ASSESSING LOCAL COMMUNITY'S PERCEPTIONS ON THE PLANTING OF INDIGENOUS TREE SPECIES: A CASE OF MUHEZA DISTRICT IN TANZANIA

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN NATURAL RESOURCE ASSESSMENT AND MANAGEMENT, DEPARTMENT OF GEOGRAPHY, TOURISM AND HOSPITALITY STUDIES

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2025

CERTIFICATION

The undersigned certify that he has read and hereby recommends for acceptance by the Open University of Tanzania a dissertation titled: ***Assessing the Local Community's Perceptions on the Planting of Indigenous Tree Species: The Case of Muheza District in Tanzania.*** In Partial Fulfillment of the Requirements for the Degree of Master of Arts in Natural Resource Assessment and Management of the Open University of Tanzania.

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(Supervisor)

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Date

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DECLARATION

I, **Emmanuel Richard Lyimo,** do hereby declare that, this dissertation is my own original work, and that it has not presented and will not be presented to any other University or Institution for a similar or any other degree award In Partial Fulfillment of the Requirements for the Degree of Master of Arts in Natural Resource Assessment and Management of the Open University of Tanzania.

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Date

DEDICATION

This work is dedicated to my beloved wife, Rehema Jasper Temba, and my children, Bryan Emmanuel, Brightness Emmanuel, and Baraka Emmanuel, for their unwavering moral support throughout my studies. I also dedicate it to my dear mother, Elizabeth Luhamu Mlay, and my cherished sister, Lilian Richard, who laid the foundation of my education.

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ABSTRACT

This study assessed local community perceptions on planting indigenous tree species in East Usambara Mountains, in Muheza District It focused on attitudes, land tenure influences, and tree planting trends over the past 30 years. Field surveys were conducted in four villages including Kwezitu, Msasa IBC, Kwemdimu, and Shambangeda. A simple random sampling technique was used to select 155 households, while purposive sampling was employed to identify participants for four Focus Group Discussions (FGDs) and seven Key Informant Interviews (KIIs). Open Data Kit (ODK) tools facilitated data collection. Data from the household surveys were analyzed using descriptive statistics in SPSS and Microsoft Excel. Whilee data gathered through KIIs and FGDs were analyzed using content analysis. The study revealed a predominant negative attitude toward planting indigenous trees, as 80% of households viewed them as naturally regenerating without human intervention. Additionally, 73% of respondents believed that secure land tenure, particularly through Certificates of Customary Right of Occupancy (CCROs), encourages indigenous tree planting, while land size ownership also influenced planting decisions. The study further highlighted a significant decline in indigenous tree planting over the past three decades. To address these challenges, the study recommends raising awareness, TFS to establish indigenous nurseries at nature reserves and distribute seedlings free to communities. The implementing policy reforms, enhancing land security, and conducting further research on community-preferred indigenous tree species.

Key Words: *Planting, Indigenous Tree, Local Communities, Perception and Attitudes.*

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LIST OF ABBREVIATIONS AND ACRONYMS

AFR	African Forest Landscape Restoration
CBFM	Community Based Forest Management
CCRO	Certificate of Customary Right of Occupancy
FGD	Focus Group Discussion
ICRAF	World agroforestry
ITS	Indigenous Tree Species
KAP	Knowledge, Attitude and Practice
KP	Kyoto protocol
MJUMITA	The Community Forest Conservation Network of Tanzania
NTFPs	Non-Timber Forest Products
ODK	Open Data Kit
OUT	Open University of Tanzania
PES	Payment for Ecosystem Service
REDD	Reducing Deforestation and Forest Degradation
SDGs	Sustainable Development Goals
SET	Social Exchange Theory
SPSS	Statistical Package for the Social Sciences
TFCG	Tanzania Forest Conservation Group
TFS	Tanzania Forest Services
URT	United Republic of Tanzania
VLUMC	Village Land Use Management Committee

VNRC	Village Natural Resource Committee
WWF	World wildlife Fund

CHAPTER ONE

INTRODUCTION

1.1 Background to the Research Problem

The local communities' perception on planting indigenous tree species holds a significant importance for the success of reforestation initiatives. These initiatives can achieve greater socio-economic, ecological, and cultural benefits, contributing significantly to the sustainability of landscapes and the well-being of people (Obiri *et al*., 2011; Xiao *et al*., 2022; Pataki *et al*., 2021; FAO, 2022). According to Uisso *et al*. (2018), positive community perceptions significantly influence their participation in a conservation initiative. For instance, positive perceptions on tree planting as a conservation initiative can correlate with higher levels of participation in such initiative. Understanding these perceptions is essential for developing appropriate agroforestry policies and tree management plans (Mayele, 2022). Therefore, community perceptions and active involvement are key considerations in tree planting initiatives (Akbar *et al.,* 2000, as cited in Obiri *et al.,* 2011).

Many countries have initiated tree-planting initiatives; most have faltered due to insufficient community commitment. Communities with a deeper understanding of the benefits of trees are more likely to participate in tree planting programs, dedicating larger acreages of land compared to those with limited information (Obiri *et al.,* 2011; Kinuthia *et al.,* 2011). Additionally, the financial benefits from trees could also be a significant motivator for community participation in tree planting and management (Kinuthia *et al.,* 2011).

In recent years, tree planting commitments have been on the rise, particularly within the private sector for carbon offset purposes (WWF, 2020). Globally, the practice of tree planting has been influenced by the values local communities attributed to it. For example, in Costa Rica, there is a particular interest in planting tree species that provide timber, fruits, and serve as wildlife habitat (Chamayou, 2011). Further, in Britain, the people were found to be motivated to plant trees due to belief in their ecological functions, along with provision of shade, health benefits, and aiding in climate change mitigation and adaptation (Moffat *et al.,* 2024; Donovan, 2017).

According to Fleming *et al.* (2019), tree planting in Australia is viewed as having significant economic value, with the potential to become a paid service in the future. While some farmers feel rewarded by contributing to the social good, others believe that financial incentives would encourage more tree planting. This financial recognition could also help the broader community appreciate the long-term benefits of trees on a landscape scale (Fleming *et al.,* 2019).

In Vietnam, communities perceive planting indigenous trees as providing economic and environmental benefits, but households are often unwilling to undertake such efforts due to a lack of information (Rizzetti *et al.,* 2018 cited by McElwee *et al.,* 2021). McElwee *et al.* (2021), demonstrated that gender impacts tree planting, with women showing more interest, often focusing on multifunctional agroforestry, food security, and fuelwood production, while men are more interested in income opportunities.

Moreover, according to Mohamad *et al.* (2015), the Feed the Future report indicated that local communities in Ethiopia show a positive attitude towards integrating trees into their farm plots, mainly due to the benefits that these on-farm trees provide to sustain their livelihoods. However, a lack of motivation and information about legal issues hinders the community from growing indigenous trees on their farms (Mohamad *et al.*, 2015).

In Zimbabwe, the community perceives natural trees as having a spiritual connection (Chanza *et al.,* 2021). This perspective fosters a deep reverence and sense of stewardship, making it unthinkable to harm these "relatives" (Chanza *et al.,* 2021).

Further research sheds light on factors influencing community participation in tree planting and management. For instance, in South Sudan, literacy rates, engagement in extension education, social interactions, and attitudes towards participatory initiatives positively correlate with villagers' motivation levels (Rehman *et al.,* 2017, as cited in Mayele *et al.,* 2022).

In a study conducted in Kenya by Oeba *et al.* (2012), various determinants of tree retention were identified, including land size, age, education level, monthly income, tree management practices, access to extension services, availability of markets, regulations (policies and acts) on harvesting, and aesthetic and environmental motivations. Additionally, proximity to forests emerged as a factor inhibiting community participation in tree planting, as easier access to forest products reduced incentives for planting trees. The enforcement of forest regulations influenced farmers to retain trees on their farms (Oeba *et al.,* 2012).

In Tanzania, local communities are among the key stakeholders in forest management and conservation, especially in restoration initiatives. They have been involved in tree planting and protection (URT, 2022; Gayo, 2023). This engagement fosters a sense of ownership and strengthens their commitment to environmental management and conservation thereby boosting tree planting efforts (Roman *et al.,* 2015; Gayo, 2023). Communities are motivated to plant trees on their own and village lands to improve access to fuelwood (Doggart *et al.,* 2020), timber and non-timber forest products (NTFPs) such as fruits, bee products, mushrooms, gums and resins, spices, and traditional medicines (leaves, roots and barks) (URT, 2022; Gayo, 2023).

Moreover, the National Forest Policy of 1998, recognises the role of indigenous tree species in forest conservation emphasising safeguarding indigenous forests via PFM particularly community-based forest management plans and tree planting programs (URT, 1998). However, the Tanzanian forest sector has primarily emphasized tree planting as a substitute for natural forests in wood fuel biomass production, setting ambitious goals for the expansion of tree plantations (Doggart *et al.,*2020).

However, the effective implementation of these restoration/ conservation initiatives hinges on the community's tree planting behaviour (Kulindwa and Ahlgren, 2021). Forest conservationists acknowledge the significance of understanding community perceptions towards such initiatives. Gaining a deeper insight into these perceptions is vital for bolstering community participation in tree planting endeavours (Kulindwa and Ahlgren, 2021).

Against this background, understanding the local community's perceptions of the planting of indigenous tree species in Tanzania is crucial. This knowledge is necessary for shaping policies, strategies, land tenure, tree tenure, plans and practices on restoration initiatives particularly indigenous tree planting in Tanzania and other areas with similar context.

1.2 Statement of the Problem

Local community perceptions on planting trees have emerged as a prime issue in socio-ecological debates. Since, the local community perceptions are crucial for designing effective management and conservation initiatives (Beatrice *et al.,* 2011), The local communities have shown a strong preference for exotic trees over indigenous tree species, believing the former to be fast-growing and thus providing immediate benefits (Szantoi *et al.,* 2012). In Tanzania, this preference has led to the transformation of landscapes in many parts of the country particularly in Iringa, Morogoro, Kilimanjaro and Tanga including Muheza District.

Thus, this study seeks to address this gap by assessing local community's perceptions on the planting of indigenous tree species. This will enhance community knowledge, improve policy frameworks, address land tenure challenges, and promote sustainable practices in indigenous tree planting in the East Usambara Mountains. Landscape in Northern Eastern Tanzania with a focus on Muheza District Council. Moreover, this study aligns with the international agreements such as the Kyoto Protocol (KP) which support both exotic and indigenous tree species planting. The KP encourages afforestation (planting trees on land that has not been forested for a certain period) and reforestation (replanting trees on previously

forested land) as the eligible sink in the Clean Development Mechanism (Bäckstrand *et al.,* 2006). Furthermore, the Tanzania Climate Change Strategies (2021) aim to plant 2 million trees annually, including both indigenous and exotic species, which is partially supported by this study (URT, 2021).

1.3 Research Objectives

1.3.1 General Objective

The main objective of this study is to assess community's perception on planting indigenous tree species to enhance environmental management and conservation.

1.3.2 Specific Objectives

Specific objectives are:

1. To explore the community's attitudes about indigenous tree species in the study area.
2. To examine forms of land tenure which favour the planting of indigenous tree species practice in the study area.
3. To determine the trend of indigenous tree species planting over the past 30 years in study area.

1.3.3 Research Questions

Specific research questions are:

1. What are the community's attitudes towards indigenous tree species in the study area?

2. How does land tenure influence the practice of planting indigenous tree species?

3. What has been the trend of indigenous tree species planting over the last 30 years in the study area?

1.3.4 Significance of the Study

This study is crucial as it seeks to address the issue of preferences for the planting of exotic tree species over indigenous ones in Tanzania (WWF, 2019). The study's policy implications are significant aligning with the need for knowledge about indigenous trees as outlined in the National Forest Policy Implementation Strategy (2021-2031) (URT, 2021). The study also aligns with Tanzania's Third National Five-Year Development Plan (2021/22 - 2025/26) focusing on mitigation, adaptation, building resilience to climate change, and improving wellbeing and livelihoods. Furthermore, the Tanzania Climate Change Strategies (2021) aim to plant 2 million trees annually, including both indigenous and exotic species, a goal that this study partly supports. The study aims to generate timely information on the community's perceptions and attitudes towards indigenous tree planting and exploration of the influence of land tenure and forest policies on indigenous tree planting and conservation opportunities and challenges thereby contributing significantly to addressing the Sustainable Development Goals (SDGs), particularly SDG 13: Climate Action and SDG 15: Life on Land.

Additionally, this study contributes to Africa's commitment towards the Bonn Challenge and AFR 100 aiming to restore 100 million hectares of loss of natural forest and degraded farmlands with Tanzania pledged to restore about 5.2 million

hectares. Moreover, the study will support international efforts like Kyoto Agreement and REDD+, particularly by promoting reforestation and afforestation efforts through the planting of indigenous tree species (Blomley *et al.,* 2017).

