



RURAL POLICY ANALYSIS OF AFFORESTATION AND AGROFORESTRY INITIATIVES

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Prof. Felix Kanungwe Kalaba

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List of acronyms

ANR	Assisted Natural Regeneration
BCP	Biocarbon Partners
CTNA	Choma Tree Nursery Association
FD	Forestry Department
FGDs	Focus Group Discussions
FISP	Farmer Input Support Programme
IFTs	Indigenous Fruit Trees
MEA	Millennium Ecosystem Assessment
MPTs	Multipurpose Trees
NTFPs	Non-Timber Forest Products

Executive summary

The objective of this assignment was to investigate opportunities that exist for the integration of rural policies and traditional authorities in market-led tree planting initiatives in Southern, Central and Lusaka regions. A qualitative research approach was used comprising in-depth interviews with Chiefs and focus group discussions in chiefdoms in the three regions. The investigation sought to ascertain the extent of forest cover loss, drivers of deforestation, existing rural policies and their implementation, the impact of gender on afforestation choice of trees as well as opportunities and barriers to afforestation, reforestation and agroforestry initiatives. Interviews were also conducted with private sector players to explore current challenges and opportunities in their participation in afforestation programmes.

Findings revealed high rates of forest cover loss in the three regions linked to charcoal production, cutting of trees for firewood for small and medium enterprises, illegal logging, mining, unsustainable agricultural practices, migration and population increase intensifying direct drivers. Consequently, a number of perennial rivers and streams have become seasonal, increasing water scarcity for human and livestock consumption. Distance covered to collect firewood has increased; negatively affecting women who are the primary energy users in communities. The experienced impacts of forest cover loss presents an opportunity for local people participation in afforestation and reforestation initiatives.

Rural policies exist on conservation of trees albeit oral in most chiefdoms. Existing rules include protecting of trees along rivers, hills, dambos, shrines, graveyards, conserving of indigenous fruit trees such as *Uapaca kirikiana* (Masuku) *Anisophyllea boemi* (Mfungu), *Parinari curatellifolia* (Mpundu), among others. Sanctions for violating rules vary among chiefdoms, and may include payment of fines, confiscation of tree and forest products illegally harvested, and community work. Adherence to rules is however low. The low adherence to rural policies is attributed to lack of awareness, poor enforcement of existing policies, limited capacity to monitor, poor monitoring mechanisms, and limited livelihood alternatives. Taboos and cultural belief systems exist which influence which trees can be planted, retained on agricultural land or cut.

Afforestation and reforestation potential in the Southern, Lusaka and Central regions is high due to observed high levels of deforestation and forest degradation resulting in reduction in available tree products. Findings of this study revealed that local people are willing to engage in tree planting activities on degraded lands and farmlands. There is further potential to protect regenerating trees through promotion of assisted natural regeneration (ANR), and protecting plants from domestic animals and fire. Trees of interest include agroforestry tree species such as *Sesbania sesban*, *Faidherbia albida* (Musangu), *Gliricidia* and *Moringa*. Findings of the study revealed that a number of farmers deliberately preserve indigenous fruit trees (IFTs) or wild fruits on agricultural land. This practice was observed in Choma and Chisamba. The main IFTs preserved are

Mpundu (*Parinari curatelifolia*) and Masuku (*Uapaca kirkiana*). Other includes Masau (*Ziziphus Mauritania*) and Mabungo (*Landolphia kirkii*) among others. Preserved mature trees are important in promoting natural regeneration as parent trees. Local people lack knowledge on propagation of IFTs and therefore rely on natural regeneration. IFTs are an important source of income for women and youths. There is growing markets for IFTs in urban areas. There is further interest in planting exotic fruit trees such as lemons, mangos, guava, oranges, and avocados.

The findings of this assignment revealed that farmers raise seedlings at a small scale but lack necessary technical skills such as grafting and budding, breaking of seed dormancy and propagation of other tree species of local significance such as indigenous fruit trees. The main players for tree planting are traditional leaders, local communities, cooperatives, schools and Non-Governmental Organisations (NGOs). Private sector participation is limited. Agroforestry is supported by research organisations and NGOs who provide planting materials and technical services to local people. Government led extension services are existent but are highly constrained by budget constraints.

The gender dimension revealed that women are more involved in tree planting than men. Gender affects the choice of preferred trees in afforestation and reforestation. Women prefer fruit trees to meet food and nutritional needs of families. Women further being primary energy users in households, make choices on the type of trees to be used for firewood and prefer species that produce limited smoke as well as trees that provide twigs. Men preferred medicinal trees.

This study has identified a number of constraints to afforestation. These include: little involvement of traditional leaders; lack of local communities' involvement in selecting tree species to plant; little training to farmers on plant propagation and tendering; limited markets for wild fruits and mushrooms, lack of planting materials and chemicals. There is further competition for labour in tree planting seasons as demand for agriculture intensifies.

Energy production from agricultural smallholder systems through establishment of woodlots will be critical in meeting energy deficiencies for both domestic and small and medium scale industries such as beer brewing, agro processing, brick making kilns. Tree planting activities will require trees of economic value for timber, fruit trees, woodfuel and agroforestry trees species to promote resilient landscapes.

For more successful market-led tree planting efforts, it is highly recommended that communities and their sociocultural interactions with forest landscapes be considered throughout the process. Meaningful participatory approaches that recognise local sociocultural dynamics will remain important. Skills development in grafting, budding, and value addition should be part of the intervention package to expand socioeconomic opportunities for communities involved in tree planting.

To promote rural policies, this study recommends documentation of rural policies and their dissemination; promote exchange visits among traditional leaders to learn good practices; establishment of community nurseries in chiefdoms to enable communities raise seedlings of their choice and linkages to markets. Youth participation can be enhanced through youth cooperatives as young people presently do not own land and therefore, not actively engaged in afforestation activities.

1. Introduction

1.1 General background

Zambia is a highly forested country with over 60% of total land area covered by forests. Trees are an important source of livelihoods. They also provide additional income for local communities in a country with territorial and demographic disparities in wealth distribution and economic development - where rural poverty still remains stubbornly high (World Bank, 2018). Forests are a source of foods (fruits, mushrooms, etc), medicines, fuelwood and construction material (Kalaba *et al.* 2013a; Ryan *et al.* 2016). Further, forests are important carbon stores, contributing immensely to carbon sequestration. Zambian forests are therefore, important for mitigating the impacts of climate change.

However, the wealth of these forest uses are increasingly under threat due to deforestation and forest degradation that are culminating in an annual estimated forest loss of 276 021 hectares (GRZ 2018). This alarming forest cover loss is shrinking the resource base, and threatening the livelihoods of forest-dependent communities and increasing their vulnerability to climate change. Forest cover loss per province is provided in table 1. Deforestation is causing environmental problems such as declining soil fertility, increasing flooding in some areas and droughts in others - undermining rural people's ability to support livelihoods. Given the 'geographically enclaved poverty' levels across the country, remote areas have poor health services, and therefore the loss of forests which constitute their 'pharmacies' further weakens their already vulnerable context.

Table 1: Trend of forest cover loss in Zambia

Province	Total Land Area (Ha)	1990 Forest Cover (Ha)	2000 Forest Cover (Ha)	2005 Forest Cover (Ha)
Central	9,439,438	6,002,109	5,232,563	4,913,115
Copperbelt	3,132,839	2,048,808	2,004,202	1,893,522
Eastern	6,910,582	5,201,941	5,110,742	5,128,460
Luapula	5,056,908	3,301,308	3,286,495	3,465,225
Lusaka	2,189,568	1,502,000	1,405,363	1,387,786
Muchinga				
Northern	14,782,565	7,700,920	7,692,586	7,323,022
N/Western	12,582,637	9,606,934	9,599,120	9,403,079
Southern	8,528,283	6,001,224	5,161,349	5,101,232
Western	12,638,580	8,426,384	8,403,159	8,433,420
Total	75,261,400	49,791,628	48,141,216	47,048,850

Source: ILUA I, (2008)

Forest cover loss in developing countries such as Zambia has raised concerns about the effectiveness of various policies and strategies that intersect in the forest sector. This leads to questioning both consistency of policies in addressing deforestation and interactions between various policy objectives and land tenure systems and property rights (Chundama and Gumbo 2009; Mwape and Gumbo 2010). This is because policies play an essential role in human–environmental interaction by providing guidance on priorities and practices of countries, and can be one of the major factors driving ecosystems degradation when they are designed and implemented poorly (Rasul *et al.* 2011). The Millennium Ecosystem Assessment (MEA) report has highlighted the urgent need to reverse the degradation of ecosystems through substantial changes to policies, institutions and practices, since functioning of many forest ecosystems could be restored once appropriate action is taken (Nasi *et al.* 2002).

