17 Emerging Local Economic and Social Dynamics Shaping East African Forest Landscapes

Convening lead author: Abwoli Banana

Lead authors: Mukadasi Buyinza, Emmanuel Luoga and Paul Ongugo

Abstract: The forests and people of three East African countries – Kenya, Tanzania, and Uganda – are diverse but share many economic, geographic, ecological, political, and socio-cultural characteristics. Although the impacts of climate change on forest landscapes in the region are still limited, major threats that need to be overcome include the heavy dependency of local communities on forest resources for income and fuelwood, and the conversion of forest land to agriculture in response to pressure from a rapidly increasing population. The underlying drivers of deforestation and forest degradation in the region are complex, and some lie outside the forestry sector. The key drivers of deforestation include failure to implement policies and legislation governing the use of forest resources, and the inability to monitor and enforce forest rules due to the prevalence of corruption, political interference, and political failure. The regional governments have put in place several initiatives to help resolve many of the above challenges. These include decentralisation, increasing recognition of the role of communities in the management of forests, increasing roles of the private sector and local communities in forest plantation development, and recognition of Clean Development Mechanism and Reduced Emissions from Deforestation and Degradation mechanisms to reduce deforestation and increase afforestation efforts.

Keywords: deforestation, population pressure, decentralisation, Kenya, Tanzania, Uganda, forest policy, governance

17.1 Introduction

The forests and people of the three East African countries of Kenya, Tanzania and Uganda, all formerly under German and British colonial rules, are diverse but share many economic, geographic, ecological, political, and socio-cultural characteristics. The region has a remarkably wide variety of forests that support a wealth of biological diversity and endemism among plants, birds, and mammals. It is also famous for its savannah ecosystems that are home to big herds of large mammals.

Climate change in the region is already threatening the ecosystems, and the livelihoods that depend on them, at the regional, national, and local levels. The main impacts of climate change are envisaged to affect food security through increasing occurrence of droughts and floods; scarcity of water resources; increasing rainfall in the medium and high altitude areas, which will accelerate soil erosion and land degradation; increasing conflicts; and rising unemployment (IPCC 2007).

Unfortunately, policy makers and natural resources managers in the region have little information about how the management of natural resources may respond to these emerging local socio-economic, institutional, and other recent major global drivers of change (Place and Otsuka 2000). In this chapter, we focus on the impacts of the local economic, political, and social parameters of forest resources in the region. We argue that the local drivers are more likely to shape East Africa's future forest development more than the three recent major global drivers of change, namely climate change, demand and payment for environmental services, and changing energy markets (as discussed in previous chapters of this book). However, when the local drivers intersect with global drivers of change, they introduce new

challenges that require innovative local responses that will be different for each locality. This chapter seeks to identify and analyse:

- the local drivers of change in forest landscapes in Kenya, Tanzania, and Uganda;
- the effectiveness of policies and strategies put in place to respond to these challenges; and
- provide recommendations for improving performance of the various forest ecosystems in East Africa.

17.2 Major East African Forest Types

The major East African forest types include tropical/subtropical forests, forest plantations, miombo woodlands, savannah acacia woodlands, and mangroves. These broad categories by countries are summarised in Table 17.1; broad legal status categories are shown in Table 17.2.

The three national governments, forest managers, and development agencies in the region still face the dilemma of balancing conservation and forest exploitation. At present, exploitation efforts far exceed conservation efforts, which has led to drastic loss of forest cover. For example, the loss of forest cover between 1990 and 2005 was estimated at 5%, 15%, and 26% in Kenya, Tanzania, and Uganda, respectively (FAO 2001, 2007). Deforestation in the region has continued at an estimated rate of 2.2% (Table 17.3).

The spatial distribution of deforestation and degradation is not uniform throughout the region. The majority of forests in Kenya are in protected areas (98%), and the current annual rate of deforestation is estimated to be 0.2% (Table 17.3). Currently, Uganda and Tanzania have the highest annual rate of deforestation in the region. In Uganda, studies have shown that most deforestation occurs in forests on private land, which constitutes 70% of Uganda's forest cover (FD 2003). In Tanzania, also 70% of the country's forests are outside the protected area network. Forest cover fell by 15% between 1990 and 2005, and the deforestation rate has accelerated since 2000 (Milledge et al. 2007). Most of the deforestation also occurs on forests that are not reserved.

17.3 Threats and Challenges in the Various Forest Ecosystems in the Region

The colonial governments in all three of these East African countries established a comprehensive network of protected areas at the beginning of the 20th century to ensure a sustainable supply of economic, social, and environmental services from their forest resources. Large forest areas, usually the most fertile flat lands and gentle slopes, were cleared and reclaimed into plantations for cash crops like sugarcane, tobacco, coffee, and rubber.

The region's forest resources still continue to contribute significantly to poverty eradication, wealth creation, and the modernisation of the economies of these countries. For example, at present, forest resources contribute directly to the livelihoods of over 50% of the region's population that lives below the poverty line (MAAIF 2000), and indirectly support the environment that nourishes agriculture and supplies food for rural communities. This is especially true in areas where local people live in a close relationship with forests and depend upon them for their survival and well-being. There is an increasing body of economic literature demonstrating the economic importance of forests to both rural people and nations that, in the past, was not included in the national accounts (FAO 1999, Moyini and Muramira 2002, Bush et al. 2004).

There are several economic, political, and social dynamics that have and continue to shape the use and transformation of East African forest landscapes today. In this section we analyse these drivers and dynamics that are shaping the use and transformation of the different forest types and landscapes in the region.

17.3.1 Tropical High Forests in Kenya

In Kenya, loss of forest cover is predominantly high in the Montane and Western tropical high forest ecosystems. The decline in these two forest types is driven mostly by expansion of agriculture into forest lands, and increasing demand for timber for the fast-growing housing and construction industry (Table 17.4).

The major threats to these two ecosystems include:

High population pressure
There is high population pressure within the Lake Victoria basin, where these two forest ecosystems are found (Müller and Mburu 2008). The high population with limited alternative livelihoods has had adverse

Table 17.1. East African major forest types and their area coverage.

Forest type	Forested area in million ha		
	Tanzania	Kenya	Uganda
Tropical high forests (other than mangrove forests)	1.06	0.16	0.92
Forest plantations	0.08	0.12	0.035
Mangrove forests	0.12	0.8	_
Miombo woodlands	20.16	–	_
Savannah Acacia woodlands	12.14	2.5	3.9
Total	33.56	3.56	4.90

Source: Republic of Kenya 1994, URT 1998, FD 2003.

Table 17.2. Legal status of forested land in East Africa.

Legal status	Forested area in million ha		
	Tanzania	Kenya	Uganda
Forest reserves	12.52	1.64	0.73
Forests/woodlands within national parks,	2.00	0.5	0.73
Non-reserved forest land	19.04	1.42	3.46
Total	33.56	3.56	4.92

Source: Republic of Kenya 1994, URT 1998, FD 2003.

Table 17.3 Temporal and spatial changes in forest cover in East Africa.