1.3.5 Scope of the Study

This study aims to explore the community's perception regarding the planting of indigenous tree species, with a primary focus on enhancing their management and conservation efforts. Additionally, it seeks to evaluate the impact of land tenure policies and forest regulations on the promotion and sustainability of indigenous tree planting initiatives. Key areas of investigation include assessing the perception, attitudes, and practices of community members towards indigenous tree planting. Furthermore, the study analysed existing policies and regulations pertaining to land tenure and forest management, examining their influence on supporting indigenous tree planting endeavours. It was conducted in three selected villages within the Muheza district, focusing on farmers actively engaged in tree planting activities, encompassing both woodlots, farm boundary and agroforestry practices.

1.3.6 Limitation of the Study

The study faced challenges related to poor infrastructure and road conditions when accessing the villages. Although only one village had a particularly rough road, the researcher used a four-wheel-drive vehicle to mitigate limitation. Another challenge was that the selected households were scattered across sub-villages, so the researcher employed three enumerators to cover the sub-villages and reach the dispersed households effectively.

1.3.7 Organization of Dissertation

This dissertation is organized into five chapters. Chapter One presents the study by providing background information, a statement of the research problem, research objectives, and research questions. It also discusses the significance and limitations of the study. Additionally, the dissertation offers an overview of the literature review, which is presented in Chapter Two, including definitions of key concepts, the theoretical framework, an empirical review, the conceptual framework, and identification of the research gap. Chapter Three outlines the research methodology used in the study, covering the introduction, research design, study area, population, sample size and sampling frame, sampling techniques, data collection methods, and data analysis procedures. Chapter Four presents the research findings, results, and discussion, and Chapter Five provides the study conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

The purpose of this chapter is to lay the foundation for the researcher's understanding and inquiry mind to conduct the study. It describes what other researchers have found about the perception of tree planting and conservation of natural forests. The chapter begins by providing definitions of key terms and a theoretical review of the study. Then it digs into an empirical literature review of the study and ends by providing a conceptual framework that guided the study.

2.2 Conceptualization of Key Concepts

Conceptualization of key concepts is a vital part of any research as it ensures a clear and shared understanding of the terms used in the study. In this subsection, several key concepts are defined, including community, native / indigenous tree species, perception, attitude, and knowledge.

2.2.1 Community

According to Scherzer *et al.,* (2020) community defined as a group of people who live in a specific area, share common values, and interact regularly to achieve common goals and address common problems. Beyerl *et al.,* (2016) and Uisso *et al.,* (2021) view a community as a collection of individuals or group(s) of people who live in a particular locality and have diverse interests, attitudes and perceptions. In this study, community is a collection of individuals or group (s) of people who live in specific geographical area, have multiple interest, attitudes and perceptions, and interact r to achieve common goals and address common problems.

2.2.2 Perception

The concept of perceptions refers to the process by which individuals or group (s) of people understand or gain experience associated with a certain object, phenomenon or environment through the five senses (seeing, tasting, hearing, touching and smelling) (Beyerl *et al.,* 2016). Furthermore, perception is the process through which individuals assess a particular object or phenomenon by seeing, integrating, and evaluating physical and social objects as something good or bad (McDonald, 2011). Thus, an individual may have positive or negative perception about that particular object or phenomenon. Moreover, perception involves human thinking about a certain phenomenon (Apprianto, 2017). The process of perception may be influenced by various factors such as feelings, needs, motivations, educational background, and experience (Apprianto, 2017). Loomis and Philbeck, (2008) also noted that perceptions could be influenced by people's abilities which include intentional, intellectual or physical modalities and these are considered to affect decision-making about what people perceive.

In this study, perception refers to the process by which individuals or group(s) of people acquire information, analyze and interpret a phenomenon or environment, transform it into a meaningful experience or understanding of that phenomenon or environment. Therefore, in this context, the concept of "community perception" refers to combination of individual or group(s) experiences into a collective actions, experience or belief (Beyerl *et al.,* 2016). Local community perceptions entail the combination of individual or group(s) experiences into a collective actions, experience or belief within a certain geographical area.

2.2.3 Knowledge

The term knowledge refers to the understanding or awareness of a particular object or phenomenon (Nguyen *et al.,* 2019; Andrade *et al.*, 2020). It is a conscious and non-symbolic perception of meaning (Andrade *et al.*, 2020). O'Dell and Grayson (1998) define knowledge as information in action, highlighting its dynamic nature and emphasizing the active utilization and application of information. According to Hulme, (2018) there are four aspects in which knowledge can be manifested (i) scientific and social scientific knowledge (ii) local knowledge (iii) tacit knowledge; and (iv) self-reflective knowledge. Moreover, Islam *et al.,* (2013) noted that knowledge builds people's positive attitudes and values of conservation. This study considers knowledge as the level of awareness or understanding of a particular issue, specifically, what is known by local communities about indigenous tree planting.

2.2.4 Attitude

Dawson (1992) and Nguyen *et al.,* (2019) define attitude in social psychology as a predisposition toward or against a particular phenomenon, individual, or object. This definition highlights two fundamental aspects of attitudes: their bipolar nature, which allows them to encompass both positive and negative sentiments, and their capacity to range from favourable to unfavourable. In addition, attitude is considered to be a way of being, it refers to the positive or negative feelings and perceptions of people about a certain phenomenon (Sophat *et al.*, 2019; Andrade *et al.*, 2020). This study adopts the former definition and posits that the community in the study area may have either positive or negative attitudes toward indigenous tree planting.

2.2.5 Practice

Practice is the observable response of individuals to a situation, reflecting how they demonstrate their knowledge and attitudes through their actions and behaviour (Sophat *et al*., 2019; Andrade *et al*., 2020). Based on the idea of Uisso *et al.* (2022), knowledge can influence attitude which in turn can affect management and conservation actions. In this context, both knowledge and attitudes can influence tree planting trends and practices (tree planting actions). This means that in order to engage in practice, both knowledge and attitude must be present. Thus, in this study, practices are defined as tree planting actions undertaken by individuals or the community because of their knowledge and attitudes.

2.2.6 Indigenous Trees

According to URT (2019), as noted above indigenous tree species or native tree species are those tree species that have evolved naturally in a given area, without intentional or accidental human intervention s from that area. Furthermore, indigenous tree species include the original flora found in a specific region or those that naturally thrive in forest ecosystems, sometimes being transplanted onto agricultural lands (Wawira, 2016). The conservation of indigenous tree species involves purposeful actions by local communities to protect these species for their contributions to biodiversity, aesthetic appeal, and economic benefits (Wawira, 2016). Thus, in this study as defined earlier, indigenous tree species refers to those tree species that naturally occur in a particular area and which the community plants, manages, conserves and utilizes for their livelihood.

2.2.7 Local Community Perception

Local Community perception refers to the attitudes and beliefs held by members of a local community or group of essential interest toward a particular issue or topic (Castillo *et.al.,* 2016). In this case, local community perception can be described as the knowledge and awareness within the community to interpret conditions and problems. Thus, the local people may have positive or negative perception of that particular topic or phenomenon.

2.3 Theoretical Framework of the Study

This study employed Social Exchange Theory (Emerson, 1976) and the Knowledge, Attitude, and Practices (KAP) model (Nguyen *et al.,* 2019) to guide the assessment of the community's perceived knowledge, attitudes, and practices. These theories were essential to the study: Social Exchange Theory was used to evaluate how motivation and cost-benefit considerations influenced community perceptions of planting indigenous trees, while, the KAP model assessed the community's attitudes and practices regarding this activity.

2.3.1 Social Exchange Theory (SET)

The Social exchange theory, which has emerged as a fundamental theoretical perspective in the domain of social psychology, traces its origins to the late 1950s (Emerson, 1976). It has since evolved into a significant area of research on social behaviour (Davlembayeva *et al.,* 2023). Initially conceptualized by George Homans, a prominent sociologist, the theory was introduced in his essay "Social Behaviour as Exchange" in 1958. The theory suggests that a relationship between two people is

created through a process of cost-benefit analysis (Chomba *et al*., 2019). For example, individuals are more likely to appreciate or have a positive attitude toward indigenous tree planting if they benefit from it. In other words, individuals/people are more likely to endorse tree planting initiatives and actively participate in their management and conservation practices when they perceive direct benefits from such activities.

Further, Blau (1964, p. 91), as cited by Cook (2006), defines social exchange as the voluntary actions undertaken by individuals, or group (s), driven by the anticipated benefits they expect to receive and typically do receive from others. In the context of planting and conserving indigenous tree species, community involvement and sustained efforts will be realized when individuals are voluntarily engaged, motivated, and perceive tangible benefits, whether economic, cultural, or traditional.

Moreover, in social exchanges, akin to economic transactions, individuals pursue gains and are unsettled when there's a lack of fairness in the exchange, or when others receive greater rewards for the same investment of resources (Redmond, 2015). Thus, in the case of the relationship between people and tree planting when there would be inequality in terms of the benefits pursued from tree planting activities it is likely to negatively affect the activity.

In addition, the theory is founded on four primary assumptions/principles. Firstly, humans are fundamentally motivated to pursue rewards and avoid punishments (conducting cost-benefit analysis while also comparing alternatives). This assumption comes from how it loosely applied economics to human decision-making

(Blau, 2017). Secondly, individuals initiate interactions to maximize benefits while minimizing costs (the minimax principle), driven by the fundamental question of "what's in it for me?" this reflects a belief that people are generally motivated by their self-interest, regardless of the decision. Thirdly, before engaging in any interaction, individuals typically engage in a rational calculation of the potential profit and cost involved (the value of costs and rewards is highly subjective (Blau, 2017). Finally, the theory posits that individuals acknowledge the variability of this "payoff," both between different individuals and within the same individual over time. Based on this theory, the study was guided by assumption number one and two which guided the specific objective three namely assessment of the trend of indigenous tree planting over time in study area.

One major strength of the theory that considers the comparison level of alternatives to be a significant factor in maintaining commitment in relationships (Sprecher, 2001). The theory has been applied in social relationship such as marriage and friendship among couples. Uisso *et al.,* 2022 also used the social exchange theory to assess the relationships of a conservation initiative and people/community. However, a notable weakness of the theory is that it fails to account for cultural context and variations across cultures. This means that the theory is based on a rewards concept.

2.3.2 Knowledge, Attitude and Practice Model

The Knowledge, Attitude and Practices (KAP) model is another framework used to examine the local community's perceptions of knowledge, attitudes, and practices regarding indigenous tree knowledge, values, planting and conservation. (Nguyen *et al.,* 2019). Both the KAP model and Social Exchange Theory are frameworks that

help understand human behaviour and interactions. The KAP model specifically analyses the relationships between knowledge, attitudes, and behaviours (practices) within a given context, exploring how knowledge and attitudes influence behaviours and vice versa. On the other hand, SET, focuses on the dynamics of social relationships emphasizing the exchange of resources, such as rewards, costs, and outcomes, between individuals or groups. Hence, the KAP model guided objectives one and two of this study which focused on knowledge, attitudes and practice.

The KAP model is designed to assess knowledge, attitudes and practices regarding a particular phenomenon or aspect (Nguyen *et al.,* 2019), in this context, indigenous tree planting phenomenon. It provides a framework for thinking about community perceptions in terms of these three elements. The merit of using the KAP model is that it helps to identify knowledge gaps, barriers related to attitudes, and patterns of practice. This understanding can inform actions related to a particular issue such as indigenous tree planting (Ali *et al.,* 2020). The model also highlights the knowledge-practice relationship, Hungerford and Volk (1990) suggested that knowledge and skills are essential for behavioural change (practices). Regarding the relationship between attitudes and practices, Ajzen (1991) proposed that individuals with positive attitudes are more likely to have strong motivation and intention to act on the issue. Finally, Islam et al., (2013) emphasized that knowledge promotes positive attitudes and values related to conservation. Overall, the KAP model is an effective tool for understanding community perceptions and behaviour patterns offering insights into how to encourage positive attitudes and practices towards indigenous tree planting and conservation.

2.4 Empirical Literature Review

2.4.1 Community's Attitude about Indigenous Tree Species

Globally, several studies including perception, knowledge and attitudes of the communities towards the benefits and uses of tree species have been conducted. A study by Ibrahim *et al.* (2022), on the determinants and perceptions of farmers towards tree planting in Ethiopia revealed that socio-economic factors such as age, educational status, wealth status, and issues related to tree seedling survival rates had a significant effect on tree planting. Additionally, household energy sources, access to tree seedling, and tree management challenges ha significantly influenced farmer's perceptions of tree planting.

In Sudan, Mayele (2022) noted that the sustainability of tree planting requires the direct integration of people's knowledge, attitudes and perceptions. The study further highlighted those farmers view tree planting as a multifaceted opportunity, encompassing income generation, access to cooking energy, construction materials, soil fertility preservation, as well as provision of fruits, medicine, food, and erosion control. Another study by Kobbail (2011) in Sudan, established that the majority of people perceive trees as valuable and useful resources, with the community identifying numerous uses for trees that are integral to their daily lives. This high level of awareness underscores the significance of trees in their environment and implies a strong dependence on these resources. Furthermore, the study revealed that the extent of people's reliance on specific tree species correlates with their awareness of those species. Additionally, research by Almas *et al.* (2017) in southern Ontario

municipalities indicated that knowledge levels are significantly associated with length of residency and experience in tree planting.

