



SUSTAINABLE TRADE AND MANAGEMENT OF FOREST PRODUCTS AND SERVICES IN THE COMESA REGION

An Issue Paper

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With a foreword by Miti Chikakula

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FOREWORD

THE COMMON MARKET for Eastern and Southern Africa (COMESA) was established in 1994 to replace the Preferential Trade Area for Eastern and Southern Africa, which had been in existence since 1981. COMESA's priority, over the medium term, is the promotion of regional integration through trade and investment. Key objectives include creation of a free trade area among member states (achieved in the year 2000), establishment of a common external tariff among member states by the year 2008 and facilitation of the removal of structural and institutional weaknesses of member states so that they become able to attain collective and sustained development.

The COMESA region covers an area of about 12 million km² (40% of Africa's land mass) and consists of 19 member states, namely, Burundi, Comoros, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia and Zimbabwe. The human population of the COMESA region is estimated at 400 million and is increasing at an average rate of 3% per annum. Forty-two percent of the area is arable land, while 60% is endowed with rivers and lakes that could be jointly exploited for irrigation, fisheries, hydropower and water transport development.

Agriculture is a priority sector as it accounts for more than 32% of COMESA's gross domestic product and 65% of foreign exchange earnings, provides a livelihood to about 80% of the region's labour force and contributes more than 50% of raw materials to the industrial sector. However, the region has been experiencing a decline in the productiveness and competitiveness of the agricultural sector, resulting in national-level food insecurity. In order to raise the competitiveness of the COMESA region's agricultural sector, the organisation is implementing the Comprehensive Africa Agricultural Development

Programme (CAADP). CAADP is in line with the aspirations of the COMESA Treaty, which seeks promotion of co-operation and co-ordination of regional agricultural policies, food security responses, product marketing, research and development, plant and animal disease and pest control, training, irrigation development and the exploitation of marine and forestry resources.

Through CAADP, the African Union's New Partnership for Africa's Development has provided an Africa-wide vision and related strategic framework to bring agriculture to bear on the continent's sustainable development agenda. CAADP provides a strategic framework aimed at increasing agricultural growth rates to at least 6% per year and enabling the creation of wealth among rural communities and households. CAADP focuses on investment into the following four mutually reinforcing 'pillars' to Africa's agricultural agenda: (i) extending the area under sustainable land management and reliable water control systems, (ii) improving rural infrastructure and trade-related capacities for improved market access, (iii) increasing food supply and reducing hunger and (iv) improving agricultural research and technology dissemination and adoption.

The COMESA Treaty, which sets the agenda for COMESA, covers a large number of sectors and activities. A key area targeted for investment and development in the COMESA Treaty is agriculture, natural resources and the environment, which encompasses crop and livestock production, fisheries and forestry. Member states have agreed to take concerted measures to foster co-operation in the joint and efficient management and sustainable utilisation of natural resources within the region for the mutual benefit. In particular, member states have agreed to take necessary measures to conserve and manage forests through joint promotion of common forestry practice, adoption of regulations

for the preservation and management of all water catchments, joint utilisation of forestry training and research facilities, and establishment of uniform regulations for the utilisation of forestry resources in order to reduce the depletion of natural forests and avoid desertification in the COMESA region.

The COMESA member states fully recognise that economic activity is often accompanied by environmental degradation and excessive depletion of natural resources, and that sustainable utilisation of these resources is a prerequisite for long-term economic growth. In this regard, member states have adopted the Environmental Action Plan (EAP) of the African Union, which stresses the need for the region to adopt common policies and strategies on sustainable utilisation of natural resources. The EAP provides only general guidelines for environmental protection, requiring further actions to operationalise environmental protection and complementary frameworks to enhance the contribution of forestry to local and national development.

With the focus strongly shifting towards tangible implementation of CAADP and the EAP, the COMESA Ministers of Agriculture Meeting, held in Khartoum in March 2007, adopted the Fourth Ministerial Declaration to re-affirm the major role forestry plays in the economic development of the COMESA region. In this meeting, ministers underscored the importance of formulating a regional strategy on forestry management, including strategies for climate change and carbon trading. The proposed forestry strategy aims at enhancing the contribution of forests

and trees to the economic, social and environmental well-being of African people taking into account the multiplicity of forest functions. As envisioned, the strategy will address the following key issues:

- improving policy, legislative and planning frameworks;
- strengthening institutions and capacity in the strategic design and implementation of policies and legislation;
- increased investment in critical areas, especially sustainable forest management and enhanced availability of forest goods and services; and
- complementary investment into the development of value-adding industries and supporting infrastructure.

As part of the strategy for carrying this vision forwards, the ministers urged the COMESA Secretariat to work closely with the Center for International Forestry Research (CIFOR) in the formulation of the strategy. The COMESA Council of Ministers has since authorised the COMESA Secretariat and CIFOR to enter into an agreement to co-operate in the development of the forestry component of the CAADP in eastern and southern Africa. By summarising what is known about the region's forestry products and services, and highlighting challenges and opportunities for supporting economic development through trade and sustainable forest management, this Issue Paper represents one critical step in this direction.

— Miti Chikakula, COMESA Secretaria

EXECUTIVE SUMMARY

A REPORT ON sustainable trade and management of forest products and services in the Common Market for Eastern and Southern Africa (COMESA) region comes at a strategic time. Africa's economy is projected to grow at its best rate since the 1970s, and African policymakers are increasingly confident that they are developing the basis for sustained growth. Following the launch of the Free Trade Area (FTA), intra-COMESA trade has been increasing at an average annual rate of 30%. The COMESA region is consolidating its FTA and is about to launch the Customs Union and the COMESA Common Investment Area (CCIA), aimed at creating the required policy environment for enhanced regional trade and economic development. A host of current initiatives—the World Bank's World Development Report 2008, measures proposed by the Blair Commission, the Comprehensive Africa Agricultural Development Programme, the Alliance for Green Revolution in Africa and the European Union's Economic Partnership Agreements—are placing emphasis on economic development through expanded trade and market-oriented agriculture (Commission for Africa 2005, World Bank 2007b). Trade in timber and non-timber forest products is an important contributor to agricultural and economic development through the revenue it generates for government and the income it provides to rural households. In select ecoregions, forestry is the highest income earning sector for rural households. While currently a largely uncaptured opportunity, trade in forest ecosystem services (carbon, water, biodiversity) has the potential to add new value to the sector. The impetus to expand trade and investment highlights the need for appropriate policies to capture the true economic value of forests while ensuring the sustainable utilisation of forest products and services. This is particularly true given that growth in trade in forestry and other sectors that affect forests can bring substantial social and environmental costs, which require the concerted attention of government.

Trade in a range of forest products from the COMESA region is already globally significant. Member countries are among the leading African exporters of timber and non-timber forest products. The Democratic Republic of Congo is the fifth largest exporter of tropical logs. Sudan's share of global supplies of gum Arabic increased from 44% to 63% from 1999 to 2001, with annual exports in the 1991–2002 period ranging from 17 061 to 34 162 metric tonnes (Muller and Okoro 2004). Ethiopia, Eritrea, Sudan and Kenya are leading exporters in a number of valuable flavours and fragrances (frankincense, opopanax, myrrh) as well as khat. Sudan and Ethiopia are the world's largest producers of Olabanum resins (obtained from *Boswellia* spp). Export from the two countries is in the order of 5 000 tonnes annually (Ibrahim 2002). COMESA member countries Madagascar, Kenya, Burundi and Democratic Republic of Congo are also significant exporters of medicinal bark from *Prunus africana*. COMESA is a global leader in the production of vanilla (dominated by Madagascar) and ylang-ylang for perfumes (dominated by Comoros). Coffee and tea are major agroforestry crops, and several COMESA member countries (Kenya and to a lesser extent Uganda, Zambia and Zimbabwe) are significant producers of woodcarvings. Domestic markets for wood fuels (firewood and charcoal) provide an inexpensive source of energy for Africa's poor while creating employment opportunities near urban centres. In addition to its trade value, forestry provides critical support functions to rural livelihoods. In Sudan, forestry contributes 71% of national energy supplies, 14% of rural employment, 33–70% of the national feed requirement (depending on season) and up to 30% of household income (Abdelazim personal communication). In Zambia, the production and marketing of wood fuel, largely an informal activity carried out by poor households, is estimated at US\$5 billion and employs more than 400 000 people.

While such wealth of natural resources provides important opportunities for expanded trade in the forestry sector and for forestry-driven economic development, a number of challenges hinder efforts to capture this opportunity. Trade barriers and governance challenges currently undermine the ability to harvest the economic potential of the sector on a sustainable basis. At a global scale, illegal logging costs governments at least US\$10 billion in lost revenue alone, depresses global timber prices and reduces the perceived value of the sector. Increased demand for natural resources from emerging economic powers (e.g. China, India) is increasingly placing strains on local and national institutions alike, compromising their ability to ensure forest resource exploitation is sustainable and leads to concrete economic gains for society. Increased pressure over timber in areas with weak governance has resulted in revenue losses of up to 96% in some places and further undermines future economic development opportunities.

Innovative new strategies and multilateral co-operation may, however, provide partial solutions while also contributing to economic development. Emerging markets for environmental services (carbon, water, biodiversity) may help to reconcile development and conservation interests in some situations, given the necessary support is provided to secure tenure rights and assist land users (often smallholder farmers) to bear the costs of accessing information, organising themselves and making the investments required to capture this market. A global upsurge in interest in biofuels is also creating new opportunities in the forestry sector; however, adequate planning and monitoring systems are required to ensure investments in biofuels are not overly costly to the environment, to rural people or to national economies. Forest tenure reforms designed to devolve rights and responsibilities to rural communities are sweeping across Africa, creating new opportunities for the poor to secure benefits from forestry. However, complementary investments in farmer capacity (economic, organisational, political) and public institutions (such as a shift from a regulatory to service orientation) are required to help rural communities capture these opportunities. Finally, the emergence of regional bodies can assist African nations in capturing new opportunities while managing risks of expanded trade. Regional research and economic bodies provide the opportunity to share costs of strategic investments in research, training, information exchange and other investments. Regional political and economic

bodies also provide a stronger lobby from which to leverage political support for the mainstreaming of forestry into national poverty alleviation strategies, for protecting and valuing critical ecosystems and ecosystem services, and for promoting the forest governance and peace-keeping efforts that serve as a foundation of economic development.

RECOMMENDATIONS

Despite the diversity among COMESA member states, a set of recommendations may be distilled which help to navigate complexity and distil the unique role of a regional economic organisation in the forestry sector. These have been ordered roughly according to their feasibility and time required for benefits to be realised, starting with the most immediate.

1. Support sharing of lessons and “best practice” in the sector through structured information sharing and strategic research to capture lessons on strategies that support rural livelihoods, sustainable forest management and the sector’s contribution to national development and poverty alleviation.
2. Support the mainstreaming of forestry into national level CAADP Compacts and poverty alleviation strategies (e.g. efforts to achieve the MDGs, AGRA), so that forestry’s contribution to livelihoods and cross-sectoral linkages (e.g. forest-agriculture, forest-mining, forest-energy, forest-water) feature more prominently in these plans.
3. Foster regional cooperation and strategic investments to add value, retain value at diverse scales (local, national, regional), and expand forestry-related trade and investment. This should include strategic investments to assist smallholders to capture market opportunities: credit, training, support to social organization and negotiation of mutual-benefit company-community partnerships. It can also involve efforts to enhance the competitiveness of select forest-based industries, for example through support from the African Global Competitiveness Initiative.
4. Assist member States in the identification of “friendly markets” that can help bear the costs of forest governance, and support and recognize their efforts to give these markets preferential trade status.

5. Design an instrument for full accounting of the value of the sector, and support member States in its application, to raise the profile of the sector nationally and regionally.
6. Develop a framework to evaluate (ex-ante and through periodic monitoring) the impacts of strategic decisions (policies, trade agreements, investments) on revenue generation, job creation, environment and social well-being so that the relative benefits and costs of alternatives can be adequately assessed and fed back into decision-making; support member states to adapt the framework and institutionalize its use. This framework could be used to evaluate options across sectors, or help capture impacts of decisions made in any other sector or industry affecting forests (agriculture, mining, energy, construction) on forest products, ecosystem services and forest-based livelihoods.
7. Develop and support the evaluation and improvement of policies for joint management of forest reserves and forest-dependent wildlife along boundaries of member states in collaboration with the African Union and conservation organizations (The World Conservation Union—IUCN, World Wide Fund for Nature—WWF).
8. Enhance gains and minimize losses from foreign investment through cross-sector coordination in trade negotiations, regional cooperation for controlling illegal cross-border trade in high-value and endangered forest products, and support to mutual-benefit company-community partnerships. Explore the possibility of a regional negotiating block to secure more favourable trade deals for the sector and stakeholders depending on it.
9. Support decisive moves by member States to secure unambiguous, equitable and enforceable tenure rights (communal, public and private) in forest areas to strengthen incentives for sustainable forest management, restrict State regulatory functions to areas providing critical ecosystem services and strengthen the capacity of local institutions to take advantage of their rights to secure market access (e.g., carbon) and foster equitable and sustainable forest management.
10. Support the mainstreaming of forestry into joint river basin management programmes such as Nile Basin Initiative and the Zambezi River Basin Initiative to support priority watershed functions of member states (e.g., mitigating flooding, reducing siltation, securing clean water supply or securing regular water supplies) while meeting rural livelihood needs in catchment areas.
11. Support collaboration in research and capacity building in the forestry sector to enhance cost sharing and to achieve economies of scale; support the mainstreaming of forestry into agricultural research and development capacity development programmes (e.g., Strengthening Capacity for Agricultural Research and Development in Africa—SCARDA, Building Africa’s Scientific and Institutional Capacity—BASIC).
12. Support member States to expand international demand for non-timber forest products through identification of new markets (e.g., Arabic and Asian) and promotion of novel products and uses, via support to organizations concerned with market and product development.
13. Support African peace-keeping processes, without which many forest-product trade reforms and economic development are impossible.

chapter I

BACKGROUND



COLLABORATION BETWEEN THE Common Market for Eastern and Southern Africa (COMESA) and Center for International Forestry Research (CIFOR) to support the Comprehensive Africa Agricultural Development Programme (CAADP) through a strategic review of sustainable trade and management of forest products and services is timely. Africa's economy is projected to grow at its best rate since the 1970s, increasing from 6.1% in 2007 to 6.8% in 2008 (IMF 2007). Although, at a global scale, sub-Saharan Africa's share of global output is small (2%), as is the combined output of the Middle East and North Africa (World Bank 2007a), African policymakers are increasingly confident that they are developing the basis for sustained growth over the next decade, when income gaps will start to narrow (The Economist 2007). Forest product trade policies and strategies are an important part of sustainable economic development. The impetus to expand African trade and the investments required highlights the need for appropriate trade and investment policies within COMESA. This is particularly true given that growth in trade can bring substantial costs. In many cases, neither the social nor environmental costs of economic development are taken into account. To avoid this pitfall, impacts of trade policies on economic development as well as on forests and forest-based livelihoods need to be anticipated and monitored. Analytical tools are available to help with this process (Borregaard and Bradley 2000), enabling trade policies to be modified where necessary to enhance the benefits and reduce or avoid the social or environmental costs.

Trade in a range of forest products from the COMESA region is already globally significant (Figure 1). In terms of timber production, the Democratic Republic of Congo (DRC) is the major tropical log exporter within COMESA and one of the top five exporters globally (after Malaysia, Papua New Guinea, Gabon and Myanmar) (UN 2007), China being a major importer and re-exporter following processing. The COMESA region is also a key supplier of non-timber forest products (NFTPs). Sudan's share of global supplies of gum Arabic increased from 44% to 63% from 1999 to 2001, with annual exports in the 1991–2002 period ranging from 17 061 to 34 162 metric tonnes (Muller and Okoro 2004). France is the major importer and re-exporter of gum Arabic. Ethiopia, Eritrea, Sudan and Kenya are also leading exporters in a number of valuable flavours and fragrances. Sudan and Ethiopia are the world's largest producers of

olibanum resins (obtained from *Boswellia papyrifera*), with additional supplies originating from Eritrea and Kenya. Kenya and Ethiopia are also important exporters of opopanax (*Commiphora erythraea* and *C. kataf*) and myrrh (*Commiphora myrrha*) (Coppen 1995), and are the leading producers supplying the trade in khat (or miraa) leaves. Khat (*Catha edulis*) leaf exports are Ethiopia's second largest export item, representing 13.4% of gross domestic product (GDP) and worth about US\$500 million/year (Green 1999, Feylsa and Aune 2003). Khat production in Kenya and Somaliland is estimated at US\$300 and US\$50 million annually, respectively (Green 1999). Although a 'hidden economy', the Kenya–Somalia trade in khat was considered to be worth US\$100 million/year (Randall 1993), with large-scale exports to the UK also feeding into a smuggling network to the USA worth an estimated £150 million/year (Crenshaw and Burke 2004). Data on cross-border trade in khat from Ethiopia to Djibouti and Somaliland is difficult to access, but certainly raises significant tax revenue for the Ethiopia government. COMESA is a significant exporter of 'pygeum' medicinal bark from *Prunus africana*, harvested from montane forests in Madagascar, Kenya, Burundi and DRC (with unmonitored trade starting in Ethiopia) and exported to France and Italy. COMESA also has coffee and tea as major agroforestry crops, and is a global leader in the production of vanilla (dominated by Madagascar) and ylang-ylang for perfumes (dominated by Comoros). Several COMESA members, notably Kenya and to a lesser extent Uganda, Zambia and Zimbabwe, are significant producers of woodcarvings. Until recently, few forestry policymakers were aware of the scale or economic value of this trade, which in Kenya alone involves 50 000 to 60 000 carvers and generates around US\$20 million per year (Choge *et al.* 2005).

In addition to its trade value, forestry provides critical support functions to rural livelihoods. Although many policymakers consider crop and livestock production to be the major contributor to livelihoods in the COMESA region, this is not always the case. In parts of the miombo woodlands, for example, forestry is the highest income earning sector for local livelihoods, contributing up to 54% of total gross income, in contrast to crop and livestock production, which contribute 25% and 6% of household income, respectively (Mutamba 2007). In this same region, a higher proportion of forest products (54–85%) than crop and livestock products (30–31% each) are marketed for cash income. In



Figure 1: Globally, COMESA members are important producers of high value non-timber forest products. **A.** Essential oils for perfumery. Eighty percent of the world's ylang-ylang is produced from Canaga flowers in the Comoros for export to French perfume houses, with significant production also in Madagascar. **B.** Cloves are an export product from COMESA island states. **C** and **D.** Kenya and Ethiopia are the world's largest producers of khat (also known as qat or miraa) from leaves of *Catha edulis*. Although illegal in the USA and several European countries, this is a multimillion dollar trade, with 3 tonnes/week exported by air from Kenya to Somalia and an estimated 6 tonnes per year to the UK, where a bundle of leaves (**D**) sells for £5 (and 10 times higher in the USA, where markets are reached through active smuggling networks). **E.** Debarking of *Prunus africana* with an over-the-counter value (**F**) of US\$220 million/year. **G.** High-value cosmetics are produced from shea butter (*Vitellaria paradoxa* seed oils) exported mainly from Burkina Faso, but also from northern Uganda and potentially Sudan. **H.** Sudan is the world's leading exporter of gum Arabic, used in many industrial processes (soft-drinks, pharmaceuticals). **I.** Kenya, Zambia, Ethiopia and Uganda contribute significantly to the global trade in honey, valued at more than US\$781 million. **J.** Both Libya and Egypt are important date (*Phoenix dactylifera*) producers.

Sudan, forestry contributes 71% of national energy supplies, 14% of rural employment, from 33% to 70% of the national feed requirement (in the rainy and dry seasons, respectively) and up to 30% of household income (Abdelazim personal communication). In Zambia, the production and marketing of firewood and charcoal, largely an informal activity carried out by poor households, is estimated at US\$5 billion and employs more than 400 000 people. Forest products are also known to provide important livelihood support functions, including cheap supplies of energy for cooking, heating and lighting in rural and urban areas and 'safety nets' for the rural poor (Angelsen and Wunder 2003).

