

Actualization of the “Plant a Million” Initiative through Community Stakeholder engagement Between Isoka and Nakonde in the fight against climate change

(Paper ID: CFP/1582/2020)

By: Alex Sinkala

basinksrifwe@gmail.com

School of Humanities

Information and Communications University
Lusaka, Zambia

Advisor: Marvin Kabubi

marvinkabubi@ymail.com

School of Humanities

Information and Communications University
Lusaka, Zambia

Abstract

This study has been dedicated towards the reduction in forestry exploitation as one of the ways through which the fight against climate change can be enhanced. The study therefore finds cause to ride on the recently pronounced “plant a million” initiative by His Excellency the President of the Republic of Zambia, Dr. Edgar Chagwa Lungu in 2017. The study therefore looks on the aspect of making all citizens taking part in the tree planting program. Historically, forests have all too often been viewed simply as sources of timber, for fuel or for activities like construction or ship building. However, the wider importance of these ecosystems is now increasingly understood. The goods and services provided by forests are worth billions if not trillions of dollars to the global economy. They range from goods and services linked with water supplies, stabilization of soils, purifying the air that we breathe, sustaining biodiversity and tourism, to providing genetic resources and natural medicines. In a quest to resuscitate the beauty of the forest as way of fighting climate change, there is need for stakeholder engagement. This study therefore recognizes the importance of community stakeholders who with minimum possible resources would make the fight against climate change robust.

Key Terms

Climate change

Climate change is a long-term, sustained trend of change in climate conditions. Such changes can be

the result of “internal variability”, when natural processes inherent to the various parts of the climate system alter Earth’s energy budget. Examples include cyclical ocean patterns such as the well-known El Niño–Southern Oscillation and less familiar Pacific decadal oscillation and Atlantic multi-decadal oscillation. Without drastic action today, adapting to these impacts in the future will be more difficult and costly (IPCC, 2019).

Forest

A forest is best defined as “a community or assemblage of ecosystems dominated by trees and other woody vegetation” (Zimba, 2007:34).

Deforestation

Deforestation is as a result of cutting trees to clear new fields for new crops that presumably grow well on virgin land, illegal logging particularly of Mukula tree species, burning of charcoal, uncontrolled bush fires that destroy young trees and injure big ones, homestead and livestock fencing, shifting cultivation or wood fuel harvesting.

Stakeholders

Stakeholders are understood in terms of partners whose interest in support of the forest sustenance vis-à-vis the department of forestry, department of agriculture, Zambia Forestry and Forest Industries Corporation (ZAFFICO) Limited

Acronyms and Abbreviations

AFOLU	Agriculture, Forestry, and Other Land Use
CASU	Conservation Agriculture Scaling Up
CBNRM	Community Based Natural Resources Management

CBNRMF	Community Based Natural Resource Management Forum
CBOs	Community Based Organizations
CFU	Conservation Farming Unit
CHAPOSA	Charcoal Potential in Southern Africa
COMACO	Community Markets for Conservation
CSEF2	Support to Civil Society Organisations in Environment and Natural Resource Management in Zambia, Phase Two
ECZ	Environmental Council of Zambia
EIA	Environmental Impact Assessment
EPPCA	Environmental Protection and Pollution Control Act
ETOA	Zambia Environmental Threats and Opportunities
ENRM	Environmental and Natural Resource Management
FD	Forestry Department
FGD	Focus Group Discussion
FMC	Forestry Management Committees
GEF	Global Environmental Facility
GHG	Greenhouse Gas
GMA	Game Management Areas
ILUA	Integrated Land Use Assessment
IPCC	Intergovernmental Panel on Climate Change
JFM	Joint Forest Management
MACO	Ministry of Agriculture and Cooperatives
NAP	National Adaptation Plan
NAPA	National Adaptation Programmes of Action
NAPACC	National Adaptation Program of Action on Climate Change
NEAP	National Environmental Action Plan
NFP	National Forestry Policy
PPCR	Pilot Program for Climate Change Resilience
REDD	Reducing Emissions from Deforestation and Forest Degradation
UNFCCC	United Nations Convention on Climate Change
VDC	Village Development Committees
WWF	World Wildlife Fund for Nature
ZFAP	Zambia Forestry Action Plan
ZAFFICO	Zambia Forestry and Forest Industries Corporation
ZEMA	Zambia Environmental Management Agency

1.0 INTRODUCTION

One way of realizing the new way of working and the agenda for humanity in the Zambian context is the engagement of the community/stakeholders

into the implementation of the “plant a million” initiative. The problem of environmental degradation can be attributed to a number of factors amidst industrial emissions and deforestation. Efforts to resuscitate the environment therefore can only come about insofar as we can put up action against the factors which have led to its degradation. One of the achievable undertakings against environmental degradation is the reforestation and afforestation agenda against deforestation. The intensity of deforestation however varies from place to place. In Isoka and Nakonde the levels of deforestation are simply worrying as a result of charcoal burning and timber production to a larger extent, and certain farming activities to a lesser extent. Efforts to resuscitate the forest have significantly been affected by people’s lifestyles vis-à-vis not realizing the long-term effects of their activities. In 2017 the President of the Republic of Zambia announced the “plant a million” initiative in order to push the Environmental preservation agenda forward. It is hoped that people will be responsive to the cause of resuscitating our forestry for preservation of our environment. Forests are much more than resources playing key roles in climatic systems, and comprising the habitats of at least half of the species of the planet. Forest ecosystems exist in a delicate balance with the trees and photosynthesizing plants. The plants take in carbon dioxide, from the air to manufacture food and in turn release the oxygen from the reaction back into the atmosphere. Animals ranging from tiny insects to large forest dwelling herbivores browse on the plants and are in turn eaten by other animals (Robert, 1996). It is the photosynthesizing plants that are important on a worldwide scale as they affect the composition of the atmosphere. They absorb carbon dioxide, the greenhouse gas which causes global warming, and help to reduce it. This is one of the main reasons why we need to protect the forests (ibid.).

1.1 Statement of the Problem

The problem of deforestation is so rampant along the Great North Road especially between Isoka and Nakonde because of Charcoal burning, illegal timber production and shifting cultivation among other things. While government has tried to curb the scourge but very little has been achieved. The researcher wishes to find the best way through which the community/stakeholders shall be engaged in order to actualise the implementation of the “Plant a million” initiative. On average annual rate of forest loss in Zambia is between 250,000 ha and 300,000 ha/year (PEZP, 1998). Other studies indicate an annual average loss of up to about 850000 ha. FAO, (2001) indicate that in 1990 total forest cover was 39,755,000 ha and reduced to 31,346,000 ha by the year 2000. Forests in Zambia are being cut or destroyed without a clear knowledge of all the consequences and without a commitment to sustainable use. Presently, it is a great concern that forests in many parts of the country are disappearing (Shakacite, 2000).

1.2 Objectives

Generally, this study seeks to actualize the environmental preservation agenda through

1.4 The Conceptual Framework

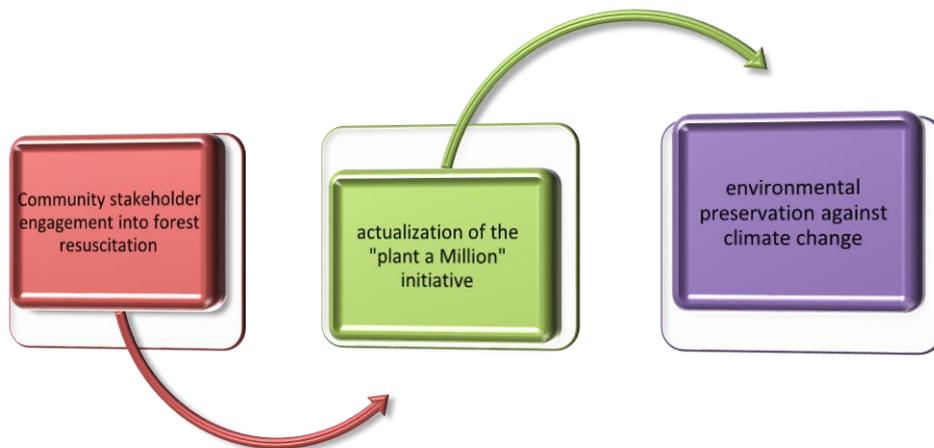
Fighting climate change requires united efforts in resuscitating the environment. One of the ways to resuscitate the environment is through reclaiming the depleted forest. In trying to make this action a reality the Republican President of Zambia Dr Edgar Chagwa Lungu in 2017 announced the “plant a million” initiative. This initiative however can only be actualized through maximum utilization of the community stakeholders.

engagement of community stakeholders. Therefore, it endeavours to;

1. Engage the community stakeholders in resuscitating the forest between Isoka and Nakonde
2. Enable the community, along Isoka and Nakonde, understand the dangers of deforestation
3. Figure out alternative activities to replace charcoal burning activities
4. Give meaning to the “Plant a Million” initiative based on the understanding levels of the community members.

1.3 Study Questions

1. How much do people know about the effects of deforestation in Isoka and Nakonde?
2. Which other activities can people venture into apart from charcoal burning and illegal timber business?
3. What is the sustainable way of using the forest resource in Zambia?
4. How can the plant a million initiative be actualised?
5. Which is the best way to engage the community to own the program of resuscitating the forest?



1.6 Scope of the Study

This study was conducted on the stretch between Isoka and Nakonde Districts along the great north road. The idea behind this study was to target areas where deforestation is rampant through charcoal burning and illegal timber business. Thus, the researcher felt the need to engage the community members by making them understand the dangers of depleting the forest. It was hoped that when the communities understood the looming dangers of deforestation, they would be made to own the “plant a million” initiative.

1.7 Significance of the Study

The study provided means of engaging the community in realizing the “plant a million” initiative. This is a means through which we can bring on board a wide spectrum of players in the fight against climate change.

2.0 LITERATURE REVIEW

This section reviews the available literature concerning the issue of community engagement in the preservation of forestry and other natural resources in relation to the attainment of the ‘plant a million’ initiative. The capitalist forestry knowledge was created in eighteenth-century Germany, led by the desire to have sustained timber yields over an unlimited period. This led to the creation of forestry schools that trained ‘scientific

foresters’, seeing forests as sources of timber. This supported the creation of single-species tree plantations. After the Second World War, argues Vandergeest and Peluso (2006), the FAO became a central organization promulgating a type of Forestry Empire, which accompanied the older ideal German forestry model that replaced natural forests with managed timber stands ever since the nineteenth century. While timber products (TPs) took the place of forests in the territorial space, they also uprooted ‘forests’ in symbolic spaces, as visible in the discourses of pro-Tree Planting politicians, capitalists and multinational organizations. These elites became very closely aligned in the post-Second World War global developmental paradigms of the green revolution and later neoliberal globalization and the new bio-economy of the present day. The formation of this new global social actor generated for it an unequal control over the social space shared with other forest- and now-TP-land definers, dwellers and users.

