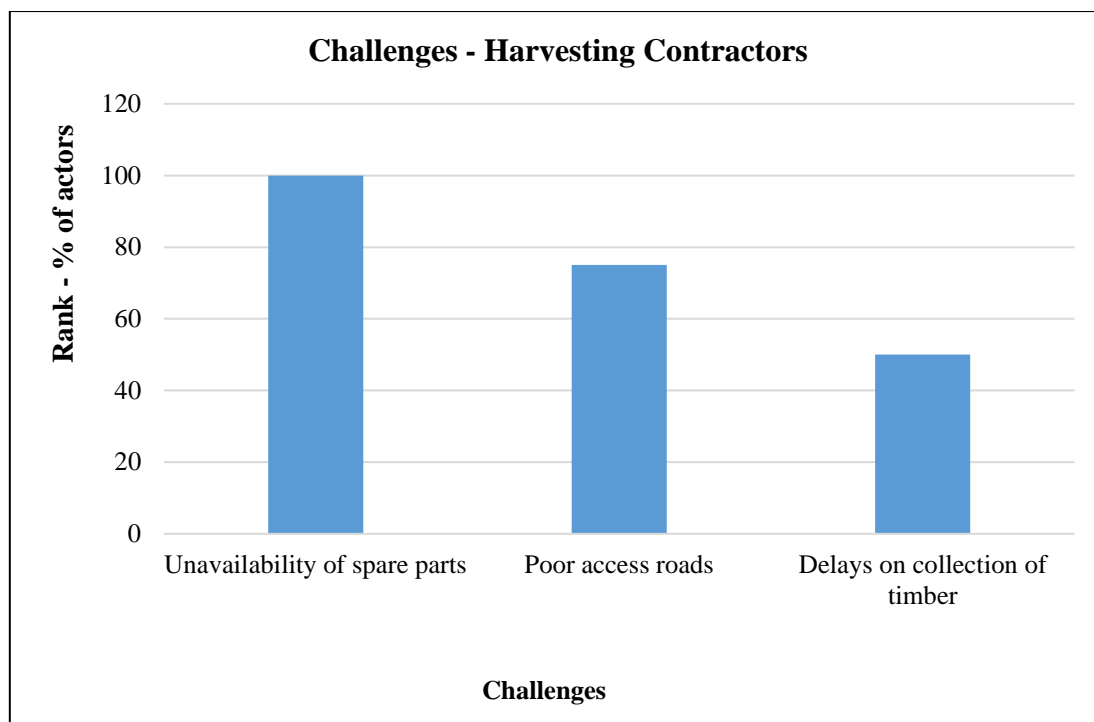


Figure 4.8: Dominant challenges faced by forestry harvesting contractors in KwaNgwanase

4.3.2.1 *Unavailability of spare parts locally*

All harvesting contractors indicated that the critical resources for their operations, in addition to labour, are equipment and consumables. These include tractors, trailers, chainsaws and fuel. The findings reveal that there are no suppliers of these spare parts in KwaNgwanase, leading to extended downtimes whenever equipment breakdowns occur. The solution implemented by the contractors is that they have a coordinated relationship to assist one another whenever an urgent need arises. Currently, if spare parts are required, they are purchased from Pongola and Empangeni towns, which are approximately 150km and 270km, respectively, from KwaNgwanase.

Late payments due to delays in collection of timber worsen the situation as harvesters cannot afford to buy consumables and spare parts in bulk, and even if they do, they may not know which equipment components could break at any point. This challenge means that the forestry harvesting contractors cannot work independently, but have to work on buyers' terms. Buyers in this node have extensive bargaining power since they decide on contract terms, when timber

must be cut and when it will be collected. The sustainability of harvesters' businesses is therefore negatively impacted in the value chain if they experience equipment failure.

4.3.2.2 *Poor access roads*

Poor road conditions around timber plantations are one of the main issues reported by harvesting contractors in the study area as a challenge that they encounter. Formalised timber loading zones are also not available. Harvesters unload timber on the side of the nearest gravel road for collection by truckers. The findings revealed that poor road condition or nonexistence of service roads makes it difficult for harvesters to short haul timber from the plantations to the depot. Forestry Harvester 4 said that *"Fuel and maintenance costs become too high due to extended wear and tear of tractors since government does not care about building serviceable roads around timber plantations."* In the study by Sanga (2016), similar findings were reported as it was also found that poor road conditions contribute to high operational costs.

The challenge for harvesting contractors is that road condition is not considered when negotiating short haulage price with the buyers and growers; only distance is considered. It is highly unlikely that the roads around the timber plantations will be improved in the near future as KwaNgwanase is a rural village that requires more serious socioeconomic interventions than the construction of forestry roads.

4.3.2.3 *Delays to collect timber by buyers*

Delays in the collection of timber once harvested were also identified as a challenge experienced by harvesting contractors in KwaNgwanase. This was said to be affecting employee salaries as contractors are paid once the trucks have collected timber from the plantation and transported it to the processing plants. Having uncollected, stagnant timber logs also attracts theft, which at the time of data collection was unaccounted for within the value chain. Overall, delays on collection of timber have a negative impact on harvesting contractors for day-to-day cash flow for operation of their businesses.

Considering that it is the buyers who appoint the truckers to transport timber, there seems to be a lack of coordination between harvesters and truckers. This gap in the value chain does not only affect the harvesters, but it also negatively affects the timber growers. When harvested timber is left for prolonged periods at the loading zone, it dries out and loses weight, resulting in a lower price per tonne to be offered by buyers. Mtengu and Green (2016) also indicated that

leaving timber for prolonged periods at loading zones presents a further challenge for timber growers since it leads to delayed payments for their timber. This grey area could be as a result of weak relationships amongst value chain actors. It is evident that lack of proper platforms for actors to communicate their views regarding improving systems related to the collection of timber results in them not having bargaining power over buyers.

4.3.3 Challenges faced by seedling producers

The forestry seedlings producer interviewed in KwaNgwanase raised few challenges facing his business. Lack of training was reported as the main hindrance to his business progression. In his own words, the seedling grower said that *“I have never received proper training for this business. All the work that you see in my nursery is based on my indigenous knowledge of how to grow trees and what I have taught myself over the years.”* The only training he had ever received was informal and did not include the industry best practices. As a result, the germination rate of seedlings becomes slow making the propagation process very lengthy and costly.

Secondly, the seedling producer reported that the grower partnership between the big corporates and small-scale local growers is negatively affecting his business as seedlings are brought in from other areas. Potential buyers thus shift the focus away from purchasing from his nursery due to the availability of free seedlings supplied by out-grower companies.

Lastly, lack of financial support from government or local banks was raised as one of the challenges facing the small-scale nursery in KwaNgwanase. The business is unable to access credit from the bank due to its high risk. The local municipality is also not recognising forestry nurseries as there have been rumours that forestry plantations are taking over cattle grazing areas which has caused discontent amongst the communities in the area.

4.4 Research objective three: To assess the high-level economic efficiency (costs and profit margins) for different actors in the forestry value chain in KwaNgwanase

The third research objective of the study was to assess the high-level economic efficiency for different actors of the forestry value chain in the study area. To assess this, gross and profit

margin analyses were used, and the results are presented and discussed in the following sub-sections.

4.4.1 Gross and profit margins at timber grower node

Data presented in Table 4.1 below summarises the information collected from the participants at the timber grower node in the study area. Approximately 47% of growers are not aware how much it costs them to cultivate 1ha of forestry plantation and how much profit they are expecting to make after harvesting. The majority of these participants are growers that are collaborating with out-grower partners such as Sappi and Mondi. This observation could be attributed to the fact that most activities are undertaken by grower partners without disclosing the actual cost of these activities to the growers i.e. provision of seedlings, harvesting and transportation of timber. As a result, these growers do not keep track of all costs involved with respect to growing and managing a forest.

