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POLICY AND POLICY ISSUES IN SUSTAINABLE AFFORESTATION IN DEVELOPING COUNTRIES:

A CASE OF ZIMBABWE

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ABSTRACT

Despite the growing focus on afforestation as an alternative land use option for economic development, little of note has been achieved in terms of afforestation uptake in developing countries whilst it remains trivialized in the Zimbabwean context. 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. The challenges of promoting afforestation has cast the limelight on the issue of afforestation policy. In light of the dynamic challenges sweeping across the global afforestation environment, policy has been hailed as the missing piece of the jigsaw towards the promotion of afforestation uptake. However, despite a plethora of studies on afforestation a close analysis of the focus of many studies conducted to date reveal the existence of a gap in knowledge on the role of policy in the viability of sustainable afforestation as an alternative land use for economic development in Zimbabwe. Therefore, this study using a qualitative research methodology sought to assess the role of policy in the viability of sustainable afforestation as an alternative land use for economic development in Zimbabwe. A close analysis of the spectrum of the critical resources for successful afforestation zeros in on three challenges that are critical to optimizing uptake of afforestation. These are, in order of importance, security of land tenure or land rights, access to extension services and access to investment capital. Dealing with these three challenges is pivotal to meeting policy targets for adoption of afforestation as an alternative land use for economic development. Zimbabwe has vast pieces of land with potential for afforestation initiatives which remain underutilised and untapped. The current study highlighted some of the current policy issues that militates against the rate of adoption of afforestation. The study was situated in Mashonaland West, there is need to do further studies on the same issue to have a holistic understanding of the challenges hindering afforestation in Zimbabwe. There is also need on how best these policy related strategies can be adopted to optimise the adoption of afforestation not only Zimbabwe but across developing countries.

KEYWORDS:

Afforestation, policy, sustainable afforestation and developing countries

1. INTRODUCTION

Despite the growing significance of afforestation, afforestation initiatives in developing countries Zimbabwe being a case have successively failed to achieve set policy targets. 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). The successive failure of afforestation initiatives has cast the limelight on the issues of policy. In light of the dynamic changes sweeping across the global agro-forest environment, government policy has been hailed as the missing piece of the jigsaw towards sustaining the infant afforestation initiatives in developing countries (Lovell et al., 2017; Sohngen et al., 2018). The role of policy cannot be overemphasised (Romanova et al., 2022; Tian et al., 2018). However despite the centrality of policy to the success of organizational performance (Romanova et al., 2022; Tian et al., 2018), a critical review of extant literature highlight the existence of a research gap on policy and policy issues in sustainable afforestation in developing countries (Ofori et al., 2020; Namaalwa et al. 2017; Sankhayan et al. 2003), whilst it remains trivialised in the Zimbabwean context (Nyikadzino, 2016; CIFOR, 2014; Gwaze&Marunda, 2014). As a result, what is of intellectual curiosity in this study is the assessment of the role of policy in the viability of sustainable afforestation as an alternative land use for economic development in Zimbabwe.

2. BACKGROUND TO THE STUDY

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. Afforestation is mentioned in Target 15.2 of United Nations Sustainable Development Goals (UN SDGs) #15 (Life on land), which states that "By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and substantially increase afforestation and reforestation globally" (UN GeneralAssembly, 2015). SDG #15 has direct and indirect relationships with various other SDGs such as SDG #2 (Zero Hunger), SDG #6 (Clean Water and Sanitation), SDG #13 (Climate Action), SDG #10 (Reduced Inequalities), and SDG #12 (Responsible Consumption and Production), and can thus help support developing and least developed countries (LDCs) to achieve parallel UN SDGs (Baumgartner, 2019). In particular, the UN SDG #13 – which urges nations to take action for combating climate change and its impacts - faces a copious number of impediments in low-income countries as a major proportion of the population here utilize forests for their livelihoods (FAO, 2020).

An average of 1.6 billion people depend on forests for subsistence,livelihoods, employment, and income generation, while between 60million and 200 million indigenous people are almost wholly dependenton forests (Chao, 2012). With large populations relying on forests forsurvival, afforestation programs are crucial for managing forests and thereby cancontribute to the fight against global warming and help increase climateresilience (Islam and Winkel, 2017;UNCTAD, 2018). Matiku, Caleb and Callistus (2013) value some of the forest products considered as needs by local communities. These include firewood, building materials, non-timber forest products (such as honey, mushrooms and butterfly pupae), fruits and herbal medicines (Matiku *et al*., 2013; CIFOR, 2014). Trees also make an essential contribution to food and nutrition as well as income (which is also needed in order to secure food) (Matiku *et al*., 2013). Some authors also describe the non-cash forest functions, which communities depend on, which include provision of forestry resources for agriculture purposes and climate change mitigation (Spittlehouse& Stewart, 2018).

Diffusion of agroforestry systems (a land-use system that integrates trees and crops) is increasingly common around the world (Maia et al., 2021). Its adoption is particularly strong among smallholder farmers, while many countries consider it a vital strategy in implementing forest restoration activities (Stanturf et al., 2019; Mahmood&Zubair, 2020; Stanturf, 2021). Not only does it have the potential to restore degraded lands and overcome water scarcity, but it can also foster climate change mitigation and adaptation (Sharma et al., 2016; Favretto et al., 2018). It is proven to be a promising strategy for biodiversity conservation around the globe (Moreno-Calles et al., 2010; Sharma et al., 2016). It helps in increasing agricultural productivity and reducing rural poverty, thus addressing both the environmental and socio-economic objectives of rural development (Sharma et al., 2016; Brown et al. 2018).

Despite the growing focus on afforestation in the sustainable development discourse (Luedeling, 2016; Ryan, 2016;;Dupraz et al., 2019), the value of supporting and regulating these services provided by forests is not well-captured in the market and therefore always undervalued. As a result many afforestation initiatives in the World are failing to convince farmers to adopt afforestation (Dupraz et al., 2019) with low uptake of afforestation as an alternative land use for economic development (see Wilson, 2016; Lovell et al., 2017). Such a scenario poses a challenge for land use allocation and modelling land use change. As a result, afforestation uptake as an alternative land use land use for economic development remains low (Wilson, 2016; Dupraz, 2019).

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 (NíDhubháin& 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 have a negative effect on 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.

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 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 have fallen way below policy targets (see Luedeling, 2016; Lovell et al., 2017; Dupraz et al., 2019).

Evidence from content analysis of literature reveal 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 in order to justify continued afforestation initiatives.

In many countries, afforestation initiatives have suffered from a number of challenges such limited awareness of the benefts of afforestation adoption, steep expenses of establishing trees, farmers' poor access to credit, and little support from local authorities (see Khan et al., 2017; Mahmood&Zubair, 2020). Rural communities also have limited knowledge required for effective management of agroforestry systems and inadequate access to extension services (Khan et al., 2017; Dobson, 2018). Additionally, a lack of access to capital and insecure land tenure contribute to these problems (Yasin et al., 2019). Thus, the poor diffusion of agroforestry is partially explained by a lack of fit between the

technical aspects required for adoption versus the economic and institutional context of the different farming communities in which they are applied.