In Kenya and Ghana studies by Kinuthia *et al.* (2011) and Obiri (2014), respectively highlighted that local communities with a better understanding of tree benefits are more likely to participate in tree planting initiatives, allocating more land to such endeavours compared to those with inadequate information. Financial benefits from trees also serve as significant motivating factors for participation in tree planting programs (Kinuthia *et al.,* 2011; Obiri, 2014). Conversely, lack of interest in tree planting poses a significant constraint to participation in Ghana (Obiri, 2014). Education also plays a pivotal role in fostering environmental conservation practices such as tree planting (Oeba, 2012). Farmers with secondary school and post-secondary education qualifications are more likely to engage in tree planting and retention on their farms (Oeba, 2012).

In Sudan, communities that are aware of productive and protective role of trees in the environment tend to develop positive attitudes toward the tree planting (Kobbail, 2011). Additionally, Tadesse (2019) reveals that farmers in Ethiopia exhibit positive attitudes towards planting, growing, and managing trees in agroforestry systems, influenced by various socioeconomic factors. However, concerns have been raised regarding certain species such as eucalyptus (exotic species), which farmers perceive to have adverse effects on food crops, soils, and water. Conversely, indigenous species such as *Acacia abyssinica, Croton macrostachyus,* and *Sesbania sesban* are believed to have beneficial effects on food crops, soils, and water resources (Tadesse, 2019).

In Ethiopia, Kenin *et al.,* (2021) indicate a preference among farmers for indigenous trees due to their agricultural and ecological values. However, due to land scarcity and lack of seedlings or knowledge on seedling preparation, many farmers prioritize the planting of exotic trees. Similarly, in Uganda, farmers express positive sentiments towards planting indigenous fruit trees provided suitable plant materials are available (Obua, 2010).

According to a study in Cameroon, Foundjem-Tita et *al.,* (2014) found that farmers are aware of the regulation of controlling indigenous trees which is part of traditional farming practices.

The Tanzanian government introduced a tree-planting campaign strategy in the 1970s, promoting both exotic such as *Eucalyptus* and *Pinus*, known for their fast growth and commercial value, and indigenous species, which were better adapted to local ecosystems and cultural values (Nduwamungu *et al.,* 2008). However, despite these efforts to encourage on-farm tree planting, regulatory restrictions remain a significant barrier. As noted by Kulindwa *et al.* (2021), individuals engaged in tree planting often face limitations similar to those imposed on natural forests, including restrictions on harvesting and transporting tree products like charcoal. This regulatory environment undermines the incentive for farmers to invest in tree planting, despite national efforts to promote it.

Kulindwa (2016) notes that households with better knowledge about the short and long-term benefits of tree planting and favourable government policies are more likely to engage in tree planting activities in Tanzania. Moreover, factors such as

land size, age, education level, annual income and sex influences tree planting practices in the country (Kulindwa, 2016).

Moreover, several forest management and conservation initiatives have been implemented nationwide (Malimbwi and Zahabu, 2008; Kulindwa and Ahlgren, 2021; Gayo, 2023). These include National Tree Planting Campaigns, Forest Landscape Restoration Initiative, Climate Smart Forest, Participatory Forest Management (PFM) and Reducing Emission from Deforestation and forest Degradation (REDD+) (Blomley *et al.,* 2017; Mansourian and Berrahmouni, 2021; Gayo, 2023). These initiatives have placed strong emphasis on tree planting within community lands through enrichment planting, plantation establishment, agroforestry and woodlots (Gayo, 2023).

2.4.2 Forms of Land Tenure in favour of Planting Indigenous Tree Species

Ashraf *et al.,* (2015), highlighted that factor such as land size, supportive policies, and regulations, particularly those promoting tree planting, exert a positive influence on local households' propensity to plant indigenous trees. Traditional indigenous property rights have been identified as providing sufficient tenure security to encourage tree-planting efforts (Foundjem *et al.,* 2021). Furthermore, granting farmers recognition of their tenure rights over land and trees can significantly enhance incentives for tree planting (Foundjem *et al.,* 2021). The implementation of strengthened policies and acts, such as the Forest, land Acts and Agriculture Acts, has triggered a notable grassroots movement aimed at augmenting tree planting endeavours and alleviating pressure on existing natural forests (Ashraf, 2015).

Globally, there are policies which encourage and discourage planting indigenous trees in individual farms. For instance, India's forest policy of 1988 incentivizes communities to establish woodlots and plant trees on individual farms. While in Cameroon, trees planted on land without a title deed belong to the state. Additionally, all naturally growing trees are considered state property, even if they grow on individual farms (Foundjem *et al.,* 2012: 2014). So, the campaign of planting indigenous tree can be successful if the government address land tenure issues (GYAU, 2012; Foundjem *et al.,* 2012: 2014). For the case of Kenya country, the agriculture and forest policy support farmers to plant and manage natural forest in individual farms and encourage and support farmers to sustainably manage natural and riverine forests (Wawira 2010). The Kenyan Forest Act also recognized importance of involve local communities in the management of natural/indigenous forests (Wawira 2010).

Moreover, various research underscores the impact of income, access to the market and local support incentives on households' tree planting behaviours (Kulindwa 2016; Etongo *et al.,* 2015). Additionally, the size and volume gain of trees emerge as pivotal motivators for households to engage in tree planting, driven by the diverse utility's trees offer (Kulindwa 2016). Also, according to Valette et al.,2020; Urzedo 2022 and Kalinganire *et al.,* 2022 involving the community in seed collection and free inputs like nursery materials, cutlasses and free supply of seedlings played a significant role in indigenous tree planting and support local livelihoods.

Same as Tanzanian Policy of 1998 gives the incentives to farmland trees that farmers will be entitled to owner rights of indigenous species including reserved species and

not only planted exotic ones. Also, the market is the key factors influence community engage in indigenous tress, for example *Allan blackia (msambu)* has well market and institutional. It is managed well by the farmers and from the institution that use it as a resource. This is the only tree product that has a well market arrangement from an institution (Fadhili *et al.,* 2013).

However, although indigenous trees provide valuable services to communities, their population is in decline due to various challenges in farmland. Contributing factors include the encroachment of exotic tree species, insecurity in land and tree tenure, a shift towards market-driven monocropping practices, the limited size of individual land holdings, and the spread of invasive alien species (Lemoma 2021). Land and tree tenure insecurity, along with legal restrictions imposed by the government to prevent the harvesting, cutting and selling of tree products, may also discourage people from planting trees on farmland (Lemoma, 2021). Without secure land title, investing in trees that take a long time to yield benefits is deemed pointless. The size of farm household landholdings is also the most important factor influencing the diversity and planting of tree species in farmlands (Legesse and Negash, 2021). Additionally, indigenous trees have been denigrated by the pejorative triple phrases, namely "difficult to propagate", "difficult to cultivate", and "slow growing" (Nagesh 2021 and Kalinganire *et al.,* 2022). Additional poor extension service, and general lack of interest in tree planting were other important constraints affecting people's planting indigenous trees (Kalinganire *et al.,* 2022). For example, Sahelian countries, including Burkina Faso, Mali, Niger and Senegal, most tree planting initiatives focus on fast-growing exotics such as acacias (*accasia species),* casuarinas (*Casuarina*

equisetifolia), eucalypts (*Eucalyptus spp*), neem (*Azadirachta indica*), senna (*Senna siamea*), and white teak (*Gmelina arborea*) which are known to yield quick economic returns to farmers/growers from the sale of wood (timber, firewood and construction poles (Kalinganire *et al.,* 2022).

In Kenya, prominent constraints include drought, pest and disease attacks, theft and destruction of trees, the cost of buying seedlings, inadequate land size, and competition for land use (Gachie *et al.,* 2020; Kaudo *et al.,* 2022). Tanzania faces similar challenges, as noted by Maghembe *et al.,* (1998), where farmers fear competition between trees and agricultural crops. Additionally, Meshack (2004) emphasized the slow growth and unpredictable survival of indigenous tree seedlings.

2.4.3 Trend of Indigenous Tree Planting

People engage in planting indigenous tree species within woodlots and agroforestry systems to meet various needs, including food provision, charcoal production, timber harvesting, construction materials for housing, fuelwood, and agricultural implements (Robi & Edris, 2017 as cited in Gemechu, 2021). The cultivation of indigenous trees across degraded landscapes is vital for enhancing agricultural productivity and fostering biodiversity development. Additionally, it plays a crucial role in maintaining water quality and quantity, while also ensuring food security (Negash, 2021).

In Asian countries like the Philippines, the integration of trees planted into annual crops, such as fruit trees and native timber trees, holds economic and ecological significance (Mongabay, 2021). Similarly, countries like Cambodia, Vietnam, Sri

Lanka, and Southern China are actively planting native tree species to address climate change issues and promote biodiversity, watershed rehabilitation, slope stabilization, and urban beautification efforts (Mongabay, 2021).

African nations, through initiatives like African Forest Landscape Restoration Initiative (AFR-100) AFR100, have voluntarily committed to restoring at least 100 million hectares of land by 2030 as part of their contribution to the Bonn Challenge. This global initiative aims to restore 100 million hectares of land by 2020 and 350 million hectares by 2030 (BGCI, 2013; Mansourian and Berrahmouni, 2021). The management practices of indigenous tree species in African countries vary across different land use types within agricultural landscapes. For instance, in Ethiopia, trees retained or planted in croplands are those believed to enhance soil fertility without competing with crops (Gemechu, 2017). Furthermore, fast-growing indigenous species are increasingly being integrated into traditional land-use practices, particularly for pole and construction wood, thereby encouraging farmers to maintain scattered tree species on their crop fields (Lelamo, 2021).

In Uganda, indigenous trees are predominantly planted in boundary and home gardens for their fruits, shade, and medicinal purposes (Graham et al., 2022). However, it is noteworthy that a significant portion of current tree planting efforts in Africa utilize non-native species, which offer limited benefits. In East Africa, Eucalyptus is the most commonly planted genus, followed by Cupressus and Pinus (BGCI, 2013).

Tanzania like other countries, local communities are among the key stakeholders that have been involved in tree planting (Gao, 2023: Persha *et al.,* 2016). The indigenous trees are integrated into the agroforestry system. The most common native tree species planted are *Albizia schimperiana, Maragarita riadiscoidea, Cordia africana (abyssinica), Ficus Vallis-Choudae, Croton macrostachyus/megalocarpus, Olea capensis, Markhamia lutea,* and *Telfairiapedata*. The most common non-native tree species are Syzygium *aromaticum* and *Cinnamomum zeylanicum* (dominant in Mixed spices agroforestry) and *Grevillea robusta, Persea americana, Psidium guajava, Mangifera indica* and *Eucalyptus*spp (Kimaro *et al.,*2023). Moreover, the East Usambara Mountains have an extremely abundant and highly endemic flora and fauna of global importance. These include timber species such as *Ocotea usambarensis, Miliciaexcelsa, Khaya nyasica and Newtonia buchanii,* as well as *Cephalosphaera usambarensis*, which is used in plywood manufacture. As well as producing valuable timber, a multitude of other forest products are available including firewood, building poles, domestic utensils, medicinal plants, edible fruits, edible fat and dyes (Kimaro *et al.,*2023).

2.4 Research Gap

Many studies such as knowledge of community on indigenous tree species and tree planting in combating deforestation have been conducted across different regions, utilizing various research methods. However, some key issues remain unaddressed, particularly concerning local communities' perceptions of indigenous tree planting and the influence of land tenure on these practices. In Tanzania, various studies have underscored the significance of tree planting in combating deforestation. However,

these studies, exemplified by Meshack (2004), Maghembe (1998), and Nduwamungu (2008), have largely overlooked the perception, attitude, and practice concerning multiple indigenous tree species. For instance, Meshack (2004) solely focused on one indigenous knowledge of *Allanblackia stuhlmannii (Msambu),* while Kulindwa (2021) empirical investigations centered on the impact of wood fuel consumption on forests, neglecting insights into local communities' perception, attitude, and practices regarding indigenous tree planting. Notably, these studies did not adopt the Knowledge, Attitude, and Practice (KAP) approach. Given this gap, it is imperative to explore and ascertain the perception, knowledge, and attitude of local communities regarding the planting of indigenous tree pecies.

2.4.4 Conceptual Framework

The conceptual model applied examines the multifaceted factors influencing local communities' decisions regarding indigenous tree planting and elucidates the intricate relationship with their perceptions of local communities. The perception of indigenous tree planting is shaped by various factors, including knowledge, attitude and regulatory frameworks (land tenure and forest policy).

The household knowledge and skills in indigenous tree planting, play pivotal roles in shaping local communities' perceptions and attitudes towards indigenous tree planting. The farmer with higher levels of knowledge and skills in tree planting, household with larger land sizes and greater wealth, may exhibit more favourable perceptions towards indigenous tree planting due to their ability to recognize its potential benefits and integrate it into their livelihood strategies.

Additionally, regulatory frameworks and policies governing land and tree property rights significantly influence farmers' perceptions of indigenous tree planting. Clear and secure land tenure arrangements, along with supportive policies promoting the sustainable management and utilization of indigenous tree species, can enhance farmers' confidence and willingness to engage in tree planting activities. Conversely, ambiguous or insecure property rights may deter farmers from investing time and resources in indigenous tree planting due to concerns over land tenure disputes or lack of incentives for long-term stewardship (Figure 2.1).
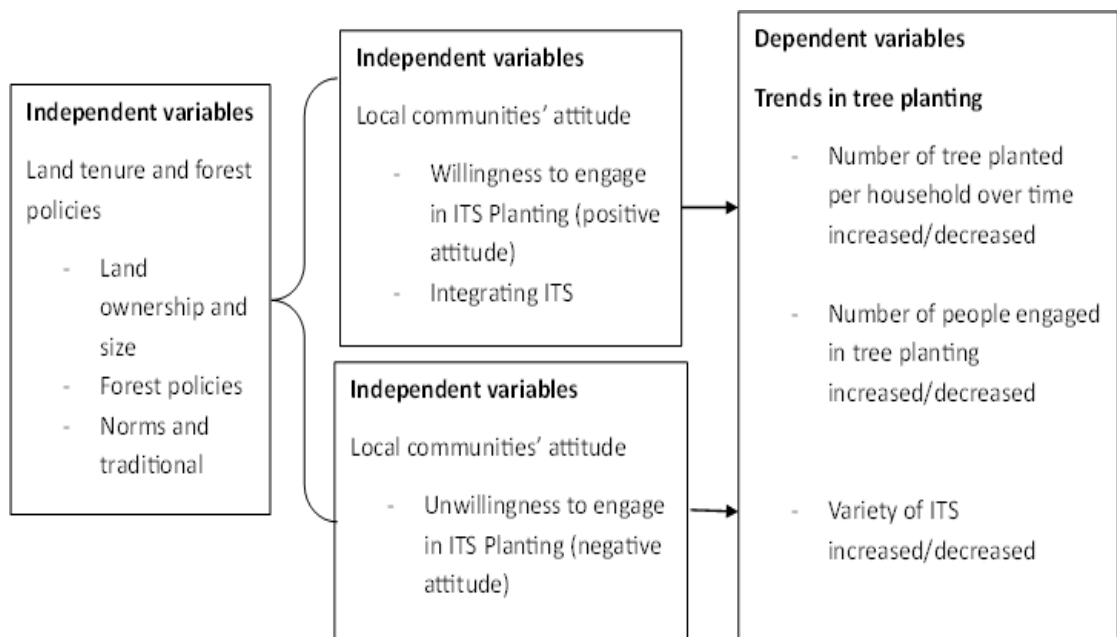
Figure 2.1: Conceptual Frame Work for Understanding Local Communities' Perception on Planting Indigenous Trees

Source: Researcher 2024, Theoretical framework of the study

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Area

The study was conducted in East Usambara Mountains landscape involving Muheza District, located in Tanga Region of Tanzania. The district is one of eleven districts in Tanga Region located in north-eastern Tanzania. The district lies west and south of Tanga City and is bordered by Mkinga to the north, Pangani to the south and Korogwe district to the west. The district lies between latitude 4° 54' 18" S and longitude of 38° 55' 23"E (Muheza 2018). The district economy and local livelihoods are heavily reliant on climate sensitive sectors. Agriculture employs 83% of the population and is dependent on rainfall (Pilato 2018). Both food crops, including maize, banana, cassava, and cash crops, including tea, rubber, and spices (cinnamon, cardamom, and cloves) are grown in the District (Pilato, 2018). Forestry is another important economic sector in the district, nine forest reserves and two nature reserves (Amani and Nilo) have been established in Muheza District for the protection of water catchments and the provision of forest products to local communities (Pilato, 2018). The East Usambara landscape is important for its unique plant species, with 3 % of plants being endemic and 22 % qualifying as 'near endemics' (WWF, 2019). Endemic flora species found in the landscape include 15 wild relatives of coffee and 20 African violet species (WWF, 2019).

Muheza District is known for its diverse ecosystem and indigenous tree species (WWF 2019). The study covered four villages namely Kwezitu, Shambangeda, Magoda, and Kwemdimu located in highland and lowland areas respectively in the

Muheza District Council (Figure 3.1). The District is chosen because it falls within the areas of high conservation priority, have been supported with tree planting programs and have a significant number of households practicing agroforestry (WWF, 2019), which suits well to the requirements of the study.
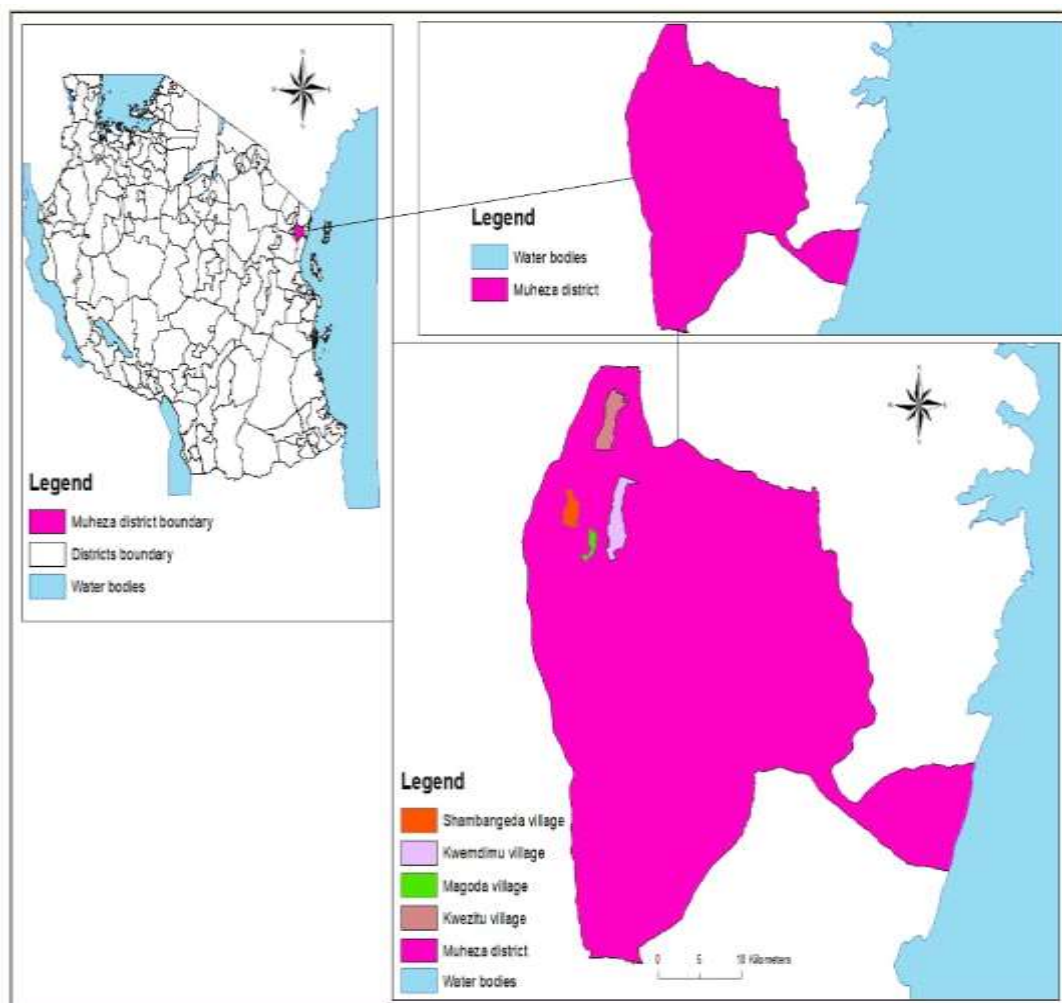
Figure 3.1 Location of the Study Area

Source: Researcher's Own Construct (2024)

3.2. Research Paradigm

According to nature of this study which is study of perception of local communities on indigenous tree planting, the research applied pragmatic paradigm, which emphasized the importance of understanding the subjective perspectives and meanings attributed by individuals and communities to indigenous tree planting practices (Žukauskas *et al*., 2018). Pragmatic further embraces the use of various methods in data collection and analysis (mixed methods or multiple methods). The methods that helped to understand the research problem. (Creswell, 2014; Creswell and Creswell, 2022).

3.3 Research Approach

Creswell (2022) and Bless *et al.,* (2016) emphasize that perceptions can be more comprehensively understood through both qualitative and quantitative methods. Overall, there are many ways of interpreting the community's perceptions with regards to tree planting to give its overall understanding. No single point of view can give the entire picture of this tree planting phenomenon without multiple realities. Based on these assumptions, this study, therefore, adopted mixed methods research approach the main framework to assess community's perceptions on the planting of indigenous tree species (Bless *et al.,* 2016; Creswell, 2014). The study assumed the use of mixed method (qualitative and quantitative) to understand the community perceptions on tree planting as informed by the ontology (single reality and objectivity) and epistemology (multiple realities and subjectivity) assumptions (Creswell 2014).

3.4 Research Design

This study used a Confirmatory Parallel Design, which involves simultaneously collecting, analysing, and interpreting both qualitative and quantitative data to validate findings through triangulation (Creswell, 2022). This design was chosen to explore and confirm the community's perceptions regarding tree planting by integrating data from various sources. Additionally, the study employed a cross-sectional design that involves collecting data at a single point in time (Bryman, 2012; Clark et al., 2021). This approach is effective for capturing respondents' current attitudes, opinions, and practices without tracking changes over time. As a result, all data for this study were gathered at once, providing a picture of community perceptions on tree planting during the study period.

3.5 Sample Size and Sampling Procedures

Both probability and non-probability sampling methods were employed. Probability sampling included simple random sampling to obtain representative of households from four villages around forest reserve while non probability sampling using purposive sampling method was used to select key informants and participants during focus group discussions. Purposeful sampling was done for the selection of district forest officer, Nature Forest Conservators, District Forest Conservator, head of agriculture department, Non-Governmental Organization, village leaders, Village Natural Resources Committee and people who involved in the tree planting in the village.

The sampling frame of this study consisted of the total number of 1,259 households of the four villages surrounding Derema Corridor Forest reserve and between Amani

and Nilo Forest Nature Reserves in East Usambara Mountains. The target population were all households in four villages in Muheza District The number of households sampled for household questionnaire were determined using the formula developed by Israel (1992).

$$n = \frac{N}{1+N(e)2}$$

Where: n is the sample size, N is the population size, and e is the level of precision (±5% equivalent to 0.05)

n = 1259/ [1+1259 (0.05)2]

n= 155

3.6 Data Collection Methods

3.6.1 Source of Data

The study obtained data from both primary and secondary sources. The primary sources included household, key informant, focus group discussions, and field observations. Moreover, secondary sources involved government reports, policy documents, published literature, and previous studies related to restoration, community forestry, and tree planting.

3.6.2 Data Collection Instruments

In this study, data collection methods included documentary reviews, questionnaires, observations, and Focus Group Discussions. These diverse data sources were utilized

to triangulate information. Additionally, the Open Data Kit (ODK) tool was employed to facilitate streamlined data collection and entry.

3.6.2.1 Document Review

The document review for this study encompassed a variety of sources, including reports from Muheza District, Tanzania Forest Conservation Group (TFCG), and WWF; resources from The Open University of Tanzania (OUT) main library; online databases and websites; past theses, journals, and articles; as well as reports from the Tanzania Forest Service and key Tanzanian policy and legislative documents. The review covered topics such as community perception of indigenous trees, the influence of land tenure and forest policies and Acts on practises of indigenous tree planting.

3.6.2.2 Questionnaires

The study employed both quantitative and qualitative data collection methods, utilizing structured and semi-structured questionnaires for household interviews (Appendix 1). Face to face interviews were conducted to the head of households by using trained enumerators. Each household head was randomly selected and interviewed to gather information on their knowledge, practices, perceptions, and attitudes related to indigenous tree planting. The questionnaire covered topics such as the benefits of indigenous tree planting, land tenure, opportunities and challenges, the number and varieties of trees planted, and the locations where these trees are planted.

On the other hand, information about the respondents' age, gender, education level, occupation, and length of residence in the area were captured. This data helps in understanding how attitudes might vary across different segments of the community.

3.6.2.3 Key Informant Interviews

In addition to formal interviews, key informant interviews were conducted with village leaders, extension workers, and other relevant personnel to gather information on the types of indigenous trees planted in the study areas and their benefits to the community and biodiversity (Appendix 3). Key Informant Interviewees were selected using purposive sampling techniques. This study interviewed representatives from two NGOs (TFCG and MJUMITA), the District Forest Conservator, the District Forest Officer, a Tanzania Forest Services officer (Amani and Nilo Nature Forest Reserve Conservator), and the District Agriculture Officer which make a total of seven key informants. The interviews were conducted one-on-one using a semi-structured questionnaire. Through these KIIs, valuable insights were gathered on community perceptions, attitudes toward indigenous tree species (ITS), type of tree planted, sources of trees, average number of trees planted per year, influence of land tenure and forest policies on planting ITS and planting trends.

3.6.2.4 Focus Group Discussion

A focus group discussion (FGD) is a structured group conversation involving individuals with knowledge and interest in a specific topic. The study conducted four focus group discussions (one per village), each comprising 12 participants, with an equal representation of six men and six women. The participants included village

leaders, members of the Village Natural Resource Committee (VNRC), Village Land Use Management Committee (VLUMC) influential community members, religious leaders, and traditional healers. The FGD was used to gather information on the types of indigenous trees planted in the study areas and their benefits to the community and biodiversity (Appendix 2).

3.6.2.5 Observation

Observational methods were important for correlating information such as type of tree planting and places of planting and species preferred by communities. The researcher observed the types of trees planted, their locations, and the transformation of the landscape from indigenous to exotic species (Appendix 4).

3.7 Data Analysis

Quantitative data were analysed through descriptive statistics using the Statistical Package for the Social Sciences (SPSS) Version 26 and Microsoft Excel to generate percentages and frequencies. Calculation of the percentage were used to analysed and interpreting quantitative data collected from respondents. The qualitative data was analysed using the content-structural analysis. The content structural analysis was used to obtain in-depth understanding of the perception and attitude expressed by communities during the discussions and key informants. Qualitative data obtained from key informant interview, focus group discussions and field observation were analysed using content analysis approach. Content analysis techniques focus on the content, underlying themes/topics, and the meaning of the text. This analysis was

used to develop descriptive narration, which used to complement the descriptive statistical analysis (Kimberly, 2017).

3.8 Validity and Reliability

Reliability refers to the stability and consistency of scores obtained from an instrument. Validity, on the other hand, ensures that the scores are meaningful, make sense, and enable the researcher to draw accurate conclusions from the sample to the broader population (Creswell, 2005).

To ensure validity in this study, structured questionnaires were administered to 155 heads of households to gather relevant information. Validity was further enhanced by conducting a pre-test survey to assess the clarity of the questionnaire items. Any identified inadequacies were addressed through modifications to ensure that the instruments used in the actual field research are clear and effective.

Additionally, to ensure reliability, the researcher employed multiple questions and methods to measure the same concept or variable, checking for consistency and correlation among them. Clear, simple language was used to avoid any confusion that jargon might cause among respondents.

3.9 Ethical Considerations

The researcher ensured that all ethical issues are thoroughly addressed throughout the study. A University Research Clearance Letter and a District Research Permit were obtained. A pre-prior informed consent process was employed, whereby the researcher clearly explained the purpose of the research to the participants and obtain their voluntary consent to participate, whether through interviews or focus group

discussions. Participants were informed that they are free to withdraw from the study at any time without having to provide a reason. The confidentiality of the information provided by the research subjects and the anonymity of the respondents were strictly maintained. Additionally, the researcher ensured that all data were collected and reported without any plagiarism.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the data analysis and discussions of the research findings in relation to the study's guiding research questions. The analysis focuses on community perceptions, attitudes, and knowledge about indigenous tree planting, as well as the trends in indigenous tree planting practices. Additionally, it explores the socio-economic characteristics of household heads, community views on indigenous tree planting, and the influence of land tenure and forest policies on this practice. The findings are based on data collected from self-administered questionnaires completed by 155 households (n=155) across four villages in Muheza District, seven KIIs, and four FGDs.

4.2 Social Economic Characteristics of the Household Respondents

The questionnaire interviews covered a diverse range of local communities, representing various demographic characteristics including gender, marital status, age group, primary occupation, ethnicity, family size, educational attainment, land ownership, and household land size.

4.2.1 Sex and Marital status of the Respondents

The study sample comprised 155 household respondents, of which 71% (N=110) were male and 29% (N=45) female. This reflects the prevalent trend in Tanzania, where most households are male-headed. Key informants indicated that, in some cases, men are considered the head of the household even when the household is

effectively managed by women. Additionally, some women may hesitate to identify themselves as the head of the household in the presence of men. It was further revealed that the few female-headed households were typically those where the husbands had passed away or the women were unmarried. This pattern is common in Tanzania, and similar trends have been reported in other studies (Kasamila and Marusuli, 2004; Nonga, 2010).

The study revealed that 76% of the respondents were married and 13% were single while the others failed on the categories of widowed and divorced (Table 4.1). The gender distribution and household dynamics highlighted in the study it has significant role in shaping perceptions, attitudes, and the practical ability of communities to engage in the planting of indigenous tree species.

Table 4. 1: Sex and Marital Status of Respondents

Characteristics	Sex and Marital status	Frequency	Percent (%)
Sex	Male	110	71
	Female	45	29
	Divorced	11	7
Marital status	Married	118	76
	Single	13	8
	Widowed	13	8

Source: Field Survey Data (2024).

4.2.2 Age of the Respondents and Family Labour Power

The respondents' ages ranged from 18 to 84, with a median age of 50. Analysis reveals that 75% of the respondents were under the age of 60, indicating a relatively young and active labour force in the surveyed areas. This demographic profile suggests a strong potential for engaging the community in labour-intensive activities,

such as planting indigenous trees. However, perceptions and attitudes toward such efforts vary within this group, influenced by factors like the perceived economic, cultural, or environmental value of the trees. Consequently, their decisions could either positively or negatively affect tree planting initiatives, depending on how they view the benefits of indigenous tree species to their livelihoods and the broader community.

Additionally, the study found that most households (85%) had fewer than four members contributing to the labour force. Many younger households primarily consisted of both a husband and wife engaged in economic activities (Table 4.2).

Table 4. 2: Age of Respondents and Labour Power at the Household Level

Characteristics	Age Group and Labour Power	Frequency	Percent (%)
Age	18-39	50	32
	40-59	66	43
	60 and above	39	25
	Total	**155**	**100**
Labour power	1-3	132	85
	4-6	23	15
	Total	**155**	**100**

Source: Field Survey Data (2024).

4.2.3 Education Level and Main Occupation of Respondents

The study revealed that 95% of the respondents had attended and completed primary and secondary education, indicating a high level of literacy, as these individuals can read and understand basic information (Table 4.3). This literacy rate is 13% higher than the national average in Tanzania, which stands at 82.02% (URT, 2022). This suggests that the surveyed population may have a greater capacity to engage to environmental conservation and the planting of indigenous tree species. Moreover,

the level of education influences the primary occupation of the local communities. The results showed that 94% of the respondents were engaged in farming, with a focus on crops and spices (Table 4.3).

Table 4. 3: Education Level and Main Occupation of the Respondents

Characteristics	Education Level and Main Occupations	Frequency	Percent (%)
Education	Not attended formal school	8	5
	Primary school	125	81
	Secondary school	22	14
	Total	**155**	**100**
Main occupation	Business	4	3
	Employed (part-time)	1	0.6
	Farming	145	94
	Entrepreneurship	1	0.6
	Masonry	1	0.6
	None (dependant)	2	1.3
	Tailoring	1	0.6
	Total	**155**	**100**

Source: Field Survey Data (2024).

4.2.4 Ethnicity, Origin and Reasons for Shifting to the Village

The study revealed that the majority of respondents in the study area belong to two main tribes, the Sambaa, who make up 67% of the population, and the Zigua, who account for 16%. The remaining percentage consists of individuals from various other tribes (Figure 4.1).

Figure 4.1: Ethnicity of the Head of the Households
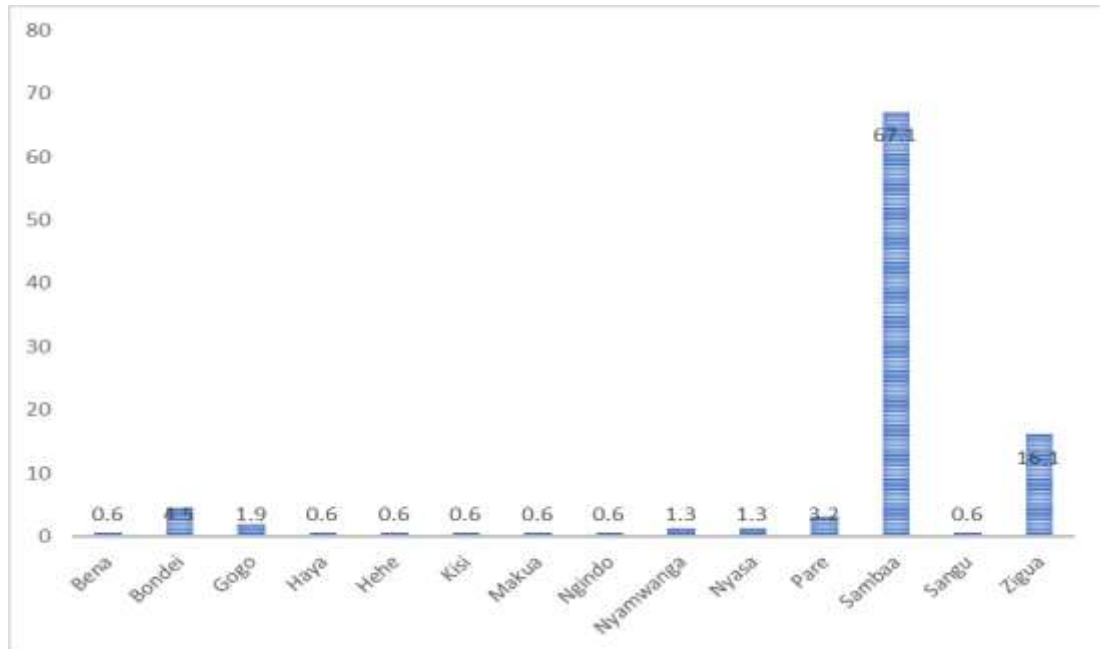
Source: Field Survey Data (2024).

Additionally, a significant portion of the population (72%) was born in the village, while the remaining 28% migrated from other regions of Tanzania. Of the migrants, 98% relocated to the area between 1960 and 2000 (see Figure 4.2). The primary reasons for moving to the village were opportunities in agriculture and employment at the tea company. This data suggests that the majority of residents have lived in the village for over 30 years, indicating that if they are interested in planting indigenous trees, they are likely capable of doing so.

Figure 4.2: Year of the Household Shifted to the Village
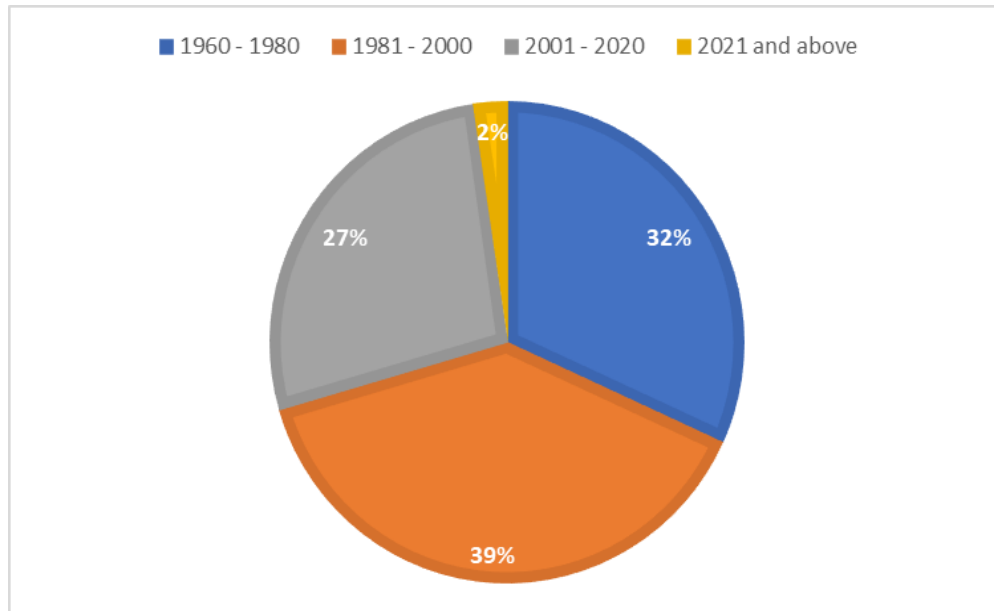
Source: Field Survey Data (2024).

4.3 Community's Attitudes on Indigenous Tree Species Planting

This section intends to explore the community's attitudes about indigenous tree species in the study area. Community attitude of planting indigenous tree species was found to be shaped by factors such as ownership, harvesting permits, benefits, opportunities, and challenges.

4.3.1 Communities Attitudes Towards the Ownership of Indigenous Trees

Household interviews revealed that 80% of respondents perceive indigenous tree species as wild trees, while 36% consider them government property (Table 4.4). Similarly, focus group discussions indicated that 90% of participants believe that planting and managing ITS is the government's responsibility. These findings align with Andrew *et al.*, 2018, who reported that municipalities are responsible for

maintaining and managing native trees in urban areas. Some species, such as *Milicia excelsa*, are even referred to as "police trees" by the community, reinforcing the perception that these trees belong to state authorities.

Among the 48 FGD participants, 33 stated that they would uproot or burn these trees if found on their farms during land preparation. Key informant interviews further highlighted that unclear land tenure rights over ITS have fostered negative attitudes, contributing to their significant decline. Additionally, FGD participants likened native trees to "stepchildren," implying that they lack ownership rights and control over them. They also noted that harvesting such trees requires government permits and lengthy bureaucratic procedures, further reinforcing the notion that these species are not privately owned.

As a result, many community members expressed negative attitudes toward having ITS on their farms, preferring to see them in public spaces (Andrew *et al.,* 2018). Even among those who had a positive attitude toward indigenous trees, only a few actively supported tree planting efforts. Furthermore, a positive perception of native species did not always translate into conservation action (Andrew *et al.,* 2018). However, the majority (80%) of respondents expressed a willingness to own and manage ITS on their farms if ownership were transferred from the Tanzania Forest Services or other government agencies to individual farmers. These findings align with Kobbail (2011), who reported similar dynamics in the management of natural forests.

4.3.2 Community Attitudes Towards the Benefits Offer by ITS in the Study Areas

According to the household survey, 90% of households perceive the indigenous trees to have less economic values compare to exotic species (Table 4.4). This implies that exotic species are more likely to be planted and more likely to be raised in nurseries and farms due to commercial potential, which is line with Clarkson, 2012. Consequently, this perception has limited the number of indigenous trees planted per household. The results revealed that only 23% of respondents actively plant indigenous tree species on their farms.

Table 4.4: Attitude of Communities Regarding Indigenous Tree Planting

Factors	Frequency	Percent (%)
Government property	56	36
Wild trees (little value to be taken care of)	124	80
Less economic values compare with exotic species	28	90

Source: Field Survey Data (2024).

Majority of respondents (74%) believe that indigenous tree species do not provide more benefits than exotic species. These included 20% who disagreed and 54% strongly disagreed with. Similarly, there is a strong negative attitude regarding the role of indigenous tree species in livelihoods, with 89% of respondents either disagreeing (25%) or strongly disagreeing (64%) that indigenous species contribute significantly to their well-being. This dominant negative attitude suggests that the community sees more immediate or tangible advantages from exotic species, which are likely due to their faster growth rates and simpler harvesting procedures compared to indigenous species. Additionally, exotic species are often integrated

into agroforestry systems, providing short-term economic returns. Although indigenous species may offer long-term environmental benefits, these advantages may not be immediately apparent to the community. The prevalence of this negative perception poses a significant challenge for promoting indigenous tree planting in the study area. Conservation and biodiversity programs will need to counter these views by demonstrating the long-term ecological, social, and economic benefits of indigenous species, such as improved soil health, enhanced water retention, and greater resilience to local environmental conditions.

On the other hand, a smaller proportion of respondents (18%) had a positive attitude of indigenous tree species, with 7% agreeing and 11% strongly agreeing that indigenous trees offer more benefits than exotic species. Similarly, 3% agreed and 5% strongly agreed that indigenous species play an important role in their livelihoods. This group likely recognizes the importance of indigenous species for maintaining local ecosystems, supporting biodiversity, and preserving cultural heritage. While small in number, these individuals could serve as advocates for sustainable land management practices by integrating indigenous tree species into farming systems. They may also play a key role in leading education and advocacy efforts aimed at shifting community attitudes.

Furthermore, the study highlighted strong community perceptions regarding the ecological significance of indigenous tree species, particularly in terms of biodiversity conservation and environmental sustainability. A vast majority of the respondents (16% agree, 82% strongly agree) recognized the importance of indigenous tree species for maintaining biodiversity in the area. This near-universal

positive perception (98%) reflects a strong awareness of the critical role indigenous trees play in supporting diverse ecosystems, preserving local flora and fauna, and maintaining natural habitats. Such widespread awareness is a valuable asset for conservation efforts, as the community already acknowledges the vital ecological role these species play in sustaining biodiversity (Table 4.5). Beatrice *et al.,* 2011 reported similar results in their studies on perception and participation of local communities in tree planting.

Table 4. 5: Level of Agreement on Importance of Indigenous Tree Species

Importance of indigenous tree species	Level of agreement	Frequency	Percent (%)
On maintaining biodiversity	Agree	24	16
	Disagree	1	0.6
	Neutral	2	1
	Strongly agree	127	82
	Strongly disagree	1	0.6
	Total	**155**	**100**
On sustaining the environment by protecting biodiversity and reducing impact of climate change	Agree	27	17
	Neutral	3	2
	Strongly Agree	125	81
	Total	**155**	**100.0**

Source: Field Survey Data (2024).

4.3.3 Integration of Indigenous Trees Species into Agriculture System

The integration of trees into farming systems represents a comprehensive and innovative land management approach (Vinodhini *et al.,* 2023). This practice is recognized for its numerous environmental, economic, and social benefits. Household interviews revealed that, 100% of the households' integrated trees into their farms. However, the findings revealed that all respondents (100%) planted exotic species, with only 11% integrating both exotic and indigenous tree species

into their farming systems. Notably, 79% of respondents were not integrating indigenous tree species at all.

Among those integrating trees, 100% used the scattered planting technique across their farms (see plate 4.1), while 11% combined this with boundary planting. Despite the prevalence of tree integration, no farms were identified as woodlots for indigenous tree species, with most observed plots dominated by exotic species.

The household interviews, FGDs and KIIs identified a variety of indigenous species in the area, including *Khaya anthotheca* and *Milicia excelsa* in the lowlands (Kwemdimu village) and species such as *Myrianthus holstii*, *Albizia sp Allanblackia stuhlmannii*, *Cordia africana, Croton macrostachyus/megalocarpus* and *Newtonia buchananii* at higher altitudes (Kwezitu, Shambangeda, and Msasa IBC). Other indigenous species such as *Perinaria excelsa*, *Ficus sp*, *Cinchona*, *Maragarita riadiscoidea,* and *Pachystela* sp. were also observed. These species are primarily retained on farms for purposes such as medicine, timber, wood, water shading, building poles, and, to a lesser extent, conservation.

On the other hand, exotic species dominated the study area, with *Maesopsis eminii*, *Cedrela odorata*, teak, and *Grevillea* being the most common (refer to plate 4.2 and 4.3).

The study further explored the reasons behind the community's reluctance to integrate indigenous tree species into their farms. Over three-quarter (79%) of the respondents (Table 4.6) expressed unwillingness to plant indigenous trees, primarily due to fears of government actions converting their land into forest reserves.

Table 4. 6: Challenges of Planting Indigenous Trees Species

Challenges	Frequency	Percent (%) *
Lack of seeds	3	3
Insufficient land	98	63
Lack of technical skills	56	36
Cover large area	90	58

Source: Field Survey Data (2024).

Note: *=percentage based on multiple responses

Focus group discussions (FGDs) revealed that past experiences, such as land losses during the gazettement of the Derema Forest Corridor, have left many farmers wary of planting indigenous trees. This process caused significant social and economic hardships, a sentiment corroborated by Rantala et al. (2013), who reported that 99% of villagers in Kwemdimu and Msasa IBC suffered adverse effects due to the establishment of the Derema Forest Reserve.

This historical context has contributed to the community's negative perception of planting indigenous tree species. Many farmers have instead opted for non-native species, as also noted by Hall et al. (2011) and Meijer (2015). Other barriers to planting indigenous trees include insufficient land, lack of technical skills, and unavailability of seeds (Table 4.8)

Plate 4.1: Areas where Indigenous Tree Species can be Found, with Majority Located in Tea Estates and Forest Reserves

Plate 4.2: Agroforestry System Practiced by Local Communities, Featuring Exclusively Exotic Tree Species, specifically *Cedrela odorata*

Plate 4.3: A Section of a Respondent's Farm Designated for a Woodlot of Exotic Tree Species

4.5 Forms of Land Tenure which Favour the Practice of Indigenous Tree Species Planting

The study examined forms of land tenure and how favour the practice of planting indigenous tree species in the study area. It examines land ownership, land size and other policies such land, forest and norms on how influence the indigenous tree planting in the study area.

4.5.1 Land Ownership Status in the Study Area

According to household survey, 97% of the interviewed households' own pieces of land with plot sizes ranging from 0.1 to 3 acres. This finding is consistent with previous research done by Rantala *et al.,* (2011). Those without land ownership were primarily young individuals aged 18–39, who were either single or divorced. A significant proportion of landowners (81%) inherited their land from their parents. Additionally, the majority of respondents (97%) reported using their land for both

residential and agricultural purposes, while a small percentage (5%) utilized their land for tree planting (Table 4.7). The small size of land ownership implies that majority are small scale farmers and had limited land for tree planting. Similar findings were reported by Johan et al., 2021 in Kenya mountains villages.

Table 4.7: Land Ownership, Size, Uses and Methods of land Acquisition

Characteristics	Own land, size, way of acquire land and use of that land	Frequency	Percent (%)
Ownership	Have land	151	97
	Don't have	4	3
	Total	**155**	**100**
Land size distribution	0.1 – 3	94	62
	3.1 – 6	37	25
	6.1 – 9	8	5
	9.1 -12	6	4
	12.1 and above	6	4
	Total	**151**	**100**
		Frequency	**Percent (%) ***
Main uses of the land	Residential	151	97
	Agriculture and farming	151	97
	Woodland/planation	8	5
	Forest conservation	0	0
Way of acquire land	**Way of acquire**		
	Inheritance	125	81
	Rent	1	0.6
	Purchase	48	31
	Allocated by government	2	1
	Forest clearance	3	2
	Borrowed	4	3

Source: Field Survey Data (2024).
Note: * = percentage based on multiple responses

4.5.2 Land Tenure System in the Study Area

Based on the household survey, the common land tenure system practised by the local communities is customary right of occupancy. All the household interviewed own the land under this system. However, it was noted that none of the household possess a certificate of occupancy, as such, 100% of those households owned land informally. Due to that tree planting especially indigenous species, requires long-term commitment, often spanning more decades. Farmers and land users are less likely to invest in trees if they fear eviction or land reallocation. The same results as been revealed by Rantala *et al.,* 2013. A clear example of this issue comes from Kwemdimu, where some households reported caring for natural trees on their farms. However, portions of their land were eventually taken by the government to establish the Derema Corridor Forest Reserve. Such experiences underline how land insecurity can discourage community members from making long-term investments in environmental conservation, as they risk losing both the land and the resources they have cultivated.

Research shows that tenure insecurity reduces farmers' willingness to engage in agroforestry and reforestation initiatives (Robinson *et al.,* 2018 and Rantala *et al.,* 2013 as cited in WWF 2019). Households who use family and borrowed land hesitate to make long term investment such as tree planting while those who inherited land from their parents were more willing to invest in tree planting (Martin *et al.,* 2011 cited by Johan 2021).

In addition, they FGD revealed that family-owned land often requires extensive discussions among family members before decisions can be made regarding tree

planting as compared to those purchased the land. Conversely, when land is purchased, there is a sense of security in ownership, which influences tree planting decisions. The study further shows that 73% of respondents believe that local communities with secure land tenure (CCROs) are more likely to engage in planting and maintaining indigenous tree species (Robinson et al., 2018). This finding emphasizes the critical role that tenure security plays in encouraging sustainable land-use practices.

Additionally, land size ownership significantly influences decisions regarding indigenous tree planting. Among the respondents, only 11% of the households reported planting indigenous trees in their own land, and all of these households owned more than three acres.

This finding was further supported by during FGD and KII, which highlighted similar concerns. The 100% of KII and 83 % of the FDG participants expressed that with smaller landholdings, they prioritize crops or another immediate livelihood needs over tree planting. For families with larger landholdings, there is more flexibility to allocate portions of their land for planting indigenous trees, which generally require more space and long-term care.

Moreover, the land conflict was noted to have slightly little effect on indigenous tree planting in the study area, seven percent (7%) of the respondents mentioned that they have been affected by land conflict, which is why they did not plant indigenous trees. The major conflict is between neighbours, which involves boundaries, where the

people prefer to plant more trees. The conflict occurs due to the fact that the indigenous trees have large canopy covers compared with exotic species.

The insights suggest that land size, along with tenure security, play a crucial role in shaping community members' willingness and ability to engage in planting indigenous tree species. Households with ample land and secure tenure feel more confident and capable of investing in these environmental practices, whereas those with limited or uncertain land resources are more likely to focus on immediate, essential uses.

Norms and traditions also have a subtle yet notable impact on tree-planting decisions. Only 7% of respondents reported that gender inequality influences these decisions, particularly because women are not equally involved in land-use choices. Due to traditional inheritance practices, most women do not inherit land, which limits their authority in decisions related to land management, including tree planting.

As men generally hold greater decision-making power over land use, women often have less influence on whether indigenous trees are planted and maintained. This unequal dynamic situation reflects broader cultural norms that prioritize male authority in land matters, potentially limiting women's contributions to environmental initiatives. Although the impact of these norms on tree planting appears minimal according to the percent, it suggests that more inclusive land rights and decision-making processes could empower women to actively participate in tree planting.

Moreover, 90% of the interviewees and FGD participants highlighted issues related to tree tenure and harvesting procedures for indigenous trees as significant barriers preventing communities from planting and maintaining these trees on their farms. They noted that harvesting exotic tree species is straightforward and requires only an immediate decision, whereas harvesting indigenous species involves lengthy procedures and associated fees. Additionally, government officers sometimes assign harvesters to private farms, further complicating the process. As a result, community perceives indigenous trees as government-owned resources. Research has shown that when tree tenure is unclear, individuals are less likely to plant and manage trees (FAO, 2019).

4.6 Trends of Indigenous Tree Planting over 30 Years in the Study Area

This section determines the trends in indigenous tree species planting in the study area from 1994 to 2024. It analyses changes in planting patterns over time and explores the key factors for those trends.

4.6.1 Tree Planted in the Study Areas

According to the household survey, 98% of household heads reported planting trees in the study area. However, the majority of the planted trees are exotic species, while only 23% of households engage in planting indigenous tree species. The number of trees planted and their management practices are presented in the Table 4.8. These findings suggest a strong preference for exotic species among local communities, likely due to factors such as faster growth rates, economic benefits, and availability

of seedlings. Similar trends were observed in previous studies, including those conducted by Nduwamungu *et al.,* (2002) and Johan *et al.,* (2021).

Table 4. 8: Number of Tree Planted over 30 Year in the Study Areas

Species planted	Number of trees planted for 30 years in the study areas					
	Home garden	Woodl ots	Scatte red	Bound ary	Total	Average per HH
Mangifera indica (exotic)	60	0	20	10	90	1
Citrus sp (exotic)	100	6	700	0	806	5
Eucalyptus sp (exotic)	0	3	87	12	102	1
Cedrela odorata (exotic)	5	3	800	10	818	5
Tectonia grandis (exotic)	3	5	600	25	633	4
Gravelia robusta	12	0	50	35	97	1
Allanblackia stuhlmannii (ITS)	0	0	20	0	20	0
Ficus sycomonis (ITS)	0	0	9	0	9	0
Cola acuminata (ITS)	0	0	3	0	3	0
Total	**180**	**17**	**2289**	**92**	**2578**	**17**

Source: Field Survey Data (2024).

Moreover, the household interview indicates that those households who planted indigenous trees, 80% planted fewer than 20 trees over the past three decades. The findings from household surveys, focus group discussions (FGDs), and key informant interviews (KIIs) indicate a significant decline in community engagement in planting indigenous trees in the study areas. According to the interview, 98% of the household respondents indicated that the trend of tree planting has been decreasing, while only 2% were uncertain (Johan et al., 2021). Additionally,

historical planting trends indicates a consistent decline in community participation in planting indigenous tree species over the past three decades (Figure 4.3).
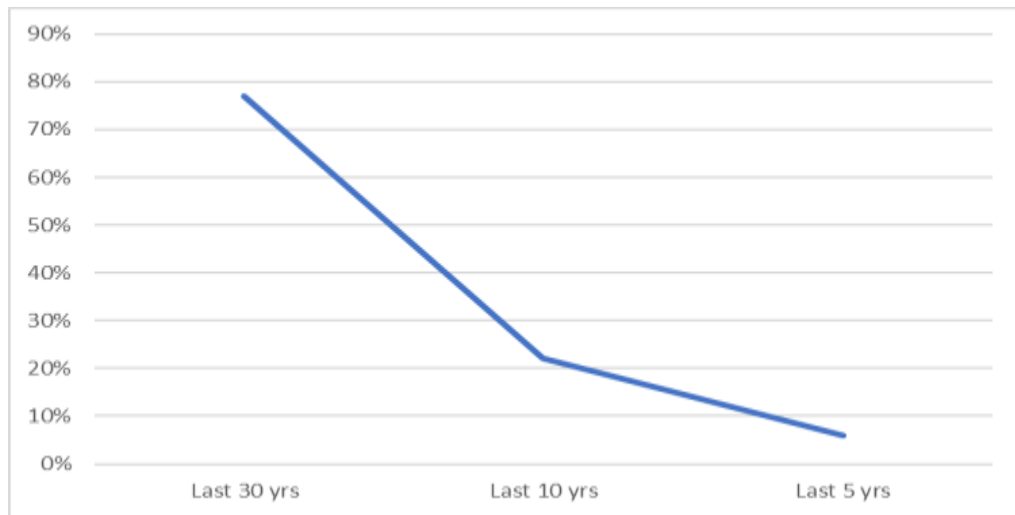
Figure 4. 3: Trend of Indigenous Tree Planting Over 30 Years in the Study Area
Source: Field Survey Data (2024).

This figure (Figure 4.3) indicates a downward trajectory in planting of indigenous tree species as time progresses. The survey also identified *Allanblackia stuhlmannii* as the predominant indigenous species planted in the period of 30 years (1994-2024), accounting for 86% of the reported cases. Other species planted in smaller proportions included *Ficus sycomonis* (6%) and *Cola acuminata* (2%). Additionally, farms retain a diverse range of indigenous species, including *Khaya anthotheca*, *Milicia excelsa*, *Myrianthus holstii*, *Albizia sp.*, *Cordia africana*, *Croton macrostachyus/megalocarpus*, *Newtonia buchananii*, *Perinaria excelsa*, *Ficus sp.*, *Cinchona*, *Margarita riadiscoidea*, and *Pachystela*. Observations further highlighted landscape changes, showing a shift from indigenous to exotic tree species (Cedrela

Odorata, Gravelea robusta, Tectona grandis -Teak and *maesopsis eminii*) throughout the area (see Plate 4.1). the same results found in west Usambara as reported by Kimaro *et al.,*2023.

4.6.2 Factors Influence Changes in Indigenous Trees Planting in the Study Area

Household interviews revealed several factors contributing to the decline of tree planting to the individual farms. These include land scarcity (23%) and a lack of awareness and training (24%). According to Tanzania's Forest Policy, the planting and management of indigenous tree species have not been adequately promoted compared to exotic species (URT 1998). Other contributing factors include the increasing demand for agricultural land, particularly for spice cultivation (42%), and a preference for exotic species over indigenous trees (19%). The Clarkson 2012 also highlighted he same factors that limited indigenous tree planting. Additional challenges included the limited presence of organizations promoting indigenous trees (15%), the perception of indigenous trees as "government trees" (8%), and the failure of previous income-generating projects, such as the *Allanblackia stuhlmannii*   nut collection business (3%). The similar results revealed by Nduwamungu *et al.,* (2002) but the study based on tree plant in general.

Land scarcity restricts the space available for indigenous trees, which are often larger and require more room to mature. Faced with these constraints, farmers tend to prioritize land for crops or faster-growing exotic species, which offer quicker economic returns. Exotic species are often seen as more economically valuable and easier to manage, making them a more attractive option for income generation

compared to indigenous species. Furthermore, indigenous tree planting is hindered by the failure of past projects, such as the *Allanblackia stuhlmannii* nut collection initiative, which once provided income opportunities but now discourages community investment due to its uncertain financial returns.

Further, FGDs identified negative perception of indigenous trees due to complex regulations governing their harvest, unlike exotic species. These perceived bureaucratic challenges make exotic species more appealing, as community members prefer trees they can manage and harvest freely. Finally, the longer maturation periods required by indigenous trees discourage farmers seeking faster economic returns. The extended time to produce marketable wood makes these trees less attractive to those with limited resources or immediate needs.

4.6.3 Future Plans for Indigenous Tree Planting

The study further examined whether local communities practicing indigenous tree planting allocate specific land for these species. Household survey results revealed that none of the respondents set aside land for indigenous trees, with most (80%) preferring to allocate land to exotic species (Plate 4.3), which are perceived as more profitable. Additionally, 88% of respondents agreed that economic factors and government policies significantly contribute to the decline of indigenous tree species in the landscape. This suggests that the trend of indigenous tree planting will continue to decrease, while the cultivation of exotic species will expand over time, a pattern also reported by Johan et al. (2021) in Kenya.

However, the few communities willing to plant native trees face challenges in accessing quality seeds and seedlings. Observations from the survey, as well as reports from KIIs and FGDs, indicated that there are currently no centralized tree nurseries in the study areas. The only major nursery observed was at Amani Botanical Garden and Lunguza Teak plantation, which primarily dominated exotic species. These findings suggest that the low rate of indigenous tree planting is likely to persist in the future, leading to landscapes increasingly dominated by exotic species and spice crops.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the major findings, conclusions derived from the study, as well as a summary of the results and discussions provided in Chapter Four. Finally, it offers recommendations for administrative action and suggestions for further research.

5.2 Summary of the Major Findings

The study revealed that indigenous tree species are widely perceived as government property or wild trees, with 80% and 36% of respondents holding these views, respectively. Despite this, 80% of respondents expressed willingness to own and manage ITS on their farms if ownership were transferred from government agencies to individuals.

Economic considerations strongly influence tree planting decisions, as 90% of households believe indigenous trees have lower economic value than exotic species. Similarly, 74% of respondents do not perceive ITS as providing more benefits than exotic species. As a result, 79% of respondents are unwilling to plant ITS, fearing that government intervention could lead to land conversion into forest reserves.

Tree planting is common, with 100% of surveyed households integrating trees into their farms. However, all respondents planted exotic species, while only 11%

incorporated both exotic and indigenous trees. Additionally, 98% of household heads reported planting trees, but only 23% planted both exotic and indigenous species.

Land tenure plays a critical role in tree planting decisions. The survey found that 97% of households own land, typically ranging from 0.1 to 3 acres, under customary rights of occupancy. However, none of the respondents possessed a formal certificate of occupancy, meaning all land was owned informally.

Several factors contribute to the decline in indigenous tree planting, including land scarcity (23%), lack of awareness and training (24%), increasing demand for agricultural land, especially for spice cultivation (42%) and a preference for exotic species (19%). Additionally, 88% of respondents identified economic factors and government policies as key drivers of the decline in indigenous tree species.

These findings highlight the challenges facing indigenous tree conservation, emphasizing the need for policy interventions, land tenure security, and increased awareness to promote ITS planting.

5.3 Conclusions

The community holds negative perceptions regarding the planting of indigenous trees on their farms. These perceptions stem from viewing indigenous trees as government property, requiring lengthy procedures and bureaucratic hurdles to obtain harvesting permits. Additionally, many believed that indigenous trees are wild species capable of regenerating naturally, making planting unnecessary. Others

perceive these trees as a burden, associating them with government control, and consider them to have lower economic value compared to spices and exotic species. Consequently, indigenous trees are often uprooted when found on farms. Despite these negative perceptions, there is a strong awareness among the community about the ecological importance of indigenous species, particularly their role in biodiversity conservation.

The lack of formal land tenure, such as a Certificate of Customary Right of Occupancy, further discourages the planting of indigenous trees. Many community members fear that planting these trees could lead to their land being converted into government forest reserves. Additionally, limited landholding sizes influence tree-planting decisions, with most households owning small plots of land. This limitation prompts a preference for planting exotic species and cash crops, which are seen as more economically profitable.

The study highlights a significant decline in the planting of indigenous tree species in the area. This trend is transforming the landscape, with native tree species being replaced by exotic tree species, leading to ecological and cultural changes. Therefore, the negative perception, land tenure insecurity, limited landholding size and bureaucratic processes of harvesting ITS has discourage community to plant them in the study area.

5.4 Recommendations

Based on the findings of the study, the following recommendations aim to enhance

the planting and management of indigenous tree species in the study area, with potential applicability in other areas:

5.4.1 Policy Recommendations

i. Ministry of Natural Resources and Tourism to simplifying harvesting permits and reducing bureaucratic barriers could address fears of government interference and encourage farmers to plant indigenous trees.

ii. Ministry of Lands, Housing and Human Settlements Development should make sure that villagers have formal ownership of their land through issuing of CCROs to every community member owning land.

iii. The central government through Tanzania Forest Service should give the community tree tenure this will increase the ownership of indigenous trees species and can encourage them to plant more trees in their farms.

iv. Forest Policies should include financial incentives, subsidies, or tax benefits for planting indigenous trees. For example, establishing payment-for-ecosystem-services such as Payment for Ecosystem Services (PES) schemes, Carbon credit and Reducing Emission from forest Degradation and Deforestation (REDD) could make indigenous tree planting financially attractive.

5.4.2 Recommendations to NGOs deal with forest and Tanzania Forest Service

i. Develop targeted educational programs to address misconceptions about indigenous tree species, particularly the belief that they are government

property. These campaigns should highlight the rights and responsibilities of landowners in planting and managing indigenous trees on their farms.

ii.   Introduce and promote agroforestry models that incorporate indigenous tree species with demonstrated economic value, such as those that provide timber, fruits, medicinal products, nuts or non-timber forest products (NTFPs).

iii. Advocate for reforms in forestry policies and the Forest Act to formally recognize the tenure rights of local communities over indigenous trees. Simplifying the bureaucratic processes related to the harvesting of indigenous tree species on community farms will encourage planting and sustainable management, reducing barriers to active participation in conservation efforts.

5.4.3 Recommendations for Further Studies

Further studies are required to assess local community preferences for indigenous tree species, along with the underlying reasons for these preferences, particularly in relation to their impacts on livelihoods and conservation efforts. This current study did not explore community preferences in detail due to several limitations, including time constraints, the complexity of identifying and categorizing indigenous species, and the need to assess their economic value. Additionally, limited financial and logistical resources restricted the study's geographic scope, making it unfeasible to conduct a comprehensive analysis of species preferences across different areas.

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APPENDICES

APPENDIX 1: HOUSEHOLD QUESTIONNAIRES

(ENGLISH VERSION)

Name of enumerator	Village name	Sub Village	Date of interview

A: DEMOGRAPHYIC INFORMATION

Information about the respondents' **age, sex, education level, occupation, and length** of residence in the area. This data helps in understanding how perception and attitudes might vary across different segments of the community.

1. Head of household. 1=Female, 2=Male: _____

2. Age of the head household: _____

3. Household size: _____

4. Number of HH member who can contribute labour (Family labour): _____

5. What is the ethnicity of the head of household? _____

6. Highest level of education completed by the head of household_____

   0=None, 1= Primary school, 2=Secondary school. 3=Vocational/technical training, 4= University degree or higher

7. What is the occupation of the Head of household? _____

   1= Employed (full-time), 2= Employed (part-time), 3= Farming, 4= Business, 5=Retired, 6=Other (please specify)

8. Was the head of the household born in this village? _____1=Yes, 2=No. If not, when did he/she move to the village? _____

9. What is your marital status? _____ 1=Single, 2= Married, 3= Divorced, 4= Widowed.

10. Do you own or rent your current agriculture land? _____1= Own, 2= Rent.

11. How do you acquire your land? _____1= Customary land acquisitions, 2= Granted Right of Occupancy, 3= Leasehold. 4= Purchase, 5= Inheritance, 6= Allocation by village government, 7=other (specify)

12. If own, what is the size of the land (acres): _____

13. How do you use that land? _____1= Residential, 2 = Agriculture and Farming, 3=Woodlot/plantation, 4=Forest conservation.

B: COMMUNITY'S ATTITUDE TOWARD INDIGENOUS TREE SPECIES IN THE STUDY AREA

14. Have you planted indigenous tree species on your land? _____1= Yes, 2=No if not why?

15. Which type of tree species have you planted on your land and what are the uses of that tree species in your household? List them use the vernacular name

16. What are the tree planting techniques/practices in the area/layout of trees in your farm plot? _____1=Plot/Farm boundary, 2=Woodlots, 3=Dispersed trees/scattered on farmland, 4=Home Garden, 5= Hedge grow/line planting, 6 = other specify_____

17. What is the level of agreement that you have enough knowledge about how to plant and care for indigenous trees? _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree

18. What is the level of agreement that the benefits of indigenous trees are well understood by most people in your community? _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree

19. What is the level of agreement that indigenous tree species provide more benefits than exotic tree species? _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

20. What is the level of agreement that indigenous tree species play an important role in your livelihoods? _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

21. What is the level of agreement that indigenous tree species are important for maintaining biodiversity in the area? _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

22. What is the level of agreement that indigenous tree species are essential for sustaining the environment in the area? _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

23. What are the opportunities/supportive factors/strengths in indigenous tree species planting in the area?

24. What are the main challenges/threats limiting planting of indigenous tree species? Tick appropriate. 1. Drought, 2. Lack/insufficient of seedlings, 3. Lack of quality seedlings, 4. Insufficient land, 6. Pests and diseases, 7.

Livestock problem, 8. Lack of knowledge on tree planting/lack of technical skills, and 8. Others mention.

25. How do you think these challenges (mentioned above) can be addressed?

26. Are you willing to be involved in indigenous tree planting activities? _____1. Yes, 2. No. If yes Which activity, are they willing. 1.Nursery establishment, 2. training, 3. planting etc if no why?

27. What is the level of agreement that you feel a personal responsibility to plant and protect indigenous tree species? _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

28. What is the level of agreement that you are willing to participate in community initiatives/project/programes aimed at planting indigenous trees? _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

29. What is the level of agreement that planting indigenous tree species should be a priority in our area? _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

30. What is the level of agreement that the local government is doing enough to promote the planting of indigenous trees? _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

31. What is the level of agreement that you would encourage others in your community to plant indigenous trees? _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

C. INFUENCE OF LAND TENURE ON THE PRACTISE OF INDIGENOUS TREE PLANTING

32. What are the ways of acquiring land for planting trees in the area? _____1. Purchase, 2. Rent, 3. Clearing Forest, 4. Given by village government, 5. Others (specify)_____

33. Do you own title or certificate?

34. How do you perceive the current land tenure system? _____1. very good, 2. good, 3. bad

35. Does land tenure affect your decision in planting indigenous tree species? ____1. Yes, 2. No. If yes how?

36. In what ways do you think land tenure affects your decision to plant indigenous trees?

37. Do you believe that people who have secure land tenure are more likely to plant indigenous trees? _____ 1. Yes, 2. No. I not why?

38. Have you ever experienced or heard of any conflicts over land that affected the planting or protection of indigenous trees? _____1. Yes, 2.No. If yes mention them_____

39. What changes, if any, do you think should be made to the land tenure system to encourage more indigenous tree planting? _____

40. Are there specific cultural or societal norms that limit women's rights to own or use land for tree planting? _____

41. What are the main challenges women face in accessing land for tree planting in your area?

42. Who holds the rights to indigenous trees planted on individual land?

43. What legal or customary frameworks govern tree tenure and the harvesting of trees on privately owned or rented land?

44. I believe that secure land tenure is essential for encouraging the planting of indigenous trees. _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

45. Land tenure issues in this community make it difficult to commit to long-term tree planting projects. _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

46. People without formal land ownership are less likely to invest in planting indigenous trees. _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

47. I feel confident planting indigenous trees on my land because I have secure tenure. _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

48. The current land tenure system in our community supports the sustainable planting of indigenous trees. _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

49. Land tenure disputes have negatively impacted indigenous tree planting efforts in this area. _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

D. TRENDS OF TREE PLANTING

50. Can you describe how the practice of planting indigenous trees has changed in this community over the last 30 years?

51. What factors do you think have contributed to the increase or decrease in indigenous tree planting over the years?

52. Have there been any events, policies, or programs in the last 30 years that have influenced indigenous tree planting in your area?

53. Can you recall any traditional practices or customs related to tree planting that have changed or been lost over the past 30 years?

54. How many indigenous trees have you or your household planted in the last 5 years? 10 years? 30 years?

55. What percentage of your land was dedicated to indigenous tree planting 30 years ago compared to now?

56. Are you willing in the future to plant indigenous tree species? _____ 1. Yes, 2. No. If yes which kind of indigenous tree species, are you willing to plant? If no why?

57. The practice of planting indigenous trees in this community has significantly increased over the past 30 years. _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

58. The number of indigenous trees planted annually in this community has remained consistent over the last 30 years. _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

59. Government policies have positively influenced the trend of indigenous tree planting in the last three decades. _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

60. Community awareness and involvement in indigenous tree planting have increased over the last 30 years. _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

61. Economic factors have played a significant role in the trend of indigenous tree planting over the past 30 years. _____1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

62. Do you have plan to plant indigenous trees in the future? If yes why and if no why, Type of species are you plan to plant?

63. Are you willing to plant indigenous trees species if your not willing why?

APPENDIX 2: INTERVIEW GUIDE FOR FOCUS GROUP DISCUSSION

PERCEPTIONS AND ATTITUDES TOWARDS INDIGENOUS TREE SPECIES

1. What do you think about indigenous tree species compared to exotic tree species?

2. How important are indigenous trees to you and your community?

3. What benefits do you believe indigenous tree species provide to the environment and community?

4. Are there any specific indigenous tree species that are particularly valued or preferred in this community? Why?

5. How communities perceive the ITS in terms ownership, benefits and biodiversity conservation?

INDIGENOUS TREE TRENDS

6. How has the practice of planting indigenous trees evolved in your community over the last 30 years? Encourage participants to discuss and compare their observations.

7. What periods saw the most significant increase or decrease in tree planting, and why? Identify specific periods of change and discuss underlying reasons. (Historical trends)

8. How do you see the future of indigenous tree planting in the community? Explore expectations and plans for the future.

APPENDIX 3: INERVIEW GUIDE FOR KEY INFORMANT

PERCEPTIONS AND ATTITUDES TOWARDS INDIGENOUS TREE

SPECIES

1. What do you think about indigenous tree species compared to exotic tree species?

2. How important are indigenous trees to you and your community?

3. What benefits do you believe indigenous tree species provide to the environment and community?

4. Are there any specific indigenous tree species that are particularly valued or preferred in this community? Why?

INDIGENOUS TREE TRENDS

5. How has the practice of planting indigenous trees evolved in your community over the last 30 years?

6. What periods saw the most significant increase or decrease in tree planting, and why? Identify specific periods of change and discuss underlying reasons.

7. How do you see the future of indigenous tree planting in the community? Explore expectations and plans for the future?

8. Number of tree nurseries with ITS established in the study areas?

9. NGOs and other organization promote ITS in the study areas?

APPENDIX 4: OBSERVATION SCHEDULE

1. Type of tree species planted in the individual farms

2. Places where the tree planted

3. Layout of tree in farms plot

4. Dominated species in the farms

5. Dominated species in the nurseries

APPENDIX 5: UNIVERSITY RESEARCH CLEARENCE LETTER

THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION SCIENCE AND TECHNOLOGY

THE OPEN UNIVERSITY OF TANZANIA

Ref. No OUT/ PG201900293

5ᵗʰ September, 2024

District Executive Director (DED).

Muheza District Council

P.O Box 754.

TANGA.

Dear Director,

RE: RESEARCH CLEARANCE FOR MR. EMMANUEL R. LYIMO, REG NO:
PG201900293

2. The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1ˢᵗMarch 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1ˢᵗJanuary 2007.In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

3. To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you **Mr. Emmanuel R. Lyimo, Reg.No: PG201900293),** pursuing **Master of Arts in Natural Resource Assessment and Management (MANRAM).** We here by grant this clearance to conduct a research

titled "**Assessing Local Community's Perceptions on the Planting of Indigenous Tree Species: The Case of Muheza District in Tanzania**". He will collect his data at your area from 6th September 2024 to 30th November 2024.

4.   In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O.Box 23409, Dar es Salaam. Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours sincerely,

THE OPEN UNIVERSITY OF TANZANIA

Prof.Gwahula Raphael Kimamala

For: **VICE CHANCELLOR**

APPENDIX 6: MUHEZA DISTRICT RESEARCH PERMIT LETTER

THE UNITED REPUBLIC OF TANZANIA
PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
MUHEZA DISTRICT COUNCIL

Office of District Executive Director
4, Bomani Road,
P.O. BOX 20,
21402 MUHEZA-TANGA

Plz. On Reply, Mention;

7th September 2024.

Ref: No. MUH/ DC/S.80/ 97

VICE COUNCELLOR,
THE OPEN UNIVERSITY OF TANZANIA,
P.O. BOX 23409,
DAR ES SALAAM.

**REF: RESEARCH CLEARANCE FOR MR. EMMANUEL R. LYIMO; REG. No.
PG201900293**

The caption above is aforementioned for your reference. Remember your letter with a Ref. No. OUT/PG201900293 dated 5th September 2024 with the caption aforementioned above.

Muheza District Council has granted a permission to the researcher in order to enable him to meet and talk to the leaders and other relevant stakeholders who are found to his research area in connection with his research titled **"Assessing Local Community's Participation on the Planting of Indigeous Tree Species: The Case Study of Muheza District in Tanzania"**.

The researcher should abide to the research laws, principles and ethics for all the time when is conducting his research. He should also notify the Wards and Village Leaders to all areas of his interest for his research before going to the field to meet with his identified respondents.

"Muheza District Council reminds the researcher to report to the Muheza District Council Head Quarters at Bomani before going to the field to conduct his research. It also wishes him a good research.

For any case of emergency, the researcher should communicate immediately with the District Natural Resources and Environmental Conservation Officer, DNECO, through the mobile phone number +255 789 182 193, in order to settle the dispute emerged.

Yours sincerely.

MSUMARI I.S. MSUMARI
FOR: DISTRICT EXECUTIVE DIRECTOR
MUHEZA DISTRICT COUNCIL

FOR DISTRICT EXECUTIVE DIRECTOR
MUHEZA