2.1 Background of the study

Effects of climate change are experienced in various forms across the globe. This has been perpetrated by human activities which over the year have resulted in environmental degradation vis-à-vis, industrial emissions and depletion of the

forestry habitats. These have resulted into lost glory of the once flourishing environment resulting into global warming, irregular weather patterns, extreme temperatures, irregular rainfall patterns (droughts and excess rainfall) and disease and pest outbreaks. Reports from the Zambia Disaster Management and Mitigation Unit indicate that as of 9 January 2017, close to 130,000 ha planted to maize had been affected by a severe outbreak of the *Fall Armyworm*, which is new to the southern African region. Of the affected area, over 68,000 ha may require re-planting. Government efforts to control the outbreak are underway...With 94% of the country's districts affected in varying degrees, including several districts bordering Zambia's eight neighbours in the SADC region, vigilant region-wide monitoring activities are required. (SADC, 13 Jan 2017). Southern Africa is reeling from the effects of two consecutive years of El Niño-induced drought that affected over 40 million people, reduced food availability by 15 percent and caused a cereal deficit of 9 million tonnes. (FAO, 3 Feb 2017). For many years the country's environment management strategies have adopted the community-based natural resource management (CBNRM) approach to environmental conservation. This approach has been driven by the principle of community participation. According to many studies and evaluation on CBNRM undertaken in Zambia and elsewhere in the sub-region confirm that CBNRM succeeds on a number of principles namely rural community closest to the natural resources ought to actively participate in the decision-making over the management, utilisation, conservation and deriving economic benefits from the natural resources. In a bid to bring community participation into context the President of the Republic of Zambia H.E. Dr. Edgar Chagwa Lungu announced the "Plant a Million" initiative as one of the best ways to conserve the environment in the fight against climate change.

2.2 Bringing into context the "plant a million" initiative

In 2007, a year of "planetary emergency", when global warming was widely recognized as the defining issue of our era, the Billion Tree Campaign came to symbolize the readiness of people everywhere to work to protect our climate and collective home. Inspired by the 2004 Nobel Peace Prize Laureate, Professor Wangari Maathai, the first United Nations global tree-planting campaign was met with more enthusiasm than anyone could have predicted. After its launch in November 2006, word of the Campaign spread rapidly and partners joined the initiative with remarkable speed. The original goal of gathering a billion pledges in one year was exceeded in just five months. The billionth tree was in the ground in November 2007. By the end of January 2008, nearly 2.38 billion trees had been pledged and more than 1.8 billion planted. This publication can introduce but a fraction of the energy and results inspired by the Campaign. It is intended to convey the range of partners moved to action: from children to giant corporations, from women's groups to technocrats, dancers to diplomats, farmers to national governments (IPCC, 2019).

2.3 Understanding climate change as a social development issue

The Intergovernmental Panel on Climate Change (IPCC) defines climate change as 'a change in the state of the climate that can be identified (for example by using statistical tests) by changes in the mean and/or the variability of its properties and that persist for an extended period, typically decades or longer' (IPCC, 2007). Effects of climate change include: increasingly erratic weather patterns; more frequent extreme weather events (such as droughts, tropical storms and floods); and longer-term stresses, such as rises in temperature and sea levels (ILO et al., 2011). Climate change has cascading impact chains from physical features to people, with social and economic consequences affecting

livelihoods and food and nutrition security (FAO, 2016). While much attention is given to extreme weather events, the less dramatic, slow and incremental impacts of climate change are equally important in their cumulative impact on human well-being (Moser et al., 2010). In this case what is deemed important is the capacity to adapt to the changes. Adaptive capacity refers to the 'ability or potential of a system to respond successfully to climate variability and change'. Adaptive capacities include preventative strategies, which involve making decisions to minimise or avoid an event, and strategies to facilitate recovery. Research has highlighted that adaptive capacities are interrelated, and no single factor is likely to account for the degree of reduced vulnerability and increased resilience in any given context (Combaz, 2014).

Transmission of climate stress may be increased or reduced by the specific vulnerabilities at each level of the system. If households face repeated shocks that steadily erode their assets, vulnerability is likely to increase as resilience erodes over time (FAO, 2016). Vulnerability depends on both physical and social dimensions – a social vulnerability lens is therefore essential to understand why certain individuals, households or communities experience impacts differently, even when they are in the same location (FAO, 2016). At this time, it is also important to familiarize with common terminologies used in association with the issue of climate change namely, adaptation, mitigation, resilience and vulnerability as follows;

Adaptation: which refers to adjustments to reduce vulnerability or enhance resilience in response to observed or expected changes in climate and associated extreme weather events. Adaptation occurs in physical, ecological and human systems. It involves changes in social and environmental processes, perceptions of climate risk, practices

and functions to reduce potential damages or to realise new opportunities' (FAO, 2016).

Mitigation: 'ability to diminish the intensity of the natural (and other) stresses to which it might be exposed. Since this definition suggests that a group's capacity to mitigate hinges on the severity of impacts, capacity may be defined as "a country's ability to reduce anthropogenic greenhouse gases or enhance natural sinks' (IPCC, 2007).

Resilience is the capacity of systems (and communities, households, individuals) to prevent, mitigate or cope with risks/shocks and recover. A system is resilient when it is less vulnerable to shocks over time enabling recovery by adaptation (Combaz, 2014).

Vulnerability is the propensity to be adversely affected by shocks; it is a complex issue incorporating various dimensions. It is useful to consider vulnerability of 'what' to 'what' (FAO, 2013). Structural and situational factors in a given context largely determine vulnerability (Mearns, 2010).

Both demographic and socioeconomic factors affect the environmental vulnerability to climate change. It is widely asserted that the poor will be hardest hit by the impacts of climate change, especially those whose livelihoods are most heavily dependent on natural resources. Vulnerability is a complex and dynamic concept. It depends on many contextual factors and system components, such as environmental, social, cultural, economic and institutional factors and livelihood strategies. Typically, more vulnerable groups are those with fewer assets and less access to means of coping with and adapting to climate risks (FAO, 2016; 2013). The poor, women, and indigenous peoples are often particularly vulnerable as they have limited access to assets, services, networks and land, and may face a range of constraints to improving their livelihoods and

building resilience (e.g. social norms, policy, inadequate legislation such as lack of land rights, limited access to services, and limited agency and engagement in public decision-making) (Ribot, 2010). Some experts advocate including power relations in understanding vulnerability, characterising vulnerability in three forms: physical vulnerability, politico-legal vulnerability, and socioeconomic vulnerability (Moser et al., 2010).

Recommended tools to identify and understand dynamics of vulnerability include vulnerability assessments, social risk management and asset-based assessments, and the sustainable livelihoods framework. The latter particularly identifies how assets and the institutional and policy environment shape resilience. These tools can help in designing interventions that are well-tailored to context and targeted to those most in need (Heltberg, 2008). Risks associated with climate change could increase household vulnerability to poverty, hunger, disease, mortality, displacement and conflict in many developing countries. This paper sets out a social risk management framework to help design interventions to increase society's capacity to manage climate risks so as to reduce households' vulnerability and maintain or increase opportunities for development.

2.4 Demographic and cultural factors affecting vulnerability to climate change

Climate change affects society in different ways depending on the capacity of the affected to adapt to its effects. Highlighted in this section are aspects of gender, age and the social standing of the indigenous people. Men and women experience climate change differently. Because of the existing gender division of labour and roles based on social norms, women have different tasks and responsibilities from men, have a different knowledge base, face different risks and have different access to climate response strategies. Men

and women have different access to information, technologies, services and support due to sociocultural normative inequalities which typically leave women at a disadvantage (Lambrou & Nelson, 2010). Women's primary care role in the household often means they feel the effects of climate change keenly – walking further for water and food due to climate-related resource scarcity, or having to care for relatives impacted by climate-related disease (Skinner, 2011). Higher rates of illiteracy and a lack of access to information about climate change can increase their exposure to risk and ability to respond (Skinner, 2011). Gender inequalities in the distribution of assets and limited access to financial capital often mean women cannot easily diversify their livelihoods (Skinner, 2011). There is also evidence of the differential impact of climate change on men's and women's health (WHO, 2014), and concerns that women are less likely to survive natural disasters and may be placed at increased risk of sexual violence in a post-disaster context (Plan International, 2011; UNDP, 2009). Despite being among the most vulnerable to climate change, and broadly excluded from international climate change policy, women and girls have a critical role in increasing the resilience and adaptive capacity of their communities. In particular, their expert knowledge of natural resources makes them well placed to take a lead in adaptation efforts (UNDP, 2009). Gender analysis tools can be useful for identifying the differential impacts of climate change interventions on women and girls. They can help tailor interventions to ensure they are gender inclusive and that the voices of women and girls are included in decision-making processes at all levels (Lambrou & Nelson 2010; FAO, 2011). How are women and men affected differently by climate change, and how can international climate action take account of gender? This report reviews the literature on these questions, and includes an annotated bibliography and list of relevant international frameworks.

Women are particularly vulnerable to climate change, for example in their roles as food producers and water collectors. But women can also play an important role in adaptation and mitigation, for example through leadership in natural resource management. Action is needed to document the differentiated impact of climate change on the quality of life of women and men, and to include explicit gender equality considerations in international climate change policies and action plans (Skinner, 2011).

Climate change will have significant generational impacts, affecting children disproportionately in both the immediate and long term (UNICEF, 2007). Children, particularly girls, are highly susceptible to disaster and health-related impacts of climate change, including an increase in the prevalence of malaria, under-nutrition, and increases in sexual exploitation and violence in a post-disaster context (Plan International, 2011). Climate change impacts compound existing discrimination faced by girls, including lack of education and health care services, and the burden of paid and unpaid work (Plan International, 2011). However, despite their vulnerability, children can play a positive role in mitigation and adaptation efforts. For instance, children can help communicate risks to their peers and relatives, and provide practical and creative ideas to help communities recover from disasters (Back, 2009). Children's awareness of the impacts of climate change, and how to mitigate them, is also crucial to sustaining development outcomes (Back, 2009). A rights-based perspective draws attention to children's issues in adaptation and emphasises that children should play a role in decisions that affect them. At this point it is important to understand effects of climate change in relation to children coil around issues of natural disasters, disease, water, food security, trees, and energy. The particular vulnerability of children in all these areas is emphasised, for example, they are affected most

severely by natural disasters. While children and young people are affected most profoundly by environmental deterioration, they are also potentially the greatest agents of positive change. Instilling environmental awareness at a young age is an effective way to encourage protection and stewardship of the earth, hence increased investment is needed in environmental education (UNICEF, 2007).

This report identifies the climate change impacts and girls' 'double disadvantage' of gender and youth. Analysis of primary evidence from Ethiopia and Bangladesh shows that climate change poses specific risks for girls and prevents them from realising their rights. Some of the negative impacts include sexual exploitation and violence, early marriage, death from pregnancy, and high HIV infection rates. The report demonstrates that girls' agency is critical for climate change adaptation and emphasises the need for policymakers to recognise girls as agents of change (International, 2011).