Table 4.1: Commercial data for timber growers in KwaNgwanase

Respondent	Capital / ha	Operating profit / ha	Maintenance / ha / year	Transport cost / ha
1	R 5,000.00	R 16,000.00	R 700.00	Not sure
2	R 9,000.00	R 34,000.00	R 600.00	Not sure
3	R 7,000.00	R 36,000.00	R 1,000.00	Not sure
4	Not sure	Not sure	R 615.00	Not sure
5	Not sure	Not sure	R 400.00	R 36,000.00
6	R 25,000.00	R 42,000.00	R 300.00	Not sure
7	Not sure	R 22,000.00	R 400.00	Not sure
8	Not sure	Not sure	R 900.00	Not sure
9	R 35,000.00	R 60,000.00	R 1,800.00	R 40,000.00
10	Not sure	R 18,000.00	R 700.00	Not sure

11	Not sure	Not sure	R 900.00	Not sure
12	Not sure	R 13,000.00	R 1,000.00	Not sure
13	R 5,000.00	R 24,000.00	R 460.00	Not sure
14	R 12,500.00	R 30,000.00	R 750.00	R 36,000.00
15	Not sure	Not sure	I do it myself	Not sure
16	R 10,000.00	R 22,500.00	R 350.00	Not sure
17	R 8,500.00	R 60,000.00	R 750.00	Not sure
Min	R 5,000.00	R 13,000.00	R 300.00	R 36,000.00
Max	R 35,000.00	R 60,000.00	R 1,800.00	R 40,000.00
Mean	R 13,000.00	R 31,458.33	R 726.56	R 37,333.33

Furthermore, the majority of growers are not sure how much it costs them to transport timber to buyers' processing plants since only 17.6% of participants were able to provide estimated transport costs. Again, this could be because the out-grower companies, who happen to be buyers, arrange transport for harvested timber. The findings also indicate that, on average, timber growers in KwaNgwanase make approximately R31, 458.33 profit per hectare in one growing cycle of approximately 6 years. This is equivalent to a monthly average profit of approximately R2, 752.60 per month, considering the fact that an average grower in the study area cultivates approximately 6.3ha of land. This is summarised in Table 4.2 below.

Table 4.2: Average monthly profit for cultivating timber in KwaNgwanase

Growing cycle	6 years
Average size of land per participant	6.3 ha

Average profit per ha per cycle	R31,458.33
Average profit per cycle	R198,187.50
Average profit per year	R33,031.25
Average profit per month	R2,752.60

The participants at timber grower node indicated that they do not pay tax since the majority of them make profit once every six years. The growers in the study area also do not incur interest and cost of debt, as they do not use loan facilities to finance operations for their plantations. In addition, timber growers who are part of out-grower schemes reported that the out-grower companies do not charge them any interest other than the direct costs used for planting and maintenance of plantations. As a result, the study findings show that the gross and profit margins for growers are 33.5% and 29.4% respectively, as exhibited in Table 4.3 below. When considering the profit margin, this means that the timber growers in KwaNgwanase obtain approximately R0.294 for every R1 invested. The study findings for KwaNgwanase timber growers are similar to the gross margins obtained in the study by Cairns (1995) for growers collaborating with Sappi and Mondi. However, the gross margins for small-scale timber growers in KwaNgwanase are approximately 40% less than the margins obtained by black wattle tree producers in the study conducted by Sanga (2016) in Tanzania.

Table 4.3: Commercial information for timber growers per ha per 6 year growing cycle

Sales	R	106,901.04
Cost of sales	R	71,083.33
Gross profit	R	35,817.71
Expenses	R	4,359.38
Operating profit	R	31,458.33
Interest	R	-
Tax	R	-
Net profit	R	31,458.33

Gross margin	33.5%
Profit margin	29.4%

There are opportunities to improve profit margins for timber growers in KwaNgwanase if growers were involved in all segments of operations at the timber grower node. The current distant and uncoordinated relationship between the growers and buyers proves to be detrimental to growers' profits. The information provided by the growers was also not complete and could not be validated, as most growers did not have statements of sales from out-grower companies.

Based on the responses from participants, the findings revealed that local private growers, who are not collaborating with Sappi and Mondi, are more involved in operations of their plantations. They are able to manage operational costs and cost of sales more effectively as compared to other growers who are collaborating with out-grower partners. No growers could however provide sufficient information to enable assessment of comparable profit margins between private growers and growers who are growing without-grower companies.

4.4.2 Gross and profit margins at forestry-harvesting node

The findings from the responses obtained from harvesting contractors indicate that gross and profit margins at this node are 71.2% and 20.8% respectively. A simulated average income statement for harvesters in the study area is exhibited in Table 4.4 below. Considering the profit margin, this means that harvesting contractors in the study area obtain approximately R0.208 for every R1 they invest per month.

Table 4.4: Commercial information for harvesting contractors per month

Sales	R 52,000.00
Cost of sales	R 15,000.00
Gross profit	R 37,000.00
Expenses	R 22,000.00
Operating profit	R 15,000.00

Interest	R	-
Tax	R	4,200.00
Net profit	R	10,800.00
Gross margin		71.2%
Profit margin		20.8%

The margins at this node are higher when compared to margins obtained by timber growers who participated in the study. However, the participants in this node of the value chain seem to experience limitations that hinder them from increasing their margins, similar to the hindrances that affect the timber grower node. Some challenges are beyond the participants' control since timber buyers control the value chain activities. Unavailability of spare parts for chainsaws and other harvesting equipment means that harvesters also have limited room to reduce their operational costs.

4.4.3 Gross and profit margins at seedling producer node

The findings from responses put forth by the seedling producer indicate that the gross and profit margins at this node are 78% and 47.8% respectively. When considering the profit margin, this translates to returns of approximately R0.47 per every R1 invested per month. An estimated income statement for a typical seedling producer in the study area is exhibited below in Table 4.5.

Table 4.5: Commercial information for seedling producers per month

Sales	R	116,000.00
Cost of sales	R	25,500.00
Gross profit	R	90,500.00
Expenses	R	13,500.00
Operating profit	R	77,000.00
Interest	R	-

Tax	R	21,560.00
Net profit	R	55,440.00
Gross margin		78.0%
Profit margin		47.8%

The seedling producer in this study receives a higher profit margin compared to the other two groups of value chain participants, grower and harvesting nodes, which is due to the fact that he has full control of the day-to-day operations of his business. The seedling producer determines the price of seedlings and has established a certain level of healthy relationship with timber growers in the area. Although the seedling producer at this node has competition from Sappi and Mondi, he still has a large market share in the study area since there is little competition locally.

The profit levels for the seedling producer could reach a ceiling capacity because of lack of land for new plantations. There is also a threat from other new entrants who may penetrate the industry and gain a market share, thus reducing margins for current participants.

4.5 Research objective four: To evaluate the contribution of commercial forestry timber activities to actors' livelihoods in KwaNgwanase

The contribution of commercial forestry activities to participants' livelihoods was assessed as the fourth objective of the research. As described by Ellis (1999), a livelihood is sustainable when it can sustain its abilities, resources and other value chain activities without degrading its natural resource base. As a source of sustainable livelihood, the forestry value chain activities were assessed to evaluate whether the actors in KwaNgwanase are able to convert natural, physical, human, social and financial resources to improve their standard of living. The following section explores the vulnerability context of the SLF in terms of the factors that affect the competencies of livelihood assets. Thereafter the livelihood assets identified by the participants in this study will be discussed more fully.

4.5.1 Vulnerability context

The vulnerability context of the SLF considers factors such as shocks, trends and seasonality factors, as described by the DFID (1999) and represented in Chapter Two in Figure 2.3. These factors affect competencies of livelihood assets since they are external and the participants of the KwaNgwanase forestry value chain have little control over them. Livelihood activities must then tolerate these elements in order to be sustainable and support a certain standard of living for value chain actors.

The forestry value chain in KwaNgwanase is affected by various vulnerabilities that negatively influence the performance of value chain activities. These trends were unpacked during the interviews with participants and they include, mainly, the challenges faced by the actors such as theft, lack of financial support, unavailability of land, risk of fire, unavailability of spare parts and exploitation by out-grower partners. These vulnerabilities are external, and the value chain actors have little or no control over these but instead must adapt to them.