In addition to forest products, forests supply a host of ecosystem services that are provided as 'subsidies' from nature. The most commonly recognised forest ecosystem services are carbon sequestration for global climate regulation, watershed functions (of which provision of clean, regular flows of water and flood control are but two), biodiversity and the aesthetic beauty of the landscape (which is linked to revenues from tourism). Forest ecosystem services generally go unrecognised in conventional economic accounting. These economic 'externalities' provide critical services to humanity, and there is growing recognition of the need to place a value on them in order to ensure their protection. Valuing ecosystem services in the COMESA region could go a long way in ensuring their sustainable management and enhancing the status of the forestry sector's contribution to economic development.

The relationship between trade and forest management is complex. Expanded trade may improve forest management through increases in forest value and farmers' willingness to invest in forest management, more efficient allocation of resources, by meeting the demand of consumers for sustainably harvested timber and NTFPs, or by increased investments in forest governance resulting from increased revenue to the sector (Frost unpublished). On the other hand, potentially negative effects of expanded trade on forests may result from (i) increased extraction rates of forest products and (ii) loss in forest cover due to increased demand in cultivated forest products (timber, biofuels) or products from other sectors affecting forests. Many cases exist where the long-term economic viability of export production has been undermined by environmental mismanagement in diverse sectors (Roughgarden and Smith 1996; Sachs and Warner 1999). The tendency

for the economic and social costs of expanded trade and resulting resource degradation to be borne largely by the poor is of particular concern. To ensure that expanded trade contributes to meeting national economic development goals and rural incomes while keeping social and environmental costs to a minimum, social and environmental considerations must be made explicit in the negotiation, design and monitoring of policy reforms, trade deals and strategic investments in the sector.

As will be discussed later in this review, there is huge variation in forest cover, deforestation rates, forest stocks and their biodiversity values across the COMESA region. In 2001, the estimated forest cover in Africa was 650 million hectares, most of it located in the tropics and equivalent to 0.85 ha per capita (FAO 2001). The impact of current patterns in forest use and trade on forest condition in the COMESA region is difficult to assess due to the paucity of data and monitoring practices to generate these data. In many cases, limited support given to the forestry sector has meant that no recent timber inventories have been done; inventories on NTFPs are similarly scarce. Improving national monitoring systems can go a long way in assessing sustainability of current use patterns and in tracking outcomes of trade and policy decisions. Global indices on forest status compiled by the Food and Agriculture Organization of the United Nations (FAO) rely on national-level statistics and are limited by the frequency, detail and accuracy of national monitoring. According to FAO, 2001 estimates suggest an annual loss of 5.3 million hectares of forest across Africa, the highest net change in the world (FAO 2001). Although the Congo basin loses about 1.5 million hectares of forest cover annually, deforestation rates are slowest in the DRC. At the other extreme are the Indian Ocean island countries, all of which are global biodiversity 'hotspots', with smaller islands such as the Comoros, Mauritius and Seychelles having lost most of their lowland forest. Miombo woodlands are also being cleared at rates of 0.9–1.0% per year in the case of Malawi¹ and Zambia. FAO data show deforestation rates in Zambia to be alarmingly high (850 000 to 900 000 ha/year), accounting for almost 50% of the total deforestation in the southern Africa region. DRC may represent a unique case for the region, where despite evidence of

1. In Malawi, 2.5 million ha of forest was converted to agricultural land from 1946 to 1996 (Openshaw 1997).

forest resource exploitation by neighbouring countries (UNSC 2002), conflict contributed to low levels of logging and deforestation (Baker *et al.* 2003). Select studies on high-value NTFPs also point to alarming trends in resource depletion. Evidence suggests that African blackwood (*Dalbergia melanoxylon*) is under threat through a combination of high value, unsubstitutability for musical instrument manufacture and insensitivity of the market to increased costs resulting from increased scarcity. Wild populations of *Prunus africana* are similarly under threat due to overexploitation for the pharmaceutical industry

(Stewart 2003b). Trade in honey, while smaller than other global competitors, is also an important source of revenue for communities across southern Africa.

Satellite imagery² gives a gross indication of the regional variation in forest cover among COMESA member states (Figure 2). This image shows DRC to be far ahead of other member states in terms of closed canopy forest and carbon. These visual differences

2. This Forest Resource Assessment–2000 low-resolution image was produced by FAO from Advance Very High Resolution Radiometer.

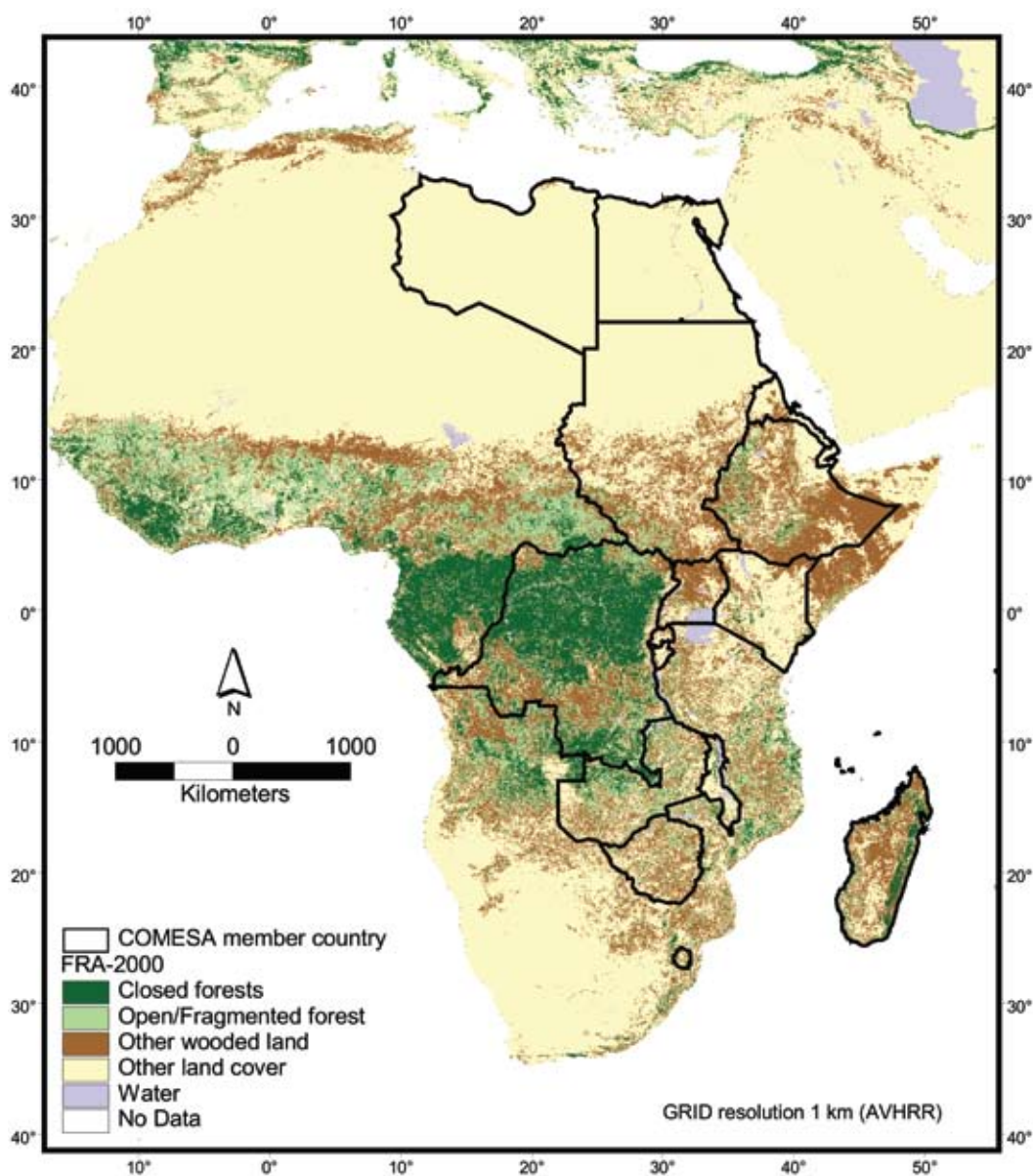


Figure 2: Forest and woodland cover in mainland Africa and Madagascar showing national boundaries of COMESA member states.

should be interpreted with caution, however, as forest coverage and biomass do not necessarily correlate with the value of different areas for NTFPs or other forest ecosystem services (biodiversity, water). Rates and patterns of forest loss vary considerably within the region. The Kenyan coast, African highlands (Ethiopia, Kenya, Uganda), miombo woodlands of southern Malawi and Indian ocean islands are characterised by 'island patterns' of deforestation in highly fragmented landscapes that correlate with high population density. In the Congo basin, the patterns and causes of deforestation are different. High-grading (removal of the best timber trees), which requires road construction and is followed by settlement and clearing, is a direct driver of the reported 1.5 million hectares of forest cover lost annually from the Congo basin—about one third of total African deforestation (WWF 2003).

Worldwide, forest governance is crucial for sustainable forest management, in terms of managing both demand (through forest fees, economic incentives for value-added processing and trade regulations) and supplies. Supply-side measures based on inventories, yield assessments and monitoring of forest management plans are important for ensuring sustainable harvest of timber or non-timber forest products (Richards 1995). In the COMESA region, complex, intersecting factors outside the forest sector—political instability, corruption, agricultural trade liberalisation, economic growth and infrastructure development—have had a profound influence on forest governance (Geist and Lambin 2002; Richards 2004). Agricultural expansion, excessive levels of timber extraction and extension of roads into forested areas are the main direct drivers of deforestation. Indirect drivers include policy and institutional weaknesses, low public awareness of forest values, uncontrolled use of new technology and human demographic factors such as population growth, refugee migrations and urbanisation (WRI 2005b). Economic liberalisation and currency devaluations tend to result in higher agricultural and timber prices, which promote deforestation (Angelsen and Kaimowitz 1999). Conflict in some countries (e.g., DRC) and corruption in the forestry sector enables valuable forest resources to be frequently exploited and controlled by political and economic elites, resulting in lost development opportunities and minimising the official value of the sector. Illegal logging costs governments at least US\$10 billion in lost revenue globally (World Bank 2002), with additional losses resulting from depressed timber prices.

Several governments and nongovernment organisations have been working on innovative ways to improve forest law enforcement and governance. Examples are bilateral agreements between countries in order to reduce trade in illegally sourced forest products, technical and financial assistance to produce adequate management plans (when over half of timber concessions in the Congo basin had none) (Ruiz Pérez *et al.* 2005) and timber certification linked to increased demand from European importers for timber supplies from certified and sustainably harvested stocks.

In 2007, unprecedented international attention was given to the complex problem of illegal logging. The US Congress has for the first time introduced a bill to ban the import and use of illegally harvested timber and wood products of illegal origin (GovTrack.us 2007). In June 2007, at the G8 Summit, illegal logging was declared 'one of the most difficult obstacles to further progress in realising sustainable forest management and thereof, in protecting forests worldwide', bolstering international commitments to combat illegal logging. Two major multilateral processes are under way in Africa to mitigate the illegal logging problem, both initiated in 2003. These are the World Bank-sponsored Africa Forest Law Enforcement and Governance (AFLEG) process initiated at the Ministerial Conference in Yaoundé, Cameroon, and the European Union-sponsored Forest Law Enforcement, Governance and Trade (FLEGT) initiative. Implementation of these initiatives has been slow, however, undermining their potential to foster sustainable trade and forest management.

Forest tenure reforms are also sweeping across Africa, in line with the tendency for a shift from central to local government (decentralisation) and from government to the private sector and civil society (devolution). More than three fourths of developing countries are now undertaking decentralisation and devolution (Contreras-Hermosilla *et al.* 2006), a process that has parallels in the forestry sector. Over the last 15 years, the amount of forest owned and officially administered by indigenous and rural communities has doubled, and communities now own or administer at least 25% of forests in developing countries (White *et al.* 2007). While these reforms have created new opportunities for rural communities to benefit from forests, results have been mixed. Devolution of powers to local bodies and authorities that are insufficiently accountable to their constituencies, devolution of responsibility without authority and inability of

community-level institutions to exercise their rights have undermined the potential of these reforms to enhance democratic process and distributional equity (Ribot 2003, Oyono *et al.* 2006). The global forest estate today remains largely characterised by unclear and contested property rights, disenfranchised local communities and rapid unsustainable exploitation (White *et al.* 2007).

It has become clear that a number of minimum (but not always sufficient) conditions must be met for sustainable forest management. The first and perhaps most important is clear and enforceable tenure arrangements—whether by communities or government. Public forest areas often become de facto ‘open access’ resources when forestry institutions are unable to enforce public tenure (e.g., exclude or regulate access), leading to unsustainable rates of extraction (Alden Wily and Mbaya 2001). Forest degradation is also likely to ensue when communities are unable to exert their customary or legal rights over forest land (e.g., exclude or regulate access by external actors). It has become increasingly apparent that locally based decision-making and tenure security enhance the sustainability of forest management (UNDP *et al.* 2005). A phased approach to securing tenure rights for communities in Tanzania, for example, has been shown to improve forest condition by providing incentives for communities to invest in sustainable management (Alden Wily 2001). The second and related requirement is to have strong institutions, in the form of organizational arrangements (community-based organisations, forestry departments, partnerships) and rules regulating access. Importantly, these rules must be enforceable. In other words, they must not be overly detrimental to local livelihoods, and they must be implemented through appropriate sanctions for noncompliance or simple peer pressure. This condition has proven to be necessary for resources held in common (Ostrom 1990, Pandey and Yadama 1990), but is also important for accountability between local communities and the government or private sector. Third, the resource must have a minimum level of value—economic or cultural—to serve as an incentive for sustainable forest management. Finally, some form of adaptive management of rules and management systems is required to match behaviour to the changing condition of the resource (Colfer 2005). Scientific and participatory monitoring systems, social learning processes and traditional belief systems may all serve this adaptive function.

The ‘window of opportunity’ for capturing the economic opportunities from forests while building upon past lessons on forest governance (e.g., to achieve both equity and sustainability) may be shrinking along with changing trade relations. For the first time since the beginning of the colonial ‘scramble for Africa’, African trade appears to be re-orienting from the ‘Global North’ (Europe and North America) to the ‘Global East’ (China and India for tropical logs, Gulf countries for timber and charcoal) (Carmody and Owusu 2007). Growing links with China reflect a combination of narrowly defined economic interests (e.g., in direct trade links) and more broadly defined political factors, including the quest by some fragile states to escape from pressures exerted by Western governments and NGOs to promote more transparent and better governance (Kaplinsky *et al.* 2006).

The diversity of COMESA member states’ ecological, institutional and economic circumstances³ may make generalisation about appropriate future strategies misleading. What is crucial in assessing and developing pragmatic strategies for sustainable forest trade and management in the region is a clear understanding of how this diversity is likely to affect the degree to which different dimensions of a regional forestry strategy require fine-tuning to national conditions. Efforts to foster trade or protection of specific forest products, for example, may need to be adapted to particular ecoregions. Specific trade policies and strategies for sustainable development of extensive forests in the DRC (Elad 2001, Perez *et al.* 2005), for example, may be inappropriate in COMESA countries where only small ‘forest islands’ are left, such as Burundi, Kenya, Rwanda, Uganda or Indian Ocean member states. However, some general principles for sustainable trade and management do exist for the sector and may apply to all member states, or to diverse forest products and services. A framework for full valuation of the sector to raise the profile of forestry nationally, for example, might be general—with specific member states choosing to apply only part of the framework due to the economic

3. Grouped according to world development indicators, COMESA members include three ‘upper-middle-income economies’ (Libya, Mauritius, Seychelles), three ‘lower-middle-income economies’ (Djibouti, Egypt, Swaziland) and a number of ‘low-income economies’ (Burundi, Comoros, DR Congo, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Rwanda, Sudan, Uganda, Zambia and Zimbabwe) (World Bank 2007).

importance of particular products and services. There is also need for regional co-operation to overcome the transaction costs of strategy implementation (including research, training and governance), and to support a collective voice in negotiating favourable terms of trade and co-operation with external actors. Finally, in terms of international policy agreements with trade and environment links, COMESA members have something in common as most COMESA members are signatories to major multilateral environmental agreements. These include the Convention on Biological Diversity (CBD), the UN Framework Convention on Climate Change (UNFCCC), the Convention on Trade in Endangered Species (CITES), the Kyoto Protocol (Kyoto), the

Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer. These conventions include trade measures and restrictions (such as CITES Appendix II regulations on *Prunus africana* trade, Box 1, or restrictions governing the use of ozone-depleting substances). Some conventions can also influence trade by creating new markets and incentives for good practice, such as for ecosystem services. In addition, most of the conventions enable countries within the COMESA region to access financial assistance to assist with the costs of achieving international policy goals, build technical expertise and capacity, or assistance with biodiversity conservation and resource management.

BOX 1

COMESA AND CITES: TRADE IN *PRUNUS AFRICANA* BARK

International conventions such as CITES have important implications for the COMESA region for trade in ivory, timber and some medicinal plants. *Prunus africana* (Hook f) Kalkman (Rosaceae) is the only indigenous representative in Africa and Madagascar of a genus of over 200 species. Often referred to by its previous name, *Pygeum africanum*, *Prunus africana* is a wild relative of several commercially important fruit crops (almonds, apricots, peaches, plums) and a plant genus of great commercial significance. Endemic to high conservation and catchment value mountain forests in Africa and Madagascar, *Prunus africana* was listed as a CITES Appendix II species in 1995. Although cultivation is taking place on a small scale in Cameroon, Kenya and Madagascar, all bark entering the international market is from wild harvest. Over the past 40 years, *Prunus africana* bark harvest has shifted from subsistence use to large-scale commercial use for international trade. From two initial brand-name products produced in France and Italy to treat benign prostatic hypertrophy (BPH), there now are at least 40 brand-name products using *Prunus africana* bark extract. These are marketed directly in 10 countries and globally through the Internet. Patents for new *Prunus africana* bark products have proliferated in the USA, where doctors received approximately 4.5 million visits for a diagnosis of BPH in 2000 (Wei *et al.* 2005).

Since 1995, international trade networks have become more complex and seven states now export *Prunus africana* bark. Encouraging developments since the CITES Appendix II listing are that an inventory and estimation of sustainable harvest have been carried out in Cameroon (Acworth *et al.* 1998) and that within the COMESA region, the Ministry of Environment, Water and Forests of Madagascar has worked with multiple stakeholders to develop a National Plan of Action for sustainable production of *Prunus africana* (DGEF 2003). In both countries, it was assumed that wild harvest of half the tree trunk bark (a quarter taken from opposite sides of the trunk) on a five year rotation would be sustainable. Recent studies on the impacts of wild harvest on *Prunus africana* populations show that this practice is unlikely to be sustainable and instead current bark harvests will lead to population decline (Stewart 2001, 2003a, b). As large trees become scarcer, harvesters are travelling farther to find mature trees. Debarking of *Prunus africana* often occurs within Afromontane forest habitats of global conservation significance (Cunningham in press). Clearing for agriculture, followed by timber extraction by small-scale loggers (pit-sawyers), forest understorey browsing and trampling by livestock and fire on forest margins are major threats to this forest type. Control over these factors is difficult in areas currently affected by armed conflict such as the Kivu region, DRC. Neither research nor managed, sustainable harvests are likely in the DRC until political stability returns, and then only with adequate training and support. At best, wild harvest is a short-term measure. Bark commercially harvested on a large scale from species such as cinnamon, cassia, cork oak, quebracho (*Schinopsis quebracho-colorado*), chestnut (*Castanea vesca*) and black wattle (*Acacia mearnsii*) is produced in agroforestry or plantation systems. The same can be done with *Prunus africana*.