	Forest type	Area 1990 (ha)	Area 2005 (ha)	Change rate per year (%)
Uganda	THF well stocked	651 110	580 011	–0.73
	THF low stocked	273 061	187 147	–2.10
	Woodlands	3 974 508	1 679 558	–3.85
Kenya	Montane forests	2 359 767	2 334 767	–0.34
	Dry forest (Savannah Acacia woodlands)	2 000 000	1 975 000	–0.11
	Coastal forests (including mangroves)	167 000	165 000	–0.12
	Western tropical rainforests	697 295	672 295	–0.24
Tanzania	Miombo woodlands	22 129 000	–	–0.39
	Savannah Acacia woodlands	10 214 000	–	
	Coastal forests (including mangroves)	200 000	–	
	Eastern Arc and other Montane Catchment forests	1 141 000	–	

Sources: FAO 2010.

impacts on the forest resources. For example, 20 000 Ogiek residents adjacent to the Mau forest, thousands of loggers, squatters, tea-planters, and communities of resettled people, have all had a severe impact on the forest. Because the Mau is an important water catchment area, and because the forest has shrunk by 25% over the last 20 years, Kenyan officials are worried about permanent environmental damage and are telling residents they must leave.

Pressure for land excision by government

A total of 165 000 ha, and 160 000 ha were excised for resettling communities evicted or displaced by civil conflicts in 1988 and 1992, respectively. In 2001, 67 000 ha were excised in Mt Kenya, Mt. Elgon, Marmeru, and south Nandi forests. Records on excisions in Kenya indicate that a total of 390 000 ha have been officially degazetted, and another 67 000 ha proposed for degazetting in the Mau forest complex (Sena 2006, Kimani et al. 2007, Baldyga et al. 2008).

Table 17.4 Forest ecosystem types and the dynamics shaping the use and transformation of forest landscapes in Kenya.

Forest type	Tenure/ Institutional arrangement	Dynamics leading to changes in forest landscape	Weaknesses undermining institutional ability to address emerging challenges	Principal opportunities to address emerging socio-economic challenges
Montane forests	Mostly government forest reserves and a few pockets of communal and private forest land	Illegal timber harvesting, agricultural encroachment (Bang growing), over-grazing, charcoal production, squatters, hunting	High population pressure, pressure for land excision by government, lack of alternative livelihoods, weak forest governance institutions and corruption, unclear boundaries, inadequate financial and human resources to enforce the law	High ecotourism potential, potential for carbon trade, existence of the National Forest Plan, Forest Nature Conservation Master Plan, Forest Policy and Forest Act to halt deforestation, enabling law to develop Joint Forest Management partner-ships, democratisation, decentralisation, and governance reforms in the forest sector
Dry forest (Acacia Savannah woodlands)	Mostly owned by local communities and Local Government Authorities	Charcoal and firewood harvesting, subsistence farming, grazing and migration for settlement, urbanisation	Lack of alternative energy sources, communal grazing, pastoral traditions and norms, poor charcoal harvesting methods, privatisation of the commons, limited incentives to sustainable savannah woodland management, weak forest governance institutions and corruption, political interferences, inadequate financial and human resources to enforce the law	Tourism, community-based tourism initiatives as an incentive for conserving the forests woodlands, exploitation of mineral resources, promotion of energy conservation technologies, improve livestock farming practices through enclosures and privatisation of commons, carbon trading as they offer large carbon sinks
Coastal Forests (including mangroves)	Government forest reserves	Illegal harvesting of forest products, salt pans, forest plantations and agriculture	Low appreciation of forest biodiversity by the surrounding communities, better profitability of alternative land uses (tourism), weak forest governance institutions and corruption, urbanisation	Sacred sites play a crucial role in conservation of the forests, commercial fishing and other marine life, gazettement of parts of the forest as national monuments and historic sites, ecotourism, as alternative sources of livelihood
Western Tropical High Forests	Government forest reserves and national parks	Illegal logging, subsistence agriculture, overgrazing	High population pressure, political interference, low appreciation of the forest biodiversity by the forest-adjacent communities, slow restructuring process of the forestry sector, forest boundary conflicts	Community-based ecotourism, domestication of valuable tree species in homes around the forests, national and international interest for biodiversity conservation

17.3.2 Savannah Acacia Woodlands of Eastern Kenya

Loss of forest cover in the dry woodland forests of eastern Kenya is mainly due to fuelwood harvesting and grazing. The weaknesses that undermine institutional ability to address the challenges of increasing demand for fuelwood and grazing in the dryland forests of Kenya include:

- lack of alternative energy sources
- pastoral traditions and norms, including communal grazing
- privatisation of parts of the woodlands, thereby excluding transhumant grazers
- limited incentives to sustainable savannah woodland management
- low appreciation of forest biodiversity by the surrounding communities
- better profitability of alternative land uses, such as tourism and commercial ranching

These weaknesses are aggravated by the lack of clear land use policy, unpredictable rainfall, and the prolonged droughts that regularly occur in this region.

17.3.3 Mangrove Forests of Eastern Kenya and Tanzania

Loss of forest cover in coastal forests of eastern Kenya and Tanzania is relatively low and is caused by rapid urbanisation and firewood collection. About 70% of the population along the Kenyan coast depends on mangrove forests for fuelwood and poles for house construction (Mohamed et al. 2009). The recent boom in tourism in the area over the last few decades has led to an increasing demand for mangrove poles for construction of restaurants, hotels, and holiday resorts.

17.3.4 The Miombo and Savannah Acacia Woodlands of Central and Southern Tanzania

Miombo woodland is one of the most extensive dry forest vegetation types in Africa, occurring in seven countries in eastern, central, and southern Africa; namely Angola, Malawi, Mozambique, Tanzania, Zaire, Zambia, and Zimbabwe (White 1983). Miombo woodland is dominated by the legume family Caesalpiniaceae (Celander 1983, White 1983). The woodlands cover about 20 million hectares in Tanzania (Table 17.1), and are important to the livelihoods of many rural and urban people, who depend on the resources, particularly for fuelwood (Luoga et al. 2000a).

The acacia savannah woodlands are mostly found in central and northern parts of Tanzania. In the north, they form extensive famous national parks. Although the miombo and acacia savannah woodlands are sparsely populated, loss of forest cover is predominantly high in these ecosystems. The major threat to the forests here are the slash-and-burn farming systems practised in the area due to the occurrence of long dry seasons with low rainfall (Table 17.5), and the lack of legal protection since most of the forests in these ecosystems exist outside protected areas (Luoga et al. 2000b). Close to urban centres, demand and consumption of timber and fuelwood is also steadily increasing in response to economic and population growth. Extensive deforestation has also occurred near roads as a result of non-sustainable forms of agriculture and production of sawn timber and charcoal (Luoga et. al. 2005).

17.3.5 Tropical High Forests (Coastal and Eastern Arc Montane forests) in Eastern Tanzania

The Coastal and Eastern Arc is a chain of ancient mountains covered by rainforests and grasslands. These forests provide many resources and environmental services to the local communities and cities in the area, such as water for electricity generation, agriculture, industry, and domestic use. The forests and mountains of the Eastern Arc also support a vibrant tourism industry. Many thousands of species of plants and animals are endemic to these forests (White 1983).