Older people are considered at highest risk of climate change-related health impacts, including heat stress and under-nutrition. Their knowledge and experience can add value to adaptation and mitigation efforts, and should be brought into the climate change adaptation processes (HelpAge, 2009). This was evidenced in the research conducted on older men and women from Bangladesh, Bolivia, Ethiopia, India, Kenya, Kyrgyzstan, Mozambique, Tanzania and Zimbabwe. It looks at older people's experience and awareness of climate change, and calls for better inclusion of their views in developing adaptive strategies. Older people are particularly vulnerable to the effects of climate change and are repositories of indigenous knowledge and experience that could contribute to local and national adaptation. They are, however, excluded from climate change debates.

Indigenous peoples and minority groups tend to live in areas that are among the worst affected by climate change, yet they have been broadly excluded from climate change discussions. Many indigenous groups are primary users of natural resources – their livelihoods depend on ecosystems based on forest and water resources. These groups are repositories of traditional ecological knowledge. Such knowledge has evolved over time in parallel with customary institutions and practices, supporting a balanced and sustainable relationship between society and its resource base (Mearns & Norton, 2010). But political discrimination and high rates of poverty among these communities exacerbate their exclusion from decision-making on climate change-related processes. Such exclusion can even increase their vulnerability – if, for example, mitigation measures lead to injustices. Despite these challenges, indigenous and minority groups can add significant value to climate adaptation and mitigation processes, particularly given their often-expert knowledge of the natural environment (Kronik & Verner, 2010).

How do climate-related disasters and slow-onset climate changes affect minorities and indigenous peoples? Why are these groups especially sensitive to the effects of climate change? In examining such questions, this report highlights a neglected area of research. It emphasises the important role of these groups as stewards of natural environments that are major carbon sinks and biodiversity hotspots. It argues for the explicit inclusion of minority and indigenous groups in plans for combating, and adapting to, climate change. National Adaptation Programmes of Action, international human rights law, and new guidelines for humanitarian agencies provide opportunities for these groups to make themselves heard (Baird, 2008).

According to the results of case studies from Latin America of the expansive knowledge base and experiences among indigenous peoples in balancing ecosystem use with human needs, there arises a need to examine three main issues: social impacts of climate change on indigenous peoples; how indigenous peoples have reacted to environmental change and shaped their societies, cultures, and capacity to adapt; and the role of indigenous peoples' knowledge in climate change adaptation and mitigation (Kronik & Verner, 2010). The authors conclude that to achieve climate change adaptation and mitigation it is vital to incorporate and strengthen conditions for the continued use and development of indigenous knowledge. This is particularly important as indigenous peoples have expressed concern over having their autonomy and authority undermined through REDD agreement negotiations.

2.5 International policy frameworks on climate change

The High-Level Panel on Post-2015 goals emphasises that sustainability must be at the core of international development efforts, and recommends immediate action to halt the pace of climate change and environmental degradation, including reducing greenhouse gas (GHG) emissions (United Nations, 2013). The Panel also encourages the incorporation of social and environmental metrics into accounting practices. The Sustainable Development Goals (SDG) – 2030 Agenda prioritises climate change adaptation and mitigation measures and consistently considers climate change in relation to vulnerability, socioeconomic development and livelihoods. Climate change is mainstreamed throughout the SDGs and targets. The stand-alone goal directly tackling climate change is Goal 13 – taking urgent action to combat climate change and its impacts. Other goals also emphasise climate change and resilience. These include Goal 2 – ending hunger

and improving food security and nutrition; Goal 8 – promoting sustainable economic growth and productive, decent work; and Goal 11 – making cities and urban settlements more resilient and sustainable.

The international policy framework for dealing with climate change is the United Nations Framework Convention on Climate Change (UNFCCC) (UNFCCC, 1992). This includes the Kyoto Protocol, which places more responsibility for mitigation on developed countries, and includes binding emissions targets for signatory industrialised countries. The Convention established a system of grants and loans, managed by the Global Environment Facility (GEF) to help finance climate mitigation and adaptation; this is based on prepared National Adaptation Programmes of Action (NAPAs) to address urgent needs. The NAPAs are to draw from community-level input to identify and address vulnerabilities to climate change.

However, tensions have been observed between global climate policy and local communities over policy and strategies. For example, some experts have stated there is concern about the impact of schemes for reducing emissions from deforestation and forest degradation (such as REDD and REDD+) regarding the rights of indigenous and other forest-based communities (Larson, 2010). REDD+ was negotiated at the UNFCCC to generate investments for forest-related CO₂ reductions and removals. However, lack of clear land tenure, ineffective law enforcement, and unrecognised customary and ancestral rights may create situations where REDD+ could represent an additional threat to local communities. Experts stress the need for secure community tenure rights (Larson, 2010).

Commenting on climate change the United Nations also produced a report. This report on the post-2015 agenda from 27 world leaders, based on global consultation, calls for five ‘transformational shifts’: leave no one behind; put sustainable development at the core; transform economies for jobs and inclusive growth; build peace and effective, open and accountable institutions for all; and forge a new global partnership. Post-2015 action must move from reducing to ending poverty; must integrate the social, economic and environmental dimensions of sustainable development, including addressing climate change; and must recognise peace and good governance as core elements of well-being (Nations, 2013).

Larson (2010) in his article, Forest tenure reform in the age of climate change, examines two issues arising from schemes for reducing emissions from deforestation and forest degradation (REDD, or REDD+): rights to forests and rules for resource use. It draws on the findings of a study conducted by the Centre for International Forestry Research on forest tenure reforms in selected countries in Asia, Africa and Latin America from 2006 to 2008. The study underlines the numerous obstacles faced by communities, after rights are won, in moving from statutory rights to their implementation and to access to benefits on the ground. It argues that there is currently little reason to expect better results from national policies under REDD+ without binding agreements to protect local rights.

2.6 Integration of climate change and social development

Consensus among experts is that climate change will have far-reaching consequences for development, poverty eradication and food and nutrition security (Mearns & Norton, 2010; FAO, 2016). There is a broad body of literature exploring the scientific dimensions of climate change and growing attention is being paid to its social and

economic impacts (ILO et al., 2011; Mearns & Norton, 2010). As yet, however, there are no agreed international indicators of the effects of climate change on social development goals. An example of possible indicators is provided by a study led by FAO in six Sub-Saharan African countries. This measured climate change impacts on household welfare indicators, including total income, agricultural income, consumption levels, and food security. Findings showed that the most vulnerable households were most adversely affected by climate hazards, such as decreased rainfall (FAO, 2016).

2.7 The Impact of Climate change on Africa: Lessons from Ethiopia

While Ethiopia battles residual needs from the 2015/2016 El Niño-induced drought, below average 2016 autumn rains in the southern and south-eastern parts of the country have led to a new drought in lowland pastoralist areas, as well as in pocket areas across the country. As a result, some 5.6 million people in Ethiopia require emergency food assistance in 2017. In addition, 2.7 million children and pregnant and lactating mothers require supplementary feeding, 9.2 million people need support to access safe drinking water, 1.9 million households need livestock support, and 300,000 children between 6-59 months old are targeted for the treatment for severe acute malnutrition in 2017. Drought conditions are expected to peak during the dry December to March season, which is likely to lead to a sharper deterioration in livestock body conditions, and impacting milk production and nutrition status of the families that depend on livestock for their food and income. During the dry season, the response will be complemented by supplementary food based on regular screenings to ensure the most vulnerable are reached. (OCHA, 17 Feb 2017)

Southern and eastern Ethiopia continues to battle the impact of the Indian Ocean Dipole-induced drought, exacerbated by disease outbreaks, large scale loss of livelihood assets and displacement. The humanitarian situation countrywide has been further compounded by below average spring rains – the third consecutive poor/failed rains in the southern drought belt. In the second half of 2017, some 8.5 million people will require emergency food assistance, some 3.6 million children and pregnant and lactating mothers will require supplementary feeding, some 10.5 million people will not have regular access to safe drinking water and some 2.25 million households will require livestock support. Partners also estimate that 376,000 children will become severely acutely malnourished until the end of 2017. (Gov't of Ethiopia, OCHA, 08 Aug 2017)

Since the revision of the Humanitarian Requirements Document (HRD) in August 2017, the humanitarian context in Ethiopia has continued to evolve which has led the Government and humanitarian partners to further adjust the HRD requirements. In the food sector the needs have been revised slightly upwards to accommodate an increase in the number of beneficiaries through the inclusion of 4 million former Productive Safety Net Programme (PSNP) clients in the HRD. In other sectors such as health and nutrition, needs have also continued to increase mainly due to the deteriorating nutrition situation in Somali region, increase in the number of displaced people, as well as the Fall Army Worm (FAW) outbreak that continues to ravage crops throughout the country. (Government of Ethiopia, OCHA, 19 Oct 2017)

2.8 The impact of charcoal production on climate change

Charcoal production for the supply of fuel for inefficient household cook stoves in Zambia

contributes to numerous environmental threats across multiple sectors. Charcoal production is a threat to forests and biodiversity particularly where access is available. Supply-side and demand-side utilization of charcoal as a household energy source leads directly and indirectly to deforestation, anthropogenic climate change, biodiversity loss, and adverse effects on human health. Charcoal and firewood are also widely used as energy sources in commercial and industrial processes. The process of charcoal creation is inherently inefficient: 6 kg of wood yield 1 kg of charcoal, with kilns operating on average at only 25-28% efficiency (Chidamayo et al. 2001). Most of this wood is procured as an illegal off-take, driving deforestation and unplanned land conversion. Zambia has one of the highest deforestation rates in the world (Wignaraja et al. 2010) and is considered particularly vulnerable to the effects of anthropogenic climate change (MTENR, 2010). As an example, in the Chongwe District, woodland cover declined by 30% between 1989 and 1998 and the CHAPOS (Charcoal Potential in Southern Africa) study found that in Miombo woodlands 88% of the tree species are preferred “charcoal trees” (Chidamayo et al. 2001). Approximately one-fifth of global anthropogenic greenhouse gas emissions come from deforestation and forest degradation (ibid.). Furthermore, deforestation and climatic changes tend to negatively impact biodiversity stocks (MTENR 2009). In the human health sector, charcoal burning has been shown to significantly impact respiratory function through the creation of carbon monoxide, soot, and other emissions (K. Trifellner, pers. comm.; ECZ 2008). With roughly 25% of households having access to electricity (49.3% of urban households, 3.2% of rural households), charcoal and firewood provide nearly 75% of the energy used in Zambian households (ibid.). Conventional charcoal and wood cook stoves tend to be dirty and inefficient, requiring approximately 1.3 tons of charcoal per household

annually (ibid.). Emissions from these conventional stoves have been known to cause headaches, vomiting, and dizziness, as well contribute to respiratory disease (ibid.). The transport of charcoal along roads on bicycles and trucks is dangerous, posing a hazard to travellers and charcoal transporters alike, particularly at night. Health effects of working with charcoal kilns and the transportation of charcoal are unknown, but anecdotal evidence shows overloaded and unsafe vehicles transporting charcoal for use in urban and peri-urban areas, only to accrue a weak profit. The direct and indirect impacts from charcoal production can be enumerated as follows:

Deforestation: Though data on Zambia’s forests is very poor, the country is experiencing a very high deforestation rate, largely due to charcoal production and agricultural practices. This in turn leads to increased greenhouse gas emissions, lower greenhouse gas sequestration potential, biodiversity loss, and negative impacts to ecosystem services (such as water quantity and quality).