Chapter II

PROMOTING SUSTAINABLE TRADE AND MANAGEMENT OF FOREST PRODUCTS AND SERVICES



A. GENERAL OVERVIEW

1. BARRIERS TO TRADE

While each forest product or service, and each sociopolitical context in which these are embedded, is likely to present its own unique set of trade barriers, a host of generic trade barriers exist. These include:

- *Markets:* Local and international markets present different opportunities and constraints for trade. While smallholders may more easily enter local markets, these markets can become saturated (Brigham et al. 1996). International markets produce barriers in terms of trade and quality standards, the knowledge and skill requirements to meet these, and business networks to penetrate the markets.
- *Knowledge and information:* Key stakeholders (policymakers, civil society, donors, small-scale producers, etc.) often have limited or no access to relevant information about (a) trade and investment trends, (b) market opportunities and possible niche markets, (c) requirements for access to markets and consumers (e.g. regulations for meeting standards for quality, fair trade, organic products and other forms of certification) and (d) harvesting and processing techniques. This lack of knowledge and information can undermine strategic decision making, restrict market access or limit the competitiveness of producers and products. Rural communities tend to lack skills to negotiate favourable market prices, outgrower schemes and benefits sharing arrangements, making them vulnerable to exploitation by outsiders and limiting the potential benefits of trade. Improved access to information on markets and sustainable use of forest products would help increase the sustainable benefits associated with the trade.
- *Capacity:* Related to the above point is a lack of key technical and institutional competencies by local communities and government actors (including forestry departments), which undermines the potential for forest product and service trade to contribute to economic growth and poverty reduction. At the policy level, capacity is required to analyse, formulate and implement trade policy options best suited to economic growth, poverty reduction and environmental sustainability. Capacity is required to meet international standards and trade regulations, to introduce environmentally sound technologies, for product development, to negotiate equitable trade agreements, etc. Local communities require capacity to influence policies and practices that directly affect them.
- *Infrastructure:* Such barriers include lack of access to capital and microcredit; poor transport, storage or laboratory facilities; limited access to low-cost technologies for extraction and processing (resulting in waste of raw material, products of inferior quality or diversity and low returns); transportation etc. Inefficient extraction and processing of timber (and NTFPs) can be both unsustainable and wasteful (Puustjarvi et al. 2005). Together, these factors limit the marketability of the product (particularly for niche markets) and the economic returns from any given area.
- *High levels of capital investment:* Small-scale producers and local communities are frequently limited by lack of capital to invest with higher or delayed returns. Capital investment requirements can present a barrier to small-scale producers with limited access to credit and collateral, paving the way for elite capture by those who can afford high up-front investments.
- *Resource tenure and access:* Access to and control over resources determines the extent to which different actors are able to secure and negotiate benefits associated with forest product trade. Tenure, both formal and informal, exerts a strong influence on the use and trade of forest products, the distribution of costs and benefits, ability to access credit and markets, and incentives to make long-term investments or manage resources sustainably (Shackleton 2005). Insecure tenure can open the system to exploitation by outsiders; ambiguous tenure can lead to uncontrolled access and environmentally harmful forms of competition. Collection of NTFPs is often on state-owned or unofficially recognised communal land, making collectors vulnerable to investment and land use policies that affect land ownership and access. This also extends to weak or absent

protection of intellectual property in developing countries, which may lead to unfair exploitation of biological resources and indigenous knowledge (Frost personal communication).

- *Regional trade barriers and existing policy and regulations:* Most trade barriers impose a monetary or nonmonetary cost on trade that raises the price of the traded products. They include customs procedures (import and export duties, quotas, bans and licenses); foreign exchange controls; subsidies; regulations on health, safety, employment and environment; product classification and standards; intellectual property laws; bribery and corruption. Economists generally agree that trade barriers are detrimental and decrease overall economic efficiency. In the forestry sector, regulations on resource use, product standards and fees can create barriers to trade for smallholders, suppress private-sector investment or foster illegal activity. Regulations and state subsidies for different sectors (e.g., energy and agriculture) often lack co-ordination, which results in contradictory or harmful outcomes. Due to corruption or political-economic advantage, some regulations may apply to those who can least afford to comply. Even countries that promote free trade heavily subsidise certain industries, however, or impose quotas and taxes on imports to keep domestic industries economically viable. In fact, such 'barriers' have been key instruments in national economic development and may be required to support early stages of development of certain products or industries until they can compete on the international market. It is important to recognise, however, that regulations or tariffs applied in one country but not in neighbouring countries, such as social or environmental standards for corporate practice, can cause businesses to flee to neighbouring states with weak regulations. Regional co-operation may be required to ensure industries are held accountable to minimum standards while supporting economic growth in certain sectors deemed important to human welfare and national economic development.
- *The resource base:* The resource traded, its ecology and sustainability affect the nature and sustainability of the trade. Seasonality of the

resource, rates of renewal (for renewable resources) and rates of extraction can affect trade. Sustainable harvesting of timber and NTFPs requires a good understanding of the resource stocks, population biology and growth rates of the target species, and how harvested species will respond to harvest. The ecology of many timber and NTFPs species harvested in the COMESA region is poorly known. Lack of ecological understanding of species' growth requirements, regeneration niche, production or yield and appropriate harvesting techniques is a significant obstacle to sustainable harvest and trade.

- *Governance:* Governance may be defined as the use of rules, institutions, structures of authority and decision-making processes to allocate resources and co-ordinate or control activity in society or the economy. In the case of sustainable trade, governance may be required to achieve competitiveness (e.g., through subsidies), equity (e.g., through support to smallholders so they can compete) or sustainability (e.g., minimum standards applied to the environment or corporate practice). In cases where forest governance is weak, trade liberalisation can lead to depletion of the resource and long-term economic opportunities, or to high levels of elite capture as national industries or smallholders are unable to compete. Each of the above factors may play out in the form of 'transaction costs', which tend to present more significant barriers to the poor and marginalised. Strategic efforts to reduce these transaction costs through support services or preferential policies would assist small-scale producers to enter the market. It is important to note that trade in many forest products is informal and is not documented or officially accounted for (Brigham *et al.* 1996, Shackleton 2005), which makes design of appropriate policies difficult.

2. RISKS OF EXPANDED TRADE

Expanded trade of forest products and services, or expanded trade in sectors that affect forests (e.g., energy, mining and agriculture), may carry a number of associated risks. These include:

- *Displacement from customary lands or resources:* Customary uses of natural resources may go unrecognised by the state, which leads to erroneous assumptions about land being ‘unutilised’ or ‘unproductive’. The targeting of land for foreign investment (e.g., timber plantations, biofuels, mining or other industries) can displace these customary uses, creating hardship for local people. Even carbon trading, seen as an opportunity to provide incentives for local people to protect the forest, may displace customary uses through increased state control and exclusionary policies. This can enhance economic vulnerability and environmental degradation, particularly where state enforcement is weak.
- *Overexploitation and environmental degradation:* Increased trade can lead to predatory uses of the environment in situations where incentives are absent (as in the case of weak or ambiguous tenure), institutions governing access and use of the resource are weak, and monitoring of the resource base and individual behaviour is absent. This problem is common in areas with weak governance, in times of conflict and where tenure is ambiguous, weak or not enforced⁴ (Baker *et al.* 2003, Mackenzie 2006). Expanded trade may affect the environment through either its positive or its negative effects on poverty (Frost personal communication).
- *Elite capture:* Unless instruments for equitable benefits capture are put into place, elite capture will be the norm under expanded trade. Elite capture encompasses the channelling of benefits streams towards international or national elites at the expense of national industry and smallholders, respectively. Benefits may flow to international elites when preferential treatment (in the form of financial incentives or weak regulations) is given to foreign investors, in particular where health, labour and environmental standards are absent, lax or unenforced. Benefits will tend to flow to national elites over smallholders where customary land tenure is not recognised, where local leaders or officials are corrupt or when the necessary support services to assist smallholders to cope with transaction costs are lacking. Barriers faced by smallholders in transporting their goods

to market restrict their share of benefits, but can create opportunities for intermediaries (Brigham *et al.* 1996). Equitable capture depends on efforts (i) to enhance smallholder capacity to access markets by minimising the above barriers or entering into equitable partnerships with corporate entities and (ii) to govern negative consequences of elite capture (e.g. loss of land, environmental services).

The complexities of natural and social systems, and the unique characteristics of different products and services, create very real challenges for the design of appropriate policies and support services. Research and monitoring each have a fundamental role to play in making strategic choices for investment of limited financial and human resources. While research can help identify strategies that are more likely to deliver competitiveness, equity and sustainability, monitoring of outcomes will be required to adapt rules and practices to real outcomes.

3. IMPLICATIONS FOR COMESA

COMESA could define its role around minimising all of the aforementioned barriers while ensuring certain minimum regulations, incentives and services are in place to foster equity and sustainability (Box 2). The costs and complexities of doing so may require a more targeted strategy, however. This complexity can be minimised through anticipatory and/or evolutionary mechanisms. Anticipatory strategies could consist of support for research that identifies the most constraining trade barriers and trade risks faced by different groups, and to target priority interventions. Evolutionary strategies, on the other hand, recognise the indeterminacy of change and the fact that most changes encompass both positive and negative outcomes. Such approaches focus on management of change as it occurs, through continuous monitoring

4. While unlike Liberia conflict has largely led to the protection of forests in DRC, the UNSC (2002) report nevertheless illustrates how conflict has enabled resource exploitation and elite capture.

BOX 2

DIVERSITY OF STRATEGIES FOR SUPPORTING REDUCTION IN BARRIERS AND RISK MANAGEMENT

- *The markets*: Assist in connecting producers to markets, understand constraints faced by producers and support targeted interventions.
- *Knowledge and information*: Facilitate information access for communities and the private sector; serve as a 'clearinghouse' for trade-related information and baseline data (e.g., volumes of trade, barriers and impacts) so that outcomes of new trade agreements and policies can be assessed; support research on scenarios for trade and investment and likely impacts on forests and forest-based livelihoods for member countries (for strategic decision-making); support knowledge transfer on a range of issues (enhancing productivity and efficiency, or social, environmental and quality standards); support the development of strategic training and extension services to meet emerging challenges and capture opportunities.
- *Capacity*: Provide leadership towards an integrated support strategy for rural producers, traders and organisations to minimise the transaction costs associated with market entry and sustainable resource management (e.g., value addition, meeting quality standards, organising to collectively manage resources and market products, negotiating fair trade deals and community–corporate partnerships). Support proper recognition of trade and its benefits among national and district-level government agencies, and government capacity to support local-level management, monitoring and governance of forest resources in the context of decentralisation.
- *Infrastructure*: Identify strategic infrastructure to support sustainable trade (transport, value-added processing, product certification, credit), including strategic subsidies (e.g., transport—see Brigham *et al.* 1996, Terry 1999, Shackleton 2005).
- *Capital investment*: Assist in deriving lessons on microcredit strategies to facilitate member states in designing appropriate and effective smallholder credit systems for cultivation, harvesting, processing and marketing or to support investment in activities with delayed returns (e.g., plantations).
- *Resource tenure and access*: Help member states understand the conditions under which resources may be utilised sustainably and for maximum social benefit (e.g., conditions of tenure and governance); support tenure reforms that recognise and institutionalise these minimum conditions (including, among others, clear, unambiguous and socially just distribution of rights on private, state and communal land; monitoring and conflict resolution systems); protect intellectual property of COMESA member states.
- *Regional trade barriers and existing policy and regulations*: Support analysis of regional and bilateral trade and investment agreements (including agreements related to reducing emissions from deforestation and degradation, 'basket' trade agreements with China, Economic Partnership Agreements with the EU, agreements in other sectors affecting forests) and their implications for forests and forest-based livelihoods. Support the development of a framework to evaluate trade agreements and regulations and its use by member states to evaluate the existing regulatory environment and new trade agreements or to assess whether markets encouraging sustainable use or regulations are more beneficial to sustainable trade. Assist member states in modifying regulations and trade agreements as needed to support identified sectoral goals, and in integrating forestry into poverty alleviation programs.
- *The resource base*: Assist member states in the management of transaction costs of social, economic and environmental monitoring systems (census, GIS, etc.) so that policies, trade agreements and investments (including plantation establishment) and local governance systems can be adequately evaluated.
- *Governance*: Support member states in the effort to control corruption and illegality; support regional monitoring on systems of governance (local vs. state vs. hybrid) and related outcomes; support rural organisations' efforts to reduce the transaction costs of investments, negotiation, meeting standards and marketing (e.g., for economies of scale, accessing niche markets).

of positive and negative effects on different social actors and outcomes, and adaptation of policies and practices for more 'wins' and fewer 'losses'. A generic framework for evaluating outcomes of different trade agreements and policies (e.g. removal or addition of

tariff or nontariff trade barriers) in terms of 'wins' and 'losses' could be a useful place to start. Benefits would include ability to evaluate both anticipated and unanticipated outcomes, and comparative analysis of different trade agreements, land uses and policies

over time by introducing a standardised system of feedback monitoring across trade agreements and locations. Outcomes to be monitored should include the flows of benefits and costs to different social actors (the state, private sector and local communities) and consequences to the environment (the resource being exploited as well as other environmental services, where relevant). COMESA could also support member states to identify emerging opportunities and to minimize the transactions costs associated with capturing these⁵.

B. FOREST PRODUCTS IN THE COMESA REGION

Effective strategies to manage forest product trade are required not only for sustainable and equitable economic growth from the forestry sector, but also because of the values of forests for ecosystem services, biodiversity conservation and local livelihoods. Trade in timber from forests, woodlands and plantations certainly provides income and employment, but other values to people also need to be taken into account. As many as 300 million people in the COMESA region, most of them very poor, depend substantially on forest ecosystems for their subsistence and survival (Figure 3). Forests and woodlands supply the vast majority of rural and urban energy needs in Africa. They also supply medicinal plants and nutritional foods (fruits, edible wild greens, mushrooms, edible insects). In addition, many indigenous groups are particularly dependent on forests for their multi-use resources and cultural values. The combined economic value of 'nonmarket' forest products may be greater than the market value of timber, but these values are rarely taken into account in forest management decisions. The tendency to focus national accounting on contributions to GDP rather than subsistence uses and other values has led to an undervaluation of the forestry sector and reduced its prominence in national development plans.

With respect to the region's timber and non-timber trade, five issues need to be addressed. First, there is the need to distinguish member countries according to context because of the vastly different extent of forest and woodland cover, timber and non-timber species and stocks, and the different challenges

facing sustainable forest management. Second, there is the need to deal with direct and indirect drivers of deforestation. Third, there is the need to take both legal and illegal trade into account. Fourth, there is the need to recognise, through an historical perspective, how the direction of trade has shifted in the past 50 years from 'North' (Europe, North America) to 'East' (China, India) and its implications for forest management and governance. Finally, there is a need to develop future policies based on past lessons to harness the sector's potential contribution to economic development and human well-being.

1. TIMBER

Four different country categories are apparent in the COMESA region in terms of timber trade:

1. Countries that export globally significant timber resources from the world's second largest area of closed moist tropical forest, but where the forest industries are poorly developed and hampered by low levels of employment creation in the forest sector (Ruiz Pérez *et al.* 2005), low productivity, illegal logging, conflict and few forest management plans (fewer than half of concessions surveyed). Member state: Democratic Republic of Congo.
2. Indian Ocean island member states with high levels of forest clearing for agriculture or agroforestry and globally significant remnant forests that generate significant international funding for forest conservation and restoration. Madagascar is an 'outlier' in this group, not only due to its global conservation significance, but because it continues to export some specialty timbers such as rosewood (from endemic *Dalbergia* species), several of which are overexploited. Member states: Comoros, Madagascar, Mauritius, Seychelles.
3. Countries that have only small areas of natural forest, often designated as protection forests (for their catchment values), forest reserves or

5. For example, supporting member states to liaise with African Global Competitiveness Hubs, or Trade Hubs, to leverage information and technical assistance on trade, investment and business activities in the sector (USAID 2007).



Figure 3: Wood products are a crucial resource for at least 300 million people within the COMESA Region. **A.** Pit-sawing is widespread, but creates long-lasting canopy gaps suppressing regeneration in montane forests. **B.** Charcoal trade is a major source of household energy. Sustainable production is possible, but is limited in practice. **C.** Mangrove poles traded for construction (Kenya). **D.** Transport and trade using dugout canoes is common in DRC, Malawi and Uganda. **E.** Kenyan woodcarving is worth US\$20 million/year, but **F.** generates illegal trade in muhugu (*Brachylanea huillensis*) logs from 'protected' forests. **G.** Cross-border trade into Kenya from Tanzania.

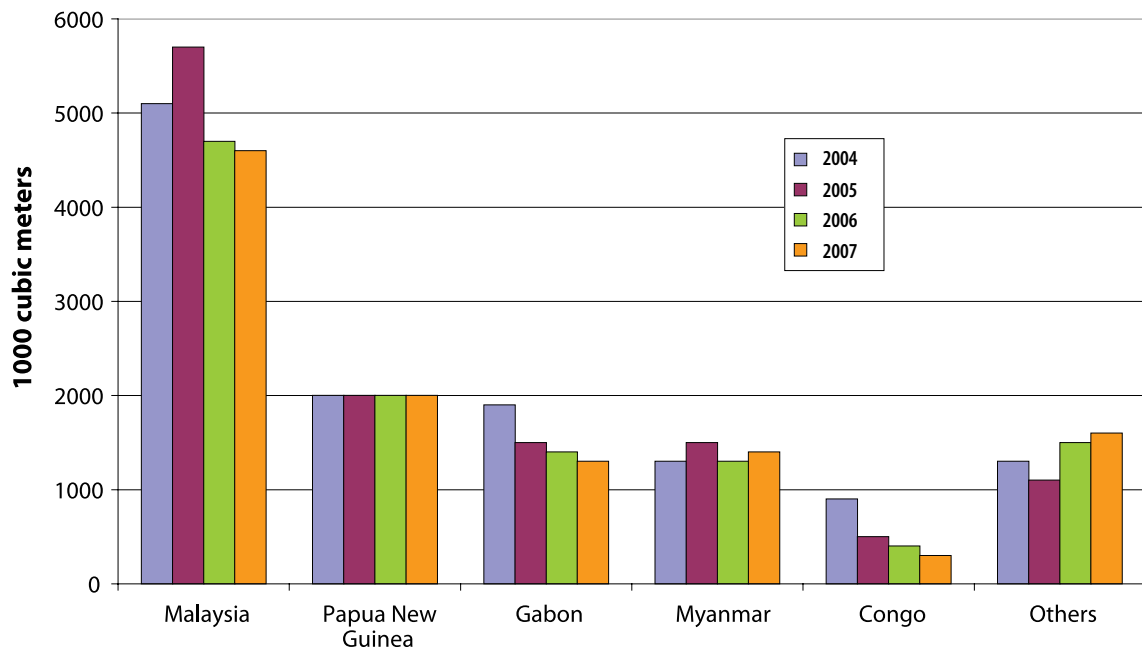


Figure 4: The world's largest exporters of tropical logs during the period 2004–2007 (UNECE/FAO 2007)

national parks (due to their biodiversity values), remaining. Most are situated within densely populated highlands (or in the case of Kenya, coastal lowlands). Forest stocks have been depleted by illegal logging and there is extensive development of plantations. Most plantation timber is used nationally rather than for export. Member states: Burundi, Ethiopia, Kenya, Malawi, Rwanda, Sudan, Swaziland.

4. Countries that have few closed canopy forests, but significant areas of miombo woodland. Stocks of valuable hardwoods such as *Pterocarpus angolensis* are dwindling, illegal logging is widespread and support for forest management needs to be strengthened through training and increased financial and technical resources for national forest administrations. Member states: Zambia, Zimbabwe.

Trends in Tropical Timber Trade

Global timber harvests have increased by 60% since the 1960s and are likely to continue to grow, although at a slower rate. The DRC is one of the top five global timber exporters (Figure 4). Only African

countries continue to export a high volume of logs compared to processed products, missing out on a significant opportunity for value-added processing. In contrast, less than 10% of logs exported from Asia were unprocessed and virtually no unprocessed logs were exported from Latin America (UNECE/FAO 2007). In recent years, however, the proportion of African log exports compared to processed timber has declined from over 40% of production in the mid-1990s to under 20% today as processing capacity has expanded.