In response to the high levels of deforestation, but also to the increased need for fuelwood (exacerbated by low level access to electricity in rural areas), afforestation and reforestation have gained traction in forest, land rehabilitation and climate change policy discussions – to maintain or enhance ecosystem stocks and flows, to mainstream nature’s contribution to nations’ economic growth and to improve rural livelihoods. This policy thrust has generally taken a ‘top-down’ approach where (member) countries have to domesticate global and regional agreements. One form in which global and regional agreements see the light of day is through projects and programmes.

In the Zambian context, the role of traditional authorities and rural institutions, that is, the ‘bottom-up’ approach in afforestation and reforestation initiatives, remains peripheral and eclipsed by short-term projects. However, forests constitute a lifeline of rural economy, and the intimate interaction of communities with forests is by definition, a totality of rural livelihoods. This interaction is mediated by socio-cultural and traditional practices. Culture shapes community gender roles defining roles and responsibilities of men and women. Socio-cultural and traditional practices are part of the successful equation in natural resources management in general, and forest management, in particular. Incorporating traditional norms, beliefs and practices in the design of afforestation programme is likely going to increase adoption rates, while support at the local level can increase ownership of trees which translates into survival of planted trees. Therefore, understanding them and the local institutions within which they operate is important in making tree-planting projects more effective to achieve social and environmental goals. A better understanding of social norms in different contexts will give rise to strategies that make natural resources management interventions more effective (Minato *et al.* 2012). This has the potential to further provide better returns on investment to donors who fund tree-planting projects by increasing the survival of planted trees.

1.2 Climate change impacts in Zambia

Impacts of climate variability and change on ecosystems and livelihoods are widely recognised (Kalaba *et al.* 2013b; England *et al.* 2018). In Africa, the impacts are an increasing threat, affecting important sectors such as agriculture, infrastructure development, water development, forestry and energy (Bele *et al.* 2011). The impacts affect men, women, youth and children differently.

Zambia is experiencing climate induced hazards, which include drought and dry spells, seasonal and flash floods and extreme temperatures. Droughts and floods have increased in frequency and intensity over the past few decades and have adversely impacted on the food and water security, water quality, energy and sustainable livelihoods of communities. Zambia has high reliance on natural resources based livelihood strategies which are susceptible to climate extremes. Studies project increased impacts of climate change due to increased exposure, high levels of vulnerability and low levels of resilience. On average for the period 1950-2016, precipitation has been decreasing by 1.1 mm yr⁻¹ across the country with Southern, Western and Central provinces receiving the least rainfall. Temperature has been increasing by at a rate of 0.01 °C yr⁻¹ in Zambia (Libanda *et al.*, 2020). With constrained asset portfolios, the impacts of climate change on livelihoods are larger for rural households that depend on rain-fed agriculture (Hamududu and Ngoma, 2020). With a projected significant increase in the number of consecutive dry days over Zambia, especially beginning from the year 2050 to the end of the century, the agriculture sector, ecosystem services and water resources management will negatively be impacted (Libanda and Ngonga, 2018).

1.3 Agroforestry and forest restoration initiatives

There is increasing interest in promoting trees on agricultural land through agroforestry, establishment of woodlots for supply of woodfuel, assisted natural regeneration and planting of fruit trees. Tree-based land uses such as agroforestry have the potential to deliver co-benefits for climate and development (Anderson and Zerriffi 2012). Trees provide important safety nets which are used by households to cope with various stresses and shocks at household and community levels such as drought related conditions leading to crop failure and other extreme weather conditions (Paumgarten and Shackleton 2011; Kalaba *et al.* 2013b). Although trees are important for both mitigation and adaptation to climate change, these options are not well integrated in policies, projects and programs (Guariguata *et al.* 2008; Di Gregorio *et al.* 2016; Di Gregorio *et al.* 2017). To address deforestation and forest degradation, various stakeholders are promoting integrated forest management and land-use management. This is against the backdrop of unprecedented impacts of climate change. Several programmes and projects are being implemented to address the dual challenge of mitigation and adaptation with a focus on forest landscapes.

The role of agroforestry in ecological restoration is widely recognised. Landscape-scale ecological restoration efforts are gaining traction worldwide to assist the recovery of degraded ecosystems (von Holle *et al.* 2020). However, the adoption of tree planting and agroforestry initiatives in rural areas remains low with integration of indigenous fruit trees and fodder banks estimated at 4.4% and 3.9% respectively (see Kabwe *et al.* 2016). Cultural norms and practices are often neglected in current agroforestry and tree planting initiatives. This reduces the adoption as well as survival rates of trees. Agroforestry practices are a form of investment in land by land-users who have been using land for other goals. While debate continues about the role of land tenure in community decision to invest in land rehabilitation, various studies have indicated a positive correlation between land tenure and investments in land rehabilitation, forest restoration, including the types of practices and technologies for doing so (see Asaaga *et al.* 2020; Teshomo *et al.* 2016). The interaction among cultural norms, traditional practices, beliefs and land tenure might be context-specific, but overall, they play a key role in how communities use land for restoration or not. There is therefore, need to examine various cultural and traditional practices and beliefs and their possible linkage with national and regional level policies. Little is known regarding how norms and customs in different local institutional settings impact the use and governance of forests and shape tree planting and agroforestry initiatives. One contributing factor is that customary rights are often considered inferior to statutory ones (Quinn *et al.* 2007).

1.4 Rural traditional policies and community dynamics

Humans in rural areas interact with their forest ecosystems in diverse ways. The diversity and complexity of social-ecological interactions in rural areas is a mark of cultural identity. Most people in rural areas manage forests and trees as part of their livelihood systems. In fact, forests, trees and land define people's daily and seasonal way of life, beyond meeting livelihood needs (see Chilombo *et al.* 2021). Rural systems have however, been historically overlooked by the forestry sector as often reflected in the forest policies and regulatory frameworks. Rural forests or forests on customary lands are typically not managed from a professional forestry perspective. Beliefs and social ties under the traditional administration system are used to enforce local rules. This is because norms exist in specific social settings, compelling individuals to act in a certain way and often punishing non-compliance (Krasner 1983). This creates a standard of appropriate behaviour which gives rise to reciprocal expectations about social behaviour in a community which determines people's interests and conduct (Dimitrov 2005).

Strong social ties that exist in native communities promote checks and balances on behaviour. The connections within the community restrain bad behaviour and hence it is less likely that people will break the rules, norms and regulations on forest protection (Wunder 2001; Keleman *et al.* 2010). Cultural norms and customary practices are facing increasing economic, commercial and demographic pressures. Studies, show that

migration of people of different ethnic groups into villages reduces adherence to taboos due to differences in cultural beliefs among different ethnic groups. Posner (1997) suggests that adherence to norms is affected by peer-pressure and other factors such as feeling of guilt. Since norms on use of forests prescribe behaviour, enforcements and sanctions elicit compliance (Hønneland 1999; Sutinen and Kuperan 1999), but norms easily erode in the absence of reciprocal behaviour and cooperation within communities (Ramcilovic-Suominen and Hansen 2012). Norms and taboo adherence is sometimes affected by changes in people's cognition regarding the supernatural, education, Christianity, and local desire for commercial benefits from the forests.

Against this background, this study was commissioned to analyze rural policies and institutional frameworks with regards to afforestation and agroforestry initiatives in Zambia, and provide recommendations on how such initiatives could be strengthened. The report is structured as follows: in section 2, it presents an overview of the objectives of the assignment and the methodology that was used to undertake a landscape analysis of the opportunities that exist for the integration of rural policies and traditional authorities in market-led tree planting initiatives in Southern, Central and Lusaka region. In section 3, the findings are presented. In section 4, the report highlights the interaction between tree-related formal and informal policies, while in section 5, it is dedicated to highlighting the deforestation and afforestation through agroforestry in the chiefdoms. In section 6, the report discusses the gender and youth dimension of tree planting in chiefdoms before concluding and offering recommendations in section 7.

2. Objective of the assignment and methodology

2.1 Assignment objective and priority areas

The main objective of the assignment was to investigate the opportunities that exist for the integration of rural policies and traditional authorities in market-led tree planting initiatives in Southern, Central and Lusaka regions, focusing on the following priority areas:

1. Examine the different rural policies that rural communities use to govern resource use, with special consideration for opportunities to integrate tree planting in rural communities;
2. Establish the beliefs around tree planting in the study areas, examining drivers and constraints that exist around tree planting; and
3. Provide an overview of who the market players in rural tree planting that must be addressed or enhanced as a basis for identifying Musika's investment.

2.2 Methodology

The review of rural policy and tree planting activities was done between 28th September and 23rd October 2021. This study was conducted in Central, Southern and Lusaka provinces. A total of 5 chiefdoms were sampled representing the traditional leadership in the study region for the Lenje, Tonga and Soli people in Zambia. In-depth interviews were conducted with the Royal Highnesses which were followed with focus group discussions. Both men and women participated in the discussions.