At timber grower node, the participants do not have full control of their business activities. The majority of growers are very dependent on out-grower companies due to lack of experience in commercial forestry, in addition to lack of funding. It is therefore challenging for them to avoid vulnerabilities such as theft and risk of fire in their plantations. These actors do not have access to financial support to purchase fire insurance and to maintain firebreaks. It is also a challenge for the growers to organise themselves through the establishment of grower associations that can assist in addressing common issues facing small-scale timber growers.

Scarcity of cultivation land is also beyond the control of the growers who are interested in expanding their operations. It is also a barrier to entry for prospective growers who are interested in venturing into commercial forestry. Although there are no land lease costs, unavailability of land to expand the footprint of plantations is a huge limitation, which the growers in KwaNgwanase have no adaptive capacity to deal with. As a result, the growers continue farming on the same land without any potential of maximising their yields.

Unavailability of spare parts to support harvesting contractors in the study area also presents a harsh vulnerability that the harvesters have no control over; instead they must adapt to this reality. Timber buyers, Sappi and Mondi, control activities for harvesters. They also control transportation of timber from the area and also compete with local seedling producers. All these

vulnerability factors affect the forestry value chain in KwaNgwanase and a lack of shocks means that it is almost impossible to convert livelihood assets to livelihood outcomes.

The performance of value chain activities in the study area largely depends on the ability to secure funding in order to have cash flow to manage operations at each node. For example, growers require cash flow for maintenance of firebreaks and hiring of resources to patrol the plantations. There is also an opportunity to engage local municipality, traditional leadership and the DFFE. In addition, the participants need to organise themselves in order to ensure that they present a united front and speak in one voice in creating measures that will counteract most vulnerabilities.

4.5.2 Livelihood assets

Different livelihood assets were uncovered in the forestry value chain in KwaNgwanase. The findings revealed that the value chain actors have access to all livelihood assets as per the SLF. These assets will be discussed below.

4.5.2.1 Physical assets

According to the SLF, physical assets refer to the physical infrastructure such as roads to plantations, equipment for cultivation and harvesting, and facilities for seedling production. Although roads/tracks are available, they are in poor condition and buyers who have huge influence in the value chain have taken no initiatives to improve roads around plantations and roads to loading zones. The only roads available are those built by government to connect villages and their servitudes are now used as loading zones for timber. This finding is similar to what was discovered by Cairns (2000) when assessing contribution of out-grower schemes to livelihoods in KZN. According to Cairns (2000), roads have been developed in the villages, but these do not lead to forest plantations. As a results, there is little contribution to timber grower livelihoods as they cannot access government assistance for construction of roads around timber plantations. The same case applies in KwaNgwanase.

Harvesting contractors also have limited access to tools and spare parts. However, due to better organisation of the participants at this node, they are able to source spare parts from other towns. These participants are also able to share some spare parts when a need arises.

4.5.2.2 Financial assets

In order for participants to venture into commercial forestry, financial assets in the form of capital and monthly cash flow are a necessity. Funds are necessary for production and purchase of seedlings, for ploughing, planting, maintenance of forest plantations, purchase of harvesting equipment and consumables, transportation and to pay for human resources. The findings of the study indicate that the value chain actors in KwaNgwanase do not have access to financial assets. Most plantations are financed by equity or through collaborating with Sappi and Mondi. The limited access to financial assets means that the participants' livelihood is not sustainable since it cannot fully support the livelihood activities. The finding reported in the study in Phillipines by Pulhin and Ramirez (2016) supports this since the KwaNgwanase timber growers and contractors are able to operate and generate income. However, the gains are at a much lower rates due to high transactional costs within the value chain.

4.5.2.3 *Natural assets*

Access to natural assets includes access to land, seedlings and favourable climate and water resources. Value chain actors have access to all these natural assets although the issue of land scarcity remains. Traditional authorities play a role in the distribution of land as land is occupied by the growers through PTO. Government has not played a role in ensuring that land for plantations is available to the residents of the villages, though local municipality has demarcated land suitable for forestry in their land use plans. The way in which land is used is still not sustainable. It was also discovered that timber growers do not have water use licences and some plantations are grown too close to wetlands; thus the activity has a degrading impact on the natural resource base. If the DFFE can participate in forestry activity in KwaNgwanase, plantations could be better planned to ensure that natural water resources and biodiversity are not impacted.

4.5.2.4 *Social assets*

The manner in which value chain actors access the social assets in the study area is very weak. Timber growers, in particular, depend largely on their collaboration with Sappi and Mondi. Participants at the grower node are not organised, they run their plantations as subsistent timber farming even though they have already commercialised them. They therefore have no bargaining power to negotiate timber prices, to determine the management structure of their

plantations or to negotiate access to new markets. The social structure is very fragmented as there is very limited horizontal and vertical integration within the value chain.

On the other hand, horizontal integration seems to exist at the forestry-harvesting node. However, even though these participants are more organised, they are still unable to negotiate harvesting prices as the buyers determine these prices. This finding supports the study finding by Cairns (2000) where the social asset was found to be a weak contributor to actors' livelihoods as timber growers cannot negotiate better contracts with buyers since timber grower associations are used only for administrative purposes.

4.5.2.5 *Human assets*

The human asset aspect for the value chain actors in KwaNgwanase includes human resources for labour and skilled expertise to run operations at different nodes of the value chain. The industry is labour intensive and unskilled labourers are readily available in the area. However, the research findings show that the majority of workers in the value chain are foreign immigrants from Mozambique since locals shy away from low-paying, labour-intense jobs. This weakens the human asset aspect since it was reported that foreign nationals normally only take temporary jobs. This creates a loss of institutional knowledge within timber farming operations in the area as the immigrant workers do not remain for extended periods of time to work on timber plantations.

The majority of participants have not had formal training, which also makes the human asset aspect weak within the forestry value chain in the area. Although some actors, especially at the grower node, depend on indigenous knowledge for cultivation of plants, the high level of illiteracy further weakens the human capital asset. The participants are thus struggling to operate their plantations commercially. This gap is currently bridged by out-grower companies, but the high level of dependency with no transparency has proved to be unviable for sustainability of the forestry value chain in the area.

4.5.3 Livelihood outcomes

Having access to livelihood assets does not automatically translate to positive impacts on the livelihoods of forestry value chain actors, unless the use of those assets is sustainable. The main focus of livelihood outcomes is whether the forestry value chain actors are able to convert the

livelihood assets to generate more household income, increased well-being, reduced vulnerability, improved food security and more sustainable use of resources (DFID, 1999).

Although the scale and magnitude of impact is lower, there were overwhelming positive responses from the research participants when asked whether they have benefited from participating in the forestry value chain. All participants reported that they have seen an increase in household income since they started participating in forestry activities in KwaNgwanase. Some actors went on to report that the profits made from selling timber have allowed them to build houses and to pay university fees for their children. The sale of timber also in turn allows them to reinvest the profits back into the value chain through expanding their plantations, using money for firebreaks maintenance or venturing into other value chain nodes.

Participating in the forestry value chain has also increased food security in the households of the actors because of increased household income. Although the extent cannot be quantified, the majority of participants reflected that the extra income that they make affords them the opportunity to spend their monthly pension grant or their main salary on food, knowing that the income from forestry activities will take care of other important needs.

Furthermore, the findings revealed that participating in the forestry value chain contributes to an increased well-being for the value chain actors. The majority of participants indicated that forestry operational activities keeps them busy and active, thus improving their fitness. The income they earn via participating in the value chain also assists them to access better healthcare as they are able to consult private medical professionals. Although forestry jobs are labour intensive and are dominated by an unskilled workforce, these jobs assist the locals as they receive a basic salary thus indirectly reducing crime in the villages. Participating in the forestry value chain does therefore contribute to reduced vulnerability.