Land Use Conversion: Deforestation and production practices supporting the charcoal industry directly contribute to land use conversion. This confounds integrated planning and sustainable use of natural resources not only through deforestation and forest degradation, but also through the creation of unplanned roads and processing facilities (e.g. charcoal kilns).

Adverse Human Health Impacts: Cooking indoors over a charcoal stove creates many potential adverse health impacts. Furthermore, these impacts disproportionately affect females, who are traditionally responsible for most food preparation.

2.9 SDGs on climate change

Climate change presents the single biggest threat to sustainable development everywhere and its

widespread, unprecedented impacts disproportionately burden the poorest and most vulnerable. Urgent action to halt climate change and deal with its impacts is integral to successfully achieving all Sustainable Development Goals (SDGs). Collectively, the three post-2015 agendas for action – the Paris Agreement, the 2030 Agenda for Sustainable Development and the Sendai Framework for Disaster Risk Reduction - provide the foundation for sustainable, low-carbon and resilient development under a changing climate. Achieving the primary goal of the Paris Agreement - to keep the average global temperature rise well below 2°C degrees and as close as possible to 1.5°C above pre-industrial levels - is vital to the achievement of all three Agendas. The global average temperature has already increased by around one degree, since then underlining the urgency of action if we are to stay as close as possible to 1.5°C degrees. The Paris Agreement builds on the UN Framework Convention on Climate Change, bringing all nations into a common cause to reduce greenhouse gas emissions rapidly and to strengthen the ability of countries to build resilience and adapt to the impacts of climate change, including through ensuring adequate support for developing countries. The early entry into force of the Paris Agreement and successful operationalization through achievement of the Katowice Climate Package, the world has entered a new era in our collective efforts on climate change, focusing us on urgently increasing ambition and implementation, at all levels of government, business and civil society. Pursuing climate action and sustainable development in an integrated and coherent way offers the strongest approach to enable countries to achieve their objectives efficiently and quickly under the Paris Agreement and the 2030 Agenda for Sustainable Development.

2.10 The “Plant a Million” initiative

The “plant a million” initiative can probably be traced from as far back as 2007. This is a year which was regarded as a year of “planetary emergency”, when global warming was widely recognized as the defining issue of our era, the Billion Tree Campaign came to symbolize the readiness of people everywhere to work to protect our climate and collective home. Inspired by the 2004 Nobel Peace Prize Laureate, Professor Wangari Maathai, the first United Nations global tree-planting campaign was met with more enthusiasm than anyone could have predicted (United Nations Environment Program, 2007). After its launch in November 2006, word of the Campaign spread rapidly and partners joined the initiative with remarkable speed. The original goal of gathering a billion pledges in one year was exceeded in just five months. The billionth tree was in the ground in November 2007. By the end of January 2008, nearly 2.38 billion trees had been pledged and more than 1.8 billion planted. Through publications such as this one there has been an enhancement a fraction of the energy and results inspired by the Campaign. The campaign was intended to convey the range of partners moved to action: from children to giant corporations, from women’s groups to technocrats, dancers to diplomats, farmers to national governments.

Trees are more significant than many of us might imagine. They commemorate births and lives lived. They beautify slums, farms and grand avenues. They provide shade, oxygen, and delight. They cool the Earth. Some of the seedlings planted would restore springs long dry, prevent soil erosion and create fertilizer to boost harvests. Others are meant to break the Sahara winds and halting the spread of desert sand dunes. Countless more trees are meant to provide food for people, in rural areas and cities alike. Some would supply forage for livestock and for insects that pollinate crops. Many would produce wood and natural oils for building

and for fuel. Yet others would be used to create medicines to heal the human body and essential oils to ease the soul. All would draw carbon dioxide from the air, leaving us a little less vulnerable to the threats posed by climate change (United Nations Environment Program, 2007).

During this campaign it was envisaged that if the world is to make a transition to a low carbon society and avoid the environmental, social and economic impacts of unchecked climate change, all sectors of society must be mobilized. For too long the debate on what to do about climate change has been confined to the political and scientific arenas. Many ordinary people have lacked a tangible way of expressing their concerns and an avenue for national, regional and global action.

In late 2006, UNEP, in cooperation with the World Agroforestry Centre, launched Plant for the Planet: The Billion Tree Campaign as a way of empowering the global public to face the challenge of this generation.

The campaign received overwhelming response and, in many ways, surpassed the expectations of the organizers. The Campaign galvanized young people, scouts, faith and community groups across the world as well as schools, kindergartens, towns, cities and companies. The precise number of people mobilized was so huge to be counted but however, it is worthy to note, that 600,000 people, including school children in Uttar Pradesh, India, planted 10.5 million trees in a single day in July 2007. 35 million young people in Turkey have been mobilized and 10,000 schools in Malaysia were taking part in the tree planting exercise. An estimated 500,000 children in schools in sub Saharan Africa and the United Kingdom at the time joined the initiative via the British Council. The 1,500 members off the Emirates Environmental Group also pledged to plant one million trees in the United Arab Emirates. In Germany, the Global

Marshall Plan Initiative distributed one million flyers to 7,000 schools in support of the Campaign. Heads of State, including the Presidents of Indonesia, the Maldives, Turkey and Turkmenistan also became involved perhaps because they saw the Billion Tree Campaign as a way of connecting with their peoples not only on the issue of climate change, but on environmental degradation in general (United Nations Environment Program, 2007).

President Felipe Calderón of Mexico at the time catalyzed the planting of 250 million trees enlisting the army to achieve that goal. The campaign was therefore extended for another year, by popular demand, with the goal of planting a total of two billion more trees. It was convincingly hoped that this new target could be met and almost certainly surpassed even though there were a few cynical smiles and shaking of heads when the Billion Tree Campaign was launched. Some said it would never happen while others failed at first to see its *raison d'être*. But citizen after citizen, community after community and country after country have proved the doubters wrong and demonstrated an abiding truth: given a focus and the chance to act, millions if not billions of people around this world want an end to pollution and environmental deterioration and they have rolled up their sleeves and got their hands dirty to prove the point. In empowering the public, the Campaign had the determination of empowering Governments by providing proof that addressing climate change is not a political risk. Far from it, it was perhaps the most popular move of our time, with electorates' right behind leaders who take significant action on a transition to a low carbon society (United Nations Environment Program, 2007).

2.11 The significance of the plant a million to Zambia

Forest Resource Situation According to Forestry Department (2007), Zambia's total forest reserves,

legally defined as National and Local Protected Forests stands at 9.6% of total national landmass. These comprises of 180 National Forests and 307 Local Forests covering 5,145,162 hectares (6.8%) and 2,076,062 hectares (2.8%) of the total land area of the country, respectively. However, between 31 December 2004 and 31 December 2007, degazettions reduced the protected forest estates by 126,912 ha; from 7,344,692ha (9.76%) to 7,217,780ha (9.59%). These 126,912 ha were given out for settlement and agriculture expansion between 2004 and 2007. In terms of management, the 2007 statistics showed 221 forest reserves (45.4%) classified as being intact, while 266 (54.6%) were encroached or depleted. This scenario is a source of concern because forest loss depletes the carbon sink and affects the REDD objective.

Currently, 65% of Zambia's population is in rural areas, their livelihoods essentially tied to the land and forests. Increased demand for food, wood energy, and other environmental services (to cater for the growing population) has contributed to decrease in forest areas. Between 1990 and 2010, forestry department lost 126,912 ha through degazettions, but not a single hectare was added to the protected forests as new reservations over the same period. In 1996, total wood volume (from the nation's 59.5 million ha. of forests) was estimated to be 47.33 m, out of which 850,000 was harvested as commercial timber; 5 million and 8 million cubic meters harvested for fuel wood and charcoal, respectively. Wood for non-fuel local community needs is estimated to be slightly above 1 million cubic meters a year. Total wood consumption was roughly 15 million cubic meters per year (about one third growth of all forests in Zambia).

2.12 Efforts being done against climate change

2.12.1 Agroforestry practices

For many years the term 'agroforestry' was applied to particular arrangements of trees in crop and

animal production systems. This view was summarised as follows:

Agroforestry is a collective name for land-use systems and technologies, where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land management unit as agricultural crops and/or animals, either in some form of spatial arrangement or temporal sequence. In agroforestry systems there are both ecological and economical interactions between the different components' (ICRAF, 1993).

Agroforestry have been promoted for the past 10 years, as a potential tool for sustainable agriculture. Eastern Province (ICRAF being the major player), Southern and Central Provinces adopted the practice on a larger scale. But the agriculture support programme where government disburses "free" fertilizer to subsistence farmers to improve crops yields is steadily eroding the gains made over the years from agroforestry interventions. Farmers are choosing short term convenience of using fertilizer against long term benefits from agroforestry practices (FAO, 2010).

The problem with trying to produce a more encompassing estimate of the extent of agroforestry systems was summarized by Nair et al (2009):

A major difficulty in estimating the area under agroforestry is lack of proper procedures for delineating the area influenced by trees in a mixed stand of trees and crops. In simultaneous systems, the entire area occupied by multistrata systems such as home gardens and shaded perennial systems and intensive tree-intercropping situations can be listed as agroforestry. However, most of the agroforestry systems are rather extensive, where the components, especially trees, are not planted at regular spacing or density; for example, the parkland system and extensive silvo-pastures. The

problem is more difficult in the case of practices such as windbreaks and boundary planting where although the trees are planted at wide distances between rows (windbreaks) or around agricultural or pastoral parcels (boundary planting), because the influence of trees extends over a larger than easily perceivable extent of areas. The problem has a different dimension of difficulty when it comes to sequential tropical systems such as improved fallows and shifting cultivation. In such situations, the beneficial effect of trees and other woody vegetation (in the fallow phase) on the crops that follow them (in the cropping phase) is believed to last for a variable length of time.

