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INSTITUTE OF LIFE LONG LEARNING AND DEVELOPMENT STUDIES

DEVELOPING A MODEL FOR SUSTAINABLE AFFORESTATION AS AN ALTERNATIVE LAND USE FOR ECONOMIC DEVELOPEMENT IN ZIMBABWE.

BY

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DEDICATION

To God is all the glory! I am forever indebted to my wife Memory, and my children; Tendai, Tina, Tanya, Garikai, Macdonald, and Daniel for their inspiration, sacrifice, and cooperation, for urging me on throughout my studies, many thanks to my mum and dad for their divine appointment to deliver me onto the earth.

STATEMENT OF SUBMISSION

I declare that:

TOWARDS A MODEL FOR SUSTAINABLE AFFORESTATION AS AN ALTERNATIVE LAND USE FOR ECONOMIC DEVELOPMENT IN ZIMBABWE.

is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

____ 20/08/2023_____

SIGNATURE DATE

Mr. Isaac Mhaka

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ABSTRACT

Amidst the continued failure of agricultural production systems to meet policy targets in developing countries, there has been a gradual paradigm shift towards afforestation. As a result, several countries across the globe have actively sought to promote afforestation as an alternative land use for economic development through state policy and support. However, policy-related challenges to markets, funding, extension service provision, and capacity building among others have remained hampering afforestation development. Current institutional and management regimes for afforestation have failed to meet policy expectations. A close analysis of the focus of many studies conducted to date on afforestation as an alternative land use option reveals the existence of a gap in the model for sustainable afforestation. As a result, afforestation has failed to proffer anticipated gains resulting in subsequent low uptake of afforestation as an alternative land use for economic development. Therefore, this study sought to develop a model for sustainable afforestation as an alternative land-use for economic development in Zimbabwe. The study was guided by five specific objectives which were to establish the state of afforestation in Mashonaland West Province, assess the extent of land utilisation in Mashonaland West, explore the perceptions of stakeholders towards afforestation as sustainable alternative land use for economic development, explore the institutional frameworks that may be adopted to promote sustainable afforestation as alternative land use for development in Mashonaland West and to develop a model for sustainable afforestation as alternative land use for economic development in Zimbabwe. To achieve a holistic approach to the development of a model, this study borrowed heavily from insights from a variety of theories, such as the Theory of Structuration, Land Rent Theory, The Stakeholder Theory, Sustainability of Livelihoods Framework, Forest Transition Theory, and The Expectancy Theory. The theory of Structuration provided the overarching and dominant insights on most of the facets of this study. The study adopted the qualitative research methodology and used purposive sampling to select 30 respondents from among the Ministry of Lands, AGRITEX Officers, Environmental Management Authority officials, Forestry Commission, TIMB, and local farmers in the province. The data for this study were generated using semi-structured interviews, journal reflections and coincidental field day discussions and filed.

The study had multiple findings. In the context of the state of afforestation in Mashonaland West Province, study findings highlighted that the land under afforestation is insignificant, only

accounting for a mere 0.00095% of the lost forest cover and 0.61 of the nation's tree cover gain which is approximately 48065.6 hectares over the period 2001-2021. Afforestation is being taken as a support venture not as the key land use amongst farming communities. The study findings highlighted that there is massive land underutilization in the province as a result of the limited adoption of afforestation initiatives. Generally, in the context of overall forest cover, the conversion of land from agriculture to forest is unusual amongst local farmers. Further, this translates into a lack of economic knowledge of the returns from afforestation and a lack of management expertise to appropriate management. Other challenges noted include among others lack of government support and inadequate extension service amongst a host of other challenges. Further, the breadth of the varieties of tree species under afforestation in the province is narrow, with a bias towards the eucalyptus, favoured for its early maturity as compared to other varieties.

The general perception amongst stakeholders towards afforestation as a sustainable alternative land use was scepticism. Issues of concern amongst the stakeholders included the fact that afforestation comes with huge opportunity cost, and they regarded it as a preserve for farmers with huge sparse of land. Other issues of concern noted include the need for huge capital injection, inadequate government support to the initiative as compared to other forms of agriculture, no motivation given to farmers who take up the initiative as other crop farming options like food crops do, and the long period taken to get returns from the venture. The economic value of supporting and regulating such initiatives has not been well-captured in the market and therefore has remained undervalued. Such a lack of knowledge and an apparent lack of economic value pose a challenge for determining land use allocation and modelling land use change.

Regarding institutional frameworks that may be adopted to promote sustainable afforestation, the study found that strategies to optimise optimize afforestation uptake should be informed by research and development. Other strategies that may be adopted to promote afforestation include having a precise policy, and value addition among other strategies. These strategies should inform the model of sustainable afforestation as an alternative land use for economic development in Zimbabwe. Noteworthy is that on stakeholder views on best practices, the study captured a situation in which not all stakeholders were consulted in the design of the intervention program and not much was done by the authorities to reflect on and consider best practices as

they were envisaged by the stakeholders in their entirety. A sustainable afforestation model is therefore based on an ethical economic model, which is binding on the entire populace of stakeholders and its principles are; multi-stakeholder engagement, developing key enablers and pro-activeness in addressing challenges inhibiting the efficient operations in afforestation. However, there is a need to replicate a similar study to test the model in a different geographical area before results can be generalised.

Key terms: Afforestation, sustainability, sustainable afforestation, and model

TABLE OF CONTENTS

CONTENTS PAGE
DEDICATION i
STATEMENT OF SUBMISSION ii
ACKNOWLEDGEMENTS iii
ABSTRACT v
LIST OF FIGURES AND TABLES xiv
ABBREVIATIONS AND ACRONYMS xv
CHAPTER ONE 1
THE PROBLEM AND ITS SETTING 1
1.0 Introduction 1
1.1 Background to the study 2
1.2 Problem statement 10
1.3 Main research objective 11
1.3.1 Specific objectives 11
1.4 Main research question 11
1.4.1 Specific Research Questions 11
1.5 Significance of the study 12
1.6 Study assumptions 13
1.7 Delimitation of the study 13
1.7.1 Conceptually 13
1.7.2 Geographically 13
1.7.3 Methodologically 14
1.7.5 Philosophical Delimitation 14
1.7.6 Theoretical delimitation: 14
1.7.7 Respondents for the study 14
1.8 Limitations and mitigations 14
1.9 Conceptual framework 15
1.10 Organisation of thesis 20
1.10.1 Chapter one 20
1.10.2 Chapter two 20
1.10.3 Chapter Three 20
1.10.4 Chapter Four 21

1.10.5 Chapter Five-Eight 21
1.10.6 Chapter Nine 21
1.11 Chapter summary 21
CHAPTER TWO 22
LITERATURE REVIEW 22
2.0 Introduction 22
2.1 Conceptual issues 23
2.1.1 Institutionalisation 23
2.1.2 Management 24
2.1.3 Afforestation 24
2.1.4 Alternative land use 25
2.1.5 Economic development 25
2.1 State of global forests 27
2.2 State of Africa and its forests 29
2.2.1 State of forests in Zimbabwe 34
2.3 Factors motivating land use change 39
2.4 Afforestation projects in Zimbabwe 40
2.4.1 Afforestation initiatives in Zimbabwe 40
2.5 Forest governance and sustainable forest management 42
2.4.1 Institutionalization of afforestation in Zimbabwe 42
2.5.1 International and regional frameworks governing sustainable forest management in Zimbabwe 42
2.5.2 National framework of sustainable forest management 42
2.6 Afforestation and economic development. 44
2.6.1 Productive functions of forest resources 45
2.6.2 Protective functions of forest resources 46
2.6.3 Socio-economic functions 46
2.7 Institutional frameworks that may be adopted to promote sustainable afforestation as an alternative land use for development 47
2.7.1 Public-private partnerships 47
2.7.2 Strengthening Institutional Frameworks 49
2.7.3 Enhancing capacity building 50
2.7.4 Developing market incentives 51
2.7.5 Fostering multi-stakeholder engagement 52

2.8 Model for effective institutionalisation and management of afforestation 54
2.9 The research gap 55
2.10 Chapter summary 56
CHAPTER THREE 58
THEORETICAL FRAMEWORK 58
3.0 Introduction 58
3.1 Theory of structuration (Giddens, Antony, 1984) 59
3.1.1 Application of the theory 62
3.2 Stakeholder theory (Edward Freeman, 1984) 63
3.3 The expectancy theory (Victor, H. Vroom, 1964) 70
3.4 Forest transition theory (A.S. Mather) 71
3.5 Land rent theory 73
3.6 Sustainable livelihood framework 75
3.7 Chapter summary 81
CHAPTER FOUR 82
RESEARCH METHODOLOGY 82
4.0 Introduction 82
4.1 Ontology 82
4.2 Research philosophy 82
4.3 Methodological approach 83
4.4 Research design 84
4.5 Sampling 85
4.5.1 Study area 85
4.5.2 Study Population 87
4.5.2 Sampling Procedure 87
4.5.3.1 Sample Frame 87
4.5.3 Sample Size 88
4.6 Data sources 88
4.7 Data collection 89
4.7.1 Data Collection Techniques 89
4.8 Data organization technique 90
4.8.1 Presentation of Data 90
4.8.2 Framework for Data Analysis 90

4.8.3 Data Analysis Strategy 91
3.8.4 Data analysis 92
4.9 Ethical research 93
4.10 Validity and reliability 94
4.10.1 Credibility 94
4.10.2 Transferability 94
4.10.3 Dependability 95
4.10.4 Triangulation 95
4.11 Chapter summary 95
CHAPTER FIVE 96
ESTABLISHING THE STATE OF AFFORESTATION IN MASHONALAND WEST PROVINCE 96
5.0 Introduction 96
5.1 Demographic profiles of study respondents 96
5.1.1 Respondents' Sex 100
5.1.2 Level of education 102
5.1.3 Period of service 104
5.1.4 Respondent age range 106
5.2 Conceptualisation of terms 107
5.2.1 Afforestation 107
5.3 The state of afforestation in Mashonaland west province 108
5.3.1 Afforestation as an alternative land use 108
5.3.2 Breadth of tree species being planted 111
5.3.3 Hectarage under afforestation 112
5.3.4 Number of farmers who are into afforestation 113
5.3.5 State of knowledge about afforestation 115
5.3.6 Funding 117
5.3.7 Types of land tenure 120
5.3.8 Limited investment in afforestation 121
5.3.9 Inadequacy of afforestation extension services 124
5.3.10 Estimated value of afforestation project after maturation 125
5.3.11 Average time taken by species to mature 126
5.3.12 Farm Size 128
5.4 Chapter Summary 129

CHAPTER SIX 131
6.0 Introduction 131
6.1Stakeholders' concerns about afforestation as an alternative sustainable land use in Mashonaland west 131
6.1.1 Outdated cultural attitudes towards afforestation 131
6.1.2 Aversion to long-term investment in afforestation 132
6.1.3 A preserve for farmers with large tracts of land 133
6.1.4 Required significant capital investment 135
6.1.5 General misconceptions about certain afforestation plants and their impacts on the environment 136
6.1.6 Opportunity cost of afforestation 137
6.1.7 Inadequate government support for afforestation 137
6.1.8 Limited knowledge of the economic benefits of afforestation 138
6.1.9 Comparability of afforestation extension services to crop and livestock farming 139
6.1.11 Social activities that could be organized around the afforestation industry 140
6.1.12 Ecotourism issues 141
6.1.13 Downstream economic benefits of afforestation 142
6.1.14 Environmental benefits of afforestation 143
6.1.14.1 Creation of micro-climates and regularization of rainfall distribution 143
6.1.14.4 Leads to improved air quality 145
6.1.14.5 Retards land degradation and improves watershed 146
6.2 Chapter summary 147
CHAPTER SEVEN 149
INSTITUTIONAL FRAMEWORK THAT MAY BE ADOPTED TO PROMOTE SUSTAINABLE AFFORESTATION AS AN ALTERNATIVE LAND USE FOR DEVELOPMENT IN MASHONALAND WEST 149
7.0 Introduction 149
7.1 Farmers' suggestions on improving existing organizations, laws, or policies to ensure the adoption of afforestation as a sustainable land use option for economic development 149
7.1.1 Improving research and development 149
7.1.2 Precise regulatory and policy framework reforms 151
7.1.3 Improved afforestation extension services 153
7.1.4 Education and training 154
7.1.5 Improved funding for afforestors and afforestation organizations 156
7.1.6 Enhanced market access 157

7.1.7 Engaging other organizations 157
7.1.8 Incentivizing afforestation 159
7.1.9 Value addition 160
7.1.10 Guaranteeing land ownership rights 161
CHAPTER EIGHT MODEL FOR SUSTAINABLE AFFORESTATION AS AN ALTERNATIVE LAND USE FOR ECONOMIC DEVELOPMENT IN ZIMBABWE 164
8.0 Introduction 164
8.1 Objective one: To establish the state of afforestation in Mashonaland west province 164
8.2 Objective two: To explore the perceptions of stakeholders towards afforestation as a sustainable alternative land use for economic development 167
8.3 Objective three: Exploring institutional frameworks for promoting sustainable afforestation as an alternative land use for economic development in mashonaland west. 170
8.4 Sustainable afforestation model 173
Framework for Implementing Sustainable Afforestation as an Alternative Land-Use Option for Economic Development 175
8.4.1 Introduction 175
8.4.2 Explanation of the sustainable afforestation frameworks 177
8.6 Chapter summary 186
CHAPTER 9 187
DISCUSSION AND FINDINGS, CONCLUSION, AND IMPLICATIONS 187
9.0. Introduction 187
9.1 Summary of the study 187
9.2 Summary of findings 189
9.3 Conclusion 192
9.4 Recommendations 193
9.4.1 Implications for policy 193
9.4.2 Implications for practice 194
9.4.3 Implications for research 194
9.4.4 Implications for theory 194
REFERENCES 197
LIST OF APPENDICES 215
Annexture 1-Interview guide for key informants 215
Annexture 2: Interview guide for potential afforestors/farmers 218
Appendice 3: Interview guide for afforestors 220

LIST OF FIGURES AND TABLES

FIGURE: 1.1 CONCEPTUAL FRAMEOWRK **25**

FIGURE 2.2 ORGANIZATIONAL FRAMEWORK **26**

Table 3.1 SAMPLING FRAME **80**

FIGURE 3.1 DATA ANALYSIS FRAMEWORK **84**

FIGURE 3.2 QUALITATIVE DATA ANALYSIS **85**

FIGURE 3.3 BRAUN AND CLARKE STAGES OF THEMATIC ANALYSIS **85**

TABLE 5.1 PARTICIPANT PROFILES **90**

FIGURE 5.1 RESPONDENT SEX DISTRIBUTION **94**

FIGURE 5.2EDUCATIONAL QUALIFICATIONS OF THE RESPONDENTS **96**

FIGURE 5.3 YEARS OF EXPERIENCE IN AFFORESTATION **97**

FIGURE 5.4 YEARS OF EXPERIENCE OF FARMERS IN AFFORESTATION **98**

FIGURE 5.5 AGE OF RESPONDENTS **99**

TABLE 5.1 SIZE OF WOODLOTS **104**

FIGURE 6.1 MASHONALAND WEST MAP **136**

FIGURE 9.1 SUSTAINABLE AFFORESTATION MODEL **239**

ABBREVIATIONS AND ACRONYMS

EO	Extension Officer
ZimStats	Zimbabwe Statistics
TMB	Tobacco Marketing Board
EMA	Environmental Management Agency

CHAPTER ONE

THE PROBLEM AND ITS SETTING

1.0 Introduction

The sustainability of plantation forestry has become an issue of wide interest and concern. In times gone by, patterns of forest land use reflect the cumulative effect of centuries of individual or small group decisions about where to hunt, where to settle, what land to clear for agriculture, and what land to preserve for religious or other purposes (Ullah et al., 2023; Minang et al., 2018). In recent years, a host of countries across the globe have actively sought to promote afforestation as an alternative land use for economic development through state policy and support (see Ofori et al., 2020; Lovell et al., 2017; Minang et al., 2018; Dupraz et al., 2019). However, the fly in the ointment has been the successive failure of these initiatives to achieve set policy targets (Luoranen et al., 2022; Ullah et al., 2022; Arimi&Omoare, 2021; Eurostat, 2013; Ryan, 2016). Past and present institutions of management have failed to provide lasting solutions in the management of afforestation as an alternative land use for economic development (see Romanova et al., 2022; Ullah et al., 2023; Ofori et al., 2020).

However, despite the continued failure of many of these afforestation initiatives (Eurostat, 2013; Ryan, 2016; Romanova et al., 2022; Ullah et al., 2023; Ofori et al., 2020; Dupraz et al., 2019), it is noteworthy that the world at large still regards afforestation as a viable land use option for economic development. To date, a plethora of studies on afforestation have been done (Lovell et al., 2017; Tian, Sohngen, Baker, Ohrel, & Fawcett, 2018; Dupraz et al., 2019), however, none of the studies has seen it fit to focus on the development of a model for sustainable afforestation as an alternative land use option for economic development specifically in a developing economy like Zimbabwe. The effectiveness of existing institutions for the management of afforestation has been widely questioned since current institutions and management frameworks for afforestation have failed to achieve set policy targets (Romanova et al., 2022; Ullah et al., 2023; Lovell et al., 2017; Tian et al., 2018). As a result, the issue of intellectual curiosity in this study was to establish a model for sustainable afforestation as an alternative land use option for economic development in Zimbabwe.

1.1 Background to the study

Even though the current global focus is biased towards the promotion of afforestation as alternative land use (see Ofori et al., 2020; Ullar et al., 2021, 2022; Beyene et al., 2019), forests have always been an indispensable asset to most global societies since time immemorial (see Lovell et al., 2017; Tian et al., 2018; Minanget al., 2018; Dupraz et al., 2019). However, despite this global hype, current afforestation management frameworks seem to have failed to achieve set targets (see Luoranen et al., 2022; Ullah et al., 2022; Dupraz et al., 2019). In most of the regions, current frameworks for afforestation management seem to have failed as output has fallen well short of policy targets (see Ryan, 2016; Dupraz et al., 2019).

Empirical evidence from multiple studies shows that planting trees on farmlands maintains the domestication of woody species, increases household income, improves soil quality, and conserves biodiversity, among other benefits (Romanova et al., 2022). It also increases the availability of forest functions, such as carbon sequestration, soil property improvement, and biodiversity conservation (Amare &Darr, 2020; Koussihouèdé et al., 2020; Gosling et al., 2021). Further, afforestation is increasingly valued for its potential to enhance ecosystem services and is being actively promoted in many countries through state policy and support (Romanova et al., 2022; Ullah et al., 2023; Arimi&Omoare, 2021). Similar to many countries, Zimbabwe has sought to increase forest cover for some time (Nyikadzino, 2016; CIFOR, 2014; Gwaze &Marunda, 2014). However, economic incentivization has mostly been absent in most of these initiatives (Aquiilas et al., 2022; Ullar et al., 2023). The economic value of supporting and regulating such initiatives has not been well-captured in the market and therefore has remained undervalued (Kim & Kim, 2021; Ofori et al., 2020; Lawson et al., 2014). Such a lack of knowledge and an apparent lack of economic value pose a challenge for determining land use allocation and modelling land use change. In the past, however, trial and error or rough rules of thumb were adequate means of determining which land to use and how (Luoranen et al., 2022; Ullar et al., 2022; FAO, 2015).

Existing forests have continued to decline posing further challenges to community livelihoods. Forests underpin key sectors of many African countries, including energy, forestry, agriculture, tourism, and water, and support the livelihoods of millions of people. Forests are crucial at a

continental scale for maintaining environmental quality and stability. They provide locally to globally important ecosystem services, such as the protection of water and soil resources, biodiversity conservation, and climate change adaptation and mitigation. Forests and trees help millions of farmers, pastoralists, and other forest-dependent people meet basic needs for income, food, and nutrition security, medicines, shelter, cooking, heating, timber and livestock fodder. Forests, therefore, are crucial for achieving the objectives of the African Union (AU) 2063 Agenda as well as the UN's Sustainable Development Goals including SDG1, SDG2, SDG 13, SDG15, SDG 14, and SDG 17.

Africa's wood industries comprise a high proportion of informal and small-scale operations. In Ghana, for example, the formal forest sector employs 50 000 workers and the informal sector employs 260 000. The country's informal sawmill sector provides an estimated 97,000 jobs and earns about USD 18 million annually, mostly in undeclared revenues. The charcoal industry in the United Republic of Tanzania generates an estimated USD 650 million per year and employs about 2 million people. In Rwanda, the wood-energy sector is reported to contribute about 5 percent of the country's gross domestic product and the timber sector contributes about 1.3 percent. In Cameroon, sawmills employ about 45,000 people in the informal sector (about triple the number employed in the formal sector) (FAO, 2018).

Forests and trees in Africa offer considerable support to agriculture, serving, for example, as reservoirs (paradoxically) of land for the expansion of agriculture and providing supporting ecosystem services such as pollination, soil stabilization, water retention, and climate moderation. There is increasing recognition of the importance of the role of forests in protecting watersheds and thereby increasing food security in Africa: land and water management are key pillars of the continent's agricultural strategy and forests contribute to sustainable land and water management. Most agriculture in Africa is rain-fed and therefore highly vulnerable to climate variability (Nyikadzino, 2016; Matsvange et al., 2016). When crops fail, many rural communities become highly reliant on forests and trees for wild foods such as fruits, tubers, fish, bushmeat, edible insects, beeswax, and honey. Forests are also sources of traditional medicines and income (Lovell et al., 2017; Dupraz et al., 2019).

Wood fuel (firewood and charcoal) dominates the supply of energy in Africa, comprising up to 91 percent of total wood use. It is estimated that, in 2013, Africa produced 649 million m3 of

wood fuel, which was 35 percent of global production in that year. Africa's per-capita consumption of wood fuel is estimated at 0.585 m3 (FAO 2015a), more than twice the global average (0.259 m3). The number of people in Africa dependent on charcoal is projected to increase from 583 million in 2000 to 823 million in 2030 (Gondo, 2010). In East, West and Southern Africa, more than 90 percent of rural people depend on wood as their primary energy source (UNEP and NESDA, 2004; NEA, 2002). There is an urgent need to develop legal and sustainable wood fuel production and marketing systems in Africa because it is unlikely that effective substitutes (i.e. that are cheap, affordable and sufficient) will be widely available in many countries in the short to medium term (Chipeta and Kowero, 2015).

Much of the trade of non-wood forest products (NWFPs) is at the local community level, although certain NWFPs, such as gum arabic, shea butter, baobab, marula, and wild nuts are traded internationally. NWFP enterprises tend to be very small, informal, and disorganized and are therefore generally not captured in official statistics. Nevertheless, they are gaining prominence in Africa and making important contributions to socio-economic development in many countries. NWFPs act as safety nets in times of food insecurity and provide income opportunities for otherwise marginalized people. In South Africa, 27 million people benefit from medicinal plants, wild fruit, and other forest-based foods, and 20 million tonnes of medicinal plants are harvested annually in natural forests and traded (DAFF, 2015). The Sudan is the largest producer of gums and resins worldwide, meeting about 80 percent of global demand. The production of shea fruit, which is widely consumed by local people and also sold in local and urban markets, in the woodlands, dry savannahs, and forests of West Africa involves 20 000 women farmers.

The kernel contains 31–62 percent edible fat (Nikiema & Umali, 2007) and is used to produce shea butter, which is traded internationally. The marketing of medicinal plants is an important activity in many countries in Africa, including South Africa, Morocco (valued at USD 12.8 million per year in each of these two countries), Cameroon (USD 2.9 million per year), and Egypt (USD 12.4 million per year). Algeria produces about 6,000 tonnes of cork each year from 460,000 ha of forest. Tunisia exports 10,000 tonnes of pine seeds annually, and Guinea produces more than 100,000 tonnes of bush meat. The woodcarving industry is important in eastern and

southern Africa. In Kenya, for example, the industry employs about 80, 000 people and generates about USD 20 million per year (Choge, Cunningham, and Ellery, 2005).

Africa's forest sector is, however, faced with many challenges that constrain its capacity to provide meaningful and sustainable ecosystem services including contributing to socio-economic development. Africa faces many challenges to ensure adequate provision of high-quality forest products and ecosystem services. These can be classified as economic, social, and cultural; policy and governance; institutional; technical; and environmental. The ability of the forest sector to contribute to green economy objectives in Africa is threatened by changes in the forest resource base, the result of pressures within the sector and from other sectors as well as market, policy, and governance failures. A key issue is the unclear and overlapping rights to forest resources. Most of the forests in Africa are formally under state ownership with relatively small areas of private ownership and formally recognised community management, the latter corresponding to barely one percent of the total forest area in Sub-Saharan Africa in 2010 although this had increased from previous assessments (FAO, 2010a). Informal rights associated with traditional systems of governance are rarely given recognition by government authorities. As a result, local communities often have little incentive to invest in forests, and if they harvest forest resources are considered to be doing so illegally. The consequences have been seen in the decline of forestry.

Forest decline, in this study, policy is interpreted as deforestation, forest degradation, or a combination of both and is a complex socio-economic, cultural, and political event (Solomon, 2018). Forests are an essential component of this fabric and could be considered the pillars of many African countries' economies (Amare & Darr, 2020), but their ability to provide these services and benefits to society on a sustained basis has been continuously threatened by the environmental crisis characterized by massive forest destruction and degradation. The continent's forest area declined by 2.8 million ha per year between 2010 and 2015 (FAO, 2016a), a much higher rate than in anywhere else in the world. Ghana, for example lost 135,000 ha per year or 1.99 per cent while Kenya's deforestation rate was less than average at 0.35 per cent. Much of the loss of forest cover to date in Africa can be attributed as much to pressures from competing land uses, agriculture in particular, as to the wood removals associated with the demand for industrial round wood and wood fuel, although they often occur together or in

sequence as logging and the expansion of infrastructure facilitates access (Geist and Lambin, 2002; Chomitz et al., 2006). Findings in the Global Forest Watch (2022) show that from 2001 to 2020, South Africa lost 1.48 million hectares of tree cover, equivalent to a 25% decrease in tree cover since 2000.

The continent's forestry sector challenges include poor forest and land-use policies and ineffective implementation of good policies; unsustainable forest management; competition for land from the agriculture, mining, livestock, and energy sectors and settlements; disputes over land; and general political conflict and instability. Moreover, the forest sector is given low priority in national plans and resource allocations and is negatively affected by many governance issues. Only a handful of countries possess organized private forest sectors capable of stimulating sectoral growth. Furthermore, the adverse effects of climate change threaten to further undermine forests and forestry in Africa.

If forest loss continues at the same rate in Africa as in the last ten years (0.5 per cent per year) this will result in a loss of 64 million ha of forest by 2030 and 122 million ha by 2050. Estimates in the literature are more pessimistic, predicting a large increase in the deforestation rate. The Living Forests report (WWF, 2012) predicts that Africa will lose 112 million ha of forest cover by 2030 implying a deforestation rate of 0.9 per cent per year. Hilderink et al. (2012) predict a 29 per cent loss of forest by 2030, implying deforestation of 195 million ha and a yearly rate of 1.69 per cent (FAO, 2018).

Africa's forests are fast diminishing to the detriment of climate, and biodiversity, and millions of people of dependent on forest resources for their well-being (Romanova et al., 2022; Rosati et al., 2021; Karimeh, 2011). The majority of people in Africa depend on forests for their livelihoods, with fuel wood accounting for about 70% of primary energy sources for households (Ebrahim & Weng, 2016). With large populations relying on forests for survival, A/R programs are crucial for managing forests (World Bank, 2021). As a result of these growing challenges, sustainable afforestation has been hailed as the missing link to promoting economic development, particularly amid climate change-induced droughts that have affected crop production.

There have been numerous initiatives to expand the area of planted forests while aiming for high environmental and social performance. Most countries in Southern Africa have made efforts to promote afforestation as a stimulant for economic development especially for rural communities. Rural development and community beneficiaries' autonomous access to markets for timber or wood products remains a difficulty in South Africa, despite the government and forestry industry's adoption of forest-based land reform partnership governance models (Tshidzumba et al., 2022). Over many years, the South African forestry industry has been vital to the nation's economic expansion and rural development (Godsmark, 2017). According to other studies (Ofoegbu, 2014; Tshidzumba et al., 2018a), the forestry sector offered employment opportunities as well as the possibility of earning money through forest contracting, annual rental fees from lease agreements, and stumpage fees (Makhathini, 2010; Chamberlain &Anseeuw, 2017).

In South Africa, the company, Mondi, has employed several approaches to ensure local communities benefit, often in combination. For example in Siyaqhubeka forests (SQF), Mondi is in a joint venture with government agencies and two community trusts, one representing communities that surround the plantations, the other local out growers, and has paid dividends to these shareholders (Elson, 2012). But it also supports communities in setting up their own businesses in the tree production and forest value chain, as well as community social investment initiatives (Godsmar, 2014). It has not been without criticism though for example that the social investment initiatives benefit the better qualified, locking out the poorer and less-skilled (Ojwang, 2009).

Some initiatives in Kenya involving community groups have shown some success in planting trees for charcoal production. In Rarieda District in Siaya County, the Youth-to-Youth Action Group (YYAG) now part of RariedaAgro-Forestry Development Initiative Programme (RAFDIP), an umbrella organisation of community self-help groups, teamed up with Thuiya Enterprises Ltd in 2002 to mobilise farmers to plant acacia trees on a six year rotation, and to encourage them to get into charcoal production. YYAG raised the seedlings and gave them on loan at zero interest to the farmers. The loan would be repaid when the wood or charcoal was purchased by Thuiya Enterprises. Farmers were also given groundnuts and beans to intercrop with the acacia trees in the initial two years so that they could get some revenue while the trees were growing. From year 3, they were loaned a beehive for every 500 trees they planted, to be

repaid over three years with a portion of the honey produced. Government agencies and universities supported the initiative with provision of seedlings, as well as advice and training on tree growing and efficient production of charcoal.

Nonetheless, several studies revealed that the institutional design of the partnership (Davis & Lahiff, 2011; Tshidzuma et al., 2022) and the low socioeconomic standing of the community beneficiaries (Chamberlain and Anseeuw, 2017; Godsmark, 2010) were the main reasons why the majority of land reform programs in South Africa failed. The livelihood of community beneficiaries has either fully stagnated or developed slowly as a result of this trend (Hall, 2009).According to several authors (Chirwa et al., 2015; Chamberlain &Anseeuw, 2017; Tshidzumba et al., 2018a), elitism also contributes significantly to conflict and jeopardizes rural development. Tshidzumba et al. (2018a) provided evidence to bolster this claim by pointing out that the primary obstacle to the FBLR PPP governance models' lack of explicit benefit-sharing mechanisms is that they ultimately result in an unfair and unequal benefit accrual among community beneficiaries (Tshidzumba et al., 2018b).

Further, in the context of overall forest cover, the conversion of land from agriculture to forest is unusual in the global context (Ryan, 2016; Romanova et al., 2022; Ofori et al., 2020). The question of choosing some particular land use over another is a core problem for landowners and managers. Critical characteristics of this decision problem are the high initial costs of establishing the new land use, a certain degree of indivisibility and irreversibility in the decision, and a considerable amount of uncertainty related to the benefits expected to arise from the land uses in question.

Despite the lure of financial incentivisation from afforestation (see Ullar et al., 2023; Hull et al., 2016; Minang et al., 2018), the greater part of Zimbabwe’s land has remained idle. Issues of land use and sustainability have become topical phenomena as they affect the poor who heavily depend on natural resources. Many agricultural and development-oriented projects have paid scant attention to forestry or failed to implement forestry components. Many social forestry programs initiated to redress the problem of unproductive land in Zimbabwe have stumbled along and eventually faded away (FAO, 2019).Similar too many countries, Zimbabwe has sought to increase forest cover for some time (Nyikadzino, 2016; CIFOR, 2014; Gwaze &Marunda, 2014). Many afforestation programs initiated to address the problem of agriculturally

unproductive land have stumbled along and eventually faded away (Gwaze &Marunda, 2014; Marufu, 2014; Nyikadzino, 2016). The Whitsun Foundation Report 'Rural Afforestation Study' (1981) proposed a project as the First Stage in a national programme to deal with the shortage of wood in communal areas. The four-year pilot rural Afforestation Project which, with World Bank assistance, officially began in June 1983, despite these noble ideas, very little has come out of the project for one reason or another. The project has suffered a stillbirth, having faced a host of challenges.

The Ministry of Environment embarked on a five-year National Tree Planting Programme in the year 2015 with a view to increasing the country's forest cover and reduce deforestation. This programme involved the planting of 75 million trees nationwide covering a total area of 45 740 hectares over five years (Government of Zimbabwe, 2016). This translates to an annual tree planting rate of 15-30 million trees covering 9 148 hectares yet falling short of the 60 million trees that are lost annually through deforestation. By 2015, Zimbabwe's forest cover had declined by 36.6% from 22,164,000ha in 1990 (FAO, 2015). Zimbabwe's planted forest fell from 154,000ha in 1990 to only 87,000 in 2015 while other naturally regenerated forest fell from 21,209,000ha to 13,174,000ha over the same period (FAO, 2015). Timber Producers Federation (TPF) (2018a) revealed that the commercial forests further declined from 120,000ha to the current 69 066 ha. Depletion of forests in Zimbabwe is taking place at an alarming rate as the country lost 36.6% of its forest area between 1990 and 2015 (FAO, 2015). It is evident from the statistics presented above that tree-planting activities in Zimbabwe have been shrinking. From the above statistics, it can afforestation programs have continually failed and potential income from unproductive land has remained unrealized. In Zimbabwe, many afforestation programs initiated to address the problem of agriculturally unproductive land have stumbled along and eventually faded away (CIFOR, 2014; Gwaze &Marunda, 2014; Marufu, 2014; Nyikadzino, 2016).

Generally, the decline in afforestation has consequences for downstream industries such as timber processing (Beyene et al., 2019; Ofori et al., 2020; Wilson, 2016; Ryan, 2016). Though pockets of research are beginning to emerge, little has been done to interrogate the existing afforestation institutional management frameworks and the development of a new model for institutionalisation and management of afforestation as an alternative land use for economic

development in Zimbabwe. Globally, to date, a few studies on afforestation initiatives have been done notably in Ireland (see Dhubain, 2010; Upton, 2015; Ryan, 2016), the difference in spatial geographical setup requires the study of the same phenomenon in the Zimbabwean context. This generalised failure of afforestation as a viable land use option calls for an interrogation of the status quo in search of an appropriate institutional and management regime.

1.2 Problem statement

Despite a growing global focus on afforestation as an on-farm economic activity, afforestation adoption in Zimbabwe remains poor (Mudzonga, 2012; Chikodzi, 2018; Banda, 2020; World Bank, 2018). Zimbabwe has vast lands with potential for afforestation initiatives, however, most of these lands remain underutilised and untapped for afforestation initiatives. Only 5% of the total potential land for afforestation is under afforestation with estimates pointing out that the total land that could be afforested is in the range of 10 to 20 million hectares, (FAO Global Forest Resources Assessment, 2020). Many afforestation programs initiated to address the problem of agriculturally unproductive land have stumbled along and eventually faded away (Gwaze &Marunda, 2014; Marufu, 2014; Nyikadzino, 2016). Policy-related challenges to markets, funding, extension service provision, and capacity building among others have remained hampering afforestation development. Current institutional and management regimes for afforestation have failed to measure up to policy expectations (Romanova et al., 2022; Ullar et al., 2023; Ofori et al., 2020; Ryan, 2016; Lovell et al., 2017; Dupraz et al., 2019). A close analysis of the focus of many studies conducted to date on afforestation as an alternative land-use option (Ryan, 2016; Lovell et al., 2017; Tian et al., 2018; Dupraz et al., 2019) reveals the existence of a gap in the model for sustainable afforestation. Despite a rich array of models for both forestry and agronomy (Luedeling, 2016; Ryan, 2016), none has been able to achieve set policy targets (Romanova et al., 2022; Ullar et al., 2023; Lovell et al., 2017; Dupraz et al, 2019). As a result, afforestation has failed to proffer anticipated gains (see Beyene et al., 2019; Ullar et al., 2023; Wilson, 2016; Dupraz, 2019) resulting in subsequent low uptake of afforestation as an alternative land use for economic development (see Wilson, 2016; Ryan, 2016). As a result, afforestation continues to fail to deliver the anticipated gains (Romanaova et al., 2022; Ofori et al., 2020; Wilson, 2016; Dupraz, 2019). Using a qualitative research methodology, this study therefore sought to develop a model for sustainable afforestation as an alternative land use option

for economic development in Zimbabwe. The study findings besides extending the frontiers of knowledge and testing theory in terms of scope and veracity on sustainable afforestation, will also be used to craft informed policy on sustainable afforestation as a viable land use option.

1.3 Main research objective

To develop a model for sustainable afforestation as an alternative land use for development in Zimbabwe.

1.3.1 Specific objectives

This study sought to: -

1. Establish the state of afforestation in Mashonaland West Province.
2. Explore the perceptions of stakeholders towards afforestation as a sustainable alternative land use for economic development.
3. Explore the institutional frameworks that could be adopted to promote sustainable afforestation as an alternative land use for development in Mashonaland West.
4. Develop a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe.

1.4 Main research question

What model would be suitable for sustainable afforestation as an alternative land use option for economic development in Zimbabwe?

1.4.1 Specific Research Questions

The study was guided by the following specific research questions:

1. What is the state of afforestation in Mashonaland West Province?
2. What are the perceptions of stakeholders towards afforestation as a sustainable alternative land use option for economic development?
3. What institutional framework may be adopted to promote sustainable afforestation as an alternative land use option for economic development in Mashonaland West?
4. How can a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe be achieved?

1.5 Significance of the study

Additionally, contribution to theory building is the end goal of every scientific research. Hence this study, through a qualitative methodology was no exception. The study may have contributed to theory building modestly. Though perhaps not generated substantive acumens on the development of a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe, in the same ambit, findings of this research may serve as a source of inspiration to the undertaking of more rigorous field-based research on the development of a model for sustainable afforestation. In sum, the findings of the current study passed as pointers to an area requiring more research attention for the theory development on the development of a model for sustainable afforestation.

The study will also advance the frontiers of knowledge by contributing to the existing body of knowledge. The study will investigate the dynamics of sustainable afforestation in developing countries, Zimbabwe in particular with a main thrust of developing a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe, thus, it will contribute to literature on the said phenomenon. This research is the first empirical study in resource-constrained nations such as Zimbabwe to develop a model for sustainable afforestation as an alternative land use for economic development. Thus, it can be said that the study adds to the academic literature on afforestation, providing case studies, data, and models that can be used for further research and comparison with other regions or countries.

Even though a host of studies on afforestation have been conducted to date (Romanova et al., 2022; Ullar et al., 2023; Lovell et al., 2017; Tian et al., 2018; Dupraz et al., 2019), a model for sustainable afforestation has remained elusive. Existing, institutional and management regimes for afforestation have failed to measure up to policy expectations (see Beyene et al., 2019; Ullar et al., 2023; Amare & Darr, 2020; Ofori et al., 2020). However, despite these continued failures of afforestation to measure up to policy expectations, what is curious is that no study has seen it worthy of interrogating the institutionalisation of afforestation. Given the fact that afforestation is still considered a viable land-use option for economic development, this research is timely in that it aims to provide valuable insights for policymakers. The study findings would inform and enable policymakers to adopt appropriate policies. The development of a sustainable afforestation framework will be a clarion call to land use planners to take appropriate action in

the planning and utilisation of underutilised land, especially in Zimbabwe. Further, the study is necessary to bring theory and practice together in finding solutions to current challenges affecting developing nations like Zimbabwe as they endeavour to economically exploit underutilised land for economic development.

1.6 Study assumptions

The main thrust of a qualitative study does not necessarily lie in proving or disapproving a hypothesis or assumptions but in gaining an understanding of the concept under study (Chinyere & Eze, 2023). Study assumptions in qualitative studies are used to validate or give the study credibility as they cannot be controlled (Caspers & Corte, 2019). In the execution of this study, there will be issues that the researcher assumes would be in place to facilitate the undertaking of the research.

Thus, the researcher assumes that:

1. There is limited uptake of afforestation initiatives in Mashonaland West.
2. Current afforestation initiatives are poorly performing in Mashonaland West.
3. The state of knowledge about various possible forms of land use in Mashonaland West province is low
4. Current models of afforestation have failed to achieve set policy targets.

1.7 Delimitation of the study

Delimitations are features of a study that can be managed to determine the scope of the parameters of the phenomenon under study (Zaukustus et al., 2019). Therefore, the following are the delimitations for the current study:

1.7.1 Conceptually: This study sought to develop a model for sustainable afforestation as an alternative land use option for economic development in Zimbabwe. Therefore, the issue of intellectual curiosity in this study was to develop a model for sustainable afforestation as an alternative land use option for economic development in Zimbabwe.

1.7.2 Geographically: The study was conducted in Mashonaland West, Zimbabwe over four years between 2019 and 2024.

1.7.3 Methodologically: This study adopted a qualitative research methodology as none of the objectives require statistical measurement of one variable over another. The qualitative approach was used to gain insights from stakeholders on how to develop a model for sustainable afforestation as an alternative land use option for economic development in Zimbabwe.

1.7.5 Philosophical Delimitation – A phenomenological stance was adopted in this study to develop a model for sustainable afforestation as an alternative land use option for economic development in Zimbabwe. Since the study was guided by a phenomenological stance, it followed that interpretive approaches in data collection and analysis had to be adopted.

1.7.6 Theoretical delimitation: This study derived illumination from a variety of interdisciplinary theories. In order to develop a model for sustainable afforestation as an alternative land use option for development in Zimbabwe, a theoretical framework which comprises a constellation of the following theories Theory of Structuration (TS), Land Rent Theory (LRT), The Stakeholder Theory (ST), Sustainability of Livelihoods Framework (SLF), Forest Transition Theory and The Expectancy Theory (ET) was adopted. The use of multiple related theories enhances the researcher's understanding of the phenomenon under study and helps to increase the validity of the findings (Ngulube, Mathipa& Gumbo, 2015).After a critical analysis of all the 'theoretical jackets' above, the Theory of Structuration and the Expectancy Theory emerged as overarching, with attributes that give it explanatory validity to all the major themes covered by this study. Its significance is overarching as it helps to explain the inter- playing factors that determine land use and decision-making in land use.

1.7.7 Respondents for the study: The target population comprises farmers, farm boards like Agritex, Ministry of Lands and Agriculture, EMA officials, and local farmers in the province and other relevant bodies/individuals with relevant knowledge to the phenomenon under study. Interviewees were purposively selected.

1.8 Limitations and mitigations

1. The researcher had no control over the social environment in which the study was carried out. Therefore, institutional policies, customs, cultural and religious norms, and values could

not be underestimated in the selected study sites. Therefore, such environmental factors had to be observed within the selected study area.

2. Poor record keeping which rendered some archival information relevant to the study missing. As a result, the researcher had to rely on published statistics.

3. The economic problems prevailing in the country militated against the smooth execution of the research study by posing financial challenges hampering the study's progress. A practical work plan and a frugal budget were used to manage and make the best use of the limited resources available.

4. In the beginning, some respondents thought with Zimbabwe being in a polarised state politically, respondents thought the study was a witch hunt and were afraid to be forthcoming with answers. The researcher had to assure the respondents of their anonymity as well as explain the fact that their responses were for academic purposes only. The researcher also had to adhere to ethical guidelines and obtain necessary approvals. Addressing these ethical concerns proactively enabled data collection to flow smoothly.

5. Results of the study are specific to Mashonaland West Province only and may not be generalisable to other provinces' settings or groups. There is a need for future similar studies to be done in other provinces/ different contexts or with different populations to test the robustness of the findings before they can be generalised.

6. Bias was also another limitation that the researcher had to contend with. In order to minimise bias, the researcher also implemented strategies to reduce bias, such as anonymizing responses and training data collectors to ensure consistency.

1.9 Conceptual framework

The search for a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe remains a grey area. The conceptual framework below (figure 1.1) presents a road map of the current study, indicating the inter-connectedness of the variables defining the phenomenon under investigation.

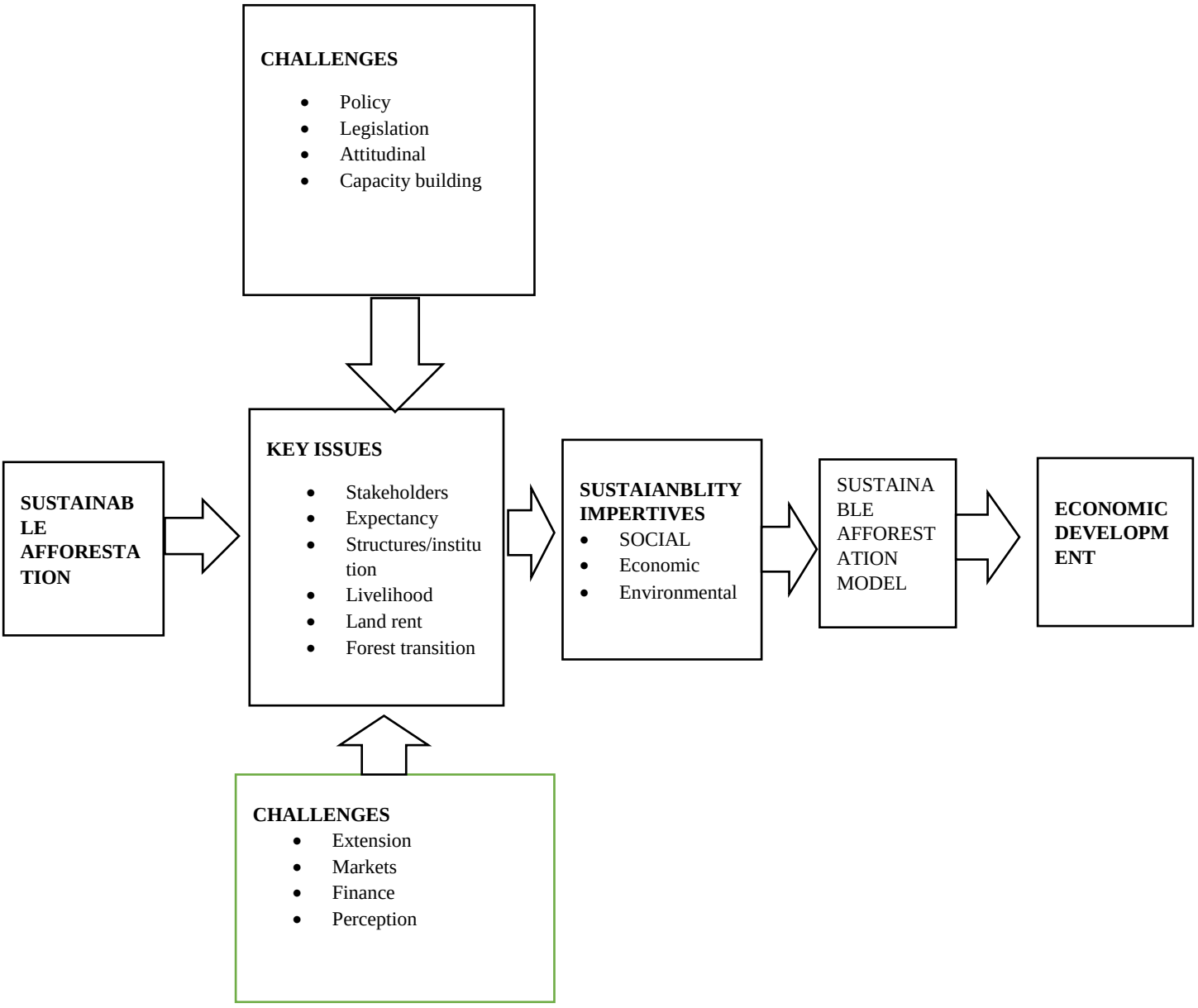


Figure 1.1: Conceptual Framework

The framework above presents a road map for developing a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe. This conceptual framework serves as a roadmap for understanding how to implement and manage sustainable afforestation

projects, ensuring that they contribute to both economic development and environmental sustainability. In qualitative studies, a conceptual framework projects a process (Jabareen, 2009; Tamene, 2016). According to Jabareen, a concept possesses specific functions, characteristics, attributes, distinct perspectives, related assumptions, and limitations. Further, Tamene argues that a conceptual framework is a provisional theory that guides the study. Where concepts are interlinked they create a conceptual framework (DeVierville, 1998; Tamene, 2016). Therefore, a conceptual framework projected below attempts to illuminate the building blocks in the development of a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe.