There was an underwhelming response from the participants when asked whether they believe that the forestry value chain results in more sustainable use of natural resources. Approximately 64% of the participants responded that forestry results in droughts, thus affecting natural watercourses and lakes. Value chain actors who also participate in livestock farming indicated that forestry has resulted in reduction of grazing land for their cattle. It was reported that they have observed lakes drying up over the past decades because of forestry, and cattle have to travel longer distances for drinking water. Participants who grow groundnuts also highlighted

that they have observed a reduction in their harvests due to drought that could be associated with the establishment of exotic forest plantation.

Lack of policies to determine the manner in which land should be used in the rural communities, in particular KwaNgwanase, leads to the land being used inappropriately. This creates competition between different livelihood activities such as forestry and livestock farming, thus negatively affecting livelihood assets from being converted into sustainable outcomes. There is therefore an opportunity for improvement in the value chain, and this can only be achieved through coordinated efforts by different value chain stakeholders. This finding is similar to those of Mahlangu and Mubangizi's (2015) study where it was argued that a holistic approach to the timber business that includes alternative land use planning and management could benefit the small-scale timber farmers. Again, spatial and land use planning has been done at local and district levels (Umhlabuyalingana Local Municipality, 2019; Umkhanyakude District Municipality, 2019); however implementation of these plans especially in the peripheral areas such as KwaNgwanase is yet to be implemented.

4.6 Comparative results between Mnyayisa and Nsukumbili villages

Although the number of cases for participants from Nsukumbili villages was limited to three, the limited data collected indicated that the forestry value chain in Nkukumbili village is similar to that of Mnyayisa village. The value chain actors in each village include for timber growers and forestry harvesting contractors. The only seedling producer was located at Mnyayisa village. Demographics of the value chain actors and challenges facing actors were also similar. However, one observation made was that Nsukumbili village was far from paved district roads making it costly to transport harvested timber from plantations to loading zones. Analysis of economic benefits and contribution of timber farming to actors' livelihoods are also similar between the two villages.

4.7 Conclusion

The research findings indicate that timber growers, harvesting contractors and seedling producers are the main stakeholders participating in the forestry value chain in KwaNgwanase. Other stakeholders include out-grower companies (Sappi and Mondi), long distance truckers

and timber buyers. Timber buyers happen to be the out-grower companies. These companies have offtake agreements with local growers and they also purchase timber from local private growers. It is clear that timber buyers in the study area have huge influence on most value chain activities. The stakeholders in KwaNgwanase are not coordinated nor organised, as there is very little horizontal and vertical integration. Although actors at each node benefit from participating in the forestry value chain, they face numerous challenges which are beyond their control. The lack of coordination among actors further exacerbates these challenges. Government has not played a pivotal role despite promises to support the local forestry sector.

Of the participants interviewed, seedling producers obtain the highest profit margins, followed by harvesting contractors. Timber growers earn the lowest margins. There is a direct correlation between larger dependence on out-grower companies and lower margins obtained by growers. This is associated with the fact that out-grower companies undertake the majority of forestry activities on behalf of growers. Value chain participants were found to have access to all livelihood assets in the study area. Although the value chain activities are able to convert livelihood assets into livelihood outcomes, there are many vulnerabilities in the value chain which affects actors' ability to convert livelihood assets to livelihood outcomes. The degradation of natural resources through the plantation of timber in sensitive wetland areas also means that the livelihood is not sustainable. Chapter Five to follow presents the overall conclusions to the study as well as the recommendations that can be made for improving the livelihood of forestry value chain actors and for future research.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The primary purpose of this study was to assess the forestry value chain in KwaNgwanase with an aim of evaluating its impact on sustainable livelihoods. The methodological choice for the research design was a mixed method approach that combined both quantitative and qualitative research methods. The case study selected for the research was KwaNgwanase which allowed the researcher to develop an in-depth understanding of the forestry value chain and the impacts on the actors involved in this location. A non-probability sampling approach was used in the form of a purposive sampling technique in order to select the seedling producer and harvesting contractors to participate in the study. The snowball sampling method was used to determine the final sample size for the timber growers who participated in the study. Data was collected during structured interviews with forestry value chain actors in Mnyayisa and Nsukumbili villages in December 2020 and January 2021 after negotiating access through the local and traditional leadership. NVivo computer aided software was used to sort and analyse the data collected. The findings of the research were discussed in Chapter Four as they relate to each research objective. This chapter will firstly present the summary of research findings for each of the objectives of the study. Thereafter the overall conclusions for the research conducted in the KwaNgwanase area will be discussed. The recommendations that can be made to improve the livelihoods of the actors in the forestry value chain in the KwaNgwanase will then be made, as well as the recommendations for future research. Lastly, the implications of the study and closing remarks will be presented.

5.2 Summary of research findings

The specific objectives of the study were:

- i. To identify the actors of the commercial forestry value chain and their roles in KwaNgwanase;
- ii. To examine the challenges faced by forestry value chain actors in KwaNgwanase;
- iii. To assess the high-level economic efficiency (costs and profit margins) for different actors in the forestry value chain in KwaNgwanase; and

- iv. To evaluate the contribution of commercial timber activities to actors' livelihoods in KwaNgwanase.

A summary of findings for the research objectives is presented in the following subsections.

5.2.1 Findings of objective one

The characteristics of the actors participating in the commercial forestry value chain in KwaNgwanase were assessed and factors such as age distribution, gender distribution, level of education, household size and main source of income were considered. Furthermore, coordination and organisation of value chain actors was examined whilst considering activities at each node of the value chain.

The study revealed that representation of the forestry value chain in KwaNgwanase consists mainly of seedling producers, timber growers and harvesting contractors. Although the majority of value chain actors have at least primary education level, elderly people who are aged above 60 years dominate the industry and they depend on pension grant as their main source of income. Timber buyers or out-grower companies, who happen to be collaborating with some growers in the area, are the main link that joins all value chain actors together. The research revealed that there is very little organisation amongst the value chain actors in KwaNgwanase. There is low level of vertical and horizontal integration as the participants are not coordinated. Lack of trust amongst one another makes it difficult for the actors to unite and to present their views in one voice. Although timber growers' associations are present, they seem to be non-functional. Two main elements that hinder growth of the industry in the study area include: 1) a fragmented value chain emanating from lack of coordination; and 2) undue influence from timber buyers, which does not benefit the majority of value chain participants in the study area.

5.2.2 Findings of objective two

Out of eight challenges reported by timber growers in the study area, risk of fire, theft and fragmented value chain activities emerged as the main challenges facing the growers. There is a very strong link between some of the timber growers' challenges and systematic exclusion of growers from having a say in the industry. Growers are discouraged by buyers from combining their harvests in order to capitalise on higher prices, which creates a monopoly for

the buyers in the industry. Again, lack of experience and training contributes to these challenges and forces growers to depend on out-grower companies such as Sappi and Mondi.

At the forestry harvesting node, unavailability of spare parts locally, poor access roads and delays in the collection of harvested timber by buyers were found to be the main challenges facing harvesting contractors. Though harvesting contractors appear to be the most organised actors in the study area, the challenges they face are beyond their control since participation of other external stakeholders is necessary to resolve challenges at this node. The harvesting contractors operate as small, medium and micro-enterprise (SMME) businesses and they depend on timber buyers to issue contracts for harvesting and short hauling of timber. The high dependency on buyers hinders the sustainability of forestry harvesting business in the study area.

Indirect competition by out-grower companies was found to be the main challenge faced by the seedling grower in KwaNgwanase. Seedlings for out-grower partnership schemes are brought in from other areas outside of KwaNgwanase. This takes a large market share from the local seedling grower, thus affecting long-term sustainability of seedling production business.

5.2.3 Findings of objective three

A high-level economic efficiency of the forestry value chain in KwaNgwanase was also analysed. The study revealed that approximately 47% of timber growers in KwaNgwanase are not aware of the actual cost of growing eucalyptus plantation. This is attributed to the fact that most growers depend on out-grower partners for end-to-end support during a growing cycle of a plantation. It was also determined that, on average, timber growers in KwaNgwanase generate approximately R2, 752.60 per month based on the average plantation per household.

