

Modelling Sustainable Afforestation as an Alternative Land Use Option for Economic Development in Zimbabwe: A Review Paper

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ABSTRACT

Amidst the continued failure of agricultural production systems in meeting policy targets in developing countries, there has been a gradual paradigm shift towards afforestation. 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. 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, despite the growing significance of afforestation in the sustainable development discourse, little has been done to interrogate the significance of sustainable afforestation as an alternative land use option for economic development in developing countries. To date, a plethora of studies on afforestation have been done, however, none of the studies have sought to interrogate the significance of sustainable afforestation as an alternative land use option for economic development especially in developing countries such as Zimbabwe. Hence this paper establishes the significance of adopting afforestation as an alternative and sustainable land use option for economic development in Zimbabwe. This paper reviews and draws insights from extant literature to demonstrate that afforestation has become a significant vehicle for poverty alleviation especially in developing countries. Despite existing challenges on adoption of afforestation as a viable land use option such as lack of knowledge on economic benefits of afforestation, retrogressive cultural attitudes, institutional and capacity gaps, long period of maturity of afforestation a deterrent to most would-be farmers without secure land tenure among a host of others, evidence from extant literature highlight the significance of sustainable afforestation as an alternative land use option for economic development in developing countries like Zimbabwe. Sustainable afforestation has become a creator of employment, income generator, and a reliable source of income especially in drought prone areas and arid regions among other such benefits. Although the rate of uptake of afforestation remains low, the study isolated a number of strategies that can be adopted to model sustainable afforestation as an alternative land use option for economic development in Zimbabwe. The strategies include funding, education and training, research and development among others.

Key words: *Afforestation; sustainable; land use and economic development.*

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I. INTRODUCTION

Globally, there has been a growing appreciation of the potential of afforestation as an alternative and sustainable land use option for economic development (Minang et al., 2018; Dupraz et al., 2019). As a result, a number of countries across the globe have actively sought to promote afforestation as an alternative land use through policy intervention and support. However, despite this perceived value, in the context of afforestation, the conversion of land from agriculture to forest is unusual in most developing countries (Ryan, 2016). Zimbabwe has vast pieces of land with potential for afforestation initiatives which remain underutilised and untapped. Of intellectual curiosity in this paper was to interrogate the significance of sustainable afforestation as an alternative land use option for economic development in Zimbabwe.

BACKGROUND

Forests have always been an indispensable asset to most global societies since time immemorial (Ryan, 2016; Lovell et al., 2017). However, the economic value of supporting and regulating these services provided by

forests is not well-captured in the market and therefore always undervalued. Insights from extant literature highlight that afforestation is increasingly valued for its potential to enhance ecosystem services and is being actively promoted in many countries through state policy and support (Kanowski, 2010). However, despite this perceived value, in the context of overall forest cover, the conversion of land from agriculture to forest is unusual in the global context (Ryan, 2016).

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).

To date, although a plethora of studies on afforestation have been done, limited if any studies have sought to interrogate the significance of sustainable afforestation as an alternative land use option for economic development especially in developing countries such as Zimbabwe. 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. Hence this paper establishes the significance of adopting afforestation as an alternative and sustainable land use option for economic development in Zimbabwe.

PROBLEM STATEMENT

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 for economic development remains low (Wilson, 2016; Dupraz, 2019). Devoid of knowledge on the economic significance of afforestation, a limited number of farmers will be convinced of the economic value of adopting afforestation. Of concern is that a lot of land globally will remain either idle or underutilised.

RESEARCH OBJECTIVE

This paper seeks to establish the significance of adopting afforestation as an alternative and sustainable land use option for economic development in Zimbabwe.

II. LITERATURE REVIEW

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 Chazdon et al., 2016; Chimhowu, Manjengwa, & Feresu, 2010; Nyikadzino, 2016; CIFOR, 2014; Gwaze & Marunda, 2014).

However, despite this growing significance of forests across the globe, especially in developed countries (Food & Agriculture Organisation, 2015; Muralikrishna & Manickam, 2017), 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 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.