The first phase tries to answer the question: What should be put in place to implement an effective successful sustainable afforestation initiative as an alternative land-use option for economic development? First and foremost, this stage is a critical inquiry into the state of afforestation, and land-use options. These elements are also reflected in the objectives which are to: establish the knowledge of various possible forms of land use in Mashonaland West province and assess the knowledge of various possible forms of land use in Mashonaland West province, explore the perceptions of stakeholders towards afforestation as a sustainable alternative land use for economic development, and explore the institutional frameworks that maybe adopted to promote sustainable afforestation as an alternative land use for development in Mashonaland West. All these critical elements that should be dealt with are informed by the universe of theories that impinge on the process of integrating these elements into the model for sustainable afforestation as an alternative land-use option for economic development. The theories constitute the outer layer of our model. The critical elements in the center of the circle are coloured by the outer circle of theories. The guiding theories are as follows:

The theory of Structuration tells us thatsocial practices such as land use and land-use change are influenced by structure as well as by individual agents' actions. Essentially, the theory helps us to understand the behavior and decision-making process of actors towards afforestation. The theory states that actors' behavior and decision-making are influenced by structural as well as individual factors.

Institutional Theory compels us to interrogate how rule configurations and those who enforce the rules may promote or militate against sustainable afforestation. In addition, institutional theory explains certain decisions and activities as it considers the processes by which structures, including schemes, rules, norms, and routines, become established as authoritative guidelines for social behaviour. The Stakeholder Theory will be used to understand the stakeholders in the design of strategies to promote sustainable afforestation as an on-farm economic activity as well as understand consultations on the community's cultural beliefs, myths, and realities. The theory will be used to scan stakeholders and their views on sustainable afforestation as an economic activity on farms.Thus, principally this theory will help in illuminating the spectrum of stakeholders, and the role they are playing and should be playing, for the efficient functioning of the entity under consideration, that is, afforestation initiatives.

The Expectancy Theory informs us that the desired goal (expectancy) or reward (instrumentality) or if the effort is worthy (valence) motivates human behavior to behave in a certain way based on the expectation that the effort will result in. Principally the theory was used to illustrate the motives of farmers in participating in afforestation initiatives.

The Forest Transition Theory which focuses more on the temporal changing of forest cover or a change in forest cover trend over time. This theory was used to understand the factors (market signals) that motivate farmers to consider afforestation as an alternative land use.

Land Rent Theory states that land should be allocated to the use that would generate the highest potential rent. For decision-makers, the main policy implication under this approach is to change the composition of land rent in such a way that forest areas can be protected and/or reforestation can be feasibly promoted.

Sustainable Livelihood Framework (SLF) focuses very much on how people organize their lives and is regarded as an analytical structure for the complexity of poor rural livelihoods, factors, and types of interventions. Thus, this theory is used to understand people's decision in considering afforestation as an alternative land use for economic development.

The theories we see impinging on the checklist of the things that we must not overlook in the design of a model for sustainable afforestation.

The second phase is the evaluation of possible encumbrances that might hinder sustainable afforestation. These include Policy, Legislation, Attitudinal, Capacity building, Extension, Markets, Finance and Perception. These need to be managed to promote sustainable afforestation. This stage involves the actual distillation or putting together of those critical elements so that they begin to influence the nature of the program/sustainable afforestation initiatives.The management of these hurdles will impact the sustainability imperatives which are social, economic, and environmental. The phase answers the question: How do you go about aligning them, mixing them, or putting them together (with references to enablers of afforestation such as extension services, enabling policies, and market access among others) to come up with a model for sustainable afforestation as an alternative land-use option for economic development? Under this phase, the challenges as well as the enablers are critically examined. In the process of analyzing, there is a need to look at the strengths and weaknesses and effectiveness of each strategy in contributing towards sustainable afforestation development. There is a need to identify and engage the stakeholders. There is a need to identify best practices for the effective development of sustainable afforestation and address institutional barriers or facilitators.

After identifying, engaging, and analyzing, the next phase is to develop a model for sustainable afforestation. This is done by combining all the theoretical perspectives to inform implementation and adoption. Under this phase, objectives and their considerations are addressed. The next stage is to foster collaboration and trust among stakeholders. Then there is a need to implement and evaluate the framework (monitor effectiveness and address deviations). Continuous data collection, analysis, and monitoring are vital for evaluating the effectiveness of efforts and identifying areas that require improvement. The evaluation would lead to the identification of areas for improvement. The framework is dynamic and requires re-evaluation.

The economic development is the final stage and shows the core elements of the model and its outcome. The model will now lead to economic development.

From the conceptual framework, by addressing these key elements, a model can lead to sustainable afforestation which would translate into economic development. A successful

sustainable afforestation program requires ongoing communication with stakeholders, collaboration, and adaptation to changing circumstances.

1.10 Organisation of thesis

1.10.1 Chapter one

This is an introductory section which saves to presents the background and orientation of the study leading to the research problem. The purpose of the study and the underlying research objectives that underpins the study feed from the background and the problem statement is also presented. The chapter also presents and justifies the adopted research methodology, paradigm and its associated data collection techniques, the significance of the study, the intended data analysis technique to be employed to test the propositions, ethical considerations, and research validity. This first phase of the research is going to be more exploratory as the study area is rather a new field of research characterized by just a handful of research done hence the absence of much-needed literature.

1.10.2 Chapter two

This chapter is exploratory as the researcher defines the research problem through a literature review in a bid to satisfy the demands of the research as presented by the research objectives. Specifically, this chapter reviews literature on the state of afforestation, institutionalization of afforestation; factors motivating land use change; perceptions of stakeholders towards afforestation as a sustainable alternative land use for economic development, institutional framework that may be adopted to promote sustainable afforestation as an alternative land use for development and models for sustainable afforestation.

1.10.3 Chapter Three

Theories in this study are the lens that facilitates our understanding of the processes, issues, and forces at play in the phenomena under investigation. This study derives illumination from a variety of inter-disciplinary theories such as the Theory of Structuration (TS), Land Rent Theory (LRT), The Stakeholder Theory (ST), Sustainability of Livelihoods Framework (SLF), Forest Transition Theory and The Expectancy Theory (ET). The approach adopted in this chapter is to pick on each of the theories adduced above and lay bare its basic tenets first then follow up with

a brief discussion on the use value of the theory in question to the study at hand: What model would be suitable for sustainable afforestation as an alternative land use option for economic development in Zimbabwe?

1.10.4 Chapter Four

This chapter serves to outline the research methodology for development and execution. It explains the research approaches adopted, the planning process as well as the intended research population, (sample size chosen). The data collection instruments and procedure, data analysis, and presentation are also outlined in a bid to satisfy both research reliability and validity. Further, ethical considerations are also highlighted. The chapter is hemmed by a chapter summary.

1.10.5 Chapter Five-Eight

These chapters of the study deal with the data collected during the exploratory phase of the study and describe the existing characteristics of the data. These chapters constitute the results chapters and results are presented and analysed building on the key elements and outcomes of the preceding chapters.

1.10.6 Chapter Nine

This chapter forms part of the descriptive section of the research study. This chapter presents the study summary, conclusion, and recommendations derived from the synthesis of the research findings. It also presents the implications of the research to the existing body of knowledge and presents knowledge gaps upon which other future researchers may build. This chapter is then followed by the section on referees used.

1.11 Chapter summary

This chapter discussed the problem and its contextual setting. The background to the study, statement problem, aim of the study, scope, assumptions, delimitations, and limitations were also looked at. Objectives that the research study is based on were also highlighted as the research questions to be answered in this study. Finally, the key terms that establish the frame of reference with which this study was conducted were defined. The next chapter reviews the literature on the phenomenon under study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section reviews the literature on the development of a model for sustainable afforestation as an alternative land-use option for economic growth in Zimbabwe. Specifically, this chapter will

review the literature on the state of afforestation, stakeholders' perceptions towards afforestation as sustainable alternative land use for economic development, the institutional frameworks that may be adopted to promote sustainable afforestation as an alternative land use for development, and models for sustainable afforestation as an alternative land use for economic development. However, before this, there is a need to reflect on key concepts of the study, that is, institutionalization, management, afforestation, alternative land use, and economic development to ensure common understanding. The section below presents a review of these key concepts.

2.1 Conceptual issues

To ensure a universal understanding of the topic under interrogation, this section reflects on terms regarded as critical to the study. These are institutionalisation, management, afforestation, alternative land use, and economic development. In this case, the section starts by reviewing the term institutionalisation.

2.1.1 Institutionalisation

Institutionalisation, as implied in the discourse of institutions, is a system of establishing and embedding social rules that structure social interactions (Hodgson, 2006), the homogenization of beliefs in the relevant population (Stevenson, 2009), a deliberate effort to incorporate knowledge at the organizational level so that it may persist and be available for future re-use (Crossan, Lane and White, 1999) or a process through which the learning that has occurred by individuals and group is embedded in the design of the systems, structures, and procedures of the organization (Bedrow, 2003). This view is further fortified by Lawrence, Mauws, Kleysen, and Dyck (2005) who view institutionalization as a process that distinguishes organizational learning from individual and group learning as it is through this process that ideas are transformed into institutions of the organization, which are available to all employees. Of importance is that all the definitions given above have one common motif, that is, emphasis on institutionalisation as the rolling out of control, group norms, values, and dynamics. In sum, it's about giving structure to a social entity.

Though seemingly outdated, Scott (2001) offers a more comprehensive and interesting definition as he views institutionalization as the process of social structures that have attained a high degree of resilience, that are composed of cultural-cognitive, normative and regulative elements that,

together with associated activities and resources, provide stability and meaning to organisations and are transmitted by various types of carriers, and operate at multiple levels of jurisdiction, from the world system to localized interpersonal relationships.

2.1.2 Management

Taken in chronological order, of the contributors' insightful exposes', management is to "forecast, to plan, to organize, to command, to coordinate and control activities of others" (Henry Fayol, 1841-1925), the "art of getting things done through people" (Mary P. Follett, 1868-1933) or is a "multi-purpose organ that manages a business and manages managers and manages workers and work" (Peter Drucker, 1909-2005). To add to these voices Hisson (2011) refers to management as the process that includes strategic planning, setting; objectives, managing resources, deploying the human and financial assets needed to achieve objectives, and measuring results. Noteworthy is that all the definitions above map out the ideal or standard management function but none of them delves into establishing the *critical path* for effective management. This is exactly what inspires this study, namely, to develop a model for *effective* management of afforestation as a land use option for economic development.

2.1.3 Afforestation

Generally, scholars on afforestation seem to agree that afforestation refers to the effort/ or the process of establishing a forest, especially on land not previously forested. Afforestation is defined by the UNFCCC (2004) as direct human-induced conversion of non-forested land to forested land through planting or seeding. This definition lacks clinical precision, as the phenomenon of afforestation and reforestation are time-bound (creating forests in less than 50 years where there were once forests is reforestation, and creating forests after 50 years where there were once forests is afforestation). The UNFCCC definition is silent on the time factor. Afforestation takes place on land that has not been covered by forest for at least 50 years (see Lubowski, Plantinga, & Stavins, 2006; Nielsen, Plantinga, & Alig, 2014; Tian, Sohngen, Baker, Ohrel, & Fawcett, 2018).

Aguilar et al (2000) posit that afforestation is the practice of converting non-forested land through planting, seeding, and/or the promotion of seed banks and sources and applies to areas that have not been forested for at least 50 years. It seems worthwhile at this point to take a position vis-a-vis the main concept of this study, that is, afforestation. To avoid confusion or

conceptual ambiguity, therefore, in this study, the term afforestation shall be construed to include reforestation. Put simply, in this study any creation of a forest where there is no forest will be viewed as afforestation.

2.1.4 Alternative land use

Ryan (2016) observes that alternative land use is the utilization of land unsuitable for crop or animal production for other uses. According to Reddy (2012) when land is put under an alternative production system to match its capability more appropriately to the new land use and achieve more sustainable biological and economic productivity in the long term, it is known as alternative land use. Unfortunately, the definition above takes a position by portraying afforestation as belonging to the realm of land unsuitable for both crop and animal husbandry. It should not but apply even to land suitable to any of the two scenarios.

2.1.5 Economic development

Economic development is a multifaceted and complex concept that has been defined and interpreted in various ways by scholars. Adam Smith, often regarded as the father of modern economics, viewed economic development primarily through the lens of wealth creation and accumulation. In his seminal work, *The Wealth of Nations* (1776), Smith focused on the role of free markets and the division of labor in fostering economic growth. His definition is rooted in the idea that economic development is synonymous with increasing the wealth of nations through efficiency and productivity gains. Smith's definition emphasizes wealth generation and market mechanisms, which overlooks the qualitative aspects of economic development such as income distribution, social welfare, and environmental sustainability. While his ideas laid the groundwork for classical economic theory, they are criticized for not addressing broader dimensions of human well-being and equitable growth. Adam Smith’s focus on market efficiency and wealth creation provides a foundational understanding but lacks consideration of broader human and environmental factors.

Renowned economist and philosopher Amartya Sen provides a more thorough and human-centered concept of economic development. Sen makes the case that economic growth should be viewed as the process of advancing people's capacities and freedoms in his 1999 book Growth as Freedom. He underlines that progress is about giving people more opportunities to live meaningful lives rather than just raising GDP. Sen's formulation, which emphasizes human

freedoms and capacities, offers a more comprehensive viewpoint. It can be criticized, nevertheless, for being quite ethereal and difficult to quantify in real-world situations. Although it focuses on personal empowerment and quality of life, it can be challenging to translate these ideas into specific policy measures and metrics. Amartya Sen's method emphasizes the value of capacities and liberties, providing a more comprehensive perspective but posing difficulties with measurement and real-world application.

In its 1987 report Our Common Future, the Brundtland Commission described economic growth as "development that meets present needs without compromising the ability of future generations to meet their own needs." This definition takes sustainability into account and strikes a balance between social justice, environmental conservation, and economic progress. The definition provided by the Brundtland Commission incorporates social and environmental aspects into the framework for economic development in a forward-thinking manner, addressing long-term issues. It has been critiqued, meanwhile, for being too nebulous and for making it challenging to operationalize the idea of "sustainable development" in real-world terms. Finding the ideal balance between social justice, environmental preservation, and economic growth can be difficult and context-specific. The Brundtland Commission’s definition integrates sustainability and long-term considerations, but its broad nature can make it difficult to apply concretely.

Based on the criteria, it is clear that economic growth plays a significant role in a country's efforts to end poverty and enhance community welfare. The widely used indicator of a country's economic development is its gross domestic product (GDP) (Sun & Tang, 2011). These two factors are connected, and economic growth indicates the effectiveness of economic development. Growth in the economy can be stimulated by economic development, and more growth in the economy will help the process of economic development. Increasing national and per capita income, creating job opportunities, and lowering the poverty rate are all ways to promote community well-being (Redmond & Nasir, 2020). Various factors can affect economic development, including social, economic, and environmental factors (Syemor et al., 2022; Ickowitz et al., 2022; Klapper et al., 2016). Then Kamaroellah and Kutsiyah (2018) also mentioned some economic factors that influence economic development, including natural resources, human resources, capital formation, expertise, or entrepreneurship.

2.1 State of global forests

Over 30% of the planet is covered by forests; they act as the planet's lungs, releasing oxygen into the atmosphere and sustaining life for all living things, including humans (WWF, 2020). Additionally, forests house 80% of all plant biomass on Earth and contribute 75% of the biosphere's gross primary productivity (Keenan et al., 2015). More than half of the world's forest resources are distributed across Asia and South America (Pan et al., 201t3). According to data from the Food and Agriculture Organization (2013), there is an uneven distribution of forests across the globe. For example, even though Asia and Europe have the majority of the world's forests, South, North, and Central America also include a sizable portion of the global forest (FAO, 2020).

From an economic perspective, forests play a major role in the world economy, employing over 50 million people globally and generating an estimated 600 billion US dollars (World Bank, 2016). Forests are a vital component of the economies of several African nations, including the Democratic Republic of the Congo (DRC), Cameroon, and the United Republic of Tanzania. Africa's forests are a "foundation for growth and development of Africa's green economy," according to the United Nations Environment Programme (UNEP, 2015, p. 7). Additionally, wood are an important global source of energy. For instance, according to FAO (2014), 13% of households in Latin America and the Caribbean, 5% of homes in Asia, and over 27% of households in Africa get their cooking energy from forests.

Forests and trees make significant contributions to human food security and nutrition, and agroforestry can increase farmer incomes and the resilience of farming systems and improve agriculturalproductivity (Lippe et al., 2022). Agroforestry can boost farmer incomes, strengthen the resilience of farming systems, and raise agricultural output. Forests and trees play a major role in human food security and nutrition (Lippe et al., 2022). Additionally, forests play a multifaceted role in mitigating the root causes of food insecurity, hunger, and poverty as well as strengthening the ability of people and livelihoods to withstand threats and disasters. In addition to providing materials for housing, wild edibles, fodder, and wood fuel for cooking, they also preserve water resources, offer other ecosystem services, and act as a buffer against harsh weather (Libert-Amico et al., 2022). Global forests have been essential to human life since they support livelihoods for people all around the world.

In recent years, forests have assumed greater importance and now are among the world's most productive land-based ecosystems and are essential to life on earth and sustainable development. The Global Forest Resources Assessment 2015 (FRA 2015), posits that forests cover 30% of the Earth's land area or nearly 4 billion hectares (ha) — are an incredibly valuable resource, storing massive amounts of carbon, helping to purify water and air, ensuring natural biodiversity, and providing livelihoods for millions of people (see Libert-Amico et al., 2022; Chazdon et al., 2016; Shackleton & De Vos, 2022). Further, Johnston et al (2023) posit thatForests and trees are vital sources of income, livelihoods, and well-being for rural populations, particularly indigenous people, smallholders, those living near forests, and those who make use of trees outside forests. Forests and trees are also important livelihood components for many, including the estimated 2.5 billion people involved in smallholder agriculture (IFAD, 2023), most of whom benefit from the regulatory and provisioning ecosystem services of trees in the landscape. Roughly 820 million rural people in the tropics live in or near forests and savannahs (Gitz et al., 2023).

This represents a sizeable share of the rural impoverished and shows that despite the challenges in gathering comprehensive data on the reliance on forests, trees, and forests have a great potential to support rural livelihoods. However, a growing body of evidence indicates that the world's forests have been declining as a result of several issues, endangering the livelihoods of numerous populations all over the world. Forests are essential, but they are under attack globally; according to the Food & Agriculture Organization (FAO) 2020, 30 soccer fields vanish per minute. Several factors, including population pressure, agricultural encroachment, fuel wood harvesting, excessive livestock numbers, and commercial logging, have contributed to this unparalleled loss.

There is an increasing body of literature that suggests a recent trend toward forest regrowth in regions across the world. These types of forest transitions have been observed in temperate, economically developed nations; most of these transitions have taken place in the latter part of the 20th century. Over the last several decades, there has been increasing evidence that tropical and sub-tropical forests on several continents are experiencing large-scale forest regrowth as well. Numerous recent studies have placed an increased emphasis on regrowth, reforestation, and afforestation—processes that frequently go hand in hand with deforestation and degradation—even in landscapes that show signs of deforestation (Moon & Park, 2022; Munroe et al., 2021;

Nagendra et al. 2018).It is a positive development that will have a significant impact on soil health, global biodiversity, carbon sequestration, and the decrease of greenhouse gas emissions that fuel climate change to concentrate on both regrowth/regeneration and reforestation/afforestation at the same time (Grainger et al., 2021).

While afforestation and reforestation have gradually increased, they are nevertheless frequently patchy, and rates of forest recovery are usually slower than those of removal. The species composition and variety of ecosystem goods and services offered by old-growth forests are frequently different in these emerging forests (Lippe et al., 2022). All the same, secondary forests offer valuable environmental services that support attempts to achieve sustainable development, boost carbon sequestration, preserve soil, stabilize hydrological cycles, and boost biodiversity overall. Therefore, to create effective policy interventions to stop or reverse deforestation and promote forest regrowth, we must gain a more thorough understanding of the variety of proximate and underlying elements that can support sustainable afforestation (FAO, 2021).

2.2 State of Africa and its forests

Additionally, a significant portion of the world's forests—roughly 17%—are found in Africa (Keenan et al., 2015). Thirty percent of Africa's territory is covered by forests, the majority of which are tropical and sub-tropical (FAO, 2020; UNEP, 2019). Forests are a vital component of the economies of several African nations, including the Democratic Republic of the Congo (DRC), Cameroon, and the United Republic of Tanzania. Africa's forests are a "foundation for growth and development of Africa's green economy," according to the United Nations Environment Programme (UNEP, 2019, p. 7). More significantly, given the region's continuous population growth, over 600 million Africans are expected to cook with wood and charcoal (UNEP 2015; World Bank, 2022). Unlike most parts of the world, in Europe and North America, forests offer indoor heating during winters (FAO, 2021).

In addition, forests are essential to the survival of wildlife and other global natural resources including water sources (Miura et al., 2015). Most of Africa's catchment forests guarantee pure drinking water and serve as habitats for biota, including the region's remaining internationally designated endangered species (WWF, 2021). Similar to this, people in Africa, especially the

majority of rural residents can gain socioeconomically from these environmental services in a number of ways (UNEP, 2020). For instance, a new report from the United Nations Conference on Trade and Development (UNCTAD, 2017) demonstrates that, in the majority of African nations, tourism-related activities have boosted local economies. Furthermore, the majority of the world's population—more than 1 billion people—lives in Asia and Africa and depends on forests for their livelihood (FAO & World Bank, 2017).

Despite humanity's dependence on forests, the earth's forest area continues to shrink. In Africa, Ethiopia, Rwanda, and Burundi have been the most affected as their forest resources have been almost totally depleted (see Food & Agriculture Organisation, 2015; Muralikrishna & Manickam, 2017). While global rates of deforestation have decreased in the recent past from a net annual forest area loss of 7.3 million ha in 2000 to 3.3 million ha in 2015, the decrease has not been even across regions (Food & Agriculture Organisation (FAO) 2020). Deforestation rates in some regions, especially Africa and Latin America, are still alarmingly high. Many drivers of deforestation lie outside the forest sector and are rooted in wider social and economic issues, including challenges related to reducing poverty, urbanization, and policies that favour land uses that produce higher and more rapid financial returns, including energy, mining, transportation, and especially agriculture (see Assmuth&Tahvonen 2015; Tikkanen et al. 2012; Ryan et al., 2008; 2016; Malone, 2008; Dhubhain, 2010). Thus, the uneven nature of the rate of deforestation rates calls for an area-specific assessment to ascertain the extent of deforestation as well as design tailor-made models for afforestation to counter this loss. The one-size-fits-all models seem to have failed to provide relief.

According to the Food and Agriculture Organization (FAO), the majority of rural Africans' subsistence farming has a negative influence on the continent's forest sector (FAO, 2017; FAO, 2020). For example, in order to meet the food demands of the expanding rural population, natural forests have been converted into farmland on over 60% of Africa's cropland (GIZ, 2013; FAO, 2019). According to research by Kairuki (2011), growing land use and demands from both inside and beyond the continent will keep agriculture exerting pressure on Africa's forests. Similarly, Ickowitz et al. (2015) argue that significant forest losses in Africa will persist due to traditional farming methods used by smallholder farmers in the region.

Furthermore, overreliance on wood fuel for cooking also contributes to the substantial loss of forests in the region (FAO, 2021, Boucher et al., 2011 & World Bank, 2019). A recent report by the FAO (2017) confirms this, pointing out that much of the wood collected globally is used to make the charcoal needed by households in towns and cities of Africa. In addition, further evidence shows that charcoal use remains the primary threat to forest sustainability on the continent (World 4 Bank, 2005; Chakravarty et al., 2012). This is attributed to unsustainable production practices employed by the majority of charcoal traders in the region (FAO, 2017). For example, a study by Malimbwi et al. (2002) found that the charcoal industry is a key barrier to sustainable forest management. This is because larger portion of forests are being logged for charcoal production (Malimbwi et al., 2022). Unfortunately, with low access to electricity and other alternative energy sources, charcoal use will continue to be a major challenge to the continent's forest sector. This emphasizes the need to understand and explore sustainable approaches that could enhance the sustainable management of Africa's forests (World Bank, 2019).

If left untamed, deforestation poses significant challenges to the livelihoods of communities. A recent World Bank report states that deforestation adversely affects the quality of life for both rural and urban poor (World Bank, 2019). The World Bank opined that deforestation can lead to a 15-20 percent reduction in crop and livestock yields. About 50 million people (in Africa) face acute fuel wood scarcity and 5 million hectares of Africa's upland watersheds are deforested and in urgent need of rehabilitation (Sustainable Biodiversity Management, 2019). Soil erosion and disruption of stream flow are shortening the life of reservoirs. Such challenges present both economic, and social consequences for communities, hence the need for afforestation. However, despite the growing calls for afforestation as a panacea to community problems, many initiatives have failed. Several reasons for the failure have been advanced chief among them being the negative perception of farmers towards afforestation.

Negative cultural attitudes towards forestry have also been widely reported in other countries. Forestry has traditionally not been seen as an integral part of traditional agriculture and most farmers consider forestry only as an alternative land use for their worst land (Ní Dhubháin&Gardiner 1994). In a study conducted in Finland, Selby, and Petajisto (1995) find that there is a perception that converting land to forestry can sever the dynamic historical process

involved in the creation of agricultural landscapes and thereby hurt local communities. Similarly in the UK, Watkins et al. (1996) find that most farmers do not want woodland on their farmland, as they see their land as being exclusively a preserve for agricultural production. It is against this background that the next section focuses on the economic incentives of forestry.

At the same time forests are disappearing, and we are seeing rapid population growth and rising per capita incomes in many countries. These trends are accelerating global demand for forest products and services (Dupraz et al., 2019). With the world population projected to reach 9.6 billion by 2050, forests and their multiple benefits need to be safeguarded (World Bank, 2018). The demand for wood alone is expected to triple to 10 billion cubic meters. This means finding ways to feed people while maintaining and expanding forests to meet other human needs. Halting and reversing deforestation globally presents an enormous challenge and will require political will and concerted action across all sectors at all levels.

Despite the growing global hype on afforestation as an alternative land use, (see Ryan, 2016; Lovell et al., 2017; Tian, Sohngen, Baker, Ohrel, & Fawcett., 2018; Minang et al., 2018), very little seem to have been achieved globally. However, despite this global hype, current afforestation management frameworks seem to have failed to achieve set targets (see Ryan, 2016; Dupraz et al., 2019). In light of the present rate of land degradation and deforestation, past and present frameworks seem to have failed to provide lasting solutions. According to Jessimen (2011) in Zimbabwe, fuel-wood supply has reached critical proportions whilst some areas are on the brink of a crisis. Deteriorating fuel-wood supplies have provided little incentive to those involved to do something about them. Consequently, many social forestry programs have stumbled along and eventually faded away. It is also worth noting that many agriculture and rural development projects in Zimbabwe have paid scant attention to forestry or failed to implement forestry components (FAO, 2021; Tshidzumba et al., 2018). Thus, one may say that current survey information on the evaluation of failed agroforestry models is critically important in developing new approaches.

Afforestation programs have been initiated in several regions as alternative land use for economic development. However, the success of existing institutions of management frameworks in afforestation has been widely questioned (see Ryan, 2016; Lovell et al., 2017; Tian, Sohngen, Baker, Ohrel, & Fawcett., 2018; Dupraz et al., 2019). In most of the regions,

current frameworks for afforestation management seem to have failed as output has fallen well short of policy targets (see Ryan, 2016; Dupraz et al., 2019).

Even in terms of research, the issue of afforestation as an alternative land use seems to have escaped under the academic research radar. Even though there exists a plethora of studies on forestry as a land use, there is a dearth of literature that deals with the factors motivating the land-use change from agriculture to forestry. A large proportion of the literature from developing countries deals with the problem of deforestation (Tshidzumba et al., 2022; Namaalwa et al. 2007; Dupraz et al., 2019). Studies on afforestation as a sustainable alternative land use have been almost non-existent. However, of late there has been an increase in the volume of literature that examines some of the wider non-timber value of forests such as biodiversity management (Tikkanen et al. 2012), biomass production for renewable energy (Lecoq et al. 2017), continuous cover forestry (Assmuth&Tahvonen 2015) agroforestry (Graves et al. 2007) and climate change mitigation (Pihlainen et al. 2015). However, land use change from agriculture to forestry has received scant attention (Diaz-Balteiro& Romero 2003; McKenney et al. 2006; Upadhyay et al. 2006).

A close analysis of the focus of many studies conducted to date on afforestation as an alternative land-use option (Ryan, 2016; Lovell et al., 2017; Tian et al., 2018; Dupraz et al., 2019) reveals the existence of a gap in the search for a model for sustainable afforestation. Despite a rich array of models for both forestry and agronomy (Luedeling, 2016; Ryan, 2016), none has been able to achieve set policy targets (Eurostat, 2013; Ryan, 2016; Ryan, 2016; Lovell et al., 2017; Dupraz et al, 2019). As a result, afforestation has failed to proffer anticipated gains (see Wilson, 2016; Dupraz, 2019) resulting in subsequent low uptake of afforestation as an alternative land use for economic development (see Wilson, 2016; Ryan, 2016). As a result, afforestation continues to fail to deliver the anticipated gains (Wilson, 2016; Dupraz, 2019).

Current survey information and evaluations of failed social forestry projects are now instrumental in developing a new approach, for the problems of environmental degradation, desertification, and fuel wood supply, cannot be solved by afforestation alone. What is required is a holistic approach to agriculture, livestock, land Settlement, forestry, and energy policies, and as Arnold (2018) opines that people are (therefore) more likely to respond to projects that enhance this broader set of values than to projects that try and address fuel wood alone.

Thus, one may conclude that existing frameworks for afforestation have failed. Despite this failure, limited studies have been done to understand the drivers behind these failures as a springboard to develop dynamic models that can be used to redress the situation. Though pockets of research are beginning to energy, little has been done to interrogate the existing afforestation institutional management frameworks and the development of a new model for institutionalization and management of afforestation as an alternative land use for economic development in Zimbabwe. Globally, to date, a few studies on afforestation initiatives have been done notably in Ireland (see McKenney et al. 2006; Upadhyay et al. 2006; Green, 2009; Dhubain, 2010; Upton, 2015), the difference in special geographical setup requires the study of the same phenomenon in the Zimbabwean context. This generalized failure of afforestation as a viable land use option calls for an interrogation of the status quo in search of an appropriate institutional and management regime

2.2.1 State of forests in Zimbabwe

Zimbabwe has continued to experience forest lost as at an unprecedented level (see Nhekairo& Gumbie, 2013; Muralikrishna & Manickam, 2017; Food and Agriculture Organisation, 2017). However, Nyikadzino (2013) posits that the level of environmental destruction in Zimbabwe is lower than that found in many other African countries. Forest loss in Zimbabwe has had its roots extending far back into colonial times. Nhekairo and Gumbie (2013) argue that as early as the 1930s and 1940s colonial officers in Zimbabwe responsible for administration in the peasant farming areas of the Upper Sabi catchment reported population 'congestion, overstocking, gully erosion, shortage of thatching grass, and difficulties experienced by people in obtaining water. Thus, from the above one may conclude that forest loss has been a problem for some time now.

Recent studies within Zimbabwe, have attempted to quantify the extent of the deforestation and accompanying degradation of communal land areas and draw both the Government's and the public's attention towards these serious issues and the large-scale catastrophic consequences they herald. The fuel wood crisis facing the country has again been documented in the Zimbabwe Energy Accounting Project (Beijer Institute, 19851 which states the equivalent of 600,000 hectares of plantation will need to be planted nationwide from 1985 until the end of the century to keep pace with the growing population and subsequent increase in fuel wood demand. Such studies conclude that fuel wood supply has reached critical proportions in many of Zimbabwe's

communal areas whilst some areas are on the brink of a crisis. However, despite input from these seminal studies on afforestation in Zimbabwe, very little on afforestation has been done to keep pace with the growing population demands

The Sabi Catchment Area serves to illustrate one of the worst examples of deforestation and environmental degradation in Zimbabwe (FAO, 2018). Food and Agriculture Organisation (2013) calculated the economic life of the soil in the upper Sabi catchment to be only 9.5 years until maize cropping became impossible and 28.5 years until sorghum cropping became impossible. They also calculated a value for soil loss of 80 tonnes per hectare per year. The future for such areas is extremely bleak and if remedial action is not quickly taken, it is just a matter of time before the Sabi Catchment and similar areas are characterised by desertification and starvation.

To rectify the problems of deforestation and forest loss, the government of Zimbabwe has undertaken several projects to date. The Whitsun Foundation Report 'Rural Afforestation Study' (1981) proposed a project as the First Stage in a national programme to deal with the shortage of wood in communal areas. In accord to develop the communal lands of Zimbabwe, the Government recognised the need for such a project and the above proposals, with a few minor modifications, were accepted and provided the planning framework for the four-year pilot rural Afforestation Project which, with World Bank assistance, officially began in June 1983. However, despite these noble ideas, very little has come out of the project for one reason or another. Of note is the failure of the Forestry extension to be effective, because the Forestry Commission, being essentially a commercial concern, has very little to offer on forestry extension. Furthermore, Agritex has been unable to fulfil its role in developing forestry extension because of a lack of resources. Thus, forestry extension in Zimbabwe is still inadequate although the key to successful rural afforestation is a strong forestry extension service (Nyikadzino, 2013).

One of the major drawbacks of the initiative was that there was very little if any community involvement in the drawing up and decision-making of the projects. The Forestry Commission (2018) points out that for a project to be successful, the forest policy should be arrived at through a widespread and democratic process of consultation and therefore much of the value of preparing a policy statement is in the dialogue that is demanded by the preparation of it. Thus, a prerequisite for a social forestry programme is a sound national forest policy backed by political

support and a firm commitment on the part of the government to provide adequate resources on a sustained basis to meet the broad objectives set out in the policy statement.

In response to the continued threat of deforestation in Zimbabwe's rural areas, the government launched the Rural Afforestation Programme (FAO, 2013). The major objective of the current rural afforestation project is not simply to establish nurseries and plantations but to develop a national afforestation programme. However, the major drawback of the project is that there was in designing an effective forestry extension service, training staff, and implementing research are some of the major components that should be investigated and developed in such a programme. All these were left to chance.

The project has suffered a stillbirth, having faced a host of challenges. The Rural Afforestation Project began and still exists on a narrow technical base of essentially three eucalyptus species. In the higher rainfall areas and on the better soils, there appear to be few problems but the main thrust of the project's activities is in the drier, semi-arid areas with correspondingly poorer and exhausted soils. Observations and late measurements undertaken by the project's Monitoring and Evaluation Unit in these areas have suggested that the eucalyptus trees are not performing as expected and growth on many sites could be very low.

The Global Environment Facility (2011) posits that to establish a truly effective forestry extension system, 'forestry' work, first, everyone involved in rural development work, be they extension workers, agronomists, or teachers, should have a basic input of -forestry during their training. Second, responsible authority should back up and provide the necessary inputs throughout the process of afforestation, offer forestry extension specialists and integrate them at all levels into the national extension system. Chimhowu et al (2010) echo the same sentiments as he argues that it is only when these two objectives are being met that forestry extension has a chance to succeed and in the long run, rural development in general will benefit enormously through the provision of this service. Thus, from the evidence provided in the literature, in the presence of infrastructure and necessary support facilities, it would be a relatively simple operation to integrate the forestry extension specialists into the existing network. The project must launch a research component to investigate the problems associated with social forestry in Zimbabwe.

In light of the present rate of land degradation and deforestation, past and present frameworks seem to have failed to provide lasting solutions. According to Jessimen (2011) in Zimbabwe, fuel-wood supply has reached critical proportions whilst some areas are on the brink of a crisis. Deteriorating fuel-wood supplies have provided little incentive to those involved to do something about them. Consequently, many social forestry programmes have stumbled along and eventually faded away (FAO, 2011). Thus, one may say that current survey information on the evaluation of failed agroforestry models is critically important in developing new approaches.

However, despite these continued failures what is curious is that no serious study has been undertaken on afforestation as an alternative land use in Zimbabwe. It is also worth noting that many agriculture and rural development projects in Zimbabwe have paid scant attention to forestry or failed to implement forestry components (FAO, 2011). The development of a model for institutionalisation and management of afforestation as an alternative land use for economic development in Zimbabwe has remained understudied and under-theorised. Thus, one may say that current survey information on the evaluation of failed agroforestry models is critically important in developing new approaches.

Care should be taken to evaluate these new afforestation projects at each stage. Even in the development of afforestation initiatives, care should be taken to evaluate the success of such projects against set targets. Nyikadzino (2013) argues that tree planting projects therefore should not be regarded as ends in themselves, with success being measured solely by the numerical targets achieved. Increasing the number of trees in an area may have little beneficial effect unless it is more closely related to the needs and priorities of the people living there. Thus, the integration of afforestation as an alternative land use for economic development should arise not from an objective to grow trees but from the objective of improving the farm families' welfare which may involve, among other things, the introduction of some form of financial benefit.

Evidence shows that by 2015, Zimbabwe's forest cover had declined by 36.6% from 22,164,000ha in 1990 (FAO, 2015). Zimbabwe's planted forest fell from 154,000ha in 1990 to only 87,000 in 2015 while other naturally regenerated forests fell from 21,209,000ha to 13,174,000ha over the same period (FAO, 2015). Timber Producers Federation (TPF) (2018a) revealed that the commercial forests further declined from 120,000ha to the current 69,066 ha.

Forest areas designated for production fell from 2,216,000 ha in 1990 to 1,406,000 ha in 2015 (FAO, 2015). Living forest biomass fell from 1483 million tonnes in 1990 to 941 million tonnes in 2015 and both public and private ownership of forests has been declining over time between 1990 and 2015 (FAO, 2015). The Zimbabwe Fourth National Report (2010) to the Convention on Biological Diversity attests to increased forest degradation and destruction due to several factors, chief being human activities such as population pressure in communal areas, effects of veld fires, and collection of non-timber forest products for medicinal purposes, commercial timber and tobacco curing. Consultations with the stakeholders revealed that forest diversity has been declining at an average annual rate of 330,000 ha due to the expansion of agriculture, unsustainable exploitation of fuel-wood (domestic, industrial and commercial use), infrastructural developments (dams, power lines, urban expansion, irrigation), uncontrolled fires, mining, invasive alien species and climate change. The depletion rate translates to over 60 million trees a year against the current planned planting rate of only 15 million trees.

Tobacco curing alone has contributed to 15% of deforestation due to dependence on fuel wood for curing by 90% of tobacco farmers (FAO, 2018). Increased mining activities following recent discoveries of gold, diamonds, chrome and coal have resulted in massive clearance of bio-mass as new mines were developed and old mines expanded. More than a million people are panning gold illegally along rivers, clearing trees and digging in river beds, which results in soil erosion, landslides and siltation of water bodies (Government of Zimbabwe, 2019). Furthermore, an increase in the population of newly resettled areas has resulted in accelerated clearance of forests and woodlands for cultivation. Land area under cultivation increased by 14% between 1992 and 2008 with close to 70,000 ha being converted to agricultural use annually (FAO 2012).

In 2017, Zimbabwe's population was estimated to be 16.5 million with an annual growth rate of 2.3%. This coupled with the prolonged economic hardships that have been hitting the country for nearly two decades now, increases pressure on the forest resource as people desperately turn to it for alternative livelihood sources.

It is when juxtaposed against this rate of forest loss that, the need for a model for afforestation assumes heights of significant proportions. However, despite global commonalities in forest loss, the one-size-fits-all models have failed to meet set targets across the globe. The difference may be in the attitude of the people to adopt afforestation as an alternative land use option for

economic development. This sentiment finds support in Green, (2009); Dhubain, (2010) and Upton, (2015) who point out that while there may be global commonalities about stakeholder attitudes around the adoption or non-adoption of afforestation, it is likely that attitudes towards forestry in Zimbabwe may be different to those in other countries.

2.3 Factors motivating land use change

Even though there exists a plethora of studies on forestry as a land use, there is a dearth of literature that deals with the factors motivating the land-use change from agriculture to forestry. A large proportion of the literature from developing countries deals with the problem of deforestation (Namaalwa et al. 2007; Sankhayan et al. 2003). Studies on afforestation as a sustainable alternative land use have been almost non-existent. However, of late there has been an increase in the volume of literature that examines some of the wider non-timber value of forests such as biodiversity management (Tikkanen et al. 2012), biomass production for renewable energy (Lecoq et al. 2011), continuous cover forestry (Assmuth&Tahvonen 2015) agroforestry (Graves et al. 2007) and climate change mitigation (Pihlainen et al. 2015). However, land use change from agriculture to forestry has received scant attention (Diaz-Balteiro& Romero 2003; McKenney et al. 2006; Upadhyay et al. 2006).

Studies elsewhere indicate that context barriers hinder afforestation initiatives (see Ryan et al., 2008; 2016; Malone, 2008; Dhubhain, 2010). Malone (2008) outlines this complexity by listing common themes that impact levels of afforestation. These include the value of the land; the need for land for farming purposes; historical negative attitudes to forestry; environmental conditions attached to afforestation; the requirement to re-afforest and a lack of forest culture. The complexity of most countries relates also in part to an absence of a farm forestry tradition within agriculture. This translates into a lack of economic knowledge about the returns to afforestation and a lack of management expertise about appropriate management (silviculture) of forests (Ryan, 2008; 2016).

These barriers are further compounded by evidence to indicate that where opportunities afforded by forestry development exist, these are very often overlooked or dismissed by farmers due to attitudinal factors such as emotional attachment to the land and/or negative attitudes around the perception of failure in farming (Malone 2008). Forestry has traditionally not been seen as an

integral part of traditional agriculture and most farmers consider forestry only as an alternative land use for their worst land (Ní Dhubháin& Gardiner 1994).

Negative cultural attitudes towards forestry have also been widely reported in other countries. In a study conducted in Finland, Selby, and Petajisto (1995) find that there is a perception that converting land to forestry can sever the dynamic historical process involved in the creation of agricultural landscapes and thereby hurt local communities. Similarly in the UK, Watkins et al. (1996) find that most farmers do not want woodland on their farmland, as they see their land as being exclusively a preserve for agricultural production. It is against this background that the next section focuses on the economic incentives of forestry.

While there may be global commonalities about stakeholder attitudes around the adoption or non-adoption of afforestation (Green, 2009; Dhubain, 2010; Upton, 2015), it is likely that attitudes towards forestry in Zimbabwe may be different from those in other countries.

2.4 Afforestation projects in Zimbabwe

Before looking at the afforestation initiatives that have been launched in Zimbabwe in recent times, there is a need to understand the state and extent of deforestation in Zimbabwe. The section below highlights the state of deforestation in Zimbabwe.

2.4.1 Afforestation initiatives in Zimbabwe

In response to the alarming forest depletion rate, the government has initiated several programmes to promote sustainable management of forest resources. The Forestry Commission has been on a massive tree-planting programme nationwide since 1992. As of 2005 an average of 8.1 million trees were planted with a survival rate of about 65 to 70% (Nhekairo& Gumbie, 2013). This has been achieved through initiatives such as the national Tree Planting Day, school tree growing and tree care competitions and also at special commemorations such as International Forest Day, and World Environment Day among others.

To consolidate these efforts, the Ministry of Environment embarked on a five-year National Tree Planting Programme in the year 2015 to increase the country's forest cover and reduce deforestation. This programme involved the planting of 75 million trees nationwide covering a total area of 45 740 hectares over five years (Government of Zimbabwe, 2016). This translates to

an annual tree planting rate of 15-30 million trees covering 9 148 hectares yet falling short of the 60 million trees that are lost annually through deforestation. FAO (2015) statistics revealed that planted forests also declined by 43.5% from 154,000 ha in 1990 to 87, 000 ha in 2015. Thus, one may conclude that such initiatives have failed as they have failed to achieve set policy targets. Depletion of forests in Zimbabwe is taking place at an alarming rate as the country lost 36.6% of its forest area between 1990 and 2015 (FAO, 2015). Overall, global forest area has declined by 129 million hectares (3.1 per cent) from 1990 to 2015 and is now just less than 4 billion hectares (FAO, 2016). It is evident from the statistics presented above that tree-planting activities in Zimbabwe have been shrinking. Thus, from this evidence, one may conclude that institutional and legal frameworks for sustainable forest management are weak.

Depletion of forest resources means that the ability of forests to deliver and sustain livelihoods is at risk and requires urgent attention. The consequences of unsustainable forest utilization and malpractices have social, economic and environmental dimensions. Economic consequences of forest depletion include limited supply of raw materials to the timber value chains, loss of foreign currency earnings the eventual destruction of forest business and loss of investor confidence. Some of the social consequences include the loss of jobs as company closures occur as well as the loss of a source of livelihood for vulnerable groups particularly those in the rural areas. Forest depletion also leads to environmental degradation through increased soil erosion, siltation of rivers and desertification among other effects.

Underlying factors affecting forest conversion include population growth, agricultural development, land tenure, and the governance of land-use change (FAO, 2016). Evidence has shown that tropical ecosystems in poor countries are facing the greatest threats of deforestation and this is mainly attributed to weak institutions and limited financial resources. Pressure on global forests is expected to increase with an increasing world population that is projected to rise from the current 7.6 billion to around 10 billion in 2050 in addition to a corresponding rise in global demand for food estimated to grow by 50 percent over that period. Nations of the world acknowledge that one of the global challenges will be how to increase agricultural production and improve food security without reducing forest area (FAO, 2018).

2.5 Forest governance and sustainable forest management

2.4.1 Institutionalization of afforestation in Zimbabwe

Various policies and regulatory frameworks are aiding Zimbabwe towards the achievement of the SFM. These include the international, regional, national and provincial frameworks both affecting the public and private sectors.

2.5.1 International and regional frameworks governing sustainable forest management in Zimbabwe

Zimbabwe is a signatory to various international and regional agreements and protocols on the environment. Key among them are the Convention on Biological Diversity; the United Nations Framework Convention on Climate Change; the United Nations Convention to Combating Desertification; the Non-Legally Binding Authoritative Statement of Principles for Global Consensus on the Management, Conservation and Sustainable Development of all Types of Forests (Forest Instrument); the Sustainable Development Goals; African Union Convention Article VIII on Vegetation Cover and the Southern African Development Community Protocol on Forestry. All these agreements have provisions that parties have committed to sustainable forest management.

Furthermore, in 2007 the United Nations (UN) General Assembly emphasized the need for more effective implementation of sustainable forest management at all levels to address challenges of continued deforestation and forest degradation, the slow rate of afforestation, and forest cover recovery and reforestation (UN 2008, Resolution 62/98). The need for sustainable management of forests has been placed high on the world's Agenda 2030 for Sustainable Development.

However, slow progress has generally been noted in the implementation of sustainable forest management worldwide, particularly in developing countries and this has been caused by limited capacity and lack of enabling conditions to implement SFM, particularly in developing countries. Other reasons have been cited as limited capacity and a lack of enabling conditions in addition to limited accessibility to a considerable body of existing knowledge on, and experiences in, the implementation of SFM.

2.5.2 National framework of sustainable forest management

At the national level, the Forest Act and the Communal Lands Forest Produce Act of 1987 are the laws that directly influence the management and utilisation of forest resources in Zimbabwe. The other ones such as the National Parks and Wildlife Act of 1975, amended 1982; Communal Land Act of 1982, amended 1985; the Rural District Councils Act of 1988; Land Acquisition Act of 1993; Mines and Minerals Act of 1996; and the Environmental Management Act of 2002 indirectly influence the management and utilisation of the forest resource.

However, despite having a host of these national frameworks, Zimbabwe has failed to achieve afforestation-set targets, further giving fuel to the argument that current frameworks for afforestation have failed. Zimbabwe has a relatively sound legal framework that lacks enforcement.

The UN (2008) review of the literature highlights that the institutional approach to the regulation of forestry suffers from conflicting interests with other regulations (see UN, 2008; Chimhou et al., 2010; Chigumira et al., 2019). According to Chigumira et al. (2019), Zimbabwe has a conflicting legal framework that also lacks enforcement. Timber Producers Federation (2018) cited a number of conflicts in the national legislation that the afforestation grappling with which include among others the Mines and Minerals Act vs. Forest Act where the former confers lands rights to the miner over the forester, Land Resettlement Act vs. Forest Act where land for afforestation is being converted into agricultural land (Government of Zimbabwe, 2016, TPF, 2018, Chigumira, 2019). This disharmony between policies has led to insufficiencies in the institutionalization and management of afforestation as a viable land-use option.

Though Zimbabwe is a signatory to numerous international and regional agreements and protocols on the environment (Government of Zimbabwe, 2016; Forestry Commission, 2018), weaknesses of the Forestry Commission, a body mandated with implementing the contents of the Forestry Act have negatively impacted on afforestation initiatives. Loss of experienced and competent staff to greener pastures (Chimhou et al., 2010; Chigumira et al., 2019) has led to widening skill gaps and loss in institutional memory (UN, 2008; Timber Producers Federation, 2018; FAO, 2015).