Traditional leaders were drawn from Rufunsa, Chisamba, Chibombo, Chikankata and Choma Districts. In each district, the Chief was interviewed as a key informant while headmen and women participated in focus group discussions. The Chiefs interviewed were Chief Chamuka of Chisamba, Chief Liteta of Chibombo, Chief Cooma of Choma, Chieftainess Mpanshya and Chieftainess Mwenda of Rufunsa and Chikankata, respectively. 49 village headmen (71%) and women (29%) participated in focus group discussions (Figure 1). During in-depth interviews with Chiefs, cultural norms and practices that affect women participation were investigated in community meetings. In all the chiefdoms visited women and men were reported to participate in community meetings. In facilitating discussions, the facilitator ensured equal participation of women by providing opportunities to air their views. This did not present a problem in soliciting participation from women. Unlike other areas where women receive different treatment and experiences compared to men, women were fully engaged in discussions in all the chiefdoms.

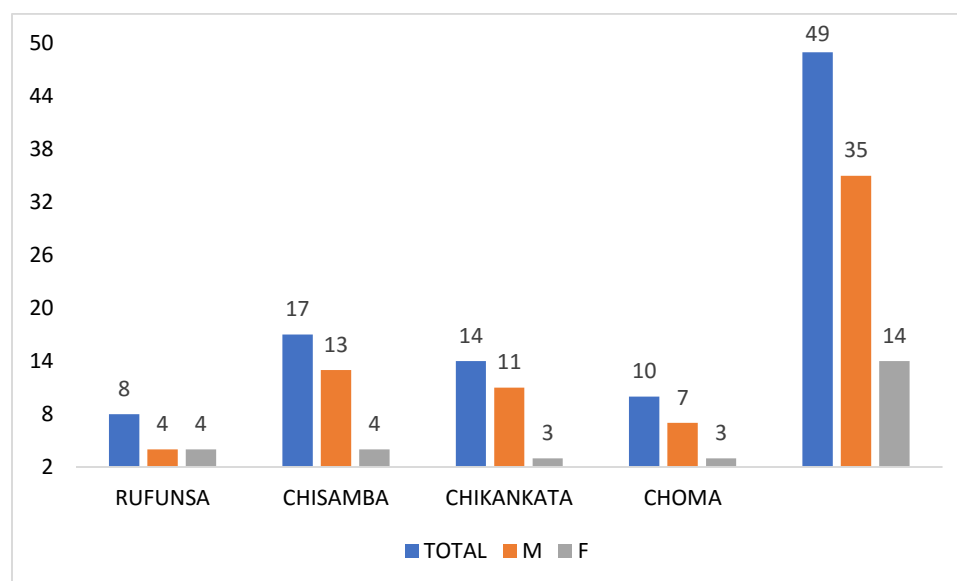


Figure 1: Traditional leadership at village level in five chiefdoms



Participants of focus group meeting with Chief Chamuka, Chisamba District



Chieftainess Mwenda of Chikankata District, Southern Province



Focus group discussion in Mpanshya Chiefdom, Rufunsa, Lusaka province



Participants of focus group discussion in Chief Cooma Chiefdom, Choma, Southern province

Source of pictures: Fieldwork

3. Presentation of findings

Consistent with the thematic interest of the assignment, the presentation of the findings will focus on findings regarding: i) the examination of the different rural policies that rural communities use to govern resource use, with special consideration for opportunities to integrate tree planting in rural communities; ii) the beliefs around tree planting in the study area, examining drivers and constraints that exist around tree planting; and iii) an overview of the market players in rural tree planting.

3.1 Market analysis of existing rural policies

Traditional leaders have rural policies which govern use and management of trees within their respective chiefdoms. In most chiefdoms, these guidelines are not formally recorded and are passed orally from generation to generation. Enforcement of these rules is often through taboos and fear of misfortune. These policies are discussed in 3.2.

3.2 Local institutional and policy arrangements for resource governance and opportunities for tree planting

Interviews with traditional authorities in all the chiefdoms revealed a wide array of rules and regulations in support of protection of trees. There are rules and regulations regarding protecting indigenous fruit trees, conservation of trees in shrines, forbidding indiscriminate cutting of trees, and protection of trees in water catchment areas and water sources. These rules are often passed on orally, however there are some chiefdoms (namely, Chiefs Chamuka and Cooma) that have developed written by-laws which are documented and incorporated in their strategic plans (see figure 3 and 4). Chief Cooma has further formally provided instructions to law enforcement officer to local people to address indiscriminate cutting down of trees.



Figure 3: Governance documents developed in Chamuka and Cooma Chiefdoms.

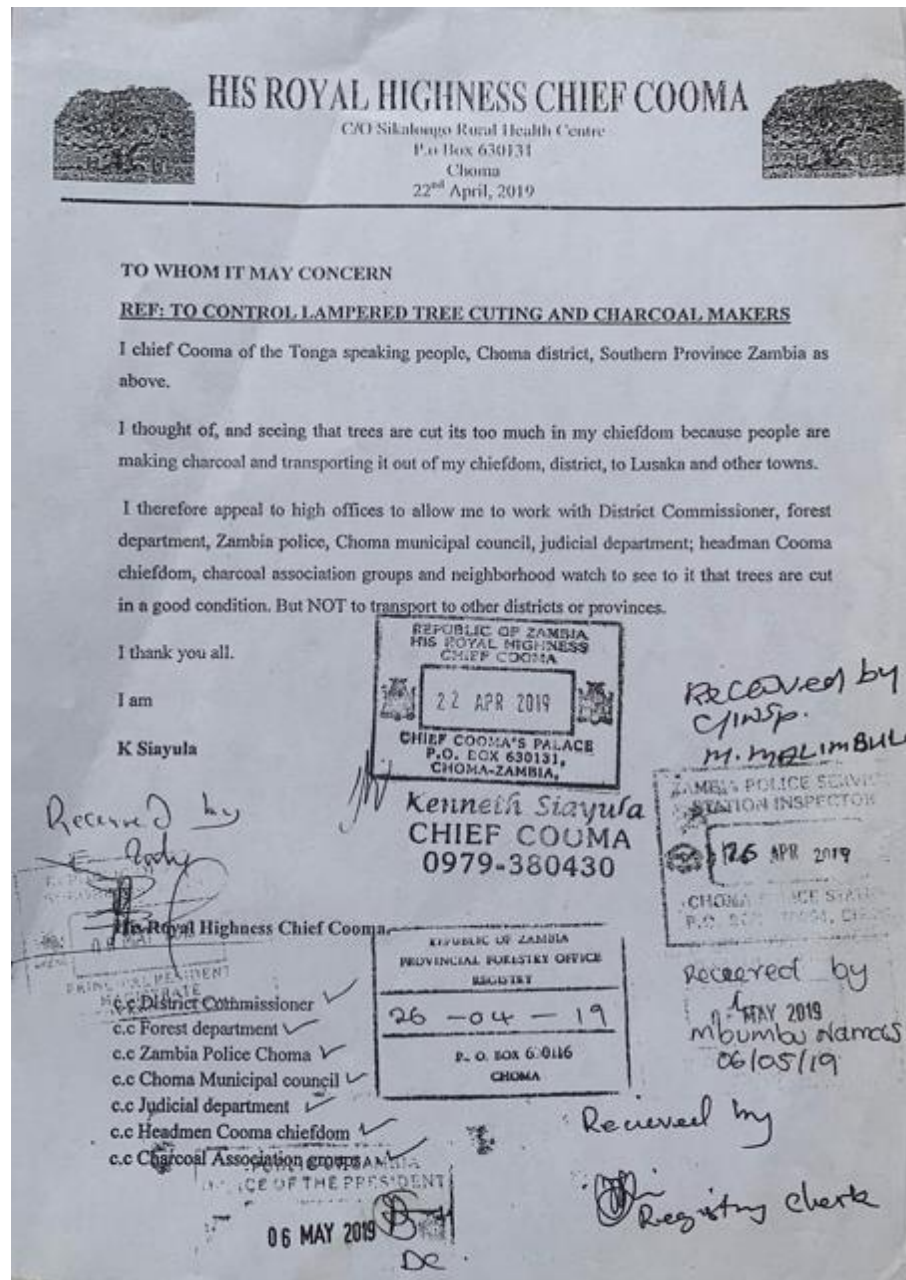


Figure 4: Communication on addressing deforestation in Cooma Chiefdom

Focus group meetings and in-depth interviews with traditional Chiefs revealed that adherence to by-laws was higher in Chiefdoms with documented by-laws compared to those without. Documenting of by-laws in both chiefdom was developed through a participatory process at the village level with technical and financial support from cooperating partners.

The interaction with interviewees further revealed that traditional leaders have a deeper understanding of the ecology of trees, and are aware of the trends in the loss of trees, habitats – the changes in floristic and structural compositions of tree species that underpin the totality of their interaction with forest landscapes. The awareness of forest loss and associated changes in rainfall patterns, soil fertility and dryness of rivers has become important in the rules of the game for the management of trees. The rules are part and parcel of everyday interactions with forest landscapes, and therefore, have been internalized and organised into forms of guidelines that are shared among subjects in chiefdoms, and bequeathed to younger generations. This is particularly important because, even if the young people may not have land in their name, they tend to inherit land from their parents.