However, despite the growing significance of afforestation, initiatives have faced a number of policy related issues that have stalled efforts to promote afforestation across the globe. Despite the lure of financial incentivisation from afforestation (see Hull et al., 2016; Minang et al., 2018), a lot of land globally remains either idle or underutilised. Similar to many countries, Zimbabwe has sought to increase forest cover for some time (Nyikadzino, 2016; Gwaze&Marunda, 2014). In Zimbabwe, many afforestation programmes initiated to address the problem of agriculturally unproductive land have stumbled along and eventually faded away (Nyikadzino, 2016). Generally, the decline in afforestation has consequences for downstream industries such as timber processing (Wilson, 2016; Ryan, 2016). Zimbabwe has vast pieces of land with potential for afforestation initiatives. 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.

3. PROBLEM STATEMENT

Despite the growing focus on afforestation as an alternative land use option for economic development (see Beyene et al., 2019; Amare&Darr, 2020; Ofori et al., 2020), little of note has been achieved in terms of afforestation uptake in developing countries (Beyene et al., 2019; Ofori et al., 2020; Wilson, 2016) whilst it remains trivialized in the Zimbabwean context (see Chimhowu, Manjengwa, &Feresu, 2010; Nyikadzino, 2016). As a result, afforestation has failed to proffer anticipated gains (see Beyene et al., 2019; Wilson, 2016) resulting in subsequent low uptake of afforestation as an alternative land use for economic development (see Wilson, 2016; Ryan, 2016; Romanaova et al., 2022; Ofori et al., 2020; Wilson, 2016). The challenges of promoting afforestation has cast the limelight on the issue of afforestation policy. In light of the dynamic challenges sweeping across the global afforestation environment, policy has been hailed as the missing piece of the jigsaw towards the promotion of afforestation uptake. However, despite a plethora of studies on afforestation (Romanova et al., 2022; Ullar et al., 2023; Ofori et al., 2020; Lovell et al., 2017) a close analysis of the focus of many studies conducted to date reveal the existence of a gap in knowledge on the role of policy in the viability of sustainable afforestation as an alternative land use for economic development in Zimbabwe. Therefore, this study using a qualitative research methodology sought to assessment of the role of policy in the viability of sustainable afforestation as an alternative land use for economic development in Zimbabwe.

3.1Aim of the study

The aim of the paper was to assess the role of policy in the viability of sustainable afforestation as an alternative land use for economic development in Zimbabwe.

4. LITERATURE REVIEW

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). 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).Amidst the continued failure of agricultural production systems in meeting policy targets in developing countries, there has been a gradual paradigm shift towards afforestation (Arimi&Omoare, 2021). Despite the

snail-paced rate of adoption of this mode of land use, globally, there has been a gradual realization of the potential of afforestation as an alternative and sustainable land use option for economic development support (Romanova et al., 2022; Ullah et al., 2023). As a result, a number of countries across the globe have actively sought to promote afforestation as an alternative land use for economic development through state policy and support. 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). A close look at extant literature seem to point towards the fact that current institutions of afforestation 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 (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; Sohngen et al., 2018; Dupraz et al., 2019). The effectiveness of existing institutions for 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 assess the role of policy in the viability of sustainable afforestation as an alternative land use for economic development in Zimbabwe.

1.4.1 Challenges in afforestation

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; Dupraz et al., 2019), 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 incentives to those involved to do something about them. Consequently, many social forestry programmes 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, 2011). Thus, one may say that current survey information on evaluation of failed agroforestry models is critically important in order to inform policy and new approaches.

Evidence from the synthesis of extant literature illustrates the existence of a number of problems in afforestation. 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). 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 agricultures and development-oriented projects have paid scant attention to forestry or failed to implement forestry components. Many social forestry programmes initiated to redress the problem of unproductive land in Zimbabwe have stumbled along and eventually faded away (FAO, 2019). As a result, afforestation programmes have continually failed and potential income from unproductive land has remained unrealised.

The pandemic and its lingering impacts still hovers and provide a haze over efforts to promote afforestation. L´opez-Feldman et al. (2020) posits that COVID19 resulted in policy changes such as budget cuts, transfer of environmental funds to other sectors, placing forest programs on hold due to travel restrictions, lax policy enforcements, and easing of environmental regulations) which are affecting forest conservation and management operations across the globe significantly. For example, in Latin America, countries such as Mexico and Ecuador announced cuts that are still directly impacting ministries enforcing environmental regulations and fighting climate change (L´opez-Feldman et al., 2020). In Indonesia, the government has started to revitalize 165,000 ha of abandoned peatland landscape into food-estates to fulfill the national food security gap (Government of Indonesia, 2020). The decision is in contradiction with the previous policy on peatlands restoration to meet national emissions reduction targets and puts the carbon-rich ecosystem at risk. Thus, it can be said that prioritization of afforestation remains an area of concern across the globe. The recent dynamics of environmental regulations will certainly affect the long-term national and global environment-related policies and climate change mitigation targets.

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 (NíDhubháin& 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 have a negative effect on 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.

Even in terms of research, the issue of policy in 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 policy issues and their impact in the viability of afforestation. A large proportion of the literature from developing countries deals with the problem of de-forestation (Namaalwa et al. 2007; Sankhayan et al. 2003). Studies on policy issue and their related impact on afforestation have been almost non-existent. Existing studies have generally been skewed towards 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, the role of policy on land use change from agriculture to forestry has received scant attention (McKenney et al. 2006; Upadhyay et al. 2006).

Similar to many countries, Zimbabwe has sought to increase forest cover for some time (Nyikadzino, 2016; Gwaze&Marunda, 2014). However, the economic incentivisation 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 have remained undervalued (Kim & Kim, 2021; Ofori et al., 2020; Lawson et al., 2014). Such a lack of knowledge and apparent lack of economic value poses 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).

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 policy approaches 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 set up 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.

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.

1.4.2 Afforestation efforts in Zimbabwe

In response to the alarming forest depletion rate, the government has initiated a number of programmes in order to promote sustainable management of the forest resources. The Forestry Commission has been on a massive tree planting programme nation-wide since 1992. As from 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, schools tree growing and tree care competitions and also at special commemoration such as International Forest Day, World Environment Day among others.

In order to consolidate these efforts, 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. FAO (2015) statistics revealed that planted forest also declined from 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). 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 and the eventual destruction of forest business and loss of investor confidence. Some of the social consequences include loss of jobs as company closures occur as well as 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.