The study indicated that gross and profit margins at timber grower node are 33.5% and 29.4% respectively. This means that the timber growers in KwaNgwanase make approximately R0.294 for every R1 rand invested. Further, the findings revealed that gross and profit margins at forestry-harvesting node are 71.2% and 20.8%, respectively. This means that harvesting contractors in KwaNgwanase generate approximately R0.208 for every Rand invested. The gross and profit margins for nursery operation are 78% and 47.8% respectively.

5.2.4 Findings of objective four

The research revealed that timber growers in the study area are exposed to vulnerabilities that they do not have control over. Value chain participants largely depend on out-grower partners due to lack of financial capital and expertise to run forestry operations. The actors are therefore unable to avoid external vulnerabilities such as theft and risk of fire to their plantations.

Timber farming in KwaNgwanase takes place in communal land; as a result, limited land resource limits growers from expanding their plantations. It also restricts the growers from benefiting from economies of scale production. Growers have no adaptive capacity over this.

Unavailability of spare parts for harvesting contractors is also a limiting factor at the harvesting node. However, the contractors are able to adapt to this vulnerability through sharing of spare parts. The fact that seedlings are brought from other regions of KZN into KwaNgwanase was found to be beyond the local nursery operator's control. Based on the SLF, lack of shocks for these vulnerabilities impedes the opportunity for livelihood assets to be converted to livelihood outcomes.

The research revealed that all five livelihood assets are available in the study area for the value chain actors. The value chain participants are able to use these assets for advancement of their standard of living, although to a lesser extent.

5.3 Conclusions of the study

Cultivation of exotic forestry has over thirty years of history in KwaNgwanase. Notwithstanding the positive contribution of forestry activities in the area, the study outcomes show that the value chain has not really developed to a level where it can contribute meaningfully to the local economy. There is huge reliance on private companies, such as Sappi and Mondi, for out-grower partnership programmes and for timber offtakes after harvesting. Despite extensive involvement of these corporates over the past three decades, development of the value chain actors has progressed at a very slow pace. The majority of timber growers are yet to learn the basics of managing a forestry plantation. Forestry harvesting contractors also rely largely on Sappi and Mondi for business. There are limited seedling producers in the area, in fact only a single producer, and they compete with Sappi and Mondi for the seedling market. These value chain dynamics create fragmented value chain activities where there is no

horizontal and vertical integration amongst value chain participants. Non-participation of government stakeholders allows big corporates to have undue influence on almost all value chain nodes in the area, thus suppressing growth of local participants.

Forestry business in KwaNgwanase is undertaken on communal land owned by Ingonyama Trust Board, under the supervision of Tembe local tribal authority. Timber growers occupy land through a PTO and the tenure/period of use is unknown. Questions therefore arise regarding how the long-term sustainability of the forestry value chain in KwaNgwanase will be affected and whether the current situation is a sustainable model to commercialise forestry farming on communal land, also considering the 6-year growing cycle of timber. With limited empirical data, it may be a challenge to address these issues. The current approach at the grower node, which is the backbone of the value chain, is not strategic. Growers enter into forestry farming based on availability of land and capital, without undertaking feasibility studies and viable business cases. Very few checks and balances are carried out to ascertain whether land is sufficient for growers to make profitable margins.

According to the SLF, in order to assess the contribution of an activity to a livelihood, it must be determined whether an activity is able to support livelihood assets for advancement of standard of living for a community. In the case of small-scale timber farming in KwaNgwanase, the value chain activities are not strong enough to withstand most vulnerabilities that are beyond the control of the value chain actors. There is large reliance on out-grower companies, who happen to be timber buyers, to fulfil certain necessary activities in the value chain.

Again, the private sector initiated the forestry value chain in the area and traditional leadership assisted the community with provision of land for timber farming. There has been no or very little involvement of government at macro and micro levels in the area. As a result, this leaves value chain participants vulnerable, as there are limited shocks to deal with value chain difficulties. Without support from key stakeholders such as government and financial institutions, the forestry value chain that falls under communal land in the long term is therefore unsustainable. However, in the short term, it can be encouraged since it does contribute to increased household income and food security.

The economic benefits of participating in the forestry value chain in KwaNgwanase remain ambiguous. Based on the gross and profit margins analysis, the value chain actors in KwaNgwanase do benefit financially, with the seedling grower having the highest profit

margins followed by the harvesting contractors. These actors fall under the SMME category, but the same does not apply to small-scale timber growers. Seedling producers, forestry-harvesting contractors, long distance logistic contractors and the buyers all benefit because of small-scale timber growers in KwaNgwanase. However, timber growers remain at the bottom of the value chain when it comes to profit earnings. Timber buyers enjoy the benefits of securing timber raw material at the expense of timber growers and nothing or very little is reinvested back to the value chain.

The value chain activities in KwaNgwanase have too few shocks to deal with vulnerabilities. Although the value chain actors have access to livelihood resources, the use of all resources is unsustainable and thus does not translate to overall positive sustainable livelihood outcomes. In order for the value chain to impact the broader KwaNgwanase area, transformational changes at operational and government levels are necessary.

5.4 Recommendations for the forestry value chain in KwaNgwanase

The research conclusions indicate that the approach in which forestry farming is carried out in KwaNgwanase is unsustainable due to large reliance on private companies with no proper training for actors and lack of involvement from key government stakeholders. Although participating in the forestry value chain yields certain commercial benefits for the value chain actors, a paradigm shift is necessary for the forestry value chain to be more impactful to the broader KwaNgwanase community. The following subsections present the recommendations that can be made for ways in which the livelihoods of actors in the forestry value chain in KwaNgwanase can be improved.

5.4.1 Coordination and organisation of value chain participants

The research showed that there is lack of vertical and horizontal integration amongst forestry value chain activities and participants in the study area, similar to the findings of the study by Mtengu and Green (2016) which was conducted in a neighbouring village in KwaNgwanase. As a result, there is an opportunity for value chain actors in KwaNgwanase to better utilise the existing associations to improve value chain organisation and coordination. This will strengthen the links between various participants and will assist in reaffirming the identity of the forestry value chain so that the actors' voices can be heard. Issues such as training

requirements, access to funding, price bargaining power, theft and risk of fire could thus be resolved.

Holistic and mandatory participation by all growers in the existing timber growers' association is required in KwaNgwanase. This will strengthen policing of operations around plantations and will ensure that all growers understand the meaning of managing forestry operations. Growers who are not maintaining firebreaks for their plots should be held accountable in order to ensure high levels of discipline by the growers. Furthermore, if timber growers are to minimise risk of fire, frequent patrols and restriction of bee-hunting activities must be implemented in the plantations.

There is also great opportunity for harvesting contractors to organise themselves. This may assist them to arrange to buy spare parts from one supplier in bulk and to negotiate spare parts' prices at discounted rates. In addition, they would be able to negotiate flexible payment terms with suppliers until a local supplier shop is opened in KwaNgwanase. Lastly the coordinated approach may assist the harvesting contractors to negotiate better timber prices with buyers. The solution for the harvesters could be to factor in poor road conditions, in addition to distance, when negotiating short haulage prices with the buyers and growers.

5.4.2 Access to government funding and support

It is evident that forestry value chain participants in KwaNgwanase cannot access funding such as loans from private institutions or government grants. Although the figures are not known, the value chain participants contribute to local economic development in the Umhlabuyalingana municipal area, for example through the creation of jobs which contribute to increased household income. There is therefore an opportunity for the participants, as a collective, to approach relevant government institutions to seek funding for their operations or any other support that could be offered such as training and skills development in forestry operations management. This includes for seedling producers, timber growers and harvesting contractors. Investment by government could assist the actors to manage their forestry operations more effectively and to maximise their profits. This may also have a ripple effect on the broader local economy.