Nair et al (2009) go on to make an estimate of 823 million hectares globally under agroforestry and silvo-pastoral systems. Of these, 307 million hectares are agroforestry. However, their estimate comes from taking the FAO estimate of agriculture land multiplied by an estimate of 20% covered by agroforestry. The value of 20% is not based on any objectively measured data. Another estimate of global agroforestry extent which is widely quoted is Dixon (1995), who suggests 585–1215 million hectares of agro-silvo-pastoral and agroforestry systems in Africa, Asia, and the Americas. However, this is an estimate of the area they judge technically suitable for these systems, not occupied by them. The current view of agroforestry is not as a collection of technologies, but of trees included in agricultural landscapes. For example, Schroth and Sinclair (2003) note that agroforestry is increasingly recognized for its ecological and economic interactions at the landscape scale. This changes the measurement problem considerably, for we have global databases which can be combined and interpreted to generate relevant information. Three data sources are used:

1. Global land use. Spatial data layers exist which classify any pixel as agricultural or some other land use.

2. Global tree cover. Remotely sensed data has been interpreted to give estimates of % tree cover in a pixel.
3. Global population. Spatially disaggregated population layers are available which give an estimate of population in any pixel and can be used to measure the extent of agroforestry in terms of population.

2.12.2 Forest Plantations

The area supposed to be under tree plantations (TPs) is about 70,000 ha of which 60,000 ha belongs to the Zambia Forestry and Forest Industries Corporation (ZAFFICO); 7,000 ha are local supply plantations under Forestry Department, located in the Provinces; 1,000 ha belong to the for research plots; and the remaining 2,000 ha are privately owned. These figures may be lower or perhaps higher for two reasons. Since ZAFFICO, the largest plantation owner, and Forestry Department have not done extensive replanting over the years, plantation hectareage could be lower. It may be higher if private entrepreneurs have taken up tree growing, in which case privately owned plantations would compensate for the shortfall. It was not possible to get updated statistics on replanting (FAO, 2010).

Land is currently valued as the base of new biologically produced commodities that are mired to replace the non-renewable resources that are running out. This emergent global 'bio-economy' will explain an ever-greater part of future TP growth. The new policy of creating a 'green' capitalist economy is destroying forests while expanding TPs. The new Brazilian Forest Code approved in 2012 allows for the consideration of the conversion of 'degraded forest' (which might be primary forest) or recently logged primary or secondary forest into a tree plantation such as pulpwood eucalyptus as reforestation (Vidal 2012). Another main reason for the prognosis of robust expansion is that plantations are becoming areas

where 'flex trees' are planted. The forest industry is merging with other industries. Flex trees are the commodity consequence of merging inter-industry interests in the emerging green/bio-economy. Biomass in the same plantations can be used for pulp or energy, pulp prices largely determining the use of biomass until now in the case of Brazil (Fearnside 1998). Energy and other timber use become more prominent, while pulp will continue to be important. Pulp prices have soared in the past 15 years, and consequently there is a mill construction boom. For example, in Brazil, one 1.5-megaton pulp mill is projected to open each year until 2020. With many new large-scale pulp projects in the pipeline, overcapacity, along with slowing growth, can slow down expansion. But pulp prices alone do not determine expansion anymore. Pulpwood plantations can be transformed into charcoal or other energy wood projects, as happened with Celmar, a failed 1990s pulp project in Brazil's Maranhão (Kröger 2013). Therefore, boom-bust market cycles as drastic as in cacao or other edible crops will not likely be seen (although, being a vulnerable monoculture, destruction of plantations might be experienced due to epidemic diseases or uncontrollable fires; these being a growing possibility as the size of monocultures and climate disruptions increase). TPs are marketed as a way to replace fossil fuels and new pulp mills are becoming major energy producers (Fontes 2012). Wood-based second-generation biodiesel-plants are also being erected, with high hopes in the industry that wood-fuel could become the next oil. UPM is setting up now the world's first wood-based biodiesel plant in Finland in Lappeenranta, and is confident that wood biodiesel will become for it alone a multi-billion-euro business in a few years (UPM 2014; also based on interviews of directors in Finnish news broadcasts in 2012). Also, the Finnish Stora Enso and Neste Oil are able already to obtain ethanol by gasifying wood residues, and

can build similar biorefineries to UPM (WRM 2008)

2.12.3 Bio-energy from Waste

The Environmental Protection and Pollution Control Act (EPPCA) no. 12 of 1990, defines waste as garbage, refuse, sludge, and other substances discarded from domestic, community, commercial, and industrial activities (ECZ, 2008). ECZ classifies waste into three (3) categories: Municipal waste (comprising of domestic and commercial waste); industrial waste, and Hazardous waste (FAO, 2003). In 2006, about two (2) million tonnes of waste were generated, of which roughly 20% was disposed off at designated landfills. Out of the 72 districts only 16 had licensed municipal waste disposal sites, suggesting that waste management in Zambia is still a problem. Yet this same waste which can easily be found at homes, markets and, shopping malls can be turned into energy (e.g. methane from agro waste). The National Institute for Scientific and Industrial Research (NISIR) has the technology for methane production, it awaits commercial adoption. The following are some of the efforts regarding bio-energy from waste. Innovative ideas such as waste recycling should be encouraged as this is likely to create jobs and incomes, which would enable people to afford cleaner sources of energy. According to Environmental Council of Zambia, some paper and plastics are being recycled for reuse. What is not clear is if the recycled paper and plastic is the total waste generated in these categories or just a fraction of it (FAO, 2010).

2.12.4 Reducing Emissions from Deforestation and Degradation (REDD)

Deforestation and forest degradation contribute significantly to climate change. Globally, tropical deforestation accounts for 3.8 billion tonnes of carbon release; that is roughly 20% of all carbon released by humans. The ILUA study estimated that forests in Zambia (excluding plantations) store

as much as 2.63 billion metric tonnes of carbon. The study further notes that this is not a total figure as it does not include carbon sequestered and stored in plantation stock, herbaceous plants, and underground plant biomass. It is clear that managed properly, forests will play an important role in reducing and mitigating climate change effects. The UN-REDD Program in Zambia is still in its infancy, not much work has been done yet. However, with the Work Plan and Budget for 2011 in place, it is anticipated that the program will soon embark on executing the activities scheduled (FAO, 2010).

2.13 Integrating climate change issues into forest policy, legal and institutional frameworks: needs, issues and options

This section briefly discusses national efforts on integrating climate change issues into forestry programmes and policy frameworks under seven sub-sections covering: Policy, Legislation, Organizational Framework, Governance Mechanisms, Information & Communication, Capacity, and Financial Arrangements. Some of the important documents to provide guidance in these thematic areas are: National Policies (NEAP, NPE, SNDP, Vision 2030, etc); National Forest Policies, Strategies, Programs & Plans (Forestry Policy, NCS, ZFAP, UN-REDD, ILUA, etc.); National CC Programs & Strategies (NAPA, NAMA, NCCRS, Needs Assessment, etc.); Legal Instruments (Forests Act 1973; EPPCA 1990; Lands Act 1996, Agricultural Lands Act 1960, etc.); and the International Conventions (UNFCCC, CBD, CCD, NLBI, etc.). Zambia has a long history of promoting sustainable forestry management, and there is a long list of policies and legal statutes that are relevant to address climate change challenges, which include, but are not limited to the statutes as can be seen in the table below;

Table 2.13.1 Sector Policies

Within Ministry of Lands and Natural Resource	Other Sectors
<ul style="list-style-type: none"> ➤ National Forestry Policy, 1998 ➤ Forests Act no. 39 of 1973 ➤ Forests Act no. 7 of 1999 (not activated, and currently under review) ➤ National Policy on Environment, 2007 ➤ National Environmental Action Plan (NEAP), 1994 ➤ National Action Plans on Forestry, ZFAP and PFAP ➤ National Action Plan to Combat Desertification ➤ Environmental Protection and Pollution Control Act (EPPCA) of 1990 ➤ National Lands Policy, 2006 ➤ Lands Act no. 29 of 1996 	<ul style="list-style-type: none"> ➤ National Agricultural Policy ➤ Agricultural Lands Act, Cap 292 of 1960 ➤ National Energy Policy, 2008 ➤ National Water Policy, 2010 ➤ Water Resources Management Bill (2010) (replacing Water Act, Cap 312 of 1949) ➤ National Wildlife Policy of 1998 ➤ Zambia Wildlife Act no. 12 of 1998 ➤ Fisheries Policy ➤ Fisheries Act, Cap 314 of 2011 ➤ Mining Sector Policy Mines and ➤ Minerals Act no. 31 of 1995 ➤ Decentralization Policy of 2002

2.13.2 The Policy Framework

The availability of policy is not a guarantee for programme success, implementers do. Programme failures arise as a consequence of failure to implement policy. For this reason, clarity in policy is important to remove vagueness. Climate change has been recognized in the Sixth National Development Plan (SNDP, 2011-2015), building on the Fifth (FNDP, 2006-2010). The National Forestry Policy of 1998, currently under review, was promulgated through a consultative process involving key stakeholders from government Ministries, academia, industry, NGOs, traditional leaders (Chiefs) and, civil society organizations. Building on the Forest Policy of 1965, the 1998 Forestry Policy espouses sustainable forest management. It aims at facilitating a “sustainable flow of wood and non-wood products and services

while at the same time ensuring protection and maintenance of biodiversity for the benefit of the present and future generations through the active participation of all stakeholders.” Its overall objective is to enhance the forest sector’s contributions to national socio-economic development, guided by the following set of principles:

1. To ensure sustainable forest management;
2. To build capacity for all stakeholders in sustainable forest management;
3. To promote participatory forest management through strategic partnerships;
4. To encourage private sector involvement in forestry development;
5. To promote gender equity, particularly the involvement of women in forestry; and
6. To embrace sectoral integration through inter and intra-sectoral collaboration.

While the 1998 Forestry Policy provides for the sustainable management of the forest resources, and the institutional and legal framework within which the policy will apply, the policy is silent on climate change issues. Probably this is because climate change effects had not becoming as devastating as they are today. The draft National Forestry Policy takes climate change issues into consideration and stipulates measures to be undertaken. The draft National Forest Policy (2011) seeks to promote participatory forest

management which will involve the active participation of local communities, traditional institutions, and other stakeholders in forest management. The draft Policy also covers issues relating to stakeholders’ roles, responsibilities, rights; resource ownership; and cost-benefit sharing mechanisms. In this respect, the policy is aligned with the Decentralization Policy (2002), Vision 2030, and the Sixth National Development Plan (2011-2015). Furthermore, the draft Forestry Policy recognizes opportunities and obligations under the regional and international agreements, such as the SADC Protocols on forestry and natural resources, MDGs/SDGs, all forest related international conventions. Considering that the current 1998 National Forestry Policy (which is under review) was based on the ZFAP framework (1998-2018), it has been noted that the ZFAP will also need updating to include climate change issues. Currently, this long-term strategic plan on forestry in Zambia does not cater for climate change challenges.