One may conclude that it is from these inequitable benefits of forestry that the general population has developed a negative attitude towards afforestation as an alternative land use option for

economic development. Communities continue to be regarded as the custodians of their community forests without notable benefits and, hence have failed to appreciate the benefits of afforestation.

Evidence suggests that institutionalization of afforestation has not been effective as publicly owned forest areas declined from 13,852,000 ha in 1990 to 9,868,000ha in 2015 (Chigumira et al., 2019) whilst privately owned forests declined from 8, 312,000 ha in 1990 to 5,756, 000ha in 2015 (FAO, 2015). Thus, it is inevitable to conclude that the institutionalization of afforestation has not been effective.

2.6 Afforestation and economic development.

Forests have been important to most human societies since time immemorial. Forests contribute to the livelihoods of many of the 1.2 billion people living in extreme poverty (Bala et al., 2007). Forests provide products of both social and economic value (see FAO, 2015). Forests provide global food security and resources, food, fodder, fuel, and medicine. However, the economic value of supporting and regulating these services provided by forests is not well-captured in the market and therefore always undervalued. However, despite these potential benefits, the exposure on the use of afforestation as an alternative land use for economic development has remained on the periphery of studies.

However, there exists a host of challenges that work against afforestation initiatives. Veld fires are a major threat to biodiversity (Nyamadzawo *et al* 2013). Each year, Zimbabwe loses an average of 900,000 ha to veld fires, most of them in resettlement areas. In 2010, the Forestry Commission reported that 79,000ha of protected indigenous forests were burnt. TPF (2018b) highlighted some of the causes of such veld fires in commercial plantations and these include smoking, honey harvesting, clearing of land for agriculture using fire with such results getting out of control and burning timber plantations, poachers who use fire to trap animals and most of all deliberate burning of the forests as a way of settling disputes.

Forests are not only susceptible to insect pests and diseases but to some extent, to invasive alien species as well. The invasive weed commonly known as Mupesepese and mostly prevalent in Chimanimani suppresses all other plant life wherever it is growing and is very difficult to eradicate (TPF, 2018b). Thus, it is threatening the establishment of not only plantation tree crops

but also crops thereby reducing the food security of the country. Despite the widespread occurrence of invasive alien species in Zimbabwe, there is no comprehensive data on plant and animal invasive species available but experts concur these species cause damage to forests, hence affecting afforestation projects as well.

Baboons and to a lesser extent monkeys have wreaked havoc to forest growth, particularly in timber plantations. The former destroys trees through bark stripping, ring barking, uprooting planted seedlings, and damaging tree tips (TPF, 2018b). Bark stripping often leads to growth retardation; mortality and tree deformation leading to yield reduction if left without control this damage can to a great extent negatively impact the viability of commercial timber (TPF, 2018b). In the plantations, emerging pests affecting eucalyptus trees include the bronze bug (*Thaumastocoris perigrinus*), Blue gum chalcid (*Leptocybe invasa*), and red gum lerp (*Glycospis brimblecombey*) (TPF, 2018b).

2.6.1 Productive functions of forest resources

The commercial timber industry is largely dominated by exotic plantations that mainly grow pine followed by eucalyptus trees. The indigenous hardwood timber industry is smaller and is based primarily on the extraction of the Zambezi teak and mukwa which are mainly found on Kalahari sands in north-western Zimbabwe (Government of Zimbabwe, 2014). Major wood products produced in Zimbabwe include sawn and processed timber; treated poles; veneer and plywood; particle and wattle extracts and charcoal. The country used to produce paper and paper products as well as match sticks but has since stopped owing to economic challenges.

Zimbabwe practices planned exploitation of Indigenous hardwood through concessions entered into between the timber consumers and the Forestry Commission. In the case of forests that are governed by Rural Districts Councils (RDCs) or those located in private farms, the Forestry Commission is charged with the duty of administering concessions entered into between timber players and RDCs or private farm owners. The concession specifies what is to be harvested, periodic limits either monthly or annually as well as how to remove the timber to protect the soil and other plants surrounding the harvested trees.

The productivity of the timber sector has declined significantly in recent years because of past overexploitation and degradation of the indigenous forests (Government of Zimbabwe, 2014).

The use of inappropriate harvesting techniques and poor post-crop harvest management of slush and burn that causes veld fires have also been documented (Government of Zimbabwe, 2014). Furthermore, non-timber forest products, such as honey and wild fruits, that provide safety nets for rural communities during drought years, are being increasingly commercialized resulting in unsustainable harvesting of forest products. Medicinal plant species have been unsustainably harvested with a few of the 500 known species now on the brink of extinction (Madzara 2013).

2.6.2 Protective functions of forest resources

Forests have protective functions for the environment such as water catchment protection; climate change mitigation through carbon sequestration; generating clean air; reduction of soil erosion and the risk of landslides, floods, and droughts, and prevent desertification and salinization (TPF, 2018b; FAO, 2018). Their unsustainable exploitation however jeopardizes them of delivering on this protective role. This leads to negative environmental impacts such as loss of habitats and biodiversity; less watershed protection (leading to increased soil erosion, siltation of rivers, and the disruption of hydrological systems), reduced availability of important forest products and services, and reduction in carbon sinks (Government of Zimbabwe, 2020).

2.6.3 Socio-economic functions

Forests and trees have important multiple functions and provide a wide range of forest goods and products that include fodder, medicines, timber, construction materials, foods, and firewood for energy. In Zimbabwe, 65 percent of households use wood as a main source of energy for cooking (Labour Force Survey, 2014). At its peak, in Zimbabwe, the forestry sector directly employed 14,445 people and over 40,000 indirectly in the downstream industries and contributed 3% to the Gross Domestic Product (GDP) (FAO, 2020).

Forest products are not only earmarked for the local market but are exported to the region and generate the much-needed foreign currency given the liquidity crunch the country is going through. In 2016 wood and articles of wood, wood charcoal exported by Zimbabwe (Harmonised Systems Code 44) raked in $23. 64 million in export revenue with Zambia, Botswana, South Africa, and Mozambique constituting 99.5% of the market share. Thus, from such statistics, one begins to see the potential of afforestation as an alternative land-use option for economic development

Rural communities have adopted alternative livelihood and income-generating activities through the sale of forest and non-forest products such as firewood trade, wild fruits to middlemen who resell them in the urban areas; honey production and caterpillar (i.e. Mopani worms) harvesting (Human Development Report, 2017). Another benefit Zimbabwe is enjoying from its forests is nature-based tourism. The sector is currently on a growth path and is expected to boost the tourism-induced economic growth.

2.7 Institutional frameworks that may be adopted to promote sustainable afforestation as an alternative land use for development

Evidence from the synthesis of literature points towards several strategies that have been used across the globe as stepping stones to sustainable afforestation development.

2.7.1 Public-private partnerships

In recent years, public-private partnerships (PPPs) have become central in the administration and success of afforestation projects (Chirwa, 20210. According ty combining resources, knowledge, and creativity from the public and private sectors, public-private partnerships (PPPs) are essential in advancing sustainable afforestation while also achieving financial and environmental objectives. This critical study will look at how PPPs help with sustainable afforestation, show instances of successful implementations, and offer recommendations on how Africa, especially Zimbabwe, may use PPPs for afforestation (Tshidzumba et al., 2018).

Evidence from several studies demonstrates that PPPs play a critical role in resource mobilization and attracting financial investment (Tshidzumba et al., 2022; Ngwenya et al., 2019; Mugabe et al., 2022). PPPs can raise large sums of money that are frequently beyond the reach of either public or private organizations acting alone. These collaborations combine the financial might of private businesses with the regulatory backing of governments to finance extensive afforestation initiatives. For instance, several PPPs have been used to assist finance and carry out restoration efforts as part of the Great Green Wall program in Africa, which seeks to repair 100 million hectares of damaged land by 2030 (GGW, 2020). Further, Private businesses frequently improve the efficacy and efficiency of afforestation initiatives by contributing technological innovation and management know-how. Innovative methods for managing forests and sequestering carbon have been made possible by The Nature Conservancy's (TNC) collaboration

with the private sector in the United States. These methods can be reproduced in other areas (TNC, 2018).

Market-based incentives for sustainable afforestation can be established through PPPs. For example, the Forest Stewardship Council (FSC) collaborates with governments and private businesses to advance certification requirements that support afforestation and sustainable forest management (FSC, 2021). PPPs encourage private investment in afforestation by establishing a market for certified sustainable products.

Good PPPs incorporate local communities in decision-making and execution, guaranteeing that afforestation initiatives satisfy local requirements and garner support from the community. The Australian Landcare program serves as an example of how local communities, the public and private sectors, and land management organizations may work together to adopt sustainable land management methods, such as afforestation (Landcare, 2019).

There a number of examples of Successful PPPs in Afforestation to date such as China's National Forest Protection Program. China's National Forest Protection Program has effectively used PPPs for afforestation. The Chinese government works with private businesses to restore degraded areas and increase the amount of forest cover. According to Zhao et al. (2019), this collaboration has significantly increased the amount of forest area and biodiversity. Another good example is Costa Rica's Payment for Ecosystem Services (PES) Program. One prominent example of a PPP that encourages afforestation and replanting is Costa Rica's PES program. The initiative compensates landowners for preserving and reestablishing forest ecosystems through a combination of public and private finance. According to Porras et al. (2016), this strategy has successfully expanded the amount of forest cover and enhanced environmental results. Thus, it can be concluded that Zimbabwe to develop sustainable afforestation should introduce PPPs.

However, it remains to be interrogated how communities are benefiting from these PPTs, with Tshidzimba et al (2022) of the opinion that communities especially in developing countries like South Africa and Malawi are not benefiting. Further, Ojwang (2009) also concluded that it has not been without criticism though for example that the social investment initiatives benefit the better qualified, locking out the poorer and less skilled (Ojwang, 2009). However, several studies found that the low socioeconomic status of the community beneficiaries (Chamberlain and

Anseeuw, 2017; Godsmark, 2010) and the institutional design of the partnership (Davis & Lahiff, 2011; Tshidzuma et al., 2022) were the primary causes of the failure of most land reform initiatives in South Africa. As a result of this pattern, the livelihood of community beneficiaries has either completely stagnated or developed slowly (Hall, 2009). Numerous scholars (Chirwa et al., 2015; Chamberlain &Anseeuw, 2017; Tshidzumba et al., 2018a) assert that elitism also seriously impedes rural development and fuels conflict. Evidence supporting this claim was provided by Tshidzumba et al. (2018a), who noted that the main reason for the absence of explicit benefit-sharing mechanisms in the FBLR PPP governance models is that they eventually lead to an unfair and unequal benefit accrual among community beneficiaries (Tshidzumba et al., 2018b). Thus, it remains to be tested and interrogated how such a framework would pan out in the Zimbabwean context.

Public-private partnerships combine financial resources, knowledge, and creativity to promote sustainable afforestation. Globally successful case studies show how PPPs can lead to major advancements in the restoration and management of forests. To effectively leverage public-private partnerships (PPPs), Zimbabwe and other African nations must fortify their institutional frameworks, improve capacity building, provide market incentives, and promote multi-stakeholder involvement. Zimbabwe can further its afforestation efforts and support more general environmental sustainability goals by putting these strategies into practice.

2.7.2 Strengthening Institutional Frameworks

Chirwa et al (2021) posit that strengthening institutional frameworks can lead to sustainable afforestation development. The general perception running in most studies is that Africa has good policies that lack implementation. Zimbabwe should focus on developing robust institutional frameworks that facilitate effective PPPs. Clear regulations and policies that define the roles and responsibilities of public and private partners can help streamline collaboration and enhance project outcomes (Munyanyi et al., 2020). Studies confirm that good forest governance is an essential ingredient for sustainable forest management (Counsell, 2009; Sekeleti, 2011; AFDB, 2018; FAO, 2020).

When talking about sustainable forest management, different academics have defined the word "forest governance" in different ways for decades. The Food and Agriculture Organization's (FAO) general description of forest governance will be used by the researcher in this thesis.

Forest governance, in the words of FAO (2022), is "the way in which people and organizations rule and regulate forests" (p. 10). As stated by the FAO (2022) on page 7, it encompasses "policy and planning, implementation, monitoring, and improvement, including the related legislative and institutional arrangements." Governments must take into account the five essential components of good governance—transparency, accountability, effectiveness, efficiency, justice or equity, and participation—in order to achieve good forest governance (FAO, 2021 p.10).

These pillars need to be combined with sound policies, institutional frameworks, decision-making processes, enforcement of governmental regulations, and adherence to them in order to provide better results (FAO, 2011). Given the overarching goal of this research, which is to evaluate the efficacy of Zimbabwe's forest policies, the FAO's description of forest governance serves as the foundation for the study's goals. In a similar vein, because this study employs a case study methodology, the FAO's explanation of forest governance offers a useful starting point for assessing the sustainable afforestation policies and initiatives put in place by the Zimbabwean government in the study's focal district, Mashonaland West Province.

2.7.3 Enhancing capacity building

Building the capacity of local institutions and communities is crucial for the success of PPPs in afforestation. In order for benefit-sharing methods to be effective, community education and capacity building are frequently necessary. The study emphasizes how crucial it is to provide local populations with the information and abilities they need to manage and profit from natural resources. To guarantee that communities can actively engage in and maintain afforestation activities, capacity building is crucial (Tshidzumba et al., 2018). Training programs and workshops can help stakeholders understand their roles and responsibilities within the partnership, leading to more effective project implementation (Chirwa et al., 2021).

Building capacity gives local stakeholders the tools they need to manage and carry out afforestation projects successfully, which is essential for the development of sustainable afforestation in developing nations. Many poor nations, particularly those in sections of Africa and Latin America, frequently lack the institutional infrastructure and technical know-how needed to carry out extensive afforestation projects. These nations may improve the ability of local communities, governmental institutions, and non-governmental organizations to organize, carry out, and manage afforestation projects by investing in capacity building, such as through

training programs, workshops, and educational efforts. The long-term sustainability of the initiatives is ensured by this investment in human capital, since local stakeholders are better suited to tackle the intricacies of forest management, including monitoring, evaluation, and adaptation to changing conditions (Munyanyi et al., 2020; Chirwa et al., 2021).

Moreover, increasing community ownership and involvement through capacity building is essential to the success of afforestation projects. Local communities are more likely to support and continue these projects when they are actively involved in the planning and decision-making processes. Positive social and environmental outcomes are more likely when afforestation initiatives are in line with local needs and objectives, which is another benefit of this involvement. Promising initiatives such as Australia's Landcare program and several community-based afforestation projects in Latin America demonstrate how enhancing local populations' capacity leads to more adaptive and resilient forest management techniques (Landcare, 2019; Porras et al., 2016). Thus, capacity building not only enhances technical and managerial capabilities but also strengthens community engagement, both of which are essential for achieving sustainable afforestation in developing countries.

2.7.4 Developing market incentives

Creating financial incentives that drive private investment and involvement in forest conservation initiatives is a critical tactic in the promotion of sustainable afforestation. Market-driven systems, like forest certification programs, payments for ecosystem services (PES), and carbon trading schemes, offer financial incentives to companies and landowners to start and continue afforestation projects. By combining private financial interests with environmental objectives, these incentives can make afforestation a viable business venture in addition to a conservation effort. For example, the Forest Stewardship Council (FSC) certification, which guarantees that certified forests are managed in accordance with strict environmental requirements, has successfully developed a market for sustainably managed forest products. This certification has led to increased investment in sustainable forest management practices and has supported afforestation efforts by providing financial returns for certified timber and non-timber products (FSC, 2021).

Furthermore, carbon trading programs have shown a great deal of promise for promoting sustainable afforestation. Through afforestation and reforestation initiatives, developing nation

projects are able to obtain carbon credits under the Kyoto Protocol's Clean Development Mechanism (CDM) in exchange for lowering emissions. One prominent instance is the Mongolian Forest and Biodiversity Project, which improved biodiversity and supported local livelihoods by using CDM credits to finance afforestation and reforestation activities (UNFCC, 2021). As an example of how market incentives may promote both environmental and economic advantages, the money received from the sale of carbon credits was crucial for continuing afforestation efforts and improving local infrastructure (UNFCCC, 2021). By creating economic value for ecosystem services and sustainable forest products, market incentives not only support the financial viability of afforestation projects but also help scale up efforts to address global deforestation and degradation challenges.

Zimbabwe could benefit from creating market-based incentives for afforestation. Initiatives such as carbon trading schemes and certification programs can attract private investment by offering financial rewards for sustainable practices. Establishing partnerships with international organizations and corporations can provide the necessary resources and expertise (Ngwenya et al., 2019).

2.7.5 Fostering multi-stakeholder engagement

Sustainable afforestation projects require multi-stakeholder participation to be successful because it guarantees that a range of viewpoints and interests are taken into account during project design and execution. Involving a range of stakeholders, including local communities, governmental bodies, non-governmental organizations (NGOs), and the corporate sector, can improve project legitimacy, promote cooperative problem-solving, and help match afforestation efforts with local needs. One example of the effectiveness of multi-stakeholder engagement is the Great Green Wall Initiative in Africa. This massive effort comprises cooperation between governments, international organizations, local communities, and corporate companies to repair 100 million hectares of degraded land. The project's reach and impact have expanded thanks to this inclusive strategy, which has also strengthened the project's responsiveness to local conditions and obstacles, boosting its sustainability (GGW, 2020).

However, competing interests and power disparities among stakeholders may make multi-stakeholder involvement less effective. Local communities' needs and rights may occasionally be eclipsed by dominating interests, producing less than ideal results. For example, in the case of

Ecuador's Yasuni-ITT Initiative, which sought to use international money to leverage oil revenue in order to maintain the Yasuni National Park, a lack of coordinated involvement among stakeholders resulted in disputes and delays to the project. The initiative eventually had difficulties in accomplishing its conservation goals, and local people felt marginalized (Martínez-Alier, 2018).In order to lessen these problems, it is critical to address power dynamics and guarantee equal participation, according to recent research (Reed, 2008).Fostering trust and attaining sustainable afforestation outcomes necessitates transparent methods, clear communication, and systems to balance interests in multi-stakeholder participation.

Engaging multiple stakeholders, including local communities, government agencies, and private companies, is essential for the success of afforestation projects. Zimbabwe should prioritize inclusive planning processes that involve all relevant parties in decision-making and project management (Mugabe et al., 2022). For sustainable afforestation, a long-term commitment from all stakeholders is necessary. The study suggests that both government and community members need to be committed to the ongoing management and development of forest resources. Short-term projects may not yield the desired outcomes if they lack sustained support and investment (Tshidzumba et al., 2018).

Further, studies emphasize that community involvement is crucial for the success of forest-based land reform models. Benefit-sharing mechanisms that are perceived as fair and inclusive lead to better community support and engagement. This supports the idea that equitable distribution of benefits from afforestation efforts is vital for long-term sustainability (Tshidzumba et al., 2018). The study highlights that the benefits from forest-based land reform models should extend beyond mere economic gains. Social benefits, such as improved local governance and enhanced community well-being, play a significant role in fostering positive attitudes toward afforestation projects. A multifaceted approach that addresses both economic and social aspects is recommended for sustainable afforestation (Tshidzumba et al., 2018).

The study by Tshidzumba et al. (2018) provides valuable insights into how benefit-sharing mechanisms influence community support for afforestation. The strategy of involving communities in benefit-sharing is promising as it aligns with the principles of social equity and participatory management. By addressing issues of fairness, economic and social benefits, and capacity building, the study highlights essential components for the success of afforestation

projects. However, the study also implies that while community perceptions are crucial, there might be challenges in implementing these mechanisms effectively. For instance, ensuring fairness and transparency requires robust governance structures and mechanisms, which might be lacking in some areas. Additionally, the emphasis on capacity building and education requires sustained investment and support from various stakeholders.

The strategy suggested by the study is aligned with broader principles of sustainable development, which emphasize the importance of involving local communities in resource management. This approach is supported by other literature, such as the work of Agrawal and Gibson (1999), which argues that local participation enhances the effectiveness and sustainability of resource management. Similarly, the findings are consistent with the principles outlined in the FAO's (2020) guidelines on community involvement in forest management.

2.8 Model for effective institutionalisation and management of afforestation

In light of the continued failure of afforestation programmes to achieve set policy targets past and present institutional management frameworks seem to have failed to provide lasting solutions. Several studies have evaluated the success of afforestation, applying a wide range of economic frameworks (see Lubowski, Plantinga, & Stavins, 2006; Nielsen, Plantinga, & Alig, 2014; Tian, Sohngen, Baker, Ohrel, & Fawcett, 2018). Studies reveal that the success of afforestation efforts in many countries particularly in developing countries has fallen way below policy targets (see Toma et al., 2004; Weyerhaeuser et al., 2005; Malezieux et al., 2009; Luedeling, 2016; Ryan, 2016; Nyikadzino, 2016; Matsvange et al., 2016; Lovell et al., 2017; Dupraz et al., 2019).

Evidence from content analysis of the literature reveals that, in the field of forest policy and management, there has often been a gap between the rhetoric, intentions, and the observed results in the field (see Blaikie & Springate-Baginski, 2007). As a consequence, the current rationale of supporting afforestation as an alternative land use for economic development has become anachronistic. A new rationale will have to be outlined to justify continued afforestation initiatives.

Vedung (2011) points out that, the issue of finding the most appropriate mix of policy tools to achieve a desired policy objective is crucial for policymakers. Therefore, it is useful to examine

the existing institutional management frameworks to provide a basis for the development of a suitable institutional management model for afforestation (see Bemelmans-Videc et al., 2011). Existing institutional management models for afforestation management seem to have continuously failed, hence the need to develop a model for institutionalization and management of afforestation as an alternative land use for economic development in the post-land reform era specifically in Zimbabwe.

Studies elsewhere indicate that context barriers hinder afforestation initiatives (see Ryan et al., 2008; 2016; Malone, 2008; Dhubhain, 2010). Malone (2008) outlines this complexity by listing common themes that impact levels of afforestation. The complexity of most countries relates also in part to an absence of a farm forestry tradition within agriculture. This translates into a lack of economic knowledge about the returns to afforestation and a lack of management expertise about appropriate management (silviculture) of forests (see Ryan, 2008; 2016).

These barriers are further compounded by evidence to indicate that where opportunities afforded by forestry development exist, these are very often overlooked or dismissed by farmers due to attitudinal factors such as emotional attachment to the land and/or negative attitudes around the perception of failure in farming (Malone 2008). Forestry has traditionally not been seen as an integral part of traditional agriculture and most farmers consider forestry only as an alternative land use for their worst land (Ní Dhubháin& Gardiner 1994). However, despite the negative uptake of afforestation as an alternative viable land use, afforestation is economically beneficial.

However, despite the presence of some studies on barriers to afforestation adoption as an alternative land use, no context-based study has been done using Zimbabwe as a laboratory. Zimbabwe remains a “black box”. Likely, attitudes towards afforestation as an alternative land use in the post-land reform era in Zimbabwe may bring a host of different perspectives.

2.9 The research gap

Despite a growing global focus on afforestation as an on-farm economic activity, afforestation adoption in Zimbabwe remains poor (Mudzonga, 2012; Chikodzi, 2018; Banda, 2020; World Bank, 2018). Zimbabwe has vast lands with potential for afforestation initiatives, however, most of these lands remain underutilised and untapped for afforestation initiatives. Only 5% of the total potential land for afforestation is under afforestation with estimates pointing out that the

total land that could be afforested is in the range of 10 to 20 million hectares, (FAO Global Forest Resources Assessment, 2020). Many afforestation programs initiated to address the problem of agriculturally unproductive land have stumbled along and eventually faded away (Gwaze &Marunda, 2014; Marufu, 2014; Nyikadzino, 2016). Policy-related challenges to markets, funding, extension service provision, and capacity building among others have remained hampering afforestation development. Current institutional and management regimes for afforestation have failed to measure up to policy expectations (Romanova et al., 2022; Ullar et al., 2023; Ofori et al., 2020; Ryan, 2016; Lovell et al., 2017; Dupraz et al., 2019). A close analysis of the focus of many studies conducted to date on afforestation as an alternative land-use option (Ryan, 2016; Lovell et al., 2017; Tian et al., 2018; Dupraz et al., 2019) reveals the existence of a gap in the model for sustainable afforestation. As a result, afforestation continues to fail to deliver the anticipated gains (Romanaova et al., 2022; Ofori et al., 2020; Wilson, 2016; Dupraz, 2019). Therefore, sought to develop a model for sustainable afforestation as an alternative land use option for economic development in Zimbabwe.

2.10 Chapter summary

A close analysis of the literature reveals that in the field of forest policy and management, there has often been a gap between the rhetoric, intentions, and observed results in the field. As a consequence, the current rationale of supporting afforestation as an alternative land use for economic development has become anachronistic. A new rationale will have to be outlined to justify continued afforestation initiatives. Zimbabwe's forests are depleting at an alarming rate of 330,000 ha per annum. Major drivers include agricultural expansion, unsustainable exploitation of fuel wood, infrastructural developments, uncontrolled fires, mining, invasive alien species, and climate change. Population rise and prolonged economic hardships will continue to exert pressure on forestry resources as people desperately turn to it for alternative sources of livelihood. In response to this level of forestry depletion, the country is implementing several initiatives such as the national Tree Planting Day, school tree growing and tree care competitions, and also at special commemorations such as International Forest Day, World Environment Day, and so on. However, these efforts are not matching the forest resource loss as evidenced by a loss of 60 million trees per annum against a planned planting program of 15,000 trees per year. This points to gaps in the country's efforts to achieve sustainable afforestation as

an alternative land-use option for economic development. The theories that have been adopted in this study have been chosen in such a way as to complement each other and mitigate the weaknesses of the other. Much emphasis is placed on the Theory of Structuration which has been chosen as the overarching theory not because it illuminates most of the thematic concerns of the research study. Other micro-level theories will be exploited to explain the various sub-themes.

CHAPTER THREE

THEORETICAL FRAMEWORK

3.0 Introduction

Theories in this study are the lens that facilitates our understanding of the processes, issues, and forces at play in the phenomena under investigation. According to Gabriel (2008) in Kivunja (2018:45) a theory is a generalised statement of abstractions or ideas that asserts, explains, or predicts relationships or connections between or among phenomena, within the limits of critical bounding assumptions that the theory explicitly makes". Noteworthy is that all the three definitions above place emphasis on the aspects of `prediction' and `explaining'. An additional and invaluable insight comes from Wacker (1998:361) who in part of his definition observes that theory "is needed for the applicability to practical real-world problems".

After capturing the voices above to assist us in our understanding of the concept of theory, it is therefore necessary to turn to the purpose of this chapter. This chapter seeks to establish theories that help to "explain processes" (Ostrom, 1999) and the relationship between and among observed phenomena in the development of a model for sustainable afforestation as an alternative land use for economic development. The theoretical framework is the blueprint for the study and acts as a foundation upon which a study is constructed (Adorn, Hussein &Agyem, 2018). It entails the application of related theories to shed some light on the phenomenon under study and in social research, no one theory adequately answers the research questions (Imenda, 2014). This study derived illumination from a variety of interdisciplinary theories. To develop a model for sustainable afforestation as an alternative land use option for development in Zimbabwe, a theoretical framework comprises a constellation of the following theories Theory of Structuration (TS), The Stakeholder Theory (ST), The Expectancy Theory (ET), Land Rent Theory (LRT), Forest Transition Theory (FTT) and Sustainability of Livelihoods Framework (SLF), and have been adopted. The use of multiple related theories enhances the researcher's understanding of the phenomenon under study and helps to increase the validity of the findings (Ngulube, Mathipa& Gumbo, 2015).

Although each of these theories has explanatory validity in the proposed study, the majority of the theories cited above fall short in scope in terms of illuminating all the phenomena 'under investigation. Hence, most of these theories could be regarded as having mid-range explanatory validity. They apply only to specific themes under study. After a critical analysis of all the 'theoretical jackets' above, the Theory of Structuration emerged as overarching, with attributes that give it explanatory validity to all the major themes covered by this study. Its significance is overarching as it helps to explain the inter- playing factors that determine land use and decision-making in land use.The approach adopted in this chapter is to pick on each of the theories adduced above and lay bare its basic tenets first then follow up with a brief discussion on the use value of the theory in question to the study at hand: What model would be suitable for sustainable afforestation as an alternative land use option for economic development in Zimbabwe?The point of departure in this thrust is the Theory of Structuration.'

3.1 Theory of structuration (Giddens, Antony, 1984)

Social practices such as land use and land-use change are influenced by structure as well as by individual agents' actions. Essentially, the theory helps us to understand the behavior and decision-making process of farmers towards afforestation. The theory states that farmers' behavior and decision-making are influenced by structural as well as individual farmer factors. The section below explores the theory of structuration in detail to comprehend its applicability in this study.

The Structuration theory, developed by Anthony Giddens (Giddens, 1976; 1979; 1984), provides a sociological perspective to analyse human behavior in a specific context. It acknowledges that human behavior is constrained and enabled by institutional factors, called the structures, while at the same time accepting the notion that humans have the power to behave in another way (Jones & Karsten, 2008). Instead of a dualistic view where social phenomena can be explained either by properties of society or human actions, structuration theory sees these phenomena as a duality of structures (Jones & Karsten, 2008).

Giddens (1984, p. 25) defines structures as the "rules and resources organised as properties of social systems." Rules, he argues, are "techniques or generalizable procedures applied in the enactment/reproduction of social practices" (Giddens, 1984, p. 21). Humans draw on these

generalizable rules in their social activities to understand and legitimate their own and other's actions. This does not imply that actors have to understand the meaning of these rules or that they can describe the underlying principle. The rules simply help them to know how 'to go on' in certain situations (Jones & Karsten, 2008). Resources are described by Giddens (1984, p. 25) as a "transformative capacity generating commands" over objects and people. This transformative capacity implies that action is essential for something to be regarded as a resource. So even though material goods may have a real existence (such as land, goods, and money), only in the process of structuration do they become resources (Giddens, 1984, p. 33). Structures, seen as the abstract aspect of social systems, have no material aspects and are not situated in time and space (Orlikowski & Robey, 1991).

The second concept of structuration theory is agency. Giddens (1984) sees agents as human beings who are knowledgeable and capable of acting. This strong voluntaristic view means that an agent always holds some amount of power in a power relationship. Even in a situation where an individual is subordinated, he holds power in the way that he can refuse to do something. This is what Giddens refers to as the dialectic of control (Whittington, 1992), and the reason why power relations for Giddens are a two-way street. This also means that at every moment of action from an agent, he can choose to act differently and thus choose to reproduce or change a structure, or even produce a new structure. Therefore, Giddens sees structures as both constraining, in the way that they structure how people 'go on' as well as enabling actors to act differently.

At the heart of structuration theory is Giddens' notion of the duality of structures. He sees "structural properties of social systems as both medium and outcome of the practices they recursively organise" (Giddens, 1984, p. 25). So human agents draw on structures for their actions while at the same time, these actions produce and reproduce these structures (Jones & Karsten, 2008). Or in other words "man actively shapes the world he lives in at the same time as it shapes him" (Giddens, 1982, p. 21). Giddens makes an analytical distinction of three dimensions of structures: signification, domination, and legitimation. Corresponding to these are the dimensions of interaction: communication, power, and sanction. The modalities (interpretive schemes, facilities, and norms) form the link between the structures and human interaction (Jones & Karsten, 2008). Human action and structures are composed of elements of each of the

three dimensions and are closely interlinked with each other (Jarzabkowski, 2008; Walsham, 2002).

The first dimension, signification, represents structures that people use to interpret human behavior and social events. They do this through the modality of interpretive schemes. These are standardised shared stocks of knowledge that actors draw upon to make sense of themselves and the world (Orlikowski & Robey, 1991). By communicating these meanings, they are shared among individuals which reproduces the structures of signification. Structures of domination, the second dimension, are linked with the action of power. As stated earlier, Giddens sees agents as having the ability to do otherwise and therefore they hold power. Power is not seen as a type of act (such as making people do something against their will) or as a stock of capital (such as land or money), but as a capability manifested in action (Jones & Karsten, 2008). In other words, humans have the power to transform the social and material world through their actions. This action is mediated by people's ability to allocate material and human resources (Ehrenhard et al., 2012).

The third dimension are structures of legitimation. Human beings sanction their and others' actions by drawing on norms of morality (Ehrenhard et al., 2012). These norms can be seen as rules or conventions that govern legitimate or appropriate behaviour. Structures of legitimation are not only guiding human behaviour, they are also an outcome of the continuous use of sanctions by agents in human actions (Orlikowski & Robey, 1991). People may draw on different structures in their actions or value similar structures differently than others. This in turn will lead to variations of modalities among individuals and ultimately will mean that people may act differently in similar situations. These dissimilarities in structures are a result of divergent modes of life (Giddens, 1984, p. 198).

Humans have different experiences, knowledge, cultural backgrounds, and roles. These can result in contradicting structures between individuals or groups and eventually lead to conflict (Giddens, 1984). Giddens sees conflict as the actual struggle between actors or groups that can be the result of contradicting structures (Walsham, 2002). He sees conflict as human action while contradiction is a structural concept. Contradiction does not mean per se that it will be acted out in the form of conflict. Only when actors feel that the differences affect them negatively and they are able and motivated to act on this, they will take action (Giddens, 1984; Walsham, 2002). For

example, Walsham's research (2002) shows that people act differently when faced with contradicting structures. In his case study, he saw that some individuals would accept a specific software application because it did not affect their day-to-day activities. Others would show forms of passive resistance by not using the new application, or action in the form of inaction.

3.1.1 Application of the theory

The theory can be applied to understand several themes from the study. The theory can be used to understand the forces that help shape the decision-making process of farmers. The policies and government assistance on afforestation can only be seen as resources when they are incorporated into the process of structuration. In other words, only when these are playing a role in promoting afforestation initiatives will they be regarded as creating value for the farmers. With structuration theory, the focus will shift from the material artifacts (such as policies, financial support, capital, etc.) to farmers' interactions with these material artifacts.

Giddens' theory helped to understand if and why people share different perspectives towards afforestation as an alternative land use. While structuration theory accepts that human behavior is constrained and enabled by social structures, at the same time it emphasizes the power of the individual to 'act differently'. This means that humans may draw on different structures in similar situations or value similar structures differently. In turn, this can result in different behavior. Structuration theory allows us to uncover these social structures that people draw on in their decision-making to either adopt or forego afforestation as an alternative land use option, thus the theory can help to explain variations in land use.

Finally, Giddens' theory states that social structures are both a medium and an outcome of human behavior (Giddens, 1984). And because humans have the power to act differently, there is always an opportunity for change. The relation between social structures and human behavior is mediated by the modalities of interpretive schemes, resources, and norms. By transforming these modalities, the structures and behaviors of farmers can be influenced. Structuration theory can show which modalities can the government reform to better align farmers towards viewing afforestation as an alternative land use.

3.2 Stakeholder theory (Edward Freeman, 1984)

The stakeholder theory states that every organisation has a moral responsibility toward all stakeholders. The traditional definition of a stakeholder is “any group or individual who canaffect or is affected by the achievement of the organization’s objectives” (Freeman1984). Every organization owes it to stakeholders to uphold moral principles. People who own stock in a business are not the only ones who stand to gain or lose when a business makes decisions. The underlying assumption in this theory is that organisations as well as individuals possess moral status and therefore should act in a morally responsible manner. Thus, principally this theory helped in illuminating the role of the community in the success or failures of afforestation initiatives. To fully comprehend how this theory was used, there is a need to explore the theory in detail. The section below unpacks the Stakeholder Theory.

The Stakeholder Theory (ST) was conceptualized by Freeman (1984) The theory is an organisational management and business ethics theory that serves to determine who and what matters in the relationship between organisations and those who hold an interest in an organisation. The theory posits that successful strategies are those that cater to the perceptions and interests of all organisational stakeholders (see Byrd, 2007; Nicholas et al., 2009). Thus, the theory can be said to be primarily a theory of management of organisations focused on the ethical responsibilities of organisations (Freeman, Harrison, Wicks, Parmar & de Colle, 2012). One of the basic tenets of the theory is that when an organisation operates, it has a social contract with its stakeholders, hence there is a need to appreciate all stakeholders in the running of the organisation (see Dabphet, 2013). Thus, the theory makes explicit reference to organisational ethical responsibilities to all those who stand to be affected by the operations of an organisation (Enyinna, 2013). The theory focuses on the relationship that exists between an organisation and its stakeholders, ST regards the interests of all stakeholder groups to be of intrinsic value and no set of interests is assumed to dominate the others (Maiden, 2008).Unlike agency theory, stakeholder theory assumes that managers are accountable to all stakeholders (Chen and Roberts, 2010). The above explanation implies that the firm has to protect the interests of different stakeholders, including shareholders (Clarke, 1998; Solomon, 2010).

The above explanation implies that the firm has to protect the interests of different stakeholders, including shareholders (Clarke, 1998; Solomon, 2010). Nonetheless, stakeholders' expectations

of an organisation differ. The theory entails the recognition of stakeholders and their relationships with the organisation which should lead to implicitly value-and-moral-laden results. It is a foundation for the stakeholder salience models and recognizes all people or entities who are socially impacted or impact the organisation (Burga &Rezania, 2016). The main purpose of ST is to help managers understand their stakeholder' environments and manage more effectively within the terms of the relationships that exist for their companies thereby improving the value of the consequences of their activities and minimise the harm to the stakeholders (Nwanji& Howell, 2004).

There are several assumptions underlying stakeholder theory. First, corporations should be operated not only for the financial benefit of their owners but also for the interests of the relevant broader society (Mitchel! et al., 1997; Chen & Roberts, 2010). Second, executive directors are equally accountable to all stakeholders, not only the firm's owners and creditors but also, other corporate stakeholders, such as employees, government, local community, customers, and suppliers (Clarke, 1998). Third, stakeholder theory is strongly connected to notions of morality in business and corporate social responsibility (Letza et al., 2004; Westphal & Zajac, 2013).

One of the challenges with using the theory lies in defining who constitutes a stakeholder. The definition of stakeholder may vary over time and from author to author (Nogueira & Pinho, 2014). A stakeholder, according to Freeman (1984), is any person or group able to influence or be influenced by the activities of an organisation. Hence, ST identifies stakeholders based on the attributes of urgency, power, and legitimacy. Power is the ability of an individual or group to impose its will in the relationship while legitimacy refers to the assumption that the actions of an entity are in line with norms and values. Urgency is the degree to which stakeholder claims deserve immediate attention (Abdulla, 2013). Unlike agency theory, stakeholder theory assumes that managers are accountable to all stakeholders (Chen & Roberts, 2010). If a stakeholder does not have the above 3 attributes, then is not worth considering (Burga &Rezania, 2016). The ST assumes organisations take care of stakeholders who have urgency, power, and legitimacy.

In this study, the local communities are the most critical stakeholders. ST, therefore, describes the perceptions and interests of different stakeholders that must be recognised for the sustainable development of a project (Byrd, 2007). Their interests should not only be viewed as an end in itself or recognised but also comprehended in all their facets (Geiger, 2017). The assumption

underlying ST is that the afforestation project should create and distribute value to all stakeholders according to their needs and at the same time coordinate their interests (Nicolaides, 2015; Geiger, 2017). The Stakeholder Theory posits that the value generated by the afforestation project must be shared by all stakeholders in society that may have an interest in the afforestation initiative (Theodoulidis, Diaz, Crotto &Rancati, 2017). However, the local community support and participation in afforestation initiatives may vary because of their heterogeneity in perceptions of the benefits of such initiatives (Easterling, 2005).

Nicolaides (2015) posits that the ST has three dimensions which are normative, instrumental, and descriptive. The normative dimension which is the primary core of ST requires fair and morally acceptable behaviour towards stakeholders by organisations. From this perspective, full appreciation of all stakeholders with an interest in afforestation should be taken into account regardless of the level of interest and power held. The descriptive view among other things, analyses what managers do concerning managing diverse stakeholders (Nicolaides, 2015; Kristiana & Nathalia, 2017).

Stakeholder theorists argue that organisations should be governed by those affected by their decisions and activities. They suggest that there should be decision-making structures in place that allow those affected by the decisions to participate. The ST is based on fundamental legal principles and beliefs that promote overall social good and responsibility (Sheehy, 2005). Under this theory, the rights and interests of all stakeholders should be determined exogenously because the theory has broader obligations to society than just the payment of taxes. Usually, it is the locals who should be prioritised before the circle widens to national interests (Ambler & Wilson, 2006). Conversely, the theory has attracted some criticism.

Although stakeholder theory has been widely embedded in governance codes (Aguilera and Cuervo-Cazurra, 2009), it has been criticized from two perspectives (Sternberg, 1997): (i) the assumptions of stakeholder theory conflict with the central objective of the firm as seeking to maximise the wealth of shareholders; and (ii) it also conflicts with the agent-principal relationship, which suggests that managers are primarily accountable to shareholders. As such, stakeholder theory is arguably incompatible with the basic principles of corporate governance. Nevertheless, stakeholder theory remains a key corporate governance theory (Solomon, 2010; Chen & Roberts, 2010).

However, despite its applicability in this study, the ST has been criticized for several inconsistencies. The reductionist tendency to reduce the ST into normative, instrumental, and descriptive theoretical realms is not only inappropriate but unproductive. The normative and instrumental branches of ST have since diverged so substantially that it may not be possible to reunite the two (Mainardes et al., 2011; Laplume, Sonpar& Litz, 2008). ST's normative status is far from clear, the problem lies in the ambiguity inherent in the theory's intent. Literature shows that the theory is fundamentally strategic and only incidentally normative and its conception of morality is hypothetical instead of being prescriptive. This makes ST morally irrelevant because the morality expressed in the theory is based on a philosophical pragmatism that is focused on strategic ends (Enyinna, 2013). The absence of a rigorous normative underpinning leads to other theoretical ambiguities such as the problem of stakeholder identification. This lack of consensus about the normative basis for applying ST has led some critics to doubt the existence of a unified ST.

The ST's normative core is not consistent with the focal organization's unchallenged power to manage and failure to acknowledge the priority of the natural environment among the firm's stakeholders (Maiden, 2008). The ST, therefore, cannot be considered a moral challenge to the shareholder theory of the firm. It is argued that as long as the organisation's objectives address the interests of its shareholders, then the Stakeholder Theory is an indirect approach to Shareholder Theory. The theory further claims that the interests of all stakeholders have intrinsic value and should not be weighted equally. However, the theory does not provide any explanation as to how such claims can be weighted, which interests should be given priority over others, and why (Mansell, 2009). Because ST fails to address natural environmental ethics, Laplume, Sonpar, and Litz (2008) suggest that the theory should be abandoned.

In another criticism, ST has been blamed for attempting to reduce human behavior to the simple assumptions necessary to make descriptive theory of this type meaningful. Yet human behavior is very complex and has elements of both irrationality and rationality. Opportunism and simple self-interest represent only one facet of human behavioral instincts. There is no consistency in human behavior as behavioral tendencies are rather varied and malleable (Jones & Wicks, 1999).

One of the prominent criticisms of Stakeholder Theory is that it is impractical to manage all those stakeholders' interests. Despite its widespread intellectual acceptance, ST has been

criticized for its ambiguity and vagueness in the identification of stakeholders and management of their interests (Freeman et al., 2012; Burga &Rezania, 2016). The theory's ambiguity is apparent in the management of stakeholder's interests. It is difficult for the management of the focal organisation to determine one stakeholder interest that will meet the firm's objectives and the interests of all its stakeholders. Stakeholder groups may have competed and conflicting interests among themselves leaving managers with a theory that makes it impossible for them to make purposeful decisions and to be accountable for their actions. The problem of determining stakeholders and theirs interests gets worse as their interests change rapidly in response to fast global change (Nwanji& Howell, 2004).

Consequently, the theory has waxed and waned in popularity. ST is unworkable because the number of stakeholders is infinite and there is no means of balancing the competing interests of infinite stakeholders as demanded by stakeholder theorists. An attempt to be equally accountable to all results is being accountable to none (Sheehy, 2005). Abler and Wilson (2006) have warned that if an organisation tries to satisfy all people it becomes unmanageable because there won't be clarity on how benefits are distributed and how stakeholders' interests are identified and protected. Ultimately, ST, like any other model is a synthesized representation and a social construction that inevitably simplifies and reduces reality (Fassin, 2008; Kristiana & Nathalia, 2017). For example, the theory tends to oversimplify the complexity of interactions that take place in the web of stakeholder relationships. In this broader network of stakeholder relationships, the focal organisation does not simply respond to each stakeholder individually as assumed by the theory. It is a network of interactions and influences in which the organisation's stakeholders also have direct relationships with each other. The theory further overlooks the fact that the focal organisation is also a stakeholder of other focal points in the system and is not even at the center of this broader network (Maiden, 2008). The theory is devoid of scientific thoroughness in its propositions; hence it is unable to explain the multi-faceted relations that exist between the organisation and its stakeholders (Mainardes et al., 2011).

Another weakness of this theory is that it assumes that members in a stakeholder category are homogenous yet in reality there is intra-stakeholder heterogeneity. Apart from that, most individuals are likely to belong to more than one stakeholder group at the same time. Fassin (2008) and Kristiana and Nathalia (2017) concur that if the interest of one primary stakeholder

group cannot be identified, the whole process becomes a failure. It is not practical to accurately identify the interests of a big heterogeneous stakeholder group, yet ST assumes it is possible to identify all stakeholders and treat them with fairness and generosity (Harrison, Freeman & Sa de Abreu, 2015). It is practically impossible to provide value equally to all stakeholders. ST fails to provide some criteria even on how the stakeholder groups should be selected (Mainardes et al., 2011).

The empirical validity of some major assumptions of ST has not yet been established because some critics argue that the theory is still under-theorized and under-researched and it remains contested since it challenges the conventional assumption that organizations are preoccupied with profit maximization. However, other critics believe that ST has been so over-researched that there are no more new insights that are theoretically significant (Laplume et al., 2008).

One of the inherent weaknesses of ST is that it always refers to economic value maximization because it still believes that the organization can only meet the needs of society economically. Yet the inclusion of stakeholders in the organisation's value creation process generates conflicting interests and compromises the firm's performance. Hence, ST in this regard is perceived as undermining the market economy principles (Narbel& Muff, 2017).

The measurement of 'stakes' in the traditional Shareholder Theory is relatively objective and quantitative. But in the ST which includes all variables, it becomes impossible to measure or compare the 'stakes'. Moreover, the benefit distribution criteria are not clear and also how power is provided to protect their interests is unspecified. In the current global village, ST is not specific about which society's interests are protected and where boundaries lie. The challenge lies in giving benefits and rights to stakeholders who neither participate nor contribute (Abler & Wilson, 2006).

Moreover, stakeholder reciprocity seems to be an important issue that has not been addressed yet in ST (Fassin, 2008; Kristiana & Nathalia, 2017). Although ST is flawed, it remains appropriate for this study (Ambler & Wilson, 2006). ST provides a practical and ethical way to run an organization in a very dynamic environment. Stakeholders get value from the organisation pay back by showing positive attitudes towards the organisation as ST provides the opportunity to reinterpret the stakeholder environment from a variety of new perspectives (Harrison et al., 2015). ST's strength lies in its focus on ethics. It is vital to discuss some social issues that have to

do with critical societal conflicts (Burga &Rezania, 2016). The theory has made a significant contribution to classical thinking (Ambler & Wilson, 2006). It sets out an appropriate theoretical framework for analyzing afforestation adoption and management since project success requires achieving an optimal level of social consensus.

The success of ST is mainly due to the inherent simplicity and clarity of the model's powerful synthesised visual conceptualization. Although in the past years some, scholars have complained of its ambiguity, the theory provides a means of combining ethical questions with complex operational environments and encapsulating details within a general vision. Hence the theory remains a rather good approximation of reality although it has generated controversy in literature and business contexts (Mainardes et al., 2011; Fassin, 2008). Any effort towards ensuring a steady growth of tourism without involving stakeholder principles is a flawed approach (Ali, Halis & Halis, 2017).

Despite the debate, ST is a valuable, effective, and systematic approach for identifying stakeholders, their attributes, and relationships in the afforestation initiatives and describing their motivations for participation and support (Byrd, 2007; Charmaz, 2018). The theory has provided fodder and a battleground for those who believe in incorporating the needs and interests of all participants (Maiden, 2008). Even detractors of the theory, have acknowledged its ability to tap into the deep emotional commitment of most individuals to the family and tribe (Laplume et al., 2008). ST has been developed as a system of voluntary exchange for individuals within a capitalist economy (Parmar, Freeman, Harrison, Wicks, Purnell & De Colle, 2010).