5.4.3 Land use policy framework

Currently, there is no regulatory framework that regulates small-scale timber farming in rural areas. Although government has developed spatial frameworks and land use policies at district and local municipal levels, these are often not implemented accordingly. In KwaNgwanase, timber farming is practiced in areas that were previously used for cattle grazing. Some plantations are found next to the wetlands which contravenes environmental regulations. Timber growers also do not have water use licenses. These issues affect land use planning and negatively affect environmental biodiversity, as was the case in the findings by Barney and van der Meer Simo's (2019) in Lao PDR and Vietnam. Government must therefore develop a small-scale timber farming framework to ensure that forestry activities are not degrading, but support advancement of livelihoods. Compliance for this could be regulated at district level. This also needs to be included in the integrated development plan for Umhlabuyalingana Municipality, to ensure that forestry does not take up land that could be better utilised for other subsistence farming needs.

5.4.4 Small-scale forestry cultivation guidelines

It is recommended that government participate in developing standardised timber farming guidelines for small-scale growers, in line with the recommendation made by Mahlangu and Mubangizi (2015) in their earlier study. Lack of best farming practices means that it is almost impossible to obtain estimated yields for plantations. Timber growers and harvesters enter into the industry with very little information to benchmark from. The DFFE in collaboration with the Department of Agriculture, Land Reform and Rural Development could develop small-scale forestry guidelines in order to ensure that the timber industry in KwaNgwanase operates in line with the best timber farming practices.

5.4.5 Collaboration between local seedling producers and out-grower companies

There is a potential for the local seedling producer to gain market share from out-grower companies, who currently bring seedlings in from outside of KwaNgwanase. The local seedling producer could collaborate with these corporates and supply seedlings to be used for out-grower schemes. For this to materialise, the local seedling producer would have to comply with all production and quality requirements that could be imposed by out-grower companies. Again, to remain competitive and sustainable, the current seedling producer could consider migrating to new production technologies, thus increasing operational efficiencies.

5.4.6 Participation of youth and women

The study findings indicate that the forestry value chain in KwaNgwanase is dominated by adult male actors. Although there are female and youth participants, approximately 90% of female participants are over the age of 50 years and youth was represented by only 17% of the study participants. There is therefore an opportunity for government institutions such as DFFE to introduce training programmes that will assist participation of youth and women in the forestry value chain in South Africa. This will ensure that there is no loss of indigenous and instructional knowledge for small-scale timber farming in rural areas.

5.5 Recommendations for future studies

In order to better understand the forestry value chain in KwaNgwanase and its deeper impact on sustainable livelihoods, the following areas of investigation are recommended for future studies:

- Analysis of the performance of out-grower partnership programmes between private companies and small-scale timber farmers should be undertaken. This will unpack sustainability of this farming arrangement since there is limited data that can be obtained from the growers alone.
- For the research findings to be validated, a pure quantitative study should be undertaken since this type of study will be based on empirical evidence stemming from examining relationships between variables, which are analysed graphically or using statistical methods.
- An insight into how small-scale private timber growers perform compared to small-scale growers who are collaborating with out-grower companies is critical for a fuller understanding of the forestry value chain dynamics in KwaNgwanase. This could uncover the true cost and benefits of participating in the forestry value chain in the study area.
- It could also be useful to evaluate whether forestry in KwaNgwanase is a more viable farming activity when compared to other subsistence farming options such as cash crops and livestock.

5.6 Implications of the research

Due to lack of sufficient literature contributing to small-scale timber farming in KwaNgwanase, the research findings in this study can contribute immensely to the knowledge base of the research subject. The research has contributed to identifying forestry value chain stakeholders in KwaNgwanase, in particular Mnyayisa and Nsukumbili villages. The study has comprehensively provided analyses of the actors' and stakeholders' characteristics and their organisation and coordination in the study area. Further, challenges facing the value chain actors operating in communal land have been unpacked in the study, and these will be useful for scholars investigating this research topic. The research has also added to the body of existing literature in terms of the financial benefits of participating in forestry activities. The research can therefore provide a foundation for other scholars to undertake sustainable livelihood research on small-scale timber farming in communal land.

The study participants interviewed during collection of data will also benefit from the research findings. Since the researcher has a relationship with some value chain actors and is also participating in the forestry value chain in KwaNgwanase, the study findings will be shared with other participants so that they can gain better insight of the value chain. There is an opportunity for the actors to start organising themselves more effectively for better coordination of value chain activities, resulting in improved gains.

Lastly, government at all spheres will benefit if the findings of the study are considered when developing integrated local development plans and land use plans.

5.7 Conclusion

The primary purpose of the study was to assess the forestry value chain in KwaNgwanase with an aim of evaluating its impact on sustainable livelihoods. The research was conducted through evaluating coordination of the value chain stakeholders, determining the challenges facing value chain actors, assessing the economic benefits and contribution of value chain activities to value chain actors, and considering the contribution of value chain activities to livelihoods. The study has revealed that the forestry value chain activities do contribute to sustainable livelihoods in KwaNgwanase. However, contributions were found to be minimal owing to

disjointed organisation of value chain stakeholders and challenges facing participants. Overall, it can be concluded that, unless all stakeholders organise themselves, small-scale timber farming is not yet a long-term sustainable livelihood contributor in KwaNgwanase.

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APPENDIX A: ETHICAL CLEARANCE LETTER



Protocol reference number : HSSREC/00002269/2020

Project title : UNDERSTANDING THE FORESTRY VALUE CHAIN AND LIVELIHOODS: A CASE OF TIMBER FARMING IN KWANGWANASE

ACKNOWLEDGEMENT: BREACH OF ETHICAL PROCESSES AT UKZN

I, the undersigned,

Student Name (Student Nr) : 205500830

School : Grad School Of Bus & Leadership

Campus : Westville

as the Principal Investigator ("the Applicant") in the above stated project, do hereby acknowledge that:

1. The University of KwaZulu-Natal's (hereinafter "UKZN") Research Ethics Policy (V) does not make provision for Retrospective Ethics Approval;
2. All researchers (both students and staff) at UKZN are obliged to be familiar with this policy;
3. I have been informed that research cannot be done without obtaining full ethical clearance as per the policy and guidelines of the University;
4. **Research for the above project was undertaken by myself without final ethical clearance being obtained;**
5. The University reserves its right to, at any stage and time, withdraw the relevant degree obtained by myself if:
 - 5.1 It becomes known to UKZN that there was an additional ethical breach during any field work or whilst collection data for the above stated project, and / or
 - 5.2 I fail to apply for ethical clearance for any future research projects.
6. In addition to point 5 above, the appropriate disciplinary processes will follow should this occur again.

I further acknowledge that should there be any legal implications/actions emanating from the research in terms of any ethical violations, I will be personally liable and hereby indemnify UKZN against any legal action that may arise from my failure to adhere to the University Research Ethics Policy (V).

Signed at *9th Durban* on the *9th* day of *February* 2021

Signature of applicant: _____

Signed at *WESTVILLE* on the *16* day of *February* 2021

Signature of Chair (HSSREC): _____

Date: *16/02/2021*

Humanities & Social Sciences Research Ethics Committee
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Tel: +27 31 260 8350 / 4557 / 3587

(Only complete this section if applicable)

ACKNOWLEDGEMENT: BREACH OF ETHICAL PROCESSES AT UKZN

I, the undersigned,

Supervisor name : Migiro, Stephen Oseko
School : Grad School Of Bus & Leadership
Staff / student number : (33746)

acting as supervisor in the above stated project, do hereby acknowledge that:

1. The University of KwaZulu-Natal's (hereinafter "UKZN") Research Ethics Policy (V) does not make provision for Retrospective Ethics Approval;
2. All researchers (both students and staff) at UKZN are obliged to be familiar with this policy;
3. I have been informed that research cannot be done without prospective full ethical clearance as per the policy and guidelines of the University;
4. I have failed to verify whether the Applicant obtained Final Ethical Clearance in accordance with the UKZN Research Ethics Policy (V) for the above stated Project;
5. The appropriate disciplinary processes will follow, should this occur again.