Loss of forest cover in the Eastern Arc Mountains is relatively low compared to coastal forest cover types. Most of the Eastern Arc forests and other montane forests around northern volcanic mountains are managed under Joint Forest Management (JFM), where local communities and the central government are the main stakeholders. This approach has yielded positive results not only in montane catchment forests (Luoga et al 2005), but also in government forest reserves that are covered with woodlands (Kajembe and Kessy 2000).

There is a higher loss of forest cover in the forests located outside the protected areas due to conversion to farmland, establishment of bio-fuel plantations, unsustainable timber and fuelwood harvesting, and uncontrolled fires. Loss of forest cover is aggravated by increasing demand for charcoal, timber, and building poles due to high population pressure, rapid urbanisation, outdated forest management plans, and government policies that encourage bio-fuel plantation development, which threatens coastal forests in particular (WWF-TPO 2009).

Table 17.5 Forest ecosystem types and the dynamics shaping the use and transformation of forest landscapes in Tanzania.

Forest type	Tenure/ Institutional arrangement	Dynamics leading to changes in forest landscape	Weaknesses undermining institutional ability to address emerging challenges	Principal opportunities to address emerging socio-economic challenges
Miombo woodlands	Mostly outside protected areas in general, and village lands	Agriculture (e.g., tobacco in Tabora area) and charcoal close to cities	Most miombo woodlands exist out of protected areas; lack of incentives for sustainable management of woodlands, improvement in accessibility	Many non-extractive forestry related enterprises (bee-keeping, tourism) and collection of non-wood products, such as mushrooms
Acacia Savannah woodlands	Mainly in protected areas, including game reserves	Fuelwood, poles, subsistence farming, grazing	Attractive to livestock keeping and crop farming and therefore potential areas for farmers-pastoralist conflicts	Game parks for tourism
Coastal Forests (including mangroves)	Mainly Nature Forest Reserves along coastal strip	Illegal logging, poles, charcoal, boat building and salt pans, biofuel plantations, and agriculture	Outdated forest management plans, weak forest governance institutions and corruption, urbanisation	Commercial fishing and other marine life, gazettement of marine parks, ecotourism as alternative sources of livelihood
Eastern Arc and other Montane Catchment Forests	Mainly national forest reserves and nature reserves	Agricultural encroachment, illegal logging, slash-and-burn farming	High population pressure, political interference, low appreciation of the forest biodiversity by the forest-adjacent communities	Participatory forest management, biodiversity and domestication of valuable species, PES and REDD initiatives

17.3.6 Tropical High Forests in Uganda (well stocked)

The tropical high forest in Uganda consists mainly of lowland evergreen or semi-deciduous rainforests with a canopy up to 50 m with several storeys of trees. A subtype of this vegetation type, the Cynometra zone, which occurs at 700–1200 m in the lowland areas of Uganda, covers most of Uganda's potential forest zone (Hamilton 1984).

According to the National Forest Authority (NFA 2005), the rate of deforestation in Uganda is estimated at 0.73% in the well-stocked Tropical High Forests. These forests predominantly occur in national parks, where the Uganda Wildlife Authority (UWA), together with the resource use and boundary management village committees under collaborative resource management arrangements, monitor and enforce park rules. Collaborative resource management has proved successful in some areas, and not so successful in others. For example, agricultural encroachment in some parts of Mt. Elgon National Park resulted in the clearance of 25 000 ha of virgin forest between 1980 and 1990 (NFA 2007). At about the same time, over 10 000 hectares of forest were cleared by encroachers in Kibaale National Park in the Kabarole district of south-western Uganda. The major threat in this forest ecosystem is demand for agricultural land.

17.3.7 Tropical High Forests in Uganda (low stocked)

The heavily felled and encroached-upon tropical high forests are located in central Uganda within the fringes of the Lake Victoria crescent. Most of

Table 17.6 Forest ecosystem types and the dynamics shaping the use and transformation of forest landscapes in Uganda.

Forest type	Tenure/ Institutional arrangement	Dynamics leading to changes in forest landscape	Weaknesses undermining institutional ability to address emerging challenges	Principal opportunities to address emerging socio-economic challenges
THF well stocked	Mostly in forest reserves, national parks and private land	Selective timber logging, subsistence and commercial agriculture, commercial fuelwood	Population pressure, lack of alternative livelihoods, weak forest governance institutions and corruption, unclear boundaries, political interferences, Inadequate financial and human resources to enforce the law, changes in traditions, cultural values and norms	Existence of the National Forest Plan, Forest Nature Conservation Master Plan, forest policy and Forest Act to halt deforestation, plan for modernisation of agriculture to improve farming practices, enabling law to develop collaborative forest management partnerships, democratisation, decentralisation, and governance reforms in the forest sector
THF low stocked	Mainly in forest reserves, customary and private land	Selective timber logging, illegal pitsawing, charcoal, subsistence and commercial farming, settlement	Better profitability from alternative land uses, limited incentives to private forest owners, unclear land and tree tenures, population pressure, lack of alternative livelihoods, weak forest governance institutions, corruption, unclear boundaries, political interferences, inadequate financial and human resources to enforce laws, changes in traditions, cultural values and norms	Institutional support to private and customary land owners to address challenges of deforestation, supportive legislation to halt deforestation, modernisation of agriculture for improved livelihoods, enabling law to develop collaborative forest management partnerships, decentralisation and governance reforms in the forest sector, existence of PES and REDD initiatives
Woodlands	Mainly customary, private and forest reserves and national parks	Overgrazing, charcoal, forest plantation development, agriculture, commercial ranching, hunting, civil war	High cost of alternative forms of energy, communal grazing, pastoral traditions and norms, poor charcoal harvesting methods, privatisation of the commons, better profitability from alternative land uses, limited incentives to sustainable woodland management, unclear land and tree tenure, weak forest governance institutions, corruption, unclear boundaries, political interference, inadequate financial and human resources for law enforcement, conflicts and civil war and internally displaced peoples' camps	Promotion of energy conservation technologies, land and tree tenure reforms, establishment of compensatory forest plantations, Plan for modernisation of agriculture to improve livestock farming practices, decline in level of conflicts and civil war in Northern Uganda
Forest Plantations	Mostly in forest reserves and private land	Grazing and forest fires	Loss of access by local communities to forest resources, loss of biodiversity	Existence of incentives for private forest plantation development, supportive legislation for afforestation/ reforestation, high demand for timber and poles, forest carbon trade initiatives

these are secondary forests and occur on private land, forest reserves, and customary lands that have a long history of human occupancy, cultivation, and fire (which is used to maintain grazing lands). Selective logging, pitsawing, and subsistence and commercial farming are the major drivers of deforestation in this forest ecosystem (Table 17.6). About 2.7 million people (15% of the population) live in parishes that neighbour forest reserves in this ecosystem (Jacovelli and Caevalho 1999).