1.4.3 Strategies to promote afforestation

As a result of the successive failures of afforestationiintiitaives and the limited uptake of afforestation, it is imperative to interrogate policy issues and their impacts on the vaiability of afforestation. Despite the centrality of policy to the success of organizational performance (Romanova et al., 2022; Tian et al., 2018), a critical review of extant literature highlight the existence of a research gap on policy and policy issues in sustainable afforestation in developing countries (Ofori et al., 2020;Namaalwa et al. 2017), whilst it remains trivialised in the Zimbabwean context (Nyikadzino, 2016; CIFOR, 2014; Gwaze&Marunda, 2014). Therefore, this study sought to assess the role of policy in the viability of sustainable afforestation as an alternative land use for economic development in Zimbabwe.

5 THEORETICAL FRAMEWORK

This study derived illumination from a variety of inter-disciplinary theories. In order to assess the role of policy in the viability of sustainable afforestation as an alternative land use for economic development in Zimbabwe, a theoretical framework which comprises a constellation of the following theories Theory of Structuration (TS), The Stakeholder Theory (ST), and Sustainability of Livelihoods Framework (SLF) 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. After a critical analysis of all the 'theoretical jackets' above, the Stakeholder Theory emerged as overarching, with attributes that gives 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 which determine land use and decision making in land use.

6. RESEARCH METHODOLOGY

Qualitative research method was used to prosecute the study. Data collected from the primary sources were mainly in-depth interviews, oral tradition and key informants interviews (20 respondents). Content analysis was also used to aid data collection. Information obtained from both primary and secondary sources were used in the analysis and interpretations of study findings. The people targeted as key informants were purposively selected from of farmers, farm boards like Agritex, Ministry of Lands and Agriculture, EMA, Agricultural funding institutions egAgribank, Women's Bank, Agriculture training institutions egGwebi Agricultural College, Chinhoyi University of Technology (specifically school of Agriculture, Ministry of Local Governance, Rural District Councils, Chiefs, Headmen, Kraal heads, and other relevant bodies/individuals with relevant knowledge to the phenomenon under study. The study was conducted in Mashonaland West. A thematic approach was used to analyse the data collected. Observation was used to triangulate findings.

7. RESULTS: INTERPRETATION AND SYNTHESIS

This paper assessed the role of policy in the viability of sustainable afforestation as an alternative land use for economic development in Zimbabwe.

7.1 Performance of afforestation in Mashonaland West

Generally, evidence from the study demonstrates that afforestation remains subdued in Zimbabwe. Evidence from research findings that the size of afforested areas, including reforestation are too little,

if compared to the size of open or sparsely populated forests that need reclamation. Such sentiments are illustrated in the narratives captured below:

> *I have dedicated thirty-hectares of my six hundred and fifty hectares 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)***

From the sentiments above, one may conclude that afforestation constitute an insignificant part of land use considering the farm sizes. 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). From these findings, it can be said that the size of the land under afforestation is very insignificant indicating limited investment. 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 total land are available.

Generally, it can be captured by the sentiments expressed above that afforestation an insignificant land use option within the province. Little consideration is given to afforestation as an alternative land use option for economic development. This can be seen on figures captured in table 1 below:

DISTRICT	**PRORPTION OF LAND UNDER COMMERCIAL WOODLOTS**
Chegutu	0.02%
Mhondoro Ngezi	No record
Sanyati District	0.19%
Kariba District	0.05%
Zvimba	0.10%
Makonde	0.03%
Hurungwe	0.04%

Table 1: Commercial woodlot statistics for districts in Mashonaland West

Generally, 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. A close look at literature highlights that these findings are not only unique to Zimbabwe, but a common phenomenon across the

globe. These findings are in synchrony with Ryan (2016) who posits that in the context of overall forest cover, the conversion of land from agriculture to forest is unusual in the global context. Further, the study findings are also echoed by Minang et al (2018) who opines that despite the lure of financial incentivisation 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 programmes have continually failed and potential income from unproductive land has remained unrealised.

7.2 Farmers in afforestation

The uptake of afforestation among farmers in the province remains low. The findings illustrate that afforestation adoption remains alien to most of the farmers in the province. Such sentiments are shared in the narratives presented below:

> *It is not easy to spell out the exact numbers of farmers who are into afforestation, in our province. Getting back to the farming community now, what I am only sure of is the fact that we have a target of reaching 15% of our farmers venturing into afforestation as a commercial venture by 2030. This is too high a bar though as we are currently having very few farmers onboard and the farming community perception towards commercial afforestation is still a cause of concern. (Drueke, Planning and Monitoring Officer)*

> *Afforestation seems to be a preserve of large scale commercial farmers and schools, mainly in the rural Mashonaland- West who normally plant at least half a hectare of eucalyptus. A1 farmers are usually left out and most of them have the perception that, eucalyptus trees reduce soil fertility and provide too much shade that retards crop growth, hence can not grow such trees even for wind break around their small pieces of land. (Deonnr, District Agritex Officer)*

Generally, sentiments shared from the narratives above illustrate that only a limited number of farmers are into afforestation. A possible explanation for the limited adoption of afforestation within the province might be the fact that the conversion of land from agriculture to forest remains unusual among landowners. Further, a close look at the findings also noted the existence of a number of challenges that militates against the adoption of afforestation. One of the major challenge faced in the promotion of afforestation as an alternative and sustainable land use option for economic development in Zimbabwe is inadequate knowledge of the potential economic gains that may accrue from afforestation initiatives. These findings share much in common with Beyene et al (2018) who opines that there is a general lack of economic knowledge in relation to the returns from afforestation and a lack of management expertise in relation to appropriate management (silviculture) of forests (also see Flemming et al., 2019; Jara-Rojas et al., 2020; Ryan, 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 or negative attitudes around the perception of failure in farming (also see Jha et al., 2021; Li et al., 2020). Thus, it can be construed from the study findings as well as from extant literature that 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.

8. POLICY ISSUES HINDERING AFFORESTATION

Evidence from the study illustrated a number of policy issues that are hindering the success of the afforestation drive in Zimbabwe.

8.1 Effect of limited knowledge on inclination towards afforestation amongst farmers

Evidence from the study demonstrate that farmers are not well-informed about the dynamics of afforestation. Such sentiments are captured in the narratives presented below:

> *There is a gap, they are not informed. There are so many misconceptions especially with eucalyptus, where they are said to have high water usage, hence farmers are skeptical about adopting afforestation as an alternate land use* ***(Forestry extension officer)***.

> *With the current economic arises people tend not to see the benefits of afforestation. They are mainly concerned of food provisions thus more inclined to cropping* ***(Wynot, Farmer).***

The narratives above illustrates that ignorance about afforestation and its related issues remains a challenge in the province and Zimbabwe at large. The generality of the study findings on afforestation challenges highlight poor education and training as one of the hindrances to the uptake of afforestation as an alternative and sustainable land use. The Forestry Commission, according to FAO (2018), is hindered by a lack of human resources capabilities as a result of the brain drain brought on by the extended period of economic crisis during the early 2000s. Some of the stakeholders contacted mentioned a lack of skills in forestry mapping due to the current personnel being overworked, mapping of vegetation cover, and geographic information system skills to track vegetation change. The monitoring of forestry diseases and pests also faces a skills gap. The only entomologist who requires replacement has left the government, according to inquiries with the Forestry Commission. Support is required for more forestry research. Forestry extension skills are sufficient, but there aren't many people who have them.

