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Editorial

In this Newsletter issue we try to provide evidence on how forest reliance differs across different types of livelihood strategies which are partly determined by the local context. Vulnerable poor households tend to rely more on trees and forests. The policy implication of this is that policy makers should aim for a sustainable forest management that strikes a balance between forest protection and forest use, especially by vulnerable households. Such being the case, local people need to take responsibility to manage the resources on which their livelihoods depend to preserve them. With such an understanding, It will be uncontroversial to combine conservation and poverty alleviation goals within policy although the feasibility of doing so remains highly uncertain. All the same, there is a general understanding that trees or forests provide the fundamental support to rural livelihoods.

On a brighter note, join the editor in congratulating Mr. Henry Utila who was acting Head of Forestry Research Institute of Malawi (FRIM) on his promotion to Deputy Director of Forestry (Grade E/P4) responsible for FRIM. Let us support and wish him well as he steers FRIM to greater heights. Congratulations are further extended to Madam Patricia Chidyera Masupayi, Mr. Titus Zulu and Mr. Jipate Munyenyembe on their promotion to the position of Deputy Director of Forestry (Grade E/P4) responsible for Central Forestry Zone, Forestry Communication & Advisory Division, and Northern Forestry Zone respectively.

New members of staff at FRIM

The Editor would like to welcome the following members of staff who have joined FRIM recently. The new technical additions are expected to strengthen research capacity at the Institution.

Forestry Research Officers (PO):

1. Brown Scott
2. Caroline Sengani
3. Pilirani Kamanga Matandika

Forestry Research Assistants (TA):

1.Steve Mphamba
2.Davie Dzonzi
3.Brenda Mogha
4.Enerst Kanyemba
5.Brenda Mapemba
6.William Mayeso
7.Stephano Maele
8.Sivero Benias
9.Mabvuto Mkango
10.Evelyn Mighah
11.Edward Kabuye
12.Leo Sikwese

The Healing Power Mix of the Miombo Woodlands: A *case of Mangochi, Machinga and Phalombe districts*

U. Nthenda, M. Namoto, C. Manyalo & M. Kunje (PhD.)

Medicinal plants play crucial roles in modern drug development and constitute a prolific source of novel compounds or pharmacophores for ongoing drug discovery programs. Knowledge of medicinal plants and their use by indigenous cultures are not only useful for conservation of cultural traditions and biodiversity but also for community healthcare and drug development in the present and future. In Malawi, traditional treatments using medicinal plants enjoy considerable popularity and are practiced by numerous healers all over the country despite western medicine being the main-stream of the health care system. By the late 1990s, Malawi had more than 2,000 traditional healers who mainly operated in rural communities. Considering the population of Malawi, it has been noted that at least one healer serves about 750 people, whereas almost 50,000 people are served by one qualified medical doctor. Though most practices and treatments in herbal medicine require traditional specialists which are referred to as herbalists, herbal medicine knowledge and usage is common among Malawians for personal ailments management. However, the plant parts used, preparation and administration of herbal medicines vary from one place to another.

There are concerns that the knowledge of herbal medicines is gradually declining although some of the traditional healers are effectively still practicing the art of traditional healing using herbs. There are several reasons to the decline which include disappearance of some plant species used in herbal medicine. Medicinal plant species throughout the tropics are threatened in the wild due to over-exploitation. Unsustainable harvesting of plant products and land-use change for Miombo woodland are recognized as serious problems. The main threat, however, is unsustainable harvesting practices, particularly ring-barking, tree wounding and uprooting. A well-known example is the commercial exploitation of *Jateorhiza palmata* (*Thabalaba /Mdyoka*) tubers from the Miombo woodland of Southern Malawi, which is commercially traded outside Malawi and on local markets. Harvesting and provision of medicinal plants to meet the urban demand have become an environmentally destructive activity due to the development of a substantial network of rural commercial gatherers, herb traders, traditional healers and consumers. As such, the value chain of herbal medicine is now replete with laymen in traditional medicine who have ventured into herbal harvesting and trading (including prescribing treatment). Like many other rural communities, the people around the Miombo woodlands of Machinga, Mangochi and Phalombe use medicinal plants for their primary health care and this article shares the study findings from these areas.