Although some private forest owners and clan leaders are conservation-minded and have both the traditional respect and the financial ability to enforce and monitor harvesting levels in their forests (Becker et al. 1995, Banana et al. 2007), a proportionately high number of privately owned forests have been converted to agriculture. Nearly 1.3 million ha of forests located outside the protected area system (private, community, and local forests) have been lost over the last 15 years, whereas 91 000 ha have been lost in government forest reserves mainly due to subsistence and commercial farming in this forest ecosystem.

17.3.8 Savannah Acacia Woodlands of Central and Northern Uganda

This ecosystem has experienced the highest rate of deforestation (3.85% between 1990 and 2005) in Uganda (FAO 2007). Most of the woodlands in Uganda occur outside the gazetted forest reserves – on customary land in northern Uganda and on private land in the cattle corridor of central Uganda. The high rate of deforestation and degradation is caused by better economic returns that accrue from the alternative land uses, such as charcoal production, cattle-keeping, subsistence agriculture, and commercial ranching. The government policy establishing forest plantations in the woodlands has also led to accelerated conversion of forest land in this ecosystem. In addition to charcoal burning, grazing, and subsistence farming, civil war has also significantly affected land use and land cover changes in the savannah woodlands of central (in the 1980s) and northern Uganda (1986–2005). Northern Uganda has experienced civil war for the last two decades and the local communities have been living in internally displaced peoples' (IDP) camps. Landsat images from the mid-1980s show that the movement of large numbers of people – up to 1.5 million – to IDP camps has enabled the vegetation to recover, but has also led to degradation of vegetation around the camps and urban centres where they have resettled (Nampindo et al. 2005).

17.4 Weaknesses that Undermine Institutional Ability to Address the Threats and Challenges

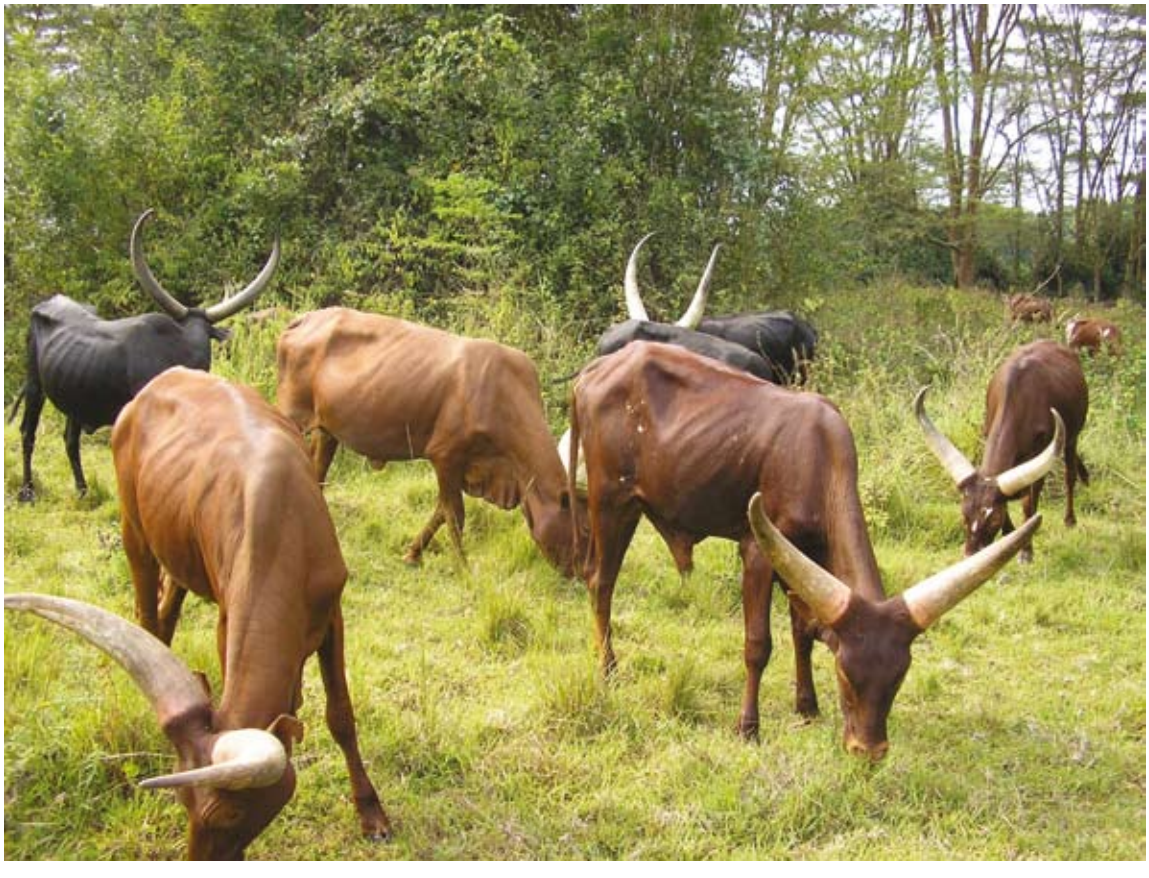
The key weaknesses that undermine institutional ability to address the threats and challenges in the forest sector include:

- Corruption, political patronage, political interference, lack of political good will, and lack of commitment to employ the best forest management practices. These have led to poor governance and weak forest law enforcement, which results in non-collection of revenue, deforestation, and forest degradation.
- A major focus on government forests with limited incentives for private forest owners to keep their land under forest cover. In Uganda and Tanzania, 70% of the forests occur on private and public land that is outside the protected area network. Often, alternative land uses, such as subsistence and commercial agriculture and livestock keeping, are more profitable than keeping the land under forest (Namaalwa et al. 2001). Forests are not just the domain of foresters in reserved forests, but are part of the social, political, and economic fabric of the region.
- Lack of clearly defined and enforceable property rights in the majority of the regions' woodland forests leads to a *de facto* open access situation and is one of the major causes of deforestation in these ecosystems.
- Weak and conflicting policies, coupled with poor implementation of policies in place in different areas, has led to poor governance of the natural resources in this region.

It is the corruption, political interference, and lack of political will at both local and national levels that most undermine the institutional ability to monitor and enforce forest rules and regulations that have led to deforestation and forest degradation. Illegal logging and encroachment on forest lands are fuelled by both political interference and corruption. According to Transparency International's 2005 and 2009 Corruption Perceptions Indexes, all of these three East African countries scored less than 3 out of a possible score of 10, indicating very serious levels of corruption in the region (Transparency International 2009). The recent de-gazettement of forest reserves for establishment of large scale agricultural plantations in Kenya and Uganda, excisions and illegal/unauthorised occupation/acquisition or use of forest land for various uses by the politically strong, are examples of conflicting government policies and political interference, respectively.

Awboli Banana

Photo 17.1 Agricultural encroachment on forest land in Mpigi district, Uganda.



Awboli Banana

Photo17.2 Cattle grazing in Malamagambo forest in Rakai district, Uganda.