Table 2.13.3 Forestry and Environmental Policies

POLICY/PLANS	KEY PROVISIONS	CLIMATE CHANGE STATUS
National Forestry Policy 1998	Defining gazetted forest areas (farm forests, community forests, botanical reserves, etc.).	The policy does not cover climate change. The review process incorporates climate change into the Forestry Policy.
National Forestry policy 2009/2011	Reviews the 1998 National Forest Policy. Consideration being given to public-private partnerships, redefining gazetted forest areas (farm forests, community forests, botanical reserves, etc.).	The policy incorporates climate change issues
Zambia Forestry Action Plan 1996	A long-term strategic plan on forestry that promotes sustainable forest management, and provides bankable projects in forestry.	The plan does not cover climate change.
National Environmental Action Plan 1994	This was the first policy framework on environment. It gives guidelines and strategies for environmental management.	The plan does not cover climate change.
National Policy on Environment 2007	This first policy on environment sets the agenda for a harmonized approach to environmental management. Provides an umbrella strategy for a multi-sectoral approach to environmental and NR management problems. It captures nine (9) sectors and fourteen (14) cross sectoral scenarios.	Covers climate change indirectly. It covers atmosphere and climate, placing emphasis on the need to “curb atmospheric pollution” as well as support ZMD to enhance its weather forecasting ability to buttress developmental and resource management activities.

2.14 Major Challenges in addressing climate change in Zambia

2.14.1 Land Tenure and Forest Ownership in Zambia

There are two (2) types of land tenure systems in Zambia (with one subdivision): Trust land also referred to as the “native land” (customary land, 55%), with its subdivision called reserve land (non-tribal land, 35%); and State land (land in and around townships, 10%).

Both the Reserve and Trust land are administered on behalf of the local people by the traditional rulers under a customary law, while state land is administered by central Government through the Commissioner of lands in the Ministry of Lands, where title deeds may be offered to individuals, institutions and companies. The Forests Act of 1973 describes the establishment, control and management of protected forests. It also provides for the ownership, tenure and access rights in open forests. There is free access to forest resources for

domestic use but require a license for commercial use. Following the inaction to activate Forest Act No. 7 of 1999, an amendment was made to the Forests Act No. 39 of 1973 to incorporate the joint forest management (JFM) concept. This amendment, Statutory Instrument No. 47 of 2006, gave legal mandate to collaborative initiatives that enables individuals, groups or corporate entities to get involved in forest management. Since the introduction of JFM, numerous community-based natural resource projects have been implemented under the MTENR. For instance, seven (7) areas were established as JFM projects in Southern and Copperbelt Provinces. All land in Zambia is vested in the Republican President on behalf of the Zambian people (Land Act). The ILUA study found that 61% of the land is under traditional rulers' (Chiefs) jurisdiction, (FAO, 2008) quite a huge shift from the 1960s when central and local government together owned only 6% of the land (at independence) while the remaining 94% was Chief's land.

Naturally, central government relies heavily on Chiefs' goodwill for any activities requiring expansion of forest estates. This "ownership" arrangement has great implications for forestry programmes (e.g. the UN-REDD). How easy will it be to bring more forests under such programmes? Will the Traditional leaders (who have more land) be willing or encourage their people and local investors in their areas to commit land for the carbon trading investments? Another important consideration on forest management in Zambia, particularly for the expansion of carbon markets, relates to the prevailing "dual state" system: the classic (traditional) Chiefs' Forestry Departments versus the contemporary (modern) state called Zambia (Department of Forestry, 2008).

As noted above, Chiefs have rights on more land than the modern State, which means the state (central government) has no absolute control over

land. And because it owns so little, central government will continue to depend on Chiefs' goodwill to manage the forests sustainably. Mobilizing local community participation is a must. Does the Forestry Department have the institutional capacity for this undertaking? Is the current organizational structure conducive for this task? What functional and operational changes, if any, will be necessary to prepare the Forestry Department for this task?

2.14.2 Funding

Poor funding to research was highlighted as a major constraint contributing to lack of updated data. There is urgent need that research be revamped to provide evidence that should contribute to informed decision making. It is important that research funds are also allocated to academia as these institutions are equally well positioned for research. Collaboration among research institutions and academia is weak, it requires strengthening. Another area of concern relates to the weak links among the programmes under the different departments within Ministry of Lands and Natural Resources. This feature was noted even for programmes within Forestry Department, e.g. REDD and ILUA programmes have very weak links. Information exchange across Ministries and their departments is equally problematic. Although institutional collaboration has improved (through inter-ministerial committees) information sharing still needs attention. One way to improve this would be through online depositories which can be accessed from any remote location (Department of Forestry, 2008). Climate change financing is currently highly dependent on external financiers. Currently, the major ones include the FAO, UNDP, UNEP, and the Finnish Government who are supporting various programmes. The local private sector, a potential partner in this business, has not shown up yet. Forestry department should consider engaging the corporate world to finance some of the

programmes as part of their social responsibility. To this end, the best starting point would be to identify and rank areas needing financing, and then design a plan for resource mobilization and follow-up actions (Department of Forestry, 2008).

2.14.3 Lack of Capacity

There is a general lack of capacity in forestry department to respond to climate change challenges. And this situation runs across the Zambian bureaucracy. Lack of information on climate change that is suitable for different audiences is slowing down the pace for adoption of adaptation strategies and coping against climate change. Capacity building for implementing climate change related initiatives is required not only for Forestry Department but for other stakeholders too, particularly the resource poor who are most vulnerable to climate change (Department of Forestry, 2008).

2.14.4 Lack of updated Information, Communication and Research

Information and communication stand out as a problematic area. First the sector suffers from lack of and inconsistent research which results in having outdated data. For instance, there are no statistics on current forest stock, species composition, or effects of climate change on the forest ecosystem. The last national forest inventory was undertaken, 33 years ago, as far back as 1986. The ILUA study which attempted to update the forest data has also been received with skepticism. For instance, the ILUA gives the same old deforestation rates (250,000 to 300,000 ha per year) despite changes in demographics and other indices likely to affect forests. Cost-benefit analyses of the forest resources are yet to be undertaken (Department of Forestry, 2008).

3.0 METHODOLOGY

This section takes into account the methodology that was used in making this research a possibility inasmuch as it brought to the fore methods of engaging stakeholders towards forestry preservation. The section therefore sought to address the issue of how data was to be collected and made useful to the study and thus the data collection techniques. The section further looked at the strategic population sampling taking into account the size. In addition, the section highlights how the gathered was analyzed and compiled as evidence of the study.

3.1 Study Design

This research had a preliminary study carried out for understanding the topic and also to find out the research problems. After the research problems identification, a detailed outline for conducting research was developed. Because the research had a lot to do with field study it was targeted at areas where forestry has been depleted mainly due to charcoal burning and other human activities especially along the great north road, between Isoka and Nakonde Districts. All data as per study requirement was collected from the field. This being the case therefore household surveys were conducted in three communities namely Ndeke, Lyuchi and Kantongo.

3.2 Sample Population

The primary data were obtained by conducting household survey of selected community members from charcoal burning communities along the great north road between Isoka and Nakonde. The research sampled fifty participants from the selected communities (i.e. 20 from Ndeke; 15 from Lyuchi and 15 from Kantongo). Other important data was collected from various publications like reports on forestry management in the country.

3.3 Data Collection

Prior to the data collection exercise however an authority letter to conduct research was obtained from the academic Office of the Information and Communications University. This letter was addressed to the authorities within the area in which the study was conducted, seeking authority to conduct research in their area. Only with consent of the local leadership was the data collection process conducted. Further, whenever a study of this magnitude is conducted the issue of confidentiality plays a very important role. This is to ensure that the information given by the respondents is kept as private and confidential as possible. Therefore, it was of particular importance to guard against any condition which could lead to spillage of information about any respondent for purposes other than this research as this could constitute unethical conduct.

For the actual data collection therefore, questionnaire was designed as an important tool that was used for safeguarding the collected data. The questionnaire was administered to the respondents for acquisition of in-depth data. The use of a questionnaire will help the researcher to safeguard the data which later was processed with use computer data processing software for production of results. It was hoped that the use of a questionnaire accorded the respondents autonomy and ample time to give out authentic data. The primary data was gathered using a self-administered questionnaire which was distributed among the research target population. The filled-in questionnaires were thereafter collected from the respondents by the researcher for data analysis and compilation of results.

3.4 Data Analysis

During data analysis the researcher used inferential and descriptive statistics vis-à-vis frequency, mode, mean and percentage of variables whereas the inferential consisted in the information about

variables. The research therefore made use of the statistical Package for Social sciences (SPSS) and Microsoft excel in analyzing the collected data. In this case therefore the results were presented in tabular frequencies, mean, standard deviation; charts, and graphs.

3.5 Limitations of the Study

It is important to mention that this study caused significant anxiety in the respondents. In some instances, the study was a first encounter with some community members and this caused them not to give out authentic information. Further the study caused guilt and Punic in the respondents as it was emphasizing on the practice which people have neglected without better reasons, this made respondents defend their actions.

4.0 RESEARCH FINDINGS

This section gives a picture of the research findings as a representation of the data collection process. The results were therefore compiled in accordance with the objectives of the research and took into account the following; the land tenure for the people between Isoka and Nakonde; the social economic standing of the target population; knowledge levels of the target population with regards the impact of Climate change and environmental degradation; how far knowledgeable the target population is about the “plant a million” initiative towards environmental conservation. The results also give a picture of what is being done in the communities in relation to preservation of the environment. Further the results sought to familiarize with how the effects of environmental degradation are impacting the communities especially the target population. Finally, the results shall unveil the benefits of conserving the environment.

4.1 Geographical and climatic features of the area between Isoka and Nakonde

4.1.1 Climate

Generally, Nakonde and Isoka districts have a tropical climate and experiences three seasons in a year namely, the warm/wet season which extends from November to May; the cold/dry season from May to August and; the hot/dry season between September and November. Average temperatures range between 15°C and 27°C during the coldest and the hottest months respectively. The two districts further record normal to above-normal rainfall pattern even when other parts of the country have no rain. Thus, the number of rainfall days per season range between 94-98 (NDC, 2013).

4.1.2 Topography and Vegetation

The area of this research consists in an undulating topography forming hills and perennial streams with Kalungu and Nakonde streams being the major ones. The major soil types for the area of study are coarse loamy and fine loamy. Further, the area is covered by the savannah type of vegetation which includes miombo and mutondo trees interspaced with grass (NDC, 2013).