8.2 Inadequate funding and its impact on afforestation uptake

Insight from the study findings show that afforestation ventures require a lot of capital for land preparation and maintenance of the woodlot when the trees are still small. Study findings illustrated that afforestors and potential afforestors suffer from an absence of adequate funding. Such sentiments can be perceived in the narratives presented below:

> *The management aspect comes at cost. Right now we are supposed to be getting a fair share of the afforestation fund from fiscals' but we are not getting commensurate or adequate funds to support* ***(Afforestor).***

> *There is a huge cost on the upkeep of these trees and unfortunately these are not seasonal crops. We are talking of 9 years being the minimum. We expect about 15-20yrs of investment is a tree crop because of other side factors that may retard growth. Creating fireguard are costs though they will never be as costly as having your forestry destroyed by fire* ***(Afforestor).***

Generally, it can be construed from the narratives above that most farmers felt that costs of supporting an afforestation initiative are beyond their means. Farmers were put off by the long time that such a venture would take to pay off. The problems identified include among others, financial in-capacitation as most afforestors and potential afforestors are suffering from inadequate financial muscle to undertake afforestation initiatives. Such findings are in synchrony with literature. According FAO (2018) forestry projects require high rates of financing at the beginning, forests take some time to

deliver revenues and benefits. Hence investors face high initial costs and delayed returns, which demands the availability of initial investment capital and the ability to wait for revenues (Nyakatonje, 2023). Financial challenges have meant that responsible authorities lack the finances to hire or train experts in the field of afforestation, provide funding to afforestors.

The challenge of funding has not only been limited to farmers but to extension workers as well. Voices captured below offers insights into the current financial challenges being experienced by afforestation extension officers:

> *We cannot raise enough nursery for the farmers. There is a nursery which is raising the stock of plant trees. There are supposed to be 5 but at the moment Zvimba district has one. In fact, we do not have enough manpower at our offices to meet the demand. Of late we were subcontracting farmers to do so. We managed to enter into contracts with three different farmers, two of which have long withdrawn citing delays in payments. Such incapacitation has affected our continued services.* ***(Forestry extension officer)***

The voices above show that, inadequate government support for afforestation is crippling the growth of afforestation as a sustainable farming venture like any other crops. Afforestation is a new venture in the agriculture spectrum in most regions hence, farmers expect to be in constant contact with their extension officers. In broad sense extension is an education process that informs, convinces and links people. It facilitates flows of information between farmers and other resource users, administration managers and leaders (Tafere&Nigusse, 2018; Ullar et al., 2021). To further buttress the compounding issue of "the missing link", that is forestry extension services, FAO (2017) posits that the planting of trees is not fundamentally a forestry issue, it is a farm system and social issue and therefore there is a need for an `extension approach' which treats trees as one of many potential productive activities that must be incorporated into the farm system.

The government is said to be taking a limited interest in afforestation as characterized by its limited support to the Forestry Commission. Such sentiments can be captured in the narratives presented below:

> *Government is focusing more on crops than forestry activities. This is visible where for the vast of rural communities there are agritex officers for both crops and livestock at community level* ***(Zepn, Farmer).***

From the sentiments captured above, it can be construed that the government has not been taking an active role in supporting afforestation initiatives as compared to other traditional crops. The Forestry Commission is a government apparatus that thrives on government support. The absence of government life-support renders the apparatus incapable of performing its mandated duties. According to FAO (2015), the undervaluation of the forest resource in the context of Zimbabwe is one of the reasons why there has been limited government investment for afforestation. This is due to the shortage of forestry economists in the nation who can estimate the true value of forests to socioeconomic development. This frequently results in knowledge gaps that must be filled before making government policy decisions. The issue of limited government support in afforestation has been noted in literature with Musasa (2014), who projected that the issue of micro finance to assist small and medium scale entrepreneurs in afforestation is salient. There is biased government support of other crops at the expense of afforestation can be captured in the voices presented below:

> *Government is focusing more on crops than forestry activities. This is visible where for the vast of rural communities there are agritex officers for both crops and livestock at community level* ***(Zepn, Farmer).***

This absence of support has incapacitated the Forestry Commission with one afforestor pointing out that:

> *We lack resources for raising adequate seedlings for giving tobacco farmers for free, further because of limited resources we cannot follow up on each and every farmer, monitoring the upkeep of their plantations. To that effect one would realize that after a year or two some of the plantations would have been destroyed by veld fires, due to lack of close monitoring* ***(Forestry commission officer).***

Maybe there is need to educate the government through its ministries that support agriculture such as the Ministry of Agriculture on the benefits of afforestation especially in arid and semi-arid areas. Ignorance might explain why the government is biased towards supporting traditional agricultural crop production at the expense of afforestation. Thus, there is need for knowledge edifying programmes not only for the farmers but the government and other would be investors. However, of late there have been a number of organizations that have taken a vested interest in afforestation and seek to provide funding to the sector. What remains worrying however, it general ignorance among farmers of these organizations that seeks to partner afforestors in the province. The ignorance of these about these organizations may explain why funding has remained a challenge within the afforestation sector.

8.3 Existing land tenure systems and their impacts on afforestation

Farmers decried the land tenure in Zimbabwe which made it difficult for them to venture into long term investments like afforestation. 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 illustrated in one of the narratives presented below:

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

A close analysis of sentiments presented above, farmers in Zimbabwe only have usufruct rights to land as they have no title deeds. Generally, this uncertainty and the risk associated with such landownership militate against long term investment on farms. Hence, long term investment projects like afforestation suffer. The problem of land ownership is one of the most serious problems in the history of forest lands (Beyene et al., 2019; Ullar et al., 2021).It is generally 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. Secure tenure rights are a critical foundation for local economic development. However, despite importance of land ownership/land rights in spurring farm production, Zimbabwe land ownership after the Land Redistribution exercise remains unclear, prompting farmers to shy away from investing in long term projects or development. Such uncertainty on landownership rights may explain the limited adoption of afforestation among farmers in Zimbabwe. This insecurity arose because the land on which new farmers were settled was now owned by the government and was, therefore, worthless as collateral. Study findings bears testimony that tenure insecurity can demotivate long term investment into livelihoods and adoption of improved farming practices, it might constrain farmers' ability to use their land as collateral for credit or make substantive or long term investment on farms. Secure tenure is an anecdote for improved land use. Reviews of the empirical literature have shown 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 the mentioned reviews are contradictory. Generally, study findings highlighted that farmers will be more likely to make medium- to long-term land improvements if their tenure is secure because they will be more likely to benefit from investment.