The response of civil society to the high level of corruption and political interference and conflicting government policies has been the formation of advocacy groups – such as the Green Belt Movement in Kenya, Environmental Alert in Uganda and Tanzania Association of foresters in Tanzania – demanding better management of forest resources. These advocacy groups conduct educational campaigns to raise awareness about the environment and civic empowerment in addition to ensuring that local peoples' voices in the region are heard at the global level. In recognition of her work, Professor Wangari Maathai, founder of the Green Belt Movement in Kenya, was awarded a Nobel Peace Prize in 2004 for her work in mobilising the rural poor people in the region to advocate for good forest governance and for planting indigenous trees for sustainable development.

The relatively high level of public environmental awareness and a strong network of environmental advocacy groups have increased public resistance to corruption and poor governance of the forest sector. In 2006, the public and civil society successfully resisted the conversion of the Mabira forest reserve to sugarcane growing. Similarly, the recent governance reforms in the forest sector are partly a response by the regional governments to the public outcry about the poor condition of the forests in their regions.

17.5 Governments' Policies, Strategies, and Interventions to Address the Threats and Challenges

Over time, the governments in the region have formulated policies and regulations that are intended to encourage sustainable management and use of forest resources so they can improve local livelihoods and contribute to regional, national, and global economies.

17.5.1 Responses to Increasing Demand for Forest Products

Institutional and management responses to the increasing demand for forest products include:

A ban on harvesting timber and charcoal from tropical high forests

The governments in the region banned the harvesting of timber from the central government tropical forest reserves in the early 1990s. Timber concessions in tropical high forests were suspended and the population was encouraged to use softwood timber harvested from plantations established in the late 1950s and early 1960s. However, the ban on harvesting timber and charcoal from tropical high forests has not been effective, and illegal logging and commercial fuelwood harvesting continues in these forests (Falkerberg and Sepp 1999). Despite this ban, Tanzania's timber exports have grown by 1400% in value since 1997. Concerns over deforestation led the government to ban the export of logs in July 2004. However, the regulations were not effectively enforced and illegal logging continued almost unabated. A report by TRAFFIC estimated that Tanzania lost USD 58 million a year in 2004 in timber revenue due to poor governance and corruption in the forestry sector (Milledge et al. 2007). In early 2006, the government reinforced the export ban on logs and sandalwood. In addition, 100 million trees were planted between 1990 and 2006 in an attempt to address the damage caused by illegal timber harvesting (Milledge et al. 2007). According to TRAFFIC, there are substantial volumes of illegal timber importation in the region from Democratic Republic of Congo and Sudan.

As a measure to control illegal logging, a timber chain of custody has been implemented by the regional governments. Legally harvested timber is stamped to minimise illegal trade, control harvesting, monitor origin of forest product, and provide data on harvested volumes (Milledge and Elibariki 2005, Mwima et al. 2006). A forest product declaration form is issued to the timber owner that indicates the details of timber volume, forest of origin, and tree species. This serves as evidence that the timber has been legally acquired. A regional Forest Law Enforcement, Governance, and Trade (FLEGT) process has been launched under the auspices of the East African Community (EAC) to control illegal timber trade and strengthen enforcement of forest laws in the region (Milledge et al. 2007).

A ban on the use of chain saws in processing hardwood logs into timber

In order to promote efficient processing of saw logs and to reduce the rate of forest clearance by local people, a ban on the use of chainsaws in felling and sawing of logs was put in place in the 1990s because this timber production method is wasteful and characterised by low timber recovery. However, implementation has not been successful due to difficulties in monitoring and enforcement of the law. The ban on the use of chainsaws also meant that local communities could no longer engage in timber harvesting; concessions were left mainly to large companies since the local communities lacked capital and were not well enough organised to apply for large timber harvesting concessions.

Promotion of agro-forestry practices

In the region, agroforestry continues to contribute significantly to the supply of tree products and services. Agroforestry has evolved from the traditional retention of useful trees to promotion of fast-growing multi-purpose trees and shrubs geared towards soil fertility improvement, fuelwood, and fodder production. For example, the coffee-banana homegardens in central Uganda, the homegardens of Bukoba in northwestern Tanzania, and the Chagga homegardens on the slopes of Mt. Kilimanjaro in Tanzania (Rugalema et al. 1994) are very productive and biodiversity-rich agroforestry farming systems.

The Chagga homegardens system is a unique agroforestry farming system on the southern and southeastern slopes of Mt. Kilimanjaro. Typical of the agri-silvicultural system of the Chagga homegardens is their multilayered vegetation structure, similar to a tropical montane forest. The growth form spectrum displays herbs, trees, shrubs, lianas, and epiphytes. Apart from some cultivated fruit trees, such as avocado and mango, or the introduced timber trees, such as Silk oak (*Grevillea robusta*) and Mexican cypress (*Cupressus lusitanica*), most of the trees species are remnants of the former forest cover. Most widespread are Nnongo (*Albizia schimperiana*), South African quinine tree (*Rauvolfia caffra*), *Large-leaved cordia* (*Cordia Africana*), and Kanniedood (*Commiphora eminii*)(Hemp 2006).

In the savannah acacia and miombo woodlands, trees are managed in the grazing system as a means of supplementing animal feed or to provide high quality fodder in times of drought when grass is scarce (Agea et al. 2007). The tree fodders contain high levels of crude protein and minerals, and many show high levels of digestibility. They are readily accepted by livestock farmers because they continue to produce well into the dry season due to their deep root systems. There are abundant niches in Kenya on small farms where fodder trees can be grown without affecting crop production. For example, in Kenya's Embu region, it has been estimated that 3 kg of fresh fodder of *Calliandra calothyrsus* has the same effect on milk production as 1 kg of commercial dairy meal. The tree fodder can either replace the concentrate without loss of yield, or it can complement it to produce more milk (Paterson et al. 1998).

Establishment of industrial forest plantations

In the past, there has been limited investment in forest plantation development in the region. The recent national forest plans promote private sector investment in plantation development to relieve pressure on the rapidly diminishing tropical high forests. In Uganda, the National Forestry Authority and the Sawlog Production Grant Scheme, which is a special fund from the European Union aimed at attracting the private sector to establish commercial timber plantations in Uganda, have prepared a Plantation Development Strategy that envisages a total of 150 000 ha of fast-growing commercial timber plantations by 2025. Most of these plantations are to be established in the woodland forest reserves that have undergone massive degradation as a result of charcoal burning and cattle grazing (NFA Annual Report 2005/2006). In addition, large scale forestry companies have been allocated land to establish plantations in forest reserves under the Clean Development Mechanism (CDM). These incentives have made plantation development a profitable business in the region. Softwood plantation developments in Kenya and Tanzania have focused on the protection of water catchments and rehabilitation of degraded forests.

17.5.2 Responses to the Increasing Conversion of Forest Land to Agriculture

There have been several institutional and management responses to the increasing conversion of forest land to agriculture, for example:

Eviction of encroachers

According to the NFA (2009), encroachers in Uganda's government forest reserves have increased from 170 000 to 300 000 people in the last five years (see Box 17.1 for causes of encroachment). The governments in the region regularly evict encroachers from forest reserves. In Kenya, resettling squatters evicted from the forest reserves gave rise to excisions of forested areas to create land for them in the 1980s. However, there has been political interference whereby most of the land has been allocated to, or grabbed by, powerful members of the community and local politicians (Markakis 1999). There was political patronage in the allocation of land whereby the landless, who were the intended beneficiaries of the resettlement scheme, were sidelined by the provincial administration in favour of the elites.