Communities residing within the study sites belong to two main ethnic groups that are Lhomwe and Yawo, though other tribes do exist in small proportions. The main livelihoods of the locals in the study area are subsistence farming and livestock keeping. However, pit sawing and charcoal production are undertaken regularly as a main safety net while seasonally non-timber forest products such as wild fruits, mushrooms and medicinal plants are collected and sold.

The study findings show that both men and women have rich knowledge in traditional medicine hence no gender based pattern for knowledge on the practice of medicinal plants. The involvement of women is important as home keepers and their involvement offers an opportunity for conservation and sustainable use of medicinal plants.

The study revealed 207 plant species belonging to 60 families as being used for traditional medicinal. Most common tree species were mentioned as medicinal whose roots and barks are used in traditional medicinal practices and these include *Securidaca longepedunculata (Bwazi), Catunaregum spinosa (Chipembere), Zyziphus mucronata (Kankhande),*

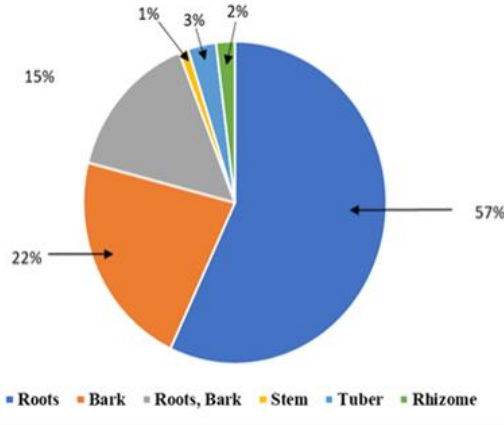

Figure 1. Plant parts usage frequency

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Flacourtia indica (Nthema), Pseudolachnostylis maprouneifolia (Nsolo), Pterocarpus angolensis (Mlombwa), Erythrophleum suaveoles (Mwabvi), Cassia abreviata (Muwawani), Terminalia sericea (Naphini) and Bauhinia thoningii (Chitimbe). Details of other most preferred medicinal plant species are provided in Table 1 on page 6 of this Newsletter.

The study found that root digging and bark stripping are the most unsustainable methods used for harvesting medicinal plant parts in different village forest areas (VFAs) and Forest Reserves. Other plant parts such as leaves and branches are used in few cases and these do not affect the growth of plants unlike roots, barks and main stem.

The roots and barks are the plant parts that are used most frequently (Figure 1) in traditional medicine hence bringing threats to individual plants as damage of roots and bark can kill the entire plant. This is one way that has contributed to extinction of particular medicinal plant species and deforestation of some forests. It was found that one of the underlying reason for the said threats to medicinal plants is the weak customary laws that regulate the use of natural resources. To deal with poor harvesting techniques, others suggest that there is need for training and education to all tradition medicine experts on conservation and sustainable harvesting of medicinal plants. Some of the best practices to sustainable harvesting include removal of the bark from opposite quarters of trunks; collection of lateral roots from a plant at a distance of 30 cm from the main stem or tap root; filling back the soil after digging to ensure protection against pests and infection; and avoid ring barking.

In conclusion, traditional medicine practice by both men and women in Phalombe, Mangochi and Machinga districts is dominated by the use of roots. High dependence on roots jeopardizes plant survival as it leads to tree mortality and eventually, deforestation. However, traditional medicine has a great potential to contribute to primary health care and local economies through the established value chain in the medium to long term. As such, sustainable harvesting practices in addition to domestication of medicinal plants need to be promoted for sustainable provision of traditional medicine in the country. Traditional healers and members of the community need to be sensitized and trained on sustainable harvesting techniques. The findings of this study are crucial in designing strategies to support and promote primary health care and ensure sustainable utilization of wild plant resources in the Miombo woodlands of the country.