Afforestation programmes have been initiated in several regions as alternative land use for economic development. However, the success of existing institutions of management frameworks in afforestation have 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). However, despite these misgivings, evidence from the synthesis of extant literature highlights several benefits emanating from afforestation initiatives.

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). However, there are several limiting factors in the diffusion of agroforestry in developing countries (Sood & Mitchell, 2009; Jara-Rojas et al., 2020), with Pakistan being no exception (Khan et al., 2017; Mahmood & Zubair, 2020). Because of poor adoption strategies and high deforestation rates, rural communities are exposed to climate risks, including floods and droughts in the country (Mahmood et al., 2020; Ullah et al., 2021a).

Even in terms of research, the issue of afforestation as an alternative land use seem 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 de-forestation (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 which 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).

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 have 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 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 benefits 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 these challenges, evidence from various studies show that afforestation initiatives can provide impetus to economic development.

CENTRALITY OF AFFORESTATION IN 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 res, 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 plantation 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, 2018). Thus, it is threatening the establishment of not only plantation tree crops but also agricultural 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 the forest growth particularly in timber plantations. The former destroy 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 and if left without control this damage can to a great extent negatively impact on the viability of commercial timber (TPF, 2018b). In the plantations, emerging pests affecting eucalyptus trees include the bronze bug (*Thaumastocorisperigrinus*), Blue gum chalcid (*Leptocubeinvasa*) and Red gum lerp (*Glycospisbrimblecombey*) (TPF, 2018).

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 (Atel *et al.*, 2012; 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 Ryan, 2016; 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 (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 Gwaze & Marunda, 2014; Nyikadzino, 2016; Matsvange *et al.*, 2016; Matsvange *et al.*, 2016).

However, despite the continued failure of many of these afforestation initiatives (Eurostat, 2013; Ryan, 2016; 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 (Ryan, 2016; Lovell *et al.*, 2017; Tian *et al.*, Sohngen *et al.*, 2018; Dupraz *et al.*, 2019), however, none of the studies has seen it fit to interrogate the benefits of sustainable afforestation as an alternative land use option for economic development specifically in a developing economies like Zimbabwe.

In the context of overall forest cover, the conversion of land from agriculture to forest is unusual in the global context (Ryan, 2016). Despite the lure of financial incentivisation from afforestation (see 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 agriculture 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, 2015). As a result, afforestation programmes have continually failed and potential income from unproductive land has remained unrealised.

In Zimbabwe, many afforestation programmes 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 (Wilson, 2016; Ryan, 2016). As a result, this study interrogates the significance of sustainable afforestation as an alternative land use in order to support and encourage afforestation initiatives and the utilisation of underutilised and unproductive land in Zimbabwe.

III. METHODOLOGY

The literature review based paper adopted a qualitative critical 'content analysis' research technique to unravel the significance of adopting afforestation as an alternative and sustainable land use option for economic development. According to Utt and Short (2018) critical content analysis is an explicit method for the study of text that also offers flexibility in theoretical approach and textual selection. Bengtsson (2016) illuminates another angle of content analysis by arguing that its purpose is to organize and elicit meaning from the data collected and to draw realistic conclusions from it. The study made use of Google Scholar search for articles that

addressed the phenomenon under study. In order to get relevant articles on the internet, the researcher used the following study focus related search terms: 'afforestation', 'afforestation benefits', 'afforestation' and 'sustainable land use', 'incentives in afforestation initiatives' among a host varied but similar terms. Both classical and contemporary literature was made use of and a total of 30 articles were reviewed. This number is commensurate with content analysis (Nueundorf, 2016; Kripperndorff, 2018). The study made use of themes as units of analysis and the study results are based on this.

IV. RESULTS: INTERPRETATION AND SYNTHESIS

This paper reviewed and drew insights from extant literature to demonstrate that afforestation can be a significant vehicle for poverty alleviation especially in developing countries. Findings highlight that sustainable afforestation has become a creator of employment, income generator, and a reliable source of income especially in drought prone areas and arid regions among other such benefits. Although the rate of uptake of afforestation remains low due a number of challenges such as lack of knowledge on economic benefits of afforestation, retrogressive cultural attitudes, institutional and capacity gaps, long period of maturity of afforestation a deterrent to most would-be farmers without secure land tenure among a host of others, the study isolated a number of strategies that can be adopted to model sustainable afforestation as an alternative land use option for economic development in Zimbabwe.