Local rules and regulations in support of protection of trees take different forms and mechanisms. These include the following:

3.2.1 Restricting Local rules on cutting of trees in own land

Each family or clan has a piece of land where they live, cultivate and keep their livestock. Local people do not clear their whole land at once but keep some for future utilisation. They grow different crops on their land to have a diverse crop produce in each growing season. Furthermore, they do not go back to cut the young trees under secondary growth. Areas with small tree if cut for farming cannot produce good harvest. People who are not members of a particular clan/family cannot go and cut or farm in an area of another clan/family. This was found in Rufunsa, Chisamba and Chikankata however, this should be the same scenario in all other districts. They have to get permission from the head man/ woman who allocated a piece of land to the interested person.

3.2.2 Local rules on protection of trees in shrines and grave yards

Graveyards and shrines are sacred places and as such no tree is allowed to be cut in all chiefdoms. Cutting a tree on graveyards is a serious crime or taboo. No land is allocated for residence or farming on the grave yard. Traditional leaders in Chief Cooma

appreciated the role that trees play in grave yards as they provide shed to the dead as well as to mourners as they put their loved one to rest.

Grave yards in rural areas are seen as areas for tree and wildlife conservation. Grave yards are treated as lands belonging to the dead.

3.2.3 Local rules on retention of fruit trees on agricultural land

During bush clearing for agriculture, local people do not cut trees for medicinal or fruit trees. Indigenous fruits supplement the daily diets of local communities and substitute for exotic fruits. They also gain importance during periods of household food shortage, particularly during the rainy season when crops are not yet ready for harvest and stored supplies have run low. Fruit trees on a farm belong to the owner of the farm; a visitor may pick a fruit which has fallen to the ground to eat but may not harvest directly from the trees. In all chiefdoms it was observed that it is illegal to cut fruit trees such as Masuku, mpundu and others. In Chiefdom Cooma, retained fruit trees on farm land was observed. These fruits are collected and consumed within the household and some are traded to generate income.



Fruit trees retained on farmland in Choma

Source: Fieldwork

3.3 Sanctions related to abrogation of local rules

Although customary beliefs exist on the use and management of forest resources, adherence to these rules is low. All Chiefdoms have developed sanctions to deter the deviation from local rules. Sanctions include confiscation of forest and other tree products such as charcoal or logs illegally acquired (chiefdom Cooma). Culprits are ordered to pay a fine of K250 and K350 in Chamuka and Cooma chiefdoms, respectively. Enforcement of sanctions is plagued with challenges linked to lack of monitoring mechanisms; little knowledge of some traditional leaders on the importance of trees; traditional headmen and women engaging in illegal activities themselves thereby setting bad example themselves; and the migration of people from other parts of the country in these chiefdoms has weakened chiefs' authority – new comers come with their beliefs that do not necessarily resonate with values in chiefdoms, and are often seen as rubbishing local rules regarding tree protection. In response to this, Chief Chamuka is in the process of finalizing by-laws that will require that: i) new comers in the chiefdom need to sign to agree to leave 30% of farmland covered in trees; ii) plant fruit trees; and iii) commit not to cut trees on their parcels of land.

Adherence to local rules is further limited by lack of documentation. Rural policies are shared verbally, in case of death this information may be lost. Chief Chamuka of Chisamba has since embarked on documenting local rules on paper which are shared to every subject through headmen. This exercise is supported by Caritas in Kabwe to document the chiefdom's mission and vision regarding tree planting in the chiefdom. The non-documentation of policies in rural areas can lead to violations especially among new comers who may not know what is required of them.

3.4 Beliefs around tree planting in the study area

The section above on local institutions and informal policies has highlighted how the local rules and regulations help to restrict the felling of trees even on own land and how the rules benefit the floristic and structural integrity of tree species while helping to uphold the culture of shrines. The section has also highlighted how trees contribute to food and nutritional security by preventing the cutting down of fruit trees on agricultural land. Moving further, however linked to the rules are belief systems that underpin these rules for natural resources management. It should be noted that, traditional knowledge and local regulations, informal and context-specific as they are, are codified into important belief and taboo systems and play a critical role in protecting trees in different biomass and ecosystems such as river banks, water catchment areas and places of culture heritage and important sites such as shrines and grave yards. These resources play an important role as they provide various services such as habitats for wildlife, livelihood support and carbon sequestration.

In this section, the report presents findings regarding the existing beliefs and taboo systems for protecting or cutting trees in the chiefdoms studied. Overall, the belief and taboo systems in the studied chiefdoms are bifurcated into indiscriminate cutting and use as detailed in the sub-sections below.

3.4.1 Local cultural beliefs on prevention of indiscriminate cutting of trees

The level of local indigenous knowledge on the role of trees in protecting river catchment areas and preventing erosion is appreciable, and community leaders have the memory of rivers that were perennial but have turned seasonal. As has already been noted, this awareness of drying rivers with the passage of time, changing rainfall and temperature patterns have been informed cultural practices on forest landscape, including rules prohibiting the cutting down of trees and farming along river banks. To discourage tree cutting along rivers, stories about hostile spirits living in the riverine and riparian forests that grow along river banks. Local people believe that ghosts or spirits inhabit some tree species such as Mululu and Mubuyu found along river banks in Rufunsa. These scary tales bring about flickering lights, moving objects, crying babies and noises such as laughter and wailing in the woods which deter people from destroying them. This cultural belief was deemed inadequate in the current generation and people have access to information. These sentiments were recorded in Rufunsa and Choma.

Cutting of medicinal plants is prohibited in all chiefdoms visited. To avoid over exploitation and total destruction of trees, indigenous knowledge guides people about how to collect the barks and roots from the tree. Local people collect the material from the eastern side of the tree. If one gets the bark from the western side, the medicine will not be effective. The importance of not removing bark from all-round the tree is to keep it alive. If the bark is collected all around the trunk, water and mineral salts from the roots would not reach the leaves and photosynthesis would be affected and the tree would die.

3.4.2 Traditional beliefs affecting use and planting of trees

In all the chiefdoms studied, there are trees believed to be bad omen bearers, while others are extremely beneficial. Some trees are believed to cause death if used as such local people in their specific regions preserve them. Traditional beliefs affect use and management of identified species. The table 2 summarises some tree species and associated beliefs identified during data collection.

Table 2 Tree species and associated belief systems

Tree species	Belief/use for the tree	Comments
Mulwalwa, Muzungwe and Bakumba	Believed to bring confusion in the family and promote promiscuity of children. These trees are therefore cut immediately found on agricultural land or in the backyard.	Reported in the chiefdom of Her Royal Chieftainess Mpanshya
<i>Mulundalunda</i>	Known to bring death to families	Reported in the chiefdom of Her Royal Chieftainess Mpanshya
<i>Muzyimya ng'ombe</i>	If touched, can cause an individual and livestock to be lost in the forest.	Reported in southern province chiefdoms
<i>Ndausa tree</i>	A love potion, when a man is turned down by a woman, he can just smoke the leaves and the woman would start running after the man.	Reported in the chiefdom of Her Royal Chieftainess Mpanshya
<i>Sausage tree</i>	Used for animal diseases and enlargement of the manhood.	Reported in southern province chiefdoms
<i>Kalukumo</i>	Enlargement of the manhood.	Reported in Rufunsa
<i>Mupundu</i>	Clean teeth and control high blood pressure.	Reported in all chiefdoms

The extent to which these belief systems, myths and taboos influence positive behaviour was reported to be waning, particularly among the young people. This sentiment was echoed among traditional leaders in Rufunsa and Choma. The current generation is less superstitious as the level of enlightenment has increased with exposure to technology and information. To ensure sustainable use and management of trees in the Chiefdoms studied, it is important to note myths and taboos are no longer effective in promoting sustainable management of trees among youths. There is therefore need for awareness programmes which target youths to influence positive behaviour. This could include games and building scenarios on the implications of their decisions on trees and the environment.

3.5 An overview of the market players in rural tree planting in studied chiefdoms

Findings from the study indicate that in some chiefdoms, projects have in the past been implemented which involved tree planting. In these projects, project implementers have

been providing tree planting materials without the involvement of local communities in selecting tree species. At community level, communities have been involved in raising tree seedlings largely exist as individuals and rarely as small groups or cooperatives. Generally, there are some international development partners, for example, in Cooma Chiefdom Food and Agricultural Organisation, Plan International and Care International. In Mpanshya chiefdom, players include World Agroforestry Centre through Msekera Research Centre, Biocarbon Partners (BCP), COMACO, Kasis and Conservation Farming Unit in Mpanshya chiefdom. Chamuka chiefdom have several players among them Kasisi, Conservation Farming Unit, Plan International among others. These partner have been distributing seedlings to communities. Tree species distributed include agroforestry tree species such as *Faidherbia albida* (Musangu), *Sesbania sesban* and Moringa, and fruit trees such as lemons and oranges. Government involvement in tree planting in the studied chiefdoms was largely absent. What was apparent was that communities expressed not only lack of involvement in species selection, but they also expressed lack of enough resources and technical know-how to manage to tender seedlings as they grow.