Implications of the socio-economic status of communities surrounding Mangochi Forest Reserve

Dan Ndalowa, Sarah Tione (PhD) & Francis Kamangadazi

(Malawi College of Forestry & Wildlife)

Communal management of common-property resource is widespread in developing countries due to its appealing nature as an alternative option to participatory management and governance of natural resources such as forests and fisheries. This is because of failures attributed to state management and market-oriented policies. The recognition that resources held in common face competing claims from multiple users gives impetus to the understanding of how forests can be governed effectively by engaging the communities around them. The article presents underlying socio-economic influences motivating level of community participation forestry management projects. The article brings to light the most salient and pressing issues to be dealt with for a successful and sustainable forest projects.

To understand community opinion and experience, household interviews were conducted to assess the social economic conditions of households around Mangochi Forest Reserve. The survey was conducted in Traditional Authorities (TA) Ntonda and Chilipa which are dominated by the Yao and Chewa tribes (72%) that mostly practice matrilineal marriage. The survey tool focused on household characteristics, agricultural and community variables. To cover a range of perspectives regarding the said focus areas, 92 household interviews were conducted. Across the respondents, 78% were heads of household and 21% were spouses. Overall, 45% of the respondents were females with 33% female headed households. Majority of respondents (63%) were residing in the village where they were born, implying being native to the area compared to 37% who relocated into the village. Apart from marriage, people also relocated in search of land for farming and settlement. This highlights the importance of land as a push or pull factor in defining the socio-economic status of households in any project area.

Study findings show that matrilineal and matrilocal systems do not imply that women have full control of land, which is a socio-cultural issue that should be considered, including religious values, when implementing projects. The study shows that 74% of the respondents are Moslems and 24% are Christians and almost 60% of the household heads are married in either monogamous or polygamous marriage. The different marital status further reflects the gender dimension that any development project should reflect when targeting or selecting beneficiaries.

Household Head Characteristics: The observed mean age is 43-years for the household head or spouse in the study area. This implies that any proposed project in the area is likely to have youthful household heads. This may be advantageous for the project if incentives are available to attract this youthful population into conserving forest resources.

Such incentives will be important considering that 69% of the household heads (or spouse) are literate while very few made it past primary education and only 4 percent completed secondary education, which is the minimum qualification for any skills development program in Malawi. This state of affairs leave most households with unskilled labour and consequently low livelihood choices and overdependence on smallholder farming and forest exploitation. Successful forest interventions would have to take into account skills level and type in designing appropriate project activities to ensure successful implementation or adoption. Any initiatives that are mentally demanding would not have a buy in due to low levels of education. Additionally, project activities with accompanying incentives would go a long way in ensuring successful project implementation.

Land holding: From the study, 84 households (91%) reported having farmland. The average household farmland holding size is 2.13 acres (0.86 ha.), with a range from 0 to 12 acres (5 ha.). The farmland is mainly obtained through inheritance or bequeathed by family members under the common tenure system of customary (clan) land. These are important indicators of long-term land fragmentation as the population increases. Most of the land is for agriculture, which mostly supports the unskilled households presented above. Nonetheless, alternative economic activities or exploring viable agricultural ventures can be the best step towards household economic sufficiency and also influence forest conservation. Investments on agricultural land can be long-term considering that most households consider their land tenure to be secure. The perceived security of tenure offers an opportunity for long-term projects that can leverage community's current land investments. Some households (68%) are already investing in tree cultivation outside forests (including agroforestry) which shows the interest and potential of investing in long-term ventures in the area.

Food Security Characteristics: The study findings indicate that most households consume two meals a day on average, despite being an adult or a child. The food security situation for the study area under the two (2) TAs, imply that households in both Chilipa and Ntonda TAs are not food secure. On average, 80% of respondents in Ntonda TA indicated they worried about

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food in the past 7 days while 77% had no sufficient food for their household needs. In Chilipa, the situation is similar to the one in Ntonda. The results show that 93% of households have insufficient food in some months. In 2019 alone, 23% of the households experienced food insufficiency between 5 and 9 months. The respondents indicated that food insufficiency was due to low crop production as a result of drought or reduced rain days, crop damage and small landholding size. Food insufficiency in the area exposes the community to vulnerabilities that drive them to forest exploitation with little or no focus on conservation of nature. Food being a basic human need and a foundation for any development process, calls for immediate address of households' food security needs as a priority which can later be used as an incentive to forest conservation in the area.

The three components of food security which are availability (having sufficient quantities of appropriate food available), access (having adequate income or other resources to access food), and utilization / consumption (having adequate dietary intake and the ability to absorb and use nutrients in the body) provides the basis for a household to be food secure. Literature has not yet prescribed the number of meals in a day per person, but nutritional requirements are specified for different groups of people. If households are taking two (2) meals a day on average, against the tradition of taking three (3) meals a day in Malawi, it can be attributed to challenges related to food availability and thus defies the condition of being food secure. It is therefore important to understand the community's food and nutritional security challenges in order to develop appropriate interventions.

Community shocks: The insufficient food stocks, drought and related crop failure concurs with the experienced shocks at the household level. Most households in the study area suffered from the experienced drought, irregular rains, floods, crop failure, pests' attack and livestock diseases. These challenges can be attributed to prevailing climate variability that continues to influence inclement weather in recent times. Apart from climate-related challenges, farmers also face high cost of inputs and low prices for agriculture outputs. The study showed that farmers are responding to these shocks by changing their eating habits like skipping meals, reducing the food quantities or food substitutions. This is a way of self-preservation in desperate times when food security turns to be a far-fetched dream. This situation calls for resilient coping mechanisms such as climate smart agricultural practices which include crop diversification, agroforestry, Conservation Agriculture, raising drought resistant crops and livestock and investing in profitable agricultural ventures for sustainable livelihoods.

Like all rural poor communities in Malawi, there remains a huge demand for Income Generating Activities (IGAs) or Forest-Based Enterprises (FBEs) in the study area to satisfy the monetary needs of community members. The results from the study show that the most desired ones include bee-keeping (honey production), small livestock development, and non-timber forest products such as Moringa powder production and basket weaving for sale. The community needs in the study area may be many but most of the catalogued needs can be addressed once the community starts generating sustainable cash income to improve households' socio-economic status. This calls for community projects which will provide a springboard for the much needed investment capital. To achieve this, the projects should either directly be tied to cash payments to improve money circulation in the communities or introduce viable agricultural investments with high market value to empower the households financially and sustainably. The investments on agricultural land need to be long-term in nature considering the view that households consider their land tenure to be secure and as such likely to contribute to sustainable livelihoods.

In conclusion, the study revealed how precarious is the socio-economic status of communities surrounding Mangochi Forest Reserve, to warrant sustainable management of the forest. The matrilineal and matrilocal systems still render women not in full control of land, and this has implications on projects design for the area. The study has shown that the majority of both males and females are mostly unskilled and a strong capacity building program may be a requisite requirement to successfully implement any interventions that are mentally demanding in the area. Farmland holding size is varied and acquired through inheritance customary land tenure system and this has implications on land investment choices even though community members perceive their land tenure system as secure. So far, land investments have been so basic such that food insufficiency in the area exposes the community to vulnerabilities that drive the community to rely on forest exploitation to sustain their households. It is therefore important to understand the community's food and nutritional security challenges in order to develop appropriate interventions to enhance community livelihoods. Food insufficiency due to drought and related crop failure ushers in shocks at the household level because most households persistently suffer from hunger due to drought, irregular rains, floods, crop failure, pests attack and livestock diseases. Local farmers in the area also face high cost of inputs and low prices for agriculture outputs which exacerbates their vulnerability.

Annual Crops and Woody Perennials Combinations in the Lower Shire Valley

Willie Sagona

A variety of indigenous and exotic trees are grown or maintained and managed on farms to provide a variety of products and service functions. Previous work on the description of the farming systems by World Agroforestry Centre (ICRAF) was mainly based on the current farming systems with emphasis on the role of crops and animals. The only traditional system that has been a subject of detailed studies is that of *Faidherbia albida* agroforestry system which is popular in Bwanje Valley and other Lake Shore areas. There are other traditional systems that have not been studied in detail but have some tree species that are prominent in farming systems such as *Syzygium cordatum* in Tsangano, *Erythrina abysinica* in Lilongwe and Kasungu plain; *Bauhinia thoningii* in Lilongwe and Mchinji; *Philenoptera violaceae* (formerly *Lonchocapus capassa*) in Balaka and Lakeshore areas; and *Azadirachta indica* and *Moringa oleifera* in the Shire Valley (Chirwa *et al*. 2004).

Agro-ecosystems in Malawi are complex and diverse as they respond to human resource uses. These ecosystems include, by definition, people and their institutions, as well as the agricultural biodiversity and trees in the landscape that they use and influence through their diverse range for their livelihood and well-being. These trees in the landscape represent a key element in managing the relationship between forest and agriculture that result into agricultural biodiversity. The landscapes in which the woodlands are found tend to be dominated by human settlements and are therefore exposed to different levels of exploitation for provision of different services including energy, construction materials, and a diversity of non-timber forest products. The current status of the woodlands is largely driven by the land use to which they are exposed with the main drivers of forest cover change being agricultural expansion, energy, in the form of fuel wood and charcoal, urbanization, and extractive mining.

A study was conducted in the Lower Shire Valley (Chikwawa and Nsanje) to investigate the existing combinations involving annual crops and woody perennials (trees and shrubs) and develop strategies for improving and/or optimising the system's performance. This article presents findings of a study conducted in the Lower Shire Valley.

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Study Results

Agro-ecosystems of the study area: The main food crops grown in the Lower Shire Valley include maize, sorghum, millet, beans and pigeon peas. Cotton is the major commercial crop in the Lower Shire Valley while Sorghum is resistant to drought hence, acts as an alternative staple food to maize.

There are both traditional and improved farming systems being practiced by most farm families in the Lower Shire Valley. For instance, making of ridges is not commonly practiced; instead, minimum tillage is used for crop establishment in contrast to what is practiced in many parts of the country where plants are planted on ridges. Intercropping system of farming is very well adopted in most parts of the districts where maize is planted together with pigeon peas or other legume crops including Agroforestry trees. The other traditional farming system was observed in Nyachirenda EPA in TA Ndamera, Nsanje where people are converting part of Lulwe forest into agricultural land (Figure 2). Cultivation of hill steep slopes is intensifying in the area and reducing area under forest cover but also exposing the cultivated land to serious soil erosion through surface run-off.

Figure 2. Hill slope cultivation in Ndamera area of Nsanje District

The Lower Shire Valley is one of the areas in Malawi with a high number of livestock. The most common types of domestic animals are cattle, goats, pigs and chicken. According to NSO (2019), 92,737 households in the Lower Shire Valley keep 213,850 goats, 32,993 pigs, 112,014 cattle, 4698 sheep and 480,011 chickens. This translates into livestock densities of 32 goats per km^2, 5 pigs per km^2, 17cattle per km^2, and 72 chickens per km^2. The Lower Shire Valley comes second after Mzimba district in terms of cattle population. People keep livestock especially cattle not only for sale but also for societal prestige. These animals, for example, Cattle and goats are a source of milk; chicken are a source of eggs; while Cattle, goats, chicken and other domesticated animals also provide meat and cash income. Movement of livestock and meat from the Shire Valley is strictly regulated by the Department of Veterinary services to control foot and mouth disease.

Cattle and goats are grazed in *dambos*, natural woodlands and farmland. During the cropping season, there are recognized user rights to the land but once the agricultural crops are harvested, the rest of the community have usufruct rights to the land as grazing of livestock becomes the major activity off cropping season. However, there may be competition for land between cattle owners and the 'land owner' especially when the owner of the farmland has planted trees on their farm to control and strengthen tenureship. As such, farming and tree planting in the Lower Shire Valley is constrained by animal grazing. Nevertheless, farmers take advantage of the winter rains to cultivate in the wetlands where crops like maize, sweet potato, cassava and vegetables are grown.

A number of indigenous and exotic tree species and/or shrubs were identified as fodder for livestock. Some of these are planted on homesteads and farmland. Plants such as *Manihot glaziovii* (*Mpira*), reeds (*Mabango*) and elephant grass (*Nsenjere*) are other good sources of animal fodder in the Lower Shire Valley.

Table 2. Common tree species browsed by livestock in the Lower Shire Valley

Livestock	Tree species browsed	Vernacular Name
Goats	*Boscia salisfolia*	*Mtakala/Mtukila*
Sheep	*Phileneptera violaceae*	*Chimphakasa*
Pigs	*Zyziphus mauritiana*	*Masau*
	Sterculia quinquiloba	*Msetanyani*
	Cordyla africana	*Mtondo*
	Azadirachta indica	*Neem*
	Vossia cuspitata	*Kateta/Kauteka/Nduvi*
	Markhamia obstifolia	*Mbewe*
	Senna siamea	*Kesha wa Milimo*
	Combretum imberbe	*Msimbiti/Nkolong'onjo*

Tree component in the farming system: The Lower Shire Valley is predominantly covered with Acacia and Combretum species. The common species found on the natural woodlands include *Bauhinia petersiana, Diplorhynchus condylocarpon, Phileneptera violaceae, Dalbegia melanoxylon, Albizzia versicolor, Cordyla africana, Sterculia Africana, Sterculia quinqueloba, Kigelia Africana, Acacia polyacantha, Faidherbia albida, Combretum imberbe, Sclerocarya birrea, Azanza garkeana, Ficus species, Pterocarpus rotundifolius, Brachystegia speciformis, Bridelia micrantha, Adansonia digitata, Acacia tortilis, Albizzia harveyi, Acacia nigrescence* and Palm trees. Most of these tree species are multipurpose in nature and retained on farm because they are able to provide products like fruits for food; wood for cooking and heating energy; poles for construction and fodder for livestock nutrition including other services such as soil fertility improvement and soil and water conservation.

Homestead planting was found to be popular in the Lower Shire Valley. Tree species such as *Azadirachta indica, Senna siamea, Senna spectabilis* and *Moringa oleifera* feature highly when it comes to homestead planting. Most households, government institutions such as schools and offices and religious institutions in the Lower Shire Valley have planted trees within their premises to provide shade against the scorching heat that is experienced in summer which is characterized by being very hot and dry.

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The study found that households and smallholder farmers retain or grow in their homesteads and on their farmland respectively some preferred tree species for food production. Such trees may have the ability to ameliorate the soil, provide fruits as food to supplement diet and also conserve soil water. Respondents from the Lower Shire Valley indicated that *Senna spectabilis, Gliricidia sepium, Faidherbia albida, Acacia polyacantha, Moringa oriefera, Sesbania sesban* (in rice fields), *Philenoptera violaceae* and *Albizzia lebbeck* are used to maintain soil fertility; *Zyziphus mauritiana, Mangifera indica, Bridelia micrantha, Sclerocarya birrea* and *Ficus* species including *Moringa oleifera* provide food. *Cordyla Africana* retains moisture and used for live fencing to protect agricultural crops against browsing animals. *Azadirachta indica* (Neem), another multipurpose tree widely found in homesteads and farmlands of the Lower Shire Valley, is used as shade, fodder and medicine. It was indicated by the respondents that the desire to raise more seedlings for agroforestry, fruits and other uses is constrained by lack of improved planting material for the preferred species. In a bid to manage the existing trees on farm, some farmers in the Lower Shire Valley have adopted Farmer Managed Natural Regeneration (FMNR).

It was learnt through the study that most of the woody components in agro-ecosystems occur naturally long after years of selective management by farmers. Farmers decide which tree species to retain on farm due to multipurpose uses and allied products. Those retained mostly have multiple uses in a wide range of needs including fire wood, poles, soil nitrogen fixing, fodder, medicine, crafts and others. Small holder farmers' decision to manage certain trees on farm is also based on the recognition of ecological services which woody components such as *Gliricidia sepium* play in the nutrient cycle for crop production including moisture retention in the agro-ecosystem.

The traditional tree legume-based system: The Shire Valley agro-ecosystem has in some parts including Chididi and Lundu area thrived on the versatile and resilient *Faidherbia albida*. The species has special phenology which makes it more compatible with growing annual crops such that the species hardly competes for light and water during the growing season of annual crops such as maize and sorghum. In addition, *F. albida* fixes nitrogen and provides other nutrients to a crop when their leaves are incorporated into the soil. The trees serve as fuel wood or live fence and provide fodder and shade to livestock. Hence, within the traditional smallholder farming system, the species provides ecosystem services which are provisioning services, regulating services and supporting services.

Farmers in the Lower Shire Valley acknowledge the positive effect of *F. albida* trees on yields of crops such as maize and sorghum. For a long time, farmers have retained a low density of trees in their farmlands or two-tiered systems in order to improve the yield of understorey crops. The species has a unique characteristic of shedding most of its leaves during the wet season and resuming leaf growth during the dry season which makes it possible to cultivate under its canopy with minimum shading effect on the companion crop. Substantial benefits are realized from these practices as resource-use by trees and associated crop components rarely overlap. The optimal combinations of trees, crops and livestock help smallholder farmers understand how to benefit from the myriad ways in which the diversity of species and life forms that nature offers. However, tree density for *Faidherbia albida* on farm is restricted to some parts within the Lower Shire Valley and threatened by pressure for wood and charcoal production. In the absence of restocking through seedling regeneration, the Lower Shire Valley risk losing its *Faidherbia albida* population.

Other than the tree / crop combinations discussed above, production by smallholder farmers is based on the limited use of agricultural inputs, such as fertilizer and credit, due to some constraints accessing these inputs. As a result, farmers experience low crop yield and agricultural production, leading them to rely heavily on casual labour, sale of charcoal and firewood and petty trade for cash income to purchase food. The sale of timber, charcoal and other forest products represent substantial income input for the households in the Lower Shire Valley. Other studies have highlighted the high level of dependence on forest products by households where it has been revealed that sales of charcoal and timber are a high return activities that may contribute to reducing income inequality across households in most rural households. The study showed that the main underlying driver of charcoal sales in the Lower Shire Valley is poverty mostly influenced by family size and the number of times crops failed (food insecurity) during the past years. Families who experienced numerous crop failures during the past years have a higher likelihood to sell firewood. Crop failure leads to food insecurity and forces farmers to hire out and embrace non-farm activities as coping strategies. These strategies help households to cope with income shocks, but may increase the pressure on forest resources and the incidence of deforestation, further increasing the vulnerability to impacts of climate variability. Such being the case, Agroforestry interventions and/or technologies suited to the Lower Shire Valley once successfully adopted, should address food insecurity. This is the case because tree planting and management might no longer be seen as purely a forestry issue but also part of farming system if forestry is to take rural development perspective.

In conclusion, the study established that intercropping farming system is very well adopted in most parts of the Lower Shire Valley districts where maize is planted together with pigeon peas or other legume crops including agroforestry trees. Cultivation of hill steep slopes is intensifying in the area in an attempt to extend smallholder farmers' land holding capacity. This practice has negative impacts on forest cover but also expose the cultivated land to serious soil erosion. Animal grazing tend to be a constraint to good farming practices and tree planting in the Lower Shire Valley. However, a number of indigenous and exotic tree species and/or shrubs were identified as fodder for livestock and live fences to relieve the pressure of grazing animals on farm land. The pressure on natural resource exacerbated by change in land use has translated into severe land degradation and loss of biodiversity in some parts of the Lower Shire Valley.

The study recommends to deal with land tenure issues to strengthen individual user rights to the land that would enable farmers to optimally use their land all year around. Policy issues on land ownership or tenancy need to be addressed in line with the current Land Policy and law to manage conflicting land use by cattle owners and other farming communities. There is a potential of using some AF technologies/ practices in controlling grazing on agricultural crops outside main cropping season while at the same time asserting authority on land ownership.

High adaptability of *Moringa oleifera, Senna siamea/spectabilis* and *Azadirachta indica* in the Lower Shire Valley is a motivation to afforestation as these are some of the few successful tree species that can be promoted in afforestation programme to rehabilitate degraded areas alongside other multiple benefits from these species.

In high population densities and small land holdings as that of the Lower Shire Valley, meeting household needs from tree products such as firewood, building materials, fruits and income generation remain farmers' great desire. As such research should identify better species for improved agroforestry technologies well suited to the Lower Shire Valley in order to attain sustainable livelihoods and food security.

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Table1. Preferred and commonly used medicinal tree species

Vernacular name	Botanical name	Family	Plant part used
Mlombwa	*Pterocarpus angolensis*	Fabaceae	bark, leaves
Mtombozi/ Mtomoni	*Diplorhynchus condylocarpon*	Apocynaceae	roots
Gombauti/ Mpoloni, Kaliuti	*Steganotaenia araliacea*	Apiaceae	roots, bark
Chitimbe	*Bauhinia thoningii*	Leguminosae	Barks
Naphini	*Terminalia sericea*	Combretaceae	leaves
Chipembere,Nsondoka	*Catunaregum spinosa*	Rubiaceae	roots, bark
Mwavi	*Erythrophleum suaveoles*	Fabaceae	bark
Kankhande	*Zizyphus mucronata*	Rhamnaceae	Roots
Muwawani/ Mchalamila	*Cassia abbreviata*	Leguminosae	Leaves, barks
M'dima, Mtima	*Psorospermum febrifugum*	Hypericaceae	Roots, leaves, fruits
Nthema,Mtawa	*Flacourtia indica*	Flacourtiaceae	Roots
Mvunguti	*Kigelia africana*	Bignoniaceae	Fruits
Mtutumuko/ Mjuju	*Zanha africana*	Sapindaceae	Roots, stem, bark
Mposa/ Mpoza	*Annona senegalensis*	Annonaceae	roots, bark
Mtatu,Chipule, Chikule	*Allophylus africana*	Sapindaceae	roots, leaves
Msambamfumu	*Afzeria quanzesis*	Fabaceae	bark
Palibe kanthu	*Heteromorpha trifoliata*	Embelliferae	roots, sap
Mdyoka/Dululu,kamvabingu	*Jateorhiza Palmata*	Menispermaceae	Roots
Chipisyawago	*Dicrostachys cinerea*	Fabaceae	roots
Mango	*Mangifera indica*	Anacardiaceae	Leaves
M'banga	*Pericopsis angolensis*	Fabaceae	Leaves
Mwanamphepo	*Cissus zombensis*	Vitaceae	Rhizome, roots, tubers
Bwazi	*Securidaca longepedunculata*	Polygalaceae	Roots
M'bawa	*Khaya anthothecca*	Meliaceae	leaves
Gondolosi	*Mondia whytei*	Apocynaceae	Roots
Mtambe	*Cissus integrifolia*	Vitaceae	Roots
Alovera	*Aloe vera*	Asphodelaceae	Sap
Mphinji/Mpinji	*Ximenia caffra*	Olacaceae	leaves
Msolo	*Pseudolachnostylis maprouneifolia*	Phyllanthaceae	leaves
Nkandanyalugwe	*Vaccinium exul*	Ericaceae	Roots
Mlambe, Malambe	*Adaninsonia digitata*	Malvaceae	seeds, bark
Chammwamba	*Moringa oleifera*	Moringaceae	leaves
Mkwale	*Hagenia abyssinica*	Rosaceae	Roots
Mbwabwa	*Cussonia arborea*	Araliaceae	leaves
Neem	*Azadirachta indica*	Meliaceae	leaves
Phingo	*Dalbergia melanoxylon*	Fabaceae	roots, bark, seeds
Mlungamo	*Erythroxylum emarginata*	Erythroxylaceae	leaves
Chisoni, Chanasa	*Myrothamnus flabellifolia*	Myrothamnaceae	roots, bark
Chiumbu	*Lannea discolor*	Anacardiaceae	Bark
Tseketseke, Wangalawiwu	*Abrus precatorius*	Fabaceae	leaves
Mateme, Mtonga	*Strychnos spinosa*	Loganiaceae	roots


Abrus precatorius


Mondia whytei

Our Mission

To conduct operational forestry research to generate usable technologies and provide information for sustainable management, conservation and utilization of forests/trees and allied natural resources in order to contribute to improving the welfare of the people of Malawi.

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