I further acknowledge that should there be any legal implications/actions emanating from research in terms of ethical violations, I will be personally liable, jointly and severally with the Applicant and hereby indemnify UKZN against any legal action that may arise from my failure to adhere to the University Research Ethics Policy (V).

Signed at _____ on the _____ day of _____ 2021

Signature of supervisor (where applicable): NB: Supervisor deceased

Signed at _____ on the _____ day of _____ 2021

Signature of Chair (HSSREC):  Date: 16/02/2021

Cc: College Dean of Research:
Cc: Academic Leader Research: Mashau, Pfano
Cc: School Administrator: Bullyraj, Zarina

APPENDIX B: GATEKEEPERS' LETTERS

KwaNgwanase
3973
01/09/2020

Att: Mr N Nsele
Mnyayisa Village
KwaNgwanase
3973

Dear Mr Nkosinathi Nsele

Re: Permission to Conduct Research

Permission is hereby granted for you to conduct research at Mnyayisa village, in KwaNgwanase Area. This permission is only for purposes of your postgraduate studies only, provided that the ethical clearance is obtained from the University of KwaZulu-Natal. We note the title of your research:

UNDERSTANDING THE FORESTRY VALUE CHAIN AND LIVELIHOODS: A CASE OF TIMBER FARMING IN KWANGWANASE.

It is noted that you will be interviewing forestry value chain actors such as growers, seedling nurseries and harvesting contractors. Please ensure that consent is obtained from the participants prior to interviews.

We hope the study will add value, not only to yourself, but also to the entire KwaNgwanase economic development, especially the forestry value chain.

All the best and good luck.

Yours Sincerely



UMHLABUYALINGANA MUNICIPALITY
Councillor L.D. Tembe
Ward 4
P.O. Box 553, Kwa-Nqwanase 3973


Date: 01/09/2020

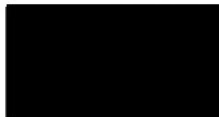
Umhlabuyalingana Nursery (PTY) Ltd
P O Box 112
KwaNgwanase
3973
23 December 2020

Dear Mr Nkosinathi Nsele

This letter confirms that I grant you a permission to interview me for purposes of collecting data for your research project with the University of KwaZulu-Natal. I understand the intentions of the investigation and I hope it will add value to the forestry value chain especially for us small-scale businesses in KwaNgwanase.

All the best and good luck.

Yours Sincerely

A black rectangular redaction box covering the signature of Mr G.I Nsele.

Mr G.I Nsele

Managing Director: Umhlabuyalingana Nursery

Cell:

A black rectangular redaction box covering the cell phone number of Mr G.I Nsele.

APPENDIX C: INFORMED CONSENT LETTER

Dear Participant,

My name is **Nkosinathi Nsele (student number 205500830)**. I am a **Masters** candidate studying at the University of KwaZulu-Natal, Westville Campus. The title of my research is: **Understanding the Forestry Value Chain and Livelihoods – A case of Timber Farming in KwaNgwanase.**

The purpose of this study is to assess the forestry value chain in KwaNgwanase area with an aim of evaluating its contribution to sustainable livelihoods. The specific objectives of the study are:

- i. To identify the stakeholders of commercial forestry value chain and their roles in the study area,
- ii. To evaluate the contribution of commercial forestry activities to actors' livelihoods in the study area,
- iii. To examine the challenges faced by small-scale forestry growers in KwaNgwanase area, and
- iv. To assess a high-level economic efficiency for different actors in the forestry value chain in the study area.

I am interested in interviewing you so as to share your experiences and observations on the subject matter.

Please note that:

- The information that you provide will be used for scholarly research only.
- Your participation is entirely voluntary. You have a choice to participate, not to participate or stop participating in the research. You will not be penalized for taking such an action.
- Your views in this interview will be presented anonymously. Neither your name nor identity will be disclosed in any form in the study.
- The interview will take about 15 min.
- The record as well as other items associated with the interview will be held in a password-protected file accessible only to myself and my supervisors. After a period of 5 years, in line with the rules of the university, it will be disposed by shredding and burning.
- If you agree to participate please sign the declaration attached to this statement (a separate sheet will be provided for signatures)

I can be contacted at: Graduate School of Business, University of KwaZulu-Natal, Westville Campus, Durban, 4000. Email: 205500830@ukzn.ac.za, Cell: [REDACTED]

My supervisor is **Prof. Stephen Mogiri**, who is located at the Graduate School of Business, University of KwaZulu-Natal, Westville Campus, Durban, 4000. Email: Migiro@ukzn.ac.za, Cell: 031 260 8104

My co-supervisor is **Odunayo Olarewaju**, who is located at the Graduate School of Business, University of KwaZulu-Natal, Westville Campus, Durban, 4000. Email: [REDACTED], Cell: [REDACTED]

The Humanities and Social Sciences Research Ethics Committee contact details are as follows: Prem Mohun, University of KwaZulu-Natal, Research Office, Email: HSSREC@ukzn.ac.za, Phone number +27312604557.

Thank you for your contribution to this research.

DECLARATION

I..... (full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire. I understand the intention of the research. I hereby agree to participate.

I consent / do not consent to have this interview recorded (if applicable)

SIGNATURE OF PARTICIPANT

DATE

.....

.....

**APPENDIX D: QUESTIONNAIRE FOR FORESTRY GROWERS IN
KWANGWANASE**

Questionnaire Number:

Date of interview:

Village:

Part I: Personal information of participant

1. Name of the participant (optional):

2. Age:

3. Gender (M / F):

4. Education Level: Primary school / Secondary school / Tertiary / no formal education

5. Number of people in the household:

Part II: Information on timber production

6. Number of years as timber grower:

7. Type of timber grown:

8. Total area (ha) under forest plantation:

9. Do you own the land? Yes / No?:

If Yes, do you have a title deed?

If No, who is the owner and under which conditions do you use the land?

.....

10. Number of ha harvested to date:

11. Average capital outlay per ha (in Rands):

12. Number of years it takes to harvest a plantation:

13. Revenue / Income per ha (in Rands):

14. Where do you sell your harvests:

15. Who transport your timber to the market place:

16. Do you receive any support from the Department of Forestry / Agriculture? Yes / No?

If yes, what type:

17. Average plantation maintenance cost per year:

List of maintenance tasks performed on a plantation annually:

.....

18. Any marketing costs for your harvest:

19. Transport costs for harvested timber:

20. Any other hidden costs not mentioned above:

Part III: Information on livelihoods in relation to timber farming

21. Main source of household income:

21. Do you think timber farming activity contribute to the following livelihood outcomes? Yes / No?:

a) More household income:

b) Increased wellbeing:

c) Reduced vulnerability:

d) Improved food security:

e) More sustainable use of natural resource base:

22. Have you ever received any training in timber farming? Yes / No:

If Yes, describe:

23. Do you get market information? Yes / No:

If yes, how? 1 = friends [], 2 = from media [], 3 = direct visit to the markets [], 4 = others []

Specify:

24. Who sets the price for your timber? 1 = buyer [], 2 = seller (producer) [], 3 = others [] Specify:

.....

25. Do you know the current price per ton for your timber? Yes / No:

If Yes, how much:

26. What factors are considered in setting up the price of your timber? (Please rank):

- a) Production costs [],
- b) Transportation costs [],
- c) Weight [],
- d) Size [],
- e) Seasonality [],
- f) Others (specify):

27. Are you satisfied with the current prices for your timber? Yes /No:

If no, why? 1 = price is low [], 2 = operational costs are very high [], 3 = buyers offer prices which are in their favour [], 4 = others (specify).....