Several global changes are worth mentioning because of their effects on trends in the region. The first is an increased demand for pulpwood over sawnwood. Since 1961, the portion of wood harvested for use as pulp has increased threefold. Plantations are also providing an increasing proportion of timber products at a global scale. This increase in plantation timber has been accompanied by genetic selection of superior trees resistant to insect pests and pathogens. According to a recent UN report (UNECE/FAO 2007), plantations represented 5% of the global forest cover in 2000, providing about 35% of roundwood harvests. By 2020, roundwood harvests from plantation timber are projected to increase to 44%. While Africa is

making decisive moves to expand plantation forestry, the region is currently home to only 7% of tropical timber plantations (hardwood and softwood), while the 80% majority is produced in the Asia-Pacific region and 13% in Latin America and the Caribbean. African International Tropical Timber Organization (ITTO) members produce virtually no softwood primary products, whereas COMESA members who are not members of ITTO are significant producers. In 2005, non-ITTO African tropical countries reported an estimated production of 3 million m³ of softwood and industrial roundwood, the bulk of it produced in Zimbabwe, Kenya and Tanzania. Most of this roundwood was found to be used within the region. Only a small portion of softwood logs (about 21,250 m³) and slightly more sawnwood (the main product of softwood production) went into global exports (UNECE/FAO 2007).

In addition to being the main buyer of tropical timber until the mid-twentieth century, Europe (especially France, Belgium, Italy and Germany) has for decades successfully dominated the logging sector in Central Africa. Nearly all log production is still dominated by foreign firms⁶. Since the early 1990s, however, significant changes have taken place in this established pattern of trade. Seeking to expand their operations globally, Malaysian timber concessionaries were the first to break the Europeans' stronghold on Africa's forests. By the end of the decade, the increasing demand for timber in China steered progressively more timber exports to the Far East. Over the last 10 years China has made extensive inroads in Africa's forestry sector. Although 85% of Africa's exports to China and India consist of petroleum, metals and agricultural raw materials, timber and food products are also part of this growing trade (Broadman 2007). In exchange for development aid and also as part of package deals combining trade agreements on a range of products (oil, gas, minerals and agricultural products in exchange for infrastructure and low-cost manufactured goods), China has been able to secure both vast forest concessions as well as assurances of increased timber export for its expanding economy. During the 2004–2007 period, China and India were the largest importers of unprocessed tropical logs (Figure 5).

Other observed changes are regional in nature. In the 1960s and 1970s, West Africa was the main supplier

of African tropical hardwoods for the European market. With the progressive decline of forest resources in the region in the 1980s, due to pressure from agricultural conversion and overexploitation (except for Liberia, where it was instead driven by conflict), the focus began to shift to more remote and intact forest resources of the Congo basin. More recently, logging has extended into the dry woodlands of eastern and southern Africa (Mackenzie 2006, Milledge *et al.* 2007).

Illegal Logging

The accelerating pace of exploitation of African forests for timber has long been a cause of concern for NGOs, research institutions and international donor agencies. While the initial focus was on preventing forest degradation and desertification in West Africa, by the 1990s the discourse had turned to illegal logging and its effects. Illegal logging is the harvest, transportation, purchase or sale of timber in violation of effective national laws. This dialogue spans a vast array of issues, including processes for acquisition of forest concessions; forest management planning; harvesting, production and transport of timber; meeting environmental and social standards; payment of taxes and other royalties; following export procedures etc. Following trends in Asia, analyses in Africa have revealed that more than half of timber production in Central Africa does not adhere to relevant legal standards. In fact, the level of illegality in some countries in the region is thought to be in the order of 80–90%.

Illegal logging and corruption in the forestry sector can deepen poverty, depress timber prices, harm state revenues and severely damage biodiversity. At a global scale, illegal logging costs governments US\$10 billion per year in lost revenue (World Bank 2002). The main reason for the widespread nature of illegal logging in Africa, as in other parts of the

6. Employment figures from these concessions suggest mean and median employment to be in the range of 2.7 and 1.2 workers per 1 000 ha, respectively (Perez *et al.* 2005), suggesting the only real contribution of these concessions to national development to be through national revenue capture.

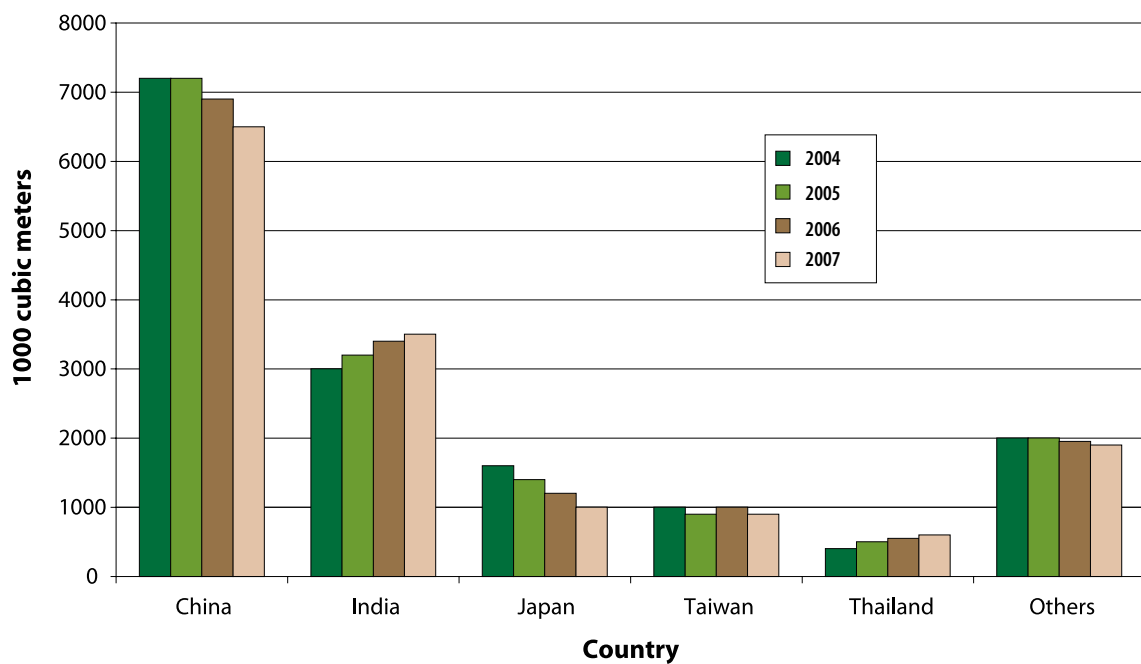


Figure 5: Major tropical log importers, 2004–2007

world, is the lack of capacity of relevant government institutions to effectively monitor, manage and control remote forest areas. Once underdevelopment, poverty and widespread corruption are added to the picture, it is clear that logging operations have effectively been beyond the reach of the law in many countries in sub-Saharan Africa. As a result, the potential benefits from illegal activities have consistently outweighed the costs.

Evidence suggests that steps are being taken to address the illegal logging problem. In 2007, unprecedented international attention was given to economic and policy solutions to the complex problem of illegal logging. While the US track record is poor (EIA 2006), the US Congress recently introduced a bill to ban the import and use of illegally harvested timber and wood products of illegal origin (GovTrack.us 2007). At the 2007 G8 Summit, illegal logging was declared 'one of the most difficult obstacles to further progress in realising sustainable forest management' and therefore in protecting forests worldwide. A commitment was made to support processes that combat illegal logging. As mentioned above, two major multilateral processes are also under way in Africa to mitigate the illegal logging problem. The

World Bank-sponsored AFLEG process, launched at the 2003 Ministerial Conference, aims to foster partnerships between producers and consumers, donors, civil society and the private sector to address illegal forest exploitation and associated trade in Africa and to build Africa's forest governance capacity. By 2006, the World Bank was supporting some nine forest law enforcement and governance-related programmes in Central Africa at a total cost of nearly US\$500 million. The EU-sponsored FLEGT initiative also seeks to strengthen timber legality standards in producer countries, improve the effectiveness of forest law enforcement and ensure greater adherence to EU timber import legislature. The vehicle for achieving this is the Voluntary Partnership Agreements (VPAs), which producer countries negotiate with the EU. Once negotiated, VPAs provide access to premium timber markets in Europe and extensive capacity building opportunities for producer countries. Cameroon is the only country with such an agreement in effect; Central African Republic, Congo-Brazzaville, Gabon and Ghana have also expressed interest in initiating the process towards VPAs.

While VPAs are generally seen as a positive development at the macro-economic scale,

especially as they will help improve the capacity and effectiveness of forestry institutions in Central Africa and ensure better terms of trade with the EU, there are several unanswered questions. The first concerns the potential negative implications for rural livelihoods. As the VPA process will result in tighter forestry legal frameworks, it may clamp down on small-scale logging largely dominated by rural communities logging for subsistence. This may lead to increased economic hardship or conflict. The second question is whether VPAs will provide opportunities for community-based timber enterprises. As most timber operations currently benefit large multinational logging companies with established links to European markets, explicit investments are likely to be needed to ensure rural communities capture benefits flows. Finally, with the emergence of China as the leading consumer of Africa's raw materials and the declining clout of Europe, VPAs may have limited influence in the absence of parallel legal tightening of the terms of trade with China, India and other emerging economies.

As the tropical forests of Central Africa are coming under increased scrutiny, there are indications that logging operations are expanding beyond the moist tropical zone. The miombo woodlands of southern Africa are one such expansion area. For instance, there have been reports of intensive logging linked to the expansion of timber exports to China from Mozambique and southern Tanzania (Mackenzie 2006). It is possible that Malawian and Zambian timber may be contributing to this growing trade as well. As international attention will inevitably turn to this commodity trade and related problems, COMESA countries should learn from the experiences of timber exporters in Central Africa.

Implications for COMESA

COMESA can support its member states in planning for and implementing the following measures:

- Strengthen forestry planning, monitoring and enforcement agencies.
- Support cross border co-operation in select subregions (eastern and central Africa, southern Africa) to develop mutually recognised legality standards for timber export and import and

customs procedures drawing on international models from COMESA member countries⁷.

- Support transboundary conservation activities between COMESA member states with explicit peace promoting components, such as (1) promoting international co-operation between security personnel and conservation authorities, (2) intensifying administrative presence in remote forest spaces and (3) protecting legal forest-based activities of local populations.
- Support forest-based enterprise development, community forest management and mutual-benefit community-company partnerships to help communities capture economic benefits of timber trade.
- Consider co-operation on these issues with the EU and the costs and benefits of entering into dialogue with the EU over VPAs.
- Demand legally tighter terms of trade with China and India and forestry sector participation in negotiated trade deals.
- Support development of alternative wood supplies, including agroforestry and timber plantations, in COMESA member states with a limited forest resource base⁸. Support member states with instruments to ensure the negative social and environmental impacts of plantations are minimised, monitored and controlled (e.g. ensuring they are far from water catchments and do not displace customary land uses) and social benefits enhanced (e.g., through mutual-benefit partnerships between communities and corporations).

7. Adapted from Forest Monitor (2007).

8. An ex-COMESA member state, Mozambique, has recently floated the proposal to develop 2 million ha of timber plantations over the next two decades. Uganda has a similar program under way, and Kenya and Tanzania are moving in the same direction.

2. NON-TIMBER FOREST PRODUCTS

Plant-Based NTFPs

Trade in NTFPs can be considered at two main levels—local trade and international or regional trade (cross-border trade between COMESA member states and neighbouring nonmember countries). While local NTFP use at a household level is less significant in household subsistence strategies in high per capita income COMESA countries such as Mauritius (average annual income per person, US\$5260) and Seychelles (US\$8290), NTFPs are crucial to household strategies in COMESA countries where average per capita income is less than US\$2 per day. In Burundi, Comoros, Ethiopia, Eritrea, Malawi, Rwanda, Sudan, Uganda, Zambia and Zimbabwe, for example, plants provide ‘green social security’ in the form of firewood, charcoal, building materials, herbal health care and subsistence income. Recognition and support for the diverse roles that forests and woodlands play in local livelihoods is crucial. Given COMESA’s regional mandate, however, this section focuses on international and regional (cross-border) trade (Figure 6), for which trade information is summarised in Annex A⁹.

In contrast to Asia, where rattan and bamboo make a major contribution to national economies (e.g. Indonesia, where rattan exports earn US\$300 million per year), Africa is poor in both bamboo and rattan species. Therefore, these are used mainly at the local level. From a global perspective, however, COMESA members are leading producers of the following categories of NTFPs:

- *Colloidal gums from Acacia*. Gum Arabic, the best known natural gums (from *Acacia senegal* and *A. seyal*), is used in the food industry as a stabilizer; in soft drink syrups; for making gummy sweets (gum drops), chewing gums and marshmallows; in shoe polish and in watercolour paints. In 2002 Africa exported over 54 000 tonnes of gum Arabic, with Sudan dominating the world market and exporting to about 30 countries. Ethiopia and Eritrea, contributing 1.6% and 0.6% of world production, respectively, are small-scale producers. While raw material harvesting, processing and grading are done in the COMESA region, most value-adding

is done in importing countries. The same applies to flavours and fragrance products. France is the leading importer of gum Arabic (accounting for more than 40% of global imports), Colloides Naturels International of Rouen, France, being a world leader of gum Arabic processing. The specifications of gum Arabic are defined within the European Union as ‘the dried exudate from the trunks and branches of *Acacia senegal* or *Acacia seyal* in the family Leguminosae’. Novel gums therefore need to conform to the EU Regulation on Novel Foods and Novel Food Ingredients.

- *Flavours and fragrances*. The world flavour and fragrance market is predicted to reach US\$18.6 billion in 2008. Flavours are used commercially in beverages, foods (confectionery, bakery, and savoury and snack foods), pharmaceutical products and mouthwashes. Fragrances are used in perfumes, cosmetics and toiletries, soaps and detergents, household cleaners, air fresheners and aromatherapy. COMESA is a leading producer from two sources. The first includes indigenous tree shrubs in the plant family *Burseraceae*: (a) frankincense (gum olibanum) from Ethiopia, Eritrea, Sudan and to a lesser extent Kenya, with Somalia being the only other producer at a global scale; (b) opopanax (*Commiphora erythraea* and *C. kataf*) produced in northeastern Kenya and eastern Ethiopia; and (c) myrrh (*Commiphora myrrha*) exported from Kenya and Ethiopia. The second source emanates from island states in the COMESA region, who dominate trade in two cultivated products from introduced trees: (a) ylang-ylang essential oils from *Canaga odorata* flowers (a tree introduced from Asia), of which Comoros produces 80% of world supplies while additional production is carried out in Madagascar; and (b) vanilla fruits (‘pods’) from the orchid *Vanilla planifolia*. Although Indonesia is a noteworthy competitor in vanilla production, Madagascar is the major vanilla producer, and the COMESA region (including production in

9. Major tree crops (i.e., coffee, tea, dates) of importance to several COMESA countries have been excluded here as they are well known.



Figure 6: COMESA forest products in local or regional trade. **A.** Rattan (*Calamus deerratus*) cultivation trial (Gede Forest Station, Kenya). **B.** African rattan (*Calamus*, *Eremospatha*, *Laccosperma*) trade is minor compared to Asia, but is locally significant for furniture and basketry in the Congo basin and East Africa. **C.** Bamboo provides low-cost housing in Madagascar and montane Kenya and Uganda. **D.** Trade in edible mushrooms is important in DRC, Malawi and Zambia and has export potential. **E & F.** In Malawi, the vine *Cocculus hirsutus* is used to weave 'cane' furniture for export to South Africa and Zambia. **G.** Enset (*Ensete*) an important food crop and component of Gurage agroforestry systems, Ethiopia. **F.** Edible caterpillars are the basis of a valuable local and regional trade (DRC, Zambia, Zimbabwe) with exports to Botswana and South Africa. **G.** *Warburgia salutaris* medicinal bark is traded from Mozambique to Zimbabwe and Swaziland to South Africa. **H & I.** Red pepper (*Piper guineense*) is traded locally (DRC, Uganda) and has international export potential. **J.** Farm in Kenya exports butterflies to Europe and generates local tourism revenue.

the Comoros, Mauritius and, to a smaller extent, Uganda) collectively dominates the trade. Four companies currently account for around 40% of the global market. These are Givaudan SA, based in Vernier, Switzerland; International Flavors and Fragrance, based in New York; Firmenich International SA, based in Geneva, Switzerland; and Symrise, located in Holzminden, Germany.

- *African medicinal plants.* Out of a global total of 422 000 flowering plant species, over 50 000 are used for medicinal purposes, with an estimated 2 500 species of medicinal and aromatic plants traded worldwide. Most of these medicinal plants are still collected from wild sources (Schippmann *et al.* 2003). Relatively few of these are African species; however, those important within COMESA are:
 - *Pygeum (Prunus africana).* The bark of this tree is harvested from montane forests of Kenya, Madagascar, Burundi and the DRC. Over the past 40 years, *Prunus africana* bark harvest has shifted from subsistence use to large-scale commercial use for international trade. From initially two brand-name products, produced in France and Italy to treat benign prostatic hypertrophy (BPH), there now are at least 40 brand-name products using *Prunus africana* bark extract, with an over-the-counter value of US\$220 million/year (Cunningham *et al.* 1997, Cunningham 2005). These are marketed directly in 10 countries and globally through the Internet. Patents for new *Prunus africana* bark products have proliferated as a result of the approximately 4.5 million cases of BPH that doctors diagnose annually (Wei *et al.* 2005).
 - *Khat (or miraa) from Catha edulis.* Farmers in Meru district, Kenya, and in Harrarghie, Ethiopia, are the most important producers. Farmers in the Habro district in Ethiopia earn 70% of their income from khat, as a maize-khat intercropping system is 2.7 times more profitable than maize monocropping (Feylsa and Aune 2003). Ethiopia earns high revenue from export taxation of khat. In Kenya, cross-border trade (including daily flights from Nairobi's Wilson Airport to Mogadishu) is largely unmonitored, but in 1993 the Kenya–Somalia trade was considered to be worth US\$100 million per year (Randall 1993). The trade in Ethiopia was estimated at US\$500 million annually (Green 1999). More recent estimates of *Catha* leaf imports to the UK are 6 tonnes per week. This export feeds into a smuggling network to the US, where khat sells for US\$28–50 for a 200 g bundle, or US\$300–440 per kilogramme (Crenshaw and Burke 2004), putting the UK–USA trade at approximately £150 million per annum.
 - *Iboga (Tabernanthe iboga).* The roots of this potent psychotropic plant, found in Gabon, Cameroon and the DRC, are effective in the treatment of heroin, cocaine and amphetamine addiction, a use that may become increasingly important in the future (Mash *et al.* 1998).
 - *Pepperbark (Warburgia salutaris and W. ugandensis).* Used to treat coughs, colds and opportunistic *Candida* infections due to HIV/AIDS, this NTFP is traded within the region and is used to produce a branded commercial product in South Africa.
- *Speciality foods.* The large and growing African diasporas not only drive international trade in products like khat (*Catha edulis*), but also in speciality foods such as indigenous fruits (*Cucumeropsis manii* or mbika), dates (*Phoenix dactylifera*), edible greens (*Gnetum*), honey, bush meat and edible caterpillars. These forest products are also traded regionally. Even a single high-value product like mopane 'worms' (the edible caterpillars of *Saturniid* moths, highly valued in DRC, Zambia and Zimbabwe) can add immense value to mopane woodlands. In South Africa, the value of mopane caterpillars was estimated in 1999 to be £2850 per hectare of mopane woodland. This means that South Africa's 20 000 km² of mopane woodland is worth £57 million annually for caterpillars alone, 40% of which is earned by poor rural women (Ghazoul 2006). Kenya, Zambia, Ethiopia and Uganda also contribute significantly to the global trade in honey, valued at more than US\$781 million in 2006. In Zambia, demand for 'African polony', a popular food made from chikanda (the edible tubers of about 20 orchid species), has generated a cross-border trade from

Angola and southern Tanzania. A key reason for this cross-border trade is overexploitation of wild orchid populations in the dambos running through Zambia's miombo woodland (Bingham *et al.* 2002).