Box 17.1 Causes of encroachment in East African forest landscapes

1. *Fertile forest soils.* The relatively rich and virgin forest soils attract encroachers because they employ poor farming methods and seriously degrade and exhaust soils outside forest reserves. However, this soil also gets leached much faster when exposed to high temperatures and heavy tropical rainfall, and is quickly exhausted. This forces encroachers to open up new land annually and hence to clear more forests.
2. *Breakdown in law enforcement.* For a long time, the Forest Department (FD) staff in the region have not been able to enforce the law. Patrols have been intermittent and at large intervals, which enables encroachers to settle unchallenged in forest lands.
3. *Unclear forest boundaries.* Many local communities that are adjacent to forests have crossed the boundaries, knowingly or unknowingly, since the boundaries are unclear. Many boundary markers have been destroyed and the positions of others altered by encroachers to obfuscate where the boundary is.
4. *Corrupt government officials.* Some corrupt forest officials, in connivance with other relevant officials, encourage encroachment.
5. *Breakdown in monitoring permits.* Forest officials allow some activities, like grazing and construction of temporary structures in CFRs, on renewable permit terms. Over time, many of these people fail to renew their permits but continue with their activities.
6. *Apparent shortage of land outside CFRs.* In some cases, local population pressure has pushed people into adjacent CFRs.
7. *Encroachment in CFRs.* Often, encroachment in CFRs has the backing of politicians, who usually trade CFR land for votes. Very often, local leaders are themselves encroachers and, when faced with eviction, tend to exaggerate the number of encroachers to enhance their stakes and win the sympathy of the public/government.
8. *Lack of awareness of government policies and laws.* Quite often, encroachers are not aware of the policies and laws on forestry.
9. *Frequent civil wars and cattle-rustling.* During war, people look for relatively safe places, like mountains and hilltops, many of which are CFRs. Such people never return to the lowlands even when the war is over; more so if there is land for settlement and cultivation up the hills or mountains.

Introduction of the Plan for Modernisation of Agriculture (PMA)

In Uganda, the Plan for Modernisation of Agriculture (PMA) is a government framework for eradicating poverty by changing the current subsistence agriculture into intensive and more productive commercial farming. The assumption is that when PMA is fully implemented, a more than 60% increase in agricultural production will be from increased productivity rather than from clearing more forest land since the plan emphasises agricultural intensification as opposed to expansion (MAAIF 2000, FAO 2001).

Use of the shamba or taungya system

The shamba or taungya system of plantation establishment allows peasant farmers to cultivate a specified forest plantation area under the agreement that they plant and tend tree seedlings on the land. In return for their labour in weeding, pruning, and forest protection, farmers are allowed to grow annual crops such as maize, potatoes, beans, peas, and other vegetables to meet their livelihoods needs. These crops are shaded out as the seedlings grow into saplings, and farmers vacate the land and are allocated another plot. Studies in Kenya, where this practice has been widespread, indicate that it contributed significantly to local livelihoods and national food security, and reduced the hunger for clearing forest land for agriculture (Awiti forthcoming, Wamukoya et al. 2005).

17.5.3 Responses to Challenges Related to Forest Governance

To address the challenges related to forest governance, the governments have instituted different measures that include:

Decentralisation in the forest sector

Decentralisation, as a policy instrument, grew in importance as an option to improve the quality of forest management by giving more authority and control over resources to lower levels of government and to local communities. It is a great opportunity to improve transparency and accountability in the forest sector, but also a major challenge as many authorities in the region do not want to decentralise. It is only Tanzania that has effectively decentralised the management of large forest areas to rural villages. The Tanzanian forest policy provides for establish-

ment, ownership, and management of central and local government forest reserves, forests on general lands (non-reserved forestland), and private and community forests (URT 1998). To implement the policy, the government has supported local community involvement in forest management with the financial, technical, and legal framework since 1998. Under the Tanzanian Forest Act of 2002 (URT 2002), Participatory Forest Management (PFM) was institutionalised. In 2008, there were 1460 village forest reserves covering 2.3 million ha, and 209 central government forest reserves covering 1.6 million ha under PFM (URT 2008). This governance reform has led to a 66% reduction in illegal logging, especially in the miombo woodlands (Kajembe and Kessy 2000, Kajembe et al. 2003, National Forum on CFM 2008).

In Kenya and Uganda, decentralisation of the forest sectors have involved transfer of responsibility for forest resources management from the central government forest departments to autonomous government agencies and local governments, but it has not changed the ownership of the land. In 2005, the Kenya forest department was transformed into Kenya Forest Service – an autonomous body charged with management of forest resources. The recent Kenya Forest Policy (Republic of Kenya 2005) allows participation of all stakeholders in forest management and conservation. Participatory forest management is a new concept in Kenya. Joint management agreements have been made between Community Forest Associations (CFAs) and the Kenya Forest Service. At present, 120 forest reserves covering 450 000 ha are being managed under this arrangement. The agreements specify user rights and benefits that accrue to the CFAs (Ongugo et al. 2008). For Kenya, it is rather early to evaluate the outcomes of this initiative.

As part of the restructuring process under the Local Government Act (Republic of Uganda 1997) and the Forest Policy (Republic of Uganda 2001), the government of Uganda also replaced the Forest department with an autonomous profit-making body – the National Forest Authority (NFA) – to manage the country's Central Forest Reserves (CFRs) in 2004, and created the District Forestry Services under the local governments to manage Local Forest Reserves (LFRs) and forests on public lands. Unlike Tanzania, genuine devolution of power over the management of forest resources to local government has been occurring only to a limited extent in Uganda, even when decentralisation and devolution are major themes of the 2001 Uganda Forest Policy (Republic of Uganda 2001). For example, only small forests gazetted in the early 1940s as LFRs amounting to 6000 ha have been transferred to the Local Government Authorities. The large economically viable forests gazetted as CFRs have been retained under the semi-autonomous NFA (Turyahabwe et al. 2007, 2008).

The recent Uganda Forest Policy also institutionalised Collaborative Forest Management (CFM). The CFM programme is being practised in all the seven forest management ranges as designated by the NFA. The process of making agreements with communities is, however, slow. Only a total of 12 CFM agreements have so far been signed (Mupada 2008) covering a total of 22 000 ha of CFRs. The process is underway with 47 other communities located in 32 CFRs.

Ethanoforestry, a form of common property regime used by communities to manage forests with cultural values, have a long history in the region. This can also be considered a form of local community participation in forest management. Sacred groves, some as old as several centuries, have contributed to the conservation of some plant species in East Africa. Prominent sacred groves in the region include the Kaya sacred forests of coastal Kenya (Nyamweru et al. 2008), sacred groves of the North Pare Mountains of northeastern Tanzania (Sheridan 2009), sacred groves of the Ugunda chieftaincy of the Wanyamwezi in central Tanzania (Mgumia and Oba 2003), and sacred groves of Buganda Kingdom in Central Uganda (Banana et al. 2008).

The possibility of using traditional religious institutions as alternative arrangements for managing natural resources has attracted much interest among academicians and policy-makers in the last decade in all three of the East African countries (Alden Wily 2008, Banana et al. 2008). Tanzania's Forest Policy 1998 permits village religious institutions, associations, or groups to manage forests, and provides detailed procedures for this in the new Forest Act of 2002 (URT 2002). Similarly, the Kenya Forest Act 2005 is also very explicit in its support for sociocultural forests (Republic of Kenya 2005). In the Act, sacred groves are defined and protection of cultural forest sites is listed as a factor to be considered in reserve creation.

The Uganda Land Act of 1998 (Republic of Uganda 1998) and the Forest and Tree Planting Act of 2003 (The Republic of Uganda 2003) state that, "Where customary forests are considered to have significant subsistence, economic, environmental, or cultural value, or where there is a history of communal management through traditional systems of regulation and control, a local community may decide to formally register ownership." The Act also provides the legal framework for the registration of customary land and sacred groves as Community Forests (NFA 2003).

Governments' responses to over-reliance on biomass energy

For the foreseeable future, both rural and urban communities in the region will continue to rely on fuelwood and charcoal as the dominant source of energy. Therefore, the challenge is how to make it more sustainable. There have been several studies to improve energy conservation technologies, such as improved cooking stoves and charcoal-making kilns (Mutimba and Senelwa 2007), establishment of charcoal plantations, and promoting on-farm production of fuelwood through agro-forestry farming systems (Luoga et al. 2000a, Kalumian and Kisagye 2001, Mugo and Poulstrup 2003, Kituyi 2004).

The governments in the region have also responded to the challenge of over-dependency on fuelwood for energy by putting in place initiatives to increase hydroelectric power generation, improvement of transmission and distribution infrastructure through rural electrification programmes, and use of alternative renewable energy sources such as wind, geothermal, and solar energy.

International strategies and interventions

There is good will from international financing agencies to support forestry development (both natural forests and plantations) in East Africa. Several financing agencies, such as the European Union, Government of Norway, Global Environment Facility, United Nations Development Programme, World Bank, Danish International Development agency, African Development Bank, World Wildlife Fund, International Union for Conservation of Nature, and Food and Agricultural Organisation of the United Nations have provided financial and technical support to the forestry sector. It is most likely that these agencies will continue supporting forestry development in the region in the foreseeable future.

17.6 Principal Opportunities to Address Challenges Facing the Management of Major Forest Ecosystems in the Region

There are a number of strengths and opportunities that spur institutions involved in the management of different forest ecosystems in the region, for example:

- Tropical high forest ecosystems in the region support a wealth of biological diversity and endemism among plants, birds, and mammals and have great potential for development of community based ecotourism.
- Degraded high tropical forest ecosystems in the region have a high potential for REDD project development.
- Commercial fishing and ecotourism offer alternative sources of livelihoods in the mangrove coastal forests of Kenya and Tanzania.
- The savannah woodland ecosystems of Kenya and Uganda, and the miombo woodlands of Tanzania are a source of non-timber forest products (NTFPs). Some have well-developed non-extractive forestry related enterprises, such as bee-keeping, fruits, oils and resins collection, and crafts.
- The savannah ecosystems are home to big herds of large mammals and support a strong tourism industry. Some of the funds generated from the tourism industry are plowed back into the communities as an incentive for conserving the dry woodland forests.
- Savannah woodlands in the region also offer large carbon sinks, and the recent carbon trading initiatives in the region are likely to further enhance conservation of these woodland resources.
- The Clean Development Mechanism of the Kyoto Protocol and carbon financing mechanisms offer an opportunity for the region to tap into the global

Box 17.2 FACE-UWA Carbon Sequestration Project

In 1990, the Dutch Electricity Board undertook an initiative to compensate for carbon dioxide emissions from Dutch power stations by means of reforestation/forestation. The FACE (Forests Absorbing Carbon dioxide Emissions) Foundation was set up with the Uganda Wildlife Authority to administer its tree planting programmes in order to create new forests for the sequestration (fixation or absorption) of carbon dioxide (CO_2) from the atmosphere. It has restored 35,000 ha of forests in Kibale and Mt. Elgon national parks, which will cumulatively absorb over 20 million tonnes of carbon dioxide over the 70-year life span. This will be a significant amount of carbon dioxide. FACE used the replanted forest areas to raise money for more restoration work through the sale of tradable CO_2 absorption certificates (FACE-UWA 2008).

carbon markets and to harness the associated investment and technology flows (Box 17.2). Other initiatives, such as the Reduced Emissions from Deforestation and Degradation (REDD), also offer potential opportunities for improved forest conservation and livelihoods through carbon trading.

17.6.1 Principal Opportunities in Tropical High forests

Tropical high forests in the region have features and attractions that are of real interest to domestic and international tourists on a sustainable basis. Ecotourism-based activities include forest walks on over several hundred km of well-developed trails in many forest reserves, such as Mabira and Bwindi and Kakamega forest reserves, mountain biking, bird-watching, environmental education and research, camping and picnicking, primate-watching (especially mountain gorilla in the Bwindi Impenetrable Forest and Ngahinga national parks, chimpanzees in Kibaale and Budongo forests, and monkeys in Kakamega Forest), butterfly identification, and general forest exploration. Ecotourism generates considerable revenue to the governments in the region. Some of the funds generated from the ecotourism industry are plowed back into the communities as an incentive for conserving the forests resources.

Degraded and low-stocked tropical high forests have high potential for REDD project development because of the possibility of achieving high emission reductions per hectare. REDD provides a unique opportunity for the region to sustainably conserve forest biodiversity and generate real benefits for the three countries and their populations. The region has been an innovator and early mover in forest carbon markets, with several pioneering and internationally recognised projects, such as ECOTRUST-, FACE-, and World Bank-supported afforestation projects (Forest Trends 2009). For example, based on a simple model, Butler (2006) calculated that at a deforestation rate of 86 400 ha/year, Uganda was in a position to earn USD10–137 million, with a potential increase in per capita income of 0.13–2.18% from avoided deforestation (see box 17.2).

REDD also has the potential to support and deepen participatory forest management approaches that have been adopted by the three countries in recent years. However, successful implementation of REDD requires clear identification and nurturing of viable projects, as well as appropriate policy, legal and institutional frameworks developed by the three counties.

17.6.2 Principal Opportunities in the Miombo and Acacia Savannah Woodlands

Non-timber forest products (NTFPs) have a high potential for economic development in the miombo and acacia savannah woodlands of central Tanzania, Northern Uganda, and Eastern Kenya. These ecosystems are important sources of NTFPs, especially non-wood forest products such as essential oils, beeswax and honey, gum, tannins, latex, dyes, medicines, fibres, and food (leaves, roots, fungi, and fruits). Harvesting and sale of NTFPs provide alternative sources of livelihood to local communities and contribute to poverty alleviation through generation of income, provision of food and improved nutrition, medicine, and foreign exchange earnings (Chikamai et al. 2000). In some communities in the region, farmers derive close to 60% of their cash income from the sale of mushrooms, honey, charcoal, fuelwood, wild fruits, and vegetables (CIFOR 1999, O'Kting'ati and Monela 1990).

Mushrooms, beekeeping, and honey-hunting in miombo woodlands and in the acacia savannah woodlands of Kenya and Uganda are very lucrative enterprises. For example, in Tanzania, the bee-keeping industry produces about 138 000 tonnes of honey and 9200 tonnes of beeswax per year from about 9.2 million honey bee colonies (Dewees 1996)). Most of the honey and beeswax produced is consumed locally and only small amounts are exported.

In Northern Uganda, the butter oil industry based on the shea-butter tree (*Vitellaria paradoxa* spp. *Nilotica*), a slow-growing hardwood fruit tree, is also a very lucrative enterprise. The shea butter oil is used for cooking and in the cosmetics industries. An integrated shea butter conservation and development project was conceived in 1990 and now covers an area of over 160 000 square kilometres across northern Uganda. The project involves over 400 community-based groups with a total membership representing over 10 000 farming households, mostly involving women. The shea-butter from northern Uganda is softer and more fragrant than West African shea-butters, and fetches higher prices on the international market (Ferris et al. 2001, Okullo 2004).

The East African region also has the potential to produce gum arabic, mainly from *Acacia Senegal* and *A. seyal* found in arid parts of the region. Tanzania has one of the largest export potentials for gum arabic among the East African countries because of the presence of vast areas of acacia woodlands in Tabora, Singida, Arusha, Kilimanjaro, Tanga, Morogoro, and Iringa, though the industry is yet to be developed. It is estimated that Tanzania produces 1000 tonnes per year of gum arabic, half of which is exported (Chihongo 2000). Kenya and Uganda pro-

duce smaller amounts of gum arabic from Karamoja and northern Kenya regions, respectively.

The wood-carving industry is a vital source of income for local people living in the miombo and dry savannah woodlands of Kenya and Tanzania. The Makonde is probably the best known art work produced in these two ecosystems. This art is produced by the Makonde people of southern Tanzania, and their material of choice is ebony, the African black wood found in the miombo and acacia savannah wood lands. Tanzania earns USD 6 million in exports of wood carvings annually, while in Kenya, the wood-carving industry generates USD 20 million a year (TED 2001), most of which is produced from ebony wood by the Akamba carvers, who live in the savannah woodlands of eastern Kenya.

However, NTFPs are threatened by over-exploitation and degradation of the forest resources. Indiscriminate harvesting of trees for charcoal and fuel wood, as well as the clearing of forests for farming and bushfires discussed earlier create obstacles for sustainable management of these forest products.

17.7 Policy Recommendations

Strengthen capacity for monitoring, enforcement, and compliance to forest rules and regulations within the nations and region.
Failure to monitor and enforce forest laws has cost East Africa dearly in terms of reduced goods and services, lost taxes and royalties, and the erosion of livelihoods. A collective regional response has been slow. A regional Forest Law Enforcement, Governance and Trade (FLEGT) process that has been launched under the auspices of the East African Community (EAC) should be implemented as soon as possible. Mechanisms of controlling illegal logging and timber trade should be worked out.

Fight corruption and government interference in the forest sector.
No doubt corruption undermines effective functioning of government institutions in the region and hampers the achievement of the Millennium Development Goals by undermining the economic growth and sustainable development. In particular corruption constrains planning for sustainable forest management. Therefore, fighting corruption within and outside the forest sector must be central to sustainable management of the forest sectors in the region.

Strengthen decentralisation and local participation in the forest sector.
Implementation of the decentralisation policies require continued commitment of the regional governments' to transfer of meaningful authority to lower levels of government and to building capacity by providing technical and financial support to local institutions. There is need to continuously review joint/collaborative forest management agreements with various stakeholders particularly local communities so that the rights and obligations of the partners, including the sharing of benefits is perceived by the local communities to be fair (Kant and Nautiyal 1993). In Tanzania, participatory policies have been in place for over a decade and there are signs of positive outcomes such as increased forest area being effectively managed by communities and village governments and increasing contribution of forestry resources to rural livelihoods (Bromely et al. 2009). Kenya and Uganda can emulate the strategies undertaken by Tanzania to enhance participatory forest management approaches.

Harvest NTFPs sustainably.
Although NTFPs are important forest products, especially in the dry woodland areas where they provide alternative sources of livelihoods and contribute to poverty alleviation through generation of income, and provide food and improved nutrition, they are threatened by over-exploitation and degradation of the forest resources. Over-exploitation not only threatens species of high-demand, but could also alter forest structure and composition. Indiscriminate harvesting of trees for charcoal and fuelwood, as well as the clearing of forests for farming and bushfires discussed earlier, create obstacles for sustainable management of these forest products. Management practices that encourage the monitoring of sustainable harvesting levels of species and promote alternative plants for the same uses, should be considered as part of conservation strategies.

Harmonise and implement policies at the regional level.
The governments in the region have put in place good programs and policies, both in the forest sector and outside it, to reduce deforestation and degradation. Many of these policies are not implemented and the rules not enforced. What is now needed is harmonisation of policies within and outside the forest sector and within the region, and active implementation of the policies and enforcement of rules within the natural resources sector.

17.8 Conclusions

The underlying drivers of deforestation and forest degradation in the East African region are complex, and some lie outside the forestry sector. The key underlying drivers of deforestation include:

- inability to monitor and enforce the regulations applicable to the use and conservation of forest resources due to weak forest governance structures, prevalence of corruption, political interference, and political failure;
- pervasive economic incentives that favour deforestation;
- conflicting policies within the natural resources sector; and
- failure to implement policies and legislation governing the use of forest resources.

Heavy dependency of local communities on forest resources for income, fuelwood, and conversion of forest land to agriculture in response to the rapid population growth, are major threats that need to be overcome.

The regional governments have put in place several initiatives to help resolve many of the challenges and problems in the forest sector. Some of these initiatives have had positive outcomes already. These include:

Increasing participation of communities in the management of forests and woodlands (in all three countries, but perhaps most in Tanzania) following the implementation of the decentralisation policies

Carbon trade under the CDM and REDD mechanisms have made forest businesses profitable and has attracted the private sector and local communities to invest in forest plantation development and management of natural forests.

Other initiatives that have a high potential to improve forest conditions in the region include:

- Overall increased recognition of the importance of forests as environmental assets (climate change, adaptation, risk and resilience, water catchments) by policy-makers and increasing recognition by regional governments of the economic importance of forests both to rural people and to nations have made forest rehabilitation, afforestation, and reforestation priority areas by these regional governments.
- A regional FLEGT process launched under the auspices of the EAC to improve forest law enforcement and governance in the region. Reduction in illegal logging in the region is likely to lead to improvement in forest conditions.

Although the impact of climate change on forest landscapes in the region is still limited, vulnerability of the region to the impacts of climate change is likely to increase in future because of the heavy reliance on climate-dependant resources, such as rain-fed agriculture, lack of skills on climate change adaptability, inadequate early warning systems for disaster management, and limited financial resources.

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