28. How would you describe the road network to your timber plantation and to your village? 1= Poor [], 2=Good [].

Part IV: Information on forestry value chain

29. Which specific role have you played within the forestry value chain, other than farming timber and selling?

30. How is the relationship between yourself and other the value chain actors, i.e. nurseries, harvesting contractors, logistics, etc..? 1 strong [], 2 = weak [], 3 = none []

Describe it:

31. Who do you perceive as having greater power in the forestry value chain?

1 = nurseries [], 2 = growers [], 3 = contractors [] 4 = buyers [] 5 = associations

32. How much do you trust other stakeholders in the forestry value chain?

1 = very much [], 2 = much [], 3 = little []

33. How do you assess the current performance of the forestry value chain?

1 = best [], 2 = good [], 3 = worse [], 4 = worst []

34. Do you think the forestry value chain require to be improved? Yes / No? why and how?
.....

35. As a forestry / timber grower, are you affiliated to any association or voluntary organisation? Yes / No?

If Yes, provide name:

36. If yes, to question 33 above, what are the benefits of the association/organization?
.....

37. As a small-scale timber grower, what have been your main challenges?
.....

**APPENDIX E: QUESTIONNAIRE FOR TIMBER HARVESTING CONTRACTORS
IN KWANGWANASE**

Questionnaire Number:

Date of interview:

Village:

Part I: Personal information of participant

1. Name of the participant (optional):

2. Age:

3. Gender (M / F):

4. Education Level: Primary school / Secondary school / Tertiary / no formal education

5. Number of people in the household:

Part II: Information on timber harvesting activity

6. Number of years as a harvesting contractor:

7. Which villages do you operate in:

8. Average Revenue / Income per month (in Rands):

9. Average Operating costs per month (in Rands):

10. Who are your clients:

11. Do you receive any support from the Department of Forestry / Agriculture? Yes / No?

If yes, what type:

12. Any marketing costs for your timber harvesting business:

13. Any other hidden costs not mentioned above:

Part III: Information on livelihoods in relation to timber harvesting activity

14. Main source of household income:

15. Do you think timber harvesting activity contribute to the following livelihood outcomes? Yes / No?:

a) More household income:

- b) Increased wellbeing:
- c) Reduced vulnerability:
- d) Improved food security:
- e) More sustainable use of natural resource base:

16. Have you ever received any training in timber harvesting? Yes / No:

If Yes, describe:

17. Do you get market information? Yes / No:

If yes, how? 1 = friends [], 2 = from media [], 3 = direct visit to the markets [], 4 = others []

Specify:

18. Who sets the price for your harvesting business? 1 = timber buyers [], 2 = sellers (producers) [], 3 = others [] Specify:

19. What factors are considered in setting up the price for your business? (Please rank):

- a) Operational costs [],
- b) Technical know-how [],
- c) Type of timber [],
- d) Terrain [],
- e) Seasonality [],
- f) Others (specify):

20. Are you satisfied with the current prices for your operation? Yes /No:

If no, why? 1 = price is low [], 2 = operational costs are very high [], 3 = buyers offer prices which are in their favour [], 4 = sellers offer prices which are in their favour [], 5 = others (specify).....

21. How would you describe the road network around your operational area and to your village? 1= Poor [], 2=Good [].

Part IV: Information on forestry value chain

22. Which specific role have you played within the forestry value chain, other than being a timber harvesting contractor?

25. How is the relationship between yourself and other the value chain actors, i.e. nurseries, timber growers, logistics, etc..? 1 strong [], 2 = weak [], 3 = none []

Describe it:

26. Who do you perceive as having greater power in the forestry value chain?

1 = nurseries [], 2 = growers [], 3 = contractors [] 4 = buyers 5 = logistics [] 6 = associations

27. How much do you trust other stakeholders in the forestry value chain?

1 = very much [], 2 = much [], 3 = little []

28. How do you assess the current performance of the forestry value chain?

1 = best [], 2 = good [], 3 = worse [], 4 = worst []

29. Do you think the forestry value chain require to be improved? Yes / No? why and how?

.....

30. As a timber harvesting contractor, are you affiliated to any association or voluntary organisation?

Yes / No?

If Yes, provide name:

31. If yes, to question 30 above, what are the benefits of the association/organization?

.....

32. As a timber harvesting contractor, what have been your main challenges?

.....

33. Do you participate in other income-generating value chain activities, other than timber harvesting contractor? Yes / No:

If Yes, describe:

34. How would you describe the competition amongst the timber harvesting contractors in KwaNgwanase?

.....

**APPENDIX F: QUESTIONNAIRE FOR TIMBER SEEDLING GROWERS IN
KWANGWANASE**

Questionnaire Number:

Date of interview:

Village:

Part I: Personal information of participant

1. Name of the participant (optional):

2. Age:

3. Gender (M / F):

4. Education Level: Primary school / Secondary school / Tertiary / no formal education

5. Number of people in the household:

Part II: Information on seedlings production

6. Number of years as a seedling grower:

7. Type of timber seedlings propagated:

8. Do you own the land where your nursery is built? Yes / No?:

If Yes, do you have a title deed?

If No, who is the owner and under which conditions do you use the land?

.....

9. Average capital outlay for the nursery (in Rands):

10. Selling price per batch of 128 seedlings (in Rands):

11. Revenue / Income per month (in Rands):

12. Operating costs per month (in Rands):

13. Where do you sell your seedlings:

14. Do you receive any support from the Department of Forestry / Agriculture? Yes / No?

If yes, what type:

15. Any marketing costs for your seedlings:

16. Any other hidden costs not mentioned above:

Part III: Information on livelihoods in relation to seedling nurseries

17. Main source of household income:

18. Do you think seedlings production activity contribute to the following livelihood outcomes? Yes / No?:

a) More household income:

b) Increased wellbeing:

c) Reduced vulnerability:

d) Improved food security:

e) More sustainable use of natural resource base:

18. Have you ever received any training in seedling production? Yes / No:

If Yes, describe:

19. Do you get market information? Yes / No:

If yes, how? 1 = friends [], 2 = from media [], 3 = direct visit to the markets [], 4 = others []

Specify:

20. Who sets the price for your seedlings? 1 = buyer [], 2 = seller (producer) [], 3 = others [] Specify:

.....

21. What factors are considered in setting up the price of your seedlings? (Please rank):

a) Production costs [],

b) Technical know-how [],

c) Type [],

d) Size [],

e) Seasonality [],

f) Others (specify):

22. Are you satisfied with the current prices for your seedlings? Yes /No:

If no, why? 1 = price is low [], 2 = operational costs are very high [], 3 = buyers offer prices which are in their favour [], 4 = others (specify).....

23. How would you describe the road network to your seedling nursery and to your village? 1= Poor [], 2=Good [].

Part IV: Information on forestry value chain

24. Which specific role have you played within the forestry value chain, other than propagating and selling timber seedlings?
.....

25. How is the relationship between yourself and other the value chain actors, i.e. nurseries, harvesting contractors, logistics, etc..? 1 strong [], 2 = weak [], 3 = none []

Describe it:

26. Who do you perceive as having greater power in the forestry value chain?

1 = nurseries [], 2 = growers [], 3 = contractors [] 4 = buyers [] 5 = associations

27. How much do you trust other stakeholders in the forestry value chain?

1 = very much [], 2 = much [], 3 = little []

28. How do you assess the current performance of the forestry value chain?

1 = best [], 2 = good [], 3 = worse [], 4 = worst []

29. Do you think the forestry value chain require to be improved? Yes / No? why and how?
.....

30. As a seedling producer, are you affiliated to any association or voluntary organisation? Yes / No?

If Yes, provide name:

31. If yes, to question 30 above, what are the benefits of the association/organization?
.....

32. As a timber seedling producer, what have been your main challenges?
.....

33. Do you participate in other income-generating value chain activities, other than propagating and selling timber seedlings? Yes / No:

If Yes, describe:

34. How would you describe the competition amongst the seedling producers in KwaNgwanase?

.....

APPENDIX G: TURNITIN REPORT

GSOB8D3 Final Dissertation - 205500830 - N Nsele -
30.06.2021

ORIGINALITY REPORT

3% SIMILARITY INDEX	3% INTERNET SOURCES	1% PUBLICATIONS	0% STUDENT PAPERS
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