Despite the criticisms that the Stakeholder Theory has received in the market, it has great value in illuminating role configuration in this study focusing on the development of a model for sustainable afforestation as an alternative land-use for economic development. Freeman (1984) defines stakeholders as a wide range of individuals and groups who can affect or are affected by corporate activities. Principally, this theory helps shed light on the spectrum of stakeholders, and the role they are playing and should be playing, for the efficient development of sustainable afforestation in Zimbabwe. The theory persuades the researcher to take into account the critical parties that should be involved in planning and actioning the development of sustainable afforestation as an alternative land use for economic development in Zimbabwe.

3.3 The expectancy theory (Victor, H. Vroom, 1964)

The Expectancy Theory by Vroom (1964) states that behavioural motivation is based on desired goal (expectancy) or reward (instrumentality) or if the effort is worth it (valence). Motivation to behave in a certain way is based on the expectation that the effort will result in a desired goal (Vroom, 1964). This theory was used to illustrate the motives of farmers in participating in afforestation. This theory in this study is a micro-level theory that affords us a lens to understand what motivates the farmers to behave in the way they do.

One of the assumptions of the Expectancy Theory is that people make decisions among alternative plans of behavior based on their perceptions [expectancies] of the degree to which a given behavior will lead to desired outcomes. Typically, the theory has been used much in understanding the relationship between employees and employers in organisations in employment relations transactions such as payment for services rendered occur between employers [providers of reward and recognition] and employees [service providers] (Dawson, 1993). As a result, those who are viewed to be productive get the rewards while those who are identified not to be productive and competitive are pushed out of the system (Hemming, 1980).

The theory highlights that there is a subtle link between expectancy, effort, productivity, and reward. Werner (2002, p.335) states that a person will exert a high effort if he/she believes there is a reasonable probability that the effort will lead to the attainment of his/her personal goals. If this is the case, one would thus conclude that if afforestation offers better rewards, farmers would forego other land use options for afforestation. One may argue that inadequate monetary benefits may lead to discontentment and disenchantment that are illustrated by a preference for other land use options than afforestation.

This motivational theory assisted us in understanding the expectations of farmers and how these expectations drive them to behave in certain ways. However, human behavior is said here to be rational as they consider the value of the outcome (valence) as compared to the costs. Principally the theory was used to illustrate the motives of farmers in participating in afforestation initiatives.

3.4 Forest transition theory (A.S. Mather)

This theory was introduced by A. S. Mather (1992). Originally, he developed this idea based on a basic sequence of natural resource destruction and conservation or the depletion- melioration model proposed by Whitaker (1940) and Friedrich (1904 in Whitaker, 1940). This model argues that, at an early stage, natural resource destruction is inevitable to meet human needs. Rising demand and price of natural resources will incentivize people to conserve and restore their natural resources. Forest transition theory focuses more on the temporal changing of forest cover or a change in forest cover trend over time (Lambin &Meyfroidt, 2010). Another simple understanding of this concept is the change in forest cover from shrinking to expanding forest areas (Mather, 1992) or shifting from deforestation to reforestation (Lambin &Meyfroidt, 2010; Mather &Needle, 1998). Transition happens when the declining forest cover trend reverses into an increasing forest cover trend (Angelsen, 2009).

By examining the pattern of forest transition from different countries and regions, Barbier et al. (2010) reveal that there is a delay time from declining to increasing trend of forest cover. The aforementioned authors argue that delaying reforestation occurs when people still keep utilizing logged-over forest marginal land for farming, especially in the case of agricultural subsistence. In the context of commercial purposes, tree planting on marginal land may be delayed because of the delay of market signal. Moreover, a recent study shows a more complex pattern in which forest transition may exhibit multiple transition phases (Yeo & Huang, 2013).

This theory was used to understand the factors (market signals) that motivate farmers to consider afforestation as an alternative land use. Literature posits that forest transition theory is driven by underlying factors from outside forestry sectors. After forest resources are extracted to meet human needs, scarcer forests will induce higher prices of forest products, including amenity, and environmental and aesthetic values of forests. The forest sector will respond to this market incentive through reforestation or afforestation. Still categorized under this path is the tree-based land use intensification path, when the driving force, market incentive, motivates people to plant high-yield tree crops, such as fruit, agroforestry, garden, and so forth (Rudel et al., 2005).

After extracting forest resources for development, generally, economic development generates off-farm opportunity jobs that, in turn, will attract rural people off of their land- economic activities (Rudel et al., 2005). Rural labor scarcity will induce reforestation or land conversion

from agriculture into forestland uses. Furthermore, development could also develop better agricultural technology and agricultural intensification. This circumstance will push agricultural activities limited to the most suitable area, and then reforestation may have more land to take place. Concentration of agricultural activities only in marginal land can be possible as the consequence of higher agricultural input prices and/or lower agricultural output prices.

Government, which is an important stakeholder in land-use development plays a crucial role in changing land-use options. Since the government owns most forests, the government has a strong political authority and policy to promote and/or de-promote afforestation. Reforestation and afforestation programs in many countries should be accredited for the government's political will as well. Yeo and Huang (2013) recognize a new path, the forest management policy path, when the government plays an important part in stirring forest transition. Globalization makes it possible for rural areas to export their forest products to global markets. Poor people migrating from rural to urban leave more marginal land to be converted into forest (Mather, 2007). Conversely, from-city-to-rural migration by wealthier people raises demands for aesthetic and environmental services provided by forests in rural areas. Global integration enables international organisations to disseminate environmental efforts and ideas globally.

Several recent studies apply forest transition theory to analyze land use or forest cover changes in different scales. At the sub-national level, Yeo and Huang (2013) explore a long-term pattern of forest transition in Mississippi. At the national level, this approach is a focus of some studies, including Hostert et al. (2011) and Bae et al. (2012). The former study was conducted in the Soviet context, which experienced two different disturbances political change and nuclear hazards. The authors conclude that the effects of socio-politic-economic disturbances (political change) are tremendously as significant as the disturbance of technology (nuclear hazard). By analyzing the case of the development of urban forest in South Korea, a high economic growth country, the latter study concludes that government policy can play an important role in transforming land cover towards a higher forest cover.

At the regional level, a study by Munteanu et al. (2014) shows how the shifts in social-demographic and institutional factors can drive the pattern of forest transition in the Carpathian region (Eastern and Central Europe). At the global level, by exploring across-country data during 1990-2010, Kothke et al. (2013) confirm that global forest transition has been taking place at the

global level, sending a uniform pattern of forest decline. For the sake of the academic field, the forest transition approach can explain the extent of two important issues, forest cover and deforestation, over time. Another prominent position of this theory is that it can be associated with other explanatory variables. Accordingly, policymakers can derive some policy alternatives from this theory. Generally, two principal policy directions can be derived, which are policies to halt deforestation and policies to accelerate the transition toward increasing forest cover through afforestation (Lambin &Meyfroidt, 2010). Nevertheless, in the field, an effective way of promoting forest cover highly depends on the competition of values among different land uses (Barbier et al., 2010).

3.5 Land rent theory

The land rent approach is deeply rooted in the land value framework developed by von Thunen in 1826. The core idea of this spatial economic theory of land use is that a piece of land should be allocated to the use that would generate the highest potential rent (Chomitz& Gray, 1996; von Amsberg, 1994). Spatially, distance or transportation cost has an important position in this land use competition. In summary, by assuming profit maximization motivation, competition among land uses will be determined by which land use yields the highest land rent/value.

Adopting this theory for the forestry sector, some scholars developed its theoretical explanation (Chomitz& Gray, 1996; Schneider, 1995; Walker, 2004). The key to explaining changes in land uses and land cover is changes in land rent of different uses (Angelsen, 2007; Hyde et al., 1996). Particularly, forests could be conserved when land use for forest can generate the maximum value compared to other possible land uses. On the other side, reforestation could be encouraged in a given land if its land use for being reforested can compete with other land uses. In the case of competition between agriculture and forest land uses, forest land use will start to take place in the location (dotted line) where land rent of forest is higher than that of agriculture.

Generally, land rent could refer to rents, profits, or utility (Walker, 2004). This value can be seen in a dynamic perspective. Taking an example of the land competition between agricultural and forest land uses, land rents for agricultural use or forest use may change. Shifts in agricultural land rent might be attributed to changes in agricultural output prices, agricultural input prices, agro-ecological conditions, agricultural technology, labor wages, or transportation costs. While,

forest land rent might be altered due to changes in forest product price, forest technology, or economic incentive introduction (Angelsen, 2007). The latter variable, the economic compensation mechanism in the forest sector, is the most recent discussion in climate change negotiation is REDD+ (reducing emissions from deforestation and forest degradation). In this notion, economic compensation can work to change the land rent inducing land use change for a favorable purpose. In the context of reducing deforestation, REDD+ is a proposed economic mechanism to compensate landholder to conserve their forest or to incentivize them to reforest their land. Shortly, it is the opportunity costs of forgone economic benefits from other alternative land uses to avoid deforestation (Ahrends et al., 2010).

The land rent theory provides a basic explanation of how land uses change spatially (Angelsen, 2007). This theory allows scholars to investigate how the landscape is determined by location. Furthermore, under this theory, to what extent the spatial pattern of forest exploitation will be (Ahrends et al., 2010) can be examined. For decision-makers, the main policy implication under this approach is to change the composition of land rent in such a way that forest areas can be protected and/or reforestation can be feasibly promoted.

Currently, the land rent theory has gained interest in several studies. Distance (to Trans- Amazon Highway) plays an important role for smallholders in the Amazon Basin in land allocation decisions (Caldas et al., 2007), which is proven by a negative sign of deforestation in the distance. Regarding the relationship between distance to the capital and forest loss, similar standing is found in the Tanzania case (Ahrends et al., 2010) and Indonesia case (Busch et al., 2012). In Costa Rica, Robalino and Pfaff (2013) reveal that such payment for environmental service mechanisms can potentially avoid deforestation by approximately 1 percent per year. A similar mechanism is the interest of Barua et al. (2012) concluding that, by combining it with the taxation of cash crops and forestry income, carbon payment can be an effective way to prevent forest clearing in Paraguay. Not only for developing country context, the land rent concept is also used in the case of deforestation and urbanization in developed countries, such as South Korea (Cho et al., 2014).

Essentially, this theory was used to understand land-use decision-making amongst farmers/landowners. The theory states that people give preference to land use that gives them the highest returns. Therefore, the theory also helped to understand motivating factors for land-use

determination as well as inform stakeholders in afforestation on what should be done to improve the appeal of sustainable afforestation and encourage its adoption.

3.6 Sustainable livelihood framework

Sustainable Livelihood Framework (SLF) is based on one key concept of sustainable livelihoods and forms the major part of the theoretical framework of the study. A livelihood comprises assets, capabilities, and activities needed for survival. Sustainability is achieved when it can cope with stress and shocks (Department for International Development, 1999). The approach postulates that the impact on livelihoods should be assessed in terms of livelihood outcomes, resources and strategies, and also context (Ellis, 2000). Context refers to a diversity of micro conditions and social trends that form the wide context for people's livelihoods. Livelihood resources refer to inputs to a livelihood system. Transforming structures and processes influence the transformation of resources into livelihood strategies and examples of outcomes are empowerment and reduced vulnerability (Ellis, 2000). Local community's access to the livelihood capital (human, social, financial, natural, and physical) is influenced by the vulnerability context (shocks, conflicts, natural disasters, and political instability) and political institutions and processes (Massoud, Issa, El- Fadel & Jamali, 2016).

The SLF focuses very much on how people organise their lives and is regarded as an analytical structure for the complexity of poor rural livelihoods, factors, and types of interventions (de Haan, 2012). It is particularly concerned with how the poor and vulnerable groups survive in the context of risk and stress (Sakdapolrak, 2014). This theoretical approach goes beyond individuals and its core is the assessment of five assets that the community may hold. Consequently, the theory has emerged as a research tool that enables adaptations that will make current livelihoods less susceptible to social and economic stresses (Edwards, Sharma-Wallace, Barnard, Velarde, Warmenhoven, Fitzgerald, Harrison, Garrett, Porou &Pohatu, 2018).

The theory aims to reflect the complex range of assets and activities on which people depend for their livelihoods and provide a framework for addressing the whole range of policy issues and institutional processes at various levels relevant to the poor. Its major focus is on sustainability and a people-centred and participatory approach responsive to changing circumstances which enables it to deal with the dynamic dimensions of poverty (Norton & Foster, 2001). The

framework provides a more accurate basis for evaluating the socio- economic impact of poverty-alleviation projects than a one-dimensional productivity or income criteria (Krantz, 2001). The key aim of SLF is eradicating poverty by putting livelihoods at the center of development efforts and recognising that poverty 1s multidimensional and- complex, hence requires diversified and dynamic actions (Kebe & Muir, 2008; Valdes-Rodriguez & Perez-Vazquez, 2011).

One of the fundamental issues of SLF is that it advocates for an intervention that is based on evidence rather than imposed by the authority with insufficient knowledge of the situation in the community. However, the theory acknowledges that other factors affect the nature of interventions and policies (Morse, McNamara &Acholo, 2009). This is because the theory puts people at the center and considers their well-being as the core of sustainable development (Acha-Anyi &Dlamini, 2019). The preoccupation of the theory is seeking explanations for how various people live and what informs their choices in life (Levine, 2014). The theory adopts a holistic approach in ambition and scope to get a whole picture of what makes living in certain contexts viable (McLean, 2015). The framework seeks to drive home the notion that quality of life means much more than material welfare in terms of income, yield, or even health (de Haan, 2012).

The SLF has its share of limitations. To exemplify, the influence of vulnerability context tends to be underplayed in the theory coupled with an oversimplification of reality which might lead to the exclusion of ethos and values of the community (Bennett, 2010). The holistic aspect of the theory inevitably leads to a flood of information difficult to deal with, in some situations, the livelihood enhancement of a specific group may impact negatively on the livelihoods of others, leading to a normative dilemma on priorities. Hence, SLF remains a simplification of the multidimensional reality of livelihoods (GLOPP, 2008).

On the one hand, the SLF might be credited for capturing the complexity of development problems and rural poor livelihoods, but on the other hand, it might be compromising focus, depth, and analytical clarity (Tefera, 2014). Moreover, though influential and useful, SLF is conceptually sophisticated and too complicated as a research tool and its effectiveness is largely hinged on the availability of data on capital assets (Levine, 2014; Apine, Turner, Rodwell & Bhatta, 2019). One of the challenges of SLF as reported in the literature is that one of the overlaps that make policy in general more evidence- based (Morse et al., 2009). On the contrary, the theory has been applauded for being more people-based, yet this particular aspect makes it

complex and messy as it tends to mean anything and everything that determines human interactions and exchanges (Sarkar & Sinha, 2015). However, Mensah (2012) maintains that the framework is not comprehensive enough in its conceptualisation of households to be of much value in the development context.

The conceptualisation of livelihood with emphasis on material aspects and analysis of livelihoods in neo-liberal terms of economic investments and gains reduces livelihood to the mobilisation and deployment of social and organisational resources for the pursuit of economic and environmental goals (de Haan, 2012). The assets are also perceived in a very economistic and materialistic way which neglects the relational, socially embedded, and contested nature of assets (Sakdapolrak, 2014). But poverty is not necessarily a matter of income or material well-being, many livelihood strategies are in fact efforts to address both social and material goals. This tendency to focus on material assets underplays the importance of institutions and policies. SLF is not specific on how capital assets can be analyzed and measured and how the relationships among assets may change as time goes on. The overall concept of livelihood is ethnocentric and, therefore is not easily translatable into livelihood interventions to alleviate poverty although it tends to offer a comprehensive analytical tool (Hautala, 2013; Levine, 2014; Mdee, 2002).

The theory's guidance to unpacking macro-micro linkages is not strong probably because the institutions, policies, and processes box is too packed to an extent that the meaning gets obscured. It is, therefore, argued that political capital be included in the framework (Norton & Foster, 2001; Mdee, 2002). While the theory assumes that the policy framework is capable of changing the livelihoods of the poor for the better, the process is complicated because informal structures of social dominance and power within communities influence people's access to resources. These inequities are hardly visible to outsiders hence any community participatory opportunity is often grabbed by the local elite (Krantz, 2001).

The SLF claims to link micro with macro in the livelihood perspective. The theory is not compatible with the real world. It caters across sectors yet in the real world, the public and private sectors operate on a sectoral basis. Therefore, its claim of linking macro with micro realities leaves a lot to be desired. (Njole, 2011). Bias towards the locals is regarded as one of the weaknesses of the SLF because the livelihoods perspective needs to include global-local

interactions in the analysis. The theory should include how the global is contested and molded locally and how local communities create localities and shape the global space. In this way, a livelihood analysis can capture the complexities of poor people's livelihood systems together with, the diverse and severe impacts of globalisation (Hautala, 2013).

Sustainable livelihood which is the primary concept is explicitly conceptualised in the theory and this makes the framework too weak for robust critical conclusions (Mensah, 2012). The livelihoods thinking major challenges lie in the conceptualisation of livelihood mediation processes and the understanding of the link between livelihoods opportunities and decision-making (Wong, 2015). Moreover, the capability to leverage opportunities, handle conflicts, and question the rules of the game is not addressed by SLF (Sarkar & Sinha, 2015). The major criticism of this theory in this study is that it is not all that useful when it is applied to measure impact, track changes, establish causes of changes, and account for different levels of impact in terms of short and long-term, direct and indirect impacts (Van Rijn, Burger & den Seider, 2012). Some critics have berated the theory for failing to explain how global environmental change will affect poor rural livelihoods in the future since climate change's impact on livelihood strategies is becoming increasingly significant (Hautala, 2013). Mdee (2002), therefore, argues that the theory is insufficiently dynamic.

The theory further assumes that the poor always make rational choices in the construction of their livelihoods. This assumption is too simplistic to answer many questions. The theory views the poor as strategic managers who are capable of making strategic livelihood decisions within a given context. By viewing livelihoods as an outcome of rational decision, this perspective overlooks a lot of potential complexities and contradictions which makes it clear that the theory has not been sufficiently tested (Mdee, 2002). SLF is again accused of adopting a simplistic view of social capital by overlooking the negative side of social capital, whereby an opportunity to participate is often hijacked by the elites (Mdee, 2002). Social capital in this framework is glorified as an asset for survival and security. Yet it is the type of social capital that matters most. It is usually the informal networks that are sustained through reciprocity that bear fruits and not those maintained through authority. This implies that social capital can benefit one group at the expense of another (Banks, 2015).

In the structure of the SLF, people are invisible especially women (Mdee, 2002). The framework is criticized for not paying much attention to women. It is argued that women are deprived of their right to voice their concerns on important matters. The theory, therefore, fails to unveil gender inequalities in decision-making and opportunities within households. This implies that poor women might be noticed only if they head households. Otherwise, they remain economically vulnerable even if they are part of rich households. Regarding the household as the only unit of analysis without disaggregating into men, women, and age groups is another form of oversimplification of reality (Krantz, 2001).

However, the SLF is appropriate for this study because it advocates for afforestation to be included in the broader portfolio of livelihood options available in most rural areas (Su, Wall, Wang & Jin, 2019). Fundamentally, the SLF is a framework that helps us to identify and analyse local communities' assets, risks, and factors that affect their daily lives. In this way, it explores how livelihood outcomes and assets are affected by different strategies (Apine, Turner, Rodwell & Bhatta, 2019). SLF is an appropriate approach for evidence-based development initiatives in which resources are limited. This represents a significant step forward in development thinking that development projects should be informed by relevant research with a holistic perspective (Morse et al., 2009).

Indeed, the framework is regarded as an improvement in refocusing on the needs of the poor. This holistic perspective of livelihoods enhances our understanding of how various livelihood strategies contribute to poverty reduction (Mdee, 2002; Nyathi et al., 2018). Despite other scholars' criticism, the SLF makes sustainability concepts clear and acknowledges the complexity of rural livelihoods. The concept of sustainable livelihoods is critical because it unpacks the complexity of the connections between livelihood strategies and contexts. The theory helps to identify development initiatives that build capital assets, decrease vulnerability, and enhance resource access (Mdee, 2002; Kebe & Muir, 2008). Because of its strong normative framing in rural development, the most pressing constraints and opportunities are explored, regardless of where people are (Leu, Ericksson & Muller, 2018; Hautala, 2013).

The SLF has also attracted critiques for its perceived rigidity and inability to address embedded power relations but remains comprehensive and adaptable. Despite a barrage of criticisms, it has managed to maintain the primary livelihood perspective (Levine, 2014; McLean, 2015). The

theory has made a significant contribution to development thinking by putting more emphasis on poverty reduction (Mensah, 2012). Sarkar & Sinha (2015) have hailed it as a problem-solving mechanism that is suitably contextualised to local conditions.

Furthermore, the SLF is compatible with the acclaimed bottom-up approach and represents a practical toolkit for analysing afforestation impacts on livelihoods (Massoud et al., 2016; Cavlek, Ladkin& Willis, 2017). The SLF adopts a holistic view of rural poor's lives and this makes it very relevant for the study in rural villages of Zimbabwe where it will be used to analyze the complex livelihoods of the rural fanning communities (Chambers &Conwayc, 1992; Lee, 2008). A holistic approach to livelihoods became necessary in which a wealth of dimensions such as cultural, social, economic, and political are included in the analysis for a better understanding of the complexity of livelihoods (de Haan, 2012).

Since there is an issue of poverty highlighted in the research problem, this approach is rural-poor-people-centered and helps in understanding the complexes of the livelihoods of the rural-poor people and how afforestation could impact their livelihoods (Srijuntrapun, 2012; Su, Sun, Min &Jiao, 2018; World Commission on Environment and Development [WCED], 1987a). In that regard, SLF enhances understanding of how marginalised groups make their living under adverse conditions (Sakdapolrak, 2014). The perspective helps broaden the scope of analysis to a wide range of livelihood impacts to portray better the more complex reality of poor people's concerns and aspirations (Ashley, 2000). The strength of the theory lies in the fact that it places the main focus on the poor, by involving them, respecting their opinions, and allowing them to define their strength, potentials, and goals. It focuses explicitly on short- and long-term changes and provides a clear and practical perspective on how to alleviate poverty in a sustainable way in which the poorest are practically involved in the decision-making process that shapes their livelihoods (GLOPP, 2008; Krantz, 2001).

Thus, this theory was used to understand people's decision in considering afforestation as an alternative land use for economic development. The theory goes on further to assess the impact of afforestation on community livelihoods. Thus, the theory can be said to be a macro-level theory that considers the benefits emanating from afforestation and their impacts on changing livelihoods of the farmers.

3.7 Chapter summary

The above combination of theories is needed for theoretical triangulation. However, the challenge of combining theories is complicated by the concept of the incommensurability of theories. That is there is no basis for comparing and understanding theoretical perspectives. These six theories closely complement each other and the decision to arrive at the six theories is informed by the research questions and their corresponding theories.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.0 Introduction

This chapter focuses on the research methodology adopted to address the research objectives and to answer the following main research question: What model would be suitable for sustainable afforestation as an alternative land use option for economic development in Zimbabwe? Specifically, the chapter focuses on the methodological and philosophical approaches, sampling, data collection techniques, data organization, ethical considerations, and validity and reliability. It also explains the data analysis methods to be used, the presentation methods, research instruments, and data reliability and validity as well as the ethical considerations adhered to during the study and after. The study proposed an interpretivism methodology approach because the nature of the data required was qualitative.

4.1 Ontology

There are three distinct positions by which knowledge in the social world can be constructed, that is realism, materialism, and idealism (Aspers & Corte, 2019). In this study, the researcher adopted the idealistic point of view which states that reality is only knowable through the minds of respondents and is socially constructed. This worldview borders well with qualitative studies that seek to uncover how human beings give meaning to their everyday experiences (Chinyere & Eze, 2023; Cresswel &Poth, 2018). The ontology justifies the existence of nature, that is the 'nature of reality' (Cresswell &Poth, 2018).

4.2 Research philosophy

The grounding of this study was laid in the interpretivism paradigm using the interpretive phenomenology approach. Brierley (2017) is of the view that interpretivism infers working with subjective meanings that already exist in the social world; that is, to acknowledge their existence, reconstruct them, understand them, avoid distorting them, to use them as building blocks in theorizing. The interpretive paradigm through phenomenology was used because it provides the

researcher with the correct framework to advance the study goal of exploring shared meanings to build insights and a profound comprehension (Silverman, 2014:6) in the development of a model for sustainable afforestation as an alternative land use option for development in Zimbabwe by collecting pre-dominantly qualitative data. The interpretive case phenomenology approach was deemed fit for the study as it helped to comprehend and interpret the participant experiences.

The fact that this study used a different case approach the researcher was able to deduce the narratives provided by the participants about the development of a model for sustainable afforestation as an alternative land use option for development in Zimbabwe. Chinyere and Eze (2023) buttressed the aforementioned sentiments by saying the purpose of research in interpretivism is comprehending and deducing everyday events, experiences, and social structures as well as the values people attached to these phenomena. This approach allowed the use of a framework that provided an unambiguous path of results; thus, the researcher had a basis for the interpretation of the findings.

Therefore, this study engaged phenomenology as the guiding principle as knowledge is going to be interpreted and construed from people's perspectives, and experiences which are also by nature, qualitative. The other reason the researcher had to settle for interpretivism and forego positivism is that the latter is not effective in understanding the significance of people and their actions whilst exploratory qualitative research encourages human interaction which gives much richer meanings to interpretations (Chinyere & Eze, 2023; Cresswel & Poth, 2018).

4.3 Methodological approach

More often than not, studies that seek to understand participants' lived experiences with a phenomenon adopt a methodological stance that is qualitative (Reiter, 2017; Boru, 2018; Zukauskus et al., 2018). Therefore, this study to develop a model for sustainable afforestation as an alternative land use option for development in Zimbabwe made use of a qualitative research methodology. Qualitative research studies are concerned with unearthing insights of great depth about a person's lifestyle, situations, and lived experiences (Boru, 2018).

Asiamah et al. (2017) and Ames (2019) are of the view that in a qualitative study, both descriptive and interpretive positions are legitimate and often overlap. As such reality is best accomplished within a natural setting where the researcher is deeply engaged with the

phenomenon of interest and where nothing is taken for granted (Ames et al., 2017a; 2019b; Zukauskas et al., 2018; Turner, Cardinal, & Burton, 2017). Interpretation thus depends on what the respondent says and the researcher's meaning-making. Therefore, this study adopted a similar stance to address the study's main research objective.

Using a qualitative approach made the researcher a key instrument as he had to guide the research through interaction with participants. A deeper meaning in the development of a model for sustainable afforestation as an alternative land use option for development in Zimbabwe as a phenomenon was sought through the interaction with participants. This opinion is supported by Creswell (2013) who believes that qualitative research is one in which the researcher seeks detailed and deeper information (perspectives) regarding a particular phenomenon.

However, by its very nature, the qualitative approach is more open to ambiguity and requires the identification of emergent key themes for its data to be organised, collated, and interpreted. As such reality is best accomplished within a natural setting where the researcher is deeply engaged with the phenomenon of interest and where nothing is taken for granted (Creswell & Clark, 2017). Qualitative research is justified in the sense that, it enables respondents to share their views on the development of a model for sustainable afforestation as an alternative land use option for development in Zimbabwe without interference from a set of frameworks. Thus, the qualitative approach was used to interrogate emergent issues relevant to the phenomenon under investigation to develop a model for sustainable afforestation as an alternative land use option for development in Zimbabwe.

4.4 Research design

Basically, for qualitative studies, there are three main types of research designs which are explanatory or casual, exploratory, and descriptive (Zukauskus et al., 2018; Boru, 2018). This study used exploratory and descriptive research designs. The rationale for adopting the exploratory and descriptive research design lies in that an exploratory research design is most ideal when dealing with emerging concepts characterized by a dearth of relevant literature as the design puts major emphasis on the discovery of new insights and ideas (Savelli & Mateus, 2019; Reiter, 2017). An exploratory research design is ideal when dealing with emerging concepts characterized by a dearth of relevant literature as the design puts major emphasis on the

discovery of new insights and ideas (Reiter, 2017). This kind of research design involves an explanation of scenarios and the involved variable. This then leads to a description of the subject matter and this is done through a literature review and interviewing experts in the research area.

This kind of research design helped the researcher as it involved an explanation of various insights that are critical in the development of a model for sustainable afforestation as an alternative land use option for development in Zimbabwe. This was achieved by interrogating the stakeholders' views towards the phenomena in question. Thus, the study adopted an exploratory research design because it is more concerned with exploring or identifying what happened, or what is happening.

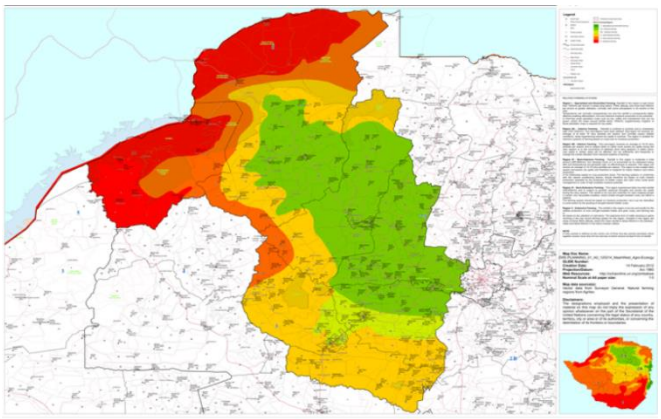
The major focus of the research study remained descriptive. The purpose of descriptive study is to provide a picture of a situation, person, or event or show how things, events, and processes are related to each other (Jilcha, 2019; Boru, 2018). Descriptive research design helped provide answers to the questions of what and others such as who, when, where, and how associated with the problem under interrogation. It may not answer why but is used to obtain information concerning the current status of phenomena and to describe what exists concerning variables or conditions in a situation. Thus, the researcher chose descriptive research as it provides an accurate account of the characteristics of this particular group of respondents. Respondent verbatim quotes were used to make sense of the phenomenon under study.

4.5 Sampling

This section focuses on the sampling technique to be adopted.

4.5.1 Study area

The study was conducted in Mashonaland West. The map of Mashonaland West is shown below:



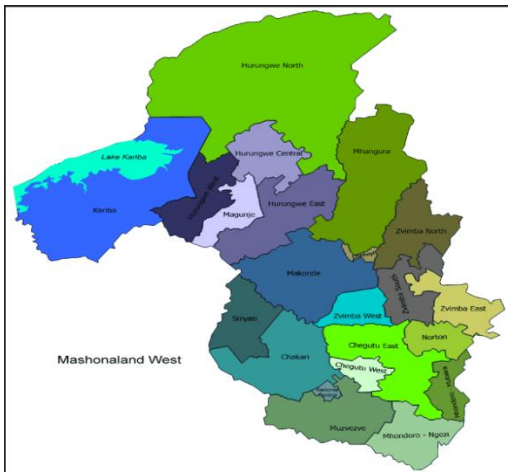


Figure 4.1: Mashonaland West Map

The areas shown on the map fall under Mashonaland West Province. The province has seven (7) administrative districts: Mhondoro Ngezi District, Kariba District, Chegutu District, Sanyati District, Zvimba District, Hurungwe District, and Makonde with a total area coverage of 57441 square km (Ministry of Lands, 2020). There are four different farming regions in Mashonaland West. Agro-ecological regions II-V are found in the different parts of Mashonaland West, which means all types of farming can be done in the province.

The rationale for selecting Mashonaland West lay in that the province with its seven (7) districts is home to several afforestation initiatives. There has been a gradual shift towards adopting afforestation in the province, hence the province was deemed a good case that would provide the needed data to address the main objective: What model would be suitable for sustainable

afforestation as an alternative land use option for economic development in Zimbabwe? Thus, curiosity for the study was generated in the province as the researcher lives in Mashonaland West and was aware of the current state of afforestation from incidental observations. Further, being the home of the researcher, the province was also selected due to considerations of costs and time.

4.5.2 Study Population

Srivastava and Thomson (2009) argue that a social phenomenon cannot be understood outside its context. In the same vein, the researcher thought it prudent to collect data from the Ministry of Lands and Agriculture (AREX and Forestry Commission), the Ministry of the Environment (EMA), the Ministry of Local Government, foresters, potential afforests, and local farmers. Interviewees were purposively selected.

4.5.2 Sampling Procedure

The current study made use of non-probability sampling in the form of a purposive sampling technique. Purposive sampling is commonly used for most qualitative and phenomenological studies (Lewin et al., 2018; Xyrichis et al., 2017; Toye et al., 2017). The main merit is that it is focused on specifically identified, characterized, and individualized elements hence less costly and less time consuming.

While purposive sampling is regarded as a generic approach to non-probability sampling, this study engaged a criterion-based sampling technique to isolate respondents of interest (Munabi-Bigumira et al., 2017). The criterion-based sampling technique assisted the researcher in selecting a group of respondents with shared experiences as recommended by Yuksel and Yildirim (2015). The selection process involved the identification of respondents based on a predetermined criterion that considers those with an understanding of the phenomenon under investigation(Ames et al 2019; Noyes et al., 2018). It was the researcher's role to decide on the suitability and the relevance of the respondent to the study as observed in Yuksel and Yildirim (2015).

4.5.3.1 Sample Frame

Table 3.2 below presents the study's sampling frame. After a sampling design is established by defining the target population, sampling frame, and sampling units, the sample size can be determined.

Table 3.1: Sampling frame

Data source	Sampling procedure	Sample size
Afforestors	Purposive	10
Officials	Purposive	10
Potential afforests (farmers/land owners)	Purposive	10

4.5.3 Sample Size

The total sample size for this study was 30. Such a sample size is commensurate with most qualitative studies (Vasikioun, 2018; Flynn, 2019). The sample size was adequate to allow for analytic generalization of results (Onwuegbuzzie& Collin 2007). Ganato, Araujo, and Jarvis (2013) contend that samples to taste should be sufficient for good-quality data. Generally, qualitative researches have smaller samples of usually 30 or less, while quantitative methods have larger samples of at least 50, to establish representativeness (Scott, et al, 2017; Rahi, 2017; Sharma, 2017). In addition, Gautterman (2015) resonances that sampling is not an issue of representative views, but an issue of information richness or appropriateness and adequacy.

Cohen et al. (2013) state that there is no clear-cut answer as to how large a sample for research should be. However, the size depends on the purpose of the study and the nature of the population under study (Malterud, 2016; Rijnsoever, 2017; Julius et al., 2018). Nastasi et al. (2010) posit that it is necessary to consider a larger sample size as it gives greater reliability.

4.6 Data sources

Primary and secondary data were the two data sources that were used in this study with primary data being used to a greater extent and secondary data being used as a supporting source.

Primary data was necessary as the study aims cannot be achieved through the minimal secondary data that the researcher may acquire from the literature. Secondary data sources such as journal articles, books, reports, newspapers, and government gazettes were used.

4.7 Data collection

This section focuses on how data was gathered.

4.7.1 Data Collection Techniques

This study used in-depth interviews and incidental observations. The study adopted two methods of data collection because the use of multiple data collection methods strengthens the credibility of outcomes and enables different interpretations and meanings to be included in the data analysis. The study made use of a semi-structured interview guide which was guided by the key variables of the study that is sustainable afforestation and economic development. The open-ended questions were formulated by the literature search done in Chapter Two. The interview guide was organized into three sections, namely: Section A which focused on the demographic data of the interviewees, with questions concerning the biographical data of interviewees/stakeholders who took part in this study to establish their different characteristics. The aspects captured under this section included the following: gender, age, organisation, position among some other relevant data. The second section was concerned about the interviewee's understanding of the conceptual issues involved. These include sustainable afforestation, sustainable development, and economic development. The purpose was to establish whether the respondents had an idea of the focus of the study. The third section focused on three specific objectives which were to: Establish the state of afforestation in Mashonaland West Province, Explore the perceptions of stakeholders towards afforestation as a sustainable alternative land use for economic development, and explore the institutional frameworks that may be adopted to promote sustainable afforestation as an alternative land use for development in Mashonaland West.

Before data collection, a pilot study was carried out. The researcher carried out a pilot study consisting of a small number of participants, in this case, 4 people were selected using the researchers' judgments. The argument for the pilot study is that it allowed the researcher to refine research questions or a set of questions, test whether the instrument can collect the

intended data, judge the time frame needed to conduct the interviews, and clarify ambiguous questions among other necessary changes that can be brought out by a pilot study.

The interview method was selected for the study because interviews allow the researcher a chance to elicit in-depth accounts from the participants (Barbour, 2014). This is unlike in quantitative approaches where the onus lies with the researcher to craft the instrument so that the maximum amount of precise information can be collected from the respondent as efficiently as possible. This means that failure to come up with a good instrument can cause wrong data to be collected. The interview technique is expected to allow the researcher to systematically collect information about the objects of study (people, objects, phenomena) and about the settings in which they occur as this helped in the analysis of data (Chinyere & Eze, 2023).

4.8 Data organization technique

This section focuses on how gathered data was organised, analysed, and presented.

4.8.1 Presentation of Data

Results from the analysis of data were presented in chapters 5-8 of the dissertation. Research questions guided the data presentation process. Data was presented in themes augmented by descriptions and explanations. Braun and Clarke (2014) suggest that data can be presented in terms of a storyline, a map, or a model, a table, or a figure. The emerging themes were networked into patterns and configured into thematic trees. Incidental observations from the field were used to augment findings. Data sources, research respondents' verbatim quotes, and the generated themes were used to provide an informed presentation. Coding was also usedto identify themes and patterns across themes.

4.8.2 Framework for Data Analysis

This study's framework for data analysis was adapted from the works of Srivastava and Hopwood (2009). Srivastava and Hopwood contend that in research, a framework for data analysis relates to the questions that one uses to address a research problem at hand. The scholars are of the view that iteration is important if one wants to gain meaningful insights from the data as it is useful in clarifying concepts. Srivastava and Hopwood argue that an answer to one research question also shapes the other questions to be addressed leading to the refinement of the major research question's focus and the integration of data. Thus, this study was guided by

different open-ended questions from the in-depth interviews which were augmented by incidental observations to fill in gaps identified during the literature review process. Figure 4.2 below shows the framework for data analysis.

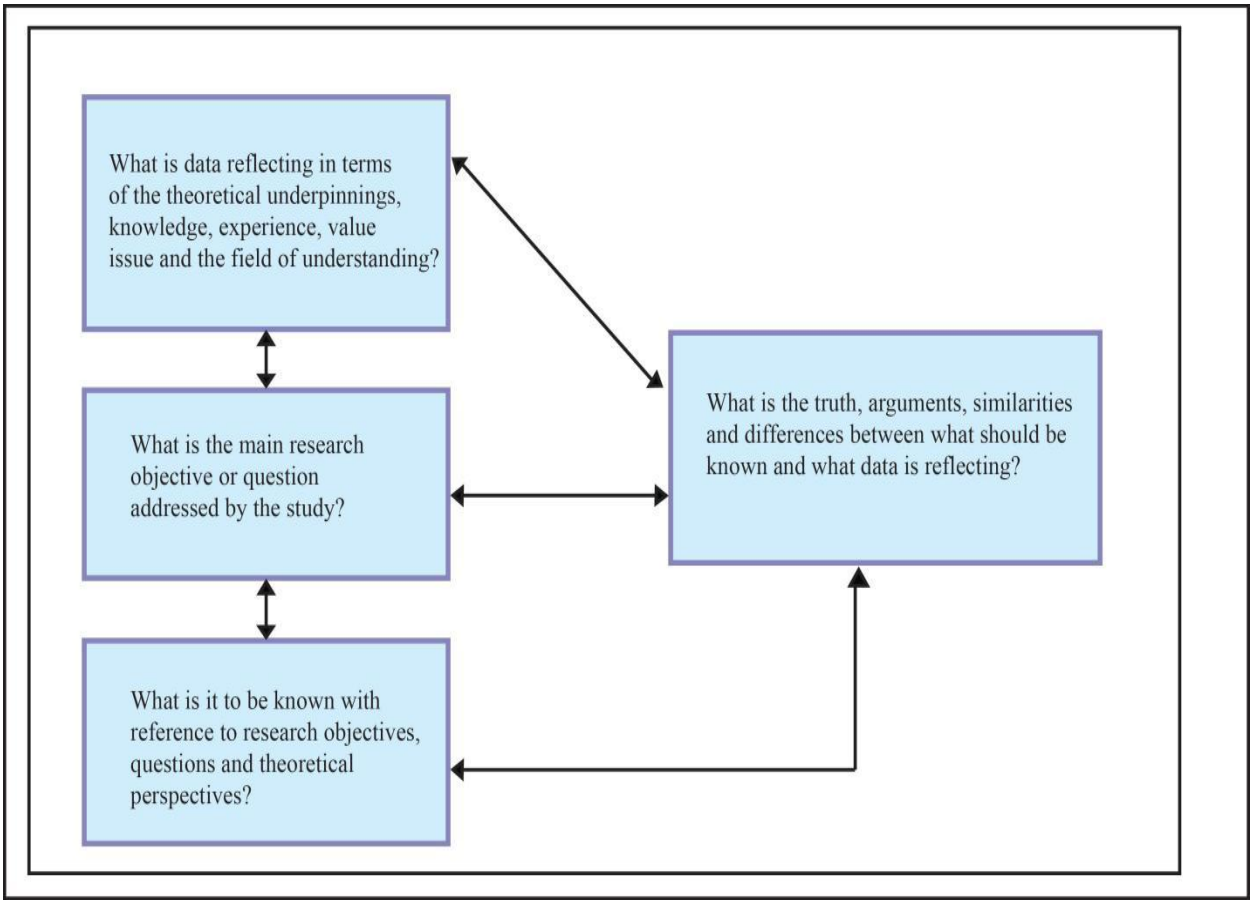


Figure 4.2 Adapted from Srivastava and Hopwood (2009)

The above framework was used as used in this study to guide the data analysis process. Four major questions were considered in this study's data analysis as indicated above.

4.8.3 Data Analysis Strategy

Thematic analysis was found to be an ideal strategy for data analysis in this study. The method was noted to possess variations and flexibility in its analysis process giving room for creativity (Braun & Clarke, 2014). The thematic analysis seeks to expose salient themes in textual data at diverse levels. Braun and Clark (2014) state that thematic analysis is an analysis process that involves the establishment of themes through reading and re-reading of recorded data resulting in

the identification of patterns within a data set. It is inductive hence it systematically connects text with content (Fereday & Muir-Coachrane, 2006).

Transcribed data was analysed for emergent themes from the respondents' statements to describe their related experiences. As a result, this study utilized the data analysis technique from Braun and Clarke (2006; 2012; 2013 & 2014) six phases of data analysis. Below is a summary of Braun and Clarke's stages of thematic data analysis.

Figure 4.3 below is a presentation of the six stages of Braun and Clarke's analysis process.

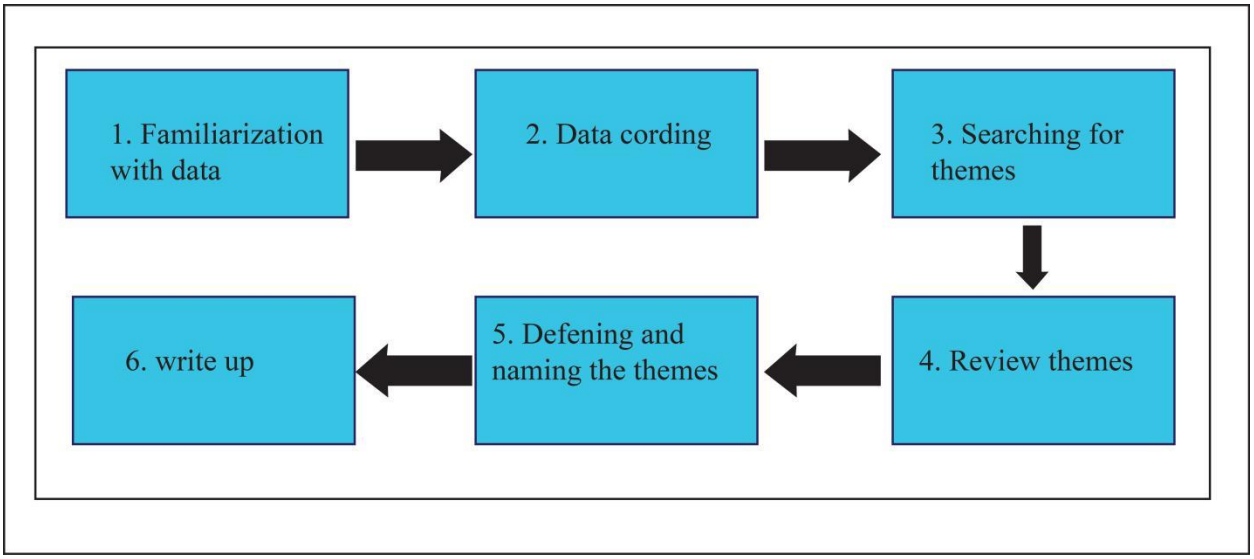


Figure 4.3 Six Stages for Thematic Analysis: Adapted from Braun and Clarke (2006)

After familiarisation with the data collected from participants axial and selective coding was utilized to comprehend the phenomenon under study. Axial coding considers the research objectives in the process. Selective coding allows the analyst to identify variable themes, and concepts, isolate relationships and patterns, identify similarities, and deduce differences for informed conclusions from data presented. Selective coding is data-driven coding and was adopted. Themes and sub-themes were generated in the process and were described to reveal their meaning and importance.

3.8.4 Data analysis

The purpose of data analysis is to obtain useful information that can be exploited to achieve the intended goals (Creswell, 2013). In simple terms, it is about what the collected data is reflecting

or reporting. Therefore, in this study data analysis is expected to illuminate the phenomenon under study. The analysis process was used to predict the results of the study and to identify apprehensible ways of presenting the findings as well as to conclude. Figure 4.4 below presents the qualitative data analysis strategy.

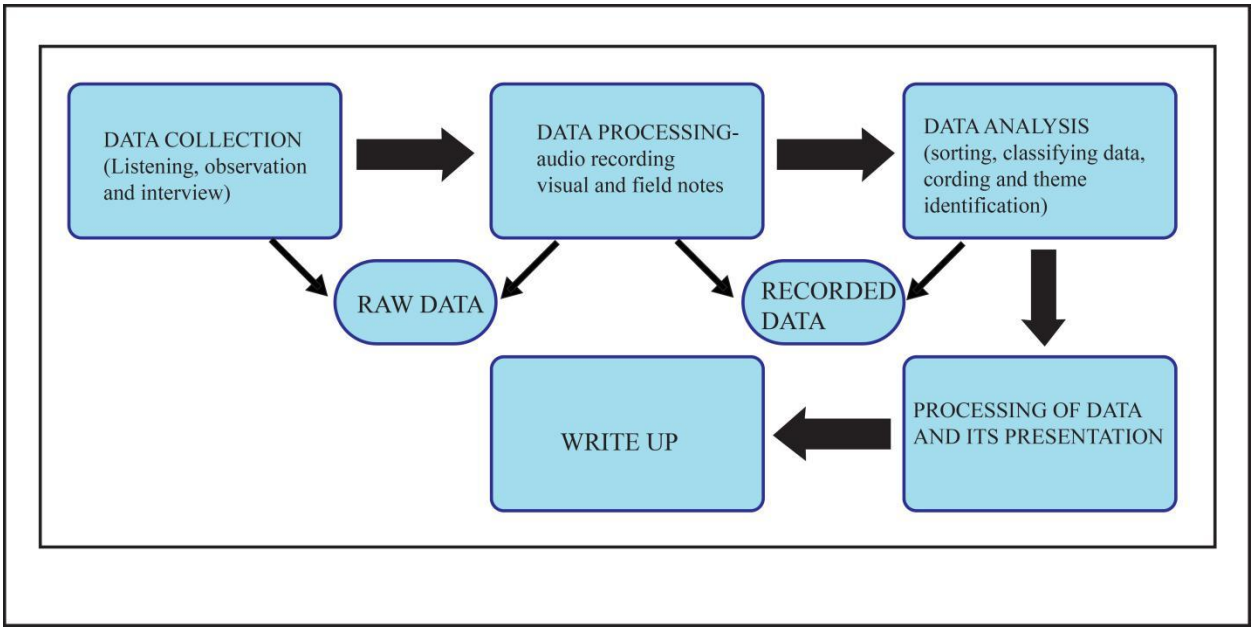


Figure 4.4 Qualitative data analysis steps

4.9 Ethical research

Research studies have to abide by a set of moral standards that ensures the dignity, safety, and social well-being of participants (Zschirnt, 2019; Kaewkunggwal, 2019). Ethics are a critical element to any standard research as research entails the gathering of information from people about people (Punch, 2013; Addissie et al., 2014). Permission before conducting the study was sought from all responsible authorities and boards in writing before data collection. The researcher observed and respected the participant's protection rights. As such, participants' identities were not to be exposed. No names were used except with the permission of the participants. In such cases, pseudonyms were used.