8.4 Inadequate afforestation extension services

Generally, study findings highlight the inadequacy of afforestation extension services in the province. Such sentiments are illustrated in the narratives [presented below:

> *Current extension services are not adequate because the limited numbers of extension officer on ground cannot bridge the gap in proper land use planning for instance forestry common has one officer in the whole district. The officer in some instance is not even mobile to visit farmers, teaching them on the practices in afforestation* ***(Fungie, Farmer).***

> *Basically, there are fewer extension officers for afforestation services as compared to agricultural extension services for crops and livestock. Government must surely do something.* ***(Contriana, Farmer/Afforestor).***

A close analysis of the sentiments expressed above highlights the inadequacy of extension services geared towards supporting afforestation initiatives in the province. Extension services provides a backbone to afforestation initiatives. In broad sense extension is an education process that informs, convinces and links people. It facilitates flows of information between farmers and other resource users, administration managers and leaders (Tafere&Nigusse, 2018; Ullar et al., 2021). The need for extension officers in afforestation has been noted in literature. In a study on role of forestry extension in promoting afforestation in Khartoum State, Mohammed (2001) found that 82% of his respondents stated that there were no extension visits to farmers. The extension personnel focused on agricultural issues on the expense of forest trees.

Extension officers who took part in the study also felt inadequate for the task assigned. Such sentiments can be captured in the voices presented below:

> *The area I am supposed to service is too big. I have three districts to service but no vehicle to use when moving around farms. We all rely on one vehicle that is well serviced and services mainly the provincial office. That makes monitoring of woodlots very difficult. We end up resorting to waiting for farmers who come to our with questions. We only give them information and, in most cases, do not go with them to their farms because the government regulation is that when I am involved in an accident in a car other than the government provided vehicles, I will not be insured, even though I will be on duty.* ***(Forestry extension officer)***

The voices above show that, inadequate government support for afforestation is crippling the growth of afforestation as a sustainable farming venture like any other crops. Afforestation is a new venture in the agriculture spectrum in most regions hence, farmers expect to be in constant contact with their extension officers. This challenges have also been noted in extant literature. In another study conducted in Limpopo Province (South Africa) by Maponya, Venter, Du Plooy, Backeberg, Mpandeli&Nesamvuni, (2019) results also indicated that less than 45% of farmers received extension services, mainly through formal extension service. Bukomeko (2012) had similar findings of inadequate forestry extension services in lira district of Uganda. To further buttress the compounding issue of "the missing link", that is forestry extension services, FAO (2017) posits that the planting of trees is not fundamentally a forestry issue, it is a farm system and social issue and therefore there is a need for an `extension approach' which treats trees as one of many potential productive activities that

must be incorporated into the farm system. In Malawi, where a social forestry programme has been implemented over the past, five years, it has been agreed and accepted that, for the future development of forestry extension, forestry subject matter specialists will be fully integrated into the agricultural extension system. The integration and development of forestry extension within the agricultural service is now gaining wider acceptance and support. Forestry extension staff - will not generally be in contact with farmers but operate with and through agricultural extension staff. This intermediary role therefore, calls for quality rather than quantity of forestry staff and emphasises the need for suitably qualified foresters in the disciplines of agriculture, soil conservation, land management, farm systems and extension methodology.

8.5 Anachronistic cultural attitudes towards afforestation as an on-farm economic activity

Generally, study findings highlight the existence of an embedded anachronistic cultural attitude towards afforestation amongst farmers in Mashonaland West. The general narratives from majority of the respondents who took part in the study attributed the poor uptake of afforestation as alternative sustainable on-farm economic activity to out-dated cultural values. Such aversions towards afforestation are embodied 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, soyabeans 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.* ***(Zepn, Farmer).***

> *Choosing which crop or activity to forego and start a forest is a challenging decision as there are switching costs involved. At the same time the farer will cease to enjoy the benefits they used to get from that piece of land, instead they will start incurring costs.* ***(Zepn, Farmer).***

Generally, it can be construed from the sentiments in shared in the above narratives that there a general aversion to afforestation as an alternative land use for economic development. Findings points towards a general anachronistic cultural attitude towards afforestation amongst the generality of farmers in Mashonaland West Province. One possible explanation for this maybe the incapacitation of the Forestry Commission in disseminating the benefits associated with afforestation to the majority of the farmers in the province. Such an anachronistic attitudes may possibly explain the limited adoption of afforestation as an on-farm economic activity in the province. Generally be said that there is a general reluctance to divert from their traditional crops towards adopting afforestation. Thus, it can be construed from the sentiments in the embodied in the narratives above that farmers feel comfortable in investing in their “traditionally trusted crops”, and are afraid to break out of their comfort zone and adopt something they are not sure of in terms of benefits. However, such findings have been found to be universal with studies in other environments confirming the existing absence of a culture of afforestation amongst most farmers. Ongolo et al (2023) opines that negative cultural attitudes towards forestry have also been widely reported since the early 90s in some countries. Green (2009), Dhubain (2010), and Upton (2015) share this concern by hypothesising that there maybe global commonalities in relation to stakeholder attitudes around the adoption or non- adoption of afforestation as a sustainable on-farm economic activity. Thus, from such findings it can be said that the conversion of farm land traditionally reserved for traditional crops, or simply regarded as ‘bad land’ for afforestation is mostly unusual amongst farmers in Mashonaland West Province, leading to limited adoption of afforestation as an on-farm economic activity.

8.5 Aversion to long term investment in afforestation

Historically, afforestation has been a strong long-term investment for landowners. Study findings illustrated that famers felt averse to long term investment in afforestation. Such sentiments are demonstrated in the narratives presented below:

> *I have not ventured into afforestation because, for me, five years needed to harvest these gum trees is equivalent to five cycles of maize, soyabeans 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.* ***(Zepn, Farmer).***

> *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.* ***(Fungie, Farmer).***

A close look at the above findings highlight that most farmers were reluctant to embrace afforestation due to long-term nature of the investment. Generally famers pointed out that realization of investment returns in afforestation takes time hence not ideal for famers who have immediate needs to meet. Such findings are in synchrony with Beyene et al (2019) who posits that afforestation is a long term investment that takes ages to get return on investment. As such, such long term investments are frowned upon by most farmers who depend on farming for their immediate needs. Generally, it can be said that most farmers are averse to long term investment due to the pressing immediate basic needs. Most farmers in the province can be said to be surviving on hand to mouth, hence an investment into a long term project is not an ideal project for them.

8.6 Limited knowledge of economic benefit of afforestation

Generally, study findings illustrated that respondents had a limited understanding of the economic benefits of afforestation. Such sentiments are embodied in the narratives illustrated below:

> *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).***

A close look at the general sentiments shared by respondents showed that the economic benefits of afforestation are not well captured in the market. Such challenges in appreciating the economic benefits of afforestation have also been captured in literature. One of the major challenges faced in the promotion of afforestation as an alternative and sustainable land use option for economic development in Zimbabwe is inadequate knowledge of the potential economic gains that may accrue from afforestation initiatives. Malone (2008) dissects this complexity by listing common themes that impact levels of afforestation. This stems from the fact that most countries lack a `farm forestry' tradition within agriculture. Further to, this translates into a lack of economic knowledge in relation to the returns from afforestation and a lack of management expertise in relation to 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 or negative attitudes around the perception of failure in farming. 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 (NíDhubháin& Gardiner 1994). However, despite the poor uptake of afforestation as an alternative land use due to farmer ignorance afforestation has been found to be economically beneficial.