- *Art and craft products: woodcarvings and basketry.* African basket-makers sell some of the world's finest baskets (Cunningham and Terry 2006), with Ethiopia, Zambia and Zimbabwe exporting baskets—often by the container-load as in the case of *mukenge* (*Combretum zeyheri* root) baskets from Zambia, for example. Africa's carvers produce the richest diversity of headrests, masks, stools and backrests in the world (Dewey 1993, Bocola 1995). Compared with other uses, woodcarving gives considerable value to wood. Not only does this value-added processing make a significant contribution to household incomes and to lifting households out of poverty, it is more ecologically sound as it produces high financial benefits for any given unit of wood extracted. In Kenya, by far the greatest value added to wood comes through woodcarving. When one sees the scarce wild olive wood being sold as charcoal or firewood in Kenya rather than being carved into beautiful bowls, it is apparent that important opportunities have been lost in the forest management and wood marketing system. *Dalbergia melanoxylon* is the world's most valuable timber and currently fetches close to US\$20 000 per cubic metre in the international market for sawn timber. The value derived from turning these sawn 'blanks' into woodwind instruments such as clarinets (Box 3) illustrates the extremely high values that some carved wood species can fetch in the world market. This is a far higher price than sawn timber from any other local species. More value is added through polishing and painting. In other cases, such as Zimbabwe, carving offers very low returns and is seen as employment of last resort, providing little incentive to manage wood stocks sustainably. Nevertheless, woodcarvings retain their value as a source of foreign exchange and thousands of wooden giraffes and hippos leave Zambia and Zimbabwe through the cross-border trade to South Africa each year.

Bush Meat

Throughout the tropics, starchy staple foods like cassava, rice and maize are made more interesting with sauces and side dishes from edible plants, fish or meat. In many parts of Africa, wild animals (often called 'bush meat') are more popular than meat from domesticated animals such as goats, sheep, cows or chickens (Figure 7). Bush meat is particularly popular in rural areas. In the Congo basin, for example, daily per capita wild meat consumption by rural dwellers can be 10 times greater than consumption by urban people (Wilkie and Carpenter 1999). In Central Africa, the bush meat harvest may be more than 2 million tonnes annually (Fa *et al.* 2003).

Demand for bush meat from logging camps has a high impact on larger wildlife in the surrounding forest, while smaller wildlife such as cane-rats ('grass-cutters') and some duiker species thrive in disturbed forest resulting from logging. Demand from large urban areas also extends into forests and woodlands, often



Figure 7: Bush meat is often more popular than meat from domesticated animals in many parts of Africa; in Central Africa its harvest may be more than 2 million tonnes annually.

BOX 3

TIMBER GENETIC DIVERSITY IN COMESA: THE DALBERGIA CASE

The COMESA region contains some of the world's best-known tropical timbers, such as okoumé (*Aucoumea klaineana*) and sapelli (*Entandrophragma cylindricum*) from the DRC. Equally well-known are African blackwood from the miombo woodlands and rosewood from Madagascar, both from the genus *Dalbergia*. For various reasons, including the lack of secure tenure, the establishment of plantations of African tropical timbers is poorly developed.

This box, focused on a single genus containing valuable timber trees, illustrates how sustainable forest trade links to the need for tree conservation. The genus *Dalbergia*, with approximately 125 species of trees, shrubs and lianas in the *Fabaceae* family, contains the world's most valuable species for woodcarving, woodturning and timber. Trade in *Dalbergia* wood from the tropics has a long history. *Dalbergia melanoxylon* (the African ebony or African blackwood), along with ivory and slaves, was an important component of the colonial-era economic exploitation of East Africa by the Arabian peninsula and later Europe. During the nineteenth century, when colonial botanists explored tropical floras for species that were potential sources of revenue, *Dalbergia melanoxylon* also provided the standard against which all other woodturning species were judged for their quality—a feature recognised today by those who use it to produce the world's finest bagpipes and woodwind instruments such as oboes and clarinets (Oldfield and Jenkins 2005). Many *Dalbergia* species are slow growing, with close grained, high density timber ranging from 800 to 1200 kg/m³. Poorly managed commercial loggers are therefore tempted to shorten cutting cycles, and natural populations in many parts of the world urgently need protection (Cunningham *et al.* 2005). Madagascar is one of two global centres of *Dalbergia* diversity with 43 species, all but one found nowhere else in the world. (The other centre is in Asia, along the Himalaya from northern Pakistan to China, with 70 species.) Eleven species (8.8%) of the genus *Dalbergia* are included in the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Plants. *Dalbergia baronii*, *D. davidii*, *D. monticola* and *D. purpurascens* are all heavily exploited endemic Madagascan species (Schatz 2001). Additionally, in the COMESA region, one species (*D. eremicola*) is listed as rare, as it is found only in northeastern Kenya and adjacent areas of Somalia. As most species are shrubs or lianas (such as *D. setifera* and *D. eremicola*, a small shrub which is locally common on red sands near Wajir in northeastern Kenya and adjacent areas of Somalia) too small and/or too crooked for their wood to be used, habitat loss, rather than the commercial timber or woodcarving trades, is the major threat. Of the 59 *Dalbergia* species in Africa, many are used on a small scale for traditional medicine, with just a few used for making walking sticks, cudgels and snuff containers (*D. hostilis*, *D. melanoxylon*, *D. nitidula*, *D. obovata* and *D. saxatilis*). Only one species (*D. melanoxylon*) enters the international markets, whereas in Asia seven species (10% of the regional total) are commercially used for timber. Opportunities for softwood and tropical hardwood plantation production in COMESA are widespread yet poorly developed, with current trade tending to destroy natural forests and transform biodiversity-rich grasslands. Development of blocks of different high-value indigenous tree species such as *Brachylaena huillensis* was pioneered in Kenya in the 1930s. With secure tenure, plantations of high-value timber species including *Dalbergia* could be developed, providing an alternative to overexploited wild stocks. *Dalbergia* plantations in India are a good example of what can be done (Tewari 1994). Selection of elite trees with higher heartwood production growth rates and suitable growth form, however, requires conserving genetic diversity in wild populations. This is an urgent need for *Dalbergia* in the COMESA region.

with long supply chains (Fa 2000). Hunting methods in areas linked to urban markets also change, with a shift to use of firearms (Milner-Gulland *et al.* 2002) and snares (Noss 1998). In contrast to the relatively high game biomass in some parts of the COMESA region where well-documented community-based wildlife management schemes occur (e.g., the East African savannas or the Zambezi valley in southern Africa), the wildlife biomass of the Congo basin is low. As a result, there is a greater chance of overexploitation, particularly where bush meat trade takes place.

The bush meat trade is of as much concern to conservation agencies as it is of interest to those interested in local livelihoods and economic development. This has led to a search for solutions through co-operative partnerships between national governments, conservation agencies and some logging companies. The government of the People's Republic of Congo, a German timber company (Congolaise Industrielle des Bois) and the Wildlife Conservation Society, for example, are collaborating to control hunting and bush meat trade within a large logging concession adjoining

Nouabalé Ndoki National Park (Elkan 2000). This effort includes strict enforcement by trained forest guards to prevent snaring and use of firearms, establishment of no-hunting zones, protection of vulnerable species and limits on transport outside the concession. In addition, the project runs education programmes for logging company staff and local people. More recently, in an effort to raise awareness on corporate practice, the World Resources Institute began to develop a Forest Transparency Initiative. This instrument includes information on whether logging companies have a bush meat policy in their concessions and whether these are enforced (Munilla and Pories 2006).

3. BIOENERGY

Bioenergy is energy that comes from biomass. Traditional forms of bioenergy include firewood, charcoal, dung and crop residues, which are generally burnt directly with low efficiency. Modern forms of bioenergy convert biomass (e.g., organic residues and energy crops) into more versatile forms of energy such as electricity, liquid and gaseous fuels. Current interest in bioenergy in Africa is largely focused on liquid biofuels and their potential for ameliorating the economic consequences of rising oil prices and recurrent crises faced by power utilities, and raising revenue and household incomes (Karekezi 2002b). Yet bioenergy also encompasses age-old practices of using plant and animal by-products (i.e., wood, charcoal, crop residues, and dung) for household cooking and lighting. This section covers both of these dimensions of bioenergy.

Wood fuel

Reliance on traditional biomass energy is high in rural and urban areas of sub-Saharan Africa, accounting for between 40% and 90% of total energy consumption in all countries but South Africa (Fishbein 2001, Karekezi 2002a, SEI 2002, The Global NTFP Partnership 2007). Even oil-rich sub-Saharan countries continue to rely on biomass energy to meet the bulk of their household energy requirements (Karekezi 1999, cited in Karekezi 2002a). While total consumption of firewood seems to be tapering off, use of charcoal is growing (Figure 8), and it is estimated that the number of people

relying on biomass for cooking and heating will increase from 583 million to 823 million between 2000 and 2030 (Nilsson 1996, FAO 1997, IEA 2002). The negative health impacts from continued use of charcoal and firewood and labour-intensive wood collection also make this an important issue (O'Keefe 1990, Fishbein 2001, The Global NTFP Partnership 2007). Collection of wood for firewood and charcoal is time consuming, women and children being the most negatively affected (O'Keefe 1990, Fishbein 2001). Yet firewood and charcoal are also important as sources of income and as safety nets for rural and urban households (The Global NTFP Partnership 2007). The production and marketing of firewood and charcoal is estimated at US\$5 billion in Zambia alone, employing more than 400 000 people (Keddy 2003). Charcoal contributes approximately 2.3% to the GDP (Hibajene *et al.* 1993). These trends emphasise the importance of continued access to both traditional biomass and affordable energy alternatives (SEI 2002, World Rainforest Movement 2007).

While the gap between supply and demand is large and growing and current levels of use may be unsustainable (O'Keefe 1990), the problem is not as serious as once thought. Evidence suggests that use of wood fuel is only an occasional cause of deforestation globally (Geist and Lambin 2002, Kaimowitz and Angelsen 1998), while the clearing of land for agriculture (often for industrial agriculture) is the most significant driver. While global charcoal consumption continues to rise, particularly as a source of fuel for the urban poor (Karekezi and Ranja 1997), firewood consumption has reached a peak. The livelihood impacts of fuel scarcity are also less than once expected, as creative responses to scarcity have reduced the economic impact on households (e.g., shift to fuel-efficient uses and alternative sources) (Deweese 1989, Vermeulen 2001). While shifts to crop residues and dung as fuel sources may have detrimental effects on agriculture through declines in soil fertility, these effects are estimated to be less detrimental than direct purchase of more expensive fuels.

i. Evaluating Past Strategies for Sustainable Wood Fuel Production

When evaluating possible strategies for managing woodfuel production and marketing in the COMESA

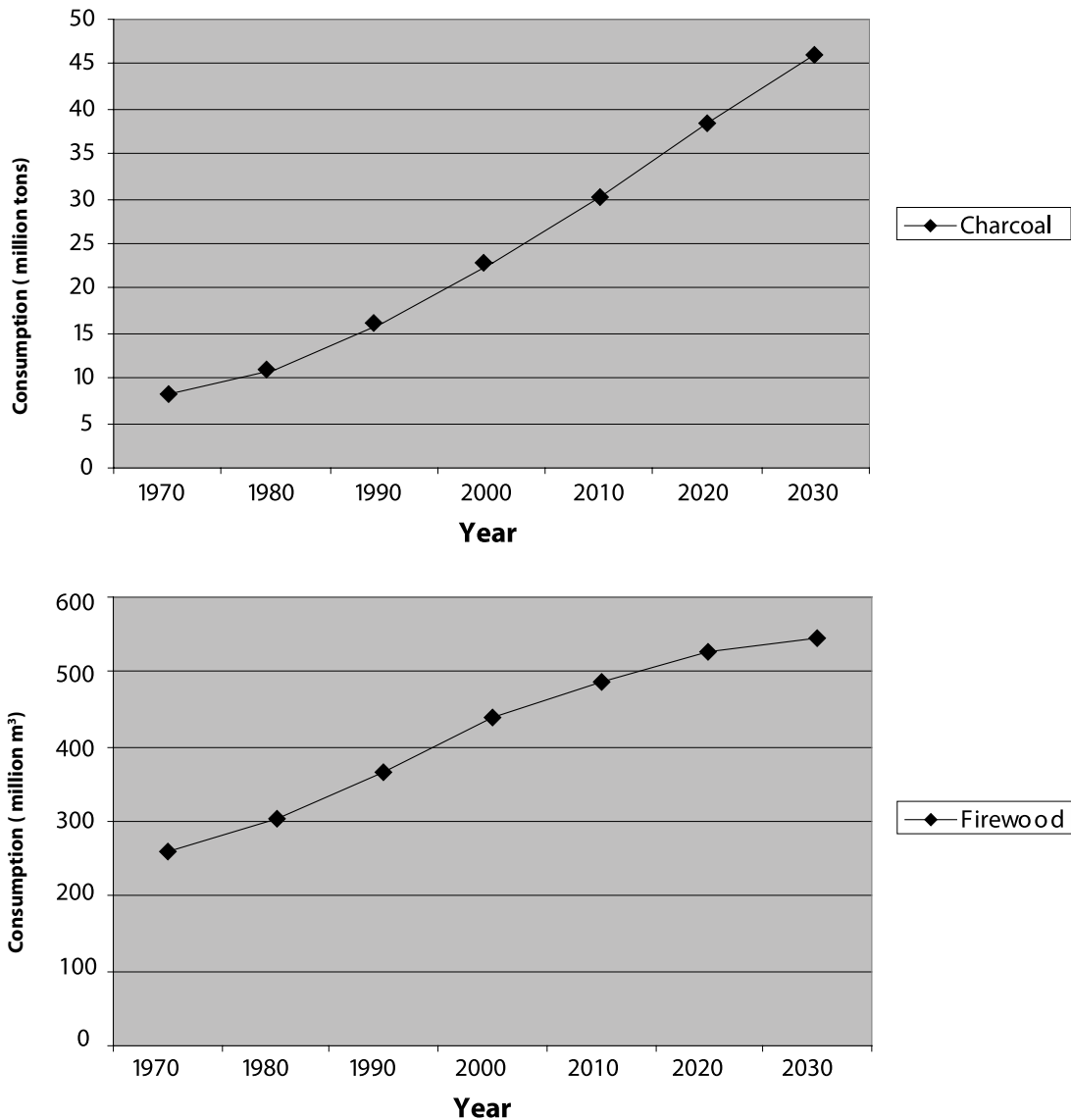


Figure 8: FAO projections of charcoal and firewood consumption in sub-Saharan Africa (Broadhead *et al.* 2001)

region, it is useful to learn lessons from the past. A number of different strategies (see, for example, Arnold *et al.* 2003) have been tested, each with its own limitations. Evaluations of these strategies have led to increased understanding of the complexity of the task, as well as important lessons—each of which is discussed below.

- *Plantations.* In an effort to reduce pressure on natural forest, governments throughout the world have experimented with the promotion of state-managed and smallholder plantations. Given the

costs of wood production, however, plantations became oriented more towards commercial than subsistence products and have done little to minimise pressure on natural sources. Plantations have also been established on communal lands, where firewood was previously obtained, leading at times to the decreased supply of rural fuel (Saxena 1997). State-owned plantations have also had limited success in meeting growing demands, failing to produce firewood at a price that covers production costs and resulting in conflicts

between state and local communities over access. Yet despite this evidence, the plantation model persists as a means to alleviate pressure on natural forests.

- *Energy efficient stoves* have received low levels of acceptance by rural households for cultural reasons, and have only been popular where they save money (e.g., in towns where woodfuel is purchased), not where they contribute only to labour savings, energy efficiency or improved health (Vermeulen 2001, ESD 2002). In many cases, these stoves remain inaccessible to the poor. Subsidies for improved charcoal stoves in urban areas, combined with energy efficient charcoal kilns for rural areas, hold some promise for slowing the rate of environmental degradation through more efficient energy conversion and use (Karekezi 2002b).
- *Energy subsidies*. Subsidies for alternative fuels have kept wood fuel prices low, causing people to obtain wood only from cheap supplies (natural forests) and undermining incentives for plantation development. Unless accompanied by strong regulation of use on state land, this solution will remain detrimental to sustainable forest management.
- *Taxes and fees*. Fiscal disincentives on the collection of wood fuel from natural forests have proved unsuccessful for various reasons. First, levels of fee collection have been low, ranging from only 1% to 25% of the amount extracted (SEI 2002). High fees have also encouraged corruption and illegal activity rather than sustainable use. Equity issues are also a concern, as such fees have created conflict between customary users and merchants from outside who are granted licences.
- *Legislation*. Laws 'illegalising' charcoal production create increased insecurity for already insecure households and drive the trade underground, making it hard to monitor (Brigham et al. 1996).
- *Market controls*. Attempts to control woodfuel markets in natural forest have included granting formal control to communities, sustainable management agreements and differential taxation to benefit supplies from controlled sources and distant communities. The effectiveness of these

efforts has been hindered by poor controls, low levels of tax collection, manipulation by corrupt officials and the difficulties of controlling competition from cheaper uncontrolled sources. Controlled wood fuel markets to benefit plantation forestry have also faced difficulty controlling flows from natural sources (Deweese and Scherr 1996). There is, however, promise for market-related controls if stronger checks and balances were put into place.

The complex interplay of history, tenure and institutions in driving the depletion of rural energy supplies has defied easy solutions to the sustainable wood fuel problem. Despite the shortcomings of each of the above approaches, however, lessons learnt from these experiences and their shortcomings can guide future strategies for sustainable woodfuel production. Any future strategy should consider the following realities:

- 'Economic availability' (affordability) is generally a greater constraint than 'physical availability' of the resource, with household income and fuel prices being the predominant determinants of household fuel usage. As such, costly plantations are unlikely to be established for fuel use or sale. Cultivation of 'multipurpose' trees, securing rights and management systems over communal land, regulated access to state forests and price controls still hold some promise for facilitating continued access for domestic use and sale.
- Policies and incentives in the energy and forestry sectors (and their effects on the pricing and availability of different types of fuel) jointly influence household fuel consumption behaviour. Wood fuel from natural supplies and subsidies, for example, depress prices and limit incentives to produce firewood as a cash crop. Charcoal, kerosene and coal are the most prominent 'transition fuels' as income increases, with urbanisation tending to shift households from firewood to charcoal. Efforts in the energy sector (e.g., those aimed at enhancing access to alternative fuels) must be coordinated with strategies in the forestry sector (e.g., efforts to manage natural stocks of charcoal near urban centres), given their mutual influence on household decision-making.

- Population density and infrastructure are important dynamics in the sustainability of forest management, with overexploitation often concentrated near urban areas and within 10 km of roads. This makes spatial planning, especially on the location of highly regulated use of forests, essential. It also makes monitoring of the impacts of such regulation on sourcing strategies critical, as uneven regulation of natural supplies will create spin-off effects in other areas.
 - Relative stability in the real price of wood fuels in urban markets tends to minimise signals of shortage and the responses such signals would bring (e.g., plantation development in response to depleted natural supplies), requiring active monitoring by government to facilitate timely response to resource degradation and shortage.
 - Tenure security to increase incentives for sustainable use, strong local institutions that regulate rates of harvest and monitoring systems to enable forest users to adjust rates of harvest to the status of the resource are all important for sustainable forest management.
 - The situation is complex, as any policy shift in the energy or forestry sectors involves winners and losers (suppliers vs. consumers, subsistence vs. market-oriented forest users). The high variability of patterns of use and impacts within any given country also undermines the meaningfulness of national-level statistics and requires that strategies be adjusted to context. These complexities make efficient and effective monitoring systems for ongoing evaluation of national and regional strategies of fundamental importance.
- keep woodfuel prices artificially low (which discourages investment in regeneration and management) or reconciling sustainable use with rural livelihoods (e.g., through carbon trading). Ultimately, strategies tested should monitor progress towards diverse outcomes, since complex spin-offs characterise most interventions.
- Assist member states in the design of strategies for forest management, wood fuel trading and energy provision based on past lessons, and in monitoring their effects on livelihoods and forest condition. This approach might include monitoring the effect of the international and regional charcoal trade on local livelihoods, revenue generation and forest management so as to facilitate more socially and environmentally beneficial trade.
 - Support an integrated and sustainable energy policy that meets energy requirements without harming the forest cover by assisting member countries in the development of cross-sectoral strategies, integrating the wood fuel issue into wider forestry objectives and strategies, identifying appropriate roles of forestry departments and designing control and management mechanisms proportionate with the value of outputs (Arnold *et al.* 2003).
 - Explore possibilities for cross-border information exchange, technology transfer and capacity-building based on existing advanced technologies and adaptive capacities (The Global NTFP Partnership 2007). Assist member countries in addressing the technical, labour, institutional and economic constraints and promote capacity building and microcredit to support alternative energy options (Fishbein 2001, Puustjarvi *et al.* 2005) .
 - Assist in evaluating community-based forestry and natural resource management programmes in the region (The Global NTFP Partnership 2007) and the conditions for success, so as to guide strategies for balancing economic and social development goals.
 - Support member countries' efforts in evidence-based policy making (analysis, planning, monitoring of impacts) to ensure sustainable energy supply for diverse users. *For rural wood fuel users:* (i) recognise the role of communal

ii. What role for COMESA?