Participants were informed about the purpose of the study and how the findings were exploited before they were made to consent. Voluntary consent was sought before conducting the

interviews and observations. Stevens (2013) and Adams et al. (2014) posit that researchers should make sure that research participants are well informed of the research study's intended purpose, its aims, data collection methods to be employed, and the merits and demerits of participation in the study before they decide whether to participate or terminate the association prematurely.

The researcher also considered the scholarly ethical considerations for this study. The ethical code states that it is the responsibility of the researcher to accurately report and prevent misuse of research of research findings. Publication credit was given to those who contributed to the sources of the study. The researcher also gave credit to the original authors for their work which the researcher used in the study. This is because plagiarism is an academic offense. It violates the ethical principles of justice, fairness, and integrity.

4.10 Validity and reliability

Establishing the accuracy of qualitative research findings is not an easy task. However, there remain several ways in which the trustworthiness of qualitative research study findings can be enhanced. The trustworthiness (analogous validity, reliability, and neutrality in quantitative studies) of qualitative studies can be established through four strategies which are credibility, dependability, transferability, and conformability (Ndlovu, 2009).

4.10.1 Credibility

Credibility is defined as the extent to which collected data and the subsequent data analysis are trustworthy and plausible (Ndlovu, 2009). To achieve credibility triangulation of data was used. Research instruments such as interview guides and checklists were used to triangulate the collected data. The researcher also included the voices of participants in the data analysis and presentation.

4.10.2 Transferability

Transferability is equivalent to external validity in quantitative studies and refers to how research findings can be generalized to other contexts outside the actual study setting (Noble & Smith, 2015). To enhance the generalizability of the study findings, the researcher provided rich and thick descriptions by taking verbatim quotes from respondents' accounts to bolster the research findings (also see Noble & Smith, 2014). In presenting the results, the researcher defined the

criteria that were established to determine what the researcher meant by "sustainable afforestation as an alternative; land use option for economic development", provided noteworthy quotes from stakeholders who participated in the study, provided other information depending on the kind of research methods used (e.g. surveys, observation) and included possibilities for furthering this type of research. Readers are then able to assess for themselves how the researcher's observation might be transferable to other provinces in Zimbabwe.

4.10.3 Dependability

Dependability refers to the consistency of the findings of research over time (Bitsch, 2015). Cohen et al. (2013) posit that dependability entails participants' evaluative feedback on reported findings, interpretations, and conclusions. To satisfy the dependability of the research findings the researcher performed a thorough record-keeping of raw data and interview notes, documents, and any other records obtained from the research field. These documents will be kept for cross-checking the research process.

4.10.4 Triangulation

During the conduct of the study, the researcher used the investigator triangulation method to cross-check results. Agunis and Solarino (2017) argue that triangulation includes, data triangulation (from other sources), investigator triangulation (use of observers), and methodological triangulation (using multiple sample types and sources). Key informants were used to triangulate data received from the stakeholders.

4.11 Chapter summary

Chapter four presented methodological and philosophical issues to do with the present study. Justification for adopting the qualitative research methodology and the research design was provided. The chapter also discussed the study population and the sampling strategies used. Ethical issues to do with data collection were presented. The way data were managed was explained. Thematic Data analysis was adopted to derive themes and sub-themes using Braun and Clark's six stages of data analysis. The presentation of findings was highlighted and justified. The next chapter presents the findings from the study.

CHAPTER FIVE

ESTABLISHING THE STATE OF AFFORESTATION IN MASHONALAND WEST PROVINCE

5.0 Introduction

The primary objective of this study was to develop a model for sustainable afforestation as an alternative land-use option for development in Zimbabwe. Several specific objectives were established to guide the development of this model. The main research question guiding this study was: 'What model would be suitable for sustainable afforestation as an alternative land-use option for economic development in Zimbabwe? As this is the opening chapter presenting the first results, it is essential to restate the specific objectives of the study, which are as follows:

1. Establish the state of afforestation in Mashonaland West Province,

2. Explore the perceptions of stakeholders towards afforestation as sustainable alternative land use for economic development,

3. Explore the institutional frameworks that may be adopted to promote sustainable afforestation as an alternative land use for development in Mashonaland West and

4. Develop a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe.

This chapter focuses on addressing the first objective. Before presenting the findings, it is imperative to provide a brief overview of the respondent characteristics.

5.1 Demographic profiles of study respondents

In social science research, the personal characteristics of respondents significantly influence the data collected on specific themes. (see Guerard, Omachonu, Harvey, Hernandez & Sen, 2015; Huff & Tingley, 2015; Chuanh, Cheam, and Kadir, 2020). The demographic profiles of the interviewees in this study included sex, age, highest educational qualification, professional

qualification, and occupation. Tables 5.1 and 5.2 below summarize the profiles of the study interviewees. The tables present the participants (using pseudonyms) along with their bio-data.

Table 5.1: Participants' profiles (Pseudonyms)

Participant	Sex	Age	Educational background	Position held	Years in service (in the study area)
1. Brue	Male	40	MSc Agroforestry	Operations Director/Conservation and Extensions	15
2. Canie	Male	38	BSc Environmental Science	District Forestry Officer	10
3. Briana	Female	32	MSc Ecological Resources Management	Provincial Forestry Extension Manager	8
4. Lee	Male	33	BSc Environmental Science and Diploma in Forestry, Certificate in Plant Nursery Management	District Forestry Extension Officer	11

5.	Tea	Male	50	Msc in Crop Science	District Agritex Officer	17
6.	Pee	Female	54	MSc In Agriculture	Provincial Agritex Officer	34
7.	Cee	Male	53	BSc In Agriculture	District Agritex Officer	20
8.	Druek	Male	35	MSc in Crop Science	Agriculture Planning and Monitoring Officer	13
9.	Deonnr	Male	53	MSc Rural Development and food Security	Agriculture Extension Officer	29

Table 5.2: Participants' profiles (Pseudonyms) Farming Community

Participant		Sex	Age	Educational background	Position held	Number of years farming experience	Farm size/ha
1.	Honia	Male	46	MSc Development Studies	Rural District Council Officer	20	N/A
2.	Fredly	Male	62	MSc Strategic management	Farm Owner	15	125
3.	Cotriana	Male	64	MSc Ecological Resources Management	Farmer/ Afforestor	21	650
4.	Mleon	Male	58	Master of	Farmer	5	65

				Business Administration			
5.	Cruden	Male	58	Doctorate	Farmer	20	46
6.	Ginie	Male	63	Mechanical Engineering	Farmer	19	390
7.	Fungie	Male	66	MSc Business Management and Entrepreneurship	Farmer	20	110
8.	Abielah	Male	32	O-Level	Afforestor, Farmer/unlimited tenure	7	68
9.	Berthin	Male	40	O-level	Farmer and afforestor	8	142
10.	Doryoton	Male	69	O-Level	Farmer, afforestor and Chief	19	Did not disclose
11.	Nels	Male	75	Diploma In Theology	Farmer/Afforestor	22	225
12.	Taffy	Male	65	MSc In Crop Science	Farmer/Afforestor	30	87
13.	Zepn	Male	40	O-Level	Farmer	8	73
14.	Tihan	Male	73	Diploma in Journalism	Farmer and Chief/Afforestor	27	624
15.	Maunn	Male	75	MSc Business Studies	Farmer/Afforestor	25	A2 farm-hectarage not disclosed.
16.	Wynot	Male	67	Masters	Farmer	21	121

17. Oma	Male	62	BSc Metallurgy	Farmer	25	263
18. Bohj	Female	55	BSc Geography	Farmer	14	128
19. Dory	Female	48	MSc Strategic Management	Farmer/leased land	11	73
20. Ziklin	Male	69	Mine technician	Farmer/ Chief	30	700
21. Obiht	Male	66	Bachelor of Education	Farmer/ afforestor	20	160

The section below unpacks the study respondents' profiled information above.

5.1.1 Respondents' Sex

The study sample included both male and female respondents.The rationale for including both sexes is that excluding certain subgroups can lead to biased outcomes, thereby limiting the knowledge produced by the research to only a segment of the public (Chuanh, Cheam, & Kadir, 2020). Including different sexes enriches the data, as males and females may have varying perspectives, perceptions, and viewpoints. This diversity also contributes to more specific views and behaviors in the data (Bryman & Bell, 2015, p. 197). By including both sexes, researchers can help prevent the perpetuation of gender disparities and obtain higher-quality, more precise data (Morgan et al., 2016). Therefore, profiling the sex of respondents is important, as it may influence the depth of input, views, perceptions, behaviors, and lived experiences. Figure 5.1 illustrates the distribution of respondents' sex:

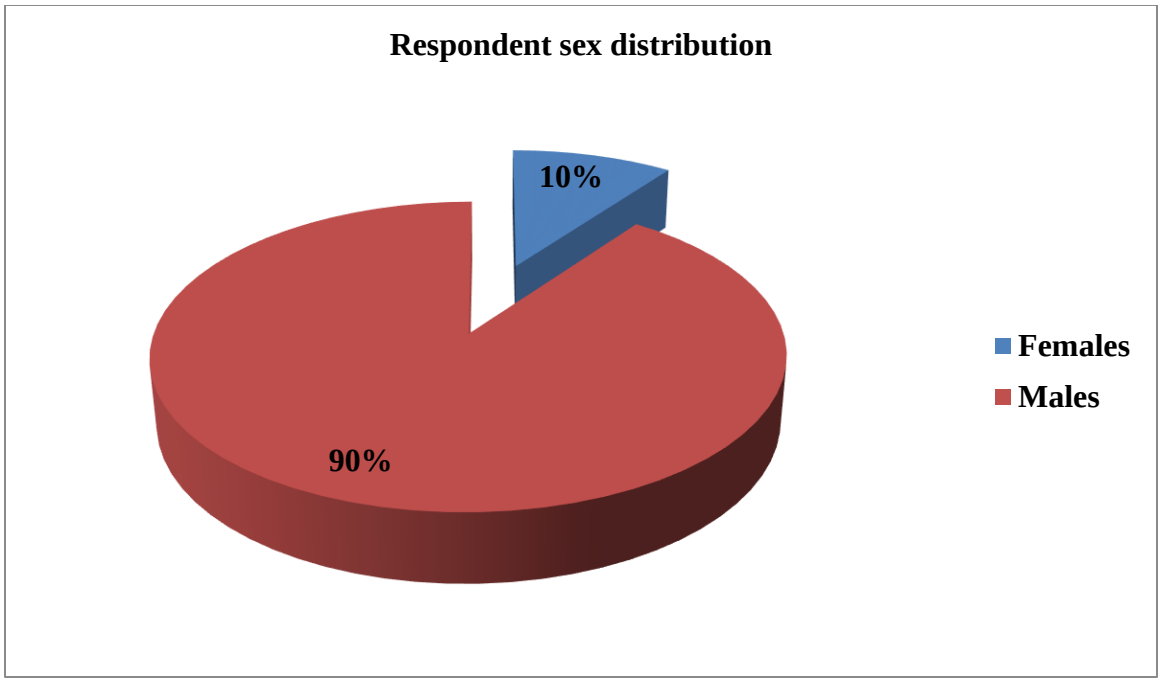


Figure 5.1: Respondent Sex Distribution

The proportion of male respondents in the study significantly exceeded that of female respondents, as shown in the pie chart above. This disproportional representation reflects the dominance of males in the afforestation industry. Consequently, women's representation and participation in forest-related decision-making remain limited in Zimbabwe. These findings are echoed by Beyene et al. (2019), who posit that gendered norms and cultural prejudices reinforcing forestry as a male profession persist in many countries. he skewed representation in favor of men can be attributed to the patriarchal nature of African societies, which often emphasize male supremacy over females.Throughout the region, several pervasive gender barriers limit women's ability to exercise their rights and fully contribute to the advancement of the forest sector. These findings are supported by both a literature review (see Convention on the Elimination of Discrimination Against Women [CEDAW], 2018; FAO, 2019) and a series of interviews conducted in this study.

The study findings indicate that, in general, women are often unaware of their rights, including their rights to land, forests, and trees; equitable benefits from forest products and services; and participation in decision-making related to natural resource management. Consequently, their participation in afforestation initiatives is limited.

As a result, their participation in afforestation initiatives remains poor. This male bias poses a worrying trend for the forestry sector in Zimbabwe, as evidence from studies elsewhere indicates that forests managed by women generally perform better than those managed by men (see Gbetnkom, 2007; Nimai, 2010; Mwangi et al., 2011; Giesecke, 2012). Agarwal (2009) in another study found that the higher the percentage of women on the executive committee, the lower the percentage of degraded forest area. Thus, such evidence from the synthesis of literature may explain why many male-dominated afforestation initiatives in Zimbabwe have stumbled and faded away as pointed out by Nykadzino (2016).

Appreciating gendered differences in the use of, access to, and benefits from forest landscapes matters for both fair and effective design of interventions and institutional arrangements for promoting sustainable afforestation as an on-farm economic activity. Supporting women's non-timber forest product (NTFP) microenterprise groups in Brazil, for example, resulted in increased incomes and empowerment, as well as a reduction in deforestation (Mello, 2014). As a result, women's representation and participation in forest-related decision-making remains limited not only in the Zimbabwean context but across the globe. In conclusion, the study findings align with existing literature on this issue.

5.1.2 Level of education

The majority of the respondents attained at least an Ordinary Level certificate, accounting for 13% (n=4) of the sample. With this level of education, it is assumed that respondents were capable of discussing the study's issues intelligently (see Robertson & Watts, 2016). According to Martinez (2010), education enhances reasoning skills, which in turn can influence the quality of responses. Thirty percent (n=15) of the respondents reported holding a Master's degree, while 20% (n=6) held a Bachelor's degree. Seven percent (n=2) of the respondents possessed professional qualifications, specifically in mechanical engineering and mine technology. Similarly, 7% (n=2) held diplomas. The doctorate category was the least represented, with only 3% (n=1) of respondents. These findings are illustrated in the bar graph below:

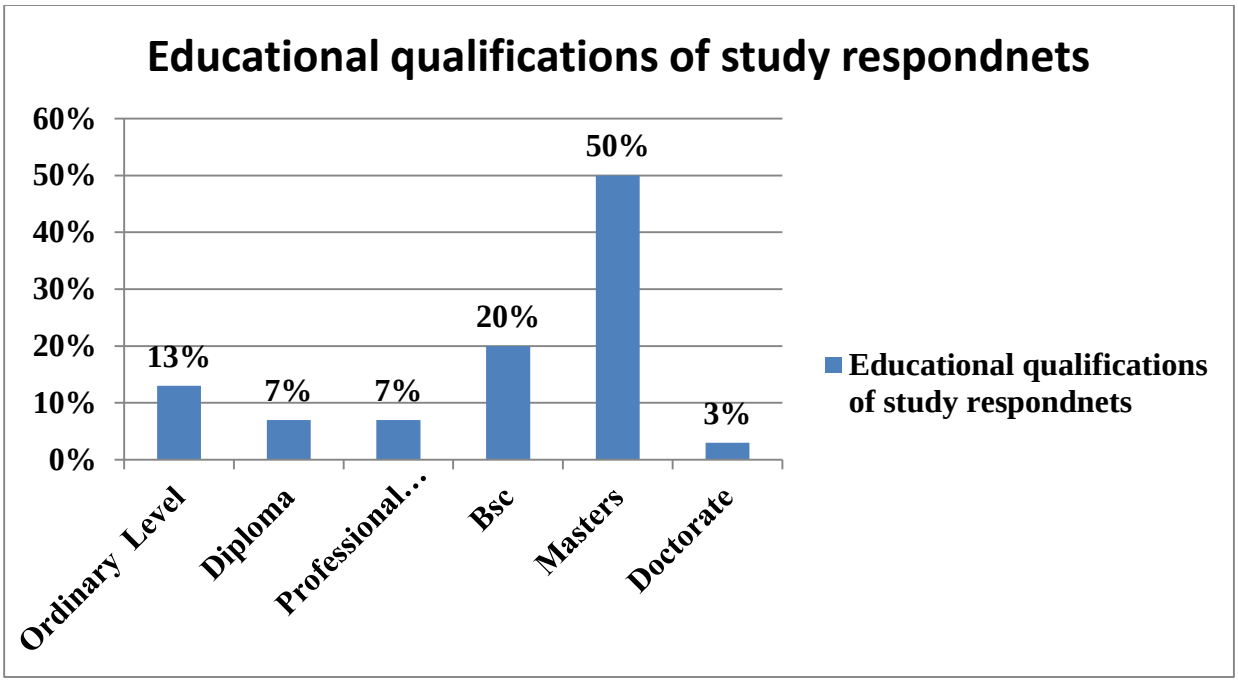


Figure 5.1 Distribution of qualifications of the respondents included in this research.

Figure 5.1 shows that the study's respondents were generally well-educated, which suggests they had a good understanding of the phenomenon under investigation. The high educational attainment of respondents gave confidence in relying on their views, as education significantly influences one's perception of various phenomena. As shown in the figure, the respondents had a reasonable level of education, which likely enabled them to comprehend the issues under investigation. According to Robertson and Watts (2016), education enhances one's thinking abilities, leading to more informed responses. Therefore, the views expressed by well-educated respondents may offer particularly valuable insights. These findings align with the literature, which highlights Zimbabwe's high literacy rate compared to other African nations. Various sources report Zimbabwe's literacy rate at different levels: The Zimbabwe Independent (April 2014) placed it at 90%; the United Nations Development Programme (UNDP) Digest (2014) at 92% (NewZimbabwe.com); Munjanganja and Machawira (2014) estimate it between 92-97%, while the Zimbabwe National Statistical Agency (ZimStat) puts it at 97% (Shoko, 2014). These statistics confirm Zimbabwe's high literacy levels. The findings indicate that both farmers and those involved in afforestation management are generally well-educated. However, a concerning issue remains: the afforestation management challenges faced by many farmers, which have led to the premature failure of some initiatives. The study sample included a diverse mix of

professionals, ranging from management to extension officers from both the Forestry Commission and Agritex. The farming community was mainly represented by A2 farmers, who typically have sufficient land for multiple uses. Additionally, there was a good representation of leadership, including three chiefs and an RDC officer, as well as farmers from various professions, reflecting their diverse educational backgrounds. The least educated interviewee had attained an Ordinary Level certificate, while many others held undergraduate and Master's degrees. This diversity allowed the researcher to gather rich and varied information regarding the phenomenon under study.

5.1.3 Period of service

Findings indicate that the afforestation sector has some of the longest-serving employees. Study findings highlight that those in afforestation management have experience. This was shown by their long stay in afforestation management as shown in Figure 5.3 below:

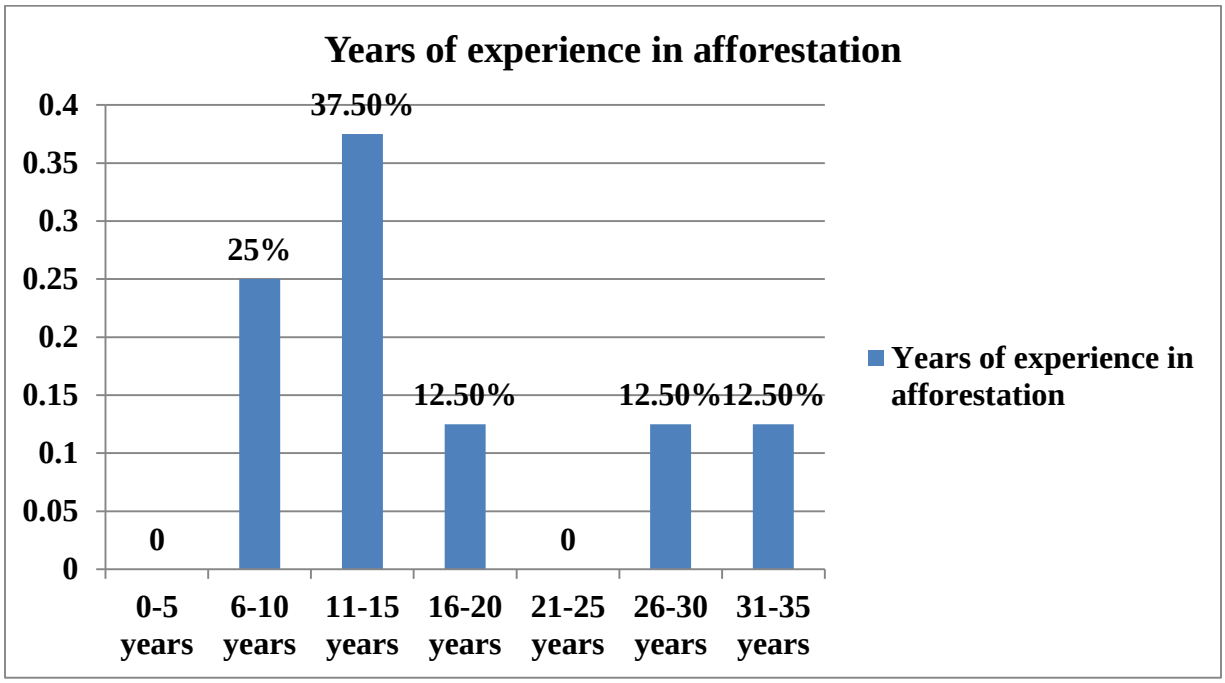


Fig 5.3: Experience of afforestation management from the Forestry Commission

Figure 5.4 presents the experience of the farming community interviewed in farming

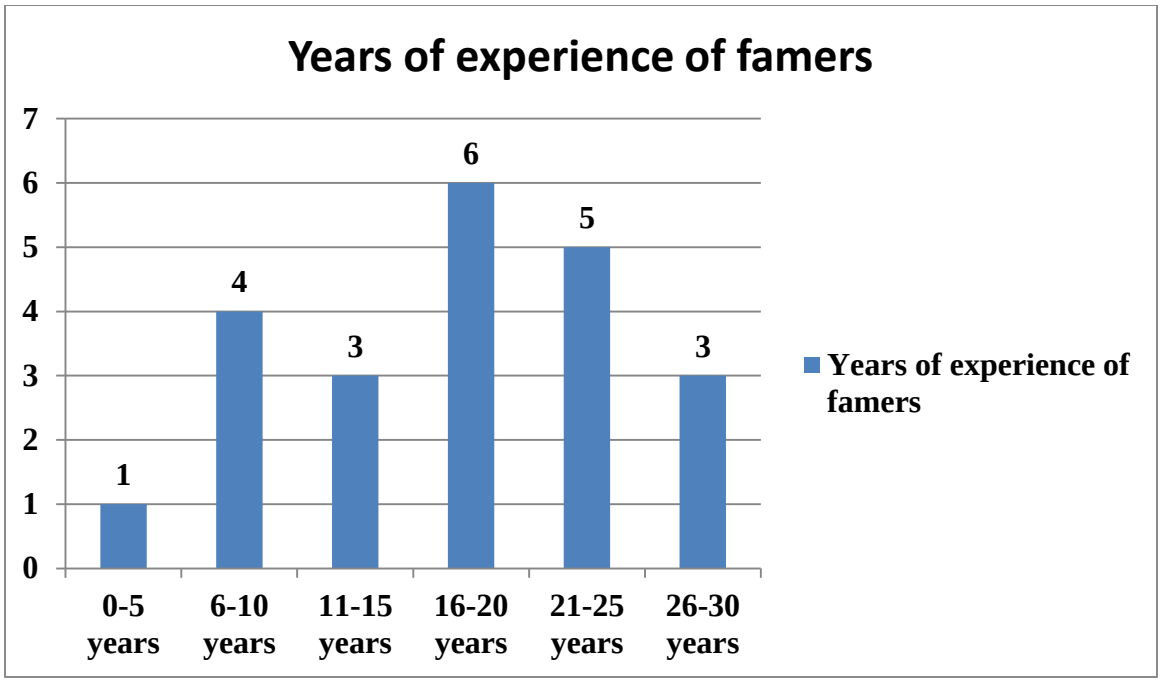


Figure 5.4: Famers` years of experience in farming

Figures 5.3 and 5.4 illustrate that all farmers, Agritex officers, and Forestry Commission officers interviewed had significant experience in either farming or the monitoring and implementation of farming projects. The respondents' experience ranged from a minimum of five years to a maximum of thirty-four years. Such long-term service is indicative of both stability and business continuity. These observations are supported by Sibanda (2016), who argues that occupations offering better returns tend to experience lower labor turnover. Therefore, based on these findings, it can be inferred that the afforestation sector provides a relatively stable working environment with satisfactory returns.

Additionally, Mutanga, Vengesa, Mirimi, Kwanisai, and Chipotereke (2013) suggest that an individual's length of tenure in a specific area or organization influences their perceptions of phenomena. Those who have been with an organization for a longer period tend to exhibit stronger perceptions regarding the impacts of phenomena affecting that organization. Consequently, it was essential to consider the length of service of both farmers and employees of farmer organizations who participated in this study, as this could influence their perceptions of the impacts of afforestation and the effectiveness of ongoing afforestation initiatives.

Having worked or resided in the farming communities of Mashonaland West for over five years at the time of this study, all respondents were familiar with the patterns of change in forest cover in their areas, as well as the successes and failures of previous initiatives aimed at restoring forest cover. This familiarity means that they possessed the necessary information on the institutional frameworks that could be leveraged to enhance sustainable afforestation as a viable land use option, thereby providing more valid data for the study.

5.1.4 Respondent age range

The respondents of the study were grouped in nine (9) ranges as presented in the bar graph below in Fig 5.5. As according to the information provided by the respondents, the age ranges from 31-35, 36-40, 41-45, 46-50, 51-55, 56-60, 61-65, 66-70, and 71+. The age distribution of the study respondents is presented in figure 5.5 below:

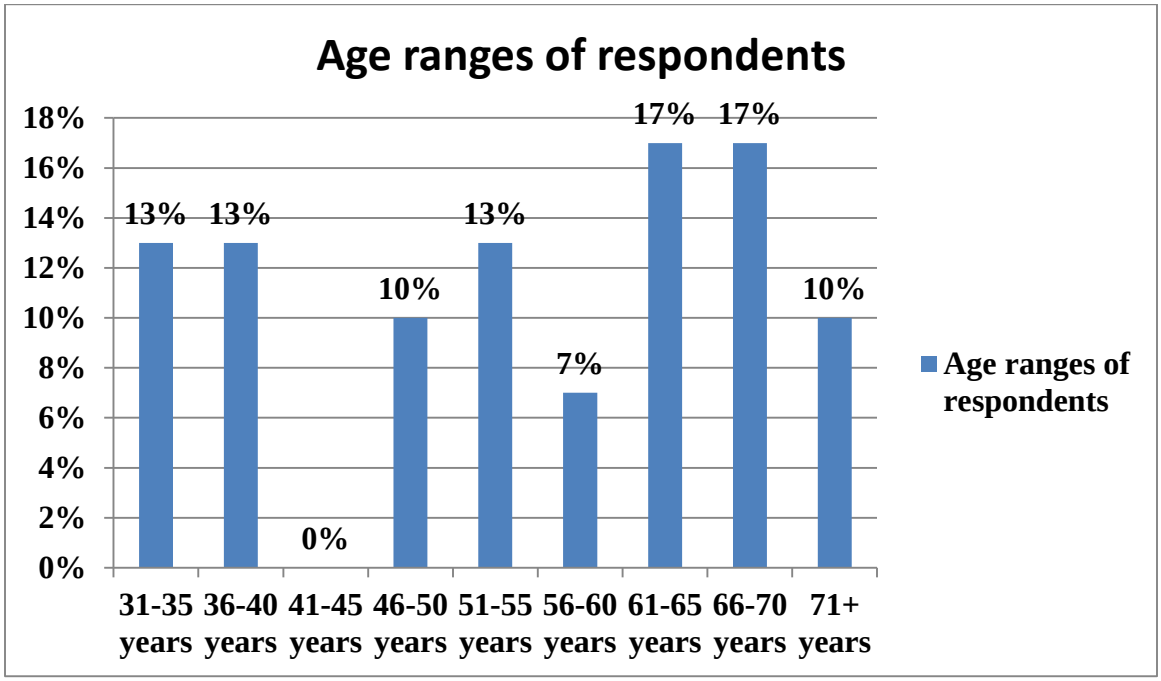


Figure 5.5: Respondent age ranges

As shown in Figure 5.5, the age of respondents ranges from 31 to 71+, with the 61-70 age range representing the highest percentage at 34%. The respondents' age ranges either fall within the economically active group or the above sixty-five years old category. This diversity in age representation enabled the researcher to obtain a balanced view of opinions across different age groups, making the findings more comprehensive and reflective of the broader population.

Dudovsky (2018) observed that there could be differences in the views of outlier age ranges in any study, particularly concerning topics to which these individuals have a strong attachment. Therefore, before delving deeply into the issues surrounding the phenomenon of afforestation, it is essential to begin by understanding how various respondents conceptualized some of the key issues under scrutiny in this study.

5.2 Conceptualisation of terms

This section focuses on the conceptualization of afforestation. This enables us to have an insight into the world views of the people involved in the study. To achieve this, this section presents the respondents' understanding of the term afforestation.

5.2.1 Afforestation

There appears to be no universally agreed-upon definition of the term 'afforestation. Field findings indicate a plethora of definitions from the respondents, all attempting to conceptualize the phenomenon of afforestation. Below we capture some of the meanings attached to it by respondents. Deonnr, an Agriculture Extension Officer, provided her perspective on afforestation.:

> *Afforestation is a method to establish a forest. It is a great way of making those lands greener which has been without forests for quite a time or none at all. It has a lot of benefits which can help both mankind and the environment. In other words, it can have a positive impact on the environment and also reduce levels of carbon dioxide. However, if we do not practice it correctly, it will harm the species diversity and agriculture profits*

> In contrast, Honia, a Rural District Council Officer in Hurugwe, expressed the following: *.Afforestation refers to the effort or the process of establishing a forest, especially on land not previously forested.*

Overall, most respondents agreed that afforestation involves converting non-forested land through planting, seeding, or promoting seed banks, specifically in areas that have not previously been forested. However, although the majority of the definitions offered seem to share much in common with the literature (see Tian, Sohngen, Baker, Ohrel, & Fawcett, 2018).All the respondents had a thorough knowledge of afforestation. It is noteworthy that some farmers viewed afforestation as synonymous with reforestation, indicating a lack of understanding of the distinctions between the two. The main focus was on that it’s about planting trees. However,

worth of appreciation was Honia's definition which reflected a good understanding of the term afforestation. Such sentiments can be captured in the voice presented below:

> *Afforestation involves planting forests on deforested land. It is recovering land that once was forested.* ***(Fredly, Farm Owner).***

Such a narrowed conceptualisation though very correct could have been a result of the fact that these farmers are being exposed to the effects of deforestation in the farmlands hence these activities attach them as hosts to all the negatives of uncontrolled logging and therefore feel the responsibility to restock the lost forests. Such findings concur with Mutanga et al (2013)'s findings that the level of attachment to an area helps explain how respondents perceive a phenomenon under study. Despite some misunderstandings, the overall sentiment among respondents indicates a solid working knowledge of afforestation. Despite the existence of a narrow understanding in some of the responses given, the theme of "planting trees" runs through the sentiments shared. Hence, it can be construed from the study findings that respondents had a good understanding of the phenomenon under study.

To understand what model would be suitable for sustainable afforestation as an alternative land use option for economic development in Zimbabwe, we need a baseline picture. The section below serves as a baseline for the state of afforestation in Mashonaland West Province.

5.3 The state of afforestation in Mashonaland west province

To develop a model for sustainable afforestation as an alternative land use in Zimbabwe, it was necessary to first profile the state of afforestation in Mashonaland West Province..The guiding research question was: What is the state of afforestation in Mashonaland West Province?The study findings generally identified the following themes: afforestation as an alternative land use, types of tenure, funding, farm size, investment in afforestation, average time for species to mature, estimated value of afforestation projects after maturation, key technical resources for successful afforestation, accessibility and ownership of key technical resources, hectarage under afforestation, types of afforestation management structures, survival rate of plantation plants, essentials for producing quality timber, and ideal soil profiles for afforestation.

5.3.1 Afforestation as an alternative land use

As traditional agricultural production systems continue to fail in meeting policy targets in developing countries, a gradual shift towards afforestation has emergedConsequently, many countries worldwide have actively promoted afforestation as an alternative land use through policy interventions and supportContriana, an afforestor provided an insight into this paradigm shift from traditional crop production to afforestation:

> *I have established this fast-growing, eucalyptus forest out of the interest in resuscitating the environment that is depleting because of the lack of trees. Unfortunately, I only managed to plant one type of tree species because the seedlings of these are easily accessible from the Forestry Commission, some I got for free, but the other half, I had to purchase on my own. Besides, this woodlot, you are seeing here, I only have about ten fruit trees on my residence because the seedlings are a bit expensive and they are difficult to maintain*

A closer examination of the above narrative demonstrates that afforestation is still in its infancy, characterized by scattered patches of afforestation on farmlands." It can be construed from the above voice that; afforestation remains to be taken seriously as an investment with potential economic returns amongst farmers. The lack of economic incentives is evident in the above statement, highlighting the need to raise awareness among farmers about the economic benefits of afforestation.These findings echo the Land Rent Theory, which posits that land should be allocated to the use that generates the highest potential rent.Such findings echo the Land Rent theory which states that land should be allocated to the use that would generate the highest potential rent. The majority of the respondents and the generality of communities still perceive their traditional cash crops like maize, cotton, soya as offering better economic incentivisation than afforestation, hence the resistance to adopt afforestation as an economic farm-activity. Farmers' motives for engaging in afforestation are largely disconnected from the potential economic gains the venture offers.While salient, the above statement also highlights some challenges of afforestation, such as maintenance difficulties and the high cost of seedlings. Thus, these challenges may also explain why afforestation has taken so long to take root in the province.

Weighing in on the same discussion, Doryoton, an afforestor again, shared almost similar sentiments as highlighted in the statement below:

> *I chose to plant, eucalyptus because Forestry Commission researchers are promoting their new breeds which have a faster growth rate and are drought and disease-tolerant. I will show you around the woodlot, there is a portion where I have a Hybrid cross (E-Eucalyptus) of E grandis x E camaldulensis, E grandis x E pellit (this has the fastest growth rate, you will see from how much they have grown in the two years), E grandis x E europhylla and E grandis x E tereticornis. You will even see these hybrid labels on the woodlots because I have offered my farm research extension services. However, I am not happy about having only one tree species. If seedlings could be made accessible, I would love to extend my love for afforestation to Hard Tick and Mukwa. These take a bit longer but produce high-value timber.*

Evidence from the study highlights that afforestation, though still in its infancy stage now characterizes some of the land use activities in the province. Eucalyptus appears to dominate afforestation efforts. Desire to adopt afforestation is shaped by expected reward at the end (The Expectancy Theory). Expectancy Theory explains that human behavior is motivated by the expectation of achieving a desired goal (expectancy), receiving a reward (instrumentality), or determining whether the effort is worthwhile (valence). Thus, the findings confirm the theory. These findings align with Marufu (2014) and Nyikadzino (2016) who posit that over the years in Zimbabwe, many afforestation programs have been initiated to address the problem of agriculturally unproductive land. However, as pointed out by Gwaze and Muranda (2014) most of these initiatives have stumbled along and eventually faded away. A close look at the existing number of afforestation initiatives in the province points towards an embedded absence of a spirit of afforestation. These negative cultural attitudes towards forestry are not unique to Zimbabwe but have also been widely reported in other countries. According to Amare and Darr (2020), afforestation has traditionally not been seen as an integral part of traditional agriculture and most farmers consider forestry only as an alternative land use for their worst land. Most farmers do not want woodland on their farmland, as they see their land as being exclusively a preserve for agricultural production.

The data currently available with the Forest Commission so far represent some insignificant efforts in the various districts on afforestation. The lack of seriousness towards afforestation as an alternative land use option can be captured in the sentiments of Zepn, a farmer in Mashonaland West who had the following to say:

> *I have not ventured into afforestation because, for me, five years needed to harvest these gum trees is equivalent to five cycles of maize, soybeans, and sorghum during summer*

cropping and five cycles of wheat during the winter cropping season. I still need someone with solid facts to convince me that, I can get revenue equivalent to the ten cropping seasons I would have forgone on the afforested piece of land.

Asked to give own view on afforestation, Fungie a farmer had the following to say:

The problem with taking up afforestation as a business is that looking at my age right now, I will not enjoy the proceeds. This is because afforestation is a venture that you can only take with the future generation in mind, not for your own sake.

A close analysis of the sentiments expressed above highlights an aversion to long-term investments among local farmland owners. Such findings are also echoed in the literature. Historically, reforestation has been a strong long-term investment for landowners. Many landowners regularly invest in other long-term investments such as individual retirement accounts (IRAs), stocks, and bonds but forego the likely chance to earn high returns from timber production (NC1 State Extension, 2022). Depending on the environmental conditions, an afforestation project takes an average of 7-10 years before reaching maturity to offer meaningful returns to the farmer. Sustainable afforestation therefore implies a typical long-term investment in a forestry project.

5.3.2 Breadth of tree species being planted

Research findings reveal that the range of tree species targeted in afforestation initiatives in Mashonaland West is too limited.The focus so far has been on two tree species—pine and eucalyptus—with eucalyptus (gum tree) being the most dominant species.These perspectives are reflected in the following narratives:

As a farmer actively involved in afforestation, I've found that eucalyptus has become the cornerstone of our efforts.. The decision to focus on eucalyptus wasn't made lightly—it's driven by a combination of practical benefits and current research. Eucalyptus trees are renowned for their rapid growth, and that's something we're keenly aware of. With the hybrid varieties we've planted, like the E grandis x E camaldulensis and E grandis x E pellit, we're seeing impressive growth rates that are vital for meeting both local timber demands and contributing to broader afforestation goals. These hybrids have been chosen specifically because they offer a balance of fast growth, drought resistance, and disease tolerance, which is crucial given the climate conditions we face here (Abielah, Farmer/Afforestor).

The same findings are also echoed by Cotriana, an afforestor who has established a sizable piece of afforestation. Fast maturity was the reason why there has been a preference for the eucalyptus.

Generally, it can be construed from the study findings that afforestation in Mashonaland West Province is mainly focused on two plant species the eucalyptus and the pine tree. The possible explanation is that these are early maturating plant varieties. The narratives presented above illustrate that afforestors prefer plant species that have faster maturity. The rationale for such preferences of short-term varieties is to achieve economic incentivization from the afforestation venture at the earliest possible time. These findings share much in common with the Forest Transition Theory which which focuses more on the temporal changing of forest cover or a change in forest cover trend over time. This theory was used to understand the factors (market signals) that motivate farmers to consider afforestation as an alternative land use. Hence, in this case early maturation was a driver that determined choice of varieties. Such findings are in consonant with the literature as Beyene et al (2018) posits that the fastest-growing pine and eucalyptus require up to five years before one can start harvesting.

5.3.3 Hectarage under afforestation

Research findings indicate that the size of afforested and reforested areas is minimal compared to the vast expanses of open or sparsely populated forests in need of reclamationThis view is reflected in the following statements:

> *I have dedicated thirty hectares of my six hundred and fifty-hectare farm to a woodlot.. I have chosen the thirty-hectare portion because the area is waterlogged and eucalyptus is very good at controlling water logging, hopefully after some few harvests, the land could be reclaimed for cropping or any other use. I could not allocate a larger portion of the farm to afforestation because, despite understanding its benefits, the direct financial returns from this woodlot remain uncertain, especially considering the seven-year period before harvesting*(Cotriana, an afforestor).

> *I grow tobacco and the regulator (Tobacco Industry & Marketing Board (TIMB), requires me to grow 0.3 hectares of eucalyptus for every hectare of tobacco I plant.Given that I plant twenty hectares of tobacco, annually, I would therefore need six hectares of my sixty-eight-hectare farm under eucalyptus. I only put two hectares under eucalyptus" (Abielah an afforestor).*

Generally, it can be construed from the sentiments shared in the narratives above that the hectares under afforestation in Mashonaland West Province are almost insignificant when compared to the total land available. These findings are supported by the Ministry of Lands (2020) which provides the following statistics for the land under afforestation in the 7 Districts in Mashonaland West: Mhondoro Ngezi District: no afforestation against a total land area of 427

936.51 (Ha), Kariba District: 0.05% against a total land area of 823 092.37(Ha), Chegutu District: 0.04% against a total land area of 938 580.15 (Ha), Sanyati District: 0.19% against a total land area of 481 931.77 (Ha), Zvimba District: 0.10% against a total land area of 608 193.91 (Ha), Hurungwe District: 0.04% against a total land area of 1 983 580.15 (Ha) and Makonde District: 0.38% against a total land area of 875 678.06 (Ha). Such meager figures, which are still less than 1% are a clear indication that there is underutilisation of land. Further to augment this argument, the researcher's observations during data collection further underscore the minimal extent of land under afforestation.. The researcher had challenges establishing these afforestors in the province as they are so spaced because of their smaller numbers.

Afforestation is viewed as a supplementary activity rather than a primary land use among farming communities.This rationale can be explained through several theoretical frameworks: Land Rent Theory, which suggests that land use decisions are driven by expected returns; Expectancy Theory, which emphasizes reward expectations; Structuration and Institutional Theories, which focus on the structures that promote afforestation; and the Sustainable Livelihood Framework, which considers how individuals organize their lives. Only a limited number of farmers are in afforestation. It can be construed from the study findings that generally, in the context of overall forest cover, the conversion of land from agriculture to forest is unusual amongst local farmers in Zimbabwe. This stems from the fact that the country lacks a `farm forestry' tradition within agriculture. The study findings are also echoed by Minang et al (2018) who opine that despite the lure of financial incentivization from afforestation, the greater part of Zimbabwe's land has remained idle as a result of the absence of a culture of afforestation. As a result, afforestation programs have continually failed and potential income from unproductive land has remained unrealised.

5.3.4 Number of farmers who are into afforestation

The uptake of afforestation among farmers in the province remains low. The findings presented below illustrate that afforestation adoption is still unfamiliar to most farmers in the region. This sentiment is echoed in the following narratives:

> *It is not easy to determine the exact number of farmers involved in afforestation in our province. Currently, we aim to have 15% of our farmers venture into afforestation as a commercial endeavor by 2030. However, this target is quite ambitious, as very few*

> *farmers are currently on board, and the farming community's perception of commercial afforestation remains a concern (Drueke, Planning and Monitoring Officer).*

Echoing similar concerns, Deonnr, a District Agritex Officer, stated:

> *Afforestation is generally reserved for those with large farms or extensive unused land. Small-scale farmers, particularly A1 farmers, are often excluded. Many of them believe that eucalyptus trees deplete soil fertility and provide excessive shade, which hinders crop growth. As a result, they are reluctant to plant such trees, even as windbreaks on their small plots. They believe growing crops is far more profitable than afforestation. Consequently, even if they have land available for afforestation, they prefer to leave it idle and unproductive, sometimes for years. (Canie, District Forestry Extension Officer).*

The narratives above suggest that only a limited number of farmers are engaged in afforestation. A possible explanation for this limited adoption could be that converting agricultural land to forest remains uncommon among landowners. Additionally, the findings highlight several challenges that hinder the adoption of afforestation. One significant challenge in promoting afforestation as an alternative and sustainable land-use option for economic development in Zimbabwe is the lack of knowledge about the potential economic benefits that could result from afforestation initiatives. These findings align with the Land Rent Theory, which suggests that land should be allocated to the use that generates the highest potential rent. As a result, most farmers believe that crops, rather than afforestation, offer the highest returns. This perspective is consistent with the views of Beyene et al. (2018), who argue that there is a general lack of economic understanding regarding the returns from afforestation and a lack of expertise in forest management (silviculture). These challenges are further compounded by evidence indicating that even when opportunities for forestry development exist, they are often overlooked or dismissed by farmers due to emotional attachment to the land or negative attitudes stemming from previous farming failures (also see Flemming et al., 2019; Jara-Rojas et al., 2020; Ryan, 2016; Jha et al., 2021; Li et al., 2020). From the study findings and existing literature, it is evident that forestry has traditionally not been considered an integral part of agriculture. Most farmers view forestry only as a land use option for their least productive land. Despite the slow adoption of afforestation as an alternative land use, there appears to be a paradigm shift, with several potential afforestors showing increased interest in embracing afforestation. This shift is reflected in the sentiment expressed by Canie, a District Extension Officer:

> *Recently, we have been working with fewer than two hundred farmers across the province. I am confident that more will join the venture soon, as we have enlisted the*

support of partners such as the Tobacco Industry and Marketing Board (TIMB). This board is striving to enforce tree planting among tobacco farmers, but significant results are yet to be seen. Additionally, as a commission, we need to start tracking TIMB tree planting statistics for reporting purposes, which we have not yet done" (Lee, District Extension Officer).

In conclusion, although the adoption of afforestation as an on-farm economic activity remains low, the evidence from this study indicates a growing awareness of its benefits. As a result, several potential afforestors are beginning to show a keen interest in afforestation. Studies conducted in recent years highlight that many countries worldwide have actively promoted afforestation as an alternative land use for economic development through state policies and support (see Ryan, 2016; Lovell et al., 2017; Minang et al., 2018; Dupraz et al., 2019). Similar to other countries, Zimbabwe has sought to increase forest cover for some time (Nyikadzino, 2016; CIFOR, 2014; Gwaze &Marunda, 2014). However, economic incentives have been largely absent from most of these initiatives. The economic value of supporting and regulating such initiatives has not been fully recognized in the market and therefore has remained undervalued (Lawson et al., 2014). Such a lack of knowledge and apparent lack of economic value poses a challenge for determining land use allocation and modeling land use change.

5.3.5 State of knowledge about afforestation

Ryan, O'Donoghue, and Phillips (2016) argue that farm afforestation decisions, which essentially involve inter-temporal land use changes, require farmers to have comprehensive information on forest market returns under different environmental conditions and forest management regimes. Therefore, knowledge about afforestation and its benefits can be considered the foundation for deciding whether to invest in afforestation. Evidence from the study indicates that farmers are not well-informed about the dynamics of afforestation. This sentiment is captured in the following narratives:

There is a gap; they are not informed. There are many misconceptions, especially about eucalyptus, where it is said to have high water usage. As a result, farmers are skeptical about adopting afforestation as an alternative land use. (Forestry Extension Officer).

With the current economic challenges, people tend not to see the benefits of afforestation. They are mainly concerned with food provision and are thus more inclined towards cropping (Wynot, Farmer).

These narratives illustrate that ignorance about afforestation and related issues remains a significant challenge in the province. The broader findings of the study on afforestation challenges highlight poor education and training as key obstacles to the adoption of afforestation as an alternative and sustainable land use. According to FAO (2018), the Forestry Commission is hindered by a lack of human resources capabilities due to the brain drain caused by the prolonged economic crisis in the early 2000s. This situation reflects the failure or absence of structures and institutions to promote afforestation (as discussed in Institutional Theory and the Theory of Structuration). Some stakeholders mentioned a lack of skills in forestry mapping due to current personnel being overworked, as well as insufficient skills in mapping vegetation cover and using geographic information systems to track vegetation change. The monitoring of forestry diseases and pests also suffers from a skills gap. According to inquiries with the Forestry Commission, the only entomologist, who required replacement, has left the government. Support for more forestry research is needed, and while forestry extension skills are available, there is a shortage of personnel with these skills.

The study findings suggest that there is a significant knowledge gap among afforestors and potential afforestors regarding the importance of afforestation for economic development. As a result, the adoption of afforestation initiatives is limited. The lack of understanding of afforestation dynamics also explains the general failure of many afforestation initiatives and the limited uptake of such projects. The findings confirm the failure or absence of the appropriate structures and institutions needed to support afforestation development. For afforestation to take root, the right structures and institutions must be prioritized (as supported by the Theory of Structuration and Institutional Theory). Evidence from the literature synthesis highlights that several afforestation initiatives have stumbled and faded away. In Zimbabwe, many afforestation programs initiated to address the problem of agriculturally unproductive land have eventually failed (CIFOR, 2014; Gwaze &Marunda, 2014; Marufu, 2014; Nyikadzino, 2016). As a result, afforestation has not delivered the anticipated gains (see Wilson, 2016; Dupraz, 2019), leading to a low uptake of afforestation as an alternative land use for economic development (see Beyene et al., 2018; 2019; Ryan, 2016). This trend continues, with afforestation failing to deliver the expected gains (Nagar et al., 2022; Dupraz, 2019). Furthermore, FAO (2019) advises that

reliable and up-to-date information on the state of forest resources is crucial to support decision-making for investment and policy-making in forestry and sustainable development.

There is a misvaluation of forest resources, partly because the country lacks forestry economists to quantify the real contribution of forests to socio-economic development. This creates an information gap that hinders government policy decision-making, particularly regarding the contribution of forests to rural livelihoods, carbon sequestration, and ecosystem protection. These variables are not quantified sufficiently to build a compelling argument for the importance of forests. The government can only be convinced of the need to allocate the necessary resources to spur the country toward sustainable forest management when provided with the requisite information. However, TPF (2018) notes that forest training in Zimbabwe is hampered by aging equipment, a lack of financial resources for refurbishment, and distressed computer laboratories and inventory equipment in state-owned forest colleges. This situation underscores the need for increased government funding for the afforestation sector. In conclusion, the findings suggest that afforestation efforts in Zimbabwe are hindered by the absence of the right structures and institutions necessary to drive them forward.

5.3.6 Funding

Insights from the study indicate that afforestation ventures require substantial capital for land preparation and maintenance of woodlots during the early stages of tree growth. The findings reveal that both current and prospective afforestors face significant challenges due to inadequate funding. These challenges are evident in the following narratives:

> *The management aspect comes at a cost. Currently, we are supposed to receive a fair share of the afforestation fund from fiscal allocations, but the funds provided are neither commensurate with the needs nor adequate to support our efforts (Afforestor).*
>
> *There is a considerable cost associated with maintaining these trees, and unfortunately, they are not seasonal crops. We are talking about a minimum of 9 years, with 15-20 years being a more realistic investment timeframe due to factors that may retard growth. Creating fireguards is expensive, although it is far less costly than losing your forest to fire (Afforestor).*

The above narratives illustrate that many farmers perceive the costs associated with supporting an afforestation initiative as beyond their financial capacity. The lengthy period before receiving returns on investment further discourages them. These challenges, particularly financial

incapacity, prevent afforestors and potential afforestors from fully committing to afforestation initiatives. This situation underscores the absence of adequate structures and institutions necessary to support afforestation.

Establishing an afforestation project requires significant initial investment, including costs for land preparation, purchasing seedlings, planting, irrigation, and early maintenance. These upfront costs pose a major barrier, especially for small-scale farmers or new entrants into forestry. Moreover, the financial rewards from timber or other forest products are realized only after many years, even when initial costs are high. This long-term horizon makes it challenging to secure financing, as many funding sources prefer quicker returns.These findings align with existing literature. According to FAO (2018), forestry projects require substantial financing at the outset, with delayed revenue streams. Consequently, investors face high initial costs and must have the capacity to wait for returns (Nyakatonje, 2023). Financial challenges also mean that the responsible authorities lack the resources to hire or train experts in afforestation and provide necessary funding to afforestors.

The funding challenges extend beyond farmers to include forestry extension workers. The following narratives provide insights into the financial difficulties faced by afforestation extension officers:

> *We cannot raise enough nurseries for the farmers. There is a single nursery raising the stock of plant trees, though there should be five. At present, Zvimba district has only one. We also lack sufficient manpower at our offices to meet demand. Recently, we subcontracted farmers to help, but two of the three farmers withdrew, citing delays in payments. This incapacity has affected our ongoing services. (Forestry extension officer).*

These statements highlight that inadequate government support for afforestation is hindering its growth as a sustainable farming venture, comparable to other crops. Afforestation is a relatively new venture in many agricultural regions, and farmers expect regular contact with extension officers. However, the absence of appropriate structures, particularly for disseminating knowledge on afforestation dynamics, has been a barrier to its adoption.

In a broader sense, extension services are educational processes that inform, persuade, and connect people. They facilitate the flow of information between farmers, other resource users, administrative managers, and leaders (Tafere&Nigusse, 2018; Ullar et al., 2021). The need for

extension officers in afforestation has been well-documented. For example, Mohammed (2001) found that 82% of respondents in Khartoum State, Sudan, reported no extension visits from forestry officers, as the extension personnel focused primarily on agricultural issues.

Similarly, Maponya et al. (2019) found that less than 45% of farmers in Limpopo Province, South Africa, received forestry extension services, primarily through formal extension channels. Bukomeko (2012) reported inadequate forestry extension services in the Lira district of Uganda. To address this "missing link" in forestry extension, FAO (2017) posits that tree planting should not be viewed solely as a forestry issue but as part of a farm system and social issue. Therefore, a comprehensive extension approach is needed, treating trees as one of many potential productive activities that must be integrated into the farm system.

In Malawi, a social forestry program implemented over five years emphasized the integration of forestry extension within the agricultural extension service. This approach is gaining wider acceptance and support. Forestry extension staff are now expected to operate through agricultural extension personnel, emphasizing the need for suitably qualified foresters with expertise in agriculture, soil conservation, land management, farm systems, and extension methodology.

The government's limited interest in afforestation, as compared to traditional crops, is evident in its minimal support for the Forestry Commission. The following narratives reflect this lack of government involvement:

> *The government is focusing more on crops than forestry activities. This is evident in rural communities, where Agritex officers are present for both crops and livestock at the community level (Zepn, Farmer).*
>
> *Our government tasked the Forestry Commission with overseeing reforestation and afforestation. However, I am unsure how they are expected to succeed when they lack the necessary support. Visit any Forestry Commission office in the province, and the dilapidated structures alone tell a huge story. It's shocking to ask for a thousand seedlings of pine or eucalyptus, the most preferred species for afforestation, only to find they cannot meet the demand. Yet, they claim these seedlings can be given to farmers for free. One wonders how they distribute something they do not have (Cee, District Agritex Officer).*

These sentiments suggest that the government has not taken an active role in supporting afforestation initiatives compared to other traditional crops. The Forestry Commission, as a

government apparatus, relies heavily on government support. Without this support, the Commission cannot effectively perform its mandated duties.

According to FAO (2020), the undervaluation of forest resources in Zimbabwe is one reason for the limited government investment in afforestation. This undervaluation stems from the shortage of forestry economists who can quantify the true value of forests to socioeconomic development. As a result, significant knowledge gaps remain, preventing informed government policy decisions. This relates to the role of forests in preserving ecosystems, sequestering carbon, and supporting rural livelihoods. None of these factors are currently measured to build a compelling case for forest importance. Only when this information is available can the government be persuaded to allocate the necessary resources to propel the nation toward sustainable forest management.Insight from the study findings shows that afforestation ventures require a lot of capital for land preparation and maintenance of the woodlot when the trees are still small.

5.3.7 Types of land tenure

Farmers expressed concerns about the land tenure system in Zimbabwe, which they believe hinders long-term investments like afforestation. The study findings reveal that following land expropriation, land ownership in Zimbabwe was transferred to the government, creating uncertainty for farmers. This insecurity in land tenure discourages farmers from making long-term investments in their farms, as illustrated in the narrative below:

> *As such, it ceased to be a transferrable asset. Investment in farming has been imperilled because necessary permits, state land leases, and 'offer letters' do not provide security of tenure (Extension Officer).*

The sentiments expressed above highlight that farmers in Zimbabwe only have usufruct rights to land, lacking title deeds. This uncertainty, coupled with the associated risks, dissuades farmers from committing to long-term investments. Poor land ownership structures and institutions are significant barriers to afforestation adoption in the province.

The issue of land ownership is one of the most significant challenges in the history of forest lands (Beyene et al., 2019; Ullar et al., 2021). It is generally argued that a lack of tenure security in the farming sector constrains farmers' access to credit, farm investments, technology adoption, and sustainable agricultural development and productivity. Secure tenure rights are critical for local economic development. However, despite the importance of ownership/land rights in

stimulating farm production, land ownership in Zimbabwe remains unclear after the Land Redistribution exercise, prompting farmers to avoid investing in long-term projects or development. This insecurity in landownership rights may explain the limited adoption of afforestation among farmers in Zimbabwe, as the land is now owned by the government and therefore cannot be used as collateral.

Study findings support the idea that tenure insecurity can discourage long-term investments in livelihoods and the adoption of improved farming practices. This insecurity may also limit farmers' ability to use their land as collateral for credit or to make significant long-term investments. Secure tenure is essential for improved land use. Reviews of empirical literature show that land tenure security or tenure-strengthening interventions have positive effects on agricultural investments (Higgins et al., 2018), human well-being, and environmental outcomes (Tseng et al., 2021), and agricultural productivity (Lawry et al., 2017), although some findings across these reviews are contradictory.

Study findings highlighted that farmers are more likely to make medium- to long-term land improvements if their tenure is secure because they will be more likely to benefit from the investment. Enhanced tenure security often leads to higher investment in land use, spurs the adoption of afforestation as an alternative land-use option for economic development, and boosts agricultural production, which in turn supports sustainable agricultural development. These findings confirm the importance of proper structures and institutions in driving afforestation (see Institutional Theory and Theory of Structuration). These findings are also echoed by Warnholtz et al. (2017), who note that there is widespread evidence linking secure property rights to a higher propensity to invest in tree planting, manuring, soil and water conservation, and other permanent improvements.

Institutional investment in forestry and afforestation has been most active in countries where there are clear and secure legal rights to land and timber, such as the USA, Australia, New Zealand, and a few others (Binkley, Stewart & Power, 2020). Secure land tenure is particularly important for attracting individuals and institutions to invest in afforestation as an alternative land use. Given that investment in afforestation is long-term, secure tenure is essential.

5.3.8 Limited investment in afforestation

The study highlights limited investment in afforestation projects in Mashonaland West. Findings indicate that even among those who have invested in afforestation, the investments are often limited to small portions of their farmland. The limited scale of investment is reflected in the following statements:

> *I have dedicated thirty hectares of my six hundred and fifty hectares to a woodlot. The best I can do is to maintain the thirty hectares dedicated to date as a woodlot (Cotriana, an afforestor).*

> *I grow tobacco, and the regulator [Tobacco Industry & Marketing Board (TIMB)] requires me to grow 0.3 hectares of eucalyptus for every hectare of tobacco I plant. Given that I plant twenty hectares of tobacco annually, I would therefore need six hectares of my sixty-eight-hectare farm under eucalyptus. I only put two hectares under eucalyptus (Abielah, an afforestor).*

A District Forestry Extension Officer commented:

> *When afforestors do not treat woodlots as a business like any other crop, their yields from the woodlots suffer. Most of our farmers just plant eucalyptus trees out of interest. Even schools that have most of the woodlots in the province (though at a small scale) do not view them as an entrepreneurial initiative, so they do not invest much time or resources in them. As a result, the woodlots take longer than necessary to mature (Lee, District Forestry Extension Officer).*

From these sentiments, it is clear that afforestation constitutes an insignificant part of land use relative to farm sizes. These findings are supported by the Ministry of Lands (2020), which states that land under afforestation in the seven districts of Mashonaland West constitutes less than 1% of the total land area. The limited land allocation for afforestation indicates limited investment, possibly due to the absence of adequate structures and institutions to drive afforestation.

The study also highlights that the government has gradually begun to appreciate the value of afforestation for economic development. Respondents noted that the government is taking steps to enhance afforestation initiatives on a national scale. However, despite these efforts, government involvement in afforestation remains limited, as seen in the following narratives:

> *Zimbabwe ratified the United Nations Convention to Combat Desertification (UNCCD) in 1997. Since then, deforestation and its ramifications have remained significant challenges, but Zimbabwe participates in the UNCCD Conferences where global leaders meet to find resolutions to desertification, land degradation, and drought. The conferences are a major source of transformational strategies utilized by the government*

to achieve land restoration through afforestation and other land reclamation strategies (Canie, District Forestry Officer).

Government programs bring together leaders from governments, the private sector, civil society, and other key stakeholders from around the world to drive progress in the future sustainable management of one of the most precious resources, which are trees (Cee, Provincial Agritex Officer).

The government received ten million United States Dollars from the Global Environment Facility. The money is being used to implement sustainable forest and land management projects to meet the country's land restoration commitments by 2030. However, the main target of the stated project is the Save and Runde catchments, covering Manicaland, Masvingo, and Midlands provinces. All the other provinces, including Mashonaland West, are yet to have a standing budget for afforestation (Druek, Agriculture Planning and Monitoring Officer).

Despite these initiatives, the effectiveness of government involvement remains questionable. Evidence suggests that government organizations such as the Forestry Commission are underfunded compared to Agritex. The literature also mentions the inadequate financial resources available from the government and development partners, which limits the institutional capabilities mentioned above. Due to these financial limitations, insufficient funds are being directed toward sustainable forest management.

Stakeholder interactions revealed that Zimbabwe previously received significant donor funds for local management of forestry resources. However, these funds gradually ceased in the early 2000s. Stakeholders also noted the limited capacity of government entities to write proposals seeking foreign funding for forestry management. While global funds exist, such as the Green Climate Fund, the GEF, and REDD+, accessing these funds is challenging but achievable with more aggressive efforts from government institutions.

UN (2008) Resolution 62/98 emphasizes that effective implementation of sustainable forest management depends on adequate resources, including financing, capacity development, and the transfer of environmentally sound technologies. Recognizing the need to mobilize increased financial resources, including from innovative sources, is crucial.The voices presented above highlight the financial challenges faced by afforestors and potential afforestors, who suffer from inadequate financial resources to undertake afforestation initiatives. These challenges confirm the inadequacy of structures and institutions in the afforestation sector. FAO (2017) highlighted that forestry projects require high rates of financing at the beginning, and forests take time to

deliver revenues and benefits. Hence, investors face high initial costs and delayed returns, demanding the availability of initial investment capital and the ability to wait for revenues. Financial challenges have also meant that responsible authorities lack the finances to hire or train experts in afforestation and provide funding to afforestors.However, studies show that some organizations partner with afforestors and provide all necessary funding, with a certain percentage to be paid during harvesting. The challenge remains that afforestors lack information on the existence of such partnerships.

5.3.9 Inadequacy of afforestation extension services

The study findings highlight the inadequacy of afforestation extension services in the province. This insufficiency is illustrated through the following narratives:

> *Current extension services are not adequate because the limited number of extension officers on the ground cannot bridge the gap in proper land use planning. For instance, Forestry Common has one officer for the entire district. In some instances, the officer is not even mobile to visit farmers and teach them about afforestation practices (Fungie, Farmer).*
>
> *There are fewer extension officers for afforestation services compared to agricultural extension services for crops and livestock. The government must surely do something (Contriana, Farmer/Afforestor).*

A close analysis of these sentiments underscores the inadequacy of extension services designed to support afforestation initiatives in the province. Extension services are fundamental to afforestation efforts. Broadly, extension involves an educational process that informs, convinces, and connects people. It facilitates the flow of information between farmers, other resource users, administrative managers, and leaders (Tafere&Nigusse, 2018; Ullar et al., 2021). The necessity for extension officers in afforestation is well-documented in the literature. For example, Mohammed (2001) found that 82% of respondents in Khartoum State reported no extension visits related to afforestation, as extension personnel prioritized agricultural issues over forest trees.

Extension officers participating in the study also expressed feelings of inadequacy regarding their assigned tasks. Their sentiments are captured below:

> *The area I am supposed to service is too large. I have three districts to cover but no vehicle to use when moving around farms. We all rely on one vehicle that is well-maintained and primarily serves the provincial office. This makes monitoring woodlots*

very difficult. We end up waiting for farmers to come to us with questions. We only provide them with information and, in most cases, do not accompany them to their farms because government regulations state that if I am involved in an accident in a non-government vehicle, I will not be insured, even if I am on duty (Forestry Extension Officer).

We cannot raise enough nurseries for the farmers. There is one nursery raising tree stock, but there should be five. Currently, Zvimba District has only one. We lack sufficient manpower at our offices to meet the demand. Recently, we subcontracted farmers to help, but two out of three contracted farmers have withdrawn due to payment delays. This challenge has affected our continued services (Forestry Extension Officer).

These narratives indicate that inadequate government support for afforestation is stifling its growth as a sustainable farming venture. Afforestation is a relatively new endeavor in the agricultural sector in most regions, leading farmers to expect constant contact with their extension officers. Consequently, the structures supporting afforestation are poor, and existing institutions are insufficient. Similar challenges have been documented in other studies. For instance, Maponya et al. (2019) found that less than 45% of farmers in Limpopo Province, South Africa, received extension services, primarily through formal channels. Bukomeko (2012) reported similar findings in the Lira District of Uganda. Additionally, FAO (2017) suggests that tree planting should be viewed not solely as a forestry issue but as a farm system and social issue, necessitating an "extension approach" that integrates trees into the broader farm system.

In Malawi, a social forestry program implemented over the past five years has moved towards integrating forestry subject matter specialists into the agricultural extension system. This integration emphasizes the quality of forestry staff and the need for foresters with expertise in agriculture, soil conservation, land management, farm systems, and extension methodology. Forestry extension staff generally operate through agricultural extension staff, highlighting the importance of qualified personnel over sheer numbers.

5.3.10 Estimated value of afforestation project after maturation

Evidence from the study indicates that several interviewees are uncertain about the actual value of their afforestation initiatives upon maturation. This uncertainty is reflected in the following statement:

I have never thought about that since it is the first time. I can't guess either (Afforestor).

Overall, the findings suggest limited knowledge about the dynamics of afforestation among farmers. Some farmers rely on rough estimates to calculate the value of their plantations. For example:

> *I have 15,000 trees on my plantation, and small poles at our local market are priced at $1 each. I expect at least two poles from each tree upon harvesting, or one very large pole, resulting in a gross income of $25,000-30,000 (Afforestor).*

These sentiments reveal a general lack of knowledge about afforestation, as supported by existing literature. The absence of comprehensive knowledge about the value of established afforestation plantations indicates inefficiencies in farm forest extension services within the province. According to the TPF (2018), forest training in Zimbabwe is hindered by aging equipment, lack of financial resources for refurbishment, and inadequate computer laboratories and inventory equipment in state-owned forest colleges, all of which impede farmers' education and knowledge-enhancing programs. Studies consistently highlight poor education and training as significant challenges in afforestation management and as barriers to the adoption of afforestation as a sustainable land use alternative (Ryan, 2016; Lovell et al., 2017; Minang et al., 2018; Dupraz et al., 2019). Forestry extension officers also noted that farmers are not taking afforestation seriously, leading to ad hoc management practices for woodlots and underutilization of land. This is exemplified by the following narrative:

> *The problem with most of our farmers is that they lack the skills to properly manage their woodlots in the early stages. The growth rate realized in the first two years, when trees are developing a root system, impacts the harvesting time. Proper management of the woodlot after a harvest affects the regeneration of remaining stumps. In our province, the few farmers who have harvested some of their trees have struggled with inadequate stump management. Once most of the stumps die after a harvest, revenue from subsequent harvests is reduced, indicating land underutilization in Mashonaland West (Canie, District Forestry Officer).*

In conclusion, there is a general lack of knowledge among farmers regarding afforestation. This knowledge gap has resulted in poor management of afforestation projects and limited adoption of afforestation initiatives. According to Ryan, O'Donoghue, and Phillips (2016), farmers require thorough knowledge of forest market returns under various environmental conditions and forest management regimes, as the decision to plant trees involves inter-temporal land use changes.

5.3.11 Average time taken by species to mature

The long harvesting cycles of existing afforestors are a significant concern among farmers and afforestors. Respondents lament the extended time required to realize returns from afforestation, as illustrated in the following narratives:

> *I have not ventured into afforestation because, for me, five years needed to harvest these gum trees is equivalent to five cycles of maize, soybeans, and sorghum during summer cropping and five cycles of wheat during winter cropping. I still need someone with solid facts to convince me that I can get revenue equivalent to the ten cropping seasons I would have forgone on the afforested piece of land (Zepn, Farmer)*

> *The problem with taking up afforestation as a business is that, given my current age, I will not enjoy the proceeds. Afforestation is a venture that you can only undertake with future generations in mind, not for your own benefit.(Fungie, Farmer).*

> *My first woodlot is in its tenth year, but I feel like only a few trees out of the five hectares are ready for the market. I planted a new woodlot three years ago, and based on the growth rate, I expect to harvest in the next two years, which should increase my revenue generation compared to the first lot (Berthin, Farmer/Afforestor).*

An extension worker also shared:

> *There are two varieties of gum trees. The shorter variety takes 5-6 years to mature, while the other requires about 7-8 years, which is still shorter than the indigenous three species (Braiana, Provincial Forestry Extension Manager).*

These sentiments reveal that afforestation is perceived as a long-term investment that takes years to mature, making it difficult for farmers to assess its viability as an alternative land use. This issue is central to livelihood challenges, particularly in supplementing income before afforestation ventures mature. The Sustainable Livelihood Framework (SLF) emphasizes how people organize their lives and meet immediate needs, suggesting that existing structures fail to address farmers' immediate challenges, leading them to favor traditional crops that offer better returns (Land Rent Theory). In many developing countries where afforestation is still emerging, farmers often lack knowledge about the returns on such investments, fostering aversions to afforestation ventures. This aligns with literature indicating that reforestation has historically been a robust long-term investment for landowners, comparable to investments in individual retirement accounts (IRAs), stocks, and bonds (NC1 State Extension, 2022). Afforestation projects typically take 7-10 years to mature and provide meaningful returns, necessitating substantial initial investment and the capacity to endure delayed revenues (Bastin et al., 2019).

These financial demands, coupled with uncertainty surrounding most farms, discourage both current and potential afforestors from investing in afforestation.

5.3.12 Farm Size

The study findings indicate that farmers engaged in afforestation own farms of various sizes. However, those with larger tracts of farmland are more likely to practice afforestation. A closer analysis of the findings reveals that the adoption of afforestation depends not only on farm size but also on farmer priorities. Some farmers with large farmland remain averse to afforestation, citing inadequate land for other uses, as illustrated in the following narratives:

I did not venture into afforestation because my farm is small. Half of the 390-hectare farm is under cultivation, and the other half is for cattle ranching. I would love promotions that encourage the planting of grasses instead, which may mean cutting down more trees. So apart from my orchard, I have no other space to spare for afforestation (Farmer).

I could not make an active move into afforestation because of the size of my farm. It is only 125 hectares, of which 80 hectares are arable, and the rest is low land that gets flooded during the rainy season (Farmer).

These findings suggest that the decision to adopt afforestation is influenced by multiple factors, not just farm size. Farmers consider various aspects before deciding whether to adopt afforestation. To emphasize the centrality of farmer priorities in the decision to adopt afforestation as an alternative land-use option for economic development, one farmer noted:

I grow tobacco, and the regulator, Tobacco Industry & Marketing Board (TIMB), requires me to grow 0.3 hectares of eucalyptus for every hectare of tobacco I plant. Given that I plant twenty hectares of tobacco annually, I would need six hectares of my sixty-eight-hectare farm under eucalyptus. What then will be left for other crops such as maize and soya beans? What about animal husbandry, given that A2 farmers should create their pastures within their farmland and not compete with A1 farmers on the grazing lands set aside for them? For these reasons, I only put two hectares under eucalyptus (Abielah, an afforestor)

Despite having 68 hectares of farmland, this farmer engages in afforestation, while others with over 100 hectares avoid it, citing limited land availability for such ventures. This reluctance may be attributed to the broader trend in Zimbabwe, where many farmers lack enthusiasm for afforestation, viewing it as a long-term investment that does not align with their immediate priorities. Traditional crops and livestock production take precedence when farmers decide whether to adopt afforestation as an on-farm economic activity. This decision-making process is influenced by livelihood considerations, the expected level of returns from the investment, and the perceived land rent value of different land uses. Thus, farmers can be seen as rational actors making decisions based on these factors.Historically, reforestation has been a strong long-term investment for landowners. These findings are consistent with those reported by the NCI State Extension (2022), which states that many landowners regularly invest in other long-term assets such as individual retirement accounts (IRAs), stocks, and bonds but often overlook the potential high returns from timber production. Therefore, it can be said that the study findings align with existing literature.

Additionally, the insecure land tenure system may contribute to the reluctance among farmers to invest in afforestation, even when they own large tracts of land. The agrarian reform of the early 2000s introduced new types of farming units, including small-scale commercial farms, medium-scale commercial farms, large-scale commercial farms, and peri-urban commercial farming systems. The smallholder subsector, which includes communal, resettlement, and small-scale commercial farmers, makes up a significant portion of the farming community in areas such as inner Makonde (Obva, Godzi, Runene, Kasonde, Gambuli), Kasimhure, Karereshe, Zvimba, Zvipani, Nyaurungwe, Chidamoyo, and others. These resettled farmers often lack land ownership rights, and according to Nyakatonje (2023), they are often unable to secure bank loans due to insufficient collateral or are hesitant to make long-term investments due to uncertainties surrounding land ownership. Therefore, multiple factors shape farmer decisions when it comes to afforestation.

5.4 Chapter Summary

This chapter aimed to establish the state of afforestation in Mashonaland West. The findings generally indicate that afforestation is predominantly practiced by a small number of large-scale

farmers with extensive landholdings. However, the area under afforestation remains minimal compared to the land available for such purposes. Several challenges faced by farmers have been identified, with the most significant being a lack of knowledge, inadequate funding, cultural barriers, and an aversion to long-term investments. The next chapter will focus on the extent of land utilization in Mashonaland West.

CHAPTER SIX

STAKEHOLDERS' PERCEPTIONS TOWARDS AFFORESTATION AS A SUSTAINABLE ALTERNATIVE LAND USE FOR ECONOMIC DEVELOPMENT

6.0 Introduction

The previous chapter assessed the state of afforestation in Mashonaland West Province. This chapter examines stakeholder perceptions of afforestation as a sustainable alternative land use for economic development. The study revealed several insights into stakeholder attitudes towards afforestation. Notably, respondents highlighted concerns regarding afforestation, including its high opportunity cost, suitability mainly for large-scale farmers, substantial capital requirements, inadequate government support compared to other agricultural sectors, lack of incentives for participating farmers, lengthy periods before harvest, and potential ecotourism issues. Conversely, proponents of afforestation identified several benefits: creation of microclimates to regulate rainfall, diversification opportunities, biodiversity conservation, climate change mitigation, enhanced food security, improved raw material supply, better air quality, land degradation reduction, and improved watersheds.

6.1Stakeholders' concerns about afforestation as an alternative sustainable land use in Mashonaland west

For afforestation to be adopted as an alternative land use, it must compete with other land uses. Stakeholders have weighed the long-term viability of afforestation. The study indicates that farmers have reservations about afforestation as a land use option for economic development. The following concerns emerged: limited adoption among farmers, outdated cultural attitudes, and resistance to long-term investment in afforestation.

6.1.1 Outdated cultural attitudes towards afforestation

The study highlights a prevalent cultural resistance to afforestation among farmers in Mashonaland West. Respondents often attributed the low adoption of afforestation to outdated cultural values. For instance:

> *I have not ventured into afforestation because five years needed to harvest gum trees equates to five cycles of maize, soybeans, and sorghum during the summer cropping season, and five cycles of wheat during the winter cropping season. I need convincing evidence that I can earn revenue equivalent to the ten cropping seasons I would forgo on the afforested land (Zepn, Farmer).*

> *The problem with afforestation is that, given my current age, I will not benefit from it. Afforestation is a venture for future generations, not for immediate gain (Fungie, Farmer).*

> *Adopting afforestation means losing valuable farmland. This could impact cattle ranching if alternative grazing land is not available, resulting in decreased productivity or increased costs for supplementary feed (Taffy, Farmer/Afforestor).*

These sentiments indicate a general aversion to afforestation as an alternative land use for economic development. This reluctance may stem from the Forestry Commission's inadequate efforts to promote the benefits of afforestation. Farmers' preference for traditional crops over afforestation aligns with the Land Rent Theory, which suggests that farmers prioritize crops offering the highest returns. Studies in other regions support this finding, noting similar cultural resistance to forestry. For example, Selby and Petajisto (1995) observed that converting land to forestry was perceived as disrupting agricultural landscapes in Finland. Watkins et al. (1996) found similar attitudes in the UK, where farmers resisted woodland on agricultural land. Additionally, Warnholtz et al. (2017) reported a historical bias towards agriculture and cattle raising in Latin America, while Green (2009), Dhubain (2010), and Upton (2015) identified global patterns of resistance to afforestation.

6.1.2 Aversion to long-term investment in afforestation

Afforestation is traditionally viewed as a long-term investment. The study found that farmers were reluctant to invest in afforestation due to its long-term nature. This is reflected in the following narratives:

> *I have not ventured into afforestation because the five years required to harvest gum trees equates to ten cropping seasons of maize, soybeans, sorghum, and wheat. I need solid evidence that the revenue from afforestation will justify the ten seasons I would forgo (Zepn, Farmer).*

> *The Zimbabwean economy is not lucrative enough to support a project with up to nine years of waiting without monetary returns (Wynot, Farmer).*

Afforestation is a venture for future generations, not for immediate gains. Given my current age, I will not benefit from it (Fungie, Farmer).

These findings suggest that farmers are reluctant to embrace afforestation due to its long-term nature. Livelihood considerations and immediate needs significantly influence their decision-making. The lengthy period before investment returns are realized is particularly challenging for farmers with pressing needs. Beyene et al. (2019) note that afforestation is a long-term investment that takes years to yield returns, a factor that discourages farmers who rely on agriculture for immediate needs. Most farmers in Mashonaland West face financial constraints that make long-term investments impractical.

6.1.3 A preserve for farmers with large tracts of land

A significant concern raised by farmers regarding afforestation was the requirement for extensive land areas. During a field day with A1 farmers, many indicated that they could not pursue forestry due to the limitations imposed by their relatively small landholdings. Their sentiments were reflected in the following statements:

> *My land was insufficient for such a venture. Although I had approximately 260 hectares, I used all of it for cultivation. I even rented additional land for crops. My equipment allowed me to manage over 500 hectares, but I lacked the land. How was I expected to establish a woodlot when there was no unused land on my farm? (Oma, A2 Farmer).*
>
> *I couldn't pursue afforestation due to the size of my farm. It was only 125 hectares, with 80 hectares arable and the rest prone to flooding during the rainy season (Farmer).*

Some farmers believed that the government should allocate land specifically for afforestation, separate from their current holdings, which they considered inadequate. This perspective was captured in the following comment:

> *I thought the government should designate land for afforestation, or large-scale commercial woodlots should be pursued by those with vast tracts of land. As it stood, A2 farmers were restricted from using communal grazing lands, and if A1 farmers acted prudently, they might even sue for trespassing. The land allocated to me should support my needs and those of my livestock. Using additional land for commercial woodlots would strain the land further (Honia, Rural District Council Officer).*

Smallholder farmers argued that they could not spare any land for afforestation without compromising their ability to meet daily needs, as this would likely reduce crop yields. Even

some A2 farmers with substantial landholdings (e.g., over 200 hectares) perceived their land as inadequate for afforestation:

> *I did not engage in afforestation because my farm was too small. Half of my 390-hectare farm was dedicated to cultivation, and the other half to cattle ranching (Farmer).*

The narratives indicated a widespread belief among farmers that afforestation could not compete with other land uses due to limited land availability. Most farmers felt their land was too small to integrate afforestation with crop farming, especially A1 farmers with an average of 7 hectares per household. Hanson et al. (2019) supported this view, noting that population growth, increased agricultural land demand, and higher livestock numbers had made it challenging to combine afforestation with crop farming.In privately owned lands, farmers needed to be convinced of the financial benefits of tree planting. If more cost-effective financial returns were available from other sources, allocating resources to afforestation might seem irrational. In communally owned lands, managing and allocating the trees planted became essential once the community agreed to dedicate land for afforestation.

It was evident from the study that both large and small-scale farmers considered their land inadequate for afforestation. Adoption of afforestation seemed to be influenced more by farmers' priorities than by farm size alone. Afforestation was often considered only after addressing all other agricultural needs, particularly when there was no clear understanding of how afforestation might yield better returns than traditional crops.

However, there were instances where the farm size argument did not hold. The study revealed that Mashonaland West Province contained underutilized “bad lands” and “underutilized land” that could potentially be converted into afforestation plantations. Yet, these areas remained idle, as illustrated by the following comment from a forest extension officer in Mashonaland West:

> *Large swathes of land remained unused. Even among A2 farms, there was significant subsistence farming, leaving large areas of land unutilized(Afforestation Extension Officer).*

This underutilization could be attributed to challenges beyond farm size, including land rights, access to extension services, and capital for investment. These structural, institutional, and

livelihood challenges were essential considerations for meeting policy targets for afforestation adoption. Addressing land tenure security was crucial, as farmers were unlikely to invest in afforestation without guaranteed tenure. Extension officers needed to focus on educating farmers about the value chain of the forestry industry and providing access to capital and technical knowledge.Matching the current enthusiasm for agricultural extension services with similar efforts in afforestation could lead to more widespread adoption of afforestation on both "bad lands" and "underutilized lands."

6.1.4 Required significant capital investment

The study findings revealed that afforestation required substantial capital for land preparation and maintenance. Farmers acknowledged the high costs associated with managing woodlots, which might be beyond their financial reach. This was evident from the following statements:

> *The costs of maintaining these trees were substantial, and they were not seasonal crops. We were looking at a minimum of 9 years, and potentially 15-20 years of investment due to various factors that could impede growth (Brue, Conservation and Extension Officer).*
>
> *Creating fireguards was costly, but it was less expensive than losing your forestry to fire (Doryoton, Afforestor).*

The insights from both afforestors and management organizations highlighted that initiating and maintaining an afforestation project demanded significant financial investment. This financial barrier deterred many potential farmers from pursuing afforestation. Literature supported this view, noting that forestry projects required high initial financing and offered delayed returns (FAO, 2018; Beyene et al., 2019).Additional costs associated with afforestation practices, such as creating fireguards and pruning, further contributed to the financial burden. None of the eight farmers already engaged in afforestation managed to harvest their eucalyptus woodlots within the expected 5–9-year period. This extended capital investment period, which impacted profitability, was a significant concern.

FAO (2017) emphasized that sustainable afforestation was a long-term investment requiring substantial initial financing and delayed returns, which posed a challenge for potential investors. The high initial costs and uncertain returns discouraged many from investing in afforestation.The study also found that investing in exotic tree species was more expensive than indigenous species. One farmer noted that afforestation with indigenous trees could be more affordable:

Afforestation was quite affordable. For example, mango seeds were readily available, and mango trees required minimal care. Even indigenous fruits were accessible in forests or from adjacent communities. It was a matter of interest and initiative (Farmer).

However, the slow growth rate of indigenous trees, such as mopane, which required around 20 years to mature, limited their commercial viability:

Most of our woodlands, like mopane, needed about 20 years to mature(Braiana, Provincial Forestry Extension Manager).

Thus, many farmers considered indigenous trees an unviable option due to their long maturation period. FAO (2017) supported this view, noting that indigenous tree species in Zimbabwe had slow growth rates, which restricted their commercial value for timber production.

6.1.5 General misconceptions about certain afforestation plants and their impacts on the environment

Evidence from the study illustrated underlying misconceptions about certain plants used in afforestation, such as eucalyptus. These misconceptions were highlighted in the following narrative:

There has been an issue with planting trees in some areas. At one point, we were summoned to Hurungwe to explain why there is a misconception that eucalyptus depletes groundwater, along with other ungrounded arguments against eucalyptus (Braiana, Provincial Forestry Extension Manager).

Another misconception noted was the belief that it is inappropriate to use "underutilized" prime land for afforestation. An afforestation extension officer expressed this view:

There is a misconception where most people question how prime land can be used for growing trees. People believe trees should be planted only along riverine areas. However, I believe they can also be planted anywhere there is land, as they are part of farm activities that can be exploited for economic benefit (Canie, District Forestry Officer).

In general, it can be concluded that the inadequacy of extension workers has contributed to the general ignorance among farmers and potential afforestors about afforestation issues. Extension services are an educational process that informs, convinces, and links people. They facilitate information flow between farmers, resource users, administration managers, and leaders (Brown et al., 2018; Kim & Kim, 2021). Literature indicates that one common challenge resulting in the

failure of many afforestation initiatives has been the inadequacy of extension services. A study on the role of forestry extension in promoting afforestation in Khartoum State found that 82% of respondents reported no extension visits to farmers (Mohammed, 2001). This ignorance necessitates the establishment of appropriate structures and institutions, including the design of education and training programs to enhance knowledge about afforestation among farmers.However, some education and training models offered elsewhere may not align with all cultural expectations. Fishbein and Ajzen's (1967) Theory of Reasoned Action is relevant here, as it helps determine a course of action based on expected outcomes. The theory emphasizes the importance of considering how well a model fits a particular context. Therefore, designing education and training programs to encourage afforestation should be based on a well-considered rationale and curriculum.

6.1.6 Opportunity cost of afforestation

Interview responses from most farmers revealed that a significant downside of afforestation is the opportunity cost, as transformed lands can no longer be used for residential developments or agriculture. These sentiments are reflected in the following narratives:

> *Generally, the problem with adopting afforestation is the loss of farmland. This means that if one is involved in cattle ranching and has no alternative grazing land, the cattle ranching project will decline or the farmer will incur additional costs for supplementary feed (Taffy, Farmer/Afforestor).*

> *When you are fully utilizing your land, deciding to forego that land for a forest is challenging due to the switching costs involved. The farmer will lose the benefits previously obtained from that land and start incurring new costs (Zepn, Farmer).*

These views suggest that, while afforestation can be a sustainable option, many considerations must be made to determine if it is the best use for any given piece of land. These findings align with the Land Rent Theory, which states that land use decisions are influenced by expected returns. For decision-makers, the main policy implication is to adjust land rent composition to protect forest areas and promote reforestation feasibly. Afforestation comes with the substantial cost of lost opportunities as the land is converted to forest.

6.1.7 Inadequate government support for afforestation

Both farmers and forestry commission employees expressed dissatisfaction with the level of government support for afforestation compared to other forms of agriculture. Many farmers felt

that while the government conducts awareness campaigns on the importance of afforestation, its implementation falls short. This sentiment is captured in the following narratives:

> *There is the presidential input scheme for maize, sorghum, sugar beans, and other garden vegetables, but none for forestry. For commercial purposes, the government has supported grain production through command agriculture, but there is little effort towards afforestation, with only the invisible SAA supporting a few farmers (Contriana, Farmer/Afforestor).*

> *Our government tasked the forestry commission with overseeing reforestation and afforestation. However, the commission is not adequately capacitated. Visit any forestry commission office in the province, and the conditions are indicative of a lack of resources. They struggle to provide seedlings, despite claims of offering them for free (Cee, District Agritex Officer).*

These narratives highlight that inadequate government support hampers the growth of afforestation as a sustainable farming venture. The lack of appropriate structures and institutions for supporting afforestation is evident. Government bias towards other traditional crops at the expense of afforestation is summarized by Zepn, a farmer:

> *The government focuses more on crops than forestry activities. This is evident from the presence of agritex officers for crops and livestock at the community level, while afforestation lacks similar support*

The literature supports the need for effective forestry extension services. According to FAO (2017), an extension approach that integrates trees into the agricultural system is crucial. In Malawi, integrating forestry specialists into the agricultural extension system has gained wider acceptance. This approach emphasizes quality over quantity and the need for qualified foresters in various disciplines (FAO, 2017).Musasa (2014) notes the importance of extension support for small and medium-sized afforestation entrepreneurs, suggesting that intervention from NGOs, foreign investors, and well-wishers could drive afforestation. The discrepancy in government support between traditional crops and afforestation underscores the need for knowledge-enhancing programs for farmers, government officials, and investors.

6.1.8 Limited knowledge of the economic benefits of afforestation

The study found that respondents had limited understanding of the economic benefits of afforestation. Farmers in Mashonaland West Province demonstrated only a vague appreciation of afforestation's economic returns. Even those involved in afforestation struggled to estimate the monetary value of their plots upon maturity. Zepn, a farmer, articulated this concern:

I have not ventured into afforestation because the five years needed to harvest gum trees are equivalent to five cycles of maize, soybeans, and sorghum, or five cycles of wheat. I need solid evidence that I can earn revenue comparable to the ten cropping seasons I would forgo (Zepn, Farmer).

The lack of appreciation for afforestation's economic benefits often leads to misinformed land-use decisions. Literature identifies a significant challenge in promoting afforestation due to inadequate knowledge of potential economic gains (Malone, 2008). This challenge is compounded by the absence of a 'farm forestry' tradition and a lack of expertise in forest management (Ryan, 2016). Attitudinal factors, such as emotional attachment to land or negative perceptions of failure, further influence farmers' decisions (Malone, 2008).

Afforestation management often emphasizes environmental conservation and climate change mitigation over economic benefits. For example:

The national tree planting campaign aims to counteract deforestation by planting millions of trees each year. As of January 2022, over 18 million trees have been planted, which is an improvement compared to previous years" (Briana, Provincial Forestry Extension Manager).

Trees help prevent soil erosion through their canopies, transpiration process, and root systems. These factors reduce soil erosion and runoff, contributing to environmental conservation (Druek, Agriculture Planning and Monitoring Officer).

Despite the limited appreciation of economic benefits, some stakeholders recognize afforestation's economic potential. For example:

The legitimate sale of firewood and timber for furniture and poles diversifies income sources, especially for rural communities. Growing woodlot plantations can therefore provide additional livelihoods" (Canie, District Forestry Officer).

Overall, despite the limited appreciation, afforestation has viable economic benefits. The increasing demand for wood products underscores the economic rationale behind afforestation. For example, in 2016, Zimbabwe's wood and wood product exports generated $23.64 million, highlighting the economic potential of afforestation. Rural communities have also adopted alternative income-generating activities through forest products and non-forest products (Human Development Report, 2017).

6.1.9 Comparability of afforestation extension services to crop and livestock farming

The study revealed that afforestation extension services are inadequate compared to those for crop and livestock farming. Farmers shared the following observations:

> *I am aware of one extension officer from the forestry commission, but their visits are infrequent. Whether this is due to the pandemic or other reasons, it indicates a resource challenge. Cropping receives more extension support than afforestation (Farmer).*
>
> *Forestry extension officers cannot match the number of crop extension officers due to the longer cycles of plantations. However, more officers are needed to implement government-proposed tree planting models effectively (Farmer).*
>
> *Current extension services are insufficient. For instance, there is only one forestry extension officer per district, making proper land use planning difficult. The officer's lack of mobility and limited resources further hinder their effectiveness (Farmer).*

The inadequacy of forestry extension services was confirmed by extension officers themselves:

> *My service area is too large, and I lack a vehicle to visit farms. We rely on a single vehicle mainly for provincial office tasks, making monitoring difficult (Forestry Extension Officer).*
>
> *We cannot meet the demand for nursery seedlings due to insufficient manpower. Recent attempts to subcontract farmers have faced challenges, including delays in payments (Forestry Extension Officer).*

The study concludes that afforestation extension services are poor compared to other crops. Extension is an educational process that facilitates information flow between farmers, resource users, and administrators (Mohammed, 2001; Ageed, 2002). The inadequacy of extension services is a common challenge leading to failed afforestation initiatives. Evidence shows that there is one forestry extension officer per district compared to ten for other crops in the province.

6.1.11 Social activities that could be organized around the afforestation industry

Study findings illustrated that several social activities could be organized around the afforestation industry. These sentiments are reflected in the narratives below:

> *Afforestation adds to the existing greenery in the countryside, enhancing the beauty of the areas. The same regions where new forests are created provide urban dwellers with the opportunity to experience fresh air when they visit, thereby promoting urban-rural tourism in the countryside. This urban-rural drift for tourism purposes can lead to the transfer of knowledge and technology from urban to rural communities, while also improving the circulation of money within rural areas (Cruden, Farmer).*
>
> *Afforestation allows native forests to regenerate as their harvesting becomes manageable, with timber resources now being sourced from newly developed exotic forests, which grow faster. Over time, the entire ecosystem would be rejuvenated, and*

experiencing a natural wildlife system has always been a significant draw for tourists (Deonnr, Agriculture Extension Officer).

The stakeholder sentiments above indicate that farmers value afforestation because it can boost other industries, such as tourism, in the countryside. From the narratives, it is evident that forests attract tourists. Therefore, the government and relevant institutions can utilize afforestation to help revert arid and semi-arid zones to productive areas, provided the right structures are in place. This transformation can enhance the appearance of barren lands, turning them into picturesque locations. Tourism brings a range of sociocultural, economic, and environmental benefits to rural communities, all of which contribute to improving livelihoods. Afforestation allows for the conservation of natural forests by providing alternative sources for commercial use, thereby enabling environmental protection agencies to conserve and protect forests more efficiently. This preservation of natural forests not only conserves the biodiversity within these habitats but also helps combat global warming and climate change, enhancing the area's aesthetic value. These findings align with the literature. According to Mkumbe et al. (2020), such enhanced panoramas attract tourists and promote tourism development in an area. Having numerous areas of outstanding beauty can enhance a country’s destination competitiveness in the international tourism market.

6.1.12 Ecotourism issues

One forestry extension officer raised concerns regarding the afforestation drive. The officer reiterated that, although afforestation initially appears beneficial, as forests become overdeveloped and tourism begins to flourish, both the government and host communities should be prepared to deal with ecotourism issues. This concern is captured in the voice below:

> *As our new forests develop into fully grown canopies, natural forests will regenerate, attracting both foreigners and urban citizens to the forested areas to enjoy the beauty of nature. However, tourism will bring numerous demands that the government will need to budget for. It poses stress on natural amenities, and local communities should be prepared for this rather than focusing solely on the advantages (Forestry Commission Officer).*

Ecotourism is becoming the most favored form of tourism as people seek to escape congested and polluted urban areas for the countryside, where they can enjoy fresher air. These findings are supported by Henman et al. (2008), who argue that afforestation has the potential to offer greener environments to leisure travelers, leading to a tourism boom. As tourism grows in an area, the

government should be prepared to address the public amenities needed for the increasing number of tourists. Further development of an area for tourism can lead to the displacement of local people to make way for touristic amenities. Additionally, ecotourism often imposes restrictions on the use of the environment by locals to protect it for paying tourists. This can cause local residents to become detached from their native places of interest and value.

6.1.13 Downstream economic benefits of afforestation

General sentiments shared by respondents showed a clear awareness of the downstream economic benefits of afforestation. The following sentiments illustrate these benefits:

> *On the commercial side, afforestation is primarily conducted by companies to grow trees for timber and charcoal. Besides this, it offers more job opportunities, supports local businesses with an increased supply of raw materials, and promotes the local economy (Honia, Rural District Council Officer).*
>
> *One of the major advantages of afforestation is its provision of raw materials to the cottage industry. The cottage industry, which forms the basis of Zimbabwe's economy, relies heavily on raw materials. When these materials are locally available, the industry flourishes, boosting the local economy through job creation, improved livelihoods, and enhanced Gross Domestic Product (Contriana, Farmer/Afforestor).*
>
> *Afforestation helps make raw materials available in large quantities by planting numerous trees, supporting industries like construction, pencil-making, sports products, basketry, the paper industry, furniture, the match industry, and many other related sectors (Lee, District Forestry Extension Officer).*

Most respondents felt that different industries source their raw materials from forestry resources. Afforestation can help solve the problem of raw material scarcity, which intermittently leads to higher prices and increased production costs. Thus, afforestation can improve livelihoods (SLF). The high production costs in many of Zimbabwe's industries, driven by expensive raw materials, make Zimbabwean products less competitive both locally and in export markets. The study findings highlighted that afforestation could bring relief from such challenges. The sentiments above demonstrate that many industries depend on forests for their raw materials. The study also highlights that forests and trees have important multiple functions and provide a wide range of goods, including fodder, medicines, timber, construction materials, food, and firewood for energy.

In support of afforestation's importance to Zimbabwean society, Ryan (2016) opined that the decline in afforestation has consequences for downstream industries such as timber processing.

Therefore, afforestation is significant, particularly in promoting the timber industry and meeting the demand for firewood, among other uses of plants. However, despite the significance of afforestation, the study findings noted that in the modern business arena, the natural growth rate of trees in forests is much slower than the rate at which they are harvested for production. The inflated demand for tree products puts pressure on forests, leading to deforestation. Afforestation alleviates this pressure by providing an alternative supply of tree products. Planting trees on previously unproductive land ensures that the supply of essential products does not cease. The study findings generally highlighted that afforestation provides people and businesses with reliable alternative sources of forest materials. In addition to making these resources accessible, afforestation ensures their sustainability for the future, as replenishing exotic forests is easier compared to the regeneration of native forests.

6.1.14 Environmental benefits of afforestation

Study findings pointed to several environmental benefits of afforestation. Generally, it can be said that stakeholders involved in this study were well-informed about these benefits. Respondents pointed out several environmental advantages of afforestation, including the creation of micro-climates that help regularize rainfall distribution in an area, benefits for biodiversity conservation, contributions to resolving climate change issues, improvements in air quality, and retardation of land degradation and watershed improvement.