9 POLICY STRATEGIES TO OPTIMISE THE UPTAKE OF AFFORESTATION

Evidence from the study highlighted a number of key resources that are imperative for successful afforestation. These range from precise regulatory and policy frameworks reforms, land, labour, funding/capital, and knowledge.

9.1 Precise regulatory and policy frameworks reforms

Precise regulatory and policy framework reforms were identified as a critical issue relating to developing afforestation in Zimbabwe. It provides guidance to operations and protecting the interests of all parties involved. The majority of respondents cited policies, codes of practice, and guiding rules and regulations as critical in the development of best practices for developing afforestation as a sustainable land use option for economic development in Zimbabwe. Narratives below are illustrative of respondents viewing policies central to improving the adoption of afforestation as a sustainable land use option for economic development:

> *There is always need for policy that would harness the need of different stakeholders in afforestation. Such policy can only be developed through an 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).***

> *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 own government is incapacitated to give all the provisions required for afforestation.* ***(Nels, Farmer/ Afforestor).***

Respondents noted with concern a number of issues with regards to the current regulatory and policy framework on afforestation in Zimbabwe. What stands out from the sentiments expressed above is the inadequacy of existing policies in afforestation. Evidence from the study points towards a number of afforestation challenges that are being experienced by afforestors/farmers which under normal circumstances should be addressed through policies. Such challenges include limited investment in afforestation, limited stakeholder support in afforestation, poor markets among a number of other challenges. Study findings illustrate that effective policy frameworks are essential in developing a framework for effective development of afforestation as a sustainable on-farm economic activity in Zimbabwe. In this study, policy frameworks are public documents that include statements that provide guidance on institutional operations, such as goals and aspirations for how they should be achieved. In this case, such structural issues are used as a reference point for all efforts to develop afforestation in Zimbabwe. Given this understanding, it was intriguing to note that the majority of respondents reiterated that the lack of an effective policy framework hampered the general implementation of effective efforts to develop afforestation in Zimbabwe.

Further sentiments from the consulted stakeholders were that although Zimbabwe has a relatively sound legal framework, the existing framework lacks robust enforcement and also suffers from conflict of interest with other existing polices. TPF (2018b) cited a number of conflicts in the national legislation that the forest plantations are grappling with. These include the Mines & Minerals Act vs. Forest Act where the former confers lands rights to the miner over the forester. Linked to this is where the Ministry of Mines is offering Mining Special Grants in Gazetted Forests or gold panning activities being conducted in gazetted forests like Tarka and Maswera Forests. The other area of conflict is

between the Land Resettlement Act vs. Forest Act where forest land is being converted into agricultural land. Mineral exploration on farms and protected areas such as Pindipark for gold and other minerals has led to land use conflicts with conservancies. Such sentiments on land use conflicts are also shared by the TPF (2018) which states that traditional and local leadership is allowing settlements in gazetted and Commercial Forest Plantations as in the cases of Martin Forest in Chikukwa; Tarka Forest in Ngorima; Gwendingwe Forest in Muusha and Cashel Estates in Mutambara. Further, there are law overlaps and duplications for example the management of fire under the Statutory Instrument 7 of 2007 is under EMA but this instrument is derived from the Forest Act being managed by Forestry Commission. Moreso, the principal forest Act is old and does not capture some of the emerging issues of sustainable forest management.

Of concern is the fact that some of the stakeholders who partake in this research professed ignorance to existing frameworks governing afforestation. The voice below demonstrates the problem ignorance of policies applying to the afforestation industry:

> *I personally did not venture into afforestation because, I am not sure of the government policy pertaining to afforestation. I only know that farmers who are into tobacco should plant trees because they use a lot of wood for curing, thus they are clearing forests leading to deforestation. As of the other farmers, I do not even know what they will have to do with the timber maybe 10-15 years later when the trees are fully grown.* ***(Mleon, Farmer)***

Evidence shared in the voice above is generally illustrative of the state of knowledge about afforestation among most of the farmers in the province. It speaks volumes as to why afforestation has generally failed to take off. The implications of these sentiments are that policies should also focus on eradicating ignorance through knowledge edifying programmes. Generally, ignorance has been noted as a common problem among afforestors.

9.2 Enhanced funding

Study findings highlighted that funding is lifeblood to an economic venture. Study respondents noted capital/funding as one of the key resources behind successful afforestation. Narratives below are illustrative of 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. This is because most of our farmers cannot afford the cost incurred on the land preparation and transplanting stage. Otherwise, onwards they will manage as the costs decrease once the woodlot is established* ***(Doryoton, an afforestor)***

> *Access to funding is critical for farmers here in Chitomborwizi. This is because most of our farmers cannot afford the cost incurred on the land preparation and transplanting stage. Otherwise, onwards they will manage as the costs decrease once the woodlot is established* ***(Farmer)***

Funding remains the Achilles heel in most afforestation initiatives. Generally, evidence from the study demonstrates that funding remains a challenge among afforestation farming community in Mashonaland West. Funding provision was highlighted as one of the institutional building blocks that maybe adopted to promote sustainable afforestation as an alternative land use for economic development. General findings points towards the need for financial support to stimulate the uptake of

afforestation among farmers. FAO (2017) highlighted that forestry projects require high rates of financing at the beginning, forests take some time to deliver revenues and benefits. Hence investors face high initial costs and delayed returns, which demands the availability of initial investment capital and the ability to wait for revenues (FAO, 2017). A close look at the findings showed that farmers felt that for afforestation to take off, there was need for funding. When compared to other on-farm land use options, farmers felt that the government was giving more priority to other crops as compared to afforestation. Thus, from the findings one can say that afforestation is grossly underfunded when compared to other crops. Generally, respondents felt that in order for farmers to adopt afforestation as an on-farm economic activity, there is need to improve on funding.