4.1.3 Socio-economic status of the people for area under review

Socio-economic variables	Women			Men			Youths		
	< 5	5 - 10	> 10	< 5	5 - 10	> 10	< 5	5 - 10	> 10
Land Holding (in Hectares)	< 5	5 - 10	> 10	< 5	5 - 10	> 10	< 5	5 - 10	> 10
Age range	45-50	36-45	Above 50	45 - 50	36 - 45	Above 50	18-25	25-30	30-36
Average Educational level	9	12	7	9	12	7	12	12	9
Family size	6	6	5	6	6	6	3	5	6
Update information on environmental conservation (%)	11	14	16	7	5	11	12	13	14

4.1.4 Land tenure and ownership for the area under review

During data collection it was discovered that 100% of the land under review for all the three villages, was under the customary administration. Ownership of land therefore was characteristic of segmentation by clans. It was further discovered that none of the land owners had their land on title. In terms of gender land distribution was biased towards men than women and youths respectively as can be seen from the following figure;

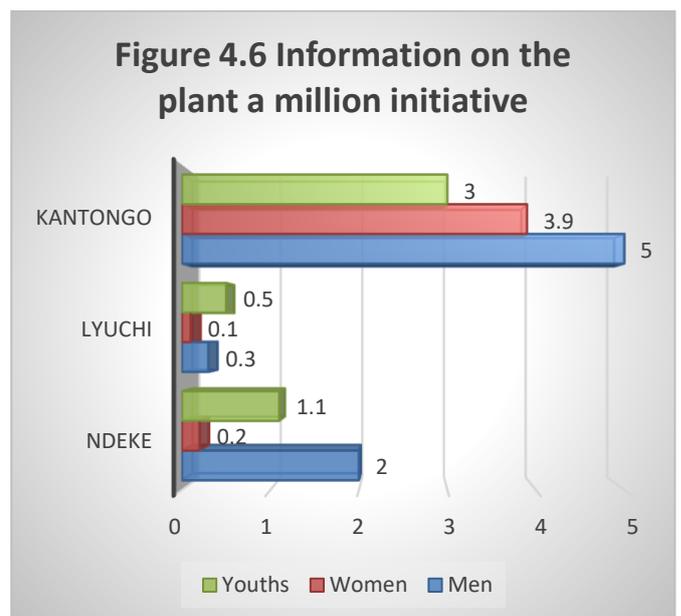
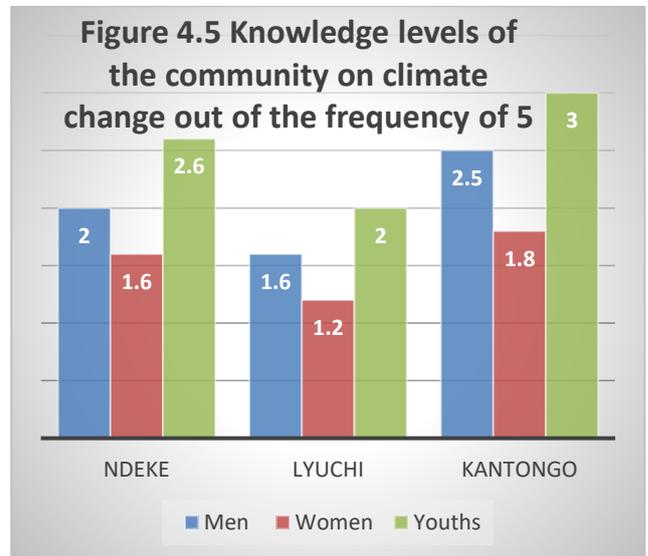
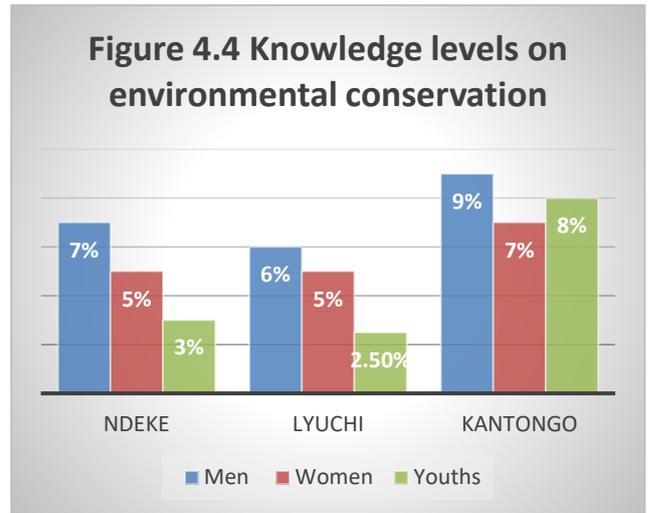
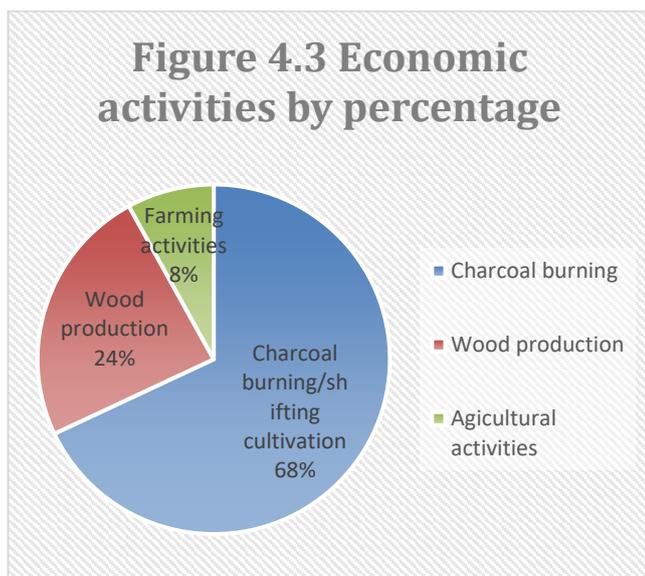
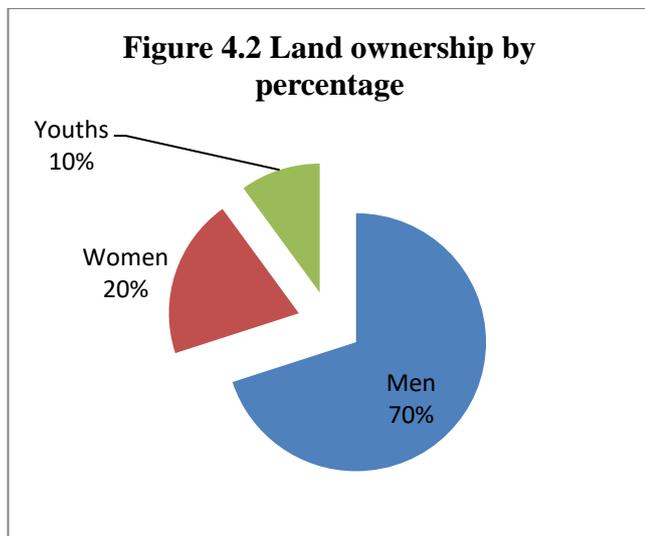
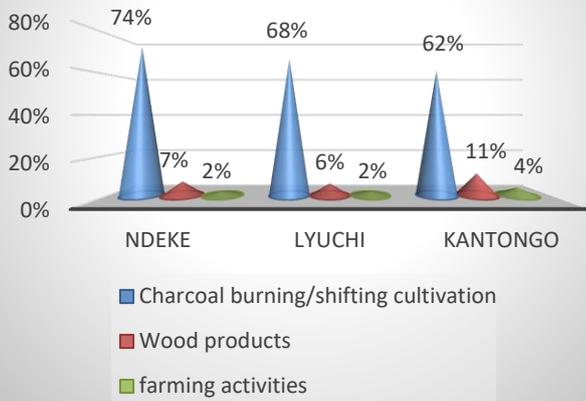
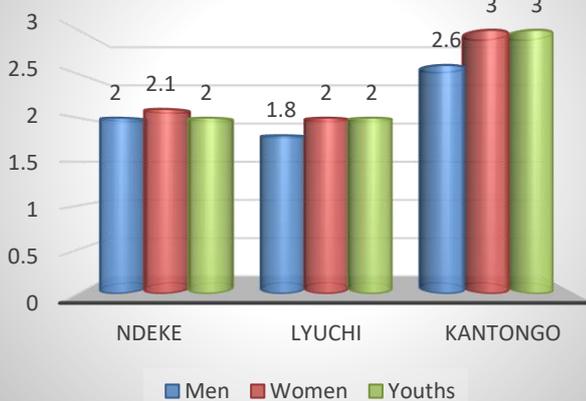


Figure 4.7 Economic activities by Percentage of each village



Arising from the above results it was discovered that the main preoccupation of the people along the great North road between Isoka and Nakonde is charcoal burning which in most instances is practiced alongside shifting cultivation. It is also worth-noting that the recent past has seen an increase in illegal timber production in terms of illegal mukula tree harvesting. However, it may be difficult to ascertain the extent of mukula harvesting within the area of study as the product could also be harvested from other regions. Other wood species however found their way from the area of study to an illegal market. The following picture illustrations depict a real case scenario of what is happening in the area;

Figure 4.8 Information on new technologies in agriculture



5.0 CONCLUSION

The primary climate change mitigation intervention in Zambia lies in the 60% forest cover. This is an extensive carbon sink with great potential for future carbon sequestration. Efforts on sustainable forest management are well articulated in all policy frameworks (National Conservation Strategy, National Environmental Action Plan, Forestry Policy, National Policy on Environment, etc), strategic plans (ZFAP, PFAP), and the legal statutes (Forest Act 1973, Forest Bill of 1999, 25 Environmental Protection and Pollution Control Act of 1990, Land Act of 1996, Agricultural Lands Act of 1960, etc.). The NEAP (1994) provides a general policy framework upon which the ZFAP, a long-term forestry strategic plan (1998-2018) builds. The ZFAP is also considered as a holistic national forest programme in Zambia. In addition, international conventions such as the UNFCCC, CBD, CCD provide guidance on what is supposed to be done in relation to forests. Further, other mitigation options for climate change are also employed such as sustainable agriculture, the use of bio-energy from waste, energy efficiency and alternative sources of supply. Government should also consider increasing the budgetary allocation towards addressing climate change challenges. Clearly, emphasis is placed on the role of trees as carbon sequesters and sinks and, it is not uncommon to hear people associating climate change to deforestation. These sentiments are particularly common in Southern Province where large tracks of land have been cleared for maize production and the region receives erratic rainfall. As the industrial plantations steadily disappear in the Copperbelt Province (a high rainfall area up north), followed by a change in rainfall pattern across the country, Copperbelt residents now share these frustrations about climate change and its impact on the rainfall pattern. Despite the general consensus on the important role forests play in climate change mitigation, forestry programmes

related to climate change receive the lowest allocation compared to other departments. There is need for Forestry Department to engage in further negotiations with the Ministry of Finance to increase its allocations for climate change mitigation activities.

5.1 Challenges and Opportunities for addressing climate change in Zambia

Among the challenges in the implementation of the forestry rehabilitation are the following;

1. Inadequate technical and institutional capacity for forest assessments and data management.
2. No coordinating institution on climate change.
3. Absence of alternative energy besides wood.
4. No legal & policy framework (currently both still under review)
5. Lack of incentives for forest conservation.
6. Forests still undervalued.
7. Forests controlled by urban & foreign interests.
8. Common pool resources versus private ownership.
9. Land ownership, modern state versus traditional state.
10. Larger population dependent on land & forests.
11. Limited knowledge about carbon stocks and carbon markets by the local people
12. Limited capacity to adapt to climate change.
13. Cost-benefit & opportunity cost analyses for forest conservation not available.

Although there are challenges there are also numerous opportunities associated with the fight against climate change in Zambia and these include the following;

1. Availability of forestry policy and legislation currently under review.
2. Availability of the multiple climate change assessments and players.
3. The presence of well-informed NGOs and civil society.
4. The country has multiple AFOLU-oriented programs.
5. Relatively low population density.
6. Stable & long working relationship with development partners.
7. Availability of the UN-REDD Pilot Country.
8. Strong political will for climate change mitigation.
9. Alternative energy sources (and technology) available: solar, bio-waste, geothermal.
10. Political stability, peaceful nation.
11. Zambia may be classified as a well wooded nation where different species of plants easily adapt.
12. Strong external financial support.

5.2 The way forward

In order to enhance forestry resuscitation government through the forestry department needs to promote rehabilitation of degraded lands through private-public partnerships. One such program is what the department has initiated with the mines to reclaim degraded lands by planting trees. Mopani and Konkola copper mines both indicated having a programme for rehabilitation of damp sites. However, due to limited time allocated to the field visit (outside Lusaka), it was not possible to verify how many hectares of degraded land has been replanted. In (2010) the forestry department also reintroduced a programme of giving free seedlings during the tree planting month (December 15 – January 15) to encourage tree planting. This programme is open to all members of the public, but initially the forestry department's target is to give 500 seedlings to each of the 150 Members of

Parliament to plant in their constituents. District forest officers will assist the MPs to identify degraded areas that need rehabilitation, and also provide technical support to do the actual planting. Assuming 1,000 seedlings are planted per ha, this programme would translate in planting 75 ha per year through this initiative.

5.3 Need for forestry department to create Synergy with other institutions

The past decades witnessed a strong advocacy for policy harmonization among all sectors and institutions that deal with the environment. How far this has been done can only be confirmed after the field interviews. However, progress has been made towards enhancing institutional collaboration among government, quasi-government institutions, and non-governmental organizations; including development partners. It is now an accepted standard to have multi-sectoral management committees to help in information processing and management of departmental programmes. To this effect, there is some level of synergy being achieved through the multi-sectoral management committees; line agencies are knowledgeable about what is happening elsewhere and are able to express their concerns where programmes may be contradictory to or a duplication of what another agency might be doing. Secondly, there is synergy too in how various institutions are approaching climate change issues at policy level. The NAPA and the NCCRS are providing guidance on climate change impact response strategies. In this respect, the creation of a Climate Change Facilitation Unit (CCFU) under Ministry of Lands has been a timely development. In the face of climate change however the CCFU's can only see to the achievement of its goals by complementing initiatives in other institutions as can be seen below.

5.4 Summary

The study has highlighted the Zambian scenario with respect to forest management initiatives in general, and climate change issues in particular. One thing is clear: forests will remain a meeting focal point for addressing climate change challenges. Because forest conservation is a multi-dimensional and multi-sectoral undertaking, it is not possible that forestry policies alone can resolve all the problems without engaging other sectoral policies. This is because policies and strategies in other sectors do affect forestry, sometimes negatively. For instance, high unemployment, rapid population growth, adverse climatic conditions, unsustainable agricultural practices, etc. Therefore, it is important that all sectors that impact forestry: land, agriculture, water, energy, the economy, population, industrial development, etc. be taken as part of the package. The REDD and other approaches that holistically cover agricultural, forestry and other land use (AFOLU) do have potential for mitigating climate change and associated problems.

The Plant a Million Zambia focuses on Education, Economy, and Ecology in its promotion of tree planting. In this regard, the program has necessitated the commencement of the tree nursery project in educational institutions. These facilities are expected to become centres of excellence for orienting a mindset shift from early childhood. This is complemented with the development of environmental educational curriculum. It is envisaged that the plant a million will potentially be a pioneer in championing educational based campaigns.

It is evident that the limited or non-involvement of the traditional leadership and local communities in the ENRM and CBNRM issues has a direct impact on the failure to attain sustainable forest and agricultural practices. This has resulted uncontrolled depletion of fish, land degradation

and severe deforestation. The limited knowledge, information and understanding of ENRM issues prevalent among the local communities have contributed to the failure to effectively manage natural resources. In addition, the existing relevant laws and policies present a number of challenges as they do not provide detailed and transparent regulations and mechanism for public participation in planning, decision-making and management of natural resources. Moreover, there are other policies and laws that are still in draft form such as the Draft Land and Administration Policy and the Draft Fisheries Policy. It is further noted that the Local Government Act does not adequately reflect the system of devolution espoused by the (amended) Republican Constitution of 2016. There is also no provision for public participation or community involvement in the development of a number of laws and policies or in their preparation as in the case of the National Environmental Protection Plan (EPP). Despite numerous provisions mandating community consultation, there are no regulations governing the method, form, and precise process that community consultations should take. Similarly, there is evidence to suggest that there is widespread noncompliance and ineffective monitoring of CBNRM mandates in the fisheries and forestry sectors.

5.5 Recommendations

Having affirmed the importance of forest sustenance in the fight against climate change this study came up with the following recommendations;

1. There is need for robust enforcement of the seemingly dormant forestry policies and laws.
2. Government should deliberately strengthen the linkages with traditional leaders who in turn should constitute community forestry

structures to support the plant a million initiative.

3. Government should consider increasing funding to the forestry sector.
4. There is need to streamline forestry activities into other government programs thereby creating synergies among government institutions.
5. There is need to introduce alternative livelihood activities among other than charcoal production
6. There is need to enhance trainings on new farming methods as opposed to the traditional ways of farming like shifting cultivation.

Acknowledgements

I wish to thank the Almighty God under whose inspiration and strength this cause has been a reality. I wish to thank the Zambia Research Development Centre (ZRDC) through the Information and Communication University (ICU) for the 70% support towards my tuition fees for the period of my study (2018-2019); this gesture was such a great opportunity and motivation to me. I owe gratitude to the encouragement from ICU academic team, indeed my supervisors Mr. Marvin Kabubi and Mr Kaela Kamweneshe (IJMDR-Editor) for their unwavering support and guidance to achieving completion this research. I recognize the encouragement from - my immediate employment supervisor - Mr. Field Simwinga, District Commissioner for Nakonde. I dedicate this work to my family who, under financial difficulties, allowed me to spare part of our meagre resources towards this achievement.

Bibliography

- [1] United Nations, 2019. *Global Conference on Strengthening Synergies between the Paris Agreement and the 2030 Agenda for Sustainable Development: Maximizing Co-Benefits by Linking Implementation across SDGs and Climate Action*, Copenhagen: UN.
- [2] Back, E. e. a., 2009. *Children and disaster risk reduction: Taking stock and moving forward*, Brighton: s.n.
- [3] Baird, R., 2008. *The impact of climate change on minorities and indigenous peoples*, London: Minority Rights Group.
- [4] Bank, W., 2012. *Carbon livelihoods: Social opportunities and risk of carbon finance.* , Washington, DC: World Bank..
- [5] Combaz, E., 2014. *Disaster resilience: Topic guide.*, Birmingham: University of Birmingham.
- [6] Department of Forestry, 2000. *National Forestry Policy*, Lusaka: Department of Forestry.
- [7] Department of Forestry, 2008. *Completion Report: The National Forest Programme Facility*, Lusaka: Forestry Department.
- [8] DMMU, 2010. *In-Depth Vulnerability and Needs Assessment Report*, Lusaka: ZVAC.
- [9] ECZ, 2008. *Environment Outlook Report. Environmental Council of Zambia*, Volume 3, p. 118.
- [10] FAO, 2003. *Forestry Outlook Study for Africa. Sub-regional Regional Report, Southern Africa.*
- [11] FAO, 2010. *Forests and Climate Change: Integrating Climate Change Issues into National Forest* , Lusaka: FAO.
- [12] FAO, 2016. *Climate-smart agriculture sourcebook.: FAO.*, Rome: FAO.
- [13] HelpAge, 2009. *Witness to climate change: Learning from older people's experience*, London: HelpAge International.
- [14] Heltberg, R. e. a., 2008. *Climate change, human vulnerability, and social risk management.*, Washington DC: World Bank.
- [15] ICRAF, 1993. *International Centre for Research in Agroforestry: Annual Report 1993.*, Nairobi: ICRAF.
- [16] International, P., 2011. *Weathering the storm: Adolescent girls and climate change*, s.l.: Plan International.
- [17] IPCC, 2007. *Climate change 2007: Synthesis report. Geneva: Intergovernmental Panel on Climate Change.*, s.l.: IPCC.
- [18] IPCC, 2014. *Climate change 2014: Impacts, adaptation and vulnerability – Summary for policymakers.*, Geneva: IPCC.
- [19] Kronik & Verner, D., 2010. *The role of indigenous knowledge in crafting adaptation and mitigation strategies for climate change in Latin America. In R. Mearns & A. Norton (Eds.), Social dimensions of climate change*, s.l.: s.n.
- [20] Larson, A., 2010. *Forest tenure reform in the age of climate change: Lessons for REDD+. Global Environmental Change*, 21(2), pp. 540-549.
- [21] Mearns, R. & A. N., 2010. *Social dimensions of climate change: Equity and vulnerability in a warming world.*, Washington DC: World Bank.
- [22] Nations, U., 2013. *A new global partnership: Eradicate poverty and transform economies through sustainable development* , New York: UN.
- [23] NDC, 2013. *Nakonde District State of the Environment Outlook Report*, Lusaka: ZEMA.
- [24] Ribot, J., 2010. *Vulnerability does not fall from the sky: Toward multi-scale pro-poor climate policy*, Washington DC: World Bank.
- [25] Schalatek, L. & N. S., 2013. *Gender and climate finance (Climate finance fundamentals 10).* , London : ODI.
- [26] Shakacite, O. A., 2000. *Country Report for the Twelfth Session of the African Forest and Wildlife Management Commission* , Lusaka: Wildlife Management Commission.
- [27] Skinner, E., 2011. *Gender and climate change: Overview Report (BRIDGE Cutting Edge Pack).*, Brighton: BRIDGE/IDS.
- [28] UNDP, 2009. *Resource guide on gender and climate change*, New York: UNDP.
- [29] UNFCCC, 1992. *Text of the United Nations Framework Convention on Climate Change.* , Bonn: United Nations Framework Convention on Climate Change..
- [30] UNICEF, 2007. *Climate change and children*, Geneva: UNICEF.
- [31] United Nations Environment Program, 2007. *Plant for the Planet: The billion tree campaign*, New York: UNEP.