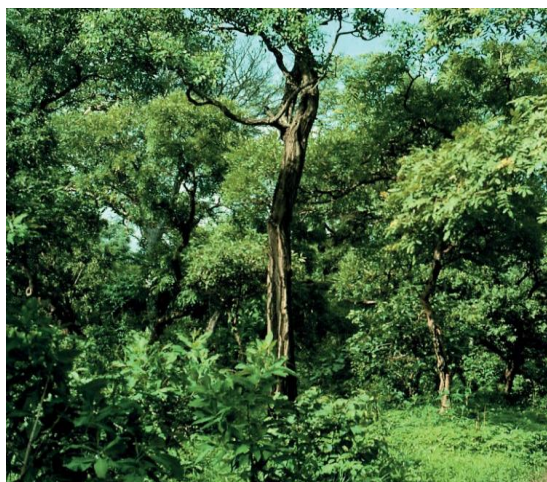




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Potential for private sector forestry development in Africa

A synthesis report for Eastern African countries of Kenya, Tanzania, Uganda, Rwanda, Ethiopia and Sudan



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Potential for private sector in forestry development in Africa

A synthesis report for Eastern African countries of Kenya, Tanzania, Uganda, Rwanda, Ethiopia and Sudan

Dr. Joshua Kiplongi Cheboiwo

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Acronyms and abbreviations

AFF	African Forest Forum
ASALs	Arid and Semi-Arid Lands
CBOs	Community based organizations
CIT	Confederation of Industries in Tanzania
COMESA	Common Market for Eastern and Southern Africa
CPA	Charcoal Producers Association
DRC	Democratic Republic of Congo
EAC	East African Community
ESDA	Energy for Sustainable Development in Africa
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	FAO Statistical Database
FBD	Forest and Beekeeping Division
FITI	Forest Industry Training Institute
FNC	Forest National Corporation
FTI	Forestry Training Institute
GAPAs	Gum Arabic Producers Associations
GRL	Green Resources Ltd
JFM	Join Forest Management
KEFGA	Kenya Forest Growers Association (KEFGA)
KEFRI	Kenya Forestry Research Institute
KFS	Kenya Forest Service
KVTC	Kilombero Valley Teak Company
KWPA	Kenya Wood Preservers Association
MAI	Mean Annual Increment
MCDI	Mpingo Conservation Development Initiative
MEWNR	Ministry of Environment, Water and Natural Resources
MF&W	Ministry of Forestry and Wildlife
MF&W&MFA	Ministry of Forestry and Wildlife and Finland Ministry of Foreign Affairs
MJUMITA	Mitandao ya Jamii ya Usimamizi wa Misitu Tanzania
MNRT	Ministry of Natural Resources and Tourism
MPM	Mufindi Paper Mills
MT	Metric Tonnes
MTTCS	Makambako Timber Traders Cooperative Society
MWE	Ministry of Water and Environment
NAFORMA	National Forest Resources Monitoring and Assessment
NFA	National Forestry Authority
NFC	New Forest Company Ltd
NOFIA	Northern Forest Industries Association
NTFPs	Non-timber Forest Products
PFM	Participatory Forest Management
PFP	Private Forest Programme
PPM	Pan African Paper Mills
PPP	Public Private Partnership
REA	Rural Electrification Authority

RNRA	Rwanda Natural Resources Authority
SAFIA	Sao Hill Forest Industries Association
SHIVIMITA	Shirika la Viwanda vya Misititu Tanzania
SMEs	Small and Medium Enterprises
SPGS	Sawlog Production Grant Scheme
SUA	Sokoine University of Agriculture
TAF	Tanzania Association of Foresters
TANESCO	Tanzania Electric Supply Company Ltd
TANWAT	Tanganyika Wattle Company
TFCG	Tanzania Forest Conservation Group
TFS	Tanzania Forest Service Agency
TGA	Tree Growers Association
TMC	Timber Manufacturers Associations
TPSF	Tanzania Foundation for Private Sector Development
USD	United States Dollar
UTGA	Uganda Timber Growers Association
UWAMBU	Umoja wa Wafanya Biashara ya Mbao Buhindi
VNRCs	Village Natural Resource Committees
WOCAN	Women Organizing for Change in Agriculture and Natural Resource Management

Executive Summary

The primary production in Eastern Africa takes place in public natural forests, plantations, farm forests, community forests and private forests. These forests, for various reasons, are experiencing heavy pressure from forest adjacent communities and illegal loggers hence roundwood extractions are under various levels of controls to reduce degradation and enhance biodiversity conservation. The indigenous forests and woodlands are the most extensive and produce wide range of products for various uses including timber and woodfuel, among others. The public sector dominated public plantations remain the main supply of industrial timber in the region, but due to poor management and governance related issues are, in some cases, also experiencing low productivity and losses to other land uses.

In counties such as Uganda and Tanzania where the private actors have leased forest reserves from public sector agencies and communities to establish forest plantations, they have witnessed fast expansion of forest plantations within the last decade. In the mix are private agricultural based enterprises such as tea estates, farmers, investment syndicates, social entrepreneurs and other entities that have also invested in plantation forests, largely driven by the high demand for forest products hence good returns to investment, or internal demand for forest products own uses. Except for farm and private forests other types of forests are declining in either coverage or quality or both. The preferred plantation species, though differing according to ecological conditions, revolve around fast growing exotic species and few retained or planted indigenous species. The key species planted in the region include highland and lowlands Eucalyptus, Pinus, Cupressus lusitanica, Tectonia grandis and Gmelina arborea, among others. In the drier ecosystems in Sudan are found trees like Acacia seyal, Balanites aegyptiaca, Anogiessus leiocarpus, Albizia amara and Acacia senegal.

Depending on resources endowment, the countries in the region have a wide range of industry operators such as saw millers, reconstituted wood manufacturers, utility pole manufacturers, charcoal producers, wood carvers, paper and paper product manufacturers, and non-timber producers. Others include furniture energy producers, fuel pellet producers, handcraft makers and furniture manufacturers, among others. The industries process roundwood into various products that include sawnwood, fibre boards, particle boards, and plywood.

The non-timber forest products (NTFPs) produced in the region also vary according to ecological conditions, local community needs and commercial purposes. Some of the NTFPs found in the region are myrrh, baobab fruits, tannins, tamarinds, Aloes, shea butter, medicinal plant parts such as Prunus bark, and gum Arabic, among others. These are collected by communities from forests and woodlands before sorting, grading and processing into various products for home use and/or sale.

The public forest resources in the region are managed by lead public forest institutions such as Kenya Forest Service (KFS) in Kenya, Forest National Corporation (FNC) in Sudan, Tanzania Forest Service (TFS) in Tanzania, National Forest Authority (NFA) and Rwanda National Natural Resources Authority (RNNRA) both in Rwanda. These operate through some form of management plans that align various types of forests to technical, conservation and commercial aspects of the business. The lead forest agencies in primary forest production have a well-organized administrative structures and resources to cover the core business of

management and protection of public forests, and also support private and individual forest owners. The key primary products that are produced for use in domestic and industrial purposes include sawlogs, peelerlogs, woodfuel, pulpwood and poles that are inputs to secondary forest processing, construction sector and households' biomass energy needs.

The technical and management organization among key players in primary forest production range from partnerships that involve signing of contracts between individual farmers and respective companies or social investors and tree growers' associations. However, they are in most cases still at infancy stages of growth and still need varying levels of support from public agencies, NGOs and professional entities. The study countries have grassroot and apex associations operating in the forest sector with Gum Arabic Producers Association (GAPAs) of Sudan being the most extensive in members and organization structure as compared to those found in the other countries due to long history of operation in the sector. Technical and commercial organizations in secondary forest production are few and found in Kenya, Uganda and Tanzania, mostly representing saw millers and wood manufacturers.

The countries in the region have enacted various policies and legislations to guide forest sector development, with some under revision, to cope with the changing local and global dynamics including climate change. The policy and legal instruments have good provisions to support vibrant tree growing, forest conservation and environmental management in the respective countries. Some countries like Kenya and Uganda have enacted policies and legislation on PPP mostly in form of high cost infrastructure projects that can support legal engagement in other sectors of the economy including forestry. In some countries like Kenya, revised forest sector policies and legislations have included provisions for inclusion of PPPs. Kenya, Uganda and Tanzania already in some variants of PPPs in operation that include corporate social responsibility (CSR) funding for protection and rehabilitation of forests, private sector supported out-grower schemes and forest land leases to local and international investors. Tanzania and Uganda are the leading countries in forest leases to private sector investors for establishment of commercial plantations that run into hundreds of hectares. The widely practiced PPP variants include engagement of communities by forest agencies in joint forest management (JFM) and other participatory forest management (PFM) approaches.

Most countries in the region are not self-sufficient in various forest products and have to import from the region and outside the region, mostly from Asia and Europe. For example, Kenya is the leading importer of hardwood and softwood timber from eastern and Central Africa, and manufactured products such as furniture, paper and paper products and wood panels from Asia and Europe; with some being re-exported to neighbouring countries. Sudan is a net importer of sawnwood and manufactured forest products as well. Tanzania is the only country that produced surplus forest products, mostly sawnwood for export to COMESA countries.

The projection on supply and demand of forest products in the region for the next 20 years indicate that the demand for various forest products is growing fast as compared to supply potential from the various sector actors. Therefore, the region provides opportunities for private investors with desired financial capital and operational efficiency expertise to compliment public and smallholder actors in expansion of the sector forest products supply capacity and contribution to overall national economic development.

1.0 INTRODUCTION

1.1 Background and justification of the study

Many African countries, as part of market liberalization, have been implementing policy and legal reforms in the forest sector aimed at attracting private sector into public dominated primary forest production and also to increase competition in the already private sector dominated secondary processing and trade. The private sector players are not homogeneous entities but range from large corporate firms to individuals that include women, youth and marginalized communities. The studies therefore were aimed at identifying and understanding the interactions between different players with diverse interests in forest resources and the quantum of benefits and challenges they face in managing and accessing the resources.

The private sector participation in forestry sector, including primary and secondary forest production, is promoted on the premise that such developments will significantly impact on employment creation, income generation, poverty alleviation and environmental protection. The private sector collaboration with public sector players, under public private partnerships (PPPs), is an emerging investment approach that has become popular in large infrastructure projects but have potential in forest sector as well. The forest sector in most countries has crafted favourable policies and legislation to promote PPPs in a wide range of forest sector enterprises that range from large commercial oriented plantations to SMEs involved in roundwood processing, further product manufacturing processes, marketing and trade. The study was therefore interested in identification and promotion of viable PPP models that are compatible with sustainable livelihood development and contribute to each country's socioeconomic development.

1.2 Background

The purpose of the study was to facilitate the development of an organized private sector in forestry through identification and promotion of promising public private partnerships approaches that are all-inclusive in terms of being forest compatible, enhancing sustainable livelihoods development and simultaneously including gender considerations.

1.2.1 Objectives of the Study

The main objective of the study was to provide information to support catalysing the emergence of an organized private sector in forestry through promotion of promising public private partnership (PPP) approaches that promote sustainable forest management, enhance livelihoods and are gender sensitive, in the eastern African countries of Ethiopia, Kenya, Tanzania, Uganda, Rwanda and Sudan.

1.2.2 Specific Objectives

The specific objectives were:

- To identify the key actors and gender groups' representation in primary forest production and secondary forest production, including SMEs based on all forest types in each country;
- To collect information on actors in primary forest production including information on: tree species they use, productivity and use, forest distribution by area, age classes, and volume and plans for sustainable supply;
- To provide information on actors in secondary forest production, including information on industry type, installed capacity, products lines/types, capacity utilization, production volumes in the last five years and raw material types and sources;
- To evaluate actors in primary and secondary forest production in terms of employment opportunities, policies, regulations and other factors facilitating and/or constraining the development of forest products industry, including undertaking a SWOT analysis;
- To identify and assess gender specific inequalities;
- To identify and assess factors inhibiting and/or promoting the full and equal participation of marginalised groups, including women and youth;
- To assess and analyse gender-based control and access to required assets/resources, including specific opportunities, challenges and privileges of involvement and participation in the sector;
- To evaluate marketing and trade (domestic and international) in their products including volumes, production costs, revenues and prices of products traded in the last five years.
- To evaluate the relationship/linkages among actors in primary forest production, on one hand, and the relationship/linkages among actors in secondary forest production on the other hand; and how this can be organized to contribute to the growth of a well-organized formal private sector in forestry
- To evaluate the scope, within the country, for public private partnership in forestry; including existing promising models/approaches that can enhance social inclusion, gender equitable practices, are forest compatible, enhance sustainable livelihoods development in the different forest types and propose recommendations on enhancing PPPs;
- To provide past trends on production, trade and consumption of timber and non-timber forest products in each country in the last five years. Also provide forecasts of future production, trade and consumption of the same; and
- To assess the contribution of these private forestry sector activities to local livelihoods and national economy.

1.2.3 Study methods

The study on the forestry sector in the selected countries largely relied on national reports

developed by contracted national experts from each of the participating countries. The national experts relied mostly on literature reviews of past works from various sources and some rapid reconnaissance surveys in key forest related entities to facilitate updating of information and data, especially in areas where gaps existed.

1.2.4 Data analysis

The data and other information were extracted from the national reports that were organized to provide this synthesis report. The key areas selected from each report were the status and dynamics of primary and secondary forestry production, key investment areas, policies and legislations on public private sector partnerships, contribution of forest sector to economic growth and livelihoods, and potential models of PPPs with promising future.

2.0 STUDY RESULTS

2.1 Key actors in forest production

2.1.1 Actors in primary forest production

The actors in primary forest production in the region include individual producers, corporate producers and institutional producers. Smallholder producers operate mostly within agricultural landscapes and constitute the largest primary forest producers that undertake different forms and scales of tree growing activities such as hedge trees, woodlots and agroforestry practices to produce sawlogs, poles and woodfuel. The smallholder sector challenges are associated with land, labour, capital, and technical knowledge. Due to these challenges most of the smallholder productions are for subsistence purposes but some have diversified into short rotation commercial pole and saw log production within the last 10 years, largely being attracted by high demand for these products and good prices.

Public agencies include government institutions mandated with managing the public forest estate, wildlife resources and others public agencies such as National Forest Authority in Uganda, Kenya Forest Services (KFS) in Kenya, Tanzania Forest Services (TFS) in Tanzania, National Forest Corporation (NFC) in Sudan and Rwanda National Resources Authority (for forests) and Rwanda Development Board (for wildlife and protected areas) in Rwanda. The public forest agencies are mandated with the management of national forest reserves designated for production forests (to ensure sustainable supply of forest products), nature reserves and other protected forests areas for biodiversity and water provisioning. The public agencies in many cases, due various challenges such as inadequate funding, inadequate staffing and governance related issues, have not been able to manage forests efficiently for optimal production. Forest agencies have engaged communities, both in natural forests and plantations development activities, with the aim of improving their livelihoods through agroforestry interventions and forest protection.

Public forests reserves remain the most attractive investment destination for the private sector players due to shortage of agricultural land for private sector investors.

The private sector players include agricultural based enterprises such the tea estates that have diversified into tree growing for firewood production for curing tea, and sawnwood for packaging tea, with surplus being sold in local markets. Tea estates are dominant in tea growing areas in Kenya, Uganda, Rwanda and Tanzania. These estates use biomass energy because of the high cost of electricity in their activities. Other commercial tree growers include investment syndicates and social entrepreneurs that have leased land from the government in Uganda and communities in Tanzania. In Kenya they have entered into contract agreement with farmers and local authorities to grow tree on sharing agreements or outright lease of the land for commercial tree growing for specified rotation period. Most of these plantations are being established on degraded forest land, thus qualifying the owners to benefit from trading in carbon credits. The actors include New Forests Company, Green Resources, Global Woods, Better Globe Forestry and KOMAZA, among others, that have established plantations in hundreds of hectares.

Table 1: Players in primary and secondary forest production in eastern Africa

Product	Ethiopia	Kenya	Uganda	Tanzania	Sudan	Rwanda
Public agencies	***	***	***	***	***	***
Devolved public governments	-	*	*	**	*	*
Community groups	-	*	*	**	**	-
Tea estates	-	**	*	-	-	*
Investment syndicates	-	*	**	**	-	-
Social investors	-	*	*	*	-	-
Wood based manufacturers companies	-	**	*	***	-	*
Other related companies	-	*	**	**	*	*
Farmers	**	***	**	**	*	**
International non profit organisations		*	**	**	-	-
Timber traders	***	***	***	***	***	***
Transporters	***	***	***	***	***	***

*** Very dominant, **medium and * less dominant in the specific production niche and (-) indicates where no information was provided.

2.1.1.2 Actors in secondary forest production.

The actors in secondary forestry production in the region include hundreds of individuals, private companies, cooperatives, financiers, and other entities that are involved in alteration of wood or other plant material harvested from the forest to prepare it for further processing, direct use or transfer to markets.

Primary production actors include saw millers, reconstituted wood manufacturers, charcoal producers, wooden pole preservators, firewood processors, woody biomass energy producers, fuel pellet producers, handcraft makers, and furniture manufacturing, among others.

2.1.2 Forest resources in eastern Africa

2.1.2.1 Forest cover in eastern Africa

The region forest cover types include woodlands and bushlands, other natural forests, forest plantations, farm forests and private forests. They are both in public and private sectors. The dominant forest cover types are woodlands and bushlands, mostly located in the fragile dryland ecological zones of Sudan, Tanzania, Kenya and Uganda. The dryland forests also host pastoral communities that are changing to marginal agricultural activities (Table 2). The natural forest reserves, mostly owned by national governments, are the second in size and are some of the most biologically diverse and in some cases isolated and highly fragmented but host some endemic and endangered species of flora and fauna. These forests, apart from production of high value species for sawnwood, poles and wood fuel, are also critical for water provisioning, biodiversity conservation and ecotourism. In general, the natural forests in public, private and community lands are facing anthropogenic pressures from human needs that have led to genetic erosions due to fragmentation and overexploitation. Despite attempts to enhance protective measures, illegal timber and other resource extractions have not stopped; however, they are more pronounced in community owned forests that have minimal security protection. Therefore, natural forests, and especially those located in community and private land, are likely to continue to decrease in both land area and species diversity into the future. To counter such a process, many forest agencies have brought on board local communities and other interested parties into various forest co-management arrangements in order to enhance livelihoods as a way of incentivising local communities to protect them and therefore securing their long-term sustainable management.

The plantation forests form the smallest forest category and have been undergoing rapid expansion in the region for the last few decades. The forest plantation sub-sector was dominated by public-sector agencies in the past. However due to governance and resource scarcity most plantations are facing challenges, the key being inadequate management and supervision that has lowered overall forest productivity and quality. The reduced production from public plantations has created timber deficits that have translated to high timber prices therefore attracting private sector players, such tea estates owned by multinationals and local companies, syndicated investors, social entrepreneurs, small scale and large-scale farmers to invest in primary forest production. The new crop of forest investors have employed various strategies that range from leasing land from government and private landowners, to out-grower profit sharing mechanisms. In Kenya, Uganda and Tanzania the expansion of hydro power generation and distribution has created high demand for transmission poles, mostly sourced from *Eucalyptus grandis*, thus making it one of the leading short rotation crops grown by private investors. Due high prices and inadequate supplies the private sector investment in forest plantations has grown faster than public sector plantations in eastern Africa. The private sector investors deploy greater utilization models that include integrated utilization processing and value addition to minimize wastage and improve overall profit margins.

Most public forest agencies in the region lack sufficient resources to adequately manage both natural and plantation forests. This then provide opportunities for some forms of public private partnerships in the sector, through corporate trusts and other forms of multipurpose vehicles that bring together public and corporate sector to pool resources for sustainable management of forest resources in the region. All indicators point out to the fact that private sector forests are here to stay and will leverage on efficiency in land use, efficient technologies and high demand for forest products to compete in local and regional timber markets. The private sector players are also gearing for the potential opening up of more public plantations for forestland concessions under PPP processes. The ranges of such investors in the region also include churches, schools and state agencies such as prison, universities and wildlife services.

Table 2: Forest cover by types in eastern Africa (in hectares)

Country	Woodlands (natural forests)	Other natural forests	Plantation forests	Farm forests	Private forests
Ethiopia	-	-	-	-	-
Kenya	26,560,000	1,220,000	107,000	10,385,000	90,000
Rwanda	2,777,998	792,649	74,644	-	11,737
Uganda	2,777,998	792,649	33,527	8,401,000	
Sudan	11,731,000	1,345,000	6,121,000	-	-
Tanzania	48,702,000	250,000	554,500	20,000,000	44,220

(-) indicates that no information was provided.

2.1.2.2 Plantation species preference

The countries in the region grow a wide range of exotic and indigenous species for both subsistence and commercial purposes. The species siting and mixes depend on many factors such as ecological attributes, land use history, landowners objectives, among other factors. The eastern African countries of Kenya, Rwanda, Uganda and Tanzania have diverse conditions, ranging from highlands to lowland drylands that can host a variety of tree species, both exotic and indigenous species, as compared to drier Sudan conditions (Table 3).

In Kenya the widely planted species include *Grevillea robusta*, *Eucalyptus grandis*, *E. saligna*, *E. camaldulensis*, *E. tereticornis*, various *Eucalyptus* hybrids, *Casuarina equisetifolia*, *Pinus patula*, *Cupressus lusitanica*, *Acacia mearnsii* and many other minor species of both indigenous and exotic species depending on the climatic and utility preferences among other values demanded by both public and private investors. The public plantations, mostly located in high potential areas, are dominated by industrial species of *Eucalyptus grandis*, *E. saligna*, *Pinus patula* and *Cupressus lusitanica*. On farms woodlots and trees are based on history and climatic conditions, though similar to public plantations do exhibit some regional dominance; with coastal region being dominated by *Casuarina equisetifolia*, *Gmelina arborea*, *Tectonia grandis*, and *E. camaldulensis*, *E. tereticornis* and *E. europhylla*. In central Kenya the dominant species are *Grevillea robusta*, *Cupressus lusitanica*, *Acacia mearnsii* and *E. grandis* with the latter gaining popularity due to the high demand for transmission poles and industrial uses of its various products.

In Uganda public and private commercial plantations are dominated by two exotic species for sawlogs, plywood and pole production, namely *Pinus caribaea* and *Eucalyptus grandis* but scattered pockets of *Pinus patula*, *P. oocarpa*, *Cupressus lusitanica*, *Araucaria spp.*, and *Asiatic Teak (Tectona grandis)* are also planted across the country. Some of the indigenous plantation species in the country include *Aningeria altissima*, *Antiaris toxicaria*, *Blighia unijugata*, *Maesopsis eminii*, *Markhamia lutea*, *Albizzia coriaria* and *Milicia excelesia*.

In Rwanda the dominant exotic genus is *Eucalyptus* that occupy 59% of planted species; others include *Pinus spp*, *Callitris*, *Acacia spp.*, *Cupressus* and *Grevillea spp.*, *Leucaena spp.*, *Calliandra calothyrsus*, *Alnus sp.* and *Sesbania sp.*

In Tanzania the commercial plantations are dominated by pine species that include *Pinus patula*, *P. elliottii* and *P. caribaea*. Others include *Cupressus lusitanica* *E. Saligna* and *E. maidenii* and *Tectona grandis*. Miombo woodlands and high natural forests are key sources for hardwood timber for local consumption and exports. The following are the most common in the order of abundance *Diplorhynchus condylocarpon*, *Combretm zeyheri*, *Brachystegia spiciformis*, *Combretum molle*, *Julbernardia globiflora*, *Brachystegia boehmii*, *Dichrostachys cinerea*, *Pseudolachnostylis maprouneiolia*, *Combretum sp*, *Grewia sp*, *Grewia bicolor*, *Commiphora Africana*, *Acacia sp*, *Commiphora sp*, *Markhamia obtusifolia*, *Uapaca kirkiana*, *Terminalia sericea*, *Brachystegia longifolia*, *Diplorhynchus mossambicensis* and *Dalbergia sp.* In Sudan the species managed for commercial production are mostly indigenous species and comprise mostly *Balanites aegyptiaca*, *Acacia seyal*, *Anogiessus leiocarpus*, *Albizia amara*, *Acacia Senegal*, *Acacia tortilis*, *Ziziphus spina- Christi*, *Khaya senegalensis*, *Acacia nilotica* and *Isoberlina doka* in the order of importance. Some few pockets of *Pinus patula* and *Cupressus lusitanica* are located in high altitude forest reserves that are inaccessible, sometimes due to insecurity.

The planting patterns, management operations and rotation periods differ per species and products purpose, in both farms and plantations. On farms trees are planted on boundaries, homesteads, single and in small woodlots as compared to public and private forest plantations that have trees planted in blocks. The rotation periods for planted trees range from 5 to 30 years depending on species, climatic conditions, end uses and market niche specifications. The shortest rotations observed are those for firewood and construction poles and the longest are for saw and peeler logs. The key industrial species such as *Cupressus lusitanica* and *Pinus patula* mature for sawlogs at 25-30 years but the rotation length stretches from 5-17 years for *Eucalyptus* grown for transmission poles, sawlogs, construction poles and firewood.

Table 3: Key plantation species in order of dominance in eastern Africa

Species	Ethiopia	Kenya	Uganda	Tanzania	Sudan	Rwanda
Highland Eucalyptus	***	***	**	***	-	***
Lowland Eucalyptus	*	**	*	*	**	*
Cypress	-	**	*	*	*	*
Pines	-	**	**	***	*	*
Other exotic species	*	**	*	*	*	*

Species	Ethiopia	Kenya	Uganda	Tanzania	Sudan	Rwanda
Indigenous species	*	**	**	**	**	*
Woodland indigenous	**	**	**	***	***	*

NB: *** Very dominant, **medium and * less dominant in the specific production niche and (–) indicates where no information was provided.

2.1.2.3 Forestry sector strength, weaknesses, opportunities and threats-SWOT analysis

Strengths

Most of the countries in the region have put in place favourable policies and laws, pool of qualified technical personnel, diverse actors including government, development partners and private investors. There is growing demand for diverse forest product driven by rising population and urbanisation. The ready markets for diverse forest products and reasonable returns will remain the main attractions to both small- and large-scale private investors into forest sector in the region.

Weaknesses

There is a high rate of forest cover loss, especially in public and community forests, due to competition from other land uses such as agriculture and settlements. There is also poor management and inadequate supervision, inadequacy of legal provisions and technical skills. These are some of the weakness facing forest sector in the region. In most countries issues related to governance, such as lack of transparency and accountability, flouting of policies and laws, insufficient participation of key stakeholders in decision-making processes, and poor coordination between enforcement and management agencies, has made levels of compliance with forest-related policies and laws generally low. The forest production sector is characterised by inadequate guidelines, standards, and regulations, particularly for private forestry. Many countries have not enacted the desired regulations to operationalise existing legislations and this has made it difficult to effectively enforce the existing laws.

The private sector investors face several challenges that include inadequate information on existing forest resources and markets, limited access to credit, finance, capital and technology; and shortage of business and technical skills. In some countries there is general scarcity of good quality planting material due failure to establish and maintain good tree seed sources, and this has led to importation of seeds at high costs, and in some cases poor quality plantation products, like industrial wood, lead to huge losses when such products are rejected by buyers.

The official records on contribution of forests to the GDPs has remained low, making forestry less competitive as compared with other land uses or investments because valuation tools have not captured adequately the non-marketed services of forests. Forest sector operations are largely in an informal sector; therefore, determining size, product stock and products flows is difficult, making information available on the sector minimal to guide development of appropriate interventions and policy decision making to improve the sector.

Private sector investors in some cases have faced hostile reception from local communities who seek various forms of benefits, and in some cases resort to arson, thus scaring away potential investors in plantation forests in community national forest reserves.

Opportunities

There is a growing interest by the private sector on various forest-based enterprises such as nursery operation, tree growing, processing and marketing and trade. Others include non-traditional products and services including ecotourism, carbon sequestration, water catchment services, and biodiversity products. Forest plantations for production of timber and poles offer attractive rates of return that compare very favourably with many other agricultural enterprises. There is also goodwill by governments and development partners to finance and support provision of policy direction for forestry development. Some countries like Tanzania and Uganda have made available large tracts of land from the country's central forest reserves for leasing to private investors interested in development of forest plantations. This decision has been instrumental in facilitating raising private investors' interest and investments in plantation forestry and bringing degraded forests and forest lands into productive use.

Owing to the prevailing supply-demand gaps in many countries in the region forest products will continue to find ready market for timber, firewood and poles into the foreseeable future due to increasing population and economy expansion at both national and regional levels.

Kenya, Uganda, Rwanda and Tanzania are endowed with favourable climate for fast growth of trees; some attaining MAI of 75m³/ha/year making it global fastest achievements. The region has abundant skilled manpower trained in local premier forestry institutions at both diploma and degree levels that include Londiani Forestry College (Kenya), Nyabyeya Forestry College (Uganda), Lushoto Forestry College (Tanzania), Makerere University (Uganda), Sokoine University of Agriculture (Tanzania), University of Khartoum (Sudan) and Moi University (Kenya), among others.

Threats

The combination of population and economic growth does exert undue pressure on forest resources due to increased demands for their various products and services, such as wood fuel, construction materials, ecotourism and water provisioning. The belief that forests reserves are potential areas for settlements and infrastructural development is still widely held by many people in the region, hence the reasons for legal conservation of forests from agricultural land expansion through cultivation, grazing and permanent settlements or dam construction or road infrastructure or building of schools. Due to the fact that land and natural resources are some of the benefits that can be offered for political and economic reasons, this lends forest resources to various political interference and influence peddling and has contributed to the creation of sophisticated networks that continue to extract various products from forests within the eye of powerless government agencies and communities adjacent to the forests.

Due to the long-term nature of forest enterprises most financial institutions give a wide berth, consequently mobilizing financial resources for investment in forest enterprises remain a challenge to many potential investors. Tree plantations are subjected to a number of social risks such as insects, diseases, arson, and deliberate vandalism in situations where there are conflicts over land ownership and use.

Some agricultural policies, such as subsidies on fuel and fertilizer and high crop prices to boost agricultural production, contribute to fast rate of conversion of forestlands to agricultural enterprises. There should be counter incentives to encourage sustainable forest development and conservation.

Plantation monocultures tend to be more vulnerable to pest and disease attack and these can frustrate the tremendous efforts and resources that have gone into establishment of commercial forest plantations in the region. The number tree pest and diseases and rate of spread in some cases has been worrying because in some cases little is known on distribution, host range, population variability and magnitude, making it problematic to effectively control them. The region has not put in place structures to enhance traceability and transparent mechanism such as chains of custody, hence cannot access markets that require certified products.

2.1.2 Primary production

The countries in the region produce various products from the forests that included saw logs, peeler logs, charcoal, firewood and various types of poles. In terms forest ownership Tanzania lead with over 48 million hectares, Kenya (38,412,000), Sudan (18,197,000), Uganda (3,604,174) and Rwanda with only 240,746 hectares in that order (Table 4). The countries in the region still rely heavily on firewood and charcoal as sources of energy, and the production estimates correlate well with the forest resources and population size for each country. Public and community forests provided the bulk of the stocks used for production of charcoal and firewood. Similarly, the available stocks for saw and peeler logs are mostly sourced from public plantation forests; however, private investors have entered into the sector to fill the shortfall in timber in the region. The new private sector investors include leading wood-based companies, syndicated private investors and large scale farmers that have been attracted by lucrative business in trees-based enterprises.

In eastern Africa expanded power generation and distribution has created high demand for transmission poles, mostly sourced from *Eucalyptus grandis* trees, making it one of the leading short rotation crops grown by private investors, and mostly for commercial purposes. In the last 10 years private sector investment in short rotation species mixes for various purposes have grown faster than public sector plantations in the region, especially in Tanzania and Uganda. The productivity of plantation forests indicates that Kenya realized greater yields per hectare at above 385m³/ha as compared to the rest of the countries in the region. The statistics in individual country reports on yield levels for forest plantations in Uganda, Rwanda and Tanzania may not reflect yields for high potential forest plantations, rather they may be national averages that include forest plantations located in low potential areas. The forest plantations provide sawlogs, poles and woodfuel, with Kenya and Uganda in the lead on these products.

Private sector investors deploy greater utilization models that include integrated utilization processing and value addition that minimize wastage and improve their operating profit margins. In Kenya the private sector business model is largely a diversification strategy adopted from core agricultural based business for profitable forest enterprises. It takes both vertical and horizontal integration dimensions depending on the core business of the investors.

In Kenya, large wood-based companies have been purchasing land for tree growing but the sector has limited room for expansion into the future due to shortage of land and competition

from agricultural enterprises and settlements. In Uganda and Tanzania, private sector investors have taken leases from public forest reserves to establish commercial plantation for own uses and surplus products for the local and export markets. In the region, all indicators show that private sector forests are here to stay and will leverage on efficiency in land use, efficient technologies and high demand for forest products to compete in local and regional timber markets. The private sector players are also gearing for the potential opening up of public plantations under forestland concessions guided by PPP model, especially in Kenya.

Table 4: Forest size and primary production for key products (m³/MT)

Country	Total forests(ha)	Productivity m ³ /ha	Sawlogs (m ³)	Poles (m ³)	Charcoal (m ³)	Firewood (m ³)
Ethiopia	-	-	-	-	-	-
Kenya	38,412,000	385-503	7,363,414	3,0328,907	7,358,717	13,654,022
Rwanda	240,746	150-220	961,927	-	48,000	5,000,000
Uganda	3,604,174	68-290	3,250,000	1,531,000	16,684,000	38,858,000
Sudan	18,197,000	-	9,800	298,000	173,000	286,000
Tanzania	48,702,000	37.7-171	58,004	-	17,546939	51,000,000

(-) indicates where no information was provided.

2.2 Secondary processing and manufacturing

Secondary processing and manufacturing of wood products involves transformation of roundwood by wood-based enterprises into various products such as sawnwood, furniture and wooden interior fittings, paper and paperboards, plywoods, doors, carvings and windows. Except for saw milling, transmission pole treatment plants and industrial biomass energy production, most woodwork activities are more of cottage industry than manufacturing (Table 5).

2.2.1 Sawmills

Sawmilling is the dominant forest industry in the region that is more developed in countries with vast plantations such as Tanzania, Kenya and Uganda. The sector is usually classified into three categories, based on processing capacity, into large, medium and small size-saw mills. However, in terms of product lines, sawmills are categorized into those which produce sawn timber (both treated and untreated), value added products and dry timber. Table 4 indicates that Kenya had the highest number of registered sawmills that number 633, Uganda (180) and Tanzania, though not reported, likely to be in hundreds. Tanzania hosts the largest sawmills in the region with SaoHill industries leading with capacity to produce 48,000m³, Kilombero Valley Teak Company (KVTC) at 45,000 m³ and Tanganyika Wattle Company (TANWAT) at 20,000 m³. In Kenya the saw milling sector used employ about 300, 000 people in forest and wood processing operations, transportation and other supporting services. Similarly, in Tanzania and Uganda saw milling employ thousands of people in logging, sawing and transport sectors. Kilombero Valley Teak Company owns the largest teak-processing sawmill in the world (KVTC, 2015), which is integrated with a drying facility and processing plant. The range of products from sawmills include sawn timber, floorings, cornice, and panels. Most countries produce sawnwood for local markets except for Tanzania that realized surplus that was exported to eastern and southern African countries.

Sawmills deploy a wide range of machines from simple machines that include power saws and bench saws to gang or band saws and woodmizers. Large and medium scale sawmills deploy the most advanced technologies with high recoveries as compared to most small-scale sawmills that are equipped with inefficient and wasteful technologies whose conversion efficiency ranges between 26-35%, thus about 70% of wood is wasted. Mobile power saws are the most inefficient with an estimated recovery rate of 25%.

2.2.2 Paper and paper products

Pan Africa Paper Mill (PPM) in Kenya is the largest in the region with installed capacity of 100,000MT/year of paper products and intake of 500,000 m³ of pulpwood and 250,000 m³ of firewood per year. The second mill is the Mufundi Paper Mill (MPM) in Tanzania with capacity of 46,000MT. The region depending on roundwood supply potential still has room for more industries to meet is growing need for paper and paper products. The region also has many small-scale paper manufacturing plants that utilize recycled paper and other materials. In Kenya there are 13 paper products manufacturing mills that use recycled paper to produce various paper products; the key ones being Chandaria Industries located in Nairobi, and Highland Paper Mill located in Eldoret.

2.2.3 Reconstituted wood products

These products are largely in the domain of three Kenyan based industrial complexes, namely Rai Ply, Comply and Timsales, that are involved in integrated wood processing that ranges from saw milling to plywood and particle boards manufacturing. They produce a range of products such as plywood, particle and chip boards, block board, hard boards, chip board, melamine, machined timber, furniture, flooring tiles, MDF and blocks. However, they have diversified into manufacturing of foam and polythene bags for local and export markets. These industries have also expanded their operations into Tanzania, Uganda and Malawi. In Tanzania Tanganyika Wattle Company (TANWAT) produces 40,000 pieces of plywood per year. In Uganda a few small sized plywood mills that utilize smallwoods are in operation, mostly deploying inexpensive Chinese machinery and manual processing, mostly for domestic markets.

2.2.4 Domestic and institutional firewood

Firewood for domestic and institutional use is the largest consumer of roundwood in the region and accounts for over 90% of roundwood extraction and over 80% of national energy requirements. In Kenya firewood accounts for 94% of roundwood extraction from forests and woodlands. This translates to 34.3 million metric tonnes per year requiring 538,000 hectares. In Uganda and Rwanda the national firewood requirements are estimated 31 million and 5 million m³ per year. The firewood sector is dominated by household subsistence demands, with the balance being used by institutions such as schools, hospitals and restaurants that heavily rely on firewood for cooking and heating. In the region firewood trade is dominated by informal players including rural producers, rural and urban traders, with some slice being taken up by transporters. Since the countries in the region rely heavily on firewood, high consumption rates will still prevail in the foreseeable future, even with promotion of cleaner energy sources, mainly due to high cost and difficult access to such alternatives.

2.2.5 Industrial firewood

In the regional key users of industrial firewood are textile, food and chemical processing industries, and recently in generation of electricity. Kenya reported a diversified industrial consumer that include tea sector that consist of 94 factories with annual intake of 1.5 million m³, with an estimated value of USD 22 million. Tanzania and Uganda also have tea factories that use firewood in tea processing. Other industrial uses of firewood in the region include tobacco curing, textile and food industries, mostly in Kenya.

2.2.6 Production of charcoal

Charcoal production is the second largest consumer of roundwood in the region after firewood. Kenya consumes an estimate of 16.5 million metric tonnes, translating to harvesting 240,000 hectares per year. Roundwood demand for charcoal production in Uganda, Sudan and Tanzania has been estimated at 11 million, 49 million and 17.5 million m³ per year, respectively. The charcoal production is dominated by small scale and irregular producers deep in the rural areas. Charcoal is an important source of energy for cooking for most urban and rural households in the region and is a highly traded forest-based commodity. Except in Kenya and Sudan where pockets of sustainable production of charcoal from *Acacia mearnsii* and various indigenous Acacias, most charcoal in the region is produced unsustainably from woodlands and bushlands of the arid and semi-arid lands (ASALs). The charcoal production projection for the future indicates progressive fall in supplies in major production areas in the region; mostly attributed to decline in trees available from woodlands and farmlands. The forecast indicate that the charcoal market demand will remain high. Charcoal production in the region still remain a wasteful process with conversion efficiency of between 20% and 30% indicating over 70% of the wood materials are lost.

In the region charcoal production and marketing is a big business. In Kenya and Tanzania annual charcoal demand is estimated that 2.4 million and 2.3 million metric tonnes of charcoal being traded annually. The sector in Kenya is reported to earn USD 530 million per year and support directly 200,000 producers and indirectly 700,000 persons employed in the market value chains with an estimated 2 million dependents (Wamugunda, 2014; Cheboiwo and Mugo, 2012; ESDA, 2005). In Tanzania the value of charcoal consumed is estimated at US\$500 million (Sawe, 2009).

2.2.7 Wood carving

Traditional wood carving has been an integral form of artistic expression and use among the communities in eastern Africa, especially among the Makonde and Zaramo tribes of Tanzania and Kamba in Kenya. Kenya has the most established wood carving industry in the region that revolves around key production sites mostly Wamunyu in Machakos County and Ukamba Wood Carving Cooperative Society (UWCCS) in Mombasa city. The wood carvers prefer specific tree species, mostly indigenous species, for carving such as *Dalbergia melanoxylon*, *Terminalia brownie*, *Azizelia quanzenis*, *Jacaranda mimosifolia* and *Combretum schumannii*. The sector in Kenya is estimated to employ about 60,000 people with an estimated export value of US\$20 million per year (Choge, 2002; Cunningham et al, 2007). The major market destination for Kenyan wood carvings is mostly the U.S., United Kingdom (U.K.), Sweden and Norway. Currently, the wood carving sector is facing several challenges that include shortage of quality wood, ban on harvesting in natural forests, green consumerisms in western countries, and competition from other countries.

The combination of these factors have seen production and exports from Kenya shrink by 75% (Hamilton, 1996); and this is likely to worsen in the future.

2.2.8 Construction poles

In Kenya, construction poles are used in a variety of activities such as low-cost construction works such as scaffolding in high-rise buildings, and construction of mud houses and kiosks. Construction poles also form the bulk of the materials used in expanding slum areas in major urban centres. Construction poles are bulky and low value end products that tend to be supplied from adjacent areas to consumption centres. Construction poles are mostly produced from farms from various species such as Eucalyptus, Pines, Cypress and many indigenous species. In the coastal region of Kenya *Casuarina equisetifolia* poles are in high demanded for construction and renovation of *makuti* (grass thatch) buildings popular with tourists. The demand for poles has been on the increase due to vibrant construction activities in many urban centres that require poles for scaffolding and props. In Kenya the annual supply of poles is estimated at 3,028,907m³(MEWNR, 2013).

2.2.9 Transmission poles

The use of wooden poles to transmit power and support telecommunication has a long history that has supported growing and processing transmission poles, mostly in Kenya, Uganda and Tanzania. The sector has witnessed fast growth in the last decade due to expanded power generation and distribution. For example, in Kenya in 2004 there were only 2 treatment plants in the country capable of processing 160,000 power transmission poles per year that grew to 55 plants by 2015 with a capacity to process 2 million poles per year (Cheboiwo, 2016). This wooden transmission poles sector in Kenya is valued at USD 64 million (KES 6.4 billion) spread across tree growers, loggers/harvesters, treatment and transportation actors. However, the utilization capacity of the treatment plants has remained low due to their massive expansion that has created severe competition among the plants for a stagnant national demand capacity of 600,000 poles per year. Other factors that influence capacity utilization include unpredictability of tendering process of key institutions like Kenya Power and Electricity Company (KPLC) and Rural Electrification Authority (REA) that make it difficult for manufacturing plants to synchronize acquisition of semi-processed poles and import of treatment chemicals from overseas suppliers. Similarly, the sector has grown from one each in Uganda and Tanzania in 1999 to 5 and 7 respectively by 2016 with production capacity of 475,000 and 520,000 respectively mostly for domestic use and surplus for export to Kenya.

2.2.10 Furniture and joinery

Furniture and joinery are some of the most vibrant enterprises owing to the fast-growing construction sector and increasing urban population. The sector is characterized by hundreds of micro, small- scale units and few medium scale units located in rural and urban areas as formal and informal businesses. The furniture making is a labour-intensive, low-startup cost investment that can be operated in rural and urban areas (Indufor 2011). The less stringent and enabling characteristics of the industry make it a potential employer of most youths who leave primary and secondary schools and then find themselves jobless thereafter. Softwood and hardwood timber are commonly used, and mostly sourced from species of Cypress, Pines, Eucalyptus and mahogany.

In Kenya, furniture and joinery is reported to rely on hard work and ingenious use of resources to survive and is estimated to consume 262442 m³ of timber per year with coffins taking up 184,800m³ (Githiomi, 2010). The sector supports about 160,000 people in the forestry and manufacturing sectors of the economy. The sector is highly diversified with different types of machines, ranging from imported to locally fabricated wood lathe, bench/handsaws and clamps, among other tools and equipment. The sector supplies the needs of the local people and offer limited exports.

In Tanzania furniture businesses are organized in clusters within urban centres. For example, in Dar es Salaam the clusters are in places such as Keko, Manzese, Kinondoni-Biafra and Kinondoni Moroko, among many other areas. These clusters engage between 10 people in Manzese to close to 1000 in Keko. In these clusters, some work as producers of furniture while others are sellers or brokers of furniture. The product lines are very diverse; they include home and office furniture, parts of furniture, and of recent, is the upcoming metal furniture.

In Uganda NAFA (2009) reports that there are many groups of individuals involved in furniture and joinery with clusters in many areas, for example in Ndeeba and Bwaise in Kampala city. This section of the industry plays a critical role of supplying low-cost furniture products while providing employment opportunities to marginalised groups, particularly youths and women. There is however a number of medium sized firms employing relatively advanced technology to produce high-class furniture. These include Hwang Sung Furniture Company, Elimu Furniture Company, Lotus Arts, Kaava Furniture Company, and Master Wood Furniture Company (Kizito, 2009). Due to shortage and high cost of premium timber some furniture makers have resorted low cost and poor-quality timber sourced from mango (*Mangifera indica*), Eucalyptus, Grevillae robusta and even Avacado (*Persea americana*) that were never used for furniture in past and are now common in the market.

The annual furniture sales in Kenya is estimated at US\$496 million with an estimated annual growth rate of 10% and import and export values of USD 66 million and 22 million respectively (World Banks, 2014). The same study estimates that the East African furniture market is valued at US\$1.2 billion per year, whereas the intra-regional trade is worth a paltry US\$298 million per year. The sector needs urgent reforms to address problems of quantity and quality raw material supplies, appropriate technologies, skilled manpower and incentives to attract investments.

2.2.11 Non-Timber Forest Products (NTFPs)

The region, due to diversity of forest resources and ecological conditions, produces a wide range of non-wood forest products that include rattan and bamboo, aromatic oils, bee products, herbal medicine, wild coffee, mushrooms, wild fruits, gums, tannins, Prunus bark and resins, among many others. These products are harvested and processed by small-scale harvesters and offer opportunities for improving livelihoods of rural communities living close to the forest resources, in addition to others who process and trade in them. NTFPs are easily accessible, require little capital investment for collection, processing and marketing, while their production is relatively less destructive compared to timber.

In the dryland woodlands, some of the key NTFPs include myrrh, baobab fruits, tamarinds, Aloes and shea butter. Generally, major actors in NTFP extraction are the communities living around forests who harvest the products individually or as a community depending on local arrangements. In Kenya, the potential export of Prunus bark is estimated at USD 17 million per

year. The potential for Gum Arabic exports from Sudan and Kenya is also estimated at 30,781 MT and 3,000MT valued at USD 454 million and USD14 million respectively.

The beekeeping sub-sector is another potential employer. In Tanzania the sector generates about US\$ 19 million per annum and employs some 2 million people but holds greater potential given that the country has only exploited 3.5% of its production potential (MNRT, 2001).

Tannin production from *Acacia mearnsii* is another important activity that supports 3 factories in Kenya and 2 in Tanzania with estimated annual outputs of 46 MT and 2810 MT respectively. Tannin production in Kenya fell from 25,000 MT in 1998 to 5340 MT by 2003 and to paltry 46MT by 2015 despite the growing demand from vibrant leather industry in Kenya estimated at 10,000MT. The country imports the bulk of its tannin from Tanzania.

Table 5: Annual consumption of roundwood by various sectors in the region.

Product	Ethiopia	Kenya	Uganda	Tanzania	Sudan	Rwanda
Number of sawmills and roundwood intake in m ³	-	633(500,000)	180(2,317,000)	156,800	1,4300,000	961,927
Roundwood for charcoal production in m ³	-	16,500,000	11,180,000	17,546,939	49,000,000	48,000
Key wood carving sites and wood intake m ³	-	2(14,400)*	-	-	-	-
NTPs						
Number of plants and pole intake in pieces	-	60(600,000)	7(475,000)	5(520,000)	-	-
Number of industries and roundwood intake in m ³ (Fibre/particle boards)	-	8(250,000)	4(-)	3(13,767)	-	-
Number of plants and plywood in pieces	-	5(-)	-	1(40,000)	-	-
Number of factories and pulp and paper and roundwood intake m ³ /MT	-	1(500,000m ³)	-	1(46,000MT)	-	-
Number of furniture	-	Many(262,472)	5,000(8,300)		1,300	459(-)

makers and roundwood intake in m ³						
Number of tea factories and firewood intakes in m ³	-	65(1,592,000m ³)	12(-)	-	-	-
Number of textile and food industries and firewood intake in m ³	-	22(325,244)	6(312,000)	-	-	-
Firewood for tobacco processing in m ³	-	78,000	150,000	-	-	-
Firewood for schools and other institutions in m ³	-	30,000,000	31,980,000	-	-	5,000,000
Gum Arabic production in MT	-	3,000	-		30,781	
Number of factories and tannins outputs MT	-	3(46)	-	2(2,810)	-	-
Production of other poles in m ³	-	3,028,907	-	-	-	-

*Two large cooperatives societies with hundreds of small-scale operators, and
(-) indicates where no information was provided.

2.3 Organization and linkage among actors

In general, the forest sector's actors are largely disaggregated with limited vertical and horizontal integration by few corporate players in the primary forest production; however they appear to be pursuing a strategy of vertical integration. Most of the associations are at infancy stages, still being supported by government and bilateral agencies. The main objectives of such associations are to influence policy and legislation, support members on technical issues, marketing and sharing experiences amongst members. However, most actors in the secondary forest production operate on an individual basis and many do not belong to trade associations. Some actors are engaged in informal networks and contractual arrangements. The grouping of the actors in the forest sector in the region is given in Table 6.

In Kenya there are two apex tree growers' associations: Farm Forestry Smallholder Producers Association of Kenya (FF-SPAK) with 6 affiliates with estimated 10,000 members. The larger one, the Kenya Forest Growers Association (KEFGA), is an umbrella tree growers' group with more bias towards large scale players in the country. KEFGA is better organized with well-structured national office bearers and its members pay registration and annual subscription

fees based on forest woodlots size. Charcoal Producers Associations (CPAs) is an umbrella body that brings together individual charcoal producer groups, and is an outcome of the subsidiary legislation the Charcoal Rules 2009 to promote sustainable charcoal production in the country. Timber Manufacturers Association (TMA), formed in 1981, is another umbrella group that represents the interests of saw millers countrywide. Kenya Wood Preservers Association (KWPA) is a membership organization that draws members from wood treatment plant owners and suppliers of treatment chemicals whose objective is to promote the preservation of wood in the country to international standards for longevity in use, convenient to use and attractive to customers. The KFS under Forest Act 2005 has entered into participatory Forest Management (PFM) agreements with registered 97 Community Forest Association (CFAs) countrywide to manage 1,000,000 hectares; however, sharing of benefits remains a contentious issue.

In Uganda, the Uganda Forestry Working Group (UFWG) is a network of CSOs, academic and research institutions with the mission of promoting the development of the forestry sector and stimulating forestry stakeholders to respond to sector changes and challenges. Uganda Timber Growers Association (UTGA), formed in 2006, is comprised of individuals and firms engaged in development of forestry in the country. The association was formed in 2006 and now boasts of wide membership including small, medium and big tree planters across Uganda.

In Sudan, the Gum Producers Association is an umbrella association representing over 1344 groups with 99096 members. It is managing forests estimated at over 6 million hectares. It is the largest producer group in the region.

Tanzania has the widest range of organized players in the primary forest production that include Federation of Small-Medium Forest producers (SHVIMITA), Sao Hill Forest Industries Association (SAFIA), Norther Forest Industries Association (NOFIA) and Tanzania Private Sector Development, whose members range from individual investors in the forestry sector to large, medium and small-scale companies. The forest-based companies include Mufundi Paper Mills (MPM), Fibre Board Africa Ltd (FAL), Tanganyika Wattle Company (TANWAT), New Forest Company (NFC), Kilombero Valley Teak Company (KVTC) and Saohill Industries Ltd (SHI). Smallholder tree growers' associations include 150 tree growers' associations (TGAs) most still at formation stages with the supported of the Private Forestry Programme (PFP). KVTC supports tree out-grower schemes through supply of quality seedlings, fertilizer and purchase of logs. In the furniture sector the apex body is the Tanzania Wood Working Federation that represents all wood furniture makers. It is more active in Dar es Salaam with minimal presence in the regions. In the wood carving sector, the Makonde Handicrafts in Dar es Salaam represent wood artisans and handcart sellers in Mwenge and Kinodoni district of Dar es Salaam with smaller groups in Lindi, Mtwara, Morogoro and Ruvuma.

In Tanzania the collaboration between community and government under joint forest management (JFM) and participatory forest management (PFM) is one of the largest in the region and involves 1,052 villages and covers forest area of 5,392,095 hectares. Under JFM and other PFM initiatives, communities and the government, under Forest Act 2002, enter into agreement to co-manage specified forests.

Table 6: Technical and commercial organizations of forest production.

Product	Ethiopia	Kenya	Uganda	Tanzania	Sudan	Rwanda
Smallholder producer association		**	**	**	***	*
Secondary manufacturers association	-	**	*	**	-	-
Community associations	-	**	**	***	**	**

*Infancy stages: ** Operating and medium capacity: *** active and strong in provision of service to members. (-) indicates where no information was provided.

2.4 Gender and forest production

The regional synthesis acknowledges the fact that men, women and youth have different gender-based responsibilities, needs and priorities, as well as knowledge of, access to and control over the local environment, and forests in particular.

In Sudan women are involved in gathering of food, fuelwood, fodder, medicinal plants and raw materials for small industries. Men are generally engaged in large scale firewood collection mostly for sale. In general, women are excluded from decision and policy-making process at local and community levels. However, at professional level, the proportion of women among professional foresters in FNC and its provincial administrations is reasonably high, and they take active role in decision making.

In Kenya, traditional customs and conventional policies and legislations guide gender related land control and access to forest resources on day today basis. Therefore, participation of women in forestry cannot be complete without reference to prevailing land tenure systems, and women's rights to access, use and ownership of land. The Sessional Paper No. 3 of 2009 on National Land and Land Use Policy provided avenues for women to own land and other properties. Although existing policies and legislations are not primarily discriminatory with regards to women owning land, the World Bank Report (2007) indicates that women owned only 1.5% of all titled land in the country; that attests to the property relationship between men and women that is shaped mostly through traditional customs and marital arrangements. This is the case despite the fact that that 30.9% per of households in the country are female headed (CBS, 2006). In most cases land asset ownership in rural areas is transferred through males in the family tree. Therefore, women currently face natural resource and asset vulnerabilities because their access rights are still dominantly related to kinship and marital relationships. However, women participation in employment opportunities in primary and secondary forest production are only limited by few factors such as time available outside family commitment and strenuous menial challenging jobs such as logging and heavy machine operations. However, women dominate in some key primary production activities such tree nurseries and forest products market value chain such wholesaling and retailing in both urban and rural areas of such products as firewood, charcoal and NTFPs.

In Uganda the Land Act (1998) provides for non-discrimination against women but gender disparities in land ownership persists as only 7% of the land in Uganda is owned by women (Mukasa *et al.*, 2012). This is because most land in Uganda is acquired through inheritance, which favours men over women. In addition, under most land tenure systems, women's rights to land are largely limited to usufruct rights. This is a barrier to women's participation in

production forestry since most of them do not own land and have to first seek for consent from their spouses if they want to plant/sell trees. Women's limited control over productive resources also affects their access to credit facilities that are crucial for investment in tree planting. It is generally believed that forestry is a male domain because men do most of the work in tree planting activities in terms of clearing land, acquiring seedlings, planting, weeding and management. However, despite beliefs that women lack physical strength and courage required for most non-managerial forestry jobs, women constitute a significant proportion of the work force in the forestry sector (Mukasa *et al.*, 2012).

In Rwanda, as availability of forest resources decrease this often severely increases women's labor, especially with regard to the time required to gather firewood, and the cost of purchasing it; hence negatively impacting household nutrition. The country policies and legislations promote equality of men and women in all socioeconomic activities including forestry. Despite the equality a study by NISR showed that there is inequality of gender participating in agriculture, fishing and forestry, where male represent about 82% compared to women (61%).

In Tanzania gender inequalities surface in both forest products use and forest activities. For example, men are more dominant in the production of charcoal and bee products while women dominate firewood collection (MNRT, 2014). In forest-related institutions female employees are fewer than men, especially at the managerial levels. The same is replicated in enrolment in forestry training and higher learning institutions. However, in recent years, there has been a remarkable improvement in women enrolment, particularly in higher learning institutions. For example, in Sokoine University of Agriculture (SUA), female enrolment into BSc forestry programme constituted 25%, 29% and 22% in 2013/2014, 2014/15 and 2015/2016 respectively. In tree growing associations (TGAs) on average, women make about 35.7% while men take up the remaining 63.4% of all TGAs members (MNRT, 2011). However, women involvement in TGAs leadership varies: chairperson (0%), secretary (18%), and treasurer (82%) (Vainio-Mattila, 2011).

The roles of gender in forestry appear to evolve over time in response to changing circumstances, needs and interests; as well as the forests grow, shrink, change and shift, so gender roles and relations also undergo constant renegotiation.

2.5 Policies and legislations in relation to PPPs in forest sector

Most of the countries in the region have some policies and legislations in place that can support implementation of PPPs in the forest sector. However, the existing political, policy and legislative frameworks appear to favour them to more high cost infrastructure developments such as petroleum pipelines, ports, roads, tourism, housing, railways and water and sanitation. Other sectors, including forestry, have put in place some policies and laws that relate to development of some variants of PPPs.

In Kenya, the supporting instruments include the multi-sectoral PPP policy 2013 and PPP Act of 2013 and the National Forest Policy 2016 and National Forest Conservation and Management Act 2016. The Forest Act 2016 sets out conditions for forest concessions and management agreements for private sector players and proposes development of subsidiary legislation to operationalize the concessions. The 6th principle of the Draft Forest Policy 2016 states that the government will encourage private sector participation in the establishment and management of forest plantations on public and community land through granting of concessions on a competitive basis. However, no such concession has taken place so far.

In Tanzania there are two main types of PPPs namely for operation of existing public assets or PPPs for development and operations of new facilities. In the forestry sector the former PPP type is observed and is well supported by the Forest Policy (1998) and the Forest Act (2002) through participatory Forest Management (PFM) and concession arrangements.

In Uganda the PPP engagements are supported by various instruments that include Framework Policy (2010), the Public Private Partnerships Act (2015) and guidelines on Public Private Partnerships for Local Governments. The Forest Policy (2001) emphasizes the important roles the private sector has in developing and managing commercial forestry plantations in the country. The key areas for PPP consideration include forest management and utilization.

In general, most countries in the region have policies and legislation in place to support development of PPPs in the forest sector. However, the study confirmed that despite some countries having favourable policies and legislative frameworks to support PPPs, all the countries studied had no forestland concession in operation due to lack of specific legislation on forest concession in place. However, land leases for plantation development are in place in Uganda and Tanzania.

Table 7: Policies and legislations to support PPPs in the region.

Instrument	Ethiopia	Kenya	Uganda	Tanzania	Sudan	Rwanda
National forest policy	-	√	√	√	√	√
National forest legislations	-	√	√	√	√	√
National PPP policy	-	√	√		×	×
National PPPs legislation	-	√	√	√	×	×
Forest sector PPP policy statements	-	√	√	-	×	√
Forest legislations on PPP and forestland concession	-	√	√	√	×	×
Policy and bills on PPPs at formulation stages	-	-	-	-	×	×

√ in place, x not reported, and (-) indicated where no information was provided.

2.5.1 Potential forest PPPs sector

Public Private Partnership (PPP) is an arrangement whereby the private entities invest, manage and assume service delivery in public sector property for a significant period of time and in return, receives benefits/financial remunerations according to agreed terms. PPPs are therefore a cooperative venture built on the expertise of each partner that best meets clearly defined public needs through the most appropriate allocation of resources, risks and rewards.

In Kenya, existing forest sector PPPs are more focussed CSR activities such as provision of financial support for creation of awareness and rehabilitation of degraded forests and putting up of electric fencing to keep wild animals away from farms to reduce people and animal conflicts. Some CSR initiatives include construction and maintenance of electric fences to protect Mount Kenya and Arabuko Sokoke forests in Kilifi and Eburu forest of East Mau Forest block. Some variants of PPPs include putting up governance structures for implementation and

monitoring of the projects that include Aberdares Forest (Ndakaini Dam Marathon), Mau Forest Complex (Mau Forest Marathon) and Cherangany Hills (Cherangany Forest Marathon), among others. The private sector players include those in telecommunications, insurance, financial, tourism, and banks, among others. The awareness campaigns have enhanced the visibility of key waters towers to greater public and resultant activities have enhanced forests conservation

In Sudan, the Forest National Corporation (FNC) has been working closely with farmers and local communities in rehabilitation of degraded forests. However, it is not able to implement large scale forestry programmes due to inadequate human and financial resources. Some of the successful collaboration includes Wad Annial Shaggat community forest reserve in Sinnar State that covers an estimated 67,000 ha where village communities are allowed to cultivate crops, graze their animals, tap and collect gum arabic from *Acacia senegal* trees. In Hawata area, 250 hectares have been brought under community 20-year management plan where they are allowed to harvest about 12.5 ha every year for sale to invest in village services such as construction of embankment to protect the village from river flood, schools and mosques. Hawata area covers 615 ha, mostly of *Acacia seyal*, *Acacia mellifera*, *Acacia senegal* and *Acacia nilotica* that are jointly managed by a private investor in accordance to approved work plan with the technical advice from FNC regional staff. The owner is allowed to harvest 25 ha per year for sale as firewood and conversion to charcoal; the revenue generated is shared with the regional forest office as royalties.

In Rwanda, the government is making efforts to build public-private partnerships to complement its efforts in forest protection and conservation, forest establishment and management, processing, value addition and trade, with the aim of ensuring long-term and sustainable supply of forest products and services. Presently, the private sector participation is biased to forest based industries, small scale processing, manufacturing and trade, and has limited participation in primary forest production. The National Forestry Strategy clearly emphasizes public private investment in forestry through 7 out of 14 principles that guide the implementation of the strategy. These principles include sustainable forest management (SFM), commercialization of forestry operation, stakeholder involvement and partnerships, and private sector involvement in forest management and processing of forest products, leaving the public sector only the regulatory function, research and quality assurance.

In Uganda, some of the many variants of PPPs currently operating in the forestry sector include initiative partnerships between the Government of Uganda (GoU) and Forests Absorbing Carbon Emissions (FACE) that involve rehabilitation of 10,000 ha of degraded forest areas in Kibale and 25,000 ha in Mt Elgon National Parks. Another is the World Bank Biocarbon Fund and the Government of Uganda in conservation of the Rwoho Central Forest Reserve in Mbarara District in collaboration with local communities. The International Small Group and Tree Planting Programme (TIST) is a joint initiative of the Institute for Environmental Innovation (I4EI) and Clean Air Action Corporation (CAAC) that operates in three sites (Bushenyi, Kabale and Kanungu) to empower small groups of subsistence farmers to rehabilitated degraded forests, tree planting and sustainable agriculture. Under the PFM framework several communities are engaged in Collaborative Forest Management (CFM) arrangements with NFA to manage Central Forest Reserve (CFR) in which rights, responsibilities and returns for the communities include access to forest products such as firewood, medicinal extracts, herbs, ropes, building poles, and vegetables. These CFM arrangements are being implemented in Budongo, Bugoma, Mabira, Echuya, Kasyoha-Kitomi, and Sango Bay forests. The Saw Log Production Grant Scheme (SPGS) is a joint initiative between the Government of Uganda (GoU) and EU that is involved in building capacity of

private tree growers in commercial tree growing in CFRs. So far, some 11 000 ha have been established to the required standards and an extra 30 000ha are targeted. Tree growers are provided with technical knowledge and financial assistance (rebates) that are critical to the success of forest plantation development. Another variant of PPP being implemented by NFA and private sector players, in line with government policy, lease parts of the central forest reserves for private plantation development under fast maturing species particularly pine and eucalyptus.

In Tanzania, PFM and joint forest management (JFM) is anchored in the Forest Act of 2002, which provides a clear legal basis for communities, groups or individuals across mainland Tanzania to own, manage or co-manage forests under a wide range of conditions. The co-management of forests between government and communities is not popular because of lack of clear-cut cost-benefit sharing mechanisms between the parties. The principle of fair, social inclusion, community welfare arrangements are not provided for in the law (Simula and Kaduvage, 2005); however some of those that hold good potential include those based on JFM between central government and TGAs. TGAs are new but upcoming players in the forest sector; JFM between village governments and TGAs, or between community groups and TGAs, and also out-grower arrangements between tree farmers or TGAs and wood-based companies. The leasehold agreement between community groups and private companies are the most successful PPP variants in Tanzania where the two parties enter into an agreement where the government retains the guarantor status for such agreement. Many international investor syndicates, companies and individuals have entered into leasehold arrangement that has put hundreds of hectares under forest venture in the country. Under the leasehold schemes Green Resources has established 12,000 hectares of plantation forest in Iringa Province. In the same region Mufindi Pulp and Paper Mill has established 3,000 hectares. Others include Kilombero Valley Teak Company (KVTC) with 8,162 hectares of teak plantation and TANWAT (14,000ha). These arrangements look more likely to improve social inclusion, address gender aspects and enhance the livelihood of the communities, especially when they operate within the boundaries of bylaws set by communities themselves.

A concession arrangement as put by PPP policy (2009) is an arrangement whereby the government grants private entity exclusive rights to provide, operate and maintain an asset over a long period of time in accordance with performance requirements set forth by the government. The public sector retains ownership of original asset while the private entity retains ownership over any improvements made during contract period. In Tanzania there is no forest concession in operation (Ngaga, 2011) and if one was operational, mechanisms for monitoring forest concession are not available (PFP, 2015).

Table 8: Potential PPPs models in the region

Product	Ethiopia	Kenya	Uganda	Tanzania	Sudan	Rwanda
Community associations participation in management of forest reserves	-	√√	√√	√√	√√	√√

Product	Ethiopia	Kenya	Uganda	Tanzania	Sudan	Rwanda
Private sector participating in primary forest production under forestland concessions	-	√√√	√√√	√√√	√√√	√√√
Private sector participation in forest reserve conservation under CSR	-	√√	√√	-	-	-
Private sector purchase of roundwood from public forests for industrial manufacturing	-	√	√	√	√	√

√ in place, √√ moderately rated and √√√ highly rated by private sector players and (-) indicates where no information was provided.

2.5.2 Present and projected wood production and demand

According to projections for the countries in the region, the supply and demand for various forest products indicate growing deficits in the next 20 years. Table 9 shows that all the countries in the region will face huge forest products deficits by 2030. Therefore, there is need to intensify productivity in public forest plantations and as well bring on board the private and farm forestry sector into the national wood supply grid. The nascent private sector and farm forestry are the only potential sector players that may realize some significant growth in both land areas and production; however, such expansion will be checked by the severe competition from agriculture and settlements. Another promising option is leasing or concession of public forest reserves to private sector investors to establish plantations and put in place integrated production and processing procedures. The profit driven private sector investment in primary forest production will enhance plantation productivity and processing operational efficiency that will put more wood on the market than under prevailing public sector mismanagement.

Table 9: Wood production and consumption in m3

Product	Ethiopia	Kenya	Uganda	Tanzania	Sudan	Rwanda
Production 2015	-	31,953,470	50,794,000		10,931,000	
Production projection 2030	-	61,021,000	80,200,000	-	4,387,000	-
Consumption 2015	-	43,289,150	-	-	25,128,000	350,000*
Consumption projection 2030	-	65,058,400	-	-	38,217,000	550,000

*Sawlogs for sawnwood production only, and; (-) indicates no information was provided.

2.5.3 Economic importance of forestry

In the region forest resources are some of the most important natural assets that produce a wide range of ecological, economic, social and cultural products and services for multiple stakeholders. Forestry sector contribution to the national GDP varies between the countries in eastern Africa and range from a high of 10.6% in Rwanda to 3.6% in Kenya and 4.5% in Uganda. In the region, it is estimated that over 90% of households depend on biomass energy most of which is in the form of firewood and charcoal derived from these forests.

In Uganda, forests offer many opportunities for poverty alleviation, economic development and environmental improvement. Estimates put the annual turnover of businesses in the forestry sector such as charcoal, poles, timber, furniture, crafts, firewood, fruits and seedlings at over \$100 million and these employ over 1 million persons (UBOS, 2010).

In Kenya, the forest sector is estimated to employ over 1 million persons in firewood, charcoal, saw milling and wood carvings market value chains. The forest sector annual turnover is estimated as follows: Charcoal market value chain is valued at KES 53 billion (\$530 million) and employs 700,000 people; Saw milling employs over 300,000 persons and its outputs are currently valued at KES 3.7 billion (\$37 million); market for furniture is valued at KES 49 billion (\$496 million) while employing over 160,000 persons; wood carving employs 50,000 persons and is valued at KES 2 billion (\$220 million); transmission poles sector is valued at KES 6.9 billion (\$69 million), industrial firewood for tea processing is valued at KES 2.2 billion (\$22 million) and gums and resins exports are valued at KES 36 million (\$0.36 million). The country is the region's largest market for furniture, paper and paper products and wood panels, mainly from Asia and Europe. Therefore the deficit in both primary forest production and manufactured wood products provides huge opportunities for investors in primary production and secondary forest production sectors, in addition to marketing and trade in various forest products.

In Rwanda, the firewood and charcoal market value chain supports about 50,000 households, that is approximately 2.8% of the entire population, and its annual estimated value is USD 2.6 billion (GTZ, 2008). Studies show that tree growers earned 22% of the consumer prices, charcoal burners (7%), transporters (10%), wholesalers/retailers (13%). In Kigali it is estimated that more than 30,000 families are dependent on charcoal business. The tourism and ecological potential of forests are also estimated to be high in terms of tourist attractions, hydroelectric potential, and support to agriculture and carbon sequestration.

In Sudan the contribution of gum arabic to the world market stands at 52% and the forest sector contributes 10% to the country's GDP (Nour H.O A. (2014).

Tanzania is an important player in forest production and trade in forest products the region. The forestry sector, through its various commodities value chains support employment opportunities for over one million persons. The forestry sector contribution to GDP is estimated at 13% which is relatively high in the region.

Table 10: Forest sector contribution to the GDP and employment

Product	Ethiopia	Kenya	Uganda	Tanzania	Sudan	Rwanda
Employment		1,000,000	1,000,000	1,373,000	-	100,000
Value USD		785,440,000	-	-	-	2.6 billion
GDP		3.6	4.5	13	10	10.6

(-) indicates where no information was provided.

2.5.4 Trade in forest products

Most of the countries in the region are net importers of tree products, mostly manufactured paper and paper boards and plywood, among other products.

Kenya, despite being the most industrialized in terms of the number of wood-based industries in the region, remains a net importer of various products that include timber, paper and paper products, wood-based panels (Table 11). The exports from Kenya include paper and paper products, wood-based panels and pulp and recovered paper. For example, in 2014, Kenya imported 47 million metric tons (MT) of wood-based panels and exported 3.5 million metric tons of the same. In the period 2010-2015 the value of imports was USD 1.8 billion as compared to USD 350 million worth of exports (Cheboiwo and Kiprop, 2016). The trend in imports on average is on the upward side, whereas exports are on downward trend, indicating the country's balance of trade in forest products is negative. The exporters of forest products to Kenya include China, South Africa, Malaysia, Tanzania, Turkey, Germany, Thailand, India, USA and Sweden among many other countries. Kenya exports various wood products which include cork, wood carving, paper, wattle bark extract etc., to different countries mostly in Africa. These include Sudan, Democratic Republic of Congo, Rwanda, South Africa, Uganda, Tanzania, Ethiopia, Cameroon, Zimbabwe and Western Sahara. Kenya also exports to other parts of the world namely Israel, Italy, England, Belgium, Norway and China.

Tanzania is one of the key exporters of various tree products in the region, mostly to Europe and Asia. However the exports have been declining to these continents as compared to the fast growing exports to eastern and southern Africa countries. The range of products exported from Tanzania include roundwood, paper and paper board products and wood articles. However, sawnwood exports fell from 280,564m³ in 2012 to 166,878 in 2014 and the corresponding value from USD 12.6 million to 10.5 million in the same period. A similar trend was also observed for honey (Table 11).

In Sudan the major export commodity has been Gum Arabic, that on average was 30,781MT per year with a value of \$45.4 million. Rwanda and Uganda realized minimal exports but have increasingly become importers of various manufactured forest products.

Table 11: Forest product trade and values in USD

Product	Ethiopia	Kenya	Uganda	Tanzania	Sudan	Rwanda
Quantity imports m ³	-	-	6906		-	6,000
Value of imports* USD	-	241,336,181	-	51,500,000	20,000,000	-
Quantity export	-	-	-	58.67m ³	30,781MT#	-
Value of exports USD	-	40,841,099	-	63,820,000	45,400,000	-
Sawnwood exports m ³	-	-	-	166,878		452
Value of exports USD	-	-	-	10,500,000		-
Sawnwood imports m ³	-	38,506	-	-	-	-
Value of imports USD	-	28,900,000	-	-	-	

Product	Ethiopia	Kenya	Uganda	Tanzania	Sudan	Rwanda
Honey export	-	-	-	0.85MT	-	-
Value of exports USD	-	-	-	203,573	-	-

#Gum Arabic and (–) indicates where no information was provided.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

In the region, primary forest production takes place in public, private and community forests. The diversified ecological and climatic conditions experienced in the region support a wide range of indigenous and exotic species adapted to highlands, lowlands and drylands conditions. The plantation and indigenous species provide a wide variety of commercial products such as saw logs, poles, peeler logs and firewood for both subsistence and industrial purposes. The most productive forests in the region are located in the high and medium potential agricultural zones that fall under private and public ownerships. However, the largest category of forests the woodlands are located ASALs and are mostly owned by communities and local governments. In Kenya and Uganda public natural forests are, by policy and legislation, protected for biodiversity and water provisioning services but still face unprecedented degradation through overgrazing, tree cutting, poaching, charcoal production and encroachment by illegal settlers. While forests reserves and those on farms are declining, the demand for various forest and tree products is increasing very fast implying that plantation forests will play an increasing role in the production of various forest products in the near and distant future.

The key actors in both primary and secondary forest production in the region are many, varied, and in some cases unique to the respective countries. The actors include public agencies, private sector firms, community organizations, TGAs, CBOs and NGOs, social investors, development partners, transporters and traders of forest products, financing institutions, providers of inputs and services, the media, forest users/groups, politicians, and other forest land users. Interests of such groups/entities have to be taken into account in plans in order to adequately address their needs and in ways that could make forestry sector operate effectively and efficiently.

Secondary forest production is dominated by private actors that include saw millers, manufacturers of reconstituted wood, charcoal, furniture, non-timber forest products, wooden transmission poles, paper and paper products. The level of investment in processing technologies varies depending on the sectors, actors, and technology requirements. The secondary forest production is dominated by saw milling, that vary in size and equipment deployed- from the high recovery advanced large-scale mills to artisanal power saw and hand saw operators with low recovery rates. Another key secondary forest production sector is furniture making; which is dominated by small-scale operators, mostly located in urban areas where there are ready markets for the various products. In most countries in the region

charcoal production is a very important activity that has created thousands of jobs and support many livelihoods in its value chain. Others include few reconstituted wood industries and wooden pole treatment plants that are located in countries with vast forest plantation resources, mostly Kenya, Tanzania and Uganda. In the region the secondary forest production and subsequent manufacturing sectors face numerous challenges ranging from inadequate roundwood supplies, inefficient technologies for better conversion, high transaction costs, lack of specialized skills, high cost of credit, inadequate transport infrastructure and unfavourable policy and legal environment.

In the region, the primary forest production is dominated by farm forest producers, that in some cases are organized into many grassroot and apex associations that vary from country to country. The largest by coverage and membership are the GAPAs in Sudan that are involved in production, processing, distribution and marketing of Gum Arabic. In East Africa most TGAs are at infancy stages, both at grassroots and apex levels. They still need lots of support to transform primary small-scale producers into stronger, united and more vibrant associations that will serve the private sector better in lobbying for better policies and legal environment. The secondary forest production is dominated by saw milling associations that draw their membership from individual saw millers. Smaller groups include furniture makers, wood carvers and wooden pole preservers associations that represent the interests of the respective membership.

The links between primary and secondary forest production in the region is still weak and need good will from the government and development partners to foster stronger linkage to enable them to reinforce each other and provide a unified approach in engaging government in order to enhance forest sector performance in the region. There is a need to strengthen the value chains that cut across primary and secondary forestry production in order to improve efficiency, profitability, livelihoods, national incomes and the environment.

In the region most countries have made strides in policy and legislation to empower women and vulnerable groups in ownership, access and management of land and natural resources. However, these good policies and laws are hindered by strong cultural and traditional norms that many communities still have in relation to land and associated resources, such as forests. The East African countries of Kenya, Uganda and Tanzania have embraced some PPPs concepts in their policies and laws with the aim injecting private sector management efficiency and financial resources into public forest sector operations for enhanced socioeconomic development. In Sudan inadequate policies and laws on PPP have restricted participation to individuals and village groups that are covered by PFM, mostly in joint forest management operations. The variants of PPPs in the region range from joint forest management projects between public agencies and community, leasehold arrangements between public agencies and private sector investor (common in Tanzania and Uganda), to arrangements between tree growers and wood-based companies or social entrepreneurs, mostly in Kenya Tanzania and Uganda. The most attractive PPP models to private sector players with interest in forest sector include public forestland concessions for establishment of forest plantations. However, no project has been initiated in the region because the supporting legislative framework is still lacking; however, some countries like Kenya are already at advanced stages in developing them and most likely the other EAC member states will follow suit.

The region's economic sectors that are dependent on wood-based products such as saw milling, construction, transmission utilities, pulp and paper industries and furniture making, among others, require considerable supplies of roundwood from primary forest production. There is a considerable gap between supply and demand of roundwood in several of these

countries, and this puts public plantation forests, private forests and farm forests under considerable pressure to produce more roundwood to meet the increasing demand for diverse forest products that is driven by rapid population growth, urban expansion and general economic growth. To meet the deficits in local production some countries like Kenya and Sudan are already importing a wide variety of wood-based products that include sawnwood, knock down furniture, paper and paper products and wood panels from Asia and Europe.

Forests also produce a wide range of non-timber forest products that include gums, resins, opopanax and myrrh, Prunus bark, sandalwood essential oils, baobab fruit, tamarind products, tannins, shea butter, medicinal plant parts and Aloe products, among others, that support livelihoods of thousands rural people.

Given this background, the forest sector in the region has good potential to significantly contribute to the national economy and social development through job creation and income generation for national governments and their people.

3.2 Recommendations

The available information on primary and secondary forest production in the region is largely imprecise. There is therefore need for comprehensive inventory and data collection to provide critical information to guide decisions in the sector; be they on policies, strategies or plans; in order to guide the sector in a direction that makes it respond better to the social, economic, cultural, and environmental needs of the society.

There is also need for research on production, consumption, wood-based trade and overall contribution of forestry to rural livelihoods and the country's economy, among other things, to help to understand better the sector and position it better to capture national and global attention and resources.

The forest sector actors in the at both primary and secondary forest production are, in the main, very many, dispersed and poorly organized. They operate informally, and while they supply the bulk of forest products, generate incomes and employment opportunities in the forestry sector, they rarely feature in national plans and allocation of resources for development. There is therefore need to support them in various ways, including capacity building and their facilitation to be formal sectors of national economies. This will enable them deliver services to their members and front a unified voice to national governments and other stakeholders on their needs.

Production and consumption trends in the region indicate that supplies of major forest products fall short of the growing demand hence the need for increased investment to enhance primary and secondary forest production productivity, increased value addition and efficient infrastructure to serve both local and export markets. In this regard, national governments could pursue favourable policies that facilitate attraction of more actors and investments into the forest sector both at primary and secondary production levels. The public forest plantation sub-sector that is still largely in the hands of public sector agencies could be opened up to other players through concession and lease agreements in order to inject more professionalism into management of primary forest production and to enhance competition for greater productivity.

The saw milling, charcoal processing, reconstituted wood industries and furniture making need support to consolidate their businesses, upgrade their technologies and improve their

operational management in order to achieve competitive operational scale for increased quality and quantities of products.

In Sudan, Gum Arabic being the most important NWFP that contribute sizable income to the national and household economies, need some policy and legal reforms to enhance economic benefits to land owners, workers and other actors in the value chain like women and youth in order to motivate them to increase efficiency and profitability of the value chains, while also securing rehabilitation of the degraded lands on which the resource thrives and promote sustainable management of these resources. Public agencies like FNC in Sudan and respective countries should continue to establish and support NTFP producer associations, like GAPPA, through capacity building of its members in production, value addition and marketing operations and management of the value chains.

The furniture sector is dominated by many, dispersed and mainly small artisanal operators that are not able to sustain high production to meet the quantities, qualities and tastes of various consumer niches for such wood-based products. In the woodworks sector, that is mostly furniture making, more emphasis should be placed attracting mass production firms to compete or complement local medium size specialized industries and artisanal enterprises. The national governments could create conducive fiscal policies to facilitate financing, capacity building on modern mass production, provisioning of upgrading equipment and machinery for large-scale manufacturing in order to increase overall outputs, productivity, sales, exports, and value addition. Given the prevailing and potential vast market opportunities in the eastern Africa countries, the individual countries should position themselves to capture local market share relative to overseas furniture producers.

While the regional governments have expressed political will to provide an enabling policy and legal environment to facilitate the growth of the private sector, more reforms are needed to remove the remaining hurdles that constrain the pace of establishment and participation of a mainly formal private sector in forestry in the region.

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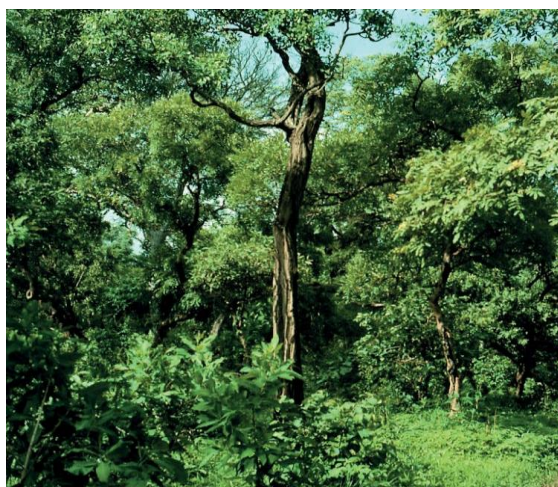
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For more information please contact:

The Executive Secretary
African Forest Forum
c/o World Agroforestry Centre (ICRAF)
United Nations Avenue, Gigiri
P.O.Box 30677-00100, Nairobi, Kenya
Phone: +254 20 722 4000, Fax: +254 20 722 4001
Email: exec.sec@afforum.org; Website: www.afforum.org