9.3 Improving research and development

Findings isolated Research and Development as another policy issues that can be used as a mechanism that can be used to stimulate the development of sustainable afforestation as an alternative land use for development in Mashonaland West. Such sentiments are embodied 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 maximising 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 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 in afforestation****(Fungie, Farmer).***

It can be construed from the sentiments expressed above that research is a vital cog in development. Findings indicate a paucity of related studies on the challenges and strategies for optimizing afforestation in the Zimbabweancontext. Most respondents shared similar sentiments that there is limited research output which has affected progress in efforts to gainfully exploit the benefits of afforestation, promote production as well as generally improve afforestation. Research and development should lead to lasting solutions on what relevant authorities should do to ensure the establishment of mechanisms for optimizing afforestation in Zimbabwe. All things being equal, research should lead to a result in production of new knowledge, systems, operations, processes or facts translating to transformation as well as improved standards of life (see Kariuki&Misaro, 2013). Therefore research and development are not treated separately in this study since they affect each other. The absence of research to inform afforestation, it is highly likely that farmers would not get the best out of afforestation leading to disillusionment with afforestation and subsequently limited adoption of afforestation as an alternative land use option for economic development. It can be summed from these findings that scientific and technical support is key to sustained success in Afforestation. Such findings are in synchrony with Chigumira et al (2019) who posit that in Burkina Faso, careful forest seed selection and breeding as well as support for village nurseries have helped ensure that planted trees are adapted to local ecosystems, and that survival rates are high. From these findings, one may conclude that research and development is key in promoting sustainable afforestation as an alternative land use for development in Mashonaland West.Research may as well improve the yield per hectare for afforestation so that, it becomes comparable or even better than the

aggregate crop yield for other crops during the same period. Afforestation should be informed by research from conception to harvesting.

9.4 Improved afforestation extension services

The improvement of extension services was cited by a number of respondents as vital in efforts to promote sustainable afforestation as an alternative land use for development in Mashonaland West. Generally, stakeholders perceived the adequate forestry extension services as the difference maker in the drive to optimise the adoption of afforestation as a sustainable alternative land use option for economic development. The voices presented below demonstrate the centrality of improved afforestation extension services:

> *…….but maybe for a start as we want to operationalize the government proposed tree planting models, we need more extension officers for education and enforcement to be successful. Thus we cannot rule out the need to recruit more extension officers* ***(Forestry extension officer).***
>
> *There is the issue of extension officers. We do not even know whether they are there or not. If we have possibly they are incapacitated to cover the areas allocated to them. So the focus will either be to capacitate them by providing transport or increasing the number of forestry officers so as to increase their visibility* ***(Farmer).***

A close look at the findings above highlights that adequate extension forestry services provide impetus to the adoption of afforestation as an on farm economic activity. Their role is important in that in the absence of extension services, expert advice to farmers on afforestation ceases resulting in some ventures collapsing. Thus, from the findings one may conclude that afforestation extension services are a must in the success of afforestation as an on farm economic activity. These findings concur with Le et al. (2012) on whose study in Philippines noted that most smallholder woodlots produce merchantable volumes far less than their site potential, resulting in disillusionment of smallholders when there are no adequate expert advice services on the first years into afforestation. This is attributed to the fact that, these new afforestors may not understand the ways that trees are valued (that is, whether trees are sold simply by the number of logs, the diameter or length of each log, by the log volume or as partially sawn log flitches) or the effect of location on the log price they are likely to receive (for example, price at the stump, at the road side or at the mill door). All these have an impact on the overall contribution of afforestation on economic development in Mashonaland West, thus afforestation extension services should be upheld if afforestation is to be taken as a sustainable, alternative land-use option in the province.

9.5 Initiate education and training

According to the research findings, education and training are another strategy and mechanism for developing best practices in the development of afforestation as an alternative sustainable economic activity for economic development in Zimbabwe. In this study, education and training are viewed as means of imparting knowledge and skills on business-related issues. The two terms are used interchangeably to inform people about what they should know about afforestation development. The majority of respondents viewed education and training as important in facilitating effective business operations. In most of their responses, they used terms like knowledge acquisition, skill equipping, enlightening and providing relevant information, teaching, learning, programs, and schooling, revealing the importance of the strategy in providing basic information about effective ways to develop afforestation Zimbabwe. Narratives below are illustrative of respondents viewing education

and training as central to improving the adoption of afforestation as a sustainable land use option for economic development:

> *There would just be education of people for instance one can be educated on afforestation as an alternative land use especially when they have land that is not cultivated to periods extending to 5 or more years* ***(Forestry Extension Officer).***

> *Education is critical because without education, people will view the laws as punitive and restrictive to their freedom a citizens thus they need to be informed on the reasons why they mustn't cut trees and at the same time plant more trees* ***(Farmer).***

It is evident from the sentiments shared above that most development efforts in afforestation plans are hampered by ignorance. As a result, stakeholders who partake in this study proposed that eradicating ignorance through related knowledge edifying programs is critical if the general public and responsible authorities are to comprehend and appreciate the significance of effectively developing afforestation ventures in Zimbabwe. Most respondents also saw knowledge and skill acquisition as important in providing effective management services and effectively implementing effective strategies. According to these findings, the vast majority of respondents saw education as the lifeblood of knowledge and skill transfer. These findings imply that imparting knowledge and skills is critical to the development of effective methods of developing afforestation as an as an alternative land use for development in Mashonaland West in Zimbabwe. When combined with the evidence presented, these findings indicate that knowledge and skills are critical pillars of development effective strategies to develop as an alternative land use for development in Mashonaland West.The essence of education and training in promoting afforestation is also echoed by Ajulor (2018) who opined that only a well-educated and informed society is able to produce policy-makers who regard harmony between people and forests as a priority for sustainable development. The scholar went on to say that in this respect, best practices may be found in a number of countries that give high priority to their extension services, using them as tools to improve public relations in the forest sector.By prioritizing education and training in their forest policies, governments have seen great success with their forest reforms, according to a close study of the existing research. An excellent illustration of this is the experience of the Baltic nations (Latvia, Estonia). Large-scale training initiatives were put into place at the beginning of the 1990s, and it was via these initiatives that they were able to make the forest industry significantly more profitable by basing its operations on sustainable forest management principles. The same strategy is currently being used in the Russian Federation, though much more slowly than in Eastern Europe and the Baltic states. Institutional reforms in forest management are being followed by substantial training programmes.

9.6 Policy enforcement

Further, evidence from the study also shows that respondents felt that policy reforms should be accompanied by policy enforcements. Such sentiments can be captured in the voices presented below:

> *Farmers should be mandated to possesses at least some form of wood lot wherever they are. This should be obtainable at law.* ***(Extension officer).***

> *Enforcement is really needed. It's one thing telling people not to cut trees and educating them on the benefits of trees and it take extra effort now to ensure the trees are not really cut. Even if we plant, where rules and regulations are not enforced, then we can never have sustained forests* ***(Farmer/Afforestor)***

Laws enforcement agents must be actively involved in the control of cutting of trees ***(Farmer/Afforestor).***

A close analysis of the voices above highlights that currently policy enforcement is missing. From the sentiments shared above, one may conclude that there are existing policies on afforestation, however the missing link has been on enforcement. Evidence from the synthesis of literature highlights that the challenge of policy implementation is a common phenomenon in Africa.Ajulor (2018) posits that Africa has severe challenges in implementing policies and programmes aimed at sustainable development such as its inability to ensure participation and poor policy change management. Policy implementation is the process of changing a formulated policy into reality. To Mbieli (2006), policy implementation is critical to the success of any policy since it constitutes the epicenter of the policy process. It involves the identification of policy plans, programme, projects, and activities; precise definition of the distinct roles of implementation organizations or agencies; details of strategies and necessary linkages and coordinating mechanisms; as well as resources (human, financial, material, technology, information acquisition, and utilization).