COMESA has an important role to play in addressing a regional concern. Possible interventions include:

- Foster a greater understanding of how wood fuel use, energy policies, forestry and livelihood interventions relate to one another and promote cross-sectoral collaboration in strategy development in the energy and forestry sectors. The focus could be on helping people move up the energy ladder, fostering sustainable energy use (renewable energy), reducing measures that

BOX 4

SOME GLOBAL STATISTICS ON BIOFUEL

Bioethanol and biodiesel are liquid fuels derived from energy crops (including crop waste). Bioethanol is made from starch or cereals (e.g., maize, sugarcane, soybeans, wheat), while biodiesel is derived from vegetable oils (e.g., sunflower, rapeseed) and animal fats. Both biodiesel and ethanol can be blended with diesel and gasoline, respectively. Ethanol is currently made from three main feedstocks: corn in the United States and Europe, sugar beet in Europe, and sugarcane in the developing world. The first two are commercially viable only with permanent subsidies and trade barriers, and their production requires substantial fossil fuel inputs (Mathews 2007). The US and Brazil account for almost 75% of the world's ethanol production, while the EU produces 95% of global biodiesel. Currently, only 3% of the world's gasoline consumption is from biofuels and less than 10% is traded globally. World production of both is growing, with ethanol increasing from 18 billion to 35 billion litres from 2000 to 2005, and biodiesel increasing from less than 1 billion to 3.5 billion litres during the same period (Peskett *et al.* 2007).

areas and (ii) develop and evaluate alternative models for securing sustainable use and access to natural supplies in rural areas. *For urban charcoal users:* develop and evaluate (i) alternative models for sustainable charcoal production to feed urban areas and (ii) strategies to enhance benefits to poor charcoal suppliers. *For industrial users:* develop and evaluate strategies (i) to match sustainable supply with demand and (ii) to enhance benefits to the poor from sale to industry. Each of these approaches is to consider the fundamental importance of secure tenure, strong institutions and monitoring, and conflict management.

- Support awareness campaigns for member states in cases where research findings question common policy assumptions (e.g., that poverty and the poor are the underlying cause of deforestation) (World Rainforest Movement 2007).

Biofuels

Renewable forms of energy are perceived to constitute an important option for mitigating and abating the emissions of greenhouse gases, and interest is rising both globally and regionally (Socolow 1992). A recent upsurge in global interest in plant-based fuels has been driven by new scientific evidence of the scope and economic impacts of global warming (Stern 2006, IPCC 2007), by rising oil prices and desires to boost energy security, and by recognition of the limited capacity of developing countries to meet their own biofuel needs. Many countries have formulated

requirements that a percentage of the gasoline and/or diesel must be blended with biofuels, which is expected to boost global demand for alternative fuels. The EU, for example, has released three different documents since 1996 setting ambitious targets for bio-energy use¹⁰. Brazil already blends 20–25% ethanol into all gasoline (Sims *et al.* 2006) and will blend 5% of biofuel into all diesel by 2013. Nine states in India have a 5% biodiesel requirement for diesel, with plans to increase this proportion to 20% by 2020. As several countries will be unable to meet their targets with domestic production¹¹, international trade is likely to grow (Peskett *et al.* 2007).

i. Biofuels in Africa

The rising demand for biofuels has generated great interest in Africa as a new frontier for biofuel production. This interest is generated from the

10. These include the 1996 'Green Paper' setting a target for renewable energy at 12% of primary energy use by 2010; the 1997 'White Paper' projecting net consumption targets of biomass by 2010; the 2003 Directive on Biofuels, targeting an increase in the consumption of biofuels to 2% and 5.75% of diesel and gasoline consumption by 2005 and 2010, respectively; and a 2007 commitment to reach 20% renewable energy by 2020, with biofuels making up no less than 10% of transport fuels (Lewandowski and Faaij 2006, Mathews 2007).

11. For example, in order to meet the target of 10% of biofuel for transport by 2020, the EU would have to convert 70% of its farmland to grow energy crops.

expectation that African countries have large expanses of unutilised land, high levels of unemployment and cheap labour, and that biofuels could contribute to the much needed income for smallholders. These optimistic views are backed by an understanding of the particular suitability of *Jatropha curcas* for the region for its ability to adapt to conditions of low soil fertility and moisture (thereby minimising competition with food production) and to be integrated into smallholder farming systems (Openshaw 2000). However, aside from research into the technical feasibility of biofuel production from different origins (agriculture, forestry, waste), the anticipated scale and types of benefits are largely based on speculation. Little is known about the potential of biofuels or *Jatropha* to address the energy needs of Africa's poor, their financial and economic feasibility, or the associated social and environmental costs (Karekezi 2002). Any look into the potential of different sources of fuel should consider not only benefits to income and revenue, but social and environmental costs and their viability as a supply of convenient and affordable energy to the rural and urban poor¹².

ii. Potential Risks of Biofuel Production

To balance the enthusiasm surrounding biofuel development in Africa, it is worth summarising the potential risks surrounding their production. This will enable planners to consider research required to fill knowledge gaps, and for risk management to be given concerted policy attention. The primary risks may be summarised as follows:

- *Land conflict and displacement.* Several authors argue that cultivation of crops like *Jatropha*, adapted to suboptimal growing conditions, will minimise conflict with cropland. If these crops produce more in fertile than infertile soils, however, an incentive will nevertheless exist to cultivate them in fertile soils—with risks to food production. Furthermore, other customary land uses such as grazing and collection of firewood tend to go unrecognised by policymakers and planners in the identification of 'unproductive' land. Introduction of cash crops with high value to industry, such as soybean in Bolivia, has caused shifts in land ownership to large-scale farms

owned by foreign investors (Kaimowitz and Thiele 1999). Efforts are needed to identify customary land uses in areas targeted for biofuel plantations (and compensate these uses where plantation establishment is nevertheless approved), and to restrict industrial-scale cultivation in areas owned by smallholders.

- *Biodiversity.* Evidence from oil palm plantations in Latin America and Southeast Asia suggest that biofuels are often produced at a huge cost to forests and biodiversity (McNeely 2006). Biofuel plantations should be established only in areas with low conservation value.
- *Water.* There are some concerns that biofuel cultivation will compete with already limited water resources, particularly for crop-based biofuels such as maize and sugarcane and for irrigated plantations. While little is currently known about the potential hydrological impacts of *Jatropha*, the Water Research Commission of South Africa has launched a three-year research study into the water resource impacts of large-scale plantations (see www.scienceinafrica.co.za).
- *Competition with food production.* Several concerns have been raised about the possible competition among fuel, food and feed production. The first is that biomass production could compete with food production and lead to regional food and energy supply shortages in developing countries (Faaij *et al.* 2003). Another is the price effect on food and feed due to an expansion in energy crop production (Mathews 2007). The United States Department of Agriculture predicts that the current expansion of energy crops will cause the prices of grain and oil crops to increase in the next 3–4 years, but decrease thereafter (USDA 2006).

12. Another justification is provided by Shapouri and Rosen (2006), who suggest that increases in the price of oil have put tremendous pressure on oil importing developing countries, burdening their trade balances and creating budget constraints that reduce their ability to import food and essential raw materials. In countries such as Brazil, with a long history of experience with technology in bioethanol production and use, there are substantial savings in oil imports and also foreign exchange earnings from alcohol-related technology exports (see Cadenas and Cabezudo 1998).

Others foresee rising prices and shortages in the downstream food industry (e.g., from corn), in feedstuffs, and in the poultry and livestock sectors (Brown 2006). The International Food Policy Research Institute has modelled what the increase of some food crops would be under three different scenarios by 2010, 2015 and 2020 (von Braun and Pachauri 2006). Results suggest there may be significant price increases in several food crops as a result of biocrop production¹³.

- *Elite capture of benefits.* While biofuels are touted as a means to reduce poverty in Africa through involvement of smallholders in their production, evidence from other emerging markets suggests their participation will depend on a host of conditions that are often difficult to ensure. These include negotiation of fair community-company contracts (Clarke and Isaacs 2005), such as the contract farming and off-take agreements envisioned by D1 Oil in Zambia and Swaziland. Experience from the EU, US and Brazil show that economies of scale are important for biofuel production and large-scale farms are therefore better suited (Peskett *et al.* 2007), suggesting that farmer organising or company contracts would be required to participate in biofuel markets.
- *Macroeconomic impacts.* Other macroeconomic effects are also difficult to anticipate, such as price effects caused by subsidies, foreign exchange savings and economic impacts associated with land use impacts.

Mathews (2007) argues that the main priorities of developing countries are to protect their interests by ensuring such investments are sustainable, that they are created in partnership with local firms or communities, foster technology and knowledge transfer, and lead to further investments in the value chain (to avoid loss of revenues from value addition). An important question to ask is how the production of biofuels can be controlled so that these social and environmental risks are minimised. Concerns about potential negative effects of large-scale biomass production and export, like deforestation or the competition between food and biomass production, have led to the demand for sustainability criteria and certification systems that can control biomass trade (Lewandowski and

Faaij 2006). Under the WTO General Agreement on Tariffs and Trade, import restrictions are only allowed if the product itself is harmful, not the process of making it. Existing certification schemes such as the 'Green Gold certificate' of the Dutch utility Essent Sustainable Energy similarly define 'eligible' forms of renewable energy, but lack sustainability criteria for biomass production (Lewandowski and Faaij 2006). Today, neither such certification systems nor criteria or indicators to describe sustainable biomass trade¹⁴ are available, but international aid agencies, NGOs and scholars are working towards this end (Lewandowski and Faaij 2006, Van Dam *et al.* 2006). Even once such certification schemes are developed, their effectiveness may be limited by their voluntary nature or the likelihood that some countries will continue to go for cheapest options irrespective of local practices.

Another means of fostering an informed approach to biofuel development is to support research into the social and environmental impacts, and bring findings into multistakeholder dialogue in the context of planning to harmonise energy, agriculture, environment and social policies. The possibility of developing a broader institutional framework that guarantees the North regular supplies of biofuels produced in a responsible manner and the countries of the South open markets in the North should also be explored through regional co-operation (Mathews 2007). Benefits to developing countries could include raising the finance needed to make the huge investments involved, and to help stave off the forces pushing for irresponsible biofuel development.

iii. Implications for COMESA

There are several possible implications for the role of COMESA, including:

- Support the design of policy and legal frameworks by (i) establishing common regulatory frameworks

13. If no new technologies are developed in production or processing, they estimate the price of cassava to increase by 135% by 2020, oilseeds by 76% and maize by 41%.

14. For a description of social, economic, ecological and other criteria of relevance to the biofuel trade, please see Lewandowski and Faaij (2006).

(e.g., on social and environmental standards and corporate social responsibility) so investments are not lost by those countries trying to foster responsible biofuel development strategies; (iii) supporting regional efforts at monitoring and enforcement of regulations to minimise the cost, given the likelihood of noncompliance of some buyer countries in certification schemes; (iv) implementing regional or international certification systems; and (v) exploring use of fiscal measures to buffer industry and producers from market fluctuations (e.g., contingency taxes to buffer against price-cutting by petroleum companies) (Mathews 2007).

- Support the establishment of a regional knowledge base to assist in planning by (i) enabling member states to assess the costs and benefits associated with different biofuel crops, locations and alternative land uses, to understand how gains can be enhanced while risks are minimised and to aid in identification of relevant certification criteria; (ii) supporting the identification of minimum conditions required for smallholders to profit from biofuel markets (information, credit etc.) so that governments know where to target support services; (iii) characterising customary land uses and livelihoods in areas prioritised for investment for the prioritisation of locations for plantation establishment and/or design of compensation mechanisms; and (iv) facilitating a regional monitoring system following plantation establishment based on agreed standards, to facilitate adaptive management of the industry.
- Explore the feasibility of national or regional processing rather than through raw material exports to capture value.
- Support comprehensive evaluations of available renewable energy resources and options for utilising them and, if deemed viable, the development of carefully selected strategies to support fuel transitions ('technological and institutional leapfrogging') for domestic use of biofuels (Karekezi 2002b).
- Support regional collective action in negotiating trade deals to maximise benefits from investment.

C. FOREST ECOSYSTEM SERVICES

Although forest ecosystems, and the environmental services emanating from these, represent a capital asset of each COMESA country, the long-term benefits that could be derived from wise management of these assets are generally not reflected in conventional economic indicators. As tropical deforestation progresses, forest environmental services—formerly provided for free as a 'subsidy from nature'—are also become scarcer. One such service is provision of clean, reliable supplies of water for household and commercial use. On average, a person needs 20–50 litres of clean water per day for drinking, cooking and personal hygiene, yet over 1 billion people lack access to safe water supplies and 2.6 billion people lack adequate sanitation (MEA 2005). Water supplies from forested catchments are also important for hydro-electrical power. Similarly, carbon, biodiversity and aesthetic values of forests are generally lost to economic accounting, contributing to the complex set of factors that enter into individuals' land use decisions (e.g., to maintain forest cover or convert to other uses) and undermining economic incentives for sustainable management of these ecosystem services.

With growing scarcity, interest in the idea of paying others, such as communities on forested land, to provide environmental services on a sustained basis, is also growing (Wunder 2007). The underlying principle of such payments for environmental services (PES) is that forests provide valuable positive externalities to off-site beneficiaries, but that these may not be taken into account by on-site landowners or users unless the beneficiaries pay for them. If the potential gains from forest conservation or restoration are large enough, the winners should be able to afford to compensate those on the land who, because they are being asked to adopt a nonpreferred land-use practice, may be losing something. Beyond achieving the objectives of conservation proper, PES can potentially provide important additional and regular income flows, or other material and nonmaterial benefits, for cash-poor forest-dwelling communities. PES schemes are therefore seen as having the potential to create 'win-win' situations for people and the environment through conditional and voluntary ecosystem

BOX 5

CHARACTERISTICS OF PAYMENTS OR REWARDS FOR ECOSYSTEM SERVICES

Key issues to be considered by COMESA are the characteristics required for effective payments for ecosystem services schemes. PES must be:

Realistic:

- They should be based on the critical watershed function of interest to downstream stakeholders.
- The reward scheme must be linked to real cause-and-effect relations between land use and the service of interest, based on clearly identified baselines, payments matched to changes in the service (both positive and negative), and changes monitored and attributed to those land users producing the change.

Conditional:

- The payment should be conditional on delivery of the service and on the magnitude of change in the service delivered.
- Other factors leading to observed changes (e.g., rainfall variability) need to be differentiated from those resulting from land use practices; indicators for capturing these differences are required.

Voluntary:

- PES schemes are generally voluntary, with decisions to participate dependent upon the decision of each land user.
- A reduction of mandatory protection (e.g. local and national regulations on forest use and water source protection) may be needed before efficiency gains can be expected from voluntary payment mechanisms.

A set of tools for rapid appraisal of ecosystem service schemes is now available on the ICRAF website (www.icraf.org/sea/publications) for assessing stakeholder concerns and knowledge systems in the 'scoping' stage of a voluntary, conditional reward mechanism.

service markets (Box 5). It is important, however, to recognise that 'payments' may be in cash or in kind, the latter in the form of increased public services or land tenure (with increased rights conditional on a set of minimum conditions for land management). In forest areas designated for protection yet where access is unregulated (and which therefore are subject to unsustainable rates of use), tenure conditional on forest protection may be tried as a means to enhance forest conservation. This approach is being tested by the World Agroforestry Centre (ICRAF) in Southeast Asia and Africa.

Conditions for effective implementation of compensation and rewards for ecosystem services identified in a recent pan-tropical study are (i) clear demonstration of an environmental problem worthy of national-level government intervention, with specific action concentrated in areas of greatest need and where local governments are willing to pay; (ii) ability to link environmental management with the national priorities for rural employment generation and poverty reduction; (iii) the political context, which sets the stage for societal value given to the service

and the allocation of rights; and (iv) research capacity to quantify and value the resource and evaluate PES programmes (Swallow *et al.* 2007).

Despite the promise the PES concept raises for reconciling livelihood needs with conservation, the International Institute for Environmental Development (IIED) points out that PES schemes do not provide a 'magic bullet' solution. Rather, success depends strongly on a suitable institutional and political context (Landell-Mills and Porras 2002), where land and forest ownership need to be clearly determined (Pagiola *et al.* 2002). This can be complex in the densely populated montane forest landscapes of East Africa or countries in conflict. Therefore caution should be used when extrapolating experiences from PES schemes in other regions to Africa, or even across COMESA member states.

As the community ecotourism experiences of COMESA member states (i.e., Indian Ocean island nations, Egypt and wildlife-rich countries of eastern and southern Africa) are widely recognised, this section focuses on carbon sequestration, watershed protection and biodiversity maintenance.

1. CARBON

Forests will play a major role in climate change mitigation efforts because deforestation and forest degradation contribute an estimated 20% of global carbon emissions. The UNFCCC is the primary mechanism for co-ordinating international action on the threat of climate change. The Kyoto Protocol is an agreement made under the UNFCCC, which commits countries that ratify it to reduce their emissions of carbon dioxide and five other greenhouse gases or engage in emissions trading if they maintain or increase emissions of these gases. The protocol, adopted in 1997 but achieving full force only in February 2005, has now been ratified by 175 parties. The treaty expires in 2012, and international talks began in May 2007 on a future treaty to succeed the current one.

The two primary ways of affecting net greenhouse gas emissions are to reduce the emissions by conserving existing carbon sources and to increase sequestration by creation of carbon sinks. Current Kyoto mechanisms for achieving these targets include joint implementation among Annex I countries¹⁵ and the clean development mechanism (CDM). The CDM is a Kyoto Protocol mechanism that allows Annex I Parties to purchase emission allowances ('certified emission reductions') from projects in non-Annex I countries that reduce or remove emissions. CDM credits may be generated from emission reduction projects or from afforestation and reforestation projects.

While generating much interest within the forestry sector for the potential of such projects to raise much-needed income and revenue, these expectations have been largely unmet due to the transaction costs, uncertainties and risks of forestry-related CDM projects. As of 14 October 2007, while 813 projects had been registered by the CDM Executive Board, only 21 of these (2.6%) were hosted by African countries. Most strikingly, only one of these projects relates to afforestation and reforestation (A/R) activities under the Land Use, Land Use Change and Forestry (LULUCF) component of the CDM (<http://cdm.unfccc.int/Statistics/index.html>), with the 52.7% majority of projects associated with energy industries.

Non-Annex I countries are increasingly looking towards a potential new mechanism of Reduced Emissions from Deforestation and degradation (RED) focused on conserving existing carbon sources as opposed to creating new carbon sinks. This new instrument, however, will be of interest mainly to a small number of forest-rich COMESA member countries. The December 2005 UNFCCC Conference of Parties (COP11) opened up a two-year period of discussion on the potential of RED, and the anticipation of a new international treaty in 2012 is likely to stimulate interest in pilot RED projects to explore the mechanisms of how such an instrument could be governed.

Asia and the Pacific (60.3%) and Latin America (36.4%) dominated the CDM projects. The inclusion of LULUCF projects in CDM has caused some debate since forests provide nonpermanent carbon sinks¹⁶, because it is difficult to determine 'additionality' (carbon sequestered as a direct result of the project intervention) and due to the likelihood of 'leakage' among land uses within a country (for example, carbon sequestered through A/R CDM undermined by deforestation in other areas). This creates risk for the investor. In addition, the CDM market is limited since buyers can use LULUCF-based CDM only up to 1% of their total carbon emission reduction target. LULUCF-based carbon trade through CDM is regulated by the Kyoto Protocol and will work only during the first commitment (2008–2012). Voluntary markets are used when buyer and seller voluntarily agree on the terms of trade. All carbon-based payments in Africa are of this type (<http://cdm.unfccc.int/Statistics/index.html>). Another concern related to A/R CDM is the potential costs to livelihoods or other environmental services, such as

15. These are the 36 industrialised countries and economies in transition listed in Annex 1 of the UNFCCC. While Annex I is often used interchangeably with Annex B of the Kyoto Protocol, the former countries are subject to nonbinding commitments while the latter (29 emissions-capped industrialised countries and economies in transition) have legally binding emission reduction obligations.

16. This is due to future use of the forest, risks from fire and other disturbances and greater ability of the energy sector to deliver permanent solutions through reduction in emissions (e.g. through increased energy efficiency).

loss of alternative uses of land and the high levels of water consumption by fast-growing tree species. The Climate Community and Biodiversity Alliance has introduced standards (<http://www.climate-standards.org/projects/>) to assess net impact on emissions and to minimise such costs through a set of criteria and indicators for evaluation of CDM projects, but use of these standards by certifiers or buyers is voluntary. Institutions are emerging at national, regional and global levels to provide services to buyers and sellers and facilitate the carbon trade¹⁷.

Since avoiding deforestation and forest degradation is cheaper than afforestation and reforestation, the global community is now exploring ways to compensate nation-states for such activities (Box 6). Global agreements on the functioning of these markets are expected to be launched in 2012. Governments of forest-rich nations are preparing themselves for RED through pilot activities to test different methods and strategies for measuring carbon stocks, determining feasible national-level commitments (total emissions reductions from avoided deforestation and degradation), setting up monitoring systems and outlining payment and payment distribution mechanisms. At national level, governments can explore innovative mechanisms for achieving RED targets, such as extending anti-money laundering laws to the forestry sector (following Indonesia's example), regulating how financial institutions make investments in the forestry sector or through rigorous application of international agreements against corruption in the forestry sector (Barr 2001, Setiono and Husein 2005). CIFOR is also exploring how the monitoring of income and investments by national economic and political elites can be used by the financial sector to curb illegal activity contributing to deforestation. Despite the opportunities presented by RED, introducing a new RED instrument into the global carbon market can flood the supply side and depress prices unless demand is also increased. It is also important to recognise that not all deforestation will be controllable through these instruments in cases where the economic incentives for alternative land uses are higher than what may be gained from forests (in this case, RED funds plus other forest income).

Governments keen to capture opportunities provided by international climate change mitigation

efforts to further both environmental and economic development targets must be aware of the potential risks involved. The first set of risks relates to who captures the benefits from international payment mechanisms. New resource flows are likely to shift the balance of power, and elites may come to dominate the new markets. Observable patterns at the international level include the greater ease with which wealthier non-Annex I countries and nonforestry land uses have benefited from the CDM. Within developing countries, there is concern that national-level monetary flows from international transfer payment schemes will not trickle down to local forest users, and that local elites will capture those benefits that are directed towards district-level actors and local communities. Equity in benefits capture concerns not only what is done (e.g., definition of rules and mechanisms for distributing payments), but what is *not* done that could otherwise support small-scale actors to enter the market (e.g., information brokering, support to community organising, negotiating with potential buyers). Lessons learnt from other payment distribution instruments such as Indonesia's Reforestation Fund highlight the critical importance of (i) ensuring benefits go not only to the offenders (in areas of high deforestation) but to provide an incentive for good behaviour and (ii) mechanisms to ensure transparency among all stakeholders in decision-making (rules on benefits sharing) and in monitoring the flow of funds received. The second set of risks relates to who bears the costs of afforestation, reforestation and RED as land uses shift towards environmental services of interest to the global community. Past experience shows the potential risks to local communities whose customary uses of land (e.g., grazing) and forest (e.g., shifting agriculture and extraction) could be marginalised as plantations

17. These include institutions in the areas of project development (Uganda Carbon Bureau, Nature Harness Initiatives, Ecotrust, BEA International, The International Small Group Tree Planting Program, select national agricultural and forestry research institutes and ministries), information brokering and networking (Katoomba Group), market experts or brokers (Eco-Securities, World Bank, UNEP Carbon Bazaar, Ecosystem Marketplace, Tetra Pak, BEA International), timber companies (Global Woods AG; Nanga Farms Ltd.), buyers (Clean Air Action Corporation, Dow Chemicals, Ecotrust, FACE Foundation, Mt. Elgon Hydropower Co. Ltd., USAID, WB) and financing (Austrian CDM, World Bank).

BOX 6

REDUCING EMISSIONS FROM DEFORESTATION IN DEVELOPING COUNTRIES: FROM CONCEPT TO ACTION

The 13th Conference of the Parties (COP) in the UN Framework Convention on Climate Change (UNFCCC) affirmed on December 12, 2007 the urgent need to take further meaningful action to reduce emissions from deforestation and forest degradation in developing countries. The COP acknowledged the contribution of the emissions from deforestation and forest degradation to global anthropogenic greenhouse gas emissions and recognized that efforts and actions to reduce deforestation and to maintain and conserve forest carbon stocks in developing countries are already being taken. They also recognized the complexity of the problem, the diversity of national circumstances and the multiple drivers of deforestation and forest degradation, as well as the substantial co-benefits for the aims and objectives of other relevant international conventions and agreements.

The COP recognized also that the needs of local and indigenous communities should be addressed when action is taken to reduce emissions from deforestation and forest degradation in developing countries. On this basis, the COP:

- Invited Parties to further strengthen and support ongoing efforts to reduce emissions from deforestation and forest degradation on a voluntary basis.
- Encouraged all Parties, in a position to do so, to support capacity-building, provide technical assistance, facilitate the transfer of technology to improve, inter alia, data collection, estimation of emissions from deforestation and forest degradation, monitoring and reporting, and to address the institutional needs of developing countries to estimate and reduce emissions from deforestation and forest degradation.
- Encouraged Parties to explore a range of actions, identify options and undertake efforts, including demonstration activities, to address the drivers of deforestation relevant to their national circumstances, with a view to reducing emissions from deforestation and forest degradation and thus enhancing forest carbon stocks through sustainable management of forests.

Indicative guidance and a process for deciding on remaining issues may be accessed at http://unfccc.int/files/meetings/cop_13/application/pdf/cp_redd.pdf.

are established and forests subjected to greater protectionism by the state. Contrary to expectation, the forest tenure reforms sweeping through sub-Saharan Africa and designed to strengthen local ownership and control of forests have created new opportunities for elite capture of opportunities by more powerful actors due to weak local institutions. Other such risks could include depletion of water supplies from the cultivation of fast-growing tree species or use of land for carbon sequestration and income over food.

Literature on how these global trends manifest in COMESA member states is limited. Country inventories commissioned by Forest Trends in Kenya, South Africa, Tanzania and Uganda provide some indication of the current situation in the region (Mutunga and Mwangi 2006, Scurrah-Ehrhart 2006). All 17 carbon projects found to be operating in the region were based on voluntary mechanisms and functioned outside of the CDM. In Uganda and

South Africa, money had changed hands in only 5 of the 17 projects (<http://www.katoombagroup.org/regions/africa/assessments.php>). National laws are increasingly incorporating guidelines for payments for ecosystem services and a host of PES support services are emerging, such as project developers and brokers and regional support networks. However, verifiers, certifiers, legal advisers and insurers are largely absent (Ruhweza 2007). Key barriers faced by sellers in the countries studied include:

- *Informational barriers* in the form of limited awareness by sellers of global instruments and eligibility requirements or existing support services, and limited awareness among the private sector of their dependence on ecosystem services.
- *Technical barriers*. Most countries inventoried lack individuals and organisations with the capacity to organise, design and implement payments for ecosystem services. Key skill gaps include ability

to determine where market-based mechanisms are appropriate, to assess market potential, to manage resources to enhance carbon sequestration, to calculate the economic value of carbon, to design and contract projects, and to monitor.

- *Policy and regulatory barriers.* These barriers include the unclear role of government in transactions, confusion over equity in the distribution of ecosystem services and benefits from their sale (particularly for low-income sellers and users of the service), the absence of standards for selling credits in voluntary carbon markets, and risks to buyers and sellers where legal standing for land tenure, sale and enforceability of contracts is unclear.
- *Institutional barriers.* Most countries lack certification bodies, financial intermediaries, national registries for ecosystem services and other related services along the value chain, increasing transaction costs (Ruhweza and Waage unpublished).
- *Financial barriers.* The inability of many potential sellers to pay for the services that do exist, or to bear the transaction costs associated with market entry, project design and implementation (Ruhweza 2007).

Further analysis is also needed on how changes in land management to provide the marketed ecosystem service affect others or detract from the ecosystem's capacity to provide other services. Experimentation to assess the viability of payment schemes tested in other similar ecoregions is also needed to capture hard-earned lessons from experience elsewhere (Box 7) (Whitehead *et al.* 2005).

Matching Forest Resources to Market Opportunities: Towards a COMESA Strategy

To strengthen regional participation in CDM or future RED markets, COMESA could play a number of roles. First, it could help generate regional understanding of the barriers currently faced by the private sector and rural communities in capturing market opportunities. It could then design a strategy explicitly targeted at overcoming these barriers. As a regional body,

COMESA could link with other regional and global actors (e.g., African Union, IUCN, WWF) and play a convening role for a regional lobby group to help shape the next climate change convention¹⁸. Yet the window of opportunity is small, and is likely to require active investments over the next two years to be able to have a voice in new international treaties. The second option is to formulate strategies to actively address identified barriers within member states. This might include efforts to:

- clarify and secure tenure to local communities, in particular those with a long history of customary land uses unrecognised by government;
- support local organising and 'hybrid' (community-government-NGO-private sector) institutions for more equitable governance of revenues and opportunities (Linton 2005);
- identify brokers (those linking buyers and sellers) and buyers and help connect interested communities and companies to these;
- support the emergence of institutions with a mandate to minimise the transaction costs of project preparation;
- design and test instruments to govern 'trade-offs' so that more is gained and less is lost (by minimising or compensating for risks of climate change mitigation);
- support the emergence of credible institutions for monitoring carbon sequestered or deforestation avoided, as a means to minimise risks to investors; and
- target such support strategies to the particular needs of different groups (e.g., private sector vs. smallholders), which are likely to have different needs and 'minimal conditions' for entering the market.

To strengthen regional preparedness for RED, COMESA could further strengthen regional understanding of the opportunity (the forest resource base and trends) and reference levels of deforestation. This would include assessments of forest cover, rates

18. Lessons may be learnt from the emerging alliances of small island states and forest-rich nations, which share common interests within the international climate regime.

BOX 7

CARBON MARKETS: DOES NORTHERN AUSTRALIA HOLD LESSONS FOR COMESA'S WOODLANDS?

An example of carbon markets from northern Australia provides a good illustration of the emerging market for carbon, and is of potential relevance to COMESA countries with extensive miombo or mopane woodlands. Across northern Australia contemporary savanna burning regimes are incurring deleterious impacts on biodiversity, soil and production values, contributing significantly to Australia's greenhouse gas emissions. Recently an Aboriginal community entered into a 20-year agreement with an oil and gas company, with the latter putting up AU\$1 million per year for the community if the community undertakes fire management practices resulting in reduced carbon emissions (by 100 000 tonnes per annum). The fire management techniques are expected to improve biodiversity outcomes, reduce carbon emissions and provide a source of income (Whitehead 2005). Such schemes are not out of the question for miombo countries as new international carbon agreements come into place. In Mozambique, two initiatives in which local communities are engaged in native tree species planting and fire protection are ongoing within miombo woodlands. The British company Envirotrade and the University of Edinburgh are monitoring the activities and paying for the carbon sequestration.

of deforestation, actors in deforestation and projected trends—against which any achievements in reduced deforestation and forest degradation would be assessed. Secondly, COMESA could support member countries in establishing levels of national commitment in terms of target percentages of reduced deforestation or degradation based on realistic scenarios. This might involve (i) 'good practice' guidelines for negotiating target levels at diverse levels within countries; (ii) assistance in setting targets based on analysis of the contribution of different sectors to livelihoods, revenue and environmental protection; and (iii) agreeing on target areas for conservation forest, production forest and forest conversion. Since setting targets on rates of conversion is ultimately a political process (which can be supported but not led by science), COMESA could assist in developing equitable processes and guidelines for active involvement and consultation of civil society and diverse sectoral interests in setting targets. COMESA might also support member states in evaluating alternative mechanisms for reaching targets—including project-based vs. government-administered instruments; the respective roles of communities, private sector and government; incentive (e.g., market-based) vs. regulatory instruments; and the combination of national vs. subnational instruments to be used.

In addition to providing support services to overcome barriers to market entry, COMESA may consider supporting the development of a framework for evaluation of the social, economic and environmental outcomes of carbon markets, and supporting member states in the utilisation of this framework to design and update governance responses.

2. WATERSHED FUNCTIONS

Forests as Provider of Watershed Services

The COMESA region encompasses 12 of the 19 major watersheds in Africa¹⁹ and almost the full spectrum of rainfall conditions of the African continent. It includes basins where all water from upstream water

19. World Resources Institute classifies Africa's watersheds into Nile, Qued Draa, Senegal, Niger, Volta, Lake Chad, Orange, Congo, Ogooue, Turkana, Jubba, Shabelle, Rufiji, Cuanza, Zambezi, Cunene, Okavango, Limpopo, Mania and Mangoky, of which 12 are located in the COMESA region (see http://www.earthtrends.wri.org/maps_spatial/watersheds/africa.php).

catchments is used downstream and river systems where at least some water reaches the oceans. In the first, water use is a 'zero-sum game', where use along one part of the river reduces water availability downstream. In the second, total water use can still increase. The relationship between 'supply' and 'demand' differs between these two scenarios, and depends on the diversity of land uses, controls used by different member states and the hydrological status of critical watersheds.

Rainfall is associated with hills and mountains, and these usually are forested. There is therefore an association between rainfall, forests and river flow, but the cause-effect relationship may well be the inverse of what is commonly perceived. Rainfall generates forest conditions; the effect of forests on rainfall is still much debated but likely to be small, especially if the additional water use by forest vegetation is accounted for (Van Noordwijk *et al.* 2007). There is an ongoing debate about whether reduced rainfall on the slopes of Mt Kilimanjaro, and associated warming and melting of snow-caps, is fully external and linked to global climate change—or whether it is also caused by reduction of tree cover and the cumulative effects of land use and land cover changes. Forest cover can potentially influence a number of aspects of 'watershed function', such as:

- total water yield, or the proportion of rainfall making its way into streams and rivers;
- buffering of peak rainfall events by providing temporary water storage;
- infiltration and gradual release of groundwater during dry periods;
- filter effects on rainfall and provision of high-quality groundwater; and
- protection of watershed integrity, reduction of landslide frequency and erosion.

The impact of different land uses on each of these 'services' is highly variable and location-specific, generally requiring location-specific comparisons between natural forest and 'alternative' nonforest land uses before 'forest services' can be adequately assessed. It is also normal that the impacts of land cover change on the different services differ in intensity and sometimes in direction. For example, a reduction of forest tree cover usually increases the annual

water yield and may thus enhance water capture in a storage lake, but it may enhance soil degradation and thereby reduce the buffering function of forests on stream flow. Effects of land use on dry-season flows and groundwater may be variable, depending on the severity of the subsequent land degradation. Most of the above services have an asymmetric relationship with change in forest or tree cover: degradation can be relatively rapid, while recovery tends to be slow. In particular, reforestation tends to increase water use relatively quickly (in the first few years), while restoration of soil conditions and their positive effects may take a decade or more. Linked to that is the common observation that planting fast-growing (often exotic) trees will reduce groundwater availability and dry season flows. Protecting old-growth forest implies protection of soils and vegetation with relatively low growth rates and water use, and may thus provide a real environmental service that is not easily replaceable. Because of the high perceived and real value of old-growth forest, stringent policies and legislation often govern the use and conversion of these forests to other uses.

The State of Major Watersheds in Africa and the Rationale for PES

Urbanisation in Africa has encouraged a shift in focus from rural areas to urban centres and the industrial and service sectors seen as engines of economic growth. Increasing urban populations and increased competition over limited water resources have increased public attention on the economic values of water catchments. About 66 large cities²⁰ in the COMESA region rely on watersheds services for their water consumption needs; 25 and 18 cities depend on the Nile and Congo basins, respectively (<http://earthtrends.wri.org/>). One third of the world's largest cities obtain significant amounts of drinking water directly from protected areas²¹, and eight major cities obtain water from forests managed in a way that gives priority to their functions. No such example

20. 'Large' is defined as having populations greater than 100,000 people.

21. Protected through official protected areas or other forms of protective forest.

was identified in Africa despite the water supply problems experienced in African cities. As a result, municipalities, hydropower plants and downstream irrigation schemes are facing increased challenges of sustaining their water supply. Institutions to foster multistakeholder, cross-sectoral collaboration in water management are limited in number, however.

Most watersheds in the COMESA region are surrounded by highly productive land that supports 80% of the rural population. This creates potential conflict over the ultimate aims of land use in catchment areas—whether for rural livelihoods or watershed function. While municipal authorities and hydropower plants spend huge sums of money on water treatment and sediment removal, the impact of the rural poor on water quality, sedimentation and quantity is rarely taken into consideration. Farmers modifying forest cover and watershed services in pursuit of more productive land uses seldom consider the downstream impacts of their activities due to the absence of incentives for internalising off-farm impacts. This emphasis on meeting rural livelihood needs in catchment areas has been one factor in the loss of natural forest cover in African watersheds²². Increased demand and dwindling water supplies have led to competition amongst upstream ecosystem service modifiers (small-scale farmers, plantation owners and other water users) and downstream service users (communities, irrigation schemes, municipal authorities and hydropower plants). PES provide an institutional mechanism for negotiated agreements between watershed service modifiers and users which help reconcile the livelihood and watershed service functions of upper catchments by delivering a set of rewards to those who protect watershed services.

Water PES in the COMESA Region: Current Status

The number of payment projects for watershed services across Africa is scanty and their state largely informal. In the last five years, however, the potential for payments for watershed services has been gaining momentum as evidenced by the number of projects in the pipeline and interest by different intermediary organisations. A review of PES projects in select countries of eastern and southern

Africa by the Katoomba Group identified a total of 10 watershed-related PES projects, but these were less developed relative to carbon and biodiversity schemes (Ruhweza 2006). An IIED review identified watershed service schemes in Malawi (Energy Service Company watershed protection and protected area contracts) and streamflow reduction licenses in South Africa (Landell-Mills and Porras 2002). A host of other PES schemes are also being piloted in the COMESA region. ICRAF, together with several partners, is currently exploring the potential of payments for watershed services in Mt Kenya East (a source of water for hydroelectric power production), the Aberdares (which supply 20% of Nairobi's water), the Lake Victoria basin, and the Uluguru and Nguru Mountains of the Eastern Arc (which supply water to Dar es Salaam). The International Soil Reference Centre is also exploring the potential of Green Water Credits as a PES mechanism in the Tana River basin. Other initiatives include those supported by the IIED/CARE/WWF partnership in the Malewa-Naivasha Catchment and Uluguru Mountains in Kenya and Tanzania, respectively. Still under discussion are payments for forms of land management that will ensure water infiltration and groundwater recharge.

While not a COMESA member state, South Africa is one of the most advanced countries in Africa for watershed PES and can also be looked upon to provide lessons for the COMESA region. One well-known innovation requires forestry plantation owners to make payments to local communities affected by excess water consumption in areas where fast-growing trees use more water than the natural vegetation (a 'water use tax'). These policy reforms were based on some of the most advanced biophysical research into the water impacts of plantations, which led the government to define timber plantations as a 'streamflow reduction activity'. Other innovations include cross-sectoral committees to allocate water by catchment area within water-limiting areas. As many other countries continue to support tree planting without restrictions

22. Most watersheds have lost varying degrees of their original forest cover depending on population densities, land use and land cover changes, and levels of control: Congo, -45.6%; Nile, -92.1%; Limpopo, -99%; Orange, -99.9% and Zambezi, -42.8%.

on species, density or location—anticipating that this will increase water flows—this example should be urgently shared among COMESA member states actively promoting timber plantations. A second and related example of the use of payments for watershed services is the removal of ‘invasive exotics’ (e.g., fast-growing perennials) from dryland riparian zones in order to save water (Box 8). Compensation for the labour involved in removal of this vegetation is deemed economically justified by the additional water availability downstream.

Watershed PES projects from other regions can also provide relevant lessons for the COMESA region. An ICRAF project called Rewarding the Upland Poor for Environmental Services has piloted PES schemes in Indonesia, Nepal and the Philippines (Swallow *et al.* 2001, Van Noordwijk *et al.* 2005) and has generated a set of tools and lessons for the design and management of PES schemes. The ProAmbiente Programme in the Brazilian Amazon is also renowned worldwide for its PES expertise.

Some observations from prior research into watershed PES schemes highlight a number of relevant findings that can inform PES work in the COMESA region (Bond *et al.* 2006). As watershed services decline, inequity in allocation increases, which suggests that schemes seeking to rehabilitate

watershed function can have an important poverty alleviation function for water users. Secondly, watershed-related PES may have neutral, positive or detrimental effects on poverty, which suggests that equity needs to be an explicit consideration in the design of these systems. Third, the magnitude of payments is generally insufficient to reduce poverty, although indirect effects may enhance the economic benefits to the rural poor.

While watershed-related PES schemes in the COMESA region are nascent, there is a lot of interest from national governments and the private sector. Further development of their potential will, however, require a solid evidence base from which to design and evaluate their effectiveness.

Implications for COMESA

In the context of broader COMESA and CAADP goals of expanded trade, investment and agricultural development, increases in both the area under cultivation and water use by industry can be anticipated. This increasing demand for water is likely to put additional pressure on ecosystems through forest conversion as well as water use. A key challenge will be how to balance the livelihood needs of the rural poor residing in catchment areas with the need for a

BOX 8

PAYMENTS FOR REMOVAL OF EXOTIC TREES FROM RIPARIAN ZONES IN SOUTH AFRICA

The Working for Water programme, funded by the government of South Africa, was initiated in 1995 in response to the threats of invasive alien species to water supplies. Invasive alien species are known to use 7% of all water resources, reduce the ability to farm, intensify flooding and fires, cause erosion and siltation, and threaten biological diversity. In the Western Cape, losses attributed to invasive alien species amount to R700 million annually. The overall cost to the South African economy is estimated to be greater than US\$10 billion. Since its inception, 10 000 km² of invasive alien species have been cleared, providing jobs and training to about 20 000 people from marginalised sectors of the economy. Some of the lessons that can be learnt from this programme include:

- Public policy can be used to stimulate PES.
- A strong scientific foundation is required (e.g., in valuation of the service).
- Payments should be directly linked to environmental service protection or delivery.
- PES programmes increase awareness of the societal benefits provided by ecosystems to policy makers and the public.
- ‘Honest brokers’ are required to equitably negotiate agreements that match service providers and the market.
- Committed and visionary leadership plays a crucial role (as in the case of Nelson Mandela, WWW patron and former Minister of Water Affairs, the Honorable Kadar Asmal).

continued supply of clean water for downstream users. COMESA can assist its member states in meeting this challenge in a number of ways, as follows:

- Support the mainstreaming of forestry into joint river basin management programmes in support of priority watershed functions of member states (e.g., mitigating flooding, reducing siltation, securing clean water supply, or securing regular water supplies) while meeting rural livelihood needs in catchment areas.
- Support the scientific base required to design, negotiate and implement watershed PES, which will focus on a number of important questions:
 - What is the relationship between land use and different dimensions of watershed function (sedimentation, quality, quantity)? Where are the erosion hotspots, and which of these affect the status of the watershed services? Where are the sediment 'sinks', and which of these are under threat?
 - What are the opportunities for ecosystem service payments or other types of compensation to alter land use and its negative outcomes on other users?
 - How should a watershed PES scheme be designed to enhance its effectiveness and equity among service providers and users?
- Support regional policy to guide member states in the implementation of watershed PES and national policy reforms to support implementation of regional agreements that take into account the role of context in PES design.
- Support policies on private sector engagement in support of watershed PES, building upon the principles and practices of corporate social responsibility developed in other arenas.
- Provide support for the sharing of information, assessment tools and experiences among member states and diverse stakeholders, including active assimilation of lessons from pilot PES schemes.

3. BIODIVERSITY

Many of the world's 'jewels' of biodiversity conservation are found within COMESA member states. Provided in summary form in Annex B, these include:

- *Congo basin forests.* The Congo basin forests are the largest tropical forest in the world after the Amazon. The majority of these forests are found within the DRC, a COMESA member state, which is home to 12.5% of the world's remaining tropical rainforest. The other five countries situated in the Congo basin are Cameroon, the Central African Republic, Gabon, Equatorial Guinea and the Republic of Congo. Congo basin forests are of global significance due to the role they play in carbon sequestration and their species richness and endemism, with many plant and animal species existing nowhere else in the world. Still relatively intact, around 50% of these forests are under timber concessions and only 8% within



Figure 9: Mountain gorillas in Bwindi Impenetrable National Park, Uganda, bring substantial tourism revenues to Uganda and help protect a host of forest ecosystem services

- protected areas, many poorly protected due to armed conflict.
- *Caesalpinoid woodlands*. A significant part of Africa's complex of Caesalpinoid woodlands (wet and dry miombo, mopane, Itigi-Sumbu thicket, *Cryptosepalum* dry forests and *Baikiaea* woodland) occurs within the COMESA region. The largest area is of miombo woodland, covering about 3 million km². The miombo extends across south-central Africa from Tanzania and the DRC to Angola, Zambia, Malawi, Zimbabwe and Mozambique. These forests have a significant stock of hardwoods, including the world's most valuable timber (African blackwood, *Dalbergia melanoxylon*), worth US\$20 000 per m³ but overexploited in all COMESA countries (the major stocks being in Mozambique and Tanzania). The most threatened of the Caesalpinoid woodland ecoregions are the Itigi-Sumbu thicket and *Baikiaea* woodlands.
 - *Indian Ocean island forests*. The last remaining forests of Indian Ocean islands, all endangered due to clearing for agricultural use, logging and the effects of introduced species, are found within the COMESA region. These include the following:
 - Madagascar's forests, which are the world's highest biodiversity conservation priority and the location of major recent extinctions. Madagascar has from 10 000 to 12 000 plant species, yet is 35 times smaller in area than tropical Africa (including the Sahel), which has a total of 30 000 to 35 000 plant species (Lowry *et al.* 1997). Ninety-six per cent of Madagascar's 4 220 tree species, including more than half (50 species) of the world's coffee species (Schatz 2001), 98% of its land mammals and 92% of its reptiles exist nowhere else on Earth. Isolated for 150 million to 180 million years, 90% of the island's forest cover has been lost and deforestation continues at a fast pace today;
 - Mascarene forests (Mauritius and the non-COMESA island of Réunion), which contain nearly 1 000 plant species (70% endemic) in 108 different families and 323 genera, including endemic caffeine-free coffee species (Box 9). Of the endemic plant species, 500 to 600 are threatened with extinction due to considerable habitat loss and the invasion of more vigorous, introduced species. Since 1600, when people arrived, many species have become extinct, including the dodo and as many as 100 plant species (Heywood *et al.* 1994);
 - Comoros forests, of which only 30% forest cover, mainly at high altitudes, remains. Of the approximately 2 000 plant species in the country, 33% are endemic to the Comoros; and
 - Granitic Seychelles forests, which due to the geographic isolation of these islands for 75 million years contain many endemic species (including ancient endemic species such as the coco-de-mer palm) found nowhere else.
 - *Ethiopian and East African montane forests*. These forests occur as 'forest islands' above 1500 meters above sea level, are considered critical or endangered, and are therefore a global conservation priority.
 - *Mangrove ecosystems*. Mangrove forests are located along the Red Sea coast from Ageig up to Halaeb, and along the coast of several eastern African countries. They extend over about 42 km², in 19 forests (FOSA 2001). Extensive stands of *Suaeda*, *monaica*, *A. eluropus lagopoides*, *Limonium axillare*, *S. fruticosa*, *Zygophyllum album*, *Z. simple x.*, *A. farinosa* and *S. picatus* are the most common halophytic fodder species in the Red Sea region of Sudan. Mangroves serve as an important habitats for much of the residents and migratory bird population. As well as their significant role in the physical coastal protection or storm protection functions for shorelines act as sort of green belt (Elsiddig *et al.* 2007).
 - *Northern Zanzibar-Inhambane coastal forests*. These forests, also endangered, have flora which are close relatives (at the generic level) to some West African forests. They include Kenya's endemic *Ancistrocladus*, closely related to *A. korupensis* in Cameroon, which has active ingredients against HIV/AIDS (Laird *et al.* 2000). Over the past 2 000 years, forest loss has intensified due to forest conversion to agriculture and unsustainable harvest of firewood, timber and building materials to supply the Arabian peninsula and former European

BOX 9

COFFEE, COMESA AND BIODIVERSITY CONSERVATION

Coffee, from forest trees in the genus *Coffea*, is one of the five most valuable agricultural exports from developing countries (<http://apps.fao.org>), employing 25 million people worldwide on over 5 million farms, with US\$9 billion in export earnings. The main species cultivated are *Coffea* (mainly *C. arabica*, *C. robusta* and *C. canephora*), which constitute about 20% of total production. Although South American countries are the world's major producers, coffee exports are significant for most COMESA countries (Burundi, DRC, Djibouti (re-exported from Ethiopia), Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles and Uganda). In Ethiopia, for example, coffee contributes 4–5% of national GDP and generates 20% of government revenue.

Several important links to COMESA countries illustrate important connections between forest biodiversity conservation, ecosystem services and trade. First, COMESA countries (principally Ethiopia, but including a few small forests in Kenya and Sudan) are the only source of wild *Coffea arabica*, the world's most favoured coffee, and forests in western Uganda and the DRC contain wild *Coffea canephora*. In addition, most of the world's 90 coffee species are found in tiny remnant forests of Madagascar (50 species) and Mauritius. The genetic diversity of these wild populations is high compared to cultivated coffee, with wild Ethiopian *Coffea arabica* containing resistance to important coffee diseases. Second, there is global health interest in naturally caffeine-free coffee, which would avoid decaffeination using synthetic chemical processes. Several wild coffee species found on Mauritius and nowhere else in the world (such as *Coffea mauritiana*, *C. macrocarpa* and *C. myrtifolia*) produce naturally caffeine-free fruits. Again, COMESA member countries have an advantage in terms of wild coffee, but this occurs within some of the world's most threatened forest types on Madagascar and Mauritius. The potential genetic value of these trees for breeding purposes is huge. Protected areas and well-managed forest reserves are the best way of conserving *Coffea*, and strategies developed for *Coffea* conservation in Mauritius (Dulloo *et al.* 1999) and Ethiopia (Geletu 2006) are excellent examples of how this should be done. Third, the coffee case provides a good example of why the principles behind forest conservation, even for cultivated coffee, are so important. In one of the few studies quantifying the value of tropical forest in supplying pollination services to agriculture, pollination experiments showed that forest-based pollinators increased coffee yields by 20% within 1 km of forest. Pollination also improved coffee quality near forest by reducing the frequency of 'peaberry', a disease producing small, misshapen seeds, by 27%. These pollination services from two forest fragments (46 ha and 111 ha) were worth US\$60,000 per year for one Costa Rican farm alone (Ricketts *et al.* 2004).

colonial powers. As a result, only remnant forests remain. These areas are still unsustainably exploited for hardwoods for the woodcarving industry, and support a thriving cross-border trade between Kenya and Tanzania of about 4 000 *Brachylaena* (muhugu) trees per year.

- *Forests of the Sudan Nile ecosystem.* The riparian *Acacia nilotica* forests growing on floodplains along the Blue Nile and tributaries and along the White Nile, under management plans since 1935, protect the Nile and regulate its water system. They also provide valuable products to local communities and for the national economy, including timber from *Acacia nilotica* (used for railway sleepers, boat and furniture construction), firewood, fodder and non-timber forest products. Another forest type of the Sudan Nile ecosystem are the permanent and seasonal swamps of southern Sudan. Doum Palm Forests

along the Atbara river are a third forest type, and provide a diversity of non-timber forest products of great importance to the rural economy. Changes in the hydrological cycle of seasonal rivers (Atbara, Gash and others), while having serious negative impact on the Doum forests, have not prevented regeneration from taking place. Human influence, however, has led to degradation of the Doum forests (Elsiddig *et al.* 2007).

Although not included in Appendix II due to the forest focus of that report, globally significant desert and xeric shrublands also occur within the COMESA region within Egypt, Libya and Sudan (East Saharan montane xeric woodlands), Eritrea (Eritrean coastal desert), Ethiopia (Ethiopian xeric grasslands and shrublands), Kenya and Sudan (Masai xeric grasslands and shrublands) and Madagascar (Madagascar spiny

thickets and Madagascar succulent woodlands). Legislatively, some of these areas fall within the mandate of forestry departments and are the source of several non-timber products in trade, mainly gum and resins (gum Arabic, frankincense, gum olibanum—see Appendix II) and, from Madagascar, seeds of endemic plants prized internationally by horticultural collectors.

The challenge is that at a global scale, it is in Africa where most plant species will go extinct, mainly as a result of rapid population growth and agricultural expansion. Although the large forests (the Congo basin, miombo and mopane woodlands) are relatively intact, this is not the case with remnant forests of Indian Ocean islands COMESA members or the montane forests of Ethiopia and East Africa (see Appendix II), which are seriously endangered.

Biodiversity Conservation and Forests: Implications for COMESA

According to the COMESA Treaty, in particular Article 123, COMESA member states have agreed to cooperate in the management of their natural resources for the preservation of ecosystems and to arrest environmental degradation. Biodiversity conservation needs to be taken into account in production landscapes for several reasons. COMESA countries are not only signatories to the CBD, but they also contain many of the world's most critically important forests for biodiversity conservation. Although these are essential to achieving conservation goals, this cannot be done without also maintaining large-scale ecological and evolutionary processes. In many cases, protected areas are 'paper parks' affected by conflict and overexploitation. They are too few, too isolated or too static in the face of climate change to achieve conservation goals. What is needed is to also consider the landscape matrix surrounding areas set aside for biodiversity conservation. Clear principles (Fischer *et al.* 2006) and planning processes (Margules and Pressey 2000) have been developed to help maintain biodiversity, ecosystem function and resilience in production landscapes where forestry and agriculture take place. Their implementation is important from both an ecological, social and long-term economic perspective, yet this is extremely difficult when

governance is weakened by corruption or conflict. Conservation of globally important biodiversity can also offer COMESA member states important opportunities for revenue generation, as illustrated by the opportunity to apply experiences from Ethiopia and Mauritius to Madagascar to enhance the benefits derived from coffee genetic resource conservation. Implementing systematic conservation plans at an Africa-wide scale would cost about 0.1% of African gross national income (US\$630 million/year), but costs per square kilometre vary greatly from one ecoregion to another (Moore *et al.* 2004). Significant international support is available for this purpose.

D. CHALLENGES AND OPPORTUNITIES FOR SUSTAINABLE TRADE

1. MANAGING INTERNATIONAL DEMAND FOR FOREST PRODUCTS

Given the sharp increase in export-oriented timber production, international demand for forest products needs management for reasons including the expanded opportunities for forest- and trade-related corruption resulting from expanded access to international timber markets and because local stakeholders generally obtain only a minute portion of the profits associated with timber production and wood processing activities. In Tanzania, for example, local harvesters completely undervalued hardwood logs, and although no value-adding was done prior to export, they received only a hundredth of the export price (Milledge *et al.* 2007). Other reasons include that infrastructure development frequently stimulates significant increases in commercial timber production and that it is crucial to understand the implications of commercial demand for new timber species on local livelihoods, and particularly the need to analyse possible 'conflicts of use' between commercial timber extraction and species that are used for other purposes. Research in Africa and Latin America, for instance, has documented the growing pressure that commercial timber extraction is now placing on species that traditionally have been used

for medicinal purposes and other subsistence uses (Cunningham *et al.* in press). The trade between the COMESA region and China and India is of particular significance with regard to the scale of trade and its rapid growth. Yet many national-level industries also place heavy pressure on dwindling forest resources, requiring systematic efforts to ensure sustainable supply to meet these demands (Box 10).

China's rapid economic growth has had far-reaching impacts on the global forest products trade over the past decade, and this could accelerate in the years ahead. Between 1997 and 2005, China's imports of wood-based products (including pulp and paper) grew from approximately 40 million cubic meters in roundwood equivalents (RWE) to 135 million m³ RWE per annum (White *et al.* 2006). China is the world's leading importer of industrial roundwood, and is second only to the US in terms of the value of its annual wood product imports, which reached US\$16.5 billion in 2005 (White *et al.* 2006). Roughly three quarters of China's timber imports come from countries in the Asia-Pacific region, although volumes from many countries in Africa and Latin America are increasing. China is also a major exporter of wood-based products. Approximately 70% of China's timber imports are processed into plywood and furniture and re-exported, much of this going to the US, EU and Japan.

In 2006, China imported approximately 2.0 million m³ of logs from Africa (Flynn 2007). The vast majority of these originated from a limited number of forest-producing countries in West and Central Africa, with Gabon, Equatorial Guinea and the DRC collectively accounting for 80% of the continent's log exports to China. Of these, Gabon is the largest African supplier of logs to China, shipping approximately 850 000 m³ of roundwood in 2006. By comparison, Equatorial Guinea supplied approximately 420 000 m³ in 2006, and the DRC shipped approximately 370 000 m³. China's imports of raw logs from Gabon are expected to decline over the next several years as Gabon has introduced a log export quota (similar to the one adopted by Cameroon) to encourage increased domestic wood processing.

With its GDP continuing to grow at nearly 10% per annum, China is now actively seeking new sources of timber and a wide range of other natural resources. In recent years, this search has resulted in growing

volumes of forest product exports from countries in eastern and southern Africa. While the volumes of logs and other wood products exported by COMESA countries represent only a small portion of China's overall timber imports, the growing trade with China is having increasingly significant impacts in the areas where the wood is harvested. CIFOR is still in the process of reviewing the export trends from the COMESA countries over the last several years in order to present a more systematic analysis of the region's trade flows. The trade data available in the public domain are unfortunately highly variable, and in many cases quite weak, making it difficult to obtain a comprehensive understanding of changes in trade flows from the region over the past decade. Country-specific analyses, however, provide at least an anecdotal picture of the growing importance of forest trade with China—and the governance issues associated with it—for several of COMESA member countries.

A 2007 study of the logging boom now occurring in southern Tanzania, published by TRAFFIC East/Southern Africa and Tanzania's Ministry of Natural Resources and Tourism, highlights the growing importance of the region's access to international markets (Milledge *et al.* 2007). The volume of timber harvested for commercial purposes in southern Tanzania has risen significantly in recent years, and is estimated to have reached 500 000 m³ in 2003—a figure that includes both officially reported volumes and unofficial, illegal timber removals. The authors believe that timber production and exports may have increased further since then. China has emerged as the fastest-growing market for indigenous hardwoods, accounting 'for all indