TOWARDS SUSTAINABLE FOREST MANAGEMENT IN TANZANIA: ANALYSIS OF THE EFFECTIVENESS OF THE NATIONAL FOREST POLICY AND ITS IMPLICATIONS FOR THE FORESTS AND PEOPLE OF UNITED REPUBLIC OF TANZANIA

A CASE STUDY OF RUFIJI DISTRICT, SOUTHERN TANZANIA

by
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ABSTRACT

Sustainable forest management (SFM) is crucial for the socio-economic development of forest-rich communities. Given its abundance of forest resources, Tanzania has adopted forest policy strategies that aim to enhance SFM through the active engagement of rural communities in forest management. Despite policy progress, Tanzania's forest sector continues to face several institutional and policy implementation challenges. Using a qualitative case study approach and the DPSIR framework, this study critically examined forest policy gaps impeding sustainable forest management in the Rufiji district of Tanzania. Data were obtained through document reviews, a workshop and semi-structured interviews with experts in the forest sector. The study found that existing forest management strategies do not adequately address key drivers of forest loss thereby hindering SFM progress in the country. Additionally, although the forest sector offers enormous opportunities to improve livelihoods and local economies, the lack of market-based policy instruments is a major barrier.

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List of Abbreviations and Symbols

CBFM	Community-Based Forest Management
DNA	Deoxyribonucleic Acid
DPSIR	Driver-Pressure-State-Impact-Response
DRC	Democratic Republic of Congo
ESRF	Economic and Social Research Foundation
EU	European Union
FAO	Food and Agriculture Organization
FBD	Forestry and Beekeeping Division
FSC	Forest Stewardship Council
GDP	Growth Domestic Product
GIZ	Gesellschaft für Internationale Zusammenarbeit
GPS	Global Positioning Systems
IIED	International Institute for Environment and Development
IUCN	International Union for Conservation of Nature
IPCC	The Intergovernmental Panel on Climate Change
JFM	Joint Forest Management
JFMA	Joint Forest Management Arrangement
LAFR	Local Authority Forest Reserve
LEAT	Lawyers Environmental Action Tanzania
MAFC	Ministry of Agriculture Food Security and Cooperatives
MCDI	Mpingo Conservation Development Initiative
MNRT	Ministry of Natural Resources and Tourism
MJUMITA	Mtandao wa Jamii wa Usimamizi Misitu Tanzania
MKUKUTA	Mkakati wa Kukuza Uchumi na Kupunguza Umaskini Tanzania
NFP	National Forest Policy

NGOs	Non-Government Organizations
NSGRP	National Strategy for Growth and Reduction of Poverty
PAI	Population Action International
PFM	Participatory Forest Management
PMO-RALG	Prime Minister's Office-Regional Administration and Local Government
PRB	Population Research Bureau
REA	Rural Energy Agency
SFM	Sustainable Forest Management
TFCG	Tanzania Forest Conservation Group
TFS	Tanzania Forest Service
UN	United Nations
UNEP	United Nations Environment Programme
UNCTAD	United Nations Conference on Trade and Development
USD	United States Dollar
URT	United Republic of Tanzania

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CHAPTER ONE: INTRODUCTION

1.1. General Introduction

Globally, forests cover more than 30 percent of the earth; they are the lungs of the earth, releasing oxygen into the atmosphere and hence providing life to various species including humans (WWF, 2011). Forests also account for 75 percent of the gross primary productivity of the earth's biosphere and contain 80 percent of the earth's plant biomass (Keenan et al., 2015). In terms of distribution, Asia and South America host more than half of the world's forest resources (Pan et al., 201t3). Data from the Food and Agriculture Organization (2013) show that the world's forests is unequally distributed. For instance, although the majority of the world's forests is in Asia and Europe, there is also significant share of the global forest in South, North and Central America region (FAO, 2013). Likewise, Africa also has a substantial forest coverage of about 17 percent of the global forests (Keenan et al., 2015). The continent's forests, which mainly include tropical and sub-tropical forests, cover 30 percent of Africa's land (FAO, 2010; UNEP, 2015).

Economically, forests are highly significant to the world; they contribute about 600 billion United States Dollars (USD) to the global economy and create more than 50 million jobs worldwide (World Bank, 2016). For many African countries such as Cameroon, Democratic Republic of Congo (DRC) and the United Republic of Tanzania, forests are an integral part of their economy. The United Nations Environment Programme (UNEP) has described Africa's forests as a "foundation for growth and development of Africa's green economy" (UNEP, 2015, p.7). Furthermore, forests serve as a major source of energy worldwide. For example, about 13 percent of households in Latin America and the Caribbean, 5 percent in Asia and more than 27 percent in Africa meet their cooking energy needs from forests (FAO, 2014). More importantly, more than 600 million Africans use wood and charcoal for cooking, and this number is projected to increase

due to ongoing population growth in the region (UNEP 2015; World Bank, 2012). For example, in Tanzania, firewood and charcoal remain primary energy sources for cooking with more than 90 percent of urban households using charcoal for cooking (World Bank, 2009). Unlike most parts of the world, in Europe and North America, forests offer indoor heating during winters (FAO, 2014).

Forests also play a critical role in sustaining other global natural resources including water sources and wildlife (Miura et al., 2015). In Africa, the majority of catchment forests ensure clean drinking water and provide habitats for biota including the globally recognized endangered species remaining in the region (WWF, 2011). Similarly, these environmental services offer several socio-economic benefits to people in Africa particularly the rural majority (UNEP, 2015). For example, recent study from the United Nations Conference on Trade and Development (UNCTAD, 2017) has shown that tourism activities have improved local economies in the majority of African countries. Additionally, more than 1 billion people depend on forests for a living, and the majority of these are in Asia and Africa (FAO & World Bank, 2007).

Other significant functions of forests include reducing the global impact of climate change (FAO, 2016; WWF, 2015). Through this function, African forests have been recognized as a major source of "carbon storage of the world" (UNEP, 2015, p.15). Although the continent forests offer multiple ecological and economic benefits to its communities, particularly the rural majority; yet, they remain vulnerable and subjected to increasing human pressure and degradation due to weak management (FAO, 2016). Consequently, today Africa losses more forests than any other region in the world and their sustainability is in question. It is thus crucial to understand how forest policies in use by African states can be strengthened to sustain forest resources and improve the livelihoods of those that depend on them.

1.2. Forestry Sustainability Challenges in Africa

Avoiding the degradation of Africa's forests has become a global sustainable development concern. A recent report from FAO (2015) shows that between 2010-2015, over 6.6 million ha of Africa's forests were lost annually (p.3). One of the primary causes of this significant loss is the subsistence agriculture practiced by the majority of the continent's rural communities (Ickowitz et al., 2015). Other leading drivers of deforestation in the region include overreliance on wood fuel for cooking, illegal harvesting and weak forest governance (World Bank, 2005; Chakravarty et al., 2012). Evidence from a number of studies confirms that agriculture (commercial and subsistence) is the principal driver of the rapid decline of forests, accounting for over 70 percent of global deforestation (FAO, 2016; EU, 2010; Chakravarty et al., 2012; Kissinger et al., 2012).

The Food and Agriculture Organization (FAO) states that in Africa, the subsistence agriculture practiced by the rural majority has serious impacts on the continent's forest sector (FAO 2007; FAO, 2016). For instance, about 60 percent of farmland in Africa has been transformed from natural forests to meet the food demands of the growing rural population (GIZ, 2013; FAO, 2016). In her study, Kairuki (2011) notes that Africa's forests will continue to be under pressure from agriculture due to increased land use and needs from within and outside the region. Likewise, Ickowitz et al., (2015) contends that traditional farming practices employed by smallholder farmers in Africa will continue to cause substantial forest losses on the continent.

Furthermore, overreliance on wood fuel for cooking also contributes to the substantial loss of forests in the region (FAO, 2010, Boucher et al., 2011 & World Bank, 2011). A recent report by the FAO (2017) confirms this, pointing out that much of the wood collected globally is used to make the charcoal needed by households in towns and cities of Africa. In addition, further evidence shows that charcoal use remains the primary threat to forest sustainability on the continent (World

Bank, 2005; Chakravarty et al., 2012). This is attributed to unsustainable production practices employed by the majority of charcoal traders in the region (FAO, 2017). For example, a study by Malimbwi et al. (2002) found that the charcoal industry is a key barrier to sustainable forest management. This is because larger portion of forests are being logged for charcoal production (Malimbwi et al., 2002). Unfortunately, with low access to electricity and other alternative energy sources, charcoal use will continue to be a major challenge to the continent's forest sector. This emphasizes the need to understand and explore sustainable approaches that could enhance the sustainable management of Africa's forests (World Bank, 2011).

Studies confirm that adapting to sustainable charcoal making offers several environmental and socio-economic benefits while also significantly addressing the challenges associated with charcoal production (World Bank, 2005; FAO, 2017). However, realizing these benefits will require governments to create an enabling environment with policies that respond to the needs and challenges of the charcoal sector. Such policies need to transform charcoal industry by putting in place incentives for charcoal traders to adopt and use sustainable and efficient charcoal making technologies (World Bank, 2009). Evidence confirms that such incentives offer both environmental and economic benefits to country's local economies (FAO, 2017). Yet, policymakers and development planners in Africa often overlook the socio-economic significance of the charcoal sector (Mayers, 2007). For example, data from the World Bank (2011) estimates that the charcoal sector in Sub-Saharan Africa to be worth 8 billion United States Dollars (USD), with the potential to create steady jobs in the region (World Bank, 2011, p. ix). However, due to slow policy reforms such as lack of incentives to boost the sector and weak institutional structures, the economic contribution of the charcoal industry has remained low.

Meanwhile, increases in greenhouse emissions resulting from wood fuel consumption, illegal logging, and weak forest governance structures also pose significant threats to forest sustainability in the region. For instance, a study by Hoare (2015) in Cameroon disclosed that half of the timber harvested in the country was smuggled without government permits, leading to revenue loss. Similar challenges have been reported in other African countries including Tanzania, Democratic Republic of Congo (DRC) and Gabon (Simon et al., 2007, WWF, 2013, Lawson, 2014). This suggest that addressing these challenges requires institutional reforms, land use plans, and forestry policies that offer clear directives and regulations to limit over-extraction and the unsustainable utilization of forest resources in the region (World Bank, 2011).

1.3. Forestry Sustainability Challenges in Tanzania: The Case of Rufiji District, Southern Tanzania

Rufiji district is one of Tanzania's most significant conservation areas. It is home to various plant species, the majority of which are threatened (WWF, 2006). The district hosts more than half of the coastal and mangrove forests of East Africa (Burgess & Clarke, 2000; Taylor et al., 2003). Given its biodiversity significance, the coastal district has received national and global conservation attention, with calls to sustain the district's environmental resources, particularly its forests. Over the years, Tanzania's Ministry of Natural Resources and Tourism (MNRT) has initiated forest management programs to strengthen conservation and forest management in the region. Such programs include *Rufiji Environment Management Project (REMP), Coastal Forests Management Program* and *Mama Misitu;* these interventions were implemented from 1990s to late 2000s advance forest conservation and protection in the region (MNRT, 2012).

Likewise, there has also been significant attention and support given to the protection and management of the districts forests. For instance, for decades the region through MNRT has

received enormous technical and funding support from local and international conservation organizations such as World Wide Fund for Nature (WWF), The International Conservation Union (IUCN), Care International and others (WWF, 2006, MNRT, 2009). More importantly, the majority of these programs set the stage for Tanzania's forest policy framework of decentralization, which emphasizes empowering communities to manage community-based forests (URT, 1998). Consequently, more than 125,346 ha of Rufiji's forests have been under central government forest management and 18,807 ha have been under village management through Community-Based Forest Management (CBFM) (WWF, 2011). Tanzania's CBFM and other forest management strategies have been commended as a model for sustainable forest management in Africa (Blomley & Ramadhani, 2009). This is because, under the CBFM arrangement, forest-rich communities are entitled to plan and manage their forest resources with limited intervention from the central government (Mniwasa & Shauri, 1998). Despite this praise, studies indicate the policy has achieved little progress in controlling deforestation at the community level (Blomley & Ramadhani, 2009; Milledge et al., 2007). This is because local governments and communities continue to experience significant forest governance challenges (Blomley & Ramadhani, 2009). This creates an urgent need to assess the contribution of forest policies in improving forest management and livelihoods at the local level. Therefore, this study attempts to analyze the effectiveness of Tanzania's national forest policy and its implications for enhancing sustainable forest management at the community level.

For these reasons, Rufiji district provides an excellent case study to understand the gaps between policy and practice and how these gaps might be addressed. Further, despite several forest conservation and management efforts, forest resources in the southern region of Tanzania have been described as the most degraded forest region in the country (Miya et al., 2012). Similarly,

charcoal making, traditional farming practices such as shifting cultivation and the unsustainable utilization of forest resources have remained enormous challenges to the district forest sector (CAMCO, 2009). This is attributed to a weak institutional framework that fails to enforce forest regulations or deliver forestry extension services at the community level (Milledge at al., 2007). For this reason, the study uses a DPSIR (Drivers–Pressures–State Change–Impact–Response) framework to investigate forest policy implementation challenges and identify gaps that limit the progress of SFM at the community level. Ultimately, the study will present recommendations for strengthening SFM and helping policymakers in Tanzania develop policies that respond to current sustainability challenges.

1.4. Sustainable Forest Management in Tanzania

For decades, the government of Tanzania through the MNRT has initiated several forest management strategies to control forest loss and degradation. The National Forest Policy of 1998 actively promotes sustainable forest management through the active engagement of rural communities (MNRT, 2001). The MNRT implements CBFM and JFM strategies that seek to enhance benefit sharing and collaboration between government and local communities (MNRT, 2001). These strategies commonly encompass Participatory Forest Management (PFM) practices and similar forest management strategies have also been employed in other parts of the world such as India and Nepal (Hobley, 1996). Evidence shows that Tanzania's forest management strategies including PFM and others have been generally effective with improvements in forest protection across the country. According to an MNRT report (2012), more than 7 million hectares of natural forests are protected (MNRT, 2012, Figure 1). Additionally, there are about 80 districts and more than 2000 villages engaged in PFM and other forest management strategies (MNRT, 2012, Figure 2).

Although progress has been to improve forest management in Tanzania, there are still institutional challenges affecting sustainable management of forests. Evidence confirms that weak enforcement of forest control measures and the widespread degradation of forest resources remain critical barriers to SFM progress in the country (Milledge et al., 2007, p.4). Studies show that Tanzania has one of the highest forest losses on the continent (FAO, 2015, Kajembe et al.,2015). Recent figures from the United Nations Food and Agriculture Organization (FAO) shows in less than a decade, the country lost about 372,000 hectares of its forests (FAO, 2015, p.16). Likewise, illegal logging and weak government controls on the trade of forest products have significantly affected the sector's contribution to the economy (WWF, 2013, Milledge et al., 2007). It hs been reported that between 2012 and 2013, Tanzania lost 6.8 billion shillings (equivalent to US$2.4 million) which could have helped to boost the country's economy (WWF, 2013, p. 2). To address these challenges, the government has implemented sustainable forest management strategies guided by the national forest policy of 1998.

The goal of Tanzania's Forest Policy of 1998 is to ensure sustaimable forest management (URT, 1998). Realizing this goal, the policy calls for the active engagement of communities in the forest management process. These engagements include local governments co-managing forest resources with the communities and giving land use rights to communities by establishing Village Land Forest Reserves (VLFRs) at the community level (Blomley et al., 2008, p.3). Despite these policy actions, several challenges persist in Tanzania's forest policy framework. They include weak coordination, staffing and financial constraints, and unclear benefits to the community for conserving forests (Blomley & Iddi 2009; Petersen & Sandhovel, 2001; Banana et al., 2011). This calls for the need for understanding and finding solutions to these challenges and policy gaps that limit Tanzania's progress in achieving Sustainable Forest Management (SFM). Understanding

these challenges would help policymakers in Tanzania and beyond design and enforce policy actions that respond to community needs and the sustainable management of forest resources (Odera, 2004, p.62).

1.5. Research Objectives

The research objectives of this study are:

1. To identify forest policy gaps that affect sustainable forest management in Tanzania.
2. To examine factors that limit the effective implementation of forest policy instruments (Performance Policy Measurement).
3. To provide recommendations for effective forest policy implementation.

1.6. Research Questions

The key research questions of this study are:

1. Using the DPSIR Framework analyses; what are the key Drivers, Pressures, States, Impacts, and Responses to forest degradation and unsustainable forest management in Rufiji district?
2. What policy gaps exist and how do they limit the implementation of forest policy in Rufiji district?
3. What policy actions, if implemented, would strengthen sustainable forest management in Rufiji district?

1.7. Thesis Organization

This thesis is organized into six chapters. Chapter One introduces the study context. Chapter Two provides an overview of Tanzania's forest sector, followed by a detailed review and analysis of DPSIR components relevant to the study. Chapter Three presents methods and techniques used in conducting this study. Chapter Four describes and presents study findings on the key issues that emerged from the study workshop and interviews. Chapter Five discusses policy

recommendations to address policy gaps and implementation challenges. Finally, Chapter Six presents conclusions and recommendations on areas for further research to advance knowledge on forest policy issues and SFM in Tanzania.

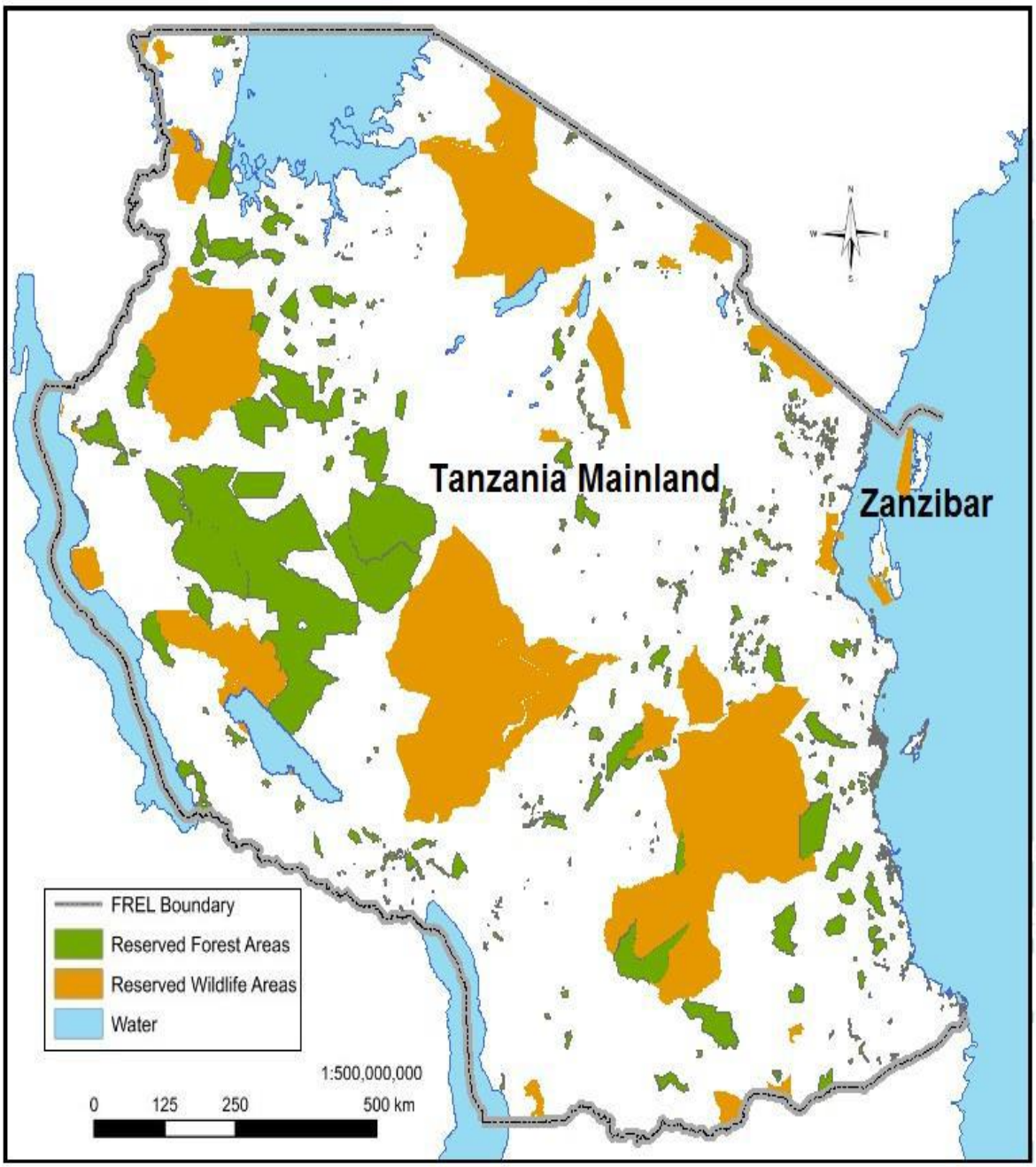


Figure 1: Forest Reserves in Tanzania

Source: URT, 2016

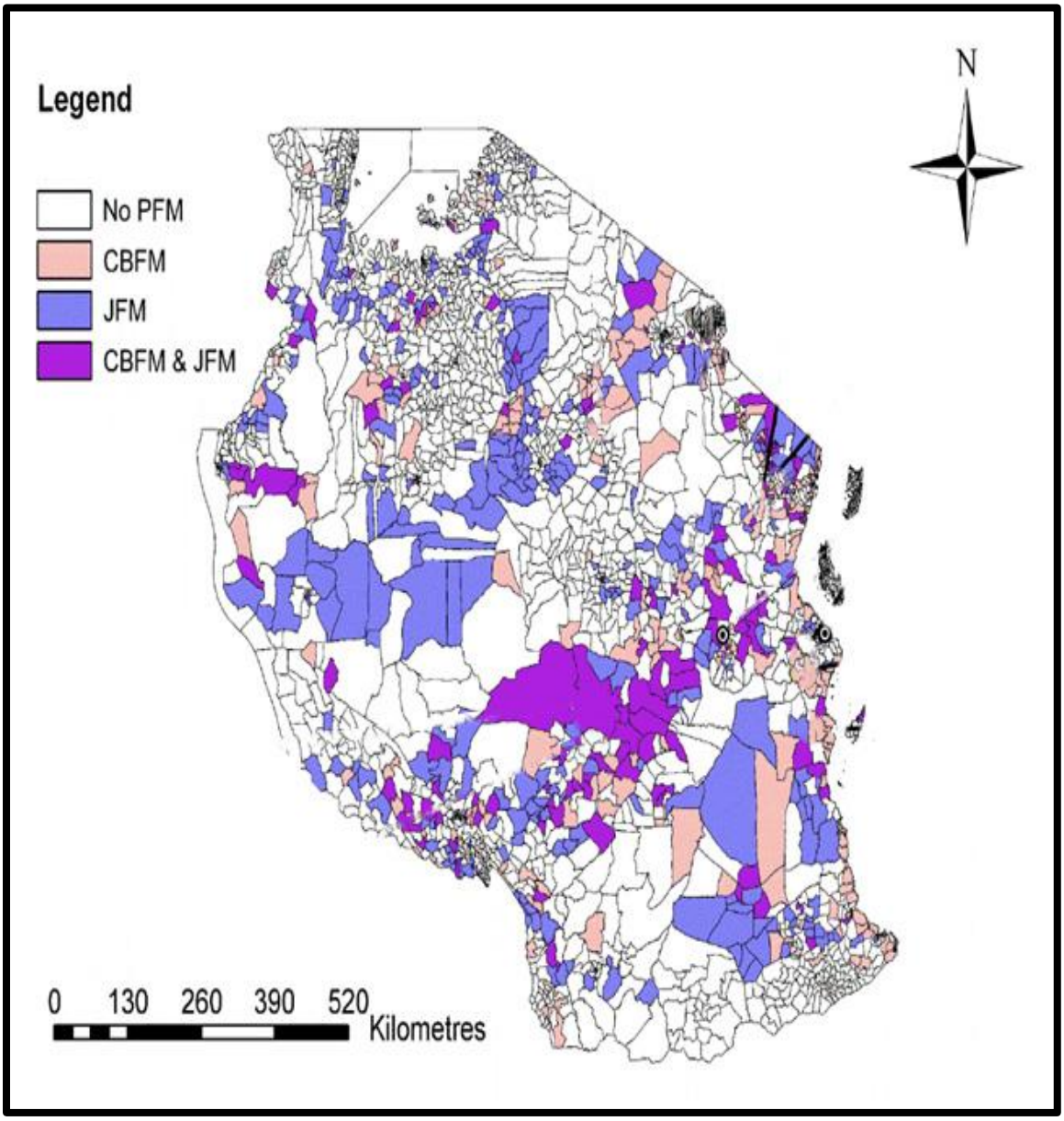


Figure 2: Spatial Distribution of PFM/CBFM/JFM Strategies in Tanzania

Source: MNRT, 2008

CHAPTER TWO: LITERATURE REVIEW

2.1. INTRODUCTION

This thesis examines forest policy implementation challenges in Tanzania. The purpose of this chapter is to explore the contributions made by researchers on forest policy and sustainable forest management agenda. The topics for discussion include forest governance, sustainable forest management, and forest policies with a focus on the United Republic of Tanzania. In this thesis, the term "forest governance" will be widely used because it is linked to sustainable forest management. A brief explanation of the term forest governance and its relationship to sustainable forest management is presented in section **2.2.1**. Further, this chapter also provides an overview of the forest sector and forest resources of the United Republic of Tanzania, which is a focus of this study. Additionally, using the Driver-Pressure-State-Impact-Response (DPSIR) as a conceptual framework for the study, this literature review also includes a comprehensive look of what drives forest loss in Tanzania, the pressures, environmental and socio-economic impacts of forest degradation. Through the evaluation of the DPSIR approach, the literature review also outlines the type of actions (policy responses) taken by the government of Tanzania to control the environmental impacts and pressures resulting from forest degradation. A detailed explanation of the application of the DPSIR framework in this study is discussed in this chapter and the methodology section. Through this literature review, the researcher hopes to contribute knowledge, help policymakers in Tanzania, and beyond understand how several factors affect effective forest policy implementation.

2.2.1. Forest Governance and Sustainable Forest Management

Studies confirm that good forest governance is an essential ingredient for sustainable forest management (Counsell, 2009; Sekeleti, 2011; AFDB, 2018; FAO, 2012). For decades, various scholars have described the term forest governance differently when discussing sustainable forest management. In this thesis, the researcher will use the general description of forest governance provided by the Food and Agriculture Organization (FAO). According to FAO (2012), forest governance implies "the way in which people and organizations rule and regulate forests" (p.10). It involves "policy and planning, implementation, monitoring, and improvement, including the related legislative and institutional arrangements" (FAO, 2012, p. 7). To achieve good forest governance, governments must consider the five key ingredients of governance, which include accountability, effectiveness, efficiency, fairness or equity, participation, and transparency (FAO, 2011 p.10). For better outcome, these pillars must be integrated with good policies, institutional structures, decision-making, enforcement and compliance of rules set by the government (FAO, 2011). Considering the overall purpose of this study to examine the effectiveness of forest policies in Tanzania, the FAO description on forest governance underpins the objectives of this research. Similarly, as this study uses case study approach, the FAO's explanation on forest governance also provides a good baseline for evaluation of forest policies and programs implemented by the government of Tanzania in Rufiji district, which is a focus of the study.

2.2.2. Forest Resources of United Republic of Tanzania

Tanzania is one of the forest-rich nations in Africa. It has two major forest types, which include natural and plantation forests (URT, 2009). The natural forest ecosystem is largely dominated by miombo woodlands, comprising of dry and wet woodlands (URT, 2013a). According to the Ministry of Natural Resources and Tourism (MNRT), out of the 30 million

hectares of natural forests of Tanzania, more than half are miombo woodlands (MNRT, 2001). These woodlands compose rich and diverse tree species covering the majority of the nation's forestland (UNEP, 2015; URT, 2013a). Such tree species include caesalpinioideae, shrubs, and grasses, largely available in the north and south of the country (Kajembe et al., 2015). Ecologically, miombo woodlands offer several environmental services to people and wildlife. For instance, the dry miombo woodlands with species such as acacia, combretum, and commiphora play the significant role to support the life of animal species as wildlife habitat (URT, 2009).

Tanzania also possesses the largest share of mangrove forests in Africa (Bregnballe et al., 1990). There are more than 10 species of mangrove forests available in both mainland and Zanzibar (Muhando & Rumisa, 2008, **Table 1**). More importantly, mangroves are the primary habitat of several marine species (URT, 2009, Muhando & Rumisa, 2008). While the mainland hosts the majority of mangroves, the island of Zanzibar (which is also part of Tanzania) accommodates substantial forest coverage including East Africa's coastal forests (UNDP, 2009). Other forest types available in Tanzania include montane forests widely distributed in the north and east of the country. Like other forest types, montane forests provide ecological and livelihood benefits to the rural communities (UNEP, 2015). For instance, nearly all major rivers in the country depend on montane forests as a primary source of water (URT, 2009). Additionally, montane forests provide habitat to more than 100 animal and plant species available in Eastern Arc Mountains that extend beyond Tanzania (URT, 2009). Recently, the sustainability of montane forests of Tanzania has been a global conservation agenda due to increased human pressure on this forest ecosystem (UNEP, 2015, Lusambo et al., 2007).

In Tanzania, forest resources are also the safety nets for both rural and urban livelihoods (UNEP, 2015). In particular, forests offer several economic and environmental services

particularly to rural communities; such services include wood products, water catchment, food and medicines (MNRT, 2008). Economically, the forest sector employs about 3 million people and is worth $2 billion equivalent to 20 percent of the nation's Growth Domestic Product (GDP) (Ngaga, 2011 & MNRT, 2008). Despite these ecological and economic benefits, much of Tanzania`s forests have limited protection and hence are exposed to human encroachment and destruction. Consequently, more than 10 million ha of Tanzania's forests remain unreserved and lack proper management, thus vulnerable to widespread deforestation (MNRT, 2008 & Akida et al., 2012).

Table 1: Mangrove Forest Species of Tanzania

No	Tree species	Family	Local Name
1.	Avicennia marina	Verbenaceae	Mchu
2.	Bruguiera gymnorrhiza	Rhizophoraceae	Msinzi or uia
3.	Ceriops tagal	Rhizophoraceae	Mkandaa
4.	Heritiera littoralis	Sterculiaceae	Msikundazi or Mkungu
5.	Lumnitzera racemosa	Combretaceae Kikandaa	Kikandaa or mkandaa Dume
6.	Rhizophora mucronata	Rhizophoraceae	Mkoko
7.	Sonneratia alba	Sonneratiaceae	Mililana
8.	Xylocarpus granatum	Meliaceae	Mkomafi
9.	Xylocarpus molluccensis	Meliaceae	Mkomafi Dume
10.	Pemphis acidula	Lythraceae	Mkaa Pwani

Source: Muhando & Rumisa, 2008

2.2.3. Forest Governance and Management in Tanzania

Following the failure of the state control forest management approach in the late 1980s, Tanzania prioritized the engagement of local communities in forest management in its forest policy agenda (Blomley & Iddi, 2009). To control forest degradation, significant changes were made in the governance and management of the forest sector. Tanzania adopted a "decentralization" approach in which the central government directly works with district and village governments to manage forest resources at the community level (Akida et al., 2012. p.18). This approach was

guided by the National Forest Policy of 1998 and Forest Act of 2002 under the MNRT (URT, 1998; Blomley and Iddi 2009). Within the MNRT, two key forest management agencies play a significant role in the decentralization process: the Forestry and Beekeeping Division (FBD) and the Tanzania Forest Service (TFS) (Milledge et al., 2007).

At the national level, the FBD develops forest policy directives and regulations while the TFS in collaboration with central and local government institutions engages various stakeholders (mainly rural communities) in policy implementation processes (Milledge et al., 2007; Akida et al., 2012). For instance, at the central government level, TFS collaborates with the Ministry of Regional Administration and Local Government in the Prime Minister's Office (PMO-RALG) to initiate policy programs at the district level (Milledge et al., 2007). TFS collaboration with the PMO-RALG aims to engage and strengthen community participation in forest management at the community level. More importantly, under this institutional framework, two primary forest management strategies are implemented: Community-Based Forest Management and Joint Forest Management (Akida et al., 2012, MNRT 2001; Milledge et al., 2007).

For CBFM, villagers have the authority to plan and manage their community forest resources, which includes the right to establish Village Land Forest Reserves (VLFRs), which are recognized as independent forest management structures (Blomley & Iddi, 2009). Likewise, under JFM, the TFS and villagers co-manage forest resources beyond village boundaries; these include National Forest Reserves (NFR) or Local Authority Forest Reserves (LAFR) at the district level (Milledge et al., 2007; Blomley & Iddi, 2009, Akida et al., 2012). Tanzania's CBFM and JFM policy arrangements have been praised nationally and internationally. Studies suggest that these two forest management strategies have enhanced forest management at community levels,

particularly among forest-dependent communities clustered in rural areas (Odera, 2004, Kajembe et al., 2003).

2.2.4. Forest Policies and Sustainable Forest Management in Tanzania

The need to strengthen sustainable forest management through effective forest policy actions is not new in Tanzania. Soon after its independence, forest policy improvements became a development concern to improve Tanzania's socio-economic growth (Mgaya, 2016; WWF & IUCN, 2001). This was influenced by the widespread degradation of forest resources in rural areas and poor outcomes of pre-independence forest policies (URT, 1998). Nevertheless, in the 1990s, Tanzania adopted new political and economic ideologies such as multiparty democracy and market-based policies, which influenced the policy change agenda in many sectors including forestry (WWF & IUCN, 2001; Mgaya 2016). As a result, there is a need for a new forest policy that reflects these political changes and addresses national forest management challenges (Mgaya, 2016).

In the mid-1990s, national policy reform discussions were held, and the outcome was a new National Forest Policy (NFP) that was approved in 1998 (URT, 1998). The new policy provided optimism to the forest sector, particularly the introduction of Participatory Forest Management (PFM), which was and still is the primary key forest policy strategy in the country. Since its introduction, PFM has received mixed reactions among policymakers in and outside Tanzania, with some commending it for engaging the rural majority in forest resources management, while others arguing that it has done little to improve forest conditions (Blomley & Iddi, 2009). Despite the active engagement of rural communities in forest management through PFM arrangements, Tanzania's forest sector has continued to face several challenges that need to be addressed to strengthen sustainable forest management in Tanzania.

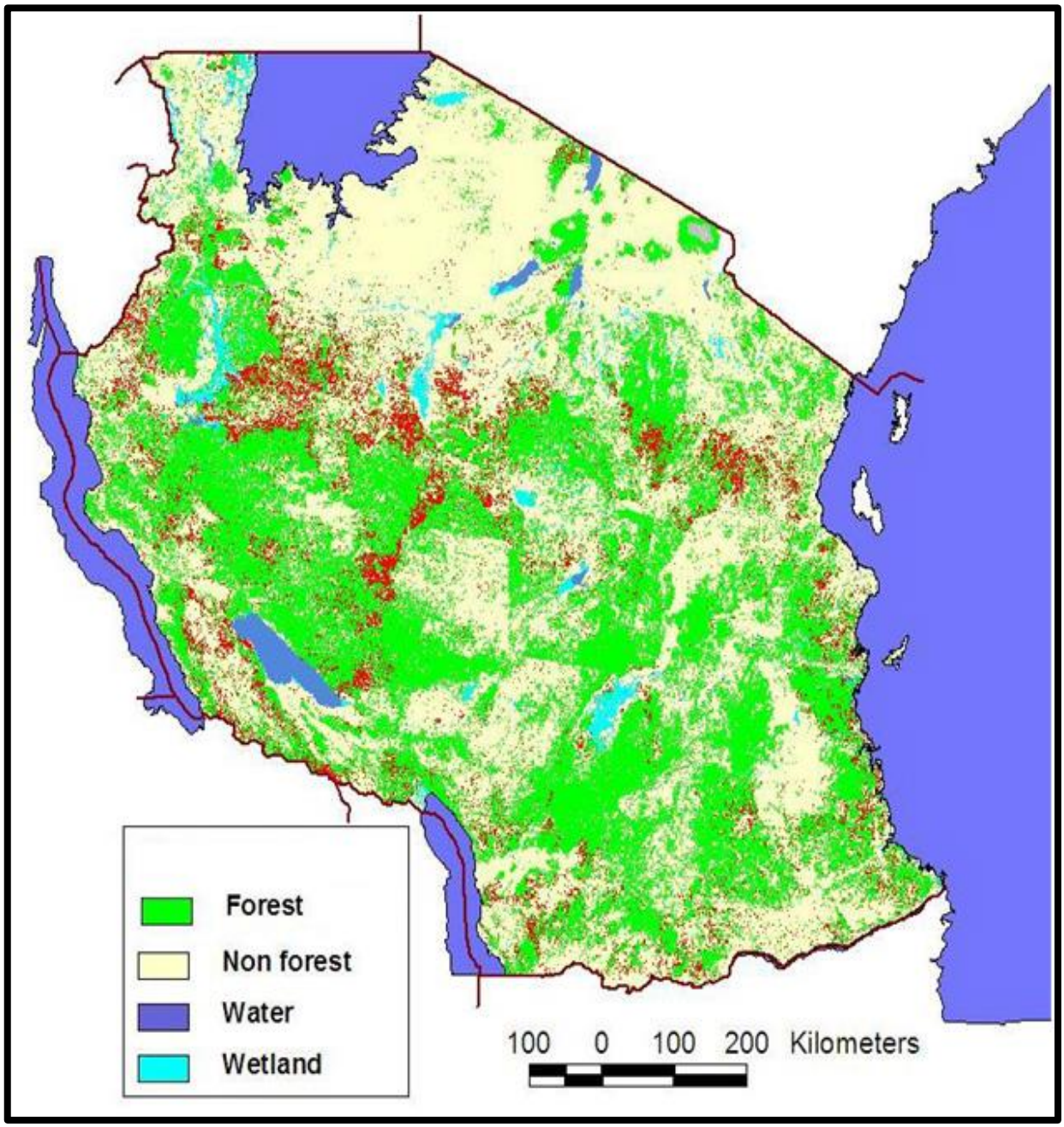


Figure 3: Mainland Tanzania Forest Coverage

Source: URT, 2016

2.2. DPSIR Analysis on Tanzania's Forest Sector: Sustainability and Policy Challenges

The study adopted the Driver-Pressure-State-Impact-Response (DPSIR) framework to understand and analyse the forest policy implementation challenges in Tanzania. For years, the DPSIR problem-solving and analytical approach has been used among scientists and researchers around the world. This is attributed to the DPSIR's methodology, which structures the problem through a systematic analysis of the five elements defined as D-P-S-I-R components illustrated in Figure 4 (Gari et al., 2015). In particular, DPSIR's popularity is due to its much strengths. First, using the DPSIR enables researchers and scientists to identify and demonstrate the interactions and interrelationships between human activities and the natural environment (Gari et al., 2015; Leka et al., 2005). Second, unlike other frameworks, the DPSIR framework is a multidisciplinary approach that can be used to examine and understand sustainability challenges at different levels (Gari et al., 2015; Hashemi et al., 2014). As result, the framework is one of the most reliable tools used by governments, organizations, and individuals to investigate and find solutions to global ecosystem and sustainability challenges (Leka et al., 2005).

Despite these strengths associated with the use of the DPSIR, it is worth noting that the framework has some weaknesses. For instance, one main criticism of the DPSIR framework is that it does not explain the community burdens resulting from the depletion of environmental resources (Svarstad et al., 2007). This is because the DPSIR framework mainly focuses on describing the forces or pressures causing the loss of ecosystem resources and gives little emphasis on social issues resulting from environmental loss (Svarstad et al., 2007, Niemeijer & De Groot, 2008). For example, the loss of forest resources has direct implications for the community's welfare such as water shortages, the time spent for wood collection and use or access to these resources (Hope, 2007). Due to this, scholars have found that the DPSIR lens to limit researchers' ability to

understand the integration of these societal problems and the environment (Svarstad et al., 2007; Potschin, 2009).

Recognizing such shortcoming, the expert opinion workshop was held with actors involved in the SFM process in Tanzania. The workshop sessions were meant to collect data on issues that could not be explained by DPSIR framework of analysis. When combined with other methods, workshops have proven to be beneficial to studies, where data are scanty (Kuhnert et al., 2010). In addition, considering that the focus of this study was examining forest policy implementation challenges, an expert opining workshop approach matched well with the DPSIR framework of analysis. This is because the DPSIR approach is recognized as an important tool for enhancing knowledge and communication between researchers and decision makers (Tscherning et al., 2012). Therefore, through the workshop, the researcher was able to collect information on issues that could not be obtained through the lens of DPSIR analysis, which enhanced research findings. Given the study objectives and the research questions, the framework is the most appropriate tool for this thesis. By using the DPSIR, the researcher hopes to identify factors that limit forest policy performance and provide a comprehensive analysis and understanding of forestry sustainability challenges in Tanzania. More specifically, the DPSIR framework was used in this thesis to discuss and address the following questions: 1) What is happening with forest resources in Rufiji and why; 2) What are the consequences towards SFM and people's livelihood (Impacts); 3) What has been done and how effective are current policy actions, strategies, and actions?