BENEFITS OF AFFORESTATION

Afforestation is increasingly valued for its potential to enhance ecosystem services and is being actively promoted in many countries through state policy and support (Kanowski, 2010). Similar to many countries, Zimbabwe has sought to increase forest cover for some time (Nyikadzino, 2016; CIFOR, 2014; Gwaze & Marunda, 2014). However, 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). Such a lack of knowledge and apparent lack of economic value poses a challenge for determining land use allocation and modelling land use change.

1. Food security

Forests provide global food security and resources, food, fodder, fuel and medicine. Amidst the continued failure of agricultural production systems in meeting policy targets in developing countries, there has been a gradual paradigm shift towards afforestation. According to the World Bank (2004), forests provide direct support to 90 percent of the world's 1.2 billion poorest people and to nearly half of the 2.8 billion people who live on US\$2 or less per day (FAO, 2011; Angelsen & Wunder, 2003). However, the economic value of supporting and regulating these services provided by forests is not well-captured in the market and therefore always undervalued. As a result, afforestation uptake as an alternative land use land use for economic development remains low (Wilson, 2016; Dupraz, 2019).

2. An improved resource of tree biomass

This benefit is obvious — afforestation increases the amount of timber available for harvesting as a source of energy, paper, and lumber. In Canada, however, this is not such an important benefit, because we still have an extensive cover of forest. In more heavily deforested countries, however, the resource benefits are more substantial and important. Foresters can rather easily predict the rate at which stands will grow. Important variables affecting productivity and the length of the harvest rotation include site quality, climate, management practices, intervening disturbances, and the end-use of the biomass (the rotation length is relatively short for pulpwood, but is longer for sawlogs). These issues are examined in detail in many publications, including Stinson and Freedman (2001) and Freedman and Keith (1996).

3. Land reclamation

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 posits 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. Along with it creating a new forest solves the problem of grazing by providing the fodder facility to the cattle.

4. Creation of employment

Sustainable afforestation has become a significant source of employment and income, especially in developing countries. Afforestation can make a difference through job creation in poor rural areas with weak labor markets (Williams 2013). More and better jobs in afforestation will ensure increased employment opportunities, higher incomes and productivity, and safer and more stable working conditions. This, in turn, will contribute to improving the availability of and securing stable access to adequate and nutritious food and general economic

development. Employment is considered crucial for a household's economy because long-term employment opportunities are scarce in most developing countries.

5. Income generator

Sustainable afforestation has become a reliable source of income especially in drought prone areas and arid regions among other such benefits. However, despite these benefits, the rate of uptake of afforestation remains low.

SATRATEGIES TO PROMOTE AFFORESTATION

Although the rate of uptake of afforestation remains low, the study isolated a number of strategies that can be adopted to model sustainable afforestation as an alternative land use option for economic development in Zimbabwe. The strategies include funding, education and training, research and development among others.

V. DISCUSSION

The commercial timber industry is largely dominated by the 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 hard wood 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 in order 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 slash 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).

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 (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, 2014).

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, 1999).

Forest products are not only earmarked for the local market but are exported to the region and generate the much needed foreign currency in view of 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.

VI. CONCLUSION

A number of countries across the globe have actively sought to promote afforestation as an alternative land use through policy intervention and support. However, despite this perceived value, in the context of afforestation, 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.

IMPLICATIONS

- There is need to conduct periodic trainings of local communities in best practices in sustainable afforestation and knowledge on the afforestation plant species and the regions in they thrive (growing conditions).
- Fostering entrepreneurial skills –how to make money from afforestation initiatives.
- Resource allocation-especially Extension Officers to be engaged in Afforestation (same as in crop protection).
- Land Audits with the aim of identifying land portions that need land reclamation or ideal for afforestation initiatives.
- Shift in power structures where we need local leaders eg Village Heads in implementation plans.
- Targeting marginalized groups such as women, disabled and the youth in entrepreneurial afforestation initiatives.

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