6.1.14.1 Creation of micro-climates and regularization of rainfall distribution

Evidence from the study revealed that afforestation creates micro-climates that improve rainfall patterns and distribution in an area. Study findings highlight the heightened vulnerability and lowered adaptive capacity of developing countries such as Zimbabwe. According to specialist reviews from forestry commission officers and practicing afforestors, afforestation has the capacity to even out anomalies in rainfall patterns when practiced effectively. These sentiments are embodied in the narratives below:

> *Afforestation plays a vital role as trees aid in conserving rainwater. Water conservation, regardless of the need, is essential. The afforestation process supports the environment in numerous ways, such as conserving rainwater, moderating rainfall, releasing water gradually in the form of springs, and more. Once water is conserved as groundwater storage in an area, it enhances evapotranspiration, leading to better rainfall (Contriana, Farmer/Afforestor).*

> *Tree planting has recently proven to be an effective method of transforming arid and semi-arid areas. Generally, regions with high tree density experience more regular rains, making afforestation an ideal way to stabilize the climate. Additionally, trees have the capability to reduce greenhouse effects, preventing warmer-than-normal temperatures, as they are the biosphere's natural air conditioners (Taffy, Farmer/Afforestor).*
>
> *Afforestation provides windbreaks to farmlands. These windbreaks regulate evaporation from groundwater storage, which in the long run helps to regularize precipitation (Nels, Farmer/Afforestor).*

Study findings generally highlight that droughts have become a common phenomenon across the country. Such sentiments are also shared in the literature, with Mayambo (2021) arguing that climate change-induced weather patterns have led to Zimbabwe experiencing perennial droughts. Further, Chanza (2018) and Gandiwa (2018) state that Zimbabwe continues to suffer from extreme climate change-related weather events, such as droughts. A close analysis of the views expressed above shows a positive relationship between groundwater storage release and the amount of precipitation received in an area.

Another key point noted is the symbiotic relationship between evapotranspiration and rainfall received. To regulate rainfall patterns and increase the amount of rainfall in an area, one should find ways to increase evapotranspiration. Afforestation is the best method for achieving this, as other crops lack the ability due to their seasonal nature. During the dry season, when most fields are dry and have little or no vegetation, evapotranspiration drops close to zero, reducing the possibility of higher rainfall in the next season. Trees, especially eucalyptus and pine species commonly used in afforestation, do not shed leaves during the dry season, maintaining a high rate of evapotranspiration throughout the year. These findings are supported by Favretto et al. (2018), who argue that afforestation has the potential to restore degraded lands, overcome water scarcity, and foster climate change mitigation and adaptation.The same findings are also echoed by TFP (2018) and FAO (2018), who in their respective studies concluded that forests have protective functions for the environment, such as water catchment protection, climate change mitigation

The TPF (2018) and the FAO (2018) argues that forests have protective functions to the environment such as water catchment protection; climate change mitigation through carbon sequestration; generating clean air; reduction of soil erosion and the risk of landslides, floods and droughts, and prevent desertification and salinization. Thus, one may conclude that afforestation

has a big role to play in climate change mitigation. Generally, it can be concluded that farmers were well informed about the role of afforestation in the attainment of climate change neutrality.

6.1.14.4 Leads to improved air quality

Various stakeholders showed knowledge of the importance of afforestation in cleaning the air and enhancing air quality. An environment surrounded by trees is less likely to suffer from air-related problems. The reason is that trees play a crucial role in cleansing the air. The narratives below illustrate the role of afforestation in improving air quality:

> *Recently, the production of carbon dioxide has become very high in diverse activities such as industrial activities, burning fossil fuel, and driving, which have amplified the amount of carbon dioxide in the atmosphere. Construction on the other hand has led to the reduction of forests. The toxins mounting in the air and entering human bodies through respiration are a result of the imbalance between carbon emissions and plant population. Some activities by humans, such as construction and driving, produce dust particles in the air, which affect the quality of the air. All these require an adequate supply of vegetation density to decarbonate and clean the air.* ***(Bruce, Operations Director/Conservation and Extensions).***

> *Various other toxic air contaminants are released as by-products from industrial processes. They make the surrounding air more toxic and grimmer to breathe in. Such environmental problems of air pollution are tackled by afforestation as the planted trees will help in reducing greenhouse gas emissions.* ***(Cee, Provincial Agritex Officer).***

> *Afforestation is very crucial because, trees do not only decontaminate carbon dioxide, rather, they also sanitize greenhouse emissions. In the air, trees also trap soil particles, which improves the air quality. As forestry commission we have been tasked to reach a commitment on net zero greenhouse gas (GHG) emissions by 2030. These solutions include, but not limited to afforestation and they help address climate change issues alongside other United Nations Sustainable Development Goals****(Lee, A District afforestation officer).***

Insights from the above sentiments reveal that afforestation plays a fundamental role in cleaning the air of carbon emissions. A breath of fresh, unpolluted air is very important especially in modern times when the risk of respiratory diseases such as Coronavirus is real. The oxygen production by trees planted thorough afforestation is imperative to tackle surmounting amounts of carbon dioxide produced from various processes like the burning of fossil fuels. Thus, the need to invest in woodlots to harvest for sustainable timber products as well as acting as a sink for carbon dioxide on land that is adjacent to human settlements and cattle farms cannot be ruled overemphasised. The role of afforestation or forests in air purification is also echoed in literature. The study findings are in line with The Global Forest Resources Assessment 2015 (FRA 2015),

which states that forests are an incredibly valuable resource, storing massive amounts of carbon, helping to purify water and air, ensuring natural biodiversity. But despite the vital importance of forests, they are under worldwide assault, with the equivalent of 30 soccer fields disappearing every minute (Food and Agriculture Organisation (FAO) 2016).

6.1.14.5 Retards land degradation and improves watershed

Stakeholders interviewed in this study were of the perception that afforestation is very vital managing land degradation in any given community. Closely linked to afforestation's ability to control land degradation is its ability to improve the watershed in an area. Such sentiments are embodied in the narratives presented below:

> *Trees have various properties that will help prevent soil erosion, such as their large canopies, transpiration process, and expansive root systems. Tree canopies prevent or reduce soil erosion by lessening the measure/ intensity of the impact the rain has on the ground. As water drains down the leaves, then branches and submerses into the soil instead ofhitting the ground vigorously, which reduces the amount of soil that is washed away by the rain? Larger canopies also interrupt the force of the wind and decrease the amount it carries away with it. The movement of water throughout plants from the roots through them and out the leaves through a process called transpiration helps from making the soil wet and prevents runoff by enabling the roots to bind the soil into place.* ***(Druek, Agriculture Planning and Monitoring Officer)***
>
> *The large root system of trees functions as a bind toward any loose soil encompassing the trees. The roots hold the soil in place while supporting the tree and improving the drainage of the soil. Water will therefore drain into the ground instead of flowing at the surface as runoff****. (Lee, District Forestry Extension Officer).***
>
> *Afforestation helps in preventing soil compaction, which happens when the soil under the surface compacts and hardens. This has the impact of decreasing water permeation and increasing runoff. Afforestation increases the number of trees and the humus from tree leaves also increases. This makes ground surfaces more permeable and hence prevents soil erosion. One other benefit directly linked to that is flood control. Through this method, one can enhance the water filtration. Thus, floods can be controlled by planting more trees. Moreover, extreme sediment transport can be prevented too.* ***(Briana, Provincial Forestry Extension Manager).***

Generally, it can be construed from the study findings that one of the major advantages of afforestation lies in the prevention of soil erosion. The chief cause of soil erosion is the tree cutting. Afforestation boosts the number of trees and the most organic way to prevent soil erosion and maintain healthy soil is to plant many trees. Soil erosion is a common problem in barren land. In large areas of developing countries like Zimbabwe the loss of trees is causing erosion and degradation of the soil, posing severe problems for economic

development.Afforestation promotes land rehabilitation. These findings are in synchrony with TPF (2018) which argues that forests have protective functions to the environment such as water catchment protection; climate change mitigation through carbon sequestration; generating clean air; reduction of soil erosion and the risk of landslides, floods and droughts, and prevent desertification and salinization.

Barren lands seem to experience very strong winds that carry large particles of soil, causing soil erosion while also negatively affecting air quality. Barren lands are also subjected to flooding when it rains, resulting in the topsoil being transported to rivers and water bodies in the area. Continued washing always of tops soils has double-barrelled effects of land degradation where erosion is taking place (visible through the formation of gullies and dongas which make the land in-arable) and siltation of rivers and water sources (which causes an acute shortage of water for domestic and commercial purposes). When rivers and dames dry up, the whole water cycle is disturbed and the likelihood of drought increases. Afforestation helps to address all the issues of soil erosion and barren land at the same time. Trees act as wind barriers, thereby weakening the speed of the wind and reducing its impact and ability to carry big soil particles.

If afforestation is to be adopted as an alternate land use, it has to compete with other land-uses on the same space of land. Thus, stakeholders had to weigh the long term viability of adopting afforestation. Stakeholder concerns included the cost of adopting afforestation, probable biodiversity issues, inadequacy of government support and length of harvesting cycles among others to be discussed in this section. The first sub-section analyses the stakeholders' perception on the opportunity cost of afforestation. Generally, it can be said such themes are in line with literature as Lawson et al (2014) pointed out that the economic incentivisation has mostly been absent in most of these initiatives. The economic value of supporting and regulating such initiatives has not been well-captured in the market and therefore have remained undervalued. Such a lack of knowledge and apparent lack of economic value poses a challenge for determining land use allocation and modelling land use change.

6.2 Chapter summary

Insights from study findings revealed that, afforestation is still at its infancy in the province. Evidence from the study showed that generally farmers are averse to the idea of afforestation due

to a number of reasons chief among them being the underlying anachronistic cultural attitudes, aversion to long term investment and the perception that there is need for huge capital for afforestation to take off.Despite these misgivings, study findings pointed out a number of benefits associated with afforestation. Some of the benefits of afforestation include creation of employment, revenue from selling afforestation products, environmental benefits such as prevention of soil erosion among other benefits. However, despite such benefits, farmers in the province remain reluctant to adopt afforestation. There is need to develop tailor made strategies in order to entice them to embrace afforestation as an on-farm economic activity. As a consequence, the current rationale of supporting afforestation as an alternative land use for economic development has become anachronistic. A new rationale will have to be outlined in order to justify continued afforestation initiatives. The proceeding chapter will therefore focus on the institutional frameworks that maybe adopted to promote sustainable afforestation as an alternative land use for economic development in Mashonaland West province.

CHAPTER SEVEN

INSTITUTIONAL FRAMEWORK THAT MAY BE ADOPTED TO PROMOTE SUSTAINABLE AFFORESTATION AS AN ALTERNATIVE LAND USE FOR DEVELOPMENT IN MASHONALAND WEST

7.0 Introduction

The previous chapter focused on stakeholders' perceptions of afforestation as a sustainable alternative land use for economic development. This chapter presents institutional frameworks that may be adopted to promote sustainable afforestation as an alternative land use for development in Mashonaland West.

7.1 Farmers' suggestions on improving existing organizations, laws, or policies to ensure the adoption of afforestation as a sustainable land use option for economic development

Evidence from the study highlights several key elements that should form the institutional framework to promote sustainable afforestation in Mashonaland West. These include improving research and development, refining regulatory and policy frameworks, enhancing afforestation extension services, providing education and training, increasing funding, improving market access, engaging other organizations, incentivizing afforestation, adding value, and guaranteeing land ownership rights.

7.1.1 Improving research and development

Research and development (R&D) are critical mechanisms for advancing sustainable afforestation in Mashonaland West. This sentiment is echoed in the following narratives:

> *Farmers' concern over afforestation is the time taken before one could start reaping benefits. There should therefore be extensive research on the possible means to maximize revenue from woodlots before actual harvest. Technology can even focus on genetic modification of tree species as long it increases growth rate without compromising on quality of timber (Contriana, Farmer/Afforestor).*

> *Afforestation mechanisms research should come up with technologies that conquer other crops in terms of yield per square meter. There is a need for research on the suitable varieties for afforestation in certain areas, find answers on how to reduce time frames to maturity for a lot of plant varieties as well as development of the right mechanisms and affordable technologies for use inafforestation(Fungie, Farmer).*

The concerns raised by Contriana and Fungie reflect common challenges faced by farmers and afforestors, particularly the need for strategies to optimize revenue and efficiency, and the long delay before benefits are realized. These concerns underscore the importance of sustained R&D efforts in afforestation. Respondents consistently indicated that limited research output has hindered progress in exploiting the benefits of afforestation and improving production.

R&D should lead to the establishment of mechanisms for optimizing afforestation in Zimbabwe. Ideally, research should result in new knowledge, systems, processes, and facts that drive transformation and improve living standards (Kariuki &Misaro, 2013). The literature also supports the centrality of R&D in afforestation. According to Pérez-Silos, Álvarez-Martínez, and Barquín (2021), farmers need to select the correct area with the appropriate soil type to ensure the viability of afforestation projects. Zhou et al. (2022) highlight that genetically modified poplars have shown increased growth rates and better pest resistance. Additionally, the use of CRISPR technology for modifying tree genomes has the potential to accelerate growth and improve wood properties (Dubois et al., 2023).

Given these findings, it is clear that addressing time delays and maximizing revenue in afforestation requires a multimodal response that includes genetic research, site-specific strategies, technological advancements, and effective management practices. Adequate R&D in these areas could help overcome obstacles and enhance the financial sustainability of afforestation initiatives. Research in afforestation is crucial for developing faster-growing, high-yielding tree varieties and innovative management practices essential for maximizing economic returns and sustainability in forestry projects.

The study also emphasized the importance of assessing suitable varieties for targeted afforestation plots. Muyi et al. (2022) explain that each species has specific requirements regarding soil quality, climate, physiography, and water supply. Without research to guide afforestation, farmers are unlikely to achieve the best outcomes, leading to disillusionment and limited adoption of afforestation as an alternative land use option. The findings suggest that

scientific and technical support is key to sustained success in afforestation, a point also supported by Chigumira et al. (2019), who noted that in Burkina Faso, careful forest seed selection and breeding, along with support for village nurseries, have ensured that planted trees are adapted to local ecosystems and have high survival rates.

7.1.2 Precise regulatory and policy framework reforms

Precise regulatory and policy framework reforms are critical for developing afforestation in Zimbabwe. The majority of respondents emphasized the importance of policies, codes of practice, and guiding regulations in promoting afforestation as a sustainable land use option for economic development.

> *There is always a need for a policy that would harness the needs of different stakeholders in afforestation. Such a policy can only be developed through extensive stakeholder engagement. Farmers' views should be given priority in this regard as these are the ones whose daily living will be directly affected by afforestation initiatives(Honia, Rural District Council Officer).*

Honia's narrative highlights the importance of precise regulatory and policy frameworks that protect the interests of all parties involved in afforestation. Successful policy-making involves extensive stakeholder engagement, with particular attention to the needs of farmers, who are directly affected by afforestation projects. Considering farmers' perspectives is crucial for developing sustainable and equitable policies that drive afforestation growth. Research indicates that policies that consider farmers' needs and preferences are more likely to gain support and achieve desired outcomes (Pretty et al., 2021).

> *We would like to see policies that promote foreign direct investment in afforestation. The moment we have investors coming in, then as farmers, we would be more assured of value addition as new technologies will be brought by new investors. Otherwise, our government is incapacitated to give all the provisions required for afforestation(Nels, Afforestor).*

Nels' call for policies that promote foreign direct investment (FDI) in afforestation reflects the potential benefits of international investment, particularly in terms of technological advancement and resource allocation. Effective policies and regulatory frameworks are necessary to ensure that FDI in afforestation aligns with national and local objectives. However, it is essential to address potential challenges, such as dependence, equity concerns, and the need for strong

legislative frameworks, to ensure that the benefits of such investments are optimized and aligned with regional needs and sustainability goals.

The study's findings highlight the inadequacy of existing policies in afforestation, particularly in terms of poor structures and institutions. Several challenges faced by afforestors and farmers, such as limited investment, stakeholder support, and market access, should be addressed through policies. These challenges are echoed in the Zimbabwean context by Chigumira et al. (2019) and FAO (2018). The study illustrates that appropriate and effective policy frameworks are essential for developing afforestation as a sustainable on-farm economic activity in Zimbabwe.

Despite Zimbabwe having a relatively sound legal framework, the study revealed that the existing framework lacks harmony with other policies and robust enforcement. For example, TPF (2018b) cited conflicts between the Mines and Minerals Act and the Forest Act, where the former grants land rights to miners over foresters. Other conflicts include the Land Resettlement Act vs. the Forest Act, where forest land is converted into agricultural land. Such land use conflicts are also noted by TPF (2018), which reports that traditional and local leadership allows settlements in gazetted and commercial forest plantations, as seen in cases like Martin Forest in Chikukwa and Tarka Forest in Ngorima.

Moreover, there are overlaps and duplications in the law. For example, the management of fire under Statutory Instrument 7 of 2007 is under EMA, but this instrument is derived from the Forest Act, managed by the Forestry Commission. Additionally, the Principal Forest Act is outdated and does not address emerging issues of sustainable forest management, such as the marketing and market value of afforestation products. One of the stakeholders commented:

There should be a policy on how forestry resources from afforested areas will be sold, and making the farmer aware of the value chain involved(Contriana, Farmer/Afforestor).

Contriana's call for a policy on the sale of forestry resources from afforested areas and increased awareness of the value chain is crucial for ensuring that afforestation projects are economically viable and beneficial for farmers. The findings align with the Draft National Forest Policy (ZELA, 2017), which identifies a legal gap in the promotion of commercialization of forest goods and the creation of an environment that facilitates sustainable trading in forest produce. The Rural District Councils Act, as mentioned above, allows RDCs to offer concessions to

foreigners for the economic use of forest resources, encouraging commercial wood poaching and providing little incentive for local communities to manage their forestry resources responsibly (Shumba, 2011).

Effective afforestation policy development hinges on extensive stakeholder engagement, with particular attention to farmers' needs. By prioritizing the input of those directly affected and employing consultative, collaborative, and adaptive strategies, policies can be crafted to better address the diverse needs of all stakeholders, leading to more sustainable and equitable afforestation outcomes. The Theory of Structuration and Institutional Theory should inform the design of intervention protocols in afforestation, supported by the Sustainable Livelihoods Framework (SLF), as livelihoods determine whether stakeholders (as per Stakeholder Theory) adopt sustainable afforestation. Such frameworks may lead to desired changes, but policy mechanisms should also provide economic incentives, as farmers are rational actors who consider the highest returns when making land use decisions.

7.1.3 Improved afforestation extension services

The enhancement of extension services was cited by several respondents as crucial in promoting sustainable afforestation as an alternative land use for development in Mashonaland West. Stakeholders generally perceived adequate forestry extension services as a pivotal factor in optimizing the adoption of afforestation as a sustainable alternative for economic development. The following voices highlight the importance of improved afforestation extension services:

> *For a start, as we seek to operationalize the government-proposed tree planting models, we need more extension officers for education and enforcement to succeed. Therefore, we cannot overlook the need to recruit additional extension officers (Forestry Extension Officer).*

> *There's an issue with extension officers. We're unsure if they even exist, and if they do, they may be too incapacitated to cover their allocated areas. The focus should be on either empowering them by providing transport or increasing their numbers to boost their visibility (Farmer).*

The findings above underscore that adequate forestry extension services are essential to adopting afforestation as a viable on-farm economic activity. Their role is critical because, without these services, expert advice to farmers on afforestation is absent, leading to the potential failure of such ventures. Consequently, the findings suggest that afforestation extension services are

indispensable for the success of afforestation as an economic activity. These results align with the FAO (2017), which posits that tree planting is not merely a forestry issue but also a farm system and social issue, necessitating an 'extension approach' that integrates trees into the farm system as a productive activity.

These findings also concur with Le et al. (2012), who noted in a study in the Philippines that most smallholder woodlots produce volumes far below their site potential, leading to the disillusionment of smallholders due to inadequate expert advice in the early years of afforestation. This lack of understanding among new afforestors about how trees are valued (whether by the number of logs, their diameter, log volume, or partially sawn log flitches) or the impact of location on log prices (e.g., price at the stump, roadside, or mill door) affects the overall contribution of afforestation to economic development in Mashonaland West. Thus, upholding afforestation extension services is crucial for adopting afforestation as a sustainable, alternative land-use option in the province.

7.1.4 Education and training

The research findings indicate that education and training are vital strategies for developing best practices in afforestation as a sustainable economic activity in Zimbabwe. In this context, education and training are seen as mechanisms for imparting knowledge and skills related to business aspects of afforestation. The terms are used interchangeably to convey essential information about afforestation development. The majority of respondents emphasized the importance of education and training in facilitating effective business operations. They used terms such as knowledge acquisition, skill equipping, enlightenment, relevant information provision, teaching, learning programs, and schooling, highlighting the significance of this strategy in promoting effective afforestation development in Zimbabwe. A forest extension officer shared the following on the role of education and training in improving the adoption of afforestation as a sustainable land-use option for economic development:

> *There should be education for people, for instance, on afforestation as an alternative land use, especially when they have land that has not been cultivated for five or more years." (Forestry Extension Officer)*

Echoing similar sentiments, an afforester added:

> *There is a need for vigorous outreach campaigns to educate farmers. A cost breakdown for plantations should be provided so farmers can make informed decisions. Education should be ongoing, with frequent contact sessions and farm visits by forestry officers (Afforester).*

The above sentiments suggest that many afforestation development efforts are hampered by ignorance, primarily due to inadequate support structures. As a result, stakeholders in this study proposed that eradicating ignorance through educational programs is critical for the public and relevant authorities to understand and appreciate the importance of effective afforestation ventures in Zimbabwe. Respondents also recognized the importance of knowledge and skill acquisition in providing effective management services and implementing strategies. According to the findings, education is viewed as the lifeblood of knowledge and skill transfer, implying that imparting knowledge and skills is essential for developing effective methods of afforestation as an alternative land use in Mashonaland West, Zimbabwe.

The U.N. Food and Agriculture Organization (FAO) (2018) echoes these sentiments, noting that worldwide, forest-related education is generally inadequate. The organization emphasizes that to meet the knowledge and information needs of various populations, the content and methods of forest education and training should be tailored to the people's needs. In a constantly changing world, education must meet the information, professional knowledge, and expertise needs of as many social groups as possible, as quickly as possible. Ajulor (2018) also emphasizes that only a well-educated and informed society can produce policymakers who prioritize harmony between people and forests for sustainable development.

A close study of existing research shows that prioritizing education and training in forest policies has led to significant success in forest reforms. For instance, the Baltic nations (Latvia, Estonia) implemented large-scale training initiatives in the early 1990s, which significantly enhanced the profitability of their forest industry by basing operations on sustainable forest management principles. A similar strategy is being adopted in the Russian Federation, albeit more slowly. Institutional reforms in forest management are accompanied by substantial training programs.These examples demonstrate how research, education, and training can impact implementing forest policies aimed at sustainable forest development at the national level, with People and Forests becoming partners in peaceful coexistence. Based on these findings, it can be

concluded that in all countries aiming to ensure sustainable forest management, high priority should be given to forest research, education, and training. Education and training programs should be multidisciplinary, communicating the latest information in various fields of research and practice. Multidisciplinary training programs should undergo prior evaluations by recognized experts in the field. It is essential to establish teaching and learning strategies for module-based training programs and provide manuals, textbooks, and other training materials translated into relevant national languages. Textbooks and training tools should focus on electronic materials that enable farmers to use the Internet and distance learning.

7.1.5 Improved funding for afforestors and afforestation organizations

Access to funding structures and institutions was highlighted as one of the key institutional building blocks for promoting sustainable afforestation as an alternative land use for development in Mashonaland West. The following narratives illustrate the centrality of funding in promoting afforestation as an on-farm economic activity in Zimbabwe:

> *Access to funding is critical for farmers here in Chitomborwizi. Most farmers cannot afford the costs incurred during land preparation and transplanting. Once the woodlot is established, the costs decrease, and they can manage from there (Farmer).*

> *If you recall the early 1980s during the Rural Afforestation Programme (RAP 1 & RAP 2 phases), supported by the World Bank, there was massive tree planting. Schools planted trees, received fences, and the then Great Forestry Common was everywhere, spreading the message extensively (Forestry Extension Officer).*

The general findings suggest a strong need for financial support to stimulate the uptake of afforestation among farmers. Financial structures and support systems are necessary to support afforestation. The study's evidence highlights that the entry costs into afforestation are prohibitive for most farmers, especially small-scale farmers. Many farmers indicated that inadequate funding is one of the main reasons they have not adopted afforestation. A Forestry Extension Officer shared the following insights:

> *Going commercial is really expensive, but it's doubly so for small-scale farmers because they don't have much; they can easily do the land preparation using animal power or on their own. However, as we move forward, financial support and expertise are needed beyond the Agritex and forestry communal officers (Forestry Extension Officer).*

Farmers generally felt that the costs of afforestation were much higher than those of traditional crops such as maize and soybeans. Some respondents even humorously commented on purchasing afforestation inputs at the expense of cash crops that offer quick returns. The narrative below highlights farmers' perspectives on sourcing afforestation inputs over traditional crops:

You can imagine people buying fertilizers for trees while their crops are suffering or weeding forest plantations while their maize or tobacco is growing (Farmer).

These findings indicate that farmers are more concerned about their immediate basic needs than future returns. Farmers felt that for afforestation to take off, there is a need for improved funding. Compared to other on-farm land-use options, farmers believed that the government prioritizes other crops over afforestation. Contrarily, both a farmer and an afforester shared the following views on government funding:

> *There's a presidential input scheme for maize, sorghum, sugar beans, and other garden vegetables, but none for forestry. For commercial purposes, the government has boosted the production of other grains through command agriculture, but no effort has been made toward afforestation—only the invisible SAA supports a few farmers.*

These findings suggest that afforestation is grossly underfunded compared to other crops. Respondents generally felt that for farmers to adopt afforestation as an on-farm economic activity, funding must be improved. Without sufficient funding, afforestation efforts may not get off the ground or reach their full potential, limiting the benefits of afforestation and negatively affecting its contribution to economic development. Government grants, private investments, crowdfunding, and international aid can all be sources of funding for afforestation projects.

7.1.6 Enhanced market access

Most respondents viewed markets as human constructs that can either be created or collapsed depending on societal incentives and historical contexts. Exploiting markets to achieve social change through afforestation is an age-old strategy that remains valid in every context, as the viability of any business is determined by the size and value of the market being served. One expert reiterated that if no effort is made to create markets

7.1.7 Engaging other organizations

Evidence from the study illustrates that one effective method to promote sustainable afforestation as an alternative land use for development in Mashonaland West is by engaging other organizations to participate. This approach is emphasized in the narrative presented below:

> *It is of great importance to increase the number of forestry promoters. Alternatively, we can collaborate with our sister board, Agritex, which has representation at the ward level. What will be required is to capacitate them and ensure they have thorough knowledge of afforestation (*Forestry Extension Officer).

The general idea is to pool resources together. While the Forestry Commission has engaged other organizations such as Agritex and the Tobacco Industry and Marketing Board (TIMB), the arrangement has not been strengthened by transferring certain powers to these organizations, as highlighted by one farmer/afforester:

> *TIMB, individual farmers, the Forestry Commission, and obviously Agritex are involved, though I am unsure to what extent they are active in my area. TIMB is very active in afforestation, but farmers, especially tobacco farmers, are not fully adopting the principles set for them. The challenge arises because TIMB lacks policing power, making enforcement difficult when government agencies are not as actively involved as they should be (*Farmer/Afforester).

The findings suggest that existing working arrangements between the Forestry Commission and other organizations involved in afforestation are not yielding desired results. There is a need to transfer some of the Forestry Commission's powers to these organizations to enable them to effectively contribute to promoting afforestation as a sustainable land-use option for economic development in Mashonaland West. However, caution is necessary when transferring these powers, as one stakeholder voiced concern about the involvement of too many organizations in afforestation:

> *There are too many claims of power in afforestation. For example, TIMB, Agritex, the Forestry Commission, and the Afforestation Association of Zimbabwe are all involved, which is good. However, these stakeholders lack coordination. We need to see coordinated activities and funding (Forestry Extension Service Officer).*

Thus, there is a need to streamline the organizations involved in afforestation. Such an exercise would allow for systematic operations to be implemented. Research findings indicate that the business of afforestation in Zimbabwe requires clear processes and systems for informed functionality. Collaborative efforts among all stakeholders are necessary to ensure the effective

adoption of afforestation as a sustainable economic activity on farms. The voices below emphasize the need for collaboration:

> *It is of great importance to increase the number of forestry promoters. Alternatively, we can collaborate with Agritex, which has representation at the ward level. What will be required is to capacitate them and ensure they have thorough knowledge of afforestation (*Forestry Extension Officer).
>
> *The Ministry of Lands should deliberately create a stencil contract with farmers who want to engage in afforestation, so the process does not become too tedious* (Extension Officer)

These sentiments suggest that collaboration brings new ideas to address challenges in promoting sustainable afforestation as an alternative land use for development in Mashonaland West. To successfully and effectively promote sustainable afforestation, there is a need to streamline stakeholders and establish a sole authority with judicial powers to oversee the promotion of afforestation while other organizations play supportive roles.

7.1.8 Incentivizing afforestation

Incentivization emerged as a key mechanism for promoting sustainable afforestation in Mashonaland West. This view is embodied in the following narratives:

> *There is a need to develop an afforestation model that will incentivize farmers. Currently, our citrus industry was declining, but the government has made a deliberate effort to reintroduce the horticulture industry, targeting plants like macadamia. Now, indigenous farmers are venturing into this because they see the benefits, offering another opportunity beyond the cereals(* Extension Officer).
>
> *We also need carbon points, as seen in international practices. Although carbon points may not fully cover the total cost of forest production, they provide the farmer with some revenue before harvesting the woodlots, which takes about ten years (Bruce, Operations Director/Conservation and Extensions)*

The above sentiments indicate that incentives for afforestation are currently limited. This could explain the limited uptake of afforestation as an on-farm economic activity in Mashonaland West Province, Zimbabwe. From the synthesis of respondent narratives, most felt that direct incentives might include cash incentives. These could come in the form of carbon points, with the amount depending on the net contribution of the woodlot to carbon sequestration. Furthermore, farmers who convert part of their arable land into forests should receive direct cash benefits from the government, encouraging them to view afforestation as a sustainable land use, not just for degraded land spaces. Given the number of seedlings needed to start a commercial woodlot,

there may also be a need for the government to subsidize some inputs, including free or subsidized nursery, land preparation, and fertilizers.Incentives provided to farmers should aim to reduce the burden of the initial outlay required to establish a new forest, such as the cost of seedlings and land preparation. Concerns about incentives among afforesters have been echoed in the literature. According to Nyikadzino (2016) and Gwaze and Marunda (2014), economic incentivization has been mostly absent in these initiatives. The economic value of supporting and regulating such initiatives has not been well captured in the market and, therefore, has remained undervalued (Lawson et al., 2014). The lack of knowledge and apparent undervaluation of economic incentives presents a challenge in determining land use allocation and modeling land use change. In the past, trial and error or rough rules of thumb were sufficient means of determining land use (FAO, 2015).

The study findings also suggest that it is not only about providing incentives, but also about disseminating information on available provisions and how to qualify for them to the intended beneficiaries. This knowledge would motivate farmers to devote part of their land to afforestation. Evidence suggests that farmers frequently overlook or dismiss opportunities provided by forestry development due to psychological factors such as emotional attachment to the land and/or negative attitudes towards the perception of failure in farming, which further exacerbates these barriers (Malone, 2008). Most farmers view forestry as an alternative land use for their least desirable areas rather than an essential component of traditional agriculture (Dhubháin& Gardiner, 1994). However, despite the unfavourable acceptance of afforestation as a viable alternative land use, it has been discovered to be economically advantageous.

7.1.9 Value addition

Many respondents viewed value addition as a critical element in sustainable afforestation. The narratives below demonstrate the significance of value addition in promoting afforestation as an on-farm sustainable economic land-use option:

> *Those along the value chain benefit more than those in afforestation. There is a need for beneficiation of afforestation products so that the incentives from afforestation would be sufficient to entice farmers to adopt afforestation (*Briana, Provincial Forestry Extension Manager).

The above narrative suggests that due to limited beneficiation, afforestation products underperform in the market. The financial incentives from afforestation are poor due to the

absence of beneficiation. As a result, it was suggested that for afforestation to take off, there is a need for financially incentivizing afforestation through value addition to its products. Several respondents reiterated that on the output side, the prices offered by local buyers for raw wood and other forest products are very low. These concerns are also raised by Gwaze and Marunda (2014), who state that economic incentivization has mostly been absent in most of these initiatives. The economic value of supporting and regulating such initiatives has not been well captured in the market, thus remaining undervalued (Lawson et al., 2014). This lack of knowledge and apparent undervaluation presents a challenge for determining land use allocation and modelling land use change.

Farmers who have taken up afforestation so far have limited options when selling their produce in Mashonaland West due to high transaction costs, which act as barriers to efficient participation in different markets. Producers are less likely to use a particular channel when the cost of using it outweighs the value it provides. The remote locations of most farmers, coupled with poor road networks, give rise to high transaction costs, particularly transport costs.

On the input side, the inaccessibility of remote farms increases the prices that input suppliers charge farmers due to the high transaction costs they incur in bringing inputs closer to the farms. Such an increase in input prices and drop in output prices worsens the situation, resulting in farmers realizing very low profitability for long-term investments, thereby diminishing economic returns from afforestation. To address this, institutional frameworks should aim to create more value from forest resources so that both farmers and local communities can benefit from their woodlots. Value addition also allows farmers to reduce transaction costs associated with transporting finished products to the market.

7.1.10 Guaranteeing land ownership rights

Evidence from the study demonstrated the need to improve land ownership among farmers to enhance the adoption of afforestation. In the Zimbabwean context, evidence from study findings shows that with expropriation, land became the property of the government. The compounding impact of insecure land tenure on farm investment is aptly captured in the following narrative:

> *As a result, land ceased to be a transferable asset. Investment in farming has been imperilled because necessary permits, state land leases, and 'offer letters' do not provide security of tenure*
> (Extension Officer)

A close analysis of the above sentiments reveals that farmers in Zimbabwe only have usufruct rights to land, as they lack title deeds. This uncertainty and the associated risks of land ownership undermine long-term investment in farms, particularly affecting long-term projects like afforestation. It is widely argued that lack of tenure security in the farming sector constrains farmers' access to credit, farm investments, technology adoption, and sustainable agricultural development and productivity. It is generally argued that the lack of tenure security in the farming sector constrains farmers' access to credit, farm investments, technology adoption, and sustainable agricultural development and productivity. Secure tenure rights are a critical foundation for local economic development. However, despite the importance of land ownership and land rights in spurring farm production, land ownership in Zimbabwe remains unclear following the Land Redistribution exercise. This lack of clarity prompts farmers to shy away from investing in long-term projects or development initiatives, such as afforestation.

Devolving land rights to local communities and farmers can lead to challenges in securing investments in long-term projects like afforestation. Therefore, it is critical that institutional frameworks address the issue of land ownership. The problem of land ownership is one of the most significant challenges in the history of forest lands (Beyene et al., 2019; Ullar et al., 2021). Sustainable afforestation development will be fundamentally strengthened by legal frameworks that recognize and secure the land ownership rights of local communities and farmers (FAO, 2018). FAO (2018) emphasizes that some prerequisites for sustainable land management include land tenure security, the formal recognition of customary rights to the use of land and forest goods, and the strengthening of the rights of vulnerable groups, such as poor, forest-dependent people.

7.2 Chapter Summary

This study highlighted several challenges hindering the growth of afforestation initiatives, including limited market access and poor extension services. Addressing these challenges is pivotal to meeting policy targets for adopting afforestation as an alternative land use for economic development. Despite these challenges, various strategies were identified that could help realize the potential of afforestation as an alternative land use option in Zimbabwe. These strategies include incentivizing afforestation, promoting research and development, enhancing

value addition, implementing policy reforms, improving market access, expanding education and training, and strengthening extension services.

The next chapter presents a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe.

CHAPTER EIGHT
MODEL FOR SUSTAINABLE AFFORESTATION AS AN ALTERNATIVE LAND USE FOR ECONOMIC DEVELOPMENT IN ZIMBABWE

8.0 Introduction

The preceding chapter examined the institutional framework that could be adopted to promote sustainable afforestation as an alternative land use for development in Mashonaland West. This chapter aims to develop a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe. To fully appreciate the model, it is essential to revisit the objectives and findings of the previous chapters, as these have informed the model's development. The data collected yielded valuable insights into creating a sustainable afforestation model for Zimbabwe.

8.1 Objective one: To establish the state of afforestation in Mashonaland west province

In the process of developing a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe, it was necessary first to profile the state of afforestation in Mashonaland West Province. In-depth interviews and observations were conducted, with responses summarized to provide a comprehensive picture of the current state of afforestation. Photographs from incidental observations supported the narratives from respondents. Several themes were identified from the findings, which were used to depict the prevailing state of afforestation within the province.

The study findings highlighted the following themes: afforestation as an alternative land use, types of tenure, funding, farm size, investment in afforestation, average time for species to mature, estimated value of afforestation projects after maturation, key technical resources for successful afforestation, accessibility and ownership of key technical resources, hectarage under afforestation, type of afforestation management structure, survival rate of plantation plants, essentials for producing quality timber, and the ideal soil profile for afforestation.

Evidence from the study shows that, although afforestation is still in its infancy, it has become part of the on-farm land use activities in the province. Despite this paradigm shift towards

afforestation, narratives from respondents revealed that afforestation uptake remains low in Mashonaland West Province. Afforestation is mainly confined to a limited number of large-scale farmers with extensive landholdings. The land under afforestation is minimal compared to the available land, with the aggregate gain in forests across the province representing a mere 0.0095% of lost forest cover and 0.61% of the nation's tree cover gain, estimated at 48,065.6 hectares between 2001 and 2021. These figures, which are still less than 1%, clearly indicate the underutilization of land.

Furthermore, afforestation is generally treated as a supplementary activity rather than a primary land use among farming communities. Afforestation is not widely considered an alternative land use option for economic development. The findings suggest that, in the broader context of forest cover, converting land from agriculture to forest is uncommon among local farmers in Zimbabwe. This reluctance stems from the absence of a 'farm forestry' tradition in the country. Despite the potential financial benefits of afforestation, much of Zimbabwe's land remains idle due to the lack of an afforestation culture. Consequently, afforestation programs have repeatedly failed, and the potential income from unproductive land remains unrealized.

The study also revealed that the range of tree species targeted in afforestation initiatives in Mashonaland West is too narrow. The focus is primarily on two tree species—the pine and eucalyptus varieties—with eucalyptus (gum tree) being the most dominant. This preference is likely because these species mature quickly, allowing for economic returns from afforestation ventures in the shortest possible time. In addition to their quick maturity, these varieties are encouraged by the Forestry Commission.

Insights from the Forestry Commission indicated that climate change has introduced new challenges to tree improvement programs. As a result, tree breeders and their assistants are shifting their focus toward planting fast-growing tree species that can easily adapt to the changing environment. Therefore, the primary focus of tree improvement in the province is on exotic softwood and hardwood forests, namely pine and eucalyptus. Many potential afforestors are deterred by the time it takes to realize the benefits of an afforestation initiative.

Generally, farmland owners appear to be averse to long-term investments. Depending on environmental conditions, an afforestation project typically takes 7 to 10 years to reach maturity and provide meaningful returns. Sustainable afforestation, therefore, requires a long-term

investment in a forestry project. Additionally, afforestation projects require substantial upfront financing, which presents a significant barrier. Investors face high initial costs and delayed returns, necessitating the availability of initial capital and the patience to wait for revenue. These financial demands, combined with the uncertainty surrounding land ownership, discourage current and potential afforestors from investing in afforestation.

The study's narratives suggest that only a limited number of farmers are engaged in afforestation. Several challenges were identified, with the most prominent being a lack of knowledge, poor funding, cultural misgivings, and aversion to long-term investments. These barriers are compounded by evidence that opportunities presented by forestry development are often overlooked or dismissed by farmers due to emotional attachment to the land or negative perceptions of potential failure in farming.Inadequate afforestation extension services have also hindered the promotion and uptake of afforestation in the province. Extension services are broadly defined as an educational process that informs, convinces, and connects people, facilitating the flow of information between farmers, resource users, administration managers, and leaders.

Land tenure has also been a significant obstacle to the adoption of afforestation among farmers and landowners. In Zimbabwe, evidence from the study indicates that land became government property following expropriation, leaving farmers with only usufruct rights rather than title deeds. This uncertainty and associated risks discourage long-term investments on farms, negatively impacting projects like afforestation. It is widely argued that a lack of tenure security in the farming sector constrains farmers' access to credit, farm investments, technology adoption, and sustainable agricultural development and productivity. Secure tenure rights are essential for local economic development and are particularly necessary for attracting individuals and institutions to take up afforestation as an alternative land use. Given the long-term nature of afforestation investments, secure land tenure is crucial.

Regarding the value estimation of afforestation projects after maturation, many interviewees were uncertain about the actual value of their initiatives. The findings suggest that there is limited knowledge among farmers about the dynamics of afforestation, pointing to poor education and training as challenges in afforestation management and hindrances to the broader adoption of afforestation as a sustainable land use.

The study highlighted several key resources essential for successful afforestation, including land, labor, funding/capital, and knowledge. The existing land tenure system, which leaves farmers without title deeds, has made it difficult to use land as collateral or invest in long-term projects like afforestation. Institutional challenges in land management and ownership have further complicated efforts for current and potential afforestors. In Zimbabwe, conflicting legal frameworks, such as the Mines and Minerals Act versus the Forest Act and the Land Resettlement Act versus the Forest Act, have created challenges for afforestation, weakening its institutionalization and management as a viable land use option.

Funding, another critical resource for successful afforestation, remains a significant challenge. Financial difficulties have hindered the responsible authorities' ability to hire or train afforestation experts and provide funding to afforestors. However, some organizations are now partnering with afforestors, offering funding in exchange for a percentage of the returns during harvesting. Despite these opportunities, many afforestors lack information about potential partnerships.

Overall, the findings suggest that afforestation management in Mashonaland West remains problematic. There are inadequacies in afforestation management, with involved organizations falling short of expectations. It is inevitable to conclude that the institutions responsible for afforestation have not been effective. However, the failure of institutions to fulfill their mandate and jeopardize afforestation initiatives as an alternative land use is not exclusive to Zimbabwe. Globally, the failure to reform forest governance institutions has led to the continued destruction of forests and forest-dependent livelihoods.

8.2 Objective two: To explore the perceptions of stakeholders towards afforestation as a sustainable alternative land use for economic development

This objective aimed to understand stakeholders' perceptions of afforestation as a sustainable alternative land use for economic development. The study findings provided valuable insights into stakeholders' views on this issue, revealing both concerns and perceived benefits.

Key Concerns: Respondents identified several challenges associated with afforestation as an alternative land-use strategy:

- High Opportunity Cost: Afforestation was viewed as carrying significant opportunity costs, particularly when compared to other forms of agriculture.
- Land Requirements: Stakeholders perceived afforestation as feasible primarily for farmers with extensive land holdings, rendering it impractical for smallholder farmers.
- Capital Intensity: The need for substantial capital investment was a major concern, with inadequate government support further exacerbating the issue.
- Lack of Incentives: Unlike other forms of crop farming, afforestation lacks sufficient incentives to encourage farmer participation.
- Delayed Returns: The long waiting period before harvesting, even with fast-growing species like pine and eucalyptus, was seen as a deterrent.
- Ecotourism Issues: Concerns about the impact of afforestation on ecotourism were also noted.

Perceived Benefits: Some stakeholders highlighted the potential advantages of afforestation:

- Microclimate Creation: Afforestation can help regulate rainfall distribution, contributing to more stable microclimates.
- Diversification: It offers an opportunity for diversification, which is beneficial for long-term economic stability.
- Biodiversity Conservation: Afforestation is seen as a way to preserve biodiversity and address climate change issues.
- Improved Resources: It enhances the supply of raw materials, improves air quality, mitigates land degradation, and supports watershed management.

Cultural Attitudes and Reluctance: The study revealed an entrenched cultural resistance to afforestation among farmers in Mashonaland West. Many respondents attributed the limited adoption of afforestation to outdated cultural values and a general aversion to departing from traditional crops. This reluctance is likely compounded by the perceived inadequacies of the Forestry Commission in effectively communicating the benefits of afforestation.

Land and Investment Concerns: The issue of land size was a significant barrier, with both smallholder and larger-scale farmers expressing concerns about the adequacy of their land for afforestation. The study found that farmers prioritize traditional crops over afforestation, mainly due to a lack of understanding of how to maximize the benefits of afforestation. Additionally, the presence of underutilized "bad lands" and other underutilized land in Mashonaland West highlights a missed opportunity for afforestation, which could be attributed to challenges such as land rights, access to extension services, and capital investment.

Capital and Operational Challenges: Afforestation requires significant capital for land preparation and ongoing maintenance, including the creation of fireguards, pruning, and disking to manage grass and reduce fire risk. These costs are prohibitive for many farmers, especially given the long-term nature of the investment and the uncertainty surrounding returns.

Misconceptions and Knowledge Gaps: The study identified widespread misconceptions about certain afforestation practices, such as the use of eucalyptus. The inadequacy of extension services has contributed to general ignorance among farmers regarding the benefits and practices of afforestation. Many respondents also raised concerns about the opportunity cost of afforestation, particularly in terms of land that could be used for residential development or other economic activities.

*Economic and Environmental Considerations***:** Respondents showed a limited understanding of the economic benefits of afforestation, with many viewing it more as an environmental conservation effort than an economic activity. This perception likely contributes to the low uptake of afforestation initiatives. However, some stakeholders recognized the potential downstream economic benefits, such as addressing the scarcity of raw materials and reducing production costs, which could enhance the competitiveness of Zimbabwean products.

Environmental Benefits: Despite the challenges, stakeholders acknowledged several environmental benefits of afforestation, including the creation of microclimates, biodiversity conservation, climate change mitigation, improved air quality, reduced land degradation, and better watershed management.

Conclusion: Overall, the study found that while there is awareness of the environmental benefits of afforestation, significant barriers—such as cultural resistance, land size constraints, capital

requirements, and knowledge gaps—hinder its adoption as a sustainable alternative land use for economic development. Addressing these challenges, particularly through improved extension services and government support, is essential for promoting afforestation in Mashonaland West and beyond.

8.3 Objective three: Exploring institutional frameworks for promoting sustainable afforestation as an alternative land use for economic development in mashonaland west.

The guiding research question for this objective was: What institutional frameworks can be adopted to promote sustainable afforestation as an alternative land use for economic development in Mashonaland West? The institutional framework should encompass several key areas: improving research and development, refining regulatory and policy frameworks, enhancing afforestation extension services, providing education and training, increasing funding, improving market access, engaging other organizations, incentivizing afforestation, and adding value to afforestation products.

Research and Development

Findings from the study underscore the importance of research and development in advancing sustainable afforestation as an alternative land use in Mashonaland West. It is clear that research plays a crucial role in development. The study revealed a significant gap in research related to optimizing afforestation within the Zimbabwean context. Respondents noted that the limited research output has hindered efforts to fully exploit the benefits of afforestation, promote production, and generally improve afforestation practices. Research should drive the establishment of effective mechanisms for optimizing afforestation, leading to new knowledge, systems, and processes that can transform practices and improve living standards.

Farmers recognize that one of the key drivers for adopting afforestation extensively is ongoing improvement in tree hybrids to enhance timber quality and growth rates. Research should aim to improve yield per hectare for afforestation to match or surpass the aggregate crop yield of other crops during the same period. Afforestation efforts should be informed by research from inception to harvesting.

Regulatory and Policy Frameworks

Precise regulatory and policy framework reforms are critical for advancing afforestation in Zimbabwe. These frameworks provide essential guidance for operations and protect the interests of all stakeholders. Most respondents emphasized that effective policies, codes of practice, and regulations are crucial for developing best practices in afforestation as a sustainable land use option. The study highlights that many challenges faced by afforestors—such as limited investment, inadequate stakeholder support, and poor market access—should be addressed through robust policies.

Effective policy frameworks are public documents that outline institutional goals and operational guidance. However, respondents pointed out that the lack of an effective policy framework has impeded afforestation development efforts. Despite having a relatively sound legal framework, Zimbabwe's existing policies suffer from a lack of harmonization and enforcement. Conflicts between laws, such as those between the Mines & Minerals Act and the Forest Act, and issues like land conversion and overlapping regulations, exacerbate these challenges. The outdated principal Forest Act also fails to address emerging issues in sustainable forest management.

Land Ownership

The study demonstrates a need to improve land ownership among farmers to enhance afforestation adoption. The expropriation of land has led to government ownership, creating uncertainty that discourages long-term investments. Lack of tenure security in the farming sector hampers access to credit, technology adoption, and sustainable agricultural development. Secure tenure rights are essential for local economic development. The unclear land ownership post-Land Redistribution has led to reluctance among farmers to invest in long-term projects such as afforestation. Institutional frameworks must address land ownership issues to strengthen pathways for sustainable afforestation development.

Extension Services

Ignorance among afforestors is a prevalent issue. The inadequacy of extension workers has contributed to a lack of awareness about afforestation issues. Extension services play a crucial role in educating and linking farmers with resources and information. The study indicates that improved extension services are vital for promoting sustainable afforestation as an alternative

land use. Effective extension services provide necessary expert advice, preventing the collapse of afforestation ventures.

Education and Training

Education and training are critical strategies for developing best practices in afforestation. They are seen as means to impart knowledge and skills related to afforestation development. Most respondents highlighted the importance of education and training in facilitating effective business operations. Programs should adopt a multidisciplinary approach, incorporating the latest research and practices, and be subject to evaluation by experts. Educational materials should be available in relevant national languages and include electronic resources for distance learning.

Funding

Funding is a key institutional element for promoting sustainable afforestation. The study reveals that financial constraints prevent afforestors from undertaking afforestation initiatives. Inadequate funds hinder the ability to hire or train experts and provide necessary support. Some organizations partner with afforestors to provide funding, but lack of awareness about these opportunities remains a challenge. Disseminating information about funding options and partnerships is crucial to enable farmers to pursue afforestation as a viable economic activity.

Market Access

Market access for afforestation products is another critical area. Effective policy frameworks are needed to attract investment, especially in value addition. Overregulation can restrict market access due to rules aimed at curbing illegal logging. Creating markets for afforestation products is essential, as market size and value are key determinants of business viability. Stakeholders should focus on developing policies that encourage investment and streamline regulations to support market access.

Engaging Organizations and Incentivization

Engaging organizations in afforestation efforts can improve systematic operations. Streamlined and coordinated collaborative efforts among stakeholders are necessary for effective afforestation adoption. Incentivizing afforestation through economic incentives is also important. Direct incentives, such as cash rewards and carbon credits, can encourage farmers to invest in

afforestation. Additionally, subsidies for inputs like nursery costs, land preparation, and fertilizers can support afforestation initiatives.

Value Addition

Value addition is crucial for the financial viability of afforestation products. The study found that limited beneficiation results in poor market performance of afforestation products. To promote afforestation, there is a need for value addition to improve financial returns. Respondents noted that local buyers offer low prices for raw wood and forest products, underscoring the need for enhanced value-addition strategies.

Overall, these findings highlight the importance of a comprehensive institutional framework to support sustainable afforestation in Mashonaland West, addressing research, policy, land ownership, extension services, education, funding, market access, organizational engagement, incentivization, and value addition.

8.4 Sustainable afforestation model

The framework illustrated in Figure 8.1 presents a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe. The model also highlights key issues that need attention such as improving afforestation viability through the enactment of enabling policies that allow for economic, sociocultural, and ecological viability of afforestation in Mashonaland West.

Model for Sustainable Afforestation

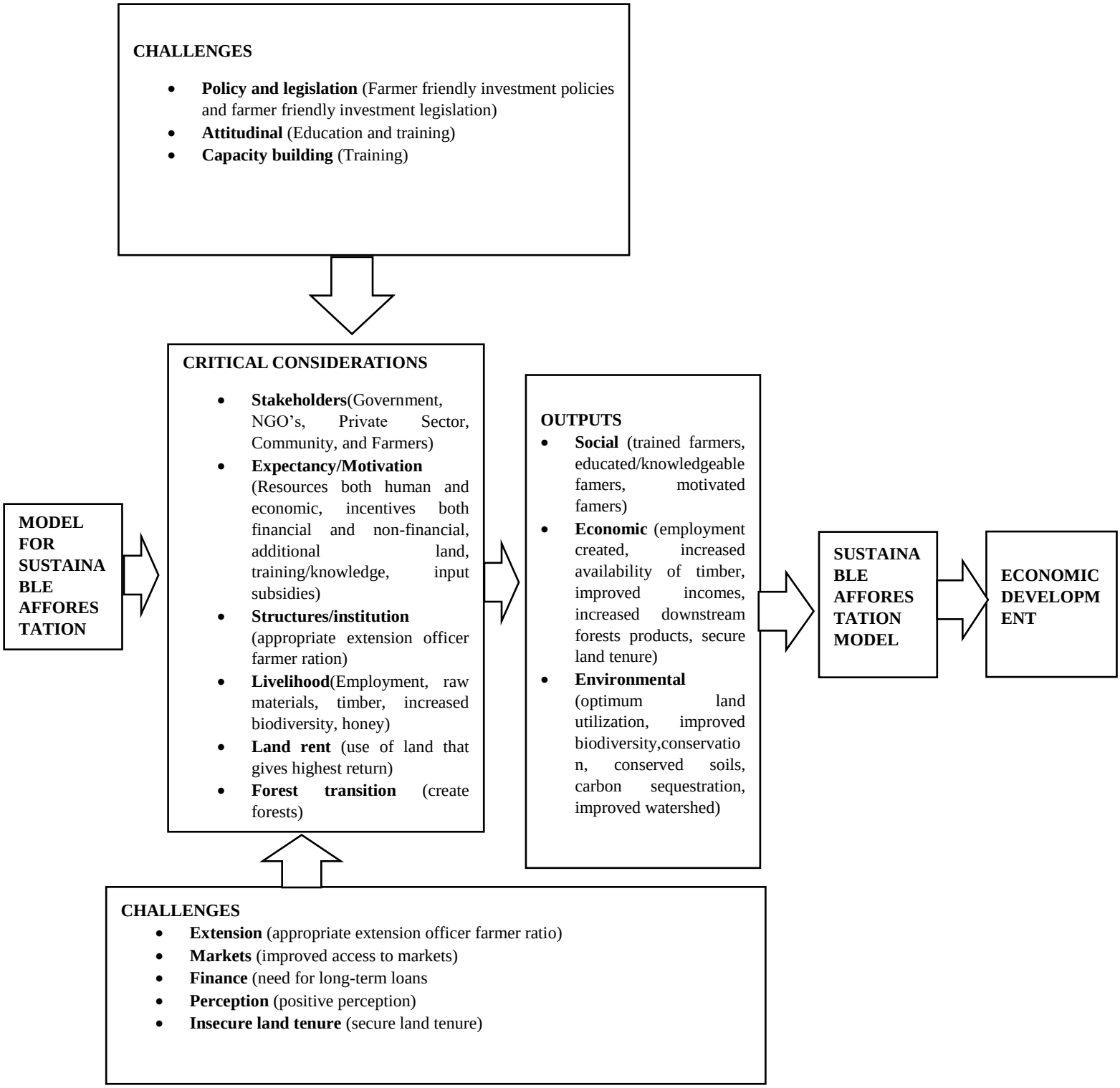


Fig 8.1: Sustainable afforestation model (*Source: Author's compilation)*

Framework for Implementing Sustainable Afforestation as an Alternative Land-Use Option for Economic Development

8.4.1 Introduction

The framework addresses the question: What measures should be implemented to ensure the success and sustainability of afforestation initiatives as alternative land-use options for economic development? The first stage involves a critical examination of the current state of afforestation and land-use options. This phase aims to:

Establish knowledge of various land-use forms in Mashonaland West Province.

Explore stakeholder perceptions regarding afforestation as a sustainable alternative for economic development.

These critical elements are informed by a set of guiding theories, which form the outer layer of our model. The core elements, represented in the center of the circle, are influenced by these theories.

Guiding Theories

Theory of Structuration: This theory suggests that social practices, including land use and land-use change, are influenced by both structural forces and individual actions.

Institutional Theory: This theory examines how rules and their enforcers can either promote or hinder sustainable afforestation.

Stakeholder Theory: This theory is used to understand stakeholder interests and design strategies to promote sustainable afforestation as an on-farm economic activity.

Expectancy Theory: This theory provides insights into the motivations of farmers participating in afforestation initiatives.

Forest Transition Theory: This theory helps understand the factors (such as market signals) motivating farmers to consider afforestation as an alternative land use.

Land Rent Theory: This theory posits that land should be allocated to uses that generate the highest potential rent.

Sustainable Livelihood Framework (SLF): This framework focuses on how people organize their lives and serves as an analytical structure for understanding poor rural livelihoods and interventions.

These theories guide the development of a model for sustainable afforestation by highlighting essential elements and considerations.

Evaluation of Potential Barriers

The second phase involves evaluating potential barriers to sustainable afforestation, including:

Policy

Legislation

Attitudinal factors

Capacity building

Extension services

Markets

Finance

Perceptions

Effective management of these barriers is crucial for promoting sustainable afforestation. This phase also involves synthesizing the critical elements to influence the nature of afforestation programs. The goal is to align these elements, considering enablers such as extension services, policies, and market access, to develop a model for sustainable afforestation as an alternative land-use option for economic development. This phase addresses the research question: What institutional frameworks can be adopted to promote sustainable afforestation in Mashonaland West?

After Development of the Afforestation Model

Identifying and analyzing the critical elements, the next phase is to develop a model for sustainable afforestation by integrating theoretical perspectives into practical implementation strategies. This phase includes:

Setting objectives and addressing relevant considerations.

Fostering collaboration and trust among stakeholders.

Implementing and evaluating the framework, including continuous data collection, analysis, and monitoring.

Ongoing evaluation and adaptation are essential for ensuring the effectiveness and sustainability of the afforestation efforts.

Key Stakeholders in Afforestation

Effective afforestation requires the involvement of several key stakeholders, each with specific interests and contributions:

Government

Interest: Protecting ecological integrity and managing forest resources sustainably.

Role: Developing a national afforestation strategy, involving relevant ministries, and supporting forest management and community engagement.

Support: Providing adequate funding, implementing supportive legislation, and facilitating community participation.

Community

Interest: Managing land-use patterns and preserving traditional land rights.

Role: Engaging in afforestation initiatives, adhering to land-use practices, and participating in management activities.

Support: Programs to empower and involve communities, prevent wildfires, and reduce forest degradation.

Non-Governmental Organizations (NGOs)

Interest: Promoting sustainable afforestation and environmental conservation.

Role: Raising awareness, strengthening legal frameworks, conducting research, and facilitating best practices.

Support: Funding, infrastructure development, and market linkages.

Private Sector

Interest: Financial investment, timber production, and market development.

Role: Providing funding, supporting research, and ensuring quality control.

Support: Encouraging investment, securing favorable policies, and creating local markets to reduce transportation costs.

8.4.2 Explanation of the sustainable afforestation frameworks

The above model presents a road map for developing sustainable afforestation as an alternative land use for economic development in Zimbabwe. This model conceptual framework serves as a roadmap for understanding how to implement and manage sustainable afforestation projects,

ensuring that they contribute to both economic development and environmental sustainability. It illuminates the building blocks in the development of sustainable afforestation in Zimbabwe.

Generally, afforestation uptake in Mashonaland West is low. Evidence from the study highlights that afforestation, though still in its infancy stage now characterizes some of the land use activities in the province. However, findings demonstrate that little consideration is given to afforestation as an alternative land-use option for economic development. Zimbabwe has vast pieces of land with potential for afforestation initiatives which remain underutilized and untapped.The uptake of afforestation remains worryingly low with large tracts of land lying idle, signifying land underutilization.

A review of the current state of afforestation and the prevailing stakeholder perception is critical in informing and mapping the way forward toward developing sustainable afforestation. The key issues in management should therefore be aimed at addressing the negative impacts of ill-informed afforestation drives. Key to take note of when creating key enablers for sustainable afforestation is that there are some challenges, that may inhibit the desired contribution of afforestation to economic development. Thus, management and policy makers should be proactive and have a strategic intent in managing the afforestation agenda (Madzara, 2013).These critical elements are informed by a set of guiding theories, which form the outer layer of our model. The core elements, represented in the center of the circle, are influenced by these theories.

The second phase tries to answer the question: What should be put in place to implement an effective successful sustainable afforestation initiative as an alternative land-use option for economic development? First and foremost, this stage is a critical inquiry into the state of afforestation, and land-use options. These elements are also reflected in the objectives which are to: establish the knowledge of various possible forms of land use in Mashonaland West province and assess the knowledge of various possible forms of land use in Mashonaland West province, explore the perceptions of stakeholders towards afforestation as a sustainable alternative land use for economic development, and explore the institutional frameworks that maybe adopted to promote sustainable afforestation as an alternative land use for development in Mashonaland West. All these critical elements that should be dealt with are informed by the universe of theories that impinge on the process of integrating these elements into the model for sustainable

afforestation as an alternative land-use option for economic development. The theories constitute the outer layer of our model. The critical elements in the center of the circle are colored by the outer circle of theories. These theories guide the development of a model for sustainable afforestation by highlighting essential elements and considerations. The guiding theories are as follows:

The theory of Structuration tells us that social practices such as land use and land-use change are influenced by structure as well as by individual agents' actions. Essentially, the theory helps us to understand the behavior and decision-making process of actors towards afforestation. The theory states that actors' behavior and decision-making are influenced by structural as well as individual factors.

Institutional Theory compels us to interrogate how rule configurations and those who enforce the rules may promote or militate against sustainable afforestation. In addition, institutional theory explains certain decisions and activities as it considers the processes by which structures, including schemes, rules, norms, and routines, become established as authoritative guidelines for social behavior. The Stakeholder Theory will be used to understand the stakeholders in the design of strategies to promote sustainable afforestation as an on-farm economic activity as well as understand consultations on the community's cultural beliefs, myths, and realities. The theory will be used to scan stakeholders and their views on sustainable afforestation as an economic activity on farms.Thus, principally this theory will help in illuminating the spectrum of stakeholders, and the role they are playing and should be playing, for the efficient functioning of the entity under consideration, that is, afforestation initiatives.

The Expectancy Theory informs us that the desired goal (expectancy) or reward (instrumentality) or if the effort is worthy (valence) motivates human behavior to behave in a certain way based on the expectation that the effort will result in. Principally the theory was used to illustrate the motives of farmers in participating in afforestation initiatives.

The Forest Transition Theory is primarily concerned with how the forest cover changes over time, either temporally or as a trend. Using this theory, it was possible to comprehend the elements (market signals) that encourage farmers to think about afforestation as a substitute land

use. According to the land rent theory, land should be put to the best possible use to maximize potential rent. The primary policy recommendation under this strategy for decision-makers is to alter land rent composition in a way that makes it feasible to protect forest areas and/or encourage reforestation.

Sustainable Livelihood Framework (SLF) focusses very much on how people organize their lives and is regarded as an analytical structure for the complexity of poor rural livelihoods, factors, and types of interventions. Thus, this theory is used to understand people's decision in considering afforestation as an alternative land use for economic development.

The theories we see impinging on the checklist of the things that we must not overlook in the design of a model for sustainable afforestation. The third phase is the evaluation of possible encumbrances that might hinder sustainable afforestation. These include Policy, Legislation, Attitudinal, Capacity building,Extension, Markets, Finance and Perception. These need to be managed to promote sustainable afforestation. This stage involves the actual distillation or putting together of those critical elements so that they begin to influence the nature of the program/sustainable afforestation initiatives. The management of these hurdles will impact the sustainability imperatives which are social, economic, and environmental.

Effective management of these barriers is crucial for promoting sustainable afforestation. This phase also involves synthesizing the critical elements to influence the nature of afforestation programs. The goal is to align these elements, considering enablers such as extension services, policies, and market access, to develop a model for sustainable afforestation as an alternative land-use option for economic development. This phase addresses the research question: What institutional frameworks can be adopted to promote sustainable afforestation in Mashonaland West?

The phase answers the question: How do you go about aligning them, mixing them, or putting them together (with references to enablers of afforestation such as extension services, enabling policies, and market access among others) to promote sustainable afforestation as an alternative land-use option for economic development. Under this phase, the challenges as well as the enablers are critically examined. In the process of analyzing, there is a need to look at the strengths and weaknesses and effectiveness of each strategy in contributing towards sustainable afforestation development. There is a need to identify and engage the stakeholders. There is a

need to identify best practices for the effective development of sustainable afforestation and address institutional barriers or facilitators.

Important to note, when adopting afforestation as an alternative land-use for economic development in Mashonaland West province is that there are various stakeholders whose interests have to be considered and harmonised. A multi-stakeholder approach that harnesses all stakeholder interests and input will consequently lead to improved community support for afforestation, improved socio-economic and ecological benefits derived from afforestation and reduced or an elimination of negative impacts. The end result will therefore be attainment of overall national objectives of improved community livelihoods, national income and ecological sustainability. The key stakeholders whose input and interests are key to the effective contribution of afforestation to economic development in Mashonaland West are as discussed below:

Key stakeholders in afforestation

The study identified four classes of stakeholders, whose input is critical for sustainable afforestation to take the desired shape and contribute positively towards economic development in Mashonaland West province. If well fostered, these same stakeholder expectations from the venture will also be met. Thus, for one to safely conclude that, afforestation is a viable land-use option, it should have been administered in a manner that it extends equitable benefits to the four stakeholder classes discussed below. The key stakeholders as shown on the model are: the government, the local community, the private sector and non-governmental organisations.

Government

Government interest in afforestation is on protection of the ecological integrity and biological composition of forests. Sustainable afforestation will therefore facilitate sustainable forest management, preserve and maintain their ecological, social and economic values especially for sustainable livelihoods and the economic development of communities, the reduction of poverty, and for the benefit of the nation.

The broader role of the government is the development of a national afforestation development strategic plan. It does this does this through line ministries such as ministries responsible for agriculture development, forestry resources, climate change, environment and tourism in

consultation with a broad spectrum of stakeholders. The national development strategic plan should emphasise a sustainable approach to the development and management of the forest resources of the country. It must recognise that forests are important for their biological diversity and that forest conservation and new forest development are priority in economic development in the province.

The government also spearheads a series of integrated programmes that will closely involve host communities in the protection of forest resources and developing and management of newer forests, to ensure an effective transition from overreliance on native forests, especially for rural communities.

In some instances, the impact of afforestation on economic development in the province will be highly dependent on the government support extended to afforestation activities, especially on forestry dependent communities. The fiscus should allocate adequate funding toward capacitation in afforestation so as to ensure effective forest development. Financial support should be augmented with stringent forest legislation where appropriate, especially legislation in relation to land tenure and property rights in farming communities, where forests should be viewed as collateral. This is based on the notion that community participation in afforestation shall be based upon a strategy of enabling communities to undertake protection, management and other forestry responsibilities as opposed to enforcing them to do so.

Thus, the policy should be aimed at enabling farmers to improve their own livelihoods as well as the condition of the forests in their vicinity by eliminating any constraints that inhibit them from doing so. The government's role in this regard will therefore be to support and facilitate communities in such efforts.

Community

These are the farmers who are supposed to alter their current land-use patterns in order to pave way for afforestation. They have some peculiar interests which a venture should be able to deliver before they could accept and own an initiative, especially one like afforestation that has the capacity to alter their communal life. Habitual land and forest usage rights, customary land management approaches and customary land boundaries are key priorities for rural residents and

leadership if zoning for afforestation should take place, and any concerned party should treat such with caution so as to capture the interest of farmers in afforestation. Traditional boundaries must be legally recognised under afforestation legislation as a basis for defining forest ownership and new forest management responsibilities, especially in small holder farming communities where afforestation can be done as a joint activity for multiple farmers.

To ensure community buy-in for afforestation there is need for programmes that will empower, engage and involve communities to manage forest land, through public relations and education activities, the prevention and physical control of wildfires and reduced livestock grazing. Reduced human activities encouraging restraint over the cutting of forest vegetation for fuelwood are equally necessary in order to provide security for the new forests.

Acceptance of community participation leads towards the constructive participation of farmers in afforestation and in the implementation of other aspects of the guiding policy. It will gradually lead to a strong sense of community identity, ownership and managerial responsibility of afforestation initiatives, which are key drivers in economic development.

Non-Governmental Organisations

NGOs serve in raising awareness of the national and regional importance of effective and long-term fortification of the country's forests, watersheds and more generally of sustainable afforestation and environmental conservation through taking the lead to form an inter-departmental and ministerial working groups with education, environmental, natural resources, energy and development ministries. NGOs also work in strengthening the legal basis for afforestation and other environmental conservation issues through closely working with the government in concluding and implementing multilateral environmental agreements signed by the government at regional and international forums.

At their own discrete, NGOs can plan, arrange, budget and undertake research programmes of high priority afforestation issues, especially on new technologies, development of new hybrids for tree species and best afforestation practices that will support sustainable afforestation

management and poverty alleviation. Research by NGOs may as well focus on impact of erosion, in certain parts of priority catchments. The aim of such researches is to determine the restoration action required, evaluation of the costs and benefits of long-term forest restoration, and the impacts on local communities. Such data will be needed by government in resource allocation for afforestation amongst selected zones and for land zoning purposes.

NGO priority areas are; ensuring equitable benefits from afforestation are shared amongst key stakeholders, ensuring best afforestation practices for biodiversity beneficiation and ensuring equitable application of legislative measures. In so doing, NGOs can be an important source of funding for afforestation and facilitation of key enablers such as infrastructure development and market linkages.

Private Sector

The private sector encompasses companies in diverse operations. Financial institutions can aid government's efforts in providing funding for afforestation. However, they are interested in the farmers' ability to payback the loans extended to them, hence maybe a another source of research on best business practices that help afforestation initiatives survive on a going concern concept.

The manufacturing industry are the market for forestry resources. They are concerned about the quality of timber produced and market prices offered for the timber produced. Forward-backward integration should be facilitated between farmers or afforestation projects and key buyers so that, there will be buyer control on quality. This would ensure, the afforestors that they produce forestry resources that are acceptable on the market, thus eliminating marketing challenges. These manufactures can as well help in research and development and funding for nursery development and forest management.

Policies by the government must therefore encourage private sector investment in afforestation, in local forestry resources utilisation and in marketing afforestation products through appropriate legal arrangements (regulatory, licencing, leases, contracts), banking facilities (loans) and fiscal incentives (tax incentives). All government agencies involved in afforestation should aim to

secure favourable legal, economic and trade policies for the development of a private sector business environment especially near woodlots. Wood is generally bulky to transport to markets that are far from the source, thus, for afforestors to cut transport costs, markets should be created within their vicinity.

Manufacturers will similarly enjoy lower raw material costs when they are operating from an area that is close to the source of the bulky raw material used during production process. Thus, if afforestation, is to be sustainable, we should see more forestry resource reliant companies opening their doors in Mashonaland-West. That would add more beneficial to the economy as manufacturing companies create better paying jobs as compared to mostly unskilled manpower requirements of the woodlots. Further communities benefit more when value addition on the raw wood is done from within the communities as finished and semi-finished products have higher value that selling raw wood both to the local and export market.

After identifying, engaging, and analyzing, the next phase is to develop a model for sustainable afforestation. This is done by combining all the theoretical perspectives to inform implementation and adoption. Under this phase, objectives and their considerations are addressed. The next stage is to foster collaboration and trust among stakeholders. Then there is a need to implement and evaluate the framework (monitor effectiveness and address deviations). Continuous data collection, analysis, and monitoring are vital for evaluating the effectiveness of efforts and identifying areas that require improvement. The evaluation would lead to the identification of areas for improvement. The framework is dynamic and requires re-evaluation.

Identifying and analyzing the critical elements, the next phase is to develop a model for sustainable afforestation by integrating theoretical perspectives into practical implementation strategies. The economic development is the final stage and shows the core elements of the model and its outcome. The model will now lead to economic development. From the conceptual framework, by addressing these key elements, a model can lead to sustainable afforestation which would translate into economic development. A successful sustainable afforestation program requires ongoing communication with stakeholders, collaboration, and adaptation to changing circumstances.Ongoing evaluation and adaptation are essential for ensuring the effectiveness and sustainability of the afforestation efforts.

8.6 Chapter summary

This chapter presents a model for sustainable afforestation as an alternative land-use option for economic development in Zimbabwe. It identifies key stakeholders, including the government, local communities, NGOs, and the private sector, each playing a crucial role in the successful implementation of afforestation initiatives. By addressing stakeholder interests and overcoming potential barriers, the framework aims to promote sustainable afforestation, ultimately contributing to economic development and ecological sustainability in Mashonaland West.

CHAPTER 9

DISCUSSION AND FINDINGS, CONCLUSION, AND IMPLICATIONS

9.0. Introduction

The primary objective of this study was to develop a model for sustainable afforestation as an alternative land use option for development in Zimbabwe. The study was guided by the central research question: What model would be suitable for sustainable afforestation as an alternative land use option for economic development in Zimbabwe? The data collected provided valuable insights into afforestation in Zimbabwe. This chapter aims to summarize the key contributions and findings of the study and to make recommendations. It begins with a summary of the study.

9.1 Summary of the study

The first chapter outlined the research problem and its contextual background. The main goal of this study was to develop a model for sustainable afforestation as an alternative land use option for development in Zimbabwe. The study addressed four specific research questions:

1. What is the state of afforestation in Mashonaland West Province?
2. What are the perceptions of stakeholders towards afforestation as a sustainable alternative land use option for economic development?
3. What institutional framework may be adopted to promote sustainable afforestation as an alternative land use option for economic development in Mashonaland West?
4. How can a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe be achieved?

The sustainability of plantation forestry has garnered significant interest. Many countries have pursued afforestation as an alternative land use for economic development through state policies and support. However, these initiatives often fail to meet set policy targets. Existing institutions have struggled to provide lasting solutions for managing afforestation as an alternative land use for economic development. The study aimed to address this issue by establishing a model for

sustainable afforestation. The conceptual framework for the study was also presented in Chapter One.

Chapter Two reviewed the literature on developing a model for sustainable afforestation as an alternative land use option. The review covered various topics including the state of forests in Zimbabwe, afforestation projects, institutional frameworks, factors motivating land use change, and the effectiveness of afforestation initiatives. The literature review identified gaps in knowledge.

Chapter Three discussed the theoretical framework underpinning the study. The research drew from various interdisciplinary theories, including the Theory of Structuration, Land Rent Theory, Stakeholder Theory, Sustainability of Livelihoods Framework, Forest Transition Theory, and Expectancy Theory. These theories provided a comprehensive understanding of the study's phenomena. The Theory of Structuration and Expectancy Theory were particularly significant, offering overarching explanatory validity for the major themes of the study.

Chapter Four outlined the research methodology used to address the research objectives and main question. A qualitative approach was employed to gather insights from stakeholders on developing a model for sustainable afforestation. Purposive sampling was used to interview 30 respondents from various relevant bodies and individuals. Observations and document analyses were also incorporated for triangulation. Thematic analysis, as proposed by Braun and Clarke (2014), was applied to analyze the data.

Chapters Five to Nine presented the findings and analysis, building on the previous chapters. These chapters described the existing characteristics of the data collected during the exploratory phase of the study.

Chapter Ten, the epilogue, presents the study summary, conclusions, and recommendations derived from the research findings. It discusses the implications for the existing body of knowledge and identifies knowledge gaps for future research. This chapter is followed by the references used.

9.2 Summary of findings

The data collected provided valuable insights into developing a model for sustainable afforestation as an alternative land use option in Zimbabwe.

9.2.1 Objective 1: To Establish the State of Afforestation in Mashonaland West Province

Guided by the question: What is the state of afforestation in Mashonaland West Province?, the study identified themes related to the breadth of tree species and the size of afforested land. Findings indicated that afforestation uptake is low in Mashonaland West. It remains limited to a few large farmers with extensive land holdings. Challenges include lack of knowledge, poor funding, cultural resistance, and aversion to long-term investments. Afforestation areas are minimal compared to available land. The aggregate increase in forest cover in the province is insignificant, representing only 0.0095% of lost forest cover and 0.61% of national tree cover gain from 2001-2021. Afforestation is primarily seen as a supplementary venture rather than a primary land use. The focus is on eucalyptus and pine forests due to their rapid growth and adaptability. Challenges include climate change impacting tree improvement programs and a bias towards non-indigenous species. The number of afforestation practitioners is low, with financial and cultural barriers being major obstacles.

9.2.2 Objective 2: To Explore Stakeholder Perceptions Towards Afforestation as a Sustainable Alternative Land Use for Economic Development

This objective aimed to understand stakeholder perceptions of afforestation as an alternative land use for economic development. Findings revealed that while afforestation is recognized for its potential benefits, such as creating microclimates, biodiversity conservation, and improving air quality, it is also associated with high opportunity costs, capital requirements, and cultural resistance. Afforestation's benefits include climate regulation, food provision, and erosion prevention. Despite its advantages, afforestation remains underdeveloped in the province due to perceptions and practical challenges. Addressing these perceptions and challenges is crucial for advancing afforestation initiatives.

9.2.3 Objective 3: To Explore Institutional Frameworks for Promoting Sustainable Afforestation in Mashonaland West

The research question for this objective was: What institutional frameworks can be adopted to promote sustainable afforestation in Mashonaland West? Respondents acknowledged afforestation's potential to improve livelihoods and biodiversity but also noted concerns about monoculture impacts and high startup costs. The study identified strategies to promote afforestation, including research and development, precise policy formulation, and value addition. Key challenges include limited market access, poor extension services, and securing land tenure. Addressing land tenure, extension services, and capital access is essential for successful afforestation. Enhanced extension services and funding mechanisms could facilitate broader adoption of afforestation.

9.2.4 Objective 4: To Develop a Model for Sustainable Afforestation as an Alternative Land Use for Economic Development in Zimbabwe

This objective aimed to develop a model for sustainable afforestation. The model was developed based on insights from the study and will be detailed in the following section.

Model for sustainable afforestation

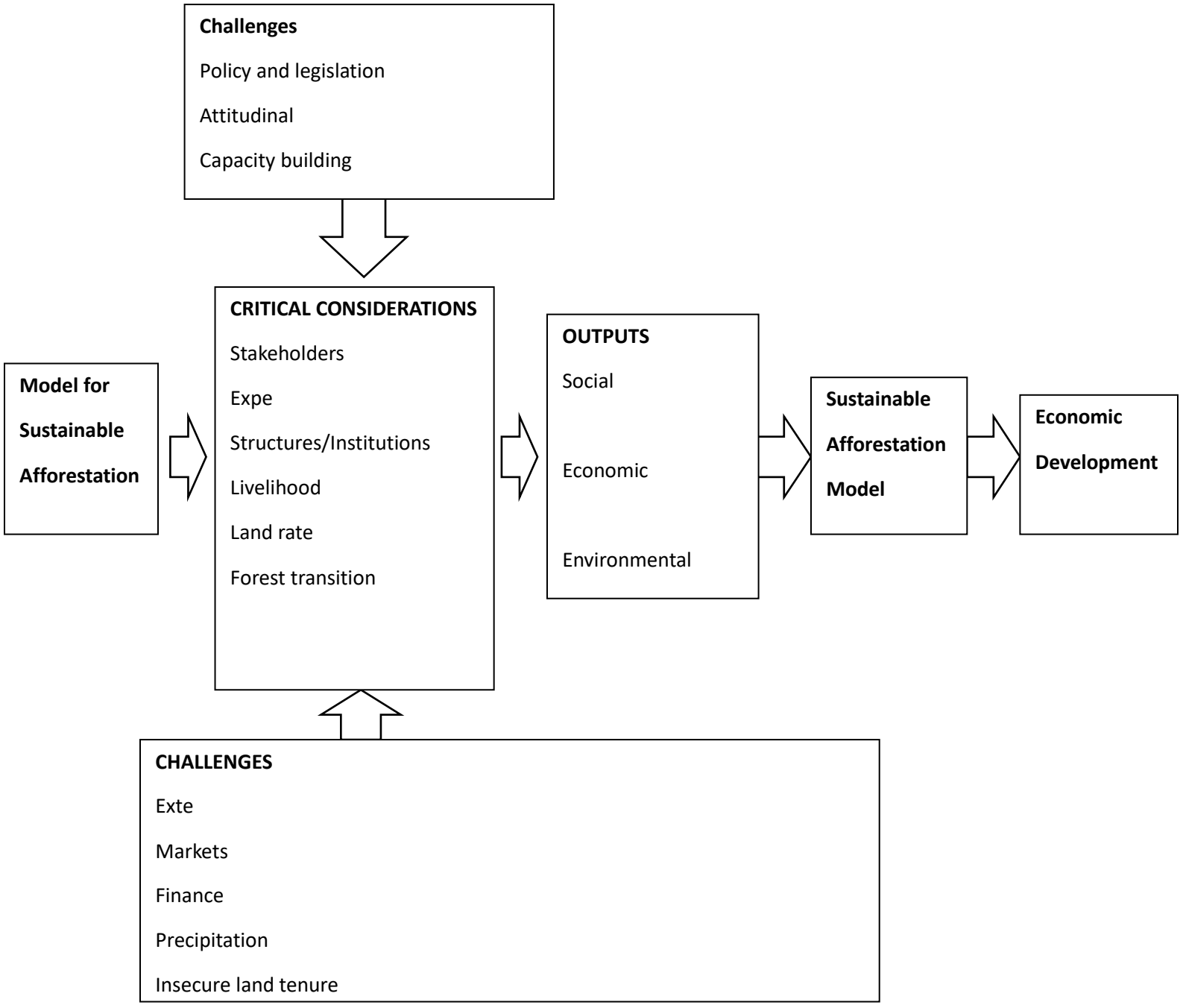


Fig 9.1: Sustainable afforestation model (*Source: Author's compilation)*

Figure 9.1 illustrates a model developed from the study findings. This model indicates that while the benefits of sustainable afforestation significantly outweigh the negatives, improper management can make it a double-edged sword. The presence of negative impacts underscores the necessity for robust management practices to achieve the intended goals of afforestation. To ensure that afforestation succeeds as a sustainable alternative land use for economic development in Zimbabwe, the involvement of various stakeholders is crucial. Key stakeholders include government ministries such as the Forestry Commission and the Afforestation Association of Zimbabwe, local communities, the private sector (e.g., TIMB), and non-governmental organizations.

For sustainable afforestation in Mashonaland West, it is imperative that these stakeholders actively engage and contribute. Their involvement is essential to address issues such as administration and coordination challenges, infrastructural deficits, social hurdles, funding, knowledge gaps, and market issues. The model suggests several interventions to make afforestation a prominent economic activity on farms. These include implementing enabling policies, enhancing market access (both international and local), improving resource mobilization, strengthening business linkages, value addition, land use zoning, infrastructure development, and capacity building.

The effectiveness of these interventions relies on collaboration among the involved organizations. Successful integration and implementation of these strategies will foster sustainable afforestation as an alternative land use in Mashonaland West. The adoption of afforestation offers numerous benefits, including employment creation, biodiversity conservation, and land preservation, leading to improved community livelihoods, national income, and ecological sustainability, which in turn enhances community support for afforestation.

9.3 Conclusion

The primary research question addressed was: What model is suitable for sustainable afforestation as an alternative land use option for economic development in Zimbabwe? The study concludes that afforestation has been limited to a few, with the uptake remaining

alarmingly low and large areas of land underutilized. Key challenges identified in the adoption of afforestation include land tenure security, access to extension services, and access to investment capital. Addressing these challenges is crucial to meeting policy targets for afforestation.

Land tenure security is the foremost issue as it affects willingness to invest. This should be resolved before promoting afforestation to potential stakeholders. Following this, access to forestry extension services, including capital and technical knowledge, should be prioritized. Extension officers need to educate farmers about the forestry value chain. Finally, investment in afforestation projects is critical, as capital is necessary for successful implementation. Extension services should also inform farmers about funding options. If the current enthusiasm for agricultural extension is mirrored in afforestation, it could lead to broader adoption of afforestation for both underutilized and unsuitable land.

For afforestation to take root, stakeholders such as government bodies, NGOs, and private sector entities must play supportive roles. There is a need for extensive research to develop tailored solutions to existing afforestation challenges. Despite its potential, land conversion for afforestation remains low in developing countries, including Zimbabwe. Further research is needed to identify optimal strategies for afforestation implementation.

9.4 Recommendations

Lyton (2014) suggests that research aims to solve societal problems. Based on the study's findings, the following recommendations are made:

9.4.1 Implications for policy

Policy is crucial in regulating and supporting industry practices globally. In Zimbabwe, conflicting legal frameworks undermine afforestation as a viable land use option. Issues such as conflicts between the Mines and Minerals Act and the Forest Act, and the Land Resettlement Act versus the Forest Act, weaken the institutional support for afforestation. A robust, enforceable policy specifically focused on afforestation is needed.

Additionally, the Forestry Commission's weaknesses have negatively impacted afforestation efforts. Loss of skilled staff and inadequate extension services contribute to these challenges. There is a need for reskilling and the introduction of additional afforestation extension workers. The failure of institutions to effectively support afforestation is not unique to Zimbabwe.

9.4.2 Implications for practice

Current afforestation promotion efforts are insufficient. New strategies are needed to address current challenges and engage local communities more effectively. Making afforestation a collective responsibility among government, private sector, and communities is crucial. Improving education and training on afforestation practices and incorporating extension services into farm systems are essential. Extension services should focus on integrating trees into farm systems and addressing the inadequacy of current services.

Secure land tenure is vital for attracting investment in afforestation. Periodic training on best practices and knowledge of plant species is also necessary. Developing entrepreneurial skills related to afforestation and conducting land audits to identify suitable areas for afforestation will further support these initiatives. Establishing monitoring teams to address challenges and educate farmers on best practices is also recommended.

9.4.3 Implications for research

The study aimed to develop a model for sustainable afforestation as an alternative land use in Zimbabwe. Despite policy interventions, land conversion for afforestation remains low. Further research is needed to identify effective strategies for promoting afforestation. Such research could lead to the development of management practices tailored to local communities and enhance the uptake of afforestation as an economic development option in Zimbabwe.

9.4.4 Implications for theory

This study draws upon a range of interdisciplinary theories to develop a model for sustainable afforestation as an alternative land use option in Zimbabwe. The theoretical framework includes the Theory of Structuration (TS), Land Rent Theory (LRT), Stakeholder Theory (ST), Sustainability of Livelihoods Framework (SLF), Forest Transition Theory, and Expectancy Theory (ET). Employing multiple related theories enhances the researcher’s understanding of the phenomenon and strengthens the validity of the findings.

Despite the explanatory validity of each theory, many fall short in fully illuminating all aspects of the phenomena under investigation. Consequently, these theories could be considered to have mid-range explanatory validity, applying primarily to specific themes within the study. Upon critical analysis, the Theory of Structuration and Expectancy Theory emerged as particularly

comprehensive, providing overarching explanatory power for the major themes addressed in this study.

Theory of Structuration aids in understanding the interacting factors influencing land use and decision-making processes. This theory helps explain how social structures both constrain and enable human behavior, highlighting the importance of individual agency within these structures. By focusing on how policies and government assistance are perceived and utilized, Structuration Theory shifts the emphasis from material artifacts—such as financial support and capital—to the interactions between farmers and these resources. This shift reveals how farmers' decisions are shaped by their engagement with these resources, thus offering insights into variations in land use practices.

Expectancy Theory, a motivational theory, helps explain how the expectations of farmers and potential afforestors drive their behavior regarding afforestation. It posits that human behavior is influenced by the perceived value of outcomes relative to costs. This theory illustrates the motivations behind farmers' participation in afforestation initiatives, providing a framework to understand their decision-making processes.

Giddens' Structuration Theory helps elucidate why individuals may hold different perspectives on afforestation as an alternative land use. It underscores the interplay between social structures and individual behavior, noting that while social structures shape behavior, individuals also have the power to act differently. This theory helps uncover the social structures influencing decisions to adopt or forego afforestation, explaining variations in land use.

Finally, Giddens' Theory asserts that social structures are both a medium and an outcome of human behavior. Given that humans can act differently, there is potential for change within these structures. Structuration Theory highlights how transforming interpretive schemes, resources, and norms can influence the behaviors and structures of farmers. It suggests that policy reforms may be necessary to better align farmers' perspectives with afforestation as a viable land use option.

In conclusion, while Expectancy Theory offers valuable insights, it does not comprehensively address all themes of the study. The Theory of Structuration provides a more holistic

understanding of the study's major themes. However, there remains a need for a theory that fully encompasses all aspects of the research.

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LIST OF APPENDICES

Annexture 1-Interview guide for key informants

TOWARDS A MODEL FOR SUSTAINABLE AFFORESTATION AS ALTERNATIVE LAND USE FOR ECONOMIC DEVELOPMENT IN ZIMBABWE

My name is Isaac Mhaka. I am conducting interviews for a dissertation on the topic:

Towards a model for sustainable afforestation as alternative land use for economic development in Zimbabwe.

The main objective of the study is to develop a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe. *Specifically the study seeks to* assess the existing forms of land use in Mashonaland West Province, establish the extent of under-utilisation of land use, explore the perceptions of stakeholders towards afforestation as a sustainable alternative land use for economic development, explore the institutional framework that maybe adopted to promote sustainable afforestation as an alternative land use for development and develop a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe.

The target population for this study ccomprises organisations such as AREX, Ministry of Lands and Agriculture, EMA, Agricultural funding institutions e.g. Agribank, Women's Bank, Agriculture training institutions, Chinhoyi University of Technology (specifically school of Agriculture, Ministry of Local Governance, Rural District Councils and other relevant bodies/individuals with relevant knowledge to the phenomenon under study.

This research will lead to the write up of a dissertation in fulfillment of a Doctor of Philosophy offered by Chinhoyi University of Technology. Please note that your participation in this interview is voluntary. You are free to object to participating in this interview or to respond to some sections or any questions that may be against your will.

Interview Schedule 2: Interview guide for Key Informants (Officials)

Section A: Demographic profile of respondents

1. Sex.....

2. Age.....

3. Number of years of involvement in afforestation industry.....

4. Role/position in the afforestation industry…….

4. Highest educational qualification.....

5. Afforestation related qualification……

6. Any other professional qualification……..

Section B: conceptualization of critical terms in the study

7. What is your understanding of the term sustainable *afforestation*?

8. Economic development?

Section D: Extent of under-utilisation of farm land

9. What is your understanding of the term under-utilisation of farm land?

10. What form(s) does underutilization take?

11. What evidence is there for under-utilisation of land?

Section E: What are the perceptions of stakeholders[1] towards afforestation as a sustainable alternative land use option for economic development?

12. What is your understanding of the term afforestation?

13. Do you think afforestation is a wise land use option?

14. How would you compare afforestation to other forms of land use as an economic activity?

15. In your view, what are the multiplier effects/benefits of afforestation?

[1] Extension workers, planners, farmers/foresters, lands officials, forestry officials, timber companies etc

16. Do you think current land users are well informed about afforestation as an alternative land use?

17. Do you think the entry costs into afforestation are affordable by anybody without external support?

18. Do you think the current extension services are adequate for supporting afforestors?

19. How would you compare extension services offered to afforestors to that of crop and livestock farming?

Section F: The institutional framework that maybe adopted to promote sustainable afforestation as an alternative land use for economic development

20. Currently, how is afforestation organised in Mashonaland West?

21. What are the strengths and weaknesses of this structure?

22. What would you propose to improve on the existing institutional framework to ensure afforestation as a sustainable land use option for economic development?

23. Do you have any other suggestions on what could be done to ensure afforestation as an alternative land use for economic development?

END OF INTERVIEW

THANK YOU VERY MUCH FOR YOUR TIME

Annexture 2: Interview guide for potential afforestors/farmers

TOWARDS A MODEL FOR SUSTAINABLE AFFORESTATION AS ALTERNATIVE LAND USE FOR ECONOMIC DEVELOPMENT IN ZIMBABWE

POTENTIAL AFFORESTORS/FARMERS' INTERVIEW SCHEDULE

My name is Isaac Mhaka. I am a Doctoral student at Chinhoyi University of Technology conducting interviews for a dissertation on the topic:

Towards a model for sustainable afforestation as alternative land use for economic development in Zimbabwe.

The main objective of the study is to develop a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe.Specifically the study seeks to assess the existing forms of land use in Mashonaland West Province, establish the extent of under-utilisation of land use, explore the perceptions of stakeholders towards afforestation as a sustainable alternative land use for economic development, explore the institutional framework that maybe adopted to promote sustainable afforestation as an alternative land use for development and develop a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe.

This research will lead to the write up of a dissertation in fulfillment of a Doctor of Philosophy. Please note that your participation in this interview is voluntary. You are free to object to participating in this interview or to respond to some sections or any questions that may be against your will.

Target interviewees: Afforestors

Section A: Demographic profile of respondents

1. Sex.....

2. Age.....

3. Highest educational qualification.....

4. How long have you been a A2 Farmer?

5. Farm size…….

Section B: Conceptualization of critical terms in the study

6. What is your understanding of the terms sustainable *afforestation*?

Section C: Knowledge of various possible forms of land use in Mashonaland west province.

8. What is your understanding of the term land use?

9. What various forms of land use do you know?

10. Are you knowledgeable about afforestation as a competing economic activity you can adopt on your farm?

11. Why did you not venture into afforestation?

12. Have you ever been approached by extension officers to consider afforestation as an on-farm economic activity?

13. Do you have any knowledge about afforestation?

Section E: Perception of afforestors on afforestation as a sustainable alternative land use for development

14. Do you think there are any social benefits of afforestation? If so what are they?

15. What are the social activities that may be organised around the afforestation industry?

16. Any economic benefits of afforestation that you know of If so what are they?

17. Any downstream economic benefits?

18. Any environmental benefits of afforestation? If so what are they?

Section F: The institutional framework and other critical elements that maybe adopted to promote sustainable afforestation as an alternative land use for economic development

19. Which organisations are currently involved in afforestation in your area which you know of?

20. Do you have adequate knowledge of their work on afforestation?

21. What would you propose to see being improved on the existing situation organisations, laws or policies to ensure adoption of afforestation as a sustainable land use option for economic development by many farmers?

22. Do you have any other suggestions on what may be done to ensure afforestation as a viable alternative land use for economic development in your area?'

END OF INTERVIEW

THANK YOU VERY MUCH FOR YOUR TIME

Appendice 3: Interview guide for afforestors

TOWARDS A MODEL FOR SUSTAINABLE AFFORESTATION AS ALTERNATIVE LAND USE FOR ECONOMIC DEVELOPMENT IN ZIMBABWE

My name is Isaac Mhaka. I am a Doctoral student at Chinhoyi University of Technology conducting interviews for a dissertation on the topic:

Towards a model for sustainable afforestation as alternative land use for economic development in Zimbabwe.

The main objective of the study is to develop a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe.Specifically the study seeks to assess the existing forms of land use in Mashonaland West Province, establish the extent of under-utilisation of land use, explore the perceptions of stakeholders towards afforestation as a sustainable alternative land use for economic development, explore the institutional framework that maybe adopted to promote sustainable afforestation as an alternative land use for development and develop a model for sustainable afforestation as an alternative land use for economic development in Zimbabwe.

This research will lead to the write up of a dissertation in fulfillment of a Doctor of Philosophy. Please note that your participation in this interview is voluntary. You are free to object to participating in this interview or to respond to some sections or any questions that may be against your will.

Target interviewees: Afforestors

Section A: Demographic profile of respondents

1. Sex.....

2. Age.....

3. Number of years of involvement in afforestation industry.....

4. Role/position in the afforestation industry…….

5. Highest educational qualification.....

6. Afforestation related qualification……

7. Any other professional qualification……..

8. Type of tenure ……..

9. Type of ownership (individual or company owned)…….

10. Source of funds invested…….

11. Farm size…….

Section B: Conceptualization of critical terms in the study

12. What is your understanding of the terms sustainable *afforestation*?

13. Economic development?

Section C: Knowledge of various possible forms of land use in Mashonaland west province.

14.. What is your understanding of the term land use?

15. What various forms of land use do you know?

16. Why did you venture into afforestation?

17. In your own view how does afforestation rate in economic value to other forms of land use?

18. On average, how long does your species take to mature?

19. What is your estimated value of your afforestation project at maturation?

20. What are the key resource requirements for successful afforestation?

21. How accessible to you are these key technical resources?

22. How much of your hectrage is under afforestation?

Section E: Perception of afforestors on afforestation as a sustainable alternative land use for development

23. Are there any social benefits of afforestation? If so what are they?

24. Do you think the current extension services are adequate for supporting afforestors?

25. What are the social activities that may be organised around the afforestation industry?

26. How comparable are the extension services offered to afforestors compared to those engaged in crop and livestock farming?

27. Any economic benefits of afforestation? If so what are they?

28. Any downstream economic benefits?

29. Any environmental benefits of afforestation? If so what are they?

Section F: The institutional framework and other critical elements that maybe adopted to promote sustainable afforestation as an alternative land use for economic development

30. Which organisations are currently involved in afforestation in your area?
31. What are the strengths and weaknesses of these organisations?
32. What would you propose to improve on the existing organisations, laws or policies to ensure afforestation as a sustainable land use option for economic development?
33. Do you have any other suggestions on what may be done to ensure afforestation as a viable alternative land use for economic development?'

END OF INTERVIEW

THANK YOU VERY MUCH FOR YOUR TIME

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