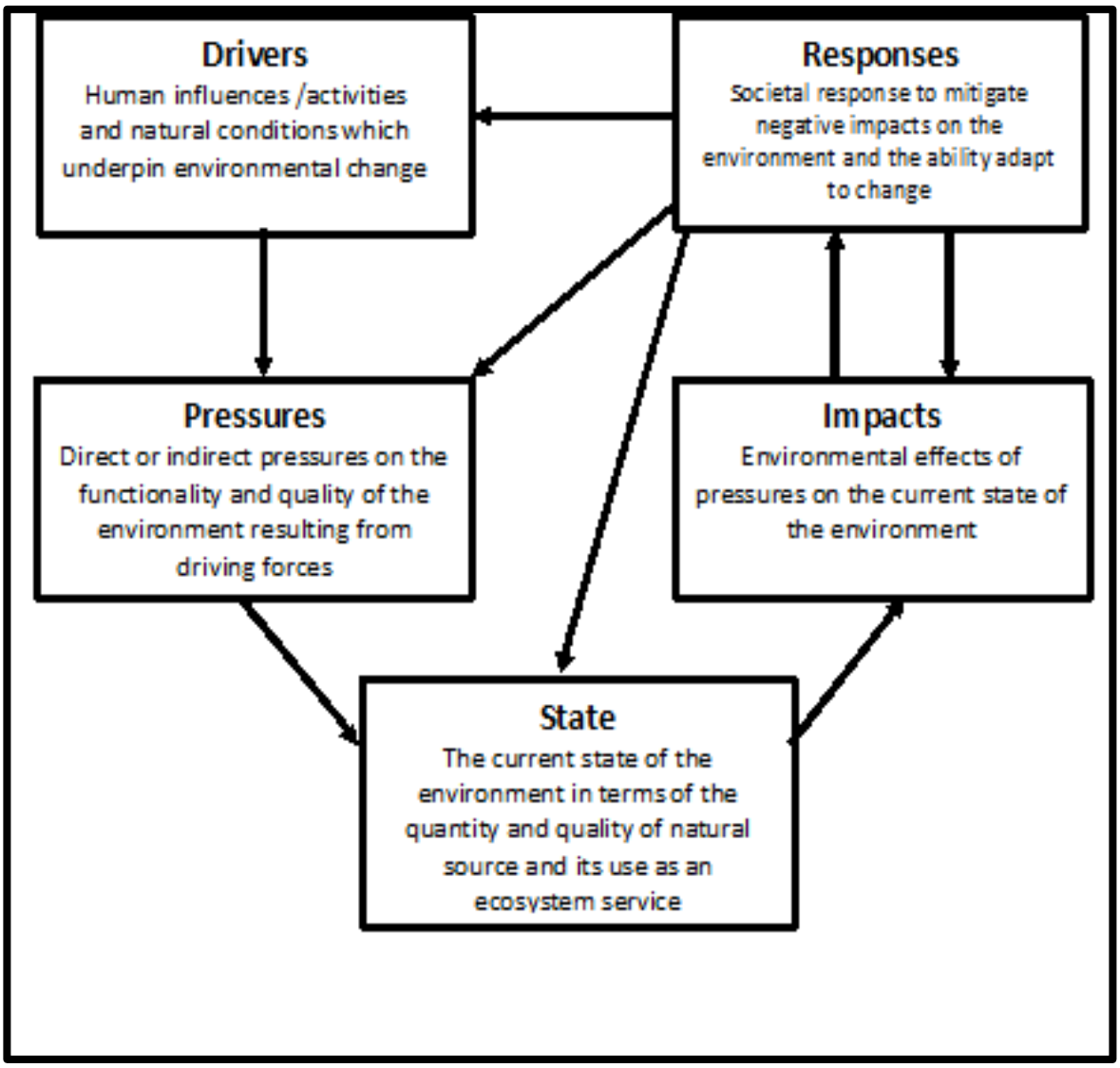


Figure 4: The DPSIR Framework
Source: Ramalho et al., (2014)

2.3. DRIVERS: What is Happening with Forest Resources in Tanzania and Why?

Drivers are described as the direct or indirect catalysts of changes in environmental conditions mainly as a result of socio, political, economic or environmental factors leading to pressure on ecological resources (Baldwin et al., 2016; Gessesew, 2017; Ramalho et al., 2014). In the context of this study, the following drivers (charcoal consumption, uncontrolled farming expansion and unregulated logging and timber business) have been identified as major contributors to rapid forest loss in Rufiji district. The next sections present and discuss these major drivers and their influence on forest loss in Tanzania and Rufiji district in particular.

2.3.1. Charcoal Consumption

Tanzania's overreliance on wood fuel sources remains a primary driver of forest loss in the country (World Bank, 2009; Sawe 2004; Mwampamba, 2007; Miya et al., 2012; Ishengoma, 2015; Riedijik, 2011). With the limited supply of electricity and other energy sources, charcoal remains the primary cooking energy source (Ishengoma, 2015, Table 2). While most charcoal is produced in rural areas, much of its consumption happens in town and cities across the nation (Sawe, 2004; Ahrends et al., 2010; Riedijik, 2011). This increasing demand for charcoal places significant pressure on forest-rich regions such as Rufiji district. For instance, a study by CAMCO (2009) showed that Dar es Salaam city consumes more than 28,000 bags of charcoal a day; the majority of this charcoal is collected from the district (CAMCO, 2009).

At a national level, Tanzania consumes over one million tonnes of charcoal annually, leading to significant forest loss (World Bank, 2009). Much of this loss occurs in southern Tanzania, which also includes Rufiji district (Malimbwi et al., 2007). Unfortunately, much of the charcoal collected from the forest-rich regions has been harvested illegally and through unsustainable means of production (CAMCO, 2009, Miya et al., 2012). Consequently, forests in

these regions are over-utilized and under significant pressure from charcoal demand (WWF, 2006, World Bank, 2009). While this could be controlled, weak government controls and lack of enforcement within local governments is a challenge. Nevertheless, with the growing number of people and increased urbanization in Tanzania, charcoal will continue to pose a serious threat to Tanzania's environmental resources (including forests) (PAI, 2009).

Table 2: Tanzania's Household Energy Consumption 2010-2012

	2010			**2012**		
	Urban	Rural	Total	Urban	Rural	Total
Electricity	3.8	0.2	1.1	6.4	0.2	0.4
LPG/Natural Gas	0.9	00	0.3	0.1	0.1	0.1
Paraffin/Kerosene	9.4	0.4	2.7	5.0	0.4	2.1
Charcoal	**62.2**	**6.3**	**20.7**	**70.0**	**8.5**	**24.8**
Wood	**20.7**	**92.4**	**73.9**	**18.0**	**90.1**	**71.9**
Other	3.0	0.7	1.3	0.5	0.7	07
	100	100	100	100	100	100

Source: Ishengoma, 2015

2.3.2. Uncontrolled Farming Expansion

Like the rest of Tanzania, subsistence farming is the dominant livelihood activity in Rufiji, employing the majority of its people (MNRT, 2001; MAFC, 2008). Despite its livelihood potential, studies reveal that farming activities across the district cause more harm to forests than any other event (Kibuga & Samweli, 2010; Mangora, 2012). Unfortunately, most farming activities within the area are uncontrolled, leading to the loss of forest resources. In fact, the United Nations Framework Convention on Climate Change (UNFCC, 2007) has described unsustainable farming

practices by the majority of small-scale farmers in developing countries (including Tanzania) to be a significant driver of forest loss. For Tanzania, these practices primarily involve the traditional slash and burn "shifting cultivation" employed by the majority of small-scale farmers (Mangora, 2012).

Another form of shifting cultivation involves farmers moving to new farmland every season while abandoning previous lands (Kibuga & Samweli, 2010). Over time, this traditional crop cultivation practice degrades land and forests on a large scale. Annually, Tanzania loses over 100,000 ha of forest area due to shifting cultivation (Kessy et al., 2016; Kibuga & Samweli, 2010; Mangora, 2012; Abdallah et al., 2007). Like the rest of the nation, in Rufiji, shifting cultivation is also common among seasonal sesame farmers farming on less than 4 ha (Abdallah et al., 2007). The practice has contributed to degrading much of the district's agriculture and forestland (WWF, 2006). Unfortunately, with the increased demand for land and food among subsistence farmers in Tanzania, the farming practice will continue to cause forest loss across the nation for many years to come (IIED, 2016).

2.3.3. Poverty and a Lack of Alternative Livelihood Options

Rural poverty in Africa remains a major threat to the sustainability of global environmental resources. To achieve environmental sustainability, African countries need to develop strategies and promote policies that will lift the rural majority out of poverty. This is because poorer communities in Africa including those in Tanzania are both the cause of environmental destruction and the principal victims of the loss of environmental resources (Hope, 2007). Studies in Tanzania suggest that rural communities are stuck in a cycle of poverty because deforestation and the degradation of natural resources have directly affected their livelihoods and local economies (Kulindwa et al., 2010). For example, due to the loss of community forests, rural farms have

become vulnerable to soil erosion and less fertile, leading to low agriculture productivity. This has negatively affected the majority of subsistence farmers. As a result, villagers have been forced to engage in activities unrelated to farming such as charcoal making and bush-meat hunting, which causes the degradation of land, forests and water resources.

A report by the Vice President's Office-Division of Environment (URT, 2009) shows that due to widespread rural poverty, forests and other environmental resources in the south experience significant pressure from anthropogenic activities performed by locals (URT, 2009). The situation is alarming, particularly in Rufiji district, which has a large number of impoverished communities. The majority of villagers in the region were found to engage in illegal activities such as the sale of forest logs and wildlife crimes to make ends meet (WWF, 2016, Milledge et al., 2007). Likewise, a study by Parker (2010) found that due to low agriculture productivity caused by floods and unreliable rain, villagers in Rufiji engage in the sale of wood and other natural resources as a coping mechanism to meet their basic household needs.

Similarly, due to income poverty, more than half of the rural households in the district use wooden materials such as poles or bamboo to build their homes. As a result, many of the village forests are constantly encroached upon and destroyed (Scanteam et al., 2009). These uncontrolled activities engaged in by low-income communities in Rufiji have continued to exert pressure on forests and other natural resources available in Rufiji (URT, 2009). Despite this evidence that has shown the increased destruction of forests, biodiversity loss and community involvement in wildlife crimes have close links to poverty levels in the region (Mascarenhas, 2004, URT, 2009, Milledge et al., 2007). Yet, there are few interventions that seek to improve incomes and provide sustainable livelihood options to communities in the region. Nevertheless, the majority of forest and environmental conservation programs implemented by government and non-government

organizations in the region are primarily focused on the conservation aspect of forests and other environmental issues, overlooking the integration of poverty alleviation for communities in their interventions.

2.3.4. Unregulated Logging and Timber Business

Rufiji's abundance of forest resources has attracted regional and international markets for timber and other forest products (Milledge et al., 2007). Although the district's forest potential offers opportunities to improve livelihoods and the local economy, its economic contribution has remained low due to weak government controls and inefficiency in the forest sector (Davie, 2013; Milledge et al., 2007). While the district's forest governance shortcomings are not new, no significant measures have been taken to control the situation, particularly illegal timber harvesting (Milledge et al., 2007).

Studies in the region have documented a number of forest governance challenges in the district. For example, a survey by the MNRT (2004) revealed the occurrence of the uncontrolled and illegal harvesting of forest products in multiple locations within the region (**Table 3**). In another study, companies engaged in forest products trade in the region were found to obtain their products without government permits or the close engagement of forest staff in the area (Davie, 2013). Studies in the region also confirm that the district has lost much of its income due to unregulated and unsustainable harvests of forest products (Milledge et al., 2007; Davie, 2013). Over the long term, these unsustainable and illegal practices in the region's forest sector will have a severe impact on the district's economy because more than half of its revenues come from forest products and services.

Table 3: Illegal Logs (Volume in m3) found in Rufiji District

Location	LSD	WSD	Total	Location	LSD	WSD	Total
Nyamwage	402.19	266.06	668.25	**Kimbunga**	164.93	20.00	184.93
Ndundunyikanza	590.90	60.00	650.90	**Msona**	151.52	30.00	181.52
Utete	437.81	166.35	604.16	**Kiwanga**	64.69	102.54	167.23
Mbwara	518.13	6.85	524.98	**Ikwiriri**	153.91	0.00	153.91
Mwaseni	334.32	75.52	409.84	**Mkongo**	144.10	0.00	144.00
Ngorongoro B	248.87	20.00	268.87	**Rungungu**	126.40	0.00	126.40
Kibiti	201.98	52.42	254.40	**Kikale**	105.25	0.00	105.25
Kipo	227.92	0.00	227.92	**Other**	791.90	168.88	960.78
Humbi	108.29	96.54	204.83	**Locations**			
				TOTAL			**5838.27**

Note: LSD = Lacking Supporting Documentation; WSD = With Supporting Documentation

Source: MNRT, 2004, Adapted from Milledge et al., 2007

2.4. PRESSURES

Pressures are voluntary or involuntary human actions that drive environmental change, which may include pollution resulting from industrial activities (UNEP, 2012). Pressures can also come in different forms including physical, chemical or biological. For instance, demographic changes in society often create a demand or need for more natural resources (Nelson et al. 2005). Because of the increased need for natural resources, society puts pressure on the environment to meet this need. In the context of this study, these pressures are discussed below.

2.4.1. Population Pressure

There are no specific studies showing how population growth in Rufiji affects the consumption of forests and other environmental resources; however, studies in Tanzania indicate that population growth in the country will negatively affect the state of forests and other environmental resources in Rufiji and beyond (Kahyarara, 2017). With a population of more than 50 million people, Tanzania is one of the most populous countries in Africa. Future projections suggest that Tanzania's population might double unless serious interventions are implemented to lower birth rates (PRB, 2015). Evidence from studies suggests that the current population growth rate is exerting significant pressure on forests and land resources, the majority of which are found in the countryside and have limited management and protection (Thaxton, 2007; Mkonda & Xinhua, 2017).

Studies have also linked the ongoing degradation and depletion of Tanzania's natural resources to demographic factors, particularly the increasing urban population (PA1, 2012; Thaxton, 2007; Madulu, 2004). For instance, a recent study has shown that forest coverage in Tanzania is projected to decline by more than 10 percent due to the growing need for charcoal and other wood fuel sources among households in the country (Kahyarara, 2017). The study further states that the loss of forests is attributed to a lack of alternative energy sources that could act as a substitute for charcoal among urban households in the country. Likewise, evidence from previous studies has indicated that urbanization in Tanzania would have several implications on the wood fuel consumption pattern. For example, according to the World Bank, due to rising levels of the urban population in Tanzania, the demand for charcoal and other wood fuel energy services will increase significantly (World Bank, 2009). This will negatively affect forest conditions in regions

like Rufiji because charcoal remains the primary and the most convenient energy source for the majority of urban households in the country (Malimbwi et al., 2007).

Given that Rufiji is a major supplier of charcoal in Tanzania, urbanization has several negative implications for the region's natural resources, particularly forests. The district supplies more than 30 percent of the charcoal consumed in Dar es Salaam city (Tanzania's commercial capital) and the majority of the charcoal consumed on Zanzibar Island (CAMCO, 2009). In particular, evidence from other studies confirms that deforestation rates in the region have worsened in the last two decades due to overreliance on charcoal use (Yanda, 2010; FAO, 2015). This suggests that unless effective forest management strategies are put in place, the current population trends in Tanzania will have several implications for the sustainability of Rufiji's forests and other natural resources.

2.4.2. International Timber Demand

With expanded physical infrastructures within Rufiji in the 2000s, the district experienced increasing demand for its forest products both within and outside Tanzania (Davie, 2013). For example, after the completion of *Mkapa Bridge,* which links the district to major cities and ports, especially those bordering Tanzania, the demand for forest products in the region skyrocketed (Milledge et al., 2007). In addition to meeting domestic market demands, Rufiji district also exports a significant amount of wood products to international markets. Interestingly, between 2005 and 2006, China accounted for more than half of all wooden products exported from Rufiji to international markets (Milledge, et al., 2007).

Other markets that Rufiji served include the Middle East and neighbouring countries in East and southern Africa. However, the majority of these exports were undocumented and did not follow government procedures (Milledge et al., 2007). This was attributed to a lack of monitoring,

government controls and staff involvement in unlawful actions (Miya et al., 2012). This contributed to the rise of illegal activities in the region, which involved many forest products being harvested and cleared without government approval, worsening forest degradation in the region (WWF, 2013; Milledge et al, 2007).

2.5. IMPACTS

2.5.1. Socio-economic Impacts

The forest sector plays an important role in Rufiji's economy. Nearly 80 percent of the local government's income comes from forest products and services (CAMCO, 2009). The district's forest sector also provides formal and informal jobs within the region and beyond. Such jobs include charcoal producers, traders and suppliers in major cities and towns across Tanzania (CAMCO, 2009; Malimbwi & Zahabu, 2008). However, the unsustainable utilization of forest resources and weak forest control measures pose a serious threat to the district's economy and residents' livelihoods. A study by the World Wide Fund for Nature (WWF, 2013) has revealed that in three districts of Southern Tanzania (including Rufiji), MNRT lost over USD $2.4 million, mainly due to weak forest governance and unlawful actions by forest staff in the region (p.2). These unlawful actions have weakened forest management within local government forest offices (including in Rufiji) and remain a major barrier to achieving SFM in the country (Davie, 2013). The need to enhance forest management and control through such actions is critical to regions like Rufiji and to strengthening SFM at the community level. Due to weak governance structures, such actions have become common, causing revenue loss to the district government.

2.5.2 Climate Change

Although the International Panel on Climate Change (IPCC) ranks Tanzania as one of the lowest emitters of carbon dioxide, methane and other greenhouse gases, climate studies in Tanzania suggest that ongoing changes in local climate conditions are a result of the unsustainable utilization of forest and land resources (Yanda, 2010). Evidence from studies show that prolonged dry seasons in many parts of the country have been closely associated with forest loss (URT, 2007). Similarly, unpredictable rains and floods in Rufiji district and the countryside have been identified to be a result of ongoing forest degradation in Tanzania (FAO, 2010). For the rural majority in Rufiji, these climate patterns have significant effects on their wellbeing because they depend on land and forest resources for a living (FAO, 2010; URT, 2007). While climate change may be considered a wider environmental problem, studies demonstrate that the health of many Tanzanians is also impacted by climate change due to changing weather and climatic conditions. For instance, outbreaks of cholera and increased mortality rates caused by malaria are expected to rise in Rufiji district and beyond due to changes in humidity and rainfall patterns (Shemsanga et al., 2010). These environmental and health effects can be avoided through the sustainable management of forests and other environmental resources.

2.5.3. Forest Loss and Implications for Local Livelihoods

The increasing degradation of forests has severe implications for the livelihoods of the poor and marginalized in Tanzania and in Rufiji district in particular. This is because forests provide socio-economic benefits to the majority of people in the region, particularly rural households, whose incomes and livelihoods rely heavily on forest goods and services (Harrison, 2006). More importantly, research has shown that in Africa, forests contribute about 20 percent to the income of forest-dependent communities, with much of this income earned by women (Dokken &

Angelsen, 2015; Manfre & Rubin, 2012). For Rufiji, this suggests that the loss of forests has several adverse impacts on the living conditions and incomes of rural households. For example, when community forests are degraded, much forest cover is lost and rural soil and farmlands become vulnerable to soil erosion, which directly affects agriculture productivity among subsistence farmers (Msuya et al., 2011). And, since most farmers in the region practice rain-fed agriculture, the continuous loss of forests will lead to unpredictable rains or prolonged dry seasons causing low agricultural production (MNRT, 2007, Mwansasu, 2006). To the majority in Tanzania, these scenarios make forest-adjacent communities vulnerable to food insecurity and increased household poverty (Chakravarty et al., 2012).

Studies have also linked forest loss in the region with changes in water flow in the Rufiji River basin. According to local studies, water levels in the Rufiji River basin have been reduced significantly due to increased land and forest degradation (MNRT, 2007). As result, national hydro power generation and supply has remained uncertain and unreliable because of inadequate water flow from the river to energy distribution centres (Kadigi et al., 2005). The Rufji River basin is a major supplier of water for hydroelectric power in Tanzania, providing more than 75 percent of the hydropower generated in Tanzania (MNRT, 2007). Likewise, studies show that low levels of water supply from Rufiji River have negatively affected paddy and rice farmers in the region who depend on Rufiji River for irrigation purposes (Mwansasu, 2006). Due to the unreliable water supply, the majority of the rice farms in the region have been forced to scale down rice production and other farming activities, exposing local households to food insecurity problems (MNRT, 2007).

Morever, studies also show that rising prices of forest products in the region are linked to the unsustainable harvesting of forests. For instance, a study in Rufiji that examined how the over-

utilization of forests will affect the marketing of forest goods and products in Tanzania shows that due to the overharvesting of forests in Rufiji, common forest species such as Afzelia Quanzensis, locally known as Mkongo, Podocarpus Usambarensis and others will become scarce in the near future (Schaafsma et al., 2013). The scarcity of these common forest and high demand species in the market has been influenced by the overharvesting of forest resources and will negatively affect the supply of forest products available in the region, impacting small businesses involved in the sale of forest goods in Rufiji region (Schaafsma et al., 2013).

2.5.4. Biodiversity and Wildlife Habitat Loss

Rufiji is known globally for its rich biodiversity and particularly its diverse forests. The district encompasses about 50 percent of the available mangrove forests in Tanzania and the majority of its wetlands (URT, 2009). In addition, the district contains nearly half of the Selous Game Reserve (Africa's largest protected area) providing a habitat to more than 100 wildlife species (Burgess et al. 2010). Likewise, the district accommodates a third of East Africa's coastal forests available in Tanzania (UNDP, 2009).

Despite its valuable forests and biodiversity potential, the district's environmental resources are in danger due to increased human activities and the overexploitation of these resources. For example, the majority of East Africa's mangroves found in Rufiji and are in serious pressures due to increased farming and human settlements (Taylor et al., 2003; URT, 2014). Similarly, an increase in anthropogenic activities in the region has continued to threaten the survival of various forest-dependent species (Pimm & Raven, 2000). For instance, studies have indicated that wildlife population in the Selous Game Reserve have been seriously reduced because of habitat loss (USAID, 2012). Likewise, due to increased human encroachment, wood fuel demand and logging of forest products, the sustainability of some of critical forest species such as

miombo woodlands available in the region is uncertain. (Burgess et al., 2010, WWF, 2006). A study by WWF (20006) shows that despite increasingly anthropogenic activities in the south, farming and excessive use of wood fuel remain the primary threat and major cause of deforestation in the region presented in **Table 4**.

Table 4: Top Ten Threats to Tanzania's Coastal Forests

Threat	Criteria				
	Area	Severity	Urgency	Total	Rank
Conversion to agriculture	**14**	**14**	**14**	**42**	**Very High**
Increased fuel demand - charcoal, firewood	**13**	**12**	**13**	**38**	**Very High**
Infrastructure development	10	13	10	33	High
Unsustainable logging (timber, poles)	12	9	12	33	High
Uncontrolled fires	11	8	11	30	High
Over-harvesting of wood for carving	8	7	9	24	Medium
Unsustainable hunting (legal & illegal)	9	5	8	22	Medium
Conversion for salt pan construction, aquaculture	6	11	5	22	Medium
Mineral mining	5	10	6	21	Medium
Adverse climate change	7	6	2	15	Medium

Source: WWF, 2006

2.5.5. Community Conflicts Over Access and Use of Natural Resources

In Rufiji and Tanzania in general, the need to control forest loss should be considered beyond conservation benefits due to several reasons (Blomley & Iddi, 2009; Milledge et al., 2007). First, forests remain the primary source of livelihood for the rural majority, particularly those in forest-rich regions (Lusambo et al., 2007). Further, studies also link forest loss to increased community conflicts over access to natural resources, particularly land and water resources (Milledge et al., 2007). For example, evidence shows that due to forest degradation, access to suitable land for farming and grazing has become a major problem among farmers and pastoralists in Rufiji (Mwamfupe, 2015).

A study by the PINGO Forum (an environmental activist NGO) indicated that the loss of forest resources in the region is the reason behind ongoing conflicts over land use between pastoralists and farmers (PINGO, 2014). According to this study, due to a lack of reliable fertile land, subsistence farmers in Rufiji were forced to farm outside their community every year in search for fertile land for drop cultivation. Similarly, pastoralist communities from other regions have found themselves in conflicts with farmers in the region due to limited access over land and water sources for their cattle (PINGO, 2014). These conflicts have remained common among these groups because forests, land and water resources are significant to the development and livelihoods of the rural majority but remain vulnerable to unsustainable utilization (Mwamfupe, 2015). Furthermore, due to increasing environmental pressures and weak institutional capacity, these conflicts have left the majority of farmers and herders in Tanzania vulnerable to poverty and endless social unrest (Mwamfupe, 2015).

2.6. RESPONSES: What is Being Done and How Effective is it?

Responses are interventions that aim to restore, prevent or control environmental changes initiated by responsible authorities or individuals with the goal of stopping drivers or pressures from causing future impacts (Baldwin et al., 2016). In addition, they may include the passing of laws or regulations that control and protect forests or enforcing and incentivizing rural communities to protect their natural resources (UNEP, 2012). Responses can be implemented at different levels, most notably at the village, national or international level, with the goal of strengthening the state of the environment (UNEP, 2012).

In the context of this study, the responses and forest policy actions implemented by the government of Tanzania are presented in this section. These policy actions were implemented nationwide as part of government efforts to control forest loss and strengthen sustainable forest management (SFM). The responses presented here may not specifically respond to or address issues in Rufiji district, which is the focus of this study; however, they directly or indirectly address some of the sustainable forest management challenges experienced in Rufiji and beyond.

2.6.1. Engaging the Rural Majority in Forest Management

Despite the many challenges that need to be addressed, meaningful progress has been made in some of the forest policy programs implemented in Tanzania (Blomley and Ramadhani, 2009; World Bank 2009; Odera, 2004; Kajembe et al, 2003). For example, one positive outcome of the implementation of CBFM and JFM policy arrangements was the active participation of community members in forest management activities (MNRT, 2012; Blomley & Iddi, 2009). Such activities involved community members developing their own village forest by-laws and participating in forest management tasks such as forest patrols to protect forest resources within their community

(FAO, 2007). These communal activities helped to improve forest conditions in some villages in Tanzania.

Moreover, studies also suggest that some of these villages in Rufiji district have been reported to generate substantial incomes from forest harvests generated through a Forest Stewardship Council (FSC) partnership developed between village governments and local NGOs (Masao, 2015). Similar progress has also been reported in some parts of the country such as several districts in northern Tanzania (MNRT, 2006; Blomley & Iddi, 2009). Unfortunately, government commitment to these policy initiatives is relatively weak considering the magnitude of the problem and the value of forest resources in Tanzania. In addition, the majority of these forest policy programs depend on external support and the work of local and international NGOs, putting the long-term sustainability of these initiatives in question.

2.6.2. Regulating Charcoal Business

Given that charcoal production and consumption are the primary drivers of forest loss in Rufiji and across Tanzania, several policy actions have been implemented to address this challenge. These policy actions include the Charcoal Regulations of 2006 and 2007. According to these regulations, district governments are responsible for monitoring, managing and supervising all issues related to charcoal business at the community level (TFCG, 2016; World Bank, 2009). More specifically, all district governments are required to create a "District Harvesting Committee" that oversees all procedures before and after the extraction of forest resources (TFCG, 2016). These procedures include locating special areas for the harvesting of forest products, issuing permits and registering all individuals or companies involved in charcoal business (TFCG, 2016; World Bank, 2009). The ultimate goal of these regulations is to limit the over-extraction of forest resources at the community level.

Although these committees exist in some districts, nothing practical has been achieved due to a lack of monitoring, and the weak enforcement and low awareness of these regulations in the public (Peter & Sander, 2012). Because of this, unlawful actions among individuals involved in charcoal business in Rufiji have continued and no significant measures have been taken. Furthermore, it has been observed that individuals involved in the charcoal trade have continued to violate forest regulations despite the passing of the Charcoal Regulations of 2006 and 2007. For example, while it is unlawful to extract forest products in forest reserves and supply overweight charcoal bags; charcoal traders in the region have been observed extracting forest products from forest reserves and carrying and supplying unchecked overweight charcoal (Burgess et al., 2016).

2.6.3. Ban on Charcoal Production

Given that charcoal consumption has been a serious challenge in the forest sector for many years, the MNRT has tried to ban the charcoal trade and limit consumption as part of the effort to control forest loss across the country (TFCG, 2016). These official charcoal bans were issued once in 2003, twice in 2004, and again in 2005 and 2006 (Milledge at al., 2007.p.8). In addition, in March 2017, the MNRT's minister issued a charcoal ban that would prohibit the exporting of charcoal from its original source of production (Kitabu, 2017). Despite these trials and bans to limit charcoal production, the higher costs of gas and electricity remain a strong barrier to using these environmentally friendly energy sources (Riedijik, 2011). Critics suggest that the bans issued were simply political statements; they lacked strong policy actions and offered no options to charcoal users (TFCG, 2016). As a result, charcoal has continued to be the only energy source used for cooking and continues to cause widespread deforestation.

2.6.4. Introducing Fees and Licenses on Forest Products

To limit the over extraction and unsustainable utilization of forest resources, in 2015, the MNRT introduced fees and taxes on forest products targeting individuals and businesses involved in forest products and services (MNRT, 2008). Under the Forest (Amendment) Regulations, 2015 GN No.324, this regulation guides individuals and businesspersons as to when and how often they are required to pay these fees (TFCG, 2016, p.10). Further, the regulation also requires individuals and businesspersons involved in the harvesting of forest products to have licenses approved by the government with the goal of maintaining the required standards for harvesting (TFCG, 2016). Despite these efforts, reports show that the MNRT, especially its local government offices, have weak control measures and fail to regularly monitor individuals and businesses (Burgess et al., 2016; Milledge et al., 2007). In addition, officials in these local governments have been found to take bribes, allowing illegal activities to continue in forest reserves (TFCG, 2016). This has affected the MNRT's ability to collect revenue generated from forest services and further exacerbates the management and enforcement policies designed to sustain the resource (Davie, 2013; Milledge et al., 2007; TFCG, 2016).

2.7. Knowledge Gaps and Research Contribution

Much of the literature reviewed in this section showed that previous studies focused mainly on examining challenges in the forest sector in Tanzania, and far less attention has been given to the forest policy agenda. In many instances, the focus has been on understanding the impact PFM/CBFM/JFM programs had, with limited research on regulations, guidelines and the weaknesses of these programs at the community level (Blomley and Ramadhani, 2006; FAO, 2010). Understanding gaps and shortcomings of these forest policy strategies is critical for Tanzania's progress to SFM. This is important because these policy strategies implemented by the

MNRT are guided by the forest policy of 1998, for two decade, the forest policy has been found to have gaps that need the attention of policy makers (Blomley and Iddi, 2009). Therefore, this section documents knowledge gaps, exposes deficiencies and suggests alternative responses. This output is designed to aid policy makers in the creation of more effective policy aimed at achieving SFM in Tanzania's forest sector (Mgaya, 2016, Blomley & Iddi, 2009; Petersen & Sandhovel, 2001). Likewise, the literature reviews also revealed that forestry guidelines, laws and policy directives remain unknown to the majority of stakeholders in Tanzania. This is due to several factors including inadequate staffing, limited research, and budget constraints; these factors will be discussed in the next sections (Blomley & Iddi, 2009). In addition, most forestry-related studies in Tanzania (including those in Rufiji) focused on the conservation aspect of the forests, overlooking related forest policy issues. Consequently, forest governance issues have received little attention among scholars and policy makers in Tanzania. This suggests the need for further research and knowledge dissemination on forest policy issues as a key component of SFM.

Therefore, this thesis expects to open up a policy discussion among policy makers, academics and SFM professionals on addressing weaknesses. That is, it will build on previous successes and improve Tanzania's forest policy. Furthermore, increased deforestation rates in Africa present a huge barrier to progress in achieving sustainable development goals (SDGs) (FAO, 2017). African governments, especially those with abundant forest resources such as Tanzania, have been urged to take bold action to address this challenge. The call urges governments in Africa to improve forest governance through forest policies and regulations that enhance SFM at the community level, as by doing so, they will be able to address the growing urgency and attain sustainable development goals by 2030 (UNDP, 2016. FAO, 2017). This is critical for many African nations including Tanzania because the sustainable management of

environmental resources including forests has a direct impact on the realization of 12 out of the 17 SDGs (UNEP, 2015). Moreover, recent reports have indicated that strengthening sustainable forest management at the community level offers an opportunity to advance and progress towards meeting the SDGs targets by 2030 (Jong et al, 2018; OECD, 2018). This is significant for Tanzania because improved forest protection at the community level ensures the realization of several global goals, particularly SDGs: 15 on Life on Land; 13 on Climate Action; 6 on Clean Water & Sanitation; and goal 7 on Affordable and Clean Energy (UNDP, 2016). Governments will also need better policy and institutional framework that prioritizes and commits to policy strategies that advance sustainable development goals (OECD, 2018).

Since the launch of SDGs, governments around the world have made progress to improve institutional and regulatory frameworks to advance their commitment to meeting the global goals (FOA, 2017). In Tanzania, little progress has been done; the contribution of SFM to SDGS has also received limited academic and policy attention, hindering the government's commitment to meeting these goals. In addition, the current forest policy and other environmental policy actions do not fully respond to issues related to SDGs (Kilama et al., 2016). This limits Tanzania's commitment to the realization of SDGs. And, considering that every country is expected to achieve the SDGs in the near future, the deficiencies in the current forest policy may be a significant barrier to the attainment of these goals, particularly SDGs 15, 13, 6 and 7 (Jong et al, 2018). Therefore, this study also calls for policy reforms in the forest sector and further research to explore relevant policy strategies and interventions that will help the government of Tanzania advance local actions that will enhance SFM and its contribution to meeting the SDGs. In summary, the study will contribute to the current and future growing body of forest policy literature towards strengthening SFM in Tanzania.

CHAPTER THREE: STUDY METHODOLOGY

3.1. Qualitative Case Study Approach

To address the research questions, a case study qualitative approach was employed, as the study's primary objectives match well with this approach. Moreover, the study's specific objectives are qualitative in context, particularly the explanatory research (Yin, 2003; Creswell & Clark, 2007). According to Yin (2003), explanatory research provides answers by evaluating the relationship between what had been done and its anticipated impact. Furthermore, Yin (2003) argues that the goal of explanatory research is to answer the 'why' and 'how' of the research questions. In addition, qualitative case studies involve the assessment of specific programs or interventions (Simons, 2009, p. 21). They also require opinions to be collected from individuals or groups of individuals to answer the research problem (Starman, 2013). My study examined how effective Tanzania's Forest Policy of 1998 has been at a community level, with Rufiji district selected as the case study. This was done by collecting opinions from individuals involved in forest policy or programs to answer the why and how questions of the research problem.

3.2. Case Study Description: Rufiji District

Rufiji is one of the four districts in Pwani region found in southeast Tanzania and has an estimated area of 14,500 square km (CAMCO, 2009, **Figure 5).** In 2012, the district had a population of 217,274, with subsistence farming being the primary economic activity for the majority in the region (URT, 2013). The district is known globally as one of East Africa's forest-rich regions and the mangrove capital of the continent (WWF, 2012; Taylor et al., 2003). Rufiji hosts more than 50,000 ha of mangrove forests, the largest mangrove forest ecosystem in East Africa (CAMCO, 2009; Taylor et al., 2003). The region's natural resources wealth has put the district on the world map of the most significant conservation areas on the planet. The World

Conservation Union (IUCN) recognizes Rufiji as a place of high biodiversity potential (WWF, 2011).

Considering Rufiji's forest landscape and the challenges the district government faces in managing forest resources, the district was purposely selected as an ideal case study for this research. Other reasons considered for selecting Rufiji as case study are explained here. Additionally, evidence confirms that Rufiji's forest resources are declining rapidly due to increased human activities and the need for environmental services, mainly in land and forest resources (Milledge at al., 2007). Likewise, sustainability of forests and other environmental resources in the region has remained low due to several socio-economic activities happening in and outside the region (Blomley and Iddi, 2009). While efforts have been made to control this, little progress has been achieved in terms of forest protection and sustainability (WWF, 2006). Therefore, Rufiji is a good representative to use to understand and analyze governance and SFM challenges experienced in Tanzania.

Secondly, for decades, Rufiji's biodiversity wealth, particularly forests, has attracted conservation attention from the government and local and international NGOs attempting to protect and conserve natural forests. For example, the majority of the 20 villages engaged in CBFM programs implemented by the MNRT in Pwani region are in Rufiji district (MNRT, 2006). Due to increased threats to the sustainability of the region's environmental resources, several international organizations and donor communities have joined forces with the government of Tanzania, with funding and technical resources geared towards improving the sustainability and conservation of Rufiji's forests and other environmental resources. Such organizations include the WWF – The World Wide Fund for Nature; IUCN - The World Conservation Union; GEF - The Global Environment Facility; USAID - The United States Agency for International Development; GIZ - The German Technical Cooperation; UNDP - The United Nations Development Programme; and

FAO - The Food and Agriculture Organization, to mention a few. Despite these interventions, the region's forests remain in a poor state due to increased encroachment and weak forest management. Evidence also shows that the district's forest sector has several gaps and challenges that are linked to inefficiencies within the local (district) government (Milledge at al., 2007). The central focus of the study is to understand how forest policy influences the sustainable management of forest resources at the community level. Examining the district's governance and institutional challenges offers a great opportunity to understand these issues, and to inform and influence institutional and policy reforms in the forest sector.

Fourth, the forest sector plays a crucial role in the district's economy, with more than 60 percent of the district's income generated from forest products and services (WWF, 2011; CAMCO, 2009). Nevertheless, recently, the sector's contribution to Rufiji's economy has increased due to the improvement of roads and other physical infrastructure in the region (Milledge et al., 2007). Despite the economic potential of forests, the contribution of forests to the local economy and people's livelihoods has remained insignificant and less beneficial to the rural majority living adjacent to such resources. This policy challenge provides an opportunity to explore how the government of Tanzania can develop policies that attain forest conservation and improve community livelihoods, especially among forest-dependent communities. Therefore, using Rufiji as the case study, this study aims to influence policy discussion and provide policy recommendations that would allow policy makers develop actions that enhance the contribution of forest products and services to community livelihoods.

Finally, increased demand for forest products and services from international markets presents a huge forest governance challenge to the Rufiji District Council. As discussed earlier, studies on Tanzania show that revenue loss, illegal logging and weak regulations remain major

governance challenges within the MNRT, particularly its local government offices (Milledge et al., 2007; Lukuzumbya & Sianga, 2017). This demonstrates that work need to done to improve institutional and regulatory frameworks to improve service delivery and logistical support for the growing market for timber and other forest products. While challenges exist, it has been confirmed that with better regulations and improved governance structures, the demand for forest products from regional and international markets offers an ideal opportunity for Tanzania to grow and improve local economies in regions like Rufiji. Therefore, this study will inform policy makers, provide policy recommendations on regulations and policy actions that will improve, enhance, and strengthen Tanzania's forest sector administration and management.

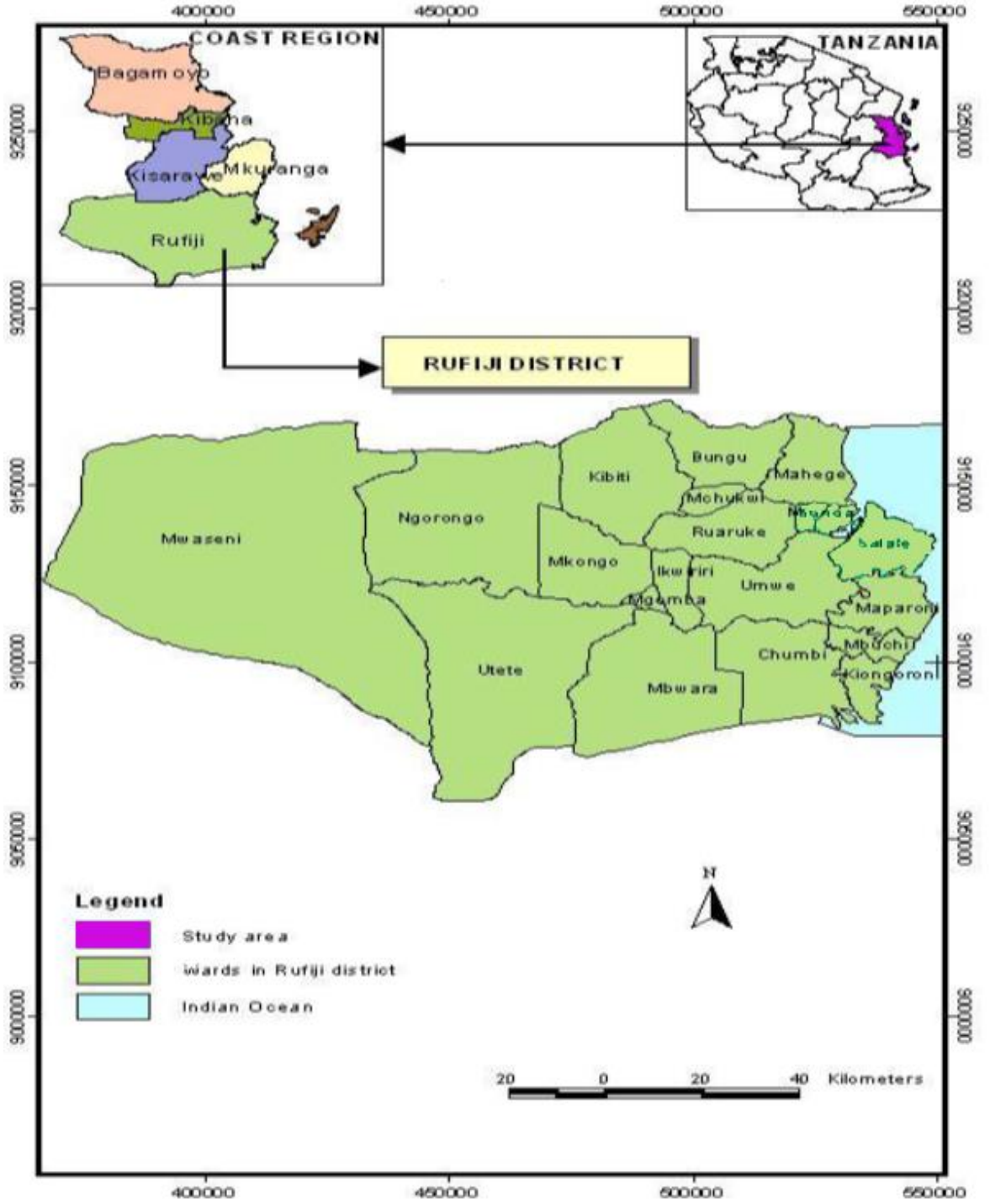


Figure 5: Administrative Map of Rufiji District, Tanzania

Source: Adopted from Lupembe, 2014

3.3. The Use of the DPSIR Framework

Although several other frameworks could be used to examine and understand Tanzania's forestry and policy challenges, in this study, the researcher employed the Driver-Pressure-State-Impact-Response (DPSIR) framework to investigate and analyse the research problem. The DPSIR framework emerged in the 1990s after the adjustments of other environmental assessment tools such as the Pressure, State, Response (PSR) framework of the Organization for Economic Co-operation and Development (OECD) (Gabrielsen and Bosch, 2003). The framework adjustment included additional components to include five key components: Drivers, Pressures, States, Impacts, and Responses; these components illustrate the integration of various environmental elements and human socio-economic activities (Tsai et al., 2009; Maxim et al., 2009; Samareh et al., 2014). The inclusion of these components has helped policy and social scientists understand the linkages between policy and sustainability issues and how these issues could be analysed in finding solutions to global environmental challenges (Baldwin et al., 2016).

More specifically, according to the DPSIR framework, human socio-economic advances are the primary cause of environmental changes, and due to these advances, environmental resources such as land, forests, and water are under significant pressure, changing the state of these resources (Kristensen, 2004). This has several impacts on society, such as people's health conditions or poor environmental conditions, which in turn push the society to respond to these impacts and pressures to try to maintain the environmental resources (Gabrielsen & Bosch, 2003; Niemeijer & Groot, 2008). This simple illustration and analysis of the relationship of these five components all together defined as Drivers-Pressures-State-Impacts and Responses has proved to be helpful to ordinary stakeholders in understanding the problem through the interlinked relationships of these components (Niemeijer & Groot, 2008).

Studies also confirm that this approach is effective and informative for policymakers seeking to understand and address sustainable development challenges such as forest loss and degradation (Baldwin et al., 2016; Niemeijer & Groot, 2008; Svarstad et al., 2007; Salehi et al., 2015). Therefore, considering the thesis research design that is qualitative research and context specific, the DPSIR framework provides an in-depth understanding of the root cause of SFM challenges in Rufiji district and how these challenges could be addressed. Similarly, the framework has been found to be an appropriate tool in understanding what actions should be taken presently or over the long term to address sustainability challenges driven by anthropogenic activities (Kristensen, 2004). Therefore, the DPSIR framework has been used to answer the following questions: 1) What is happening with forest resources in Rufiji, 2) What are the consequences towards SFM and people's livelihoods (Impacts), and 3) What has been done and how effective has it been (efforts, policy actions, etc.). In general, using DPSIR's description, the study analysed these questions and provided a summary of SFM challenges in Tanzania in **Figure 6**.

Figure 6: Flowchart Overview of SFM Challenges in Tanzania using DPSIR Framework

Source: Author, 2018

3.4. Data Collection Methods and Procedures

3.4.1. Selection of Experts for the Workshop and Interviews

The selection of experts was specific and systematic due to the nature and the objective of this research. Likewise, as discussed earlier, understanding policy issues requires collecting opinions from specific individuals or groups of individuals that are knowledgeable about the policy or research problem being investigated. Therefore, the researcher selected individuals directly involved in forest policy and programs. These included experts from government, research, academia and non-governmental institutions (NGOs) particularly those involved in the implementation of forest management or conservation programs **(Figure 7).** Selected experts (participants) were involved through workshop discussions and interviews, which helped the researcher to collect adequate and diverse opinions.

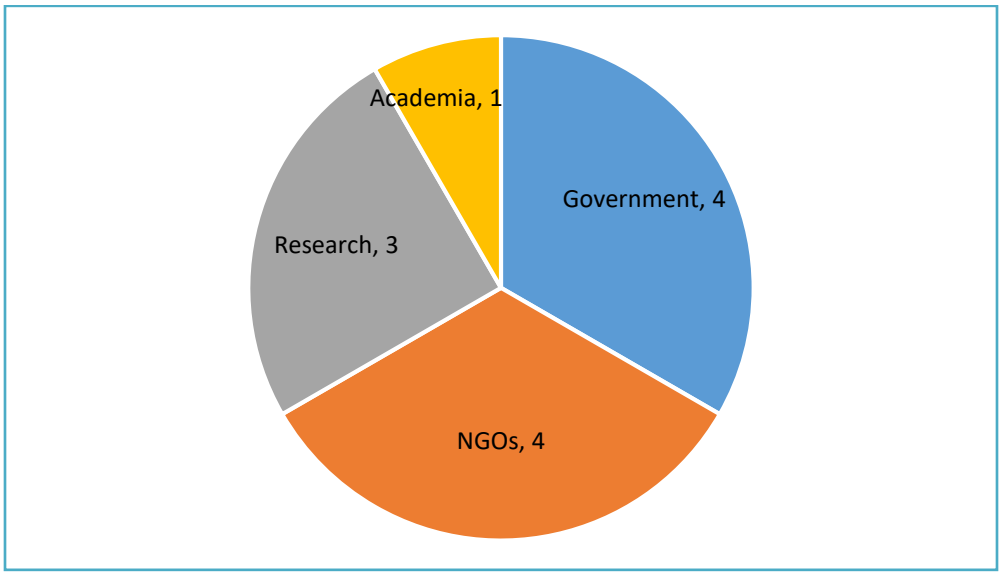


Figure 7: Workshop Participants Representation

Source: Author, 2018

3.4.2. Recruitment of Workshop and Interview Participants

The decision to recruit participants to the research workshop and for interviews considered two key criteria: which individuals (experts) have knowledge and information relevant to the research questions and objectives and which institutions they come from. Therefore, using the two criteria, I employed a purposive sampling technique to recruit potential experts that could adequately contribute to the study findings. According to Kumar (2014), through purposive sampling, selected experts become respondents to the unknown research problem (p.19). This helps the researcher explore and gain an in-depth understanding of the research problem using experts' knowledge. Likewise, Tangco (2007) suggests that this sampling technique has proved effective in qualitative research because it assists the researcher to carefully select well-informed professionals with expertise on the research problem (p.147). As per this study, the sampling technique matches well one of the research objectives, which is to fill in knowledge gaps on forest policy issues.

Because the study dealt with national forest policy, individuals from the government were the main target because they are directly involved in the policy implementation process. Other participants selected included individuals from research and academic institutions, in-service and retired forest officers and village leaders in communities where SFM programs have been implemented. To minimize bias on study findings, efforts were made to involve a diverse group of participants that have different skills and knowledge regarding forest sector. For instance, participants from academic institutions were individuals primarily working in University departments focusing on natural resources management. Whereas, those from research institutions were individuals from forestry research institutions that are fulltime forestry researchers. For

example, one representative from this group came from Tanzania Forestry Research Institute, a well-known forestry research institution in Tanzania.

The study also considered other participants such as charcoal vendors, farmers; small businesses involved in charcoal trade whose activities directly or indirectly affect forest sector. Although efforts were made to meet those in Rufiji, the majority were unavailable when the researcher was in the region. Recognizing this, for the interviews, the target was individuals from NGOs that work directly with such groups. For instance, two of the NGOs participants for the interviews were individuals from the "Transforming Charcoal Sector Program" implemented in three districts including one in southern Tanzania. This was done to ensure the study collects balanced opinions and minimize bias on the study findings.

Additionally, I had an opportunity to meet in person some of the potential participants. The majority were contacted through their mobile phones and through email exchanges. The goal of the meetings and phone calls was to brief them about study objectives and discuss their availability to attend the workshop or participate in the interview conversation. After the phone calls, official recruitment letters for the workshop were sent through email to participants and delivered to the participants' offices (Appendix 1). The recruitment letter informed the participants about the goal of the research, provided a brief schedule on how the workshop would be conducted, and explained what is expected from the participants (Appendix 2: Workshop Questions). To enrich the study findings, semi-structured interviews were also presented to individual experts using the study criteria outlined above. Ten semi-structured interviews were completed; some of the interviews were administered after the workshop to get in-depth information on issues that could have been forgotten during the workshop. The workshop and interviews with experts were completed between May 8 and August 31, 2017 in Dar es Salaam city, Rufiji district and the Morogoro region.

3.5. Data Collection Methods

3.5.1. Semi-Structured Interviews

Apart from the research workshop with experts, 10 semi-structured interviews were also conducted to collect more in-depth information about the research problem **(Figure 8**). Interviews are effective for opening up in-depth discussion with experts that have adequate knowledge about the research problem (Kothari, 2004; Boyce & Neale, 2006). Given the study objectives, the interviews with experts were also essential to enrich the study findings. In fact, all the interviews were done one on one at the participant's place of work, mainly in their offices. Each interview was about 40-60 minutes in length, although there was a time limit per interview; the interviews were conducted in an informal and flexible manner. This approach allowed the interviewee to elaborate more on the research questions and to give the researcher enough time to listen to all the responses.

The interviews were digitally recorded with the recording instruments, which were properly placed and switched on and off at the start and end of the interview. Recording of the interviews was done for future transcriptions and note taking on key issues that emerged during the interview. Interview questions (Appendix 3: Interview Questionnaire) were categorized into four main themes that responded to the research questions and objectives. Prior to the interview, participants were asked for their consent to participate in the interview process, which all agreed to without objection. Through these semi-structured interviews, the researcher was able to probe more on issues and questions that could have potentially been overlooked in my research questions. The interviews were also done to obtain information from experts that could not attend the workshop.

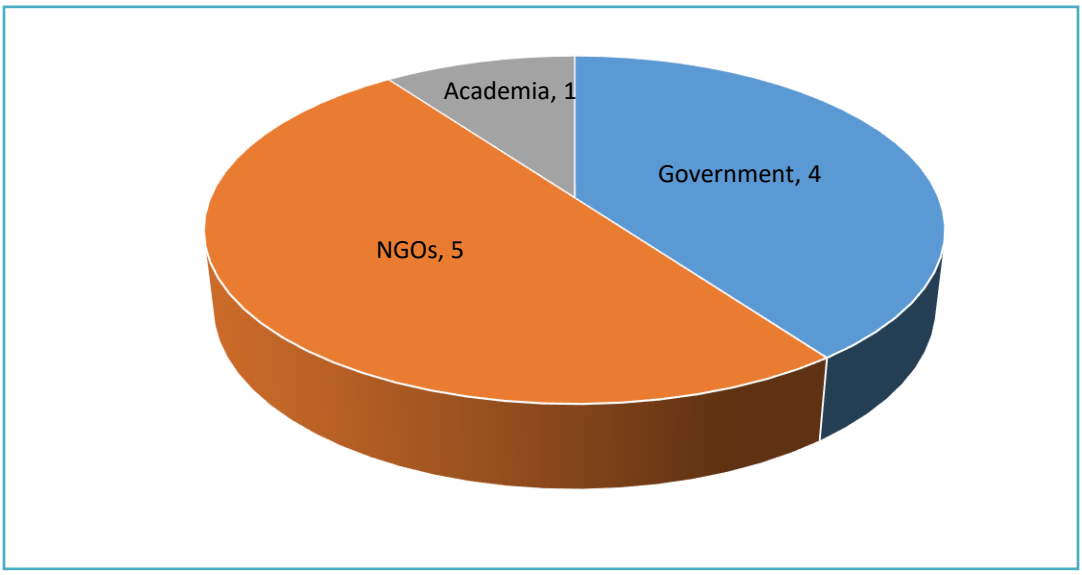


Figure 8: Interview Participants Representation

Source: Author, 2018

3.5.2. Secondary Data and Document Review

The study involved reviewing several secondary data sources that were relevant to the research problem. Information from the secondary literature was obtained from several sources within and outside Tanzania; the majority of these sources were from within Tanzania. These included both published and unpublished publications such as government reports, government records and policy papers from different ministries that closely discussed and highlighted issues related to the forest sector. In addition, major sources for study information were also obtained through Google Scholar searches, internet searches at Memorial University Library in St. John's Campus, and the Library of the University of Dar es Salaam (Tanzania). The secondary data review provided good background knowledge of the research problem, helping the researcher to develop effective research questions.

3.6. Data Analysis

Data for this study were analyzed using Content Analysis with the support of Nvivo Software (QSR NVivo 12 Pro). According to Hsieh and Shannon (2005), content analysis enables the "interpretation of text data by coding and identifying themes" (p.1278). In my case, the software and the content analysis method were used to transcribe key themes and messages obtained from the interviews and workshop. Likewise, a detailed summary notes was prepared on all the responses and discussion recorded during the workshop discussions. Unlike other methods, content analysis focuses on working with data systematically, which helps the researcher to organize patterns and themes linked to the research problem (Elo & Kynga's, 2008). This approach has been proven reliable and appropriate for qualitative studies like this one (Vaismoradi et al., 2013). The use of content analysis also considered its several strengths, particularly for studies like in which the focus is on context specific. Such strengths include giving freedom to the researcher to select only a few contents that respond to research questions (Zhang & Wildemuth, 2009). This was relevant in my study because only key themes and messages that emerged from the interviews and workshop discussions with experts were transcribed.

More specifically, with the support of Nvivo Software the data were manually analyzed, the analysis focused on specific themes that emerged from interview and workshop responses. Each specific theme was coded and written in different colors for easy identification of any emerging theme. This process was done several times to enable the researcher to compile major themes that occurred multiple times. Themes that had multiple occurrences were then coded and categorized based on the study's research questions and objectives. For example, in analyzing factors limiting forest performance, a response like "there is little government support to district forest programs"; "most of these programs depend on external donors" was coded as "financial factors"; or "often

times our departments work independently", was coded as "weak coordination". Coded themes were then organized into categories and sub-categories that respond to research questions. Such categories include "institutional barriers", "incentive challenges", "research & capacity building challenges" and the like. These key themes were also supported with statements and quotes to present key findings such policy implementation challenges and study recommendations. This process also enabled the researcher to identify and focus on key arguments that generate some statistics based on the frequency of some responses.

The use of rich verbal description or quotes from participants' responses was done to back the findings and present experts' opinions on various issues addressed by this research. Additionally, this was also done to emphasize the main arguments and opinions provided by experts and interview participants regarding the researched problem. This whole process enabled the researcher to enough findings that were responding to key research questions. Evidence confirms that with the use of computer programs such as Nvivo software, this process adequately generate findings that are linked to research questions (Zhang and Wildemuth, 2009). Likewise, for ethical considerations, information revealed by participants during the workshop or interviews were quoted with the name of the participant's institution such as *NGO Participant* or *Participant from a Government Department*. This was done to maintain the anonymity of the participants. Likewise, expressions such as "few", "many", or "majority of participants" were used to refer to information or messages provided by more than one participant.

3.7. Study Limitations

3.7.1. Scarcity of Forest Policy Studies

A lack of adequate studies regarding forest policy and governance issues in Tanzania was a barrier in this study. Although there were a few reports and reviews regarding Tanzania's forest policy presented as brief policy notes and reviews published by NGOs publishing documents, the majority were too general and lacked detailed analysis on specific forest policy issues, which was the focus of this study. This limited the scope of the literature because available sources were written as briefs for specific programs implemented by the respective departments or NGOs. Due to this, the study's main sources were primarily reports from government departments, particularly within the MNRT, the Vice President's Office-Division of the Environment and NGOs.

3.7.2. Availability of Potential Experts for the Workshop and Interviews

For a comprehensive collection of opinions regarding the research problem, the study invited 20 experts to the research workshop and 15 experts for interviews regarding the research problem. For the workshop, out of the 20 experts invited, only 12 attended the workshop, while for the interviews, only 10 participated. This happened because most of the experts invited were people from government departments and by the time, the study was being conducted (between May and August 2017); the majority of government departments and staff were relocating to Dodoma region (Tanzania's capital). In addition, due to the time and distance between Dodoma region and Dar es Salaam City, I was unable to do interviews with those that could not attend the workshop or interviews.

3.7.3. Time and Budget Constraints of the Study

The researcher recognizes that studies like this require consultations with large groups of individuals regarding their opinion on the policy being investigated. This normally might take several months to complete; however, due to time and budget constraints, this study consulted a smaller group of experts that have adequate knowledge on and experience with Tanzania's forest sector and policy programs. The selected group of experts was representative enough to fulfill the goal of this study as academic research.

CHAPTER FOUR: STUDY FINDINGS

4.1. Introduction to the Findings

The study findings were obtained through two methods: a one-day workshop and semi-structured interviews with experts. In total, 22 experts with diverse backgrounds and experience relating to the research problem were contacted in this study. In both settings, the research questions covered all key issues related to the study objectives and the research problem. During the workshop, the researcher made a brief presentation about DPSIR analysis in the context of this study. The goal of the presentation was to highlight the background of the research and stimulate discussion on the research problem.

Following the presentation, participants were divided into three groups, with each group having four experts working on the research questions developed based on the study objectives and workshop questions. The questions were categorized into key themes that responded to research questions and study objectives. A copy of Tanzania's Forest Policy of 1998 was given to each group for consultation whenever there was an issue or question that needed reference from the policy document. Given the opportunity for one-on-one discussions with the experts, the study's research questions were adjusted during the interview to open up a more in-depth discussion on issues that could not be discussed in the workshop setting due to time constraints.

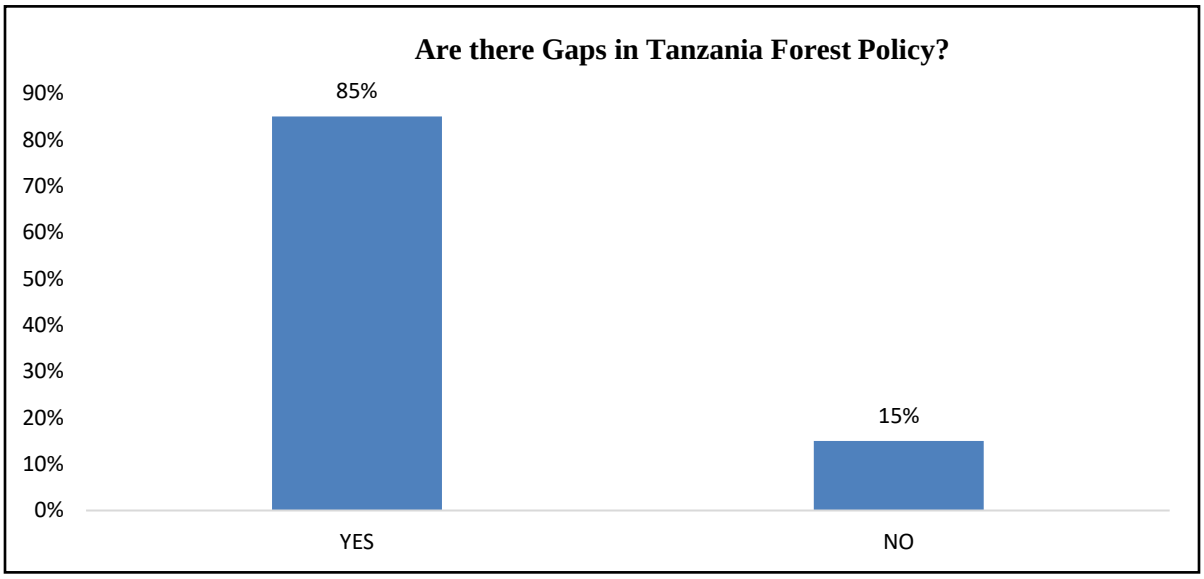
The use of these two methods enabled the researcher to collect adequate information about the research problem using a smaller group of participants with less time and resources. The two methods were also effective because each research question was discussed in detail. The findings derived from both the workshop and interviews are presented below in 4.2 and 4.3. The first theme

in 4.2 discusses what participants described to be key forest policy gaps, and 4.3 presents factors that limit forest policy performance in Tanzania.

4.2. Forest Policy Gaps

Given that one of the focuses of this study was to understand gaps in the existing forest policy, participants were asked about their opinion on what they consider key gaps in the 1998 Tanzania Forest Policy and how these gaps could be addressed. For the purpose of this study, forest policy gaps refer to what is missing with regard to what the forest policy states and what is happening or being implemented by responsible authorities in the forest sector (Mgaya, 2016). In the discussion with the experts, nearly all participants (**Figure 9**) acknowledged that the current forest policy has gaps that need to be addressed to strengthen forest sector efficiency.

Figure 9: Experts perception on Forest Policy Gaps



Source: Field Data Analysis

The policy document we are using is over 20 years old. Our forests have changed and keep changing every day. The things addressed by the policy in the 1990s have also changed, and this document is irrelevant now", pointed out one *Interviewed Participant.*

These forest policy gaps identified are presented in the following section.

4.2.1. Drivers of Forest Degradation Not Addressed

The majority of participants believe that the MNRT has been weak in addressing the effects of subsistence farming and charcoal consumption on forests and consider this a major policy gap. According to the participants, the forest policy lacks clear directives that limit unsustainable land use practices, farmers encroaching on open forests and forest reserves and unsustainable charcoal-making practices employed by the majority of charcoal producers. For example, addressing these challenges requires strong collaboration between the MNRT and Agriculture and Land Ministries; however, policy efforts to address these issues are uncoordinated. Often times, there have been unclear policy directives from these institutions towards controlling subsistence farming encroachment to open forests and forest reserves.

Although participants recognize how important farming is to the majority in Tanzania, especially rural communities, they believe that not enough has been done to educate and raise awareness on sustainable agriculture practices in these communities. In addition, land use planning, which is a prerequisite for forest protection and the conservation of land and forest resources, remains low across Tanzania. As a result, the majority of land and forests are exposed to human encroachment. Furthermore, extension services farmers and rural communities are limited, hence the majority of subsistence farmers lack basic knowledge and awareness on environmentally friendly farming practices that have little or no effect on land forests to control

the conversion of forestland to agricultural fields, which is a major driver of forest loss. These services could only be delivered if there was better policy arrangement and collaboration between TFS (MNRT) and Ministry of Agriculture and Land.

"The policy section 4.4.5 mentions strengthening collaboration between local government departments in managing natural resources, but there is a vacuum on how these institutions would work together, because each department has its own priorities", stated one participant from a Local Government Office.

In addition, one participant from the Ministry commented on conflicts of interests and unclear policy directives between key ministries to be another gap, stating,

"While the Ministry of Land encourages people to use rural, untouched land for productive farming, then the Ministry would formalize those lands. TFS advocates on conservation of forest land restricting people to utilize them".

Furthermore, an NGO participant believed that the MNRT has failed to address drivers of forest loss in Tanzania because *"there is unclear policy actions that address conversion of forest land to crop land".*

Participants stated that the existing policy directives aiming to address the impact of farming activities on forest resources are too general and weak. This is because agriculture is often believed to be a productive use of land, while the forestry sector is overlooked.

Missing Policy Directives to Limit the Excessive Use and Supply of Charcoal

While the environmental effects of charcoal consumption are known, participants mentioned that there are no effective policy actions that explicitly respond to this problem.

According to participants, although the forest policy has statements (Policy statements 1, 5 and 9) that seek to enhance SFM in Tanzania, none of these statements recognize "charcoal" as a fundamental problem that requires strong policy enforcement. In addition, although these policy statements seek to improve the sustainable management of forest resources, wood fuel use (charcoal), which is the root problem, is not clearly mentioned in these policy directives. Nevertheless, little action has been taken to implement and operationalize these policy directives.

Policy Statement (1): "To ensure sustainable supply of forest products and services and environmental conservation, all types of forest reserves will be managed for production and/or protection based on sustainable management objectives defined for each forest reserve. The management of all types of forest reserves will be based on forest management plans" (MNRT, 1998, p.16)

Policy Statement (5): "To enable sustainable management of forests on public lands, clear ownership for all forests and trees on those lands will be defined. The allocation of forests and their management responsibility to villages, private individuals or the government will be promoted. Central, local and village governments may demarcate and establish mew forest reserves" (MNRT, 1998, p.19)

Policy Statement (9): "Establishment of private woodlots and plantations for wood fuel production will be encouraged and supported through research, extension services and financial incentives" (MNRT, 1998, p.25).

"*For years, TFS has failed to come up with concrete policy directives that offer solutions to the charcoal use problem. What we see is quick-fix political moves as if the problem is new. The truth is addressing the charcoal consumption problem in this country (Tanzania) is complex; it*

needs a comprehensive policy discussion from various sectors. This is not a forestry or energy issue, it's more than that; both MEM and MNRT fail to come up with better policy directives or regulations on charcoal use because at the moment they are no alternatives to charcoal" stated one participant from the University.

Other participants were of the opinion that the MNRT treats charcoal as a forest issue, while it is a multi-sectorial challenge that may need many players and policy actions to be involved to control its environmental impact.

4.2.2. Inadequate Policy Incentives towards Community Forest Conservation

Participants expressed concerns about effectiveness of JFM as a policy strategy, as it has failed to incentivize forest-dependent communities across Tanzania. With JFM, it was expected that collaboration between the government (local governments) and village government (communities) would be strengthened. This would also involve sharing benefits resulting from the conservation and management of forest resources being shared between the two parties. Further, as is outlined in section 4.1.1 of the 1998 Forest Policy and section 16 of the Forest Act of 2002, the local government forest office would sign Joint Forest Management Agreements (JFMA) with village governments, giving land tenure rights to village governments. However, due to several forest governance shortcomings, particularly the bureaucratic processes within MNRT and other government institutions involved in land formalization processes, very few JFMAs have been signed. This has been a barrier to village governments' ability to formalize and utilize land and improve community livelihoods such as by developing small-scale community forestry projects or investments. According to one participant from an NGO, "There is little commitment from the government to ensure communities benefit from their conservation efforts. As of today, the TFS has not signed JFM agreements with the majority of villages that were identified for this strategy,

and eventually communities are less motivated to conserve and protect forest resources. JFM agreements could help village governments work with local and international investors interested in land development and forestry projects. This could be a major incentive to communities in regions like Rufiji".

Similarly, other participants pointed out that there were expectations that with JFM forest-rich communities would directly benefit from livelihood opportunities resulting from global initiatives such as Reducing Emission from Deforestation and Degradation (REDD+) particularly REDD+ financing, of which Tanzania was a pilot country. Unfortunately, due to regulatory barriers and unclear policy directives (such as delays in getting land titles) within the government, the majority of the forest-dependent communities have been unable to tap these opportunities.

4.2.3. Missing Linkages between Policy Directives and Institutional Actions

Tanzania's forest sector framework for the decentralization approach was expected to address the shortcomings resulting from the top-down forest governance approach that existed in the past. That is, the new forest policy framework was expected to improve and enhance collaboration between local governments and key stakeholders in the sector. Unfortunately, this has not been the case; participants were of the opinion that the MNRT approach to forest resource management remains top-down. Under decentralization, local forest government offices are expected to handle the majority of forest management issues such as legalizing VLFRs and retaining forest revenues collected in their respective regions. In contrast, MNRT controls many of revenue issues, with little being returned to its local government offices. Nevertheless, the majority of decisions and approvals concerning community forests remain in the hands of TFS at a central level, thereby limiting village governments' access and mandate to capitalize on regional or international forest-based livelihood opportunities. For example, according to policy Statement

9 “Establishment of private woodlots and plantations for wood fuel production would be encouraged and supported through research extension services and financial incentives” (URT, 1998, p.25). However, there are no grassroots institutional structures to support this and many other policy directives remain unclear to many stakeholders. As a result, forest-rich villages remain without forest management plans and because of delays to attain VLFRs status as recognized by PFM/CBFM guidelines and legally supported by the Forest Act of 2002, these villages fail to establish and advance forest-based investments that have several livelihoods potential. Participants believed the MNRT has been reluctant on this because it sometimes depends on revenue from local government forest resources.

In some cases, TFS meets its revenue targets by collecting fees from natural forest products that are harvested without sustainable harvesting plans; “most of these products come from village forests”, argued a participant from an NGO.

4.2.4. Lack of Market-based Policies

Participants believed that the MNRT has been weak in incorporating market-based policies in the nation’s forest sector. The majority of participants believe this has been a major barrier to growth of the forestry sector in Tanzania. Despite recognition of the private sector in policy statements 12, 13 and 14, there is no clear institutional framework to stimulate private investments in forestry. According to participants, unlike other sectors, there has been very slow policy progress and commitment from the MNRT to create an enabling environment that could attract and grow private forestry and development in the country.

"*Part of this is due to the way our economy was designed. We still hold a lot of state-centred policies, where our natural resources remain in the hands of the state",* mentioned one participant from the Government.

Furthermore, concerns were also raised about how forest policy focuses too much on conservation and overlooks business development opportunities in the sector. Participants mentioned examples of countries such as Finland and Norway that have managed to balance conserving their forests with also promoting private investments. While participants acknowledge the need for the conservation of natural forests due to increased pressures, they were also of the opinion that with good forest regulations and policy incentives, there are still opportunities to attract private investment in the sector.

Emphasizing this, one participant from a local government forest office stated that, *"with the help of Mpingo Conservation and Development Initiative (MCDI, a local NGO in Tanzania), more than 7 villages in Rufiji district have adopted and benefited from forest certification schemes that follow sustainable harvesting standards*". With better policies, initiatives like these can be scaled up and replicated in other districts across Tanzania.

4.3. Factors Limiting Policy Performance

Another focus of this study understood how various factors affect forest policy implementation. To understand these factors, participants were asked on what they perceive to be the most significant factors limiting effective forest policy implementation and how these factors hinders SFM progress in Tanzania. Key themes that emerged from this discussion are categorized as *Institutional*, *Financial* and *Political* factors, other themes that were neither institutional nor political or financial are categorized as *Other* factors. **Table 5** presents a summary of these factors

on what the experts considered to be key barriers to SFM policy implementation. In the discussion, the majority of the participants believed that institutional and financial factors (**Table 5**) play a major role in hindering SFM progress in the country. For example, there are should immediate reforms on the institutional structure in the forest sector to will give more authority to local government offices to make decisions over management forest resources as articulated in the Forest Act of 2002, argued participants from NGOs. A detailed explanation on how these factors underpins SFM progress in Tanzania is presented in in the section 4.31 to 4.3.5. Further description how these challenges and factors could addressed is also presented in Chapter 5.

Table 5: Factors Limiting Forest Effective Policy Implementation

Institutional	**Budget/Financial**	**Political**	**Other**
Weak Coordination between TFS and other Government Departments	Low budget support on Forestry Extension Services	Lack of Political Will to Transform Forest Sector	Lack of Incentives for Community Afforestation Programs
Weak Enforcement on Forest Regulations	Limited Investment on Forestry Monitoring, Verification and Reporting.	Knowledge Gap about Forest Policies and Regulations among Decision Makers	Underdevelopment of Forest-Based Livelihood Sub-sector
Staff Accountability and Integrity issues	Overreliance on Donor Support to SFM programs	Involvement of High-level Decision Makers in Timber Trade and Illegal Logging	Unclear Revenue Sharing Plans between TFS and Villages with VLFRs
Lack of Friendly Polies and Regulations to attract and retain private investment in the forest sector	Low Budget priority on Forest Sector		Inadequate facilities for Forestry Education and Extension Services.
	Limited investment on Forestry Research & Development		

Source: Field Data Analysis

4.3.1. Weak Inter-Ministerial Collaboration

Participants believed that weak collaboration between the Tanzania Forest Service (TFS) and other ministries or departments overlapping with the forest sector has contributed to inefficiency in the forest sector. Although, forest policy itself strongly advocates for institutional collaboration among department(s), little is being done to improve relationships and collaboration among sectors such as forestry, tourism, and agriculture. The policy statement (31) states, "Cross sectorial coordination between forest sector administration and other government institutions will be promoted at all levels" (MNRT, 1998, p.45). However, coordination between the forest sector and other key sectors that overlap with forest sector activities has remained weak, particularly at the district level. Consequently, in some instances, there have been policy clashes and unclear policy directives between TFS and other government departments. These kinds of policy disputes could have been avoided only if there was a clear policy implementation structure among overlapping jurisdictions such as land, agriculture and others.

In the context of Tanzania's natural resources governance, there are several crosscutting issues between the forest sector (TFS) and the Ministries of Land, Agriculture and Energy. Yet, the current forest policy has no specific integrated institutional or policy framework that could bring these sectors together. It is unfortunate that the only formal avenue for policy discussion among these ministries and departments is staff or departmental meetings. Unfortunately, staff from these ministries or departments often work independently and in some cases have little knowledge on policy directives from the forest sector or related sectors

"MoUs between TFS and other Ministries are signed by their PSs (Permanent Secretaries), but actions and directives resulting from those MoUs are not well translated or

integrated to policy frameworks within the respective department or ministry", stated one participant from the Ministry.

It is unfortunate that the MNRT has failed to strengthen its collaboration with the PMO-RALG and other key ministries. The institutional arrangement between the MNRT and other central or local government departments (agencies), particularly land, agriculture and wildlife, is weak, especially on issues that need policy integration. In addition, there are unclear functions between these institutions that directly or indirectly affect the forest sector, limiting policy progress on issues that overlap more than one sector.

4.3.2. Limited Knowledge about the Forest Sector among Key Stakeholders

According to participants, a knowledge gap exists between two key groups: Development Planners and Policy Makers. A detailed categorization is discussed below.

Knowledge Gap among Development Planners

Participants expressed concerns over the low recognition of the forest sector's potential and contribution to the past and current Tanzania's development plans (strategies). According to participants, Tanzania currently has several development strategies that can act as a guide on its path to becoming a middle-income nation. These include the Second National Strategy for Growth and Reduction of Poverty (NSGRPII, commonly known as MKUKUTA in Swahili), Tanzania Development Vision 2025 and the ongoing Big Result Now (BRN) initiative. These strategies aim to improve government service delivery processes in almost all sectors. However, little has been mentioned about how explicitly the forest sector should integrate and contribute to these strategies.

For instance, Goals 4 and 5 of NSGRPII on Cluster One emphasize improving Tanzania's economy through sound environmental policies and the effective utilization of natural resources

(IMF, 2011, p.59). In these goals, nearly all natural resource sub-sectors have been mentioned with specific targets and plans on their contribution to the attainment of NSGRPII goals. However, the forest sector's role was unnoticed and underestimated. It is unfortunate that, despite its economic significance, policy makers have often overlooked the forest sector's potential and contribution to Tanzania's national economic development. As a result, the forest sector receives less budget attention compared to other natural resources.

Knowledge Gap among Policy Makers (Politicians)

Some participants believed knowledge gaps on issues related to forest policy exist among policy makers. These include Members of Parliament (MPs) and politicians. "*It's a challenge for the policy to have an impact when people that influence and advise the government where the money should be allocated know little about the policy itself*," stated one participant from the Central Government Office.

Other participants thought this challenge could be attributed to a lack of political will, stating that decision makers within the government have less interest in the forest sector compared to other sectors. Participants also argued that policy makers such as Members of Parliament often influence policy changes on issues that build their political agenda and careers, and stated that common issues on education, health and agriculture sectors receive significant policy dialogue among politicians. Unfortunately, the forest sector is often discussed less by people like MPs.

"For years, budget discussions have focused on agriculture, education, and health and even discussion about poverty reduction focus on these sectors. The public does not understand how losing forests directly affect their livelihoods or incomes. This also includes our politicians. This means there is work to be done here to have people understand (especially politicians) that

our environmental resources are declining fast, and this will eventually affect our livelihoods" argued one participant from the NGO.

. *"Once investing on proper management of natural resources is recognized as a good investment for poverty reduction, we will see significant policy changes in the natural resources agenda*", argued a participant from another NGO.

Another participant from a university also mentioned, "Between 2009-2012, agriculture received significant fiscal policy focus, especially after the launch of KILIMO KWANZA (Agriculture First) initiative; it attracted donors and investors in and outside Tanzania. If the same budget priority was given to the forest sector, there would be differences in how Tanzania's forest sector performs".

4.3.3. Limited Provision of Forest Extension Services

Limited forestry extension services, particularly in rural Tanzania, emerged as one of several key barriers to effective forest policy performance. Although mentioned in the policy statements 35 and 36, the majority of participants argued that poor extension services in forest-rich communities have contributed to the over-extraction of forest resources and increased encroachment activities in forest reserves. Likewise, participants also believed that low investment in local forest staff's training and inadequate forestry staff in local government forest offices are major challenges to effective policy implementation.

For the majority of participants, the provision of forestry extension services should be the MNRT's priority given that more than 60 percent of Tanzania's population still reside in rural area and are engaged in farming. Unfortunately, many communities have not been engaged and many farmers are unfamiliar with some forest policy regulations enforced by the government.

"Most districts have one Forest Officer per district, while the forest staff guidelines from the Ministry require at least three Forest Staff per district. And, unfortunately, our villages are distant to each other, which makes it hard for one officer to deliver extension services", mentioned one participant from a Local Government Office.

Participants believed that without adequate allocation of forest staff at the community level, the enforcement and adoption of sustainable forest management practices would remain low across the country. In fact, previous community forestry programs initiated by the MNRT failed due to limited technical support in terms of providing education and training to communities.

"The slow progress of the National Forestry and Beekeeping Programme in Tanzania was not successful because of a lack of extension services to the community, the programme was donor-driven and once donor support ended, the government failed to sustain beekeeping programs", stated one participant from a Government Department.

Investing in forestry extension services is critical to boosting the forest sector's contribution to the economy and advancing SFM in Tanzania. Evidence from studies also points out that without adequate forestry staff at a local government level, district councils fail to adequately monitor and collect earnings that could be generated from various forest products and services in Tanzania (Akida et al., 2012).

4.3.4. Low Investment in Forestry Research and Development

Although Tanzania has four forestry-training institutes established to meet forestry education and research needs, these institutions have a limited training and research capacity due to financial and human resources constraints. For example, due to limited budget support from the central government, these institutions tend to rely on donor or external support to conduct regular

forestry training and research. This has affected forestry staff and their technical capacity in the country. In addition, some of their research focuses on issues that are irrelevant to national priorities with regard to the forest sector, which also affects policy and conservation priorities. Today, less than 1% of the budget that goes to the MNRT is directed toward forestry research and capacity building. For years, the MNRT has been relying on external donor support in most policy programs.

"REDD+ programs' support in Tanzania was politically important to donor countries that were looking on ways to show their commitment to the climate change agenda. This wasn't Tanzania's top priority with regard to forest management," stated one participant from a University.

In addition, despite the existence of these forestry research institutions, they are underutilized and their contribution to the growth of the forest sector is insignificant. Participants stated that research investment on issues such as the value chain for forest goods and services could help private sector stakeholders understand the opportunities available in the forest sector. However, little research and analysis have been directed to the value chain and related market issues, and so there is a paucity of information, limiting the growth and engagement of the private sector. For example, there are limited studies that show regional investment opportunities with regard to the forest sector in Tanzania. Such data and information are essential to draw investor interest to the sector and create growth over time.

"*Value chain analysis should be done to accommodate private sector needs and attract their investment on forest sector enterprise development. This should be backed by strong regulations, advocacy and training to interested private individuals or companies*" suggested a Workshop participant.

4.3.5. The need for new and stronger Regulations to control Drivers of Forest Loss

As discussed in Chapter 3, although the MNRT has passed several forest regulations to control unsustainable use of forests. These regulations have not adequately controlled drivers of forest loss and, at community level forest protection remains weak (Blomley & Iddi, 2009). In the discussion, experts had different opinions on whether the problem is with regulations or enforcement of the regulations passed. Some of the experts believed while enforcement is a challenge, but there is a need for new and tough regulations that can address SFM challenges overtime. In addition, considering several external and internal factors such the growth of economy in Tanzania and its neighboring countries in the East Africa region, the need for new regulations is crucial (Milledge et al., 2007). Furthermore, other participants considered some of the regulations outdated and irrelevant for the current challenges the forest sector is facing.

In the end, participants agreed that, moving forward Tanzania needs new regulations that can accommodate various socio-economic changes happening in the African region. Only, less than 20 percent of the participants had a different opining regarding the need for new regulations (Figure 9). Likewise, the majority participants from the research and academic institutions stated that challenges such as excessive charcoal use and charcoal business should be controlled with tougher regulations to both users and traders (Figure 9). Other themes that emerged in this discussion include the need for better regulation on trade of forest goods and private sector inclusion in the sector. Another area for new regulations that largely supported by nearly all participants was the inclusion and engagement of private sector in forest sector. However, participants, some of the experts were in opinion that, based on experience from other developing countries, opening up room for private investment in the forest sector should be handled with precautions to avoid the any shortcomings that come with private forestry.

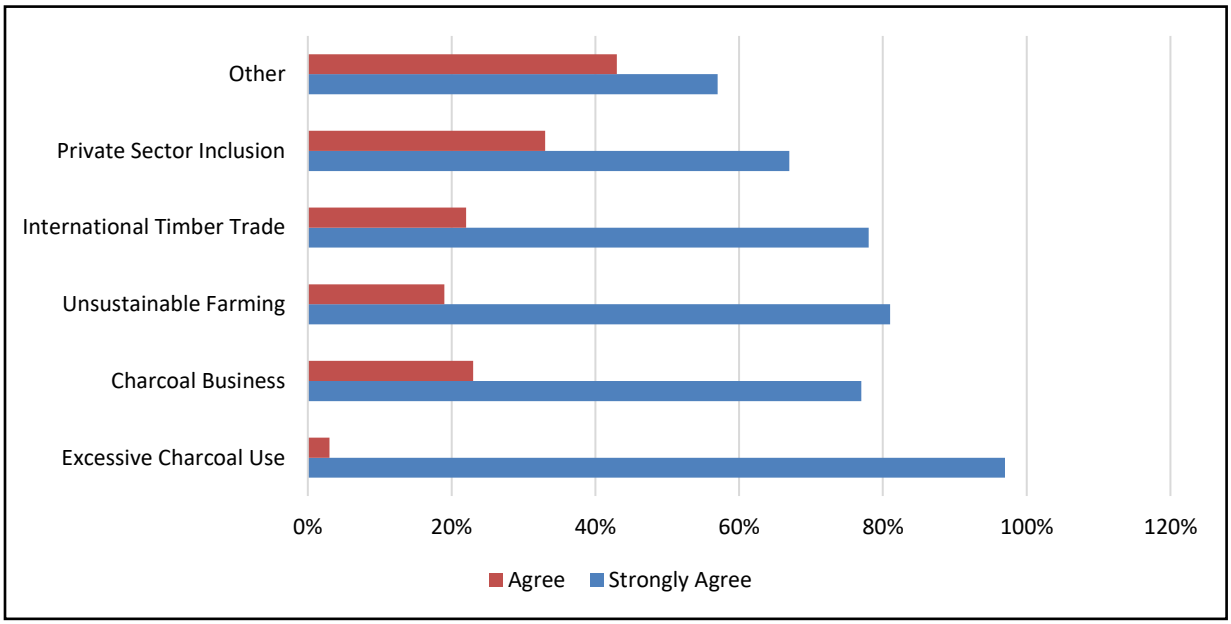


Figure 10: Where do we need New Forest Regulations
Source: Field Data Analysis

CHAPTER FIVE: POLICY RECOMMENDATIONS AND DISCUSSION

This section presents key policy recommendations that emerged from the discussion with experts. The majority of these recommendations respond to gaps that exist in Tanzania's Forest Policy of 1998. Each policy recommendation is discussed with policy suggestions offered on how the proposed intervention can be implemented to improve forest policy performance and strengthen SFM in Tanzania.

5.1. Strengthen Institutional Collaboration between TFS and Other Ministries

The study revealed that weak forest governance is a major barrier to forest policy implementation. Due to this, the majority of forest policy regulations remain unknown and unenforced at the community level, leaving forests and other environmental resources vulnerable to human-induced activities, particularly the encroachment of farmers onto forest reserves. In addition, due to weak institutional collaboration between the Departments of Land, Agriculture, Energy and Forest, forest regulations such as those prohibiting the clearing of open forests are ineffective. For example, while there is a clear policy overlap between the Ministries of Land, Agriculture and Energy about the effects of charcoal consumption to the land, energy and forest sectors, these institutions remain uncoordinated on this issue, limiting forest policy performance. This suggests that the success or failure of forest policy actions or regulations depend on how land, agriculture, and energy-related policies are integrated with the forest sector. Unfortunately, integration of these policies is missing.

Furthermore, as discussed earlier, land use conflicts between farmers and other community groups is a result of a lack of integrated land use plans. While this can be seen as a land use problem, resolving land use conflicts would require input from other sectors, which are directly affected by such disputes, particularly agriculture and forest. Therefore, improving policy

integration among these sectors is significant towards the proper management of land and forest resources in Tanzania. This is critical for Tanzania, because more than 60 percent of rural communities depend on these resources for their livelihood. However, policy integration between the land, forest and agriculture sectors is weak. Considering this, it is important for the government to first strengthen institutional collaboration between these sectors. This can be done through the establishment of an "Integration Unit" within the District Councils. The proposed "Integration Unit" will be a first step towards strengthening institutional collaboration among sectors that affect and are affected by forests. In addition, the Integration Unit can be mainstreamed within local governments' structures to address integrated and crosscutting issues related to natural resources management at the community level.

There have been efforts in the past within local governments in Tanzania to address integrated issues regarding natural resources management. However, crosscutting issues concerning natural resources management are often addressed through ad-hoc meetings while each respective department continues to work independently. Therefore, the "Integration Unit" will close knowledge gaps on crosscutting policy and sectorial issues, improve information dissemination, and strengthen collaboration between Land, Forest and Agriculture sectors at the district level. It is also important for the MNRT to develop policy instruments that reinforce the integration and regular monitoring of crosscutting issues regarding the management of forests and other natural resources at the community level.

5.2. Establish an Independent Institution for the Biomass Energy Sector

It is evident that charcoal is a major environmental policy challenge in Tanzania. Evidence also shows that addressing the charcoal problem in Tanzania requires a strong institutional and regulatory framework. This is because current government efforts regarding charcoal only offer

short-term solutions and do not adequately address the root causes of the problem. For instance, efforts are underway by the Ministry of Energy and Minerals to develop a Biomass Energy Strategy (BEST) for Tanzania under MEM, which will be a principal policy strategy used to deal with issues related to charcoal and other biomass energy sources. Critics from policy makers in and outside Tanzania have shown concern regarding BEST and its approach to the charcoal problem in the country. While this is a major step forward, the majority believe that alleviating environmental dangers caused by charcoal production requires more than a policy strategy. Thus, there is still a pressing need for the better coordination of such efforts, with institutional structures mainly focusing on addressing the charcoal problem at the community level. Additionally, several policy studies have shown that the institutional framework plays a critical role in influencing policy changes in many areas including public health, agriculture and education. Relatedly, an institutional framework for the coordination of charcoal production and consumption is crucial in Tanzania to lead reforms and the enforcement of various charcoal regulations. Therefore, it is high time for the Ministry of Energy and Minerals (MEM) and the MNRT to come together and take stronger actions on charcoal use in Tanzania.

Discussing this Policy Intervention

Reports in Tanzania indicate that households in the country will continue to use charcoal for many years to come; this means charcoal consumption will also grow significantly (Doggart, 2016). It is therefore critical for Tanzania to strengthen its legal and institutional frameworks regarding charcoal use and supply beyond BEST, as, at present, charcoal and other biomass energy sources are categorized as “renewable energy” within MEM’s institutional framework. In addition, despite the MEM’s recognition, wood fuel energy sources, particularly charcoal, have received limited policy attention compared to other renewables such as solar, wind, and others. For

example, after the establishment of a Rural Energy Agency (REA) within MEM in 2007, policy makers were optimistic that REA would take on charcoal as an energy sub-sector. In addition, many believed that, among other things, REA would advance biomass energy research and innovation in Tanzania. However, for years, REA's focus on renewable energy has been on providing rural electrification through hydropower or solar energy, overlooking charcoal and other wood fuel energy sources (biomass energy). Therefore, the establishment of a Biomass Energy sub-sector within MEM is critical to advancing the charcoal sector's regulations, policy incentives and legislations guiding the charcoal industry, which has been overlooked for many years. Ultimately, this will address governance barriers at the national and district levels.

It is noteworthy that efforts to improve the institutional framework for the charcoal sector are not new in Africa. In Ghana, wood fuel energy sources play a critical role in supplying energy to the majority of citizens. Recognizing this, the government of Ghana established an independent institution within the Ministry of Energy to deal with charcoal, which is recognized as a sub-sector within the government energy sources portfolio. Since its establishment, there has been major progress on the charcoal sector's contribution to local economies and to reducing its environmental impacts.

5.3. Invest in Research, Innovation, and the Development of Forest-Based Livelihoods

Given the economic potential for forest-based livelihoods and their contribution to reducing rural poverty in Tanzania, it is essential for the MNRT to invest and develop policy strategies that will advance the growth and innovation of small-scale forest-based enterprises with a focus on forest-rich regions. This would require both technical and financial support from the MNRT and its partners. For example, there is a significant need for market research and information on forest-based products (high-value forest products) such as bee-related products and

other Non-Timber and Forest Products (NTFPs). Unfortunately, most of this information remains unknown to individuals and NGOs interested in investing in forest-based livelihoods opportunities. Consequently, interested private individuals and NGOs have little knowledge and are unaware of market needs and opportunities in Tanzania.

Although forest-based livelihoods such as beekeeping offer several economic opportunities, evidence shows that the MNRT has done little to improve this sub-sector. For example, despite the existence of the National Beekeeping Policy of 1998, Tanzania has been weak in supplying honey and other beekeeping-related products to international markets (ITC, 2015; FAO, 2016). This is due to poor coordination and inadequate technical and financial support from the government. Little has been invested to improve market information and the coordination of key stakeholders in the beekeeping sector to boost development of the beekeeping industry. Investing in market research and the innovation and development of forest-based livelihoods is a great opportunity to reduce human pressure on forests and motivate forest-rich communities to conserve and protect forest resources.

Discussing this Policy Intervention

It is therefore recommended that the MNRT re-invest between 10 to 15 percent of the district's forest revenues to District Councils as financial support to the local government. These revenues, among other things, should be allocated to support forest-based enterprise programs at the district and village level. More importantly, much of the forest revenues should be allocated towards education, training and market research on forest-based enterprises in villages that have higher contributions to forest revenues. Similarly, the MNRT should actively engage and play a key role in coordinating major players in beekeeping and other forestry-related products such as

the Honey Council of Tanzania, Green Resources, and local and international NGOs. Engagement of these key players should take the form of policy dialogues aiming to improve information sharing about Tanzania's market trends and opportunities. For instance, the CBFM arrangement offers a great opportunity to integrate and grow forest-based enterprises in Tanzania to enrich forest benefits to community, reduce rural poverty and enhance the sustainable utilization of forest resources, a major component of SFM practice.

5.4. Improve the Private Investment Landscape for the Forest Sector

Private investment in the forest sector remains low and uncoordinated, limiting growth and investors' knowledge on forest sector opportunities in Tanzania. Additionally, there is no clear institutional arrangement within the MNRT that can guide and promote private investment in the forest sector in the country. Therefore, creating an enabling environment with better regulations and policy incentives to attract and retain investment in the forest sector should be a priority for the MNRT. Achieving this will require a better organizational arrangement and legal framework that will guide the private sector and address administrative barriers that limit investment in the sector. This can be done by offering fiscal and non-fiscal policy incentives to private individuals and institutions in and outside Tanzania.

Discussing this Policy Intervention

First, the MNRT should engage and improve its relationship with domestic and international investors interested in the forest sector. As discussed earlier, the relationship between the MNRT and the private sector is weak and uncoordinated. To improve this, the MNRT should organize and host regular forest investment forums mainly for policy advocacy, informing investors on potential areas for investment and sharing information on the market potential of

forest products and services within and beyond Tanzania. Likewise, the MNRT should also offer fiscal incentives to investors with the technical and financial capability to advance forest-based livelihoods or services. Such incentives may include lowering taxes for international investors interested in investing in building local industries for production and exporting honey/beeswax products, and/or in the establishment of large-scale plantations of tree species with high medicinal or forest values. Evidence from studies has shown that implementing tax incentives in natural resources has improved investors' relationships with governments and increased direct foreign investment to the respective country. Secondly, improving transparency, particularly on forest revenues, should be the MNRT's priority, and such information should be known publicly to gain investors' trust in Tanzania's forest governance and market potential for forest products. This would also build investors' confidence, particularly for international timber trade companies that are often concerned about government efficiency in meeting foreign investors' needs.

5.5. Conduct Forest Policy Forums Targeting MPs and Political and Village Leaders

It is evident that awareness on forest policy issues remains low among politicians and other key stakeholders in the forest sector. This has affected the general understanding of forest sector regulations and policy actions that could improve SFM practices, particularly at the community level. There is therefore a pressing need for policy advocacy targeting influential stakeholders such as politicians. This can be done by conducting regular policy advocacy forums to inform, discuss and engage forest stakeholders in Tanzania. These policy forums should be organized annually, targeting elites like Members of the Parliament (MPs), political leaders, civic groups and community leaders across the country. It is through such forums that these potential actors can come to fully appreciate the challenges faced by the forest sector. Given their influence in their communities, these representative leaders will play a significant role in educating the mass

majority about forest policy regulations after the forums. Moreover, these forums would also serve as a formal platform for forest policy education and public engagement on policy processes and the better management of national forest resources. Considering the geographical scope of Tanzania, these forums also offer an opportunity to reach the larger public with minimal costs. Over the long-term, these forums could also be used as a platform for evaluation of the effectiveness of policy actions, instruments or regulations enforced by the MNRT and for getting feedback from the stakeholders. In fact, studies have confirmed that regular policy dialogues offer an opportunity for stakeholders to contribute to the policy process. This action will increase policy awareness and alleviate misunderstandings about forest policy issues at community and national levels (Kenneth et al., 2015; Montréal Process, 2009).

5.6. Develop Innovative Incentives for Rural Communities to Advance Forest Conservation

It is widely accepted that one major prerequisite to SFM is balancing forest conservation while also providing sustainable economic benefits to the poor. In Tanzania, the study has revealed that poverty remains one of the critical barriers to SFM in the country, limiting the sustainability of forest resources. Therefore, there is a need for the MNRT to develop policy actions that offer realistic livelihood benefits and recognize individuals or community groups' activities that have improved forest conservation at the community level. This can be done through better incentives that promote the conservation and protection of forests targeting rural communities.

Discussing this Policy Intervention

It is suggested that the MNRT should provide adequate support to forest-rich communities by building their capacity through advocacy and training on forest-based and ecosystem services opportunities in Tanzania and beyond. Such opportunities include REDD+, a global initiative

established by the United Nations (UN) and the World Bank with funding for community forest conservation programs in developing countries. For instance, in 2009, Tanzania became one of the few pilot countries in Africa selected for REDD+ projects. While it was expected that REDD+ would improve forest governance and offer livelihood benefits to forest-rich communities in the country, evidence shows the majority of forest-dependent communities in the country remain unaware of REDD+ and its associated benefits (Kweka et al., 2015). This has been the result of poor coordination, and a lack of advocacy and training about opportunities provided by REDD+ to forest-rich communities across the country. Similarly, the MNRT needs to improve legal frameworks guiding land user rights at the community level, particularly among forest-rich communities. Improved land use rights for rural communities would enable forest-rich communities to seize national and global opportunities in the forest sector. Likewise, such opportunities include the voluntary carbon markets and forest certification opportunities under the Forest Stewardship Council (FSC) platform. While these opportunities remain unknown to the majority in Tanzania, recently, local NGOs have played a critical role in informing and supporting villages to allow them to benefit economically through an FSC platform.

Luckily, in southern Tanzania, the Mpingo Conservation & Development Initiative (MCDI), a local forest conservation NGO, has been using a PFM strategy to help forest-rich villages establish VLFRs. With established VLFRs, these communities are trained in sustainable harvesting procedures and how to sell and meet international standards for forest products and other ecosystem services. Furthermore, through its FSC accreditation, the MCDI helps village governments sell timber products to regional and international markets. In fact, through MCDI efforts, some villages in southern Tanzania (including in Rufiji district) have earned substantial incomes resulting from sales of forest products harvested from their VLFRs (Masao, 2015).

Consequently, villages' earnings have been used to improve community social services and finance forest conservation programs. More importantly, the MNRT needs to recognize and reward village governments or individuals that have enhanced the conservation and protection of forest resources in their communities. These rewards can be in the form of national recognition at annual events such as National Environment Days, where these groups or individuals can be awarded certificates, prizes or monetary awards. Collaboration with the private sector and media on the publicity of these awards may motivate and promote forest conservation to the public and positively influence sustainable forest management practices in Tanzania.

5.7. Strengthen Forest Sector Accountability and Transparency

In the study, weak forest governance was a key barrier to effective forest policy performance in the region. It was also revealed that the lack of accountability and transparency among district forest staff is a major problem fueling illegal logging in the district. Lessons from other African countries have shown that addressing governance challenges within the forest sector involves considerable time and effort. It is therefore recommended that the MNRT collaborate with the PMO-RALG to implement short-term and long-term interventions that focus on strengthening accountability and transparency in the forest sector. Since the MNRT is responsible for forest policy formulation and implementation, the PMO-RALG should take a leading role, particularly in district staff capacity building.

Short-term Policy Intervention

Perhaps the most immediate action the PMO-RALG and MNRT need to take is to build the capacity of staff in terms of adequate staff allocation and in-house professional training on forest accountability practices, particularly those in forest-rich and border regions. A staff increase would improve monitoring and extension service delivery, and this would enhance forest

monitoring and governance at the community level. Both institutions should prioritize a staff increase as part of strengthening district councils' capacity to manage natural resources. For instance, an optimal staff allocation plan could include having at least four Forest Officers per district, of which one will be a Senior Staff member responsible for daily supervision and reporting to the District Executive Officer and TFS.

The MNRT should also improve its transparency and communication on district forest revenue. This should involve regular planning meetings and communication between local government forest offices and respective village governments. It is important that information regarding forest revenue collection, expenditures and distribution are known to the public to motivate forest-rich communities to conserve and protect natural resources. This information should be widely disseminated to village governments to manage expectations among forest-rich communities about forests.

Long-term Policy Intervention

Studies confirm that ongoing economic growth in Asia and the Middle East will put enormous pressure on Africa's resources, particularly forests and land resources (FAO, 2017; Kairuki, 2011). To control such pressure, African governments need strong institutional and reliable governance systems that can manage and reap the benefits of this international economic boom. Unfortunately, for many countries in Africa, including Tanzania, corruption and staff misconduct practices among government officials involved in the natural resources sector is a major institutional challenge. As a result, forests and other natural resources continued to have limited protection and management, hence governments earn little from their natural wealth.

Following this challenge, it is critically important for the MNRT to strengthen measures that will control corruption, staff misconduct practices and limit the over extraction of forest goods.

This should involve improving forest control and monitoring systems, particularly in local government offices, and the use and application of advanced systems that employ remote sensing and Information and Communications Technologies (ICT) should be employed in all forest goods operations, particularly those involving timber or logging logistics for international markets. The use of ICT and remote sensing technologies has proved to be the most effective and reliable tool for forest governance monitoring in many parts of the world.

Evidence has shown that, in Africa, countries that adopted these systems have experienced an increase in revenues, improved forest governance and drastically controlled illegal logging (Kramme & Price, 2005). Likewise, through the use these technologies, these countries have managed to track and examine the origins of timber or wood products harvested nationwide (Lawson & McFaul, 2010). This has created a healthy environment for the legal timber trade and attracted large-scale forestry investment, particularly from timber trade companies. More importantly, after considerable staff training, these technologies should be tested in various Tanzania forest trade hubs to check their shortcomings and how to address them before they are operational. This is critical because the use of these technologies is new in Tanzania and therefore there is a need for the MNRT to seek technical advisory support from countries that have advanced in the use of such systems and technologies prior to national operationalization.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

This section presents key messages and concluding remarks on issues that that require the attention of the MNRT and forest policy makers in Tanzania. In this section, issues that need further research opportunities are also briefly discussed to enhance SFM in Tanzania.

6.1. Key Policy Messages and Conclusions

6.1.1. NGOs Can Play a Critical Role in Forest Extension Services

Staff and budget constraints emerged as one of the key barriers for delivering forestry extension services to the rural majority in Tanzania. The study concludes that achieving SFM would require substantial investment in forestry education, training and community extension services. To do this, the MNRT will need both financial and human resources to support extension service programs, especially in hard-to-reach forestry regions. In addition, given the geographical scope of Tanzania and the fact that the majority of forest-dependent communities reside in remote rural areas, extension services will continue to be a financial challenge for the MNRT. Fortunately, for many years, NGOs have played a critical role in providing forestry extension services to many rural communities in Tanzania. Their work has been successful through the implementation of forestry and environmental conservation projects, particularly community tree-planting programs. Some of these projects and programs involved promoting forestry-friendly activities such as training subsistence farmers on sustainable land use practices.

The majority of these programs and projects were implemented with limited financial support from the MNRT, which was responsible for ensuring the sustainability and community ownership of the programs. Given this trend, the MNRT needs to strengthen its relationship with NGOs, CBOs and CSOs involved in forestry and environmental conservation, particularly those

working at the district and village level. This should involve providing regular institutional support on technical and policy issues that need the MNRT's direct support and removing administrative barriers that may limit NGOs' work to advance sustainable forest management. More importantly, for decades, NGOs (local and international) have positively influenced the conservation and sustainable management of forest resources, particularly in hard-to-reach, forest-rich communities of Tanzania (Blomley & Iddi, 2009).

6.1.2. Institutionalize and Build Local Capacity on Forestry Certification

Evidence from studies shows that forest certification offers several benefits in the sustainable management of forest resources; such benefits include addressing the illegal trade of timber and other forest products (Kraxnera et al., 2017). The application and incorporation of forestry certification practices as a forestry management tool has proved to be economically and environmentally beneficial to many governments around the world, as it boosts forest revenues, improves local forest management, and enhances the transparency and incomes of forest-rich communities (Masao, 2015; Ball, 2010; Oldfield, 2012). Moreover, studies also confirm that certified forest products have higher economic value than non-certified (Masao, 2015; Milledge et al., 2007). Recognising the benefits of forestry certification, the government of Tanzania should prioritize and formalize forestry certification as a mandatory procedure in the trade and business of forest products in the country.

The MNRT should enforce a rule whereby companies or individuals will be obliged to have all forest products certified by the government prior to their harvest. However, since forestry certification is a relatively new practice in Tanzania, it is significant for the MNRT to create an institutional framework that will help in the adoption and application of forestry certification within the government and beyond. This should involve creating guidelines, regulations and policy

instruments that enforce the integration of forestry certification as a standard and mandatory procedure for all forestry programs implemented by government, NGOs and the private sector. Likewise, the MNRT should work with institutions such as the Forest Steward Council (FSC) to build local capacity about forestry certification procedures that are going to be shaped in the Tanzania forest sector context and international market certification standards. The training should focus on producing enough qualified forest staff who will be responsible for forestry certification in all government plantation sites.

6.1.3. Strengthen Forestry Monitoring, Verification and Reporting

While there have been efforts to improve forest monitoring in Tanzania, it is important that the MNRT allocate more resources in forest monitoring at the community level. For instance, in 2009, the MNRT established a centre for forest monitoring and assessment known as National Forestry Resources Monitoring and Assessment (Tanzania). NAFORMA was put in place under Tanzania Forest Services (TFS) to champion forest monitoring and reporting in Tanzania (FAO, 2009). Among other things, NAFORMA conducts regular forest surveys that examine and monitor the state of forests and land resources in the country. The goal is to improve the management and conservation of forests and land resources in Tanzania. Since its launching, these surveys have been useful and have played a key role in decision making towards the effective management of forests in Tanzania. However, at present, the sustainability of NAFORMA's work remains uncertain due to funding limitations. This is because NAFORMA's operations rely on external donor funding, limiting its sustainability (FAO, 2013). For example, in 2012, the majority of NAFORMA's activities were phased out following the end of financial support from the government of Finland. This affected the MNRT's forest management decisions, which have also been influenced by annual forest surveys and monitoring, most of which are done by NAFORMA.

While there has been interest from other international donor communities such as the World Bank, FAO and others to continue supporting NAFORMA's work in Tanzania, it is important for the government of Tanzania to also allocate and invest adequate resources to sustain NAFORMA's operations in the country with limited dependence on external support. Nevertheless, criticisms have also been raised on the quality of data produced by NAFORMA. Evidence shows that this has been contributed by limited knowledge among MNRT staff, particularly those in the field offices, who lack knowledge and skills about various tools used in forest monitoring. Building staff capacity on forest monitoring is critical in advancing SFM. This is because evidence confirms that effective forest monitoring at the community level is essential in enhancing and achieving the sustainable management of forests (Kweka et al.,2015) It is therefore high time for the MNRT to invest in strengthening forestry monitoring, verification and reporting systems, particularly at the district and village level. This is critical because the degradation of forest resources in Tanzania remains high in rural areas due to several factors including a lack of effective monitoring and management.

More importantly, more financial resources should be allocated toward strengthening NAFORMA's work at the community level. This should involve investing in training district-level staff to use and employ advanced forest monitoring tools such as Global Positioning Systems (GPSs), remote sensors and surveys that could measure, monitor and reports indicators such as the health of forests, log production, the level and magnitude of encroachment and others. These tools and systems have proved to be efficient and less costly, especially in countries with extensive forest coverage such as Tanzania. With such systems, the MNRT will be able track forest products' origins (where they were harvested, district or village), tree species and its destination. Additionally, once adopted and effectively used, this new forestry monitoring and verification

system could be integrated with mobile phone payment systems that are advanced and widely used in Tanzania to facilitate online payments regarding forest goods and services. This will lower the MNRT's operation costs and enhance efficiency and transparency in the forest sector in the country.

6.1.4. Enforce and Promote the Sustainable Production and Use of Charcoal

Given that, the government of Tanzania has been slow to enforce environmentally friendly practices that limit the overutilization of forests during production or consumption. Both the MNRT and MEM should collaborate to design incentives that will promote and speed up the adoption of fuel-efficient technologies for charcoal producers and users. This is critical because studies confirm that enforcing the use of fuel-efficient charcoal kilns could save several hectares of forests in Tanzania (World Bank, 2009, Riedijik, 2011). In addition, evidence shows that promoting fuel-efficient charcoal stoves has several environmental and economic benefits to charcoal users and the forest sector. However, a lack of incentives for using these technologies has been barrier to the adoption of these technologies among charcoal producers and consumers in Tanzania.

It is therefore recommended that the government of Tanzania develop policy incentives that will limit the overuse of forests or charcoal fuelled by charcoal producers and consumers. Such incentives can come in the form of lowering taxes or fees on charcoal bags to charcoal producers using efficient charcoal kilns to produce charcoal. This will encourage more charcoal producers using traditional kilns to switch to fuel-efficient kilns that have been proven environmentally friendly. Furthermore, MEM should also collaborate with research and vocational training institutions on developing fuel-efficient kilns and stoves that are less costly and can be easily adopted by charcoal producers and consumers in Tanzania.

6.1.5. Strengthen and Enforce Forestry Benefit Sharing Plans at the Village Level

Tanzania's Forest Policy of 1998 and Forest Act of 2002 advocate for the proper sharing of the economic benefits generated from the sales or incomes of forest goods and services. This is articulated in the forest regulations of 2013 & 2014, which state that a certain percent of earnings collected from the sales of village forest products should be retained at the respective village (Mbwambo, 2015, URT, 2002). However, this process remains unclear to the majority of community members and a formal institutional arrangement on how these earnings will be collected, retained and managed is lacking (Mbwambo, 2015; Blomley & Iddi, 20009; Rantala et al., 2012). In some villages, decisions regarding earnings generated from village forests remain in the hands of individuals such as village chairpersons or shared among members of village committees and these earnings barely benefit the village community. Although forest benefit sharing plans are not a new practice in Tanzania, these practices have been ineffective and weak due to limited engagement and government monitoring. It is therefore important for the MNRT through its local government forest offices to facilitate and support formalized forest benefit sharing plans through formal village assembly meetings that will be witnessed and approved by community members and staff from local forest offices. More specifically, these plans should project how much the villages expect to charge or earn and how the earnings will be distributed or invested in the village.

6.1.6. Provide Incentives that Enhance Community Afforestation

Evidence from research confirms that planting trees has several environmental and conservation benefits and ultimately improves forest canopy. By planting trees, lost forests are restored, and this enhances forest vegetation and improves the entire landscape. For rural communities, trees have many socio-economic benefits; they control soil erosion, offer wood and

fruit but more importantly, mitigate the effects of climate change. Although Tanzania's national forest policy promotes tree planting and forest plantation activities, little has been done to promote tree-planting programs at the community level. Most afforestation programs are unorganized and uncoordinated with limited institutional support from the MNRT. NGOs or individuals with limited knowledge run the majority of programs on the effective management of tree planting that could have lasting conservation impacts. Because of this, most afforestation programs in the country have been unsuccessful with a low survival rate for many of the trees planted.

With adequate government support and incentives to communities, past community afforestation programs were very successful. For example, in the late 1980s, in response to the large-scale forest degradation problem in the northern region of Shinyanga, the MNRT initiated a community tree-planting programme known as the *Shinyanga Soil Conservation Programme* better known as *Hifadhi Ardhi Shinyanga* (HASHI). Through regular training provided by local MNRT staff to household farmers on the proper management of tree seedlings before and after planting, more than 300,000 hectares of local forests in the region were restored (Barrow, 2014). The majority of these trees were raised and planted by community members on their farms. The success of the HASHI programme confirms that providing incentives such as training support to farmers and forest-dependent communities can enhance tree-planting culture at the community level. The HASHI success story suggests that with better incentives to communities, SFM challenges can be addressed. Similar incentives can also be employed to increase the adoption of SFM practices that reduce pressure on forests. Such practices include promoting the integration of agroforestry to subsistence farmers in Tanzania, a practice that has several environmental benefits for both land and forests.

6.2. Recommendations for Future Research

Given that Tanzania is primarily a natural-based economy, there is considerable need for further research to advance knowledge about the economic significance of SFM. This is critical because knowledge gaps about forest policy regulations among policy makers and development planners emerged as one of the barriers to forest policy progress. Therefore, the following are recommendations for areas that need further research to advance SFM in Tanzania and influence forest policy integration among different government institutions in the country.

6.2.1. The Economic Implications of Forest Loss

In Africa, the rapid decline of forest resources will have serious economic implications in the near future. While this is also true for Tanzania, there has been little investigation into how the current degradation of forests will negatively affect the national economy. The majority of the studies conducted have overlooked the economic aspect of forest loss. Little is known about how the current rate of deforestation in regions like Rufiji will have adverse impacts on local economies and the national economy in general. Given this gap, it is therefore necessary that future studies also investigate the economic implications of deforestation and how they will affect the growth of other sectors. These studies will inform and help policy makers and development planners understand how investing in forest conservation has fiscal returns now and in the near future. With nearly 30 percent Tanzania's economy coming from environmental resources, these studies will also influence government policies and regulations that will enforce and prioritize the sustainability of environmental resources as part of the national development agenda. More importantly, studies like these will influence government decisions towards limiting the overutilization of environmental resources and promoting the protection and conservation of forests and other environmental resources at the community level.

6.2.2. The Role of Non-Timber Forest Products (NTFPs) to Forest-adjacent Communities

Studies show that Non-Timber Forest Products (NTFPs) such as herbal products, wood-made household utensils, bamboo and forest fruits could provide additional income and alternative livelihoods to rural communities in Tanzania (Monela et al., 2000). In addition, recently, there has been a growing interest in Tanzania's herbal and wooden products from local and international consumers. However, for decades, the potential of NTFPs to improve rural incomes has been overlooked and underestimated in the country (Lusambo et al., 2007). For example, despite their huge potential, the commercial value of NTFPs is unknown, limiting their contribution as a viable forest-based livelihood opportunity to the rural majority (Monela et al., 2000). This provides a research opportunity to learn and explore the market potential for NTFPs in Tanzania and how this opportunity will benefit locals and their economies. It is therefore important for studies to examine what would be practical ways for the government, particularly the MNRT in collaboration with NGOs, to promote and enhance the contribution of NTFPs for economic, environmental and social benefits, particularly to communities adjacent to forest reserves. These studies will help the MNRT carry out programs that build the capacity of rural communities to directly benefit from NTFPs and design policies and regulations that boost the growth of and investment in NTFPs in Tanzania with a focus on identifying markets within and beyond Tanzania.

6.2.3. The Future of Forestry as an Investment and Business

This study has revealed that private investment in the forest sector remains low and uncoordinated. In addition, the MNRT's relationship with the private sector community within and outside Tanzania remains weak, limiting the growth of foreign investment in forest goods and services. Experience from other countries has shown that Public Private Partnership (PPP) arrangements provide an enormous opportunity to improve service delivery and boost the

economic growth of natural-based economies. Nevertheless, creating PPP-friendly policies in the forest sector has also proved to be a better way to attract foreign investors in many areas such as the establishment of large-scale tree plantations and beekeeping industries, which require adequate technical and financial resources. Recognizing this potential, it is high time for forestry professionals and researchers in Tanzania to conduct studies that will inform and help the government of Tanzania, particularly the MNRT and Tanzania Investment Centre (TIC), design and develop better policy frameworks that will attract and retain foreign investors in the forest sector in Tanzania. Similarly, studies should also be done to inform both domestic and foreign investors about Tanzania's forest regulations and existing investment opportunities in forest goods and services in Tanzania.

6.2.4. The Role of Incentives for SFM Compliance in Tanzania

Given that the majority of Tanzania's rural households are subsistence farmers and depend on forests for their livelihood, developing incentives for these communities to reduce farming pressure on forests is critical for the sustainability of forests and their livelihoods. While there have been policy efforts to enhance SFM compliance to these communities, no significant incentives are available at the community level to enhance the management of forests and environmental resources. For example, due to insufficient tangible conservation benefits to the rural majority, CBFM and the JFM have not adequately addressed human encroachment on forest reserves in Tanzania. As a result, forests and land resources remain vulnerable and experience significant pressure from the rural poor.

Experiences from other developing countries confirm that incentives that improve the livelihoods of rural communities ensure the sustainable and sound management of natural resources. For example, the introduction of Payment for Ecosystem Services (PES) has enhanced

the management of water and other natural resources in many countries around the world. In Tanzania, the integration of PES in forest management remains limited despite the potential to integrate PES in existing forest policy strategies such as CBFM and others where local communities can directly benefit from forest goods and services. To address this, more research is needed to explore better ways to advance and integrate PES in SFM programs at the community level.

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Appendix 1: Recruitment Letter for Workshop Participants

ECONOMIC AND SOCIAL RESEARCH FOUNDATION (ESRF)

51 Uporoto Street, (Off Ali Hassan Mwinyi Road), Ursino Estate
P.O. Box 31226 Dar es Salaam, Tanzania
Phone: (+255-22) 2926084-9
Mobile: (+255-754) 715 780133 Fax: (+255-22) 2926083
Email: esrf@esrf.or.tz Web: www.esrf.or.tz

ESRF/CBU/SC/2017/306 22nd August, 2017

Prof. James. E. Mdoe
Permanent Secretary
Ministry of Energy and Minerals
P.O.BOX 422
DODOMA

Dear Prof. Mdoe,

RE: INVITATION TO FOREST POLICY EXPERTS RESEARCH WORKSHOP

This letter serves to request for a representative from your institution to attend a Forest Policy Experts Workshop to be held on **29th August 2017** at ESRF Premises. The workshop is part of research work being done by one of our Research Student intern Mr. Evodius Waziri Rutta.

Mr. Evodius Waziri Rutta is our Intern at ESRF Office; he is pursuing MA in Environmental Policy at Memorial University of Newfoundland, Canada. His current research work has focused on policy analysis, on understanding how forest policy would influence Sustainable Forest Management in Tanzania. He is doing policy analysis for the **Tanzania National Forest Policy of 1998**; as part of his research data collection, Mr. Evodius conducts workshop with policy experts and stakeholders in Tanzania who are directly involved in forest sector.

We understand that your institution is involved in forest sector and has influence on the Forest Sector policies, because of this we would like to request one representative from your institution to attend and contribute in this research workshop. Evodius's research findings will greatly contribute to the reforms of the current Tanzania Forest Policy of 1998.

Please confirm your attendance to the workshop two days before the workshop on this number **0753062485/ 0620 679904** or through email: **gmoshi@esrf.or.tz.**

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Yours Sincerely,

Dr. Tausi Mbaga Kida
EXECUTIVE DIRECTOR

Appendix 2: Research Workshop Questions

Forest Policy Experts Research Workshop

29th August 2017, ESRF Office, Dar es Salaam.

Research Title

Towards Sustainable Forest Management in Tanzania: Analysis of the effectiveness of the National Forest Policy and its implications to forests and people of Tanzania.

A case study of Rufiji District, Tanzania.

Workshop Research Questions

1. **SFM Progress in Tanzania**
   - Has CBFM effectively contributed to effective forest governance at the community level? If yes/no explain?
   - Which forest policy actions if implemented, would adequately address key drivers of forest degradation in Rufiji district and Tanzania in general?
   - How can the government improve legal and regulatory practices for SFM in Tanzania (such as forest products pricing, enforcement of regulations, etc.)?
2. **On Forest Policy Gaps & Challenges**
   - What gaps exist in the current forest policy and why? How could these gaps be addressed?
   - What factors affect effective policy implementation in the current Tanzania Forest Policy of 1998?
   - Which policy actions would improve multi-sectoral issues among key institutions involved in forest sector and other natural resources?

3. **Forest Policy, SFM and Livelihoods**
   - How could forest policy strengthen private sector inclusion in the management of forest resources and benefit sharing?
   - How to improve benefit sharing and incentivizing locals in sustainable management of forest resources in Rufiji district and beyond?
   - Which policy actions/instruments if implemented would improve forest regulations (enforcement, pricing of forest products, sustainable harvesting etc.) at community level?

……. Thank You……

Appendix 3: Research Interview Questionnaire

Introduction

My name is **Evodius.W. Rutta,** I am Masters Student at Memorial University in Canada. I am currently in Tanzania doing data collection for my Thesis Titled "**Towards Sustainable Forest Management in Tanzania: Analysis of the effectiveness of the National Forest Policy and its implications to forests and people of Tanzania"**. I would like request your time to respond to my research questions in this questionnaire that will contribute in my research findings. The interview may take up to 45 minutes, but I will do my best to make it brief.

Asante Sana!

Name of Interviewer: Evodius Waziri Rutta

Name of Interviewee: **Institution:**

Date and Time: **Mobile Phone/E-mail:**

SECTION A: On SFM Progress in Tanzania

1. Can you briefly describe where and how your institution is involved in SFM programs in Tanzania?
2. In your opinion, what needs to be done to strengthen forest governance at community level?
3. What needs to be done to improve cross-sectorial coordination between forest sector and other sectors?

SECTION B: On Forest Policy Gaps & Challenges

1. In your opinion how effective has the current National Forest Policy been?
2. Do you this our current forest policy has gaps? If YES, what gaps exist in the policy and how they can be addressed?
3. Does the current policy enhance Sustainable Forest Management, if yes describe; if no what needs to be done?
4. What factors affect effective policy implementation of the current Tanzania Forest Policy of 1998?
5. Which policy actions if implemented would strengthen forest policy regulations in Tanzania?

SECTION C: Forest Policy, SFM and Livelihoods

1. Which policy actions/instruments if implemented would improve forest regulations (enforcement, pricing of forest products, sustainable harvesting etc) at community level?
2. How can the government improve benefit sharing and incentive mechanism to forest dependent communities?
3. Which policy initiatives would address the effects of shifting cultivation to forest resources?
4. How can the government improve the engagement of private sector in sustainable forest management in Tanzania?
5. What needs to be done to improve development of community forest-based enterprises in Rufiji and other districts?