Indigenous fruit trees have a large potential for exploitation. Diverse fruit trees exist such as Masuku, Masau and Mpundu are found in all the chiefdom's visited. Local communities have limited access to better markets for fruits, partly due to bad road networks. Fruits including indigenous fruit trees rot due to the short shelf life. There are currently no opportunities for low cost value additions for prolonged storage and sustained market supply. Fruits are sold unprocessed in roadside markets. Efficient marketing systems and market information can provide better prices to producers and improve the availability of competitively priced products. In the absence of the right technology to process abundant fruits such as Mpundu, Masuku, Mfungo to extend their shelf-life, technical know-how on processing and bad transport network, local communities are not able to benefit from Zambia's free market economy. .

Forests provide important sources of income to many rural people. Forest products such as charcoal, fruits, firewood and medicinal plants are gathered and traded to local and urban consumers. The collections of these products are for home consumption mainly, while some are sold on markets. The extent to which these different forest products are marketed depends on the needs for cash, the communities' access to markets, the quantities of the product that are available as well as the time available for their collection and sale. For most chiefdoms, local people with more access to markets are the ones who live close to the roads. For those far away from main roads, selling these products does not make a business case due to costs of transportations but also some of the products are highly perishable. 'For us here, the costs for transporting fruits to Lusaka where they can be sold at good prices is very prohibitively high. Therefore, we eat them,

and when we cannot anymore, they are left to rot. (Focus group discussion, Chamuka Chiefdom)

This is a challenge for products with short shelf life in communities without access to electricity and storage facilities. It should also be noted that some of the communities are largely cashless local economies, and therefore cannot take part fully in cash-based market economies.

Some of the local communities in Chiefs Mpanshya, Liteta and Cooma have limited access to markets thanks to road networks, and vehicles, popularly known as 'lifts' are available to transport the produce. Wild fruits and other products are sold to travelers along the Great North Road and Great East Road.

Table 3 Commonly marketed fruit trees

Local name	Scientific name	Comments
Masuku	<i>Uapaca kirkiana</i>	Reported in all chiefdoms
Mupundu	<i>Paninari cuaratelifolia</i>	Reported all chiefdom
Kasongole	<i>Strychnos cocculoides</i>	Reported in Chamuka chiefdoms
Musiika/ Kawashawasha	<i>Tamarindus indica</i>	Reported in the chiefdom in southern chiefdoms
Masau	<i>.Ziziphrus mauritiana</i>	Reported in southern province chiefdoms and Rufunsa.
Mabungo	<i>Landolphia kirkii</i>	Reported in all chiefdoms

For some chiefdoms there is good supply of indigenous fruits like Masuku and buyers come from outside. The marketing of many forest products is specialised, involving collectors, traders in rural and urban areas. While most people, and especially many

"It is now important to train collectors and producers on the importance of value addition to products they collect. This would improve the marketing of fruits in the areas, but also contribute to food security. With value addition, the young can have jobs that can help to reverse the trends in youth rural-urban migration." Chief Chamuka

households, participate in these activities seasonally, or on a part-time basis, these activities provide cash for many rural and urban people. The sale of forest products in rural areas is an especially important source of cash as communities have limited socioeconomic opportunities. This has made most fruits collected go to

waste. For this reason, Chief Chamuka insisted on capacity development of fruit collectors.

The main forest product is charcoal production and firewood collection in all the chiefdoms. It is the key source of income for most households. The markets are within the chiefdoms, but buyers of these commodities travel from Lusaka City and Copperbelt Province where the demand is high. Low cost of charcoal and firewood, high cost price of electricity and sporadic and in some cases, frequent power cuts in Lusaka and the Copperbelt drive up the demand for charcoal and firewood.

Chief Chamuka in Chisamba District called for the investigation of the importance of Mukula. Further he stated that there is need to know how to propagate Mukula and establish woodlots for Mukula trees. Furthermore, he called for capacity building on the propagation of indigenous trees, and orchids which has gone into extinction in the area.

Some chiefdoms such as Mpanshya and Cooma have people growing tree nurseries for production of fruit seedlings like mulberry, lemons, oranges and other species such as pines and eucalyptus. The challenge is that few people buy these seedlings. Market is low for tree seedlings, main buyers come from outside – this is partly attributed to lack of cash by potential customers in local communities. Nonetheless, with better links to markets, tree products have market locally and outside chiefdoms.

There are no policies on markets mentioned in the chiefdoms to protect or guide how the forest products should be sold, or what prices products are sold at. Price setting is left to each individual selling the forest product. This was common to Non-Timber Forest Products.

In a nutshell, the key market players in tree planting in the studied chiefdoms are limited to very few development institutions and local communities. Marketing is hampered by poverty levels, limited links to markets, low productivity of trees, distorted/unregulated prices and market illiteracy.

4. The interaction between tree-related formal and informal policies: synergies and conflicts

4.1 The Lands policy

Zambia's national land policy guides that most of the land in Zambia is under customary. As provided for in the Lands Act 1995, Chiefs can provide for allocation of land to individuals, families and investors for their use in line with customary land area integrated development plans. Further, Chiefs have the responsibility of hearing and resolving land disputes on customary land. After acquisition of customary land licenses, the acquirer sometimes use land as they wish, and this may lead to land cover change resulting in

forest degradation and deforestations. Land beneficiaries have to furnish Chiefs with information regarding the intended land use plan which should be approved. While the land policy alludes to using the land 'in line with customary land area integrated development plans,' enforcement of adherence to plans is a challenge, but also, some chiefdoms simply do not have the technical capacity to develop integrated development plans.

4.2 The agriculture policy

The agriculture and forestry policies were reviewed. Agriculture policy aims at promoting the sustainable management and use of natural resources by promoting techniques such as agroforestry, afforestation and reforestation. However, it does not quite interestingly mention the involvement of traditional leaders such as chiefs and village headmen in this endeavour.

4.3 The Forestry policy

The forestry policy on the other hand, has identified forest protection as one of its objectives. It is gratifying that the forestry policy has stated that this should be done with stakeholders such chiefs and headmen and women. In addition, it has supported the development of a framework where erring subjects are punished by chiefs and headmen and women in the customary land under their jurisdiction. The policy further states that "the tradition rulers shall be involved in the administration and management of forest estates within the area of their jurisdiction. They shall encourage the setting aside of land for forestry establishment, management, conservation and investment purposes and advise government on policy formulation and implementation as well as facilitate local community's participation in management and sustainable utilisation of forest resources". Among the chiefdoms studied, chiefdom Chamuka and Chief Cooma expressed knowledge about the policy and therefore developing bylaws in line with the policy objectives. Further Chief Chamuka is working towards establishing community forests in response to the forest policy provisions.

The policy also identifies agroforestry as key in the fight against climate change and deforestation due to over exploitation of trees. Consumers can establish agroforestry fields to supply forest products such fuel wood, fruits and sequestration of carbon from the atmosphere. Further the policy states that there has to be incentives for adopters during the establishment of agroforestry field. These incentives may include agricultural subsidies linked to adopting of agroforestry and other sustainable agricultural practices and further linking farmers to premium markets for sustainably produced agricultural products.

Other activities that have been highlighted are afforestation and reforestation. Consistently, all traditional leaders in all chiefdoms studied agreed that they should be involved in the implementation of projects on tree planting. They bemoaned the lack of

The lack of involvement of traditional authority in planting activities partly explains lack of community ownership of tree planting-related projects in communities. The result is that tree planting and management end with the end of the project.



involvement as they emphasized the need for them to be examples in tree planting. In previous projects, traditional leaders were only involved during project inception and during events such as field days of tree planting.

The policies are very good documents as observed by the

Choma Tree Nursery Association (CTNA). However, there is a gulf that needs to be bridged between policy provisions and implementation so that they meaningfully contribute to land rehabilitation and expanding socioeconomic opportunities of adopters. At individual level, communities need to feel incentivized to promote tree planting, which can be linked to the Farmer Input Support Programme (FISP).

4.4 National Policy on the Environment

Zambia's national policy recognises the pressing need to manage the impacts of human activities on the environment. The policy has highlighted deforestation as a major factor in soil erosion which has led to siltation of rivers and other water bodies. This is evident in all chiefdoms visited which has reported the drying of rivers, linking it to high levels of deforestation and siltation. Interviews with Royal Highnesses disclosed that a number of rivers that were perennial have become seasonal in the last decade. The Policy on Environment recognises sustainable forest resource management as key in controlling deforestation. Agroforestry and reforestation activities have the potential to reduce pressure on forests, provide various tree products to people and provide various environmental services such as reducing soil erosion. The policy seeks to reduce land degradation and biodiversity conservation.