From the same perspectives, research findings indicate that effective policy frameworks are essential in developing mechanisms for optimizing afforestation in Zimbabwe.However, there is need to timeously and regularly reflect on the policy framework changes in the dynamic environment. There for one may argue that policy issues should not be taken lightly, and policy making, review and implementation should involve different stakeholders and those in authority (see Easton's 1965 Political Systems Model). However, Bourdier's (1984) Distinction Concept argues that the taste of those in power and the elite tends to override those of lower classes in society. This means that policy can be dictated and in the process it can negatively impact on afforestation initiatives. Policy plays a crucial role in governing and regulating the afforestation practice. Evidence from the study findings showed that there is need for policy improvement in order to enhance and support afforestation in Zimbabwe. In a nut shell, only precise regulatory and policy frameworks can help in bringing about effective mechanisms for optimizing afforestation initiatives.

9.7 Enhanced market access

Farmers generally felt that, as government they should create a market for their afforestation initiative. These sentiments can be acclaimed from the views captured below:

> *The government, through local leadership should aid in creating markets for timber and timber products in the short run. If they fail to do so, no matter how much, the afforestation gospel is preached, very few if any new entrances will be realised. It will continue as a role of schools in rural areas, of which most schools put up non-commercial."****(Tihan, Farmer/Afforestor, Chief)***

> *Although the power of markets per se can be sufficient to unlock the potential of afforestation to receive private investments, my experiences is that most emerging economic activities still require appropriate government support, in terms of credit lines, regulations and policies, to develop, and that is exactly what is needed for afforestation to take up a significant share in term of contributing to economic development in Mashonaland West province. Indeed, markets may not be sufficiently robust or stable to initiate afforestation even though the need is very significant.* ***(Fungie, Farmer).***

The above sentiments reveal that, for afforestation initiatives to be successfully implemented in a manner that will yield positive benefits to economic development in Mashonaland West province,

there is need for the creation of markets for afforestation products. In the drive to create markets, responsible authorities should put up policy frameworks that attracts investment into an area, especially with special focus on value addition investment in afforestation. Additionally, overregulation often restricts market access for farmer grown tree products, partly due to rules intended to curb illegal logging from natural forests or government plantations (Henman, Hamburg & Vega, 2008). In addition to the aforementioned barriers, Henman et al. (2008) points out that a lack of reward mechanisms for environmental services provided by agroforestry hinders sustainable afforestation. There is also lack of supportive legal and institutional frameworks for smallholder tree growing and agroforestry in general (Hanson, Seymour, Chaturvedi& Ding, 2019). Thus, it is evident from these findings that creation of markerts for afforestation products should be vital cog in the development of an institutional framework to promote afforestation as a sustainable land use option for economic development in Zimbabwe.

9.8 Incentivising afforestation

Incentivisation of afforestation was isolated as a mechanism for promoting sustainable afforestation as an alternative land use for development in Mashonaland West. Such sentiments are embodied in the following narratives:

> *Need to come up with a mode that will incentivize farmer. Right now our citrus industry was on the decline but there is now a deliberate stance by the government too/re-introduce the horticulture industry targeting plants like macademia and now our indigenous farmers are venturing into such because they have seen the benefits which they can derive, thus offering another opportunity over and above the opportunities presented by cereals (Extension officer).*

> *We as well need carbon point as is taking place in the international space. The carbon points may not be enough to cover the total cost of forest production, but they at least assure the farmer of some revenue before harvesting of woodlots, which comes in ten years.* ***(Bruce, Operations Director/Conservation and Extensions).***

A close look at the sentiments shared above demonstrates that there is limited incentives in venturing into afforestation. Generally, this may explain the limited uptake of afforestation as an on-farm economic activity in Mashonaland West Province in Zimbabwe. From the synthesis of respondent narratives, generally the majority felt that direct incentives may include cash incentives. Incentives can come in the form of carbon points which the farmer raises depending with the net contribution of their woodlot to carbon sequestering. Further farmers who turn part of their arable land into forests should as well get direct cash benefits from the government. This would encourage farmers to take afforestation as a sustainable land-use not only suitable for degraded land spaces.

Insights from the above sentiments reveal that, there should be some tangible incentives, if biodiversity conservation policy makers are to motivate farmers to take up afforestation as a sustainable, alternative land-use for economic development. Incentives given to farmers should be linked to reducing the burden of the initial outlay needed in setting up a new forest such as cost of seedling and land preparation cost. Concerns for incentives amongst afforestors have also been raised in literature. According to Nyikadzino (2016) and Gwaze and Marunda (2014) 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 (Lawson et al., 2014). In addition, the incentive structure should as well be crafted in a

way that farmers do not have to wait till harvesting for them to start reaping benefits from the forests, no wonder the global forum has initiated trade in carbon points.

9.9 Addressing land tenure system

Evidence from the study emphasises that some of the prerequisites for sustainable land management are 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. The problem of land ownership is one of the most serious problems in the history of forest lands (Beyene et al., 2019; Ullar et al., 2021).In the Zimbabwean context, evidence from study findings show that with expropriation, land became the property of the government. The compounding impact of insecure land tenure on farm investment can be aptly captured in the voice captured below:

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

A close analysis of sentiments presented above, farmers in Zimbabwe only have usufruct rights to land as they have no title deeds. It is generally 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. Secure tenure rights are a critical foundation for local economic development. However, despite importance of land ownership/land rights in spurring farm production, Zimbabwe land ownership after the Land Redistribution exercise remains unclear, prompting farmers to shy away from investing in long term projects or development. Devolving land rights to local communities and farmers means that investment in long-term projects suffers like afforestation; hence it is critical that institutional frameworks address the sticking point on land ownership. Pathways to 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).

10. Conclusions

A close analysis of the spectrum of the critical resources for successful afforestation zeros in on three challenges that are critical to optimizing uptake of afforestation. These are, in order of importance, security of land tenure or land rights, access to extension services and access to investment capital. Dealing with these three challenges is pivotal to meeting policy targets for adoption of afforestation as an alternative land use for economic development.

11. AREAS FOR FURTHER RESEARCH

Despite the perceived value of afforestation across the globe, the conversion of land from agriculture to remains low in most developing countries, Zimbabwe included.Zimbabwe has vast pieces of land with potential for afforestation initiatives which remain underutilised and untapped. The current study highlighted some of the current policy issues that militates against the rate of adoption of afforestation. The study was situated in Mashonaland West, there is need to do further studies on the same issue to have a holistic understanding of the challenges hindering afforestation in Zimbabwe. There is also need on how best these policy related strategies can be adopted to optimise the adoption of afforestation not only Zimbabwe but across developing countries.

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