4.5 Local government Act

The local government Act and subsidiary bylaws in various districts provide for payment of levy on various products. Tree products such as timber and charcoal attract levies that are paid to the local authority. The local authorities do not however sustainability of harvesting methods of the products levied. The councils have the authority to confiscate forest product and dispose according to the provisions of the law.

5. Deforestation and afforestation through agroforestry in the chiefdoms

5.1 Drivers of deforestation and forest degradation

The main drivers of deforestation in Lusaka, Central and Southern provinces are charcoal production, high demand for firewood, creation and expansion of land for agriculture and mining activities. Mining activities expose areas that local communities target for charcoal production and firewood. Increase in population further increases demand for firewood, settlements and demand for food production. Equally poor management of forest has resulted in deforestation. The forestry department in all districts are understaffed and lack tools to use, besides receiving erratic financial support from the central government. Interactions with traditional authorities in the chiefdoms also revealed that deforestation in the chiefdoms is linked to generally high poverty levels. Poor communities tend to depend more on the use of forests and associated resources, hence contributing to forest degradation.



Bags of charcoal in Rufunsa awaiting transportation to Lusaka.

Picture: Fieldwork

5.2 Agroforestry practices that can reduce deforestation

Agriculture is the mainstay socioeconomic activity of local communities in the southern parts of Central, Lusaka and Southern Provinces of Zambia. Generally, they grow crops using ox-drawn ploughs and the use of inorganic fertilizers which they access through cooperatives. In addition, they keep cattle and goats. Livestock is used in their meals for milk and meat, and they are a symbol of wealth. Also, it is used to pay dowry when a man of age wants to marry. To facilitate the use of ox-drawn implements, communities tend to stamp out their fields, literally ridding agricultural fields of all trees. With limited rainfall, farmers plant their crops on flat land without making ridges.

Given this cultural background of people in this region, the adoption of new technologies will mainly be affected by it. Thus, the following are important considerations:

- Since people are pastoralists, the promotion of trees that can be used as animal fodder, especially that grass dries up quickly in dry season with reduced rainy seasons, would be of great motivation to people who keep livestock. Due to erratic rainfall that is received in the southern and central provinces, the grass dries up and shortage of fodder for animals is a common experience. Recently, the southern and central regions were hit by a drought, and pasture dried, and as a result, there was no fodder for

animals. The government started distributing relief animal feed to livestock farmers. Fodder banks by livestock farmers would reduce their vulnerability during the dry season. Tree species such as for *Leucaena leucocephala*, (Lusina) can be planted as fodder banks for the supply of animal fodder. Fodder banks were singled out by chief Chamuka as an important source of fodder for livestock especially when grass is dry.

- Farmers in the southern region use ox-drawn implements such as ploughs, rippers, boom sprayers etc. Therefore, agroforestry practices and technologies that allow the use of such equipment are likely to be adopted. One such technology is the dispersed tree on crop land. In this technology only 121 trees are planted per hectare with a spacing of 10 x 10 meters. The 10-meter spacing allows for mechanisation of agroforestry. The commonly use tree species is musangu (*Faidherbia albida*). *F. albida* has the characteristic of fixing nitrogen and its leaves can be used for animal fodder during dry seasons. It also has a peculiar feature of shedding leaves in the rain season. This makes it ideal for growing crops in the rainy season because it does not shade the agricultural crops. Village headmen and women in Rufunsa, Chamuka and Cooma Chiefdoms highlighted the importance of multipurpose agroforestry tree species such as *Musangu*, *Gliricidia*, *Sesbania* and *Moringa*.

[Given a choice between tree planting and livestock production, people in the southern province would choose livestock. Therefore, a careful selection of tree species needs to be made to meet both ends to sustain livestock production and tree planting – the two should not be in conflict. Should they be, livestock production will (always) win].

Discussion with headmen and women in chieftom of Chieftainess Mwenda

Woodlot establishment was another intervention that was proposed by women who participated as respondents during data collection. Women are responsible for cooking and use firewood as a source of energy. They walk long distances to look for firewood and consequently, proposed that woodlot be established near their homes to reduce the distance covered and time spent to collect fuel wood.

Woodlots for trees that can grow fast and produce low smoke were identified as

ideal. In Chisamba they proposed that woodlots of eucalyptus and Senna to be established. Care and monitoring of woodlots will be the responsibility of Headmen and women who report to the Senior Headman responsible for forests and natural resources working together with village headmen.

Most of the participants in the five districts favour the planting of exotic tree species. The example include mangoes, oranges, lemons, avocado among fruit trees. Two chiefdoms supported the planting of indigenous fruit trees such as Masuku. Traditional leaders in Rufunsa, Chisamba and Choma expressed interest in planting multi-purpose tree species such as Musangu, Gliricidia, Moringa which are fast growing and capable of providing various benefits and products within 5 years. This is because the land has become infertile and chemical fertilizers have become expensive. This has negatively affected crop production, and food and nutritional security.

Interview respondents in southern province pointed at the vast swaths of bare land, some of which already baked owing to the scorching sun. They confirmed the need for a very high number of trees to restore the productive function of land. They would like to be fully involved in the selection of tree species to plant, have their capacities built and linked to markets so that they can get benefits from their investments. As has already been alluded to, the participatory approach should be embraced with full and active participation of traditional leaders following the already existing structures in chiefdoms.

5.3 Promoting of tree planting activities

In all chiefdoms, there is awareness on the importance of trees. Local people are however not engaged in tree planting. This may be attributed to the perception that trees are God given and as such majority of local people do not actively engage in tree planting despite the increase in demand for tree products. There is need for sensitization on the importance of tree planting and protecting of trees. This should be done through traditional leaders. Agroforestry, afforestation and reforestation will require a change of mindset and further linking current environmental challenges being experienced such as drying of streams to loss of trees. This will be important in seeing the urgency to act. Leaders will further be expected to lead by example within their zones and villages. It should be noted that while traditional leaders have a privileged position of knowledge on the importance of tree planting given their opportunities participating in tree planting events with development partners, the situation is not the same for their subjects.

There is need to demonstrate the socioeconomic but also environmental benefits of planting agroforestry species such as Musangu, Sesbania and other nitrogen fixing species – which are important in reducing input costs for farmers and help vulnerable communities. Promoting of tree planting activities will require establishment of nurseries to help farmers raise seedlings of their choice. Establishment of nurseries will be key to

afforestation and reforestation activities. These nurseries should be established within chiefdoms on communal land for community nurseries which should be managed through the headmen. Additionally, local people currently raising seedlings such as observed in Cooma and Mpanshya chiefdoms can also be supported to expand their nursery activities with appropriate skills to increase the number and quality of seedlings. Local people will raise species of local significance and provide an opportunity to respond to local needs. Communities will then use nurseries in establishing woodlots and fodder banks.

5.3.1 Barriers to tree planting

Tree planting and survival of trees are affected by both internal and external barriers that need to be surmounted. Barriers that were identified by village headmen and women are listed below:

- Lack of technical skills such as grafting, budding and identification of diseases;
- Inadequate market access and competitive markets for saplings and seedlings
- Inadequate access to markets for saplings
- Lack of water for irrigation;
- Termite attack and lack of management skills;
- Livestock browsing on tree seedling;
- Inadequate traditional leader involvement at all stages of project implementation and
- Non-participatory approaches being used by some implementing organisations.
- Length of time it takes for trees to grow
-

5.3.2 Opportunities for tree planting

There are many stakeholders involved in tree planting and these form various interactions. There are organisations that supply seedling to farmers. These in the regions studied includes Kasisi, CFU and NGOs among others, those planting (local people) and those offering land for planting (traditional leaders for communal lands and individuals for private land). Seedlings can be produced by the public or private sector who may offer tree seedlings for free or sale. There are also individuals and or organisations that may be interested in planting trees and would source the planting material from the suppliers. The host community through traditional leaders such as chiefs and village headmen/women offer land for planting trees. In addition, individuals with land can offer part of their land for tree planting and also private and public institutions can also offer land for tree planting. After planting and when the rain season is over, care for

plants should be taken to avoid losing plants. Incentives that could be considered include provision of tree seedlings and small grants to communities to diversify their livelihoods.

In chiefdoms such as Chamuka, Cooma and Liteta, momentum has already been created through the by-laws. These offer opportunities for synergies and social license to promote tree planting in these chiefdoms.

In terms of preferences of trees, species preferred are fruit trees i.e both exotic and indigenous. Exotic species with potential include lemons, oranges, avocado, while preferred indigenous fruit trees include Masuku and Masau among others. Private sector led tree planting is likely going to succeed if they work through traditional leadership.

6. The gender and youth dimension of tree planting in chiefdoms

Gender was found to play a role in tree planting in the chiefdoms - both men and women were interested in planting trees. Notwithstanding, women, men and youths had different interests in the different tree species they wanted to plant. In the past, projects that did not involve the youths have failed. Respondents cited an example in Chieftainess Mwenda in Chikankata District where a named organisation only distributed tree seedlings to old age farmers. It turned out that the local people were unable to manage the tree seedling that were given to them. Youths in schools are also taught about the importance of tree planting. This was found to be done actively in Chief Chamuka chiefdom in Chisamba district. There is promotion of tree planting among school children, where even NGOs engage youths in school to practice afforestation.

In Chief Chamuka, Mweenda and Cooma, participants stated that women are more inclined to planting fruit trees as they provide food in times of crises. They also expressed concern for nutritional needs that they need to meet for their children. In addition, women are responsible for cooking food in household. They mainly use firewood and suggested that they would rather have a woodlot that would provide firewood nearby and cheaply. Men are more interested in medicinal plants and that for charcoal production. Further, men are interested in planting trees with a view of generating incomes such as pines. Youths in Chief Cooma are trained in tree budding – thus building capacities and earning an income.



A youth in Chief Cooma budding oranges on lemons to earn an income and capacity development
Picture: Fieldwork

Lack of land ownership by women was echoed by Chieftainess Mwenda and Chieftainess Mpanshya. Patriarchal cultural practices restrict women's access to economic resources such as land, and this has significant effect on women's level of involvement in agroforestry as well as afforestation activities. Chieftainess Mwenda mentioned that even her palace is on her husband's land because as a woman, she cannot own land. Women are not allowed to own land according to their traditions. A woman can only have a small field for production of groundnuts. A woman can only access land when her spouse dies. Even though the Chieftainess Mwenda allocates land, she cannot allocate land to herself because she is still married, and Tonga tradition forbids her from owning land. Consequently, it is a responsibility of a man as a head of the household to decide what they do on their piece of land. The man decides which trees to plant and which ones to cut. Women can express their wish. During the focus group discussion, it was only in Chamuka chiefdom where participants stated that the household sit together to make decision. Therefore, women were found to have a greater stake in forest rehabilitation and management in certain chiefdoms. Currently, there is a project supported by Musika through Medeem in Liteta and Chamuka chiefdoms aimed at land documentation and ownership which is improving women's access and ownership of land. This is having a positive impact on land ownership by women.

Overall, the findings showed different levels of participation and involvement in afforestation and agroforestry among women, men and youths. In Cooma and Mpanshya chiefdoms, youth participation was observed in grafting and budding activities. Youths are likely to participate in plant propagation activities. Youth and women are dominant in planting and selling tree products such as wild fruits. Men tend to dominate decisions on the type of species and choice of planting area sometimes with the participation of women to varying degrees in different chiefdoms. It was observed that women participation varied in southern chiefdoms compared to Chamuka and Mpanshya chiefdoms. This difference is attributed to cultural norms in different chiefdoms, the role of women in households, the marital status of the woman, age group, and presence of development interventions from development institutions intervening in women and youth empowerment programmes.

7. Conclusions and Recommendations

Taking a participatory approach that involved beneficiaries (rural communities and traditional leadership) and stakeholders, this assignment was undertaken to provide an analysis landscape analysis of the opportunities that exist for the integration of rural policies and traditional authorities in market led tree planting initiatives in Southern, Central and Lusaka regions. The study has revealed that:

- Integration of rural policies and traditional authorities is important in market-led tree planting initiatives. Tree planting initiatives have the potential to generate additional employment and income in rural areas, and thus can

be a powerful tool to promote sustainable farming systems and diversify rural livelihoods. Tree planting has the potential to enhance food and nutritional security, improve soil quality and improve pasture productivity. Incorporating trees on landscape therefore, enhances farming sustainability and productivity;

- Community members are not homogenous even at village-level. They may share similar cultural and traditional ties, however the level and ability to participate and adopt new interventions are influenced by factors such as levels of education, gender and household-level asset portfolios. Therefore, 'common but differentiated' approaches will prove more useful in influencing behaviours positively in tree planting interventions. In southern province, for example, livestock is a mark of wealth. A careful assessment should be made to determine which households are more likely to adopt tree planting between those with livestock and those with less or none, and which tree species would be favoured by those with livestock compared with those who have none. In this 'common but differentiated' approach, there is no 'one size that fits all;'
- Communities have a belief and taboo system that has been established through their interaction with forest landscapes – this system is also embedded in their socioeconomic and cultural fabric, and is reflected in their preference and choice for certain tree species over others for different uses. Interventions in market-led tree planting initiatives have to be cognizant of this cultural dimension to synergize rather than creating competition, for example, the choice between tree planting and livestock production;
- Linked to the point above, afforestation interventions need to engage local people in selecting species for planting which are suitable for the local environment and continued monitoring and management of planted trees. In designing afforestation and reforestation initiatives, local people are crucial in identifying the type of tree-planting through identification of local needs, the type of planting and developing rules and regulations for monitoring. Communities have traditional ecological knowledge that can inform how afforestation can be done. Additionally, in the absence of science-based methodological approaches to understanding edaphic factors, temperature and rainfall patterns, community members can be resourceful in providing this information. Even in the presence of scientific methods, communities can support to ground-truth historical patterns of biophysical aspects to ensure successful afforestation interventions;
- Tree species that offer socioeconomic and environmental benefits are more likely to be adopted by communities. In this regard, it is important to

support the development of value chains for species that offer environmental benefits but as well as socioeconomic ones, including the ones that can be used for fodder production for household consumption and sale of surplus. One aspect of this is including market literacy in the package of tree planting programmes with communities; and

- Building on the point above, to promote afforestation at local level, there is need to encourage communities to participate in small-scale timber plantations through promoting small-scale investment in high value timber species, establishment of woodlots for fuelwood, and provide incentives to small-scale planters. Agroforestry, afforestation and reforestation initiatives will require supporting market linkages. In most rural areas, there are limited markets for fruits and other forest produce - making selling of these products unprofitable. To conserve, recover and restore sustainable forest landscape, involvement of traditional leaders at every stage of the project will remain crucially important for the success of any market-led tree planting interventions.
- Farmers prefer fruit trees (lemons, oranges, avocado), indigenous fruit trees and agroforestry tree species
- Some farmers have established commercial nurseries and gained skills in budding, grafting and other nursery operations. In Chief Mpanshya area of Rufunsa, two farmers were identified as potential entry points. These are Mrs Brenda Mutangeti and Mr Obed Ngulube. These farmers have established nurseries which are also used to train local people in nursery operations such as breaking seed dormancy in Musangu, grafting, budding and general nursery operations. These farmers have received support from Biocarbon Partners (BCP). In Chief Cooma area of Choma, two nurseries were identified which have the potential to develop into fully fledged commercial nurseries. One nursery is owned by Mr. Jonsezi Habachimba while the other is owned by Mr. Cosgin Chabakola. Water reticulations remains a challenge in supporting nursery operations. Water is a challenge in all chiefdoms and is a hurdle in sustaining commercial nurseries. Drying of streams and rivers has increased over the last decade and was reported as affecting afforestation interventions in Chieftainess Mwenda Chief Cooma and Chieftainess Mpanshya regions. Private sector support in sinking boreholes, installing of solar pumps and general water supply has the potential to improve nursery operations. Additionally, there is need for support towards improved access to herbicides and fungicides. Linking private sector partners who supply agrochemicals and farmers will improve survival of seedlings in nurseries and on farm lands.

- Private sector market actors can be engaged in processing of wild fruits to increase shelf-life and broaden markets. Establishing small to medium scale processing of wild fruits for value addition. Technologies simple drying of fruits and mushrooms has the potential to improve rural economies and incentivise tree planting and protection.
- Establishment of bulking centres for agroforestry products has the potential to improve private sector players access to rural communities to purchase tree products for urban markets.
- Currently private sector engagement in agroforestry markets is limited by the volumes of products and quality of agroforestry products. Engaging rural community and training them in value addition has the potential to improve access to markets.
- Private sector actors could support marketing of indigenous fruits and other products offering access to competitive markets.

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APPENDIX 1: PROPOSED INTERVENTION MODELS FOR A 3 YEAR FOLLOW-UP INTERVENTIONS

The proposed interventions are as follows:

- Tree planting for afforestation and agroforestry
- Establishing of commercial nurseries
- Promoting value addition and food processing

YEAR	PERIOD	ACTIVITY	INDICATORS
Year 1	Quarter 1	Project launch	One meeting held
		Project inception meetings with heads of departments	Number of inception meeting held
		Project inception meetings for chiefs, government departments and other organisations	Number or meetings held. Number of stakeholders in attendance
		Produce tailor made afforestation and agroforestry training manual	One training manual produced
		Project inception meetings with schools	Number of meetings held
		Project inception meetings with communities	Number of meetings held
		Community awareness raising on benefits of agroforestry	Number of sessions held Number of people sensitized
		School awareness raising on tree planting	Number of pupils sensitised
		Selection or registration of beneficiaries	Number of beneficiaries registered
		Formation of school clubs	Number of clubs created
		Documentation and publication local rules and beliefs	Number of chiefdoms with documented local rules
		Identification of private sector players	Number of private sector players
	Quarter 2	Training of ToTs	Number of training held Number of ToTs trained
		Training of local communities by trained trainers	Number of trainings held Number of people trained
		Training of teachers as club leaders	Number of teachers trained Number of trainings conducted
		Selection of tree species and site	Number of species selected
		Establishment of community tree nurseries (e.g. pine, fruit trees)	Number tree nurseries established Number and variety of seedlings raised
		Establishment of school tree nurseries	Number of tree nurseries established Number of tree seedlings raised
	Quarter 3	Community sensitisations	Number of meetings held
		School sensitisations	Number of school meetings held
		Establishment of community tree nurseries- of selected MPT species such as musangu	Number of agroforestry tree nurseries held Number of MPTs raised

		Training in vegetative propagation for schools and community	Number of trainings held Number of people trained
		Conduct training in management of trees	Number of trainings held Number of people trained
		Establishment of school tree nurseries-MPTs	Number of school nurseries established Number of MPTs raised
		Conduct follow up meetings	Number of follow ups held
		Conduct train in alternative livelihoods	Number of trainings held Number of people trained
		Conduct training in alternative sources of energy	Number of sessions held
	Quarter 4	Establishment of agroforestry fields by individual farmers	Number of hectares cultivated Number of trees planted
		Establishment of school fields	Number of fields established Number of hectares planted Number of trees planted
		Conduct regular participatory monitoring	Number of monitoring sessions held
		Conduct school competitions and wards presentation	Number of competitions held Number of awards given
Year 2	Quarter1	Conduct community awareness raising meetings	Number of community awareness meetings held
		Conduct school awareness raising meetings	Number of school awareness meetings held
		Conduct refresher trainings for ToTs	Number of trainings held Number of ToTs trained
		Conduct refresher trainings for community members	Number of refresher trainings held Number of people trained
		Conduct refresher training for school teachers	Number of trainings held Number of teachers trained
	Quarter 2	Maintenance of school and community tree nurseries	Number of seedlings available Types of species available
		Maintenance of farmer field schools	Number of fields established Number of hectares planted
		Maintenance of individual agroforestry fields	Number of fields maintained Number of surviving trees Number of hectares under agroforestry
		Conduct field days	Number of field days held
		Conduct exchange and learning visits for schools and communities	Number of exchange visits held Number of participants involved
		Management of planted trees in schools and communities	Number of trees surviving number of hectares
		Conduct quarterly community tree inventory	Number of trees surviving Types of species surviving
		Conduct quarterly school tree inventory	Number of trees surviving Types of species surviving

	Quarter 3	Training in vegetative propagation of fruit trees-schools	Number of trainings held Number of people trained
		Training in vegetative propagation of fruit trees-community	Number of trainings held Number of people trained
		Radio programmes featuring community members	Number of radio programmes held
		Radio programmes featuring schools	Number of radio programmes held
		Conduct quarterly community tree inventory	Number of trees surviving Types of species surviving
		Conduct quarterly school tree inventory	Number of trees surviving Types of species surviving
	Quarter 4	Replanting of trees and expansion	Number of trees replanted Number of species planted
		Conduct competitions and rewards or awards to adopters	Number of competitions held and awards given
		Conduct quarterly community tree inventory	Number of trees surviving Types of species surviving
		Conduct quarterly school tree inventory	Number of trees surviving Types of species surviving
		Conduct regular participatory monitoring	Number of sessions held
		Conduct training in value addition and food processing	Number of trainings held Number of people trained Types of fruits processed
		Conduct the assessment of people using livelihood option	Number of people using alternative livelihoods Types of livelihood options
		Conduct the assessment of energy sources	Number of people using energy saving stoves Number of people using alternative energy
Year 3	Quarter 1	Conduct school awareness raising meetings	Number of awareness sessions
		Conduct community awareness raising meetings	Number of awareness sessions
		Maintenance of tree nurseries	Number of seedlings available Types of tree species available
		Maintenance of farmer field schools	Number of trees still surviving Types of tree species available
		Maintenance of individual agroforestry fields	Number of trees still surviving Number of hectares of land Types of species on the field
		Conduct quarterly community tree inventory	Number of trees surviving Types of species surviving
		Conduct quarterly school tree inventory	Number of trees surviving Types of species surviving
	Quarter 2	Conduct field days	Number of field days held
		Conduct exchange visits	Number of visits conducted Number of people participated

		Conduct quarterly community tree inventory	Number of trees surviving Types of species surviving
		Conduct quarterly school tree inventory	Number of trees surviving Types of species surviving
	Quarter 3	Conduct community awareness meeting	Number of community meetings held
		Conduct school awareness meeting	Number of sessions held
		Conduct participatory meetings in schools	Number of sessions held
		Conduct participatory monitoring in communities	Number of trees surviving Types of species surviving
		Conduct exchange visits	Number of exchange visit held
	Quarter 4	Conduct awareness raising in schools	Number of awareness sessions held
		Conduct awareness raising in communities	Number of awareness session held
		Conduct training in value addition and food processing	Number of trainings held Number of people trained
		Conduct project end of evaluation	One end of project evaluation

Annexes

Annex 1 Attendance register

VENUE: CHIEFTAICY MUMPASHYA: RUFUNSA: DATE:14 TH OCTOBER 2021			
S/N	NAME	SEX	PHONE
1.	ESTHELE MUMPASHYA	F	0961650447
2.	BRENDA MUTANGETI	F	0973172900
3.	LANGSON TEMBU	M	0974819925
4.	KACHEPA GODFREY	M	0979156267
5.	FAIDES KAMUTONGWE	F	0964194244
6.	PHILIP MUMPASHYA	M	0770558777
7.	EUNICE CHAKUFOLA	F	0975584040
8.	FELIX KABASO	M	0971552309
	TOTAL 8; M=4; F=4		
VENUE: CHIEF CHAMUKA: CHISAMBA DISTRICT: DATE:15 TH OCTOBER 2021			
S/N	NAME	SEX	PHONE
1.	SNR HEADMAN LYUMBO	M	0968627138
2.	SNR HEAD WOMAN CHIMPEKE	F	0960984822
3.	SNR HEAD MAN CHILUKUTU	M	0965496874
4.	SNR HEAD WOMAN CHIPEMBE	F	0976954315
5.	SNR HEAD WOMAN MBAMBO	F	0964423637
6.	SNR HEAD MAN LUMBA	M	0964644975
7.	HEAD MAN MULABE	M	0978304102
8.	SNR HEAD MAN MAPULANGA	M	0978242668
9.	HEAD WOMAN CHILUPULA	F	0963169932
10.	HEAD MAN MWANAMPAYA	M	0977312371
11.	SNR HEAD MAN MALAYA	M	0978223469

12.	JOSHUA ROYAL ELDER	M	0966169079
13.	SNR HEAD MAN MUKOBOLA	M	0978499739
14.	SNR HEAD MAN SIMPONDO	M	0960134153
15.	SNR HEAD MAN CHANKOSA	M	0967458498
16.	SNR HEAD MAN SASBERRY	M	0969711704
17.	SNR HEAD MAN MULIMBA	M	0967831860
18.	TOTAL 17; M=13; F =4		
VENUE: CHIEFTAINNESS MWEENDA: CHIKANKATA: DATE:18 TH OCTOBER 2021			
1.	DENNIS MOONO	M	0974029000
2.	HYRANCE MWENDA	M	0977859844
3.	KENNEDY HAMPOLA	M	0973344720
4.	VICTORIA KABULO	F	0979719344
5.	LASTIAL MAINZA	M	0977180422
6.	READY P MWIINGA	M	0977928862
7.	KESINA CHEELO	F	-
8.	BENNY CHOOBE	M	0979405210
9.	CHRISTOPHER HAMABUYU	M	0977348187
10.	SYLVESTER CHIBOMBA	M	0977176378
11.	DYNESS MWEENE	F	-
12.	ROSEMARY NGANDU	F	0979440671
13.	RODGER MWEEMBA	M	0971997192
14.	RED CHIBILIKA	M	0974652340
15.	TOTAL:14; M=11; F=3		
VENUE: CHIEF CHOMA: CGOMA: DATE:19 TH OCTOBER 2021			
1.	JONSEZI HABACHIMBA	M	0979628189
2.	RAPHAEL HAMAGAANTA	M	0971694013
3.	VICKS HAMBAYI	M	0975097640

4.	RAYMOND MUDENDA	M	0975957888
5.	ENELESY HAKAVUBA	F	0979940006
6.	RODIA MUDENDA	F	0974509175
7.	ELINA KANTANGALI	F	0972082554
8.	SOLOMONI MULEYA	M	0957145181
9.	KANAMANI RICHARD M.	M	0979467016
10.	ALBERT NGANDU	M	0975814451
11.	TOTAL:=10; M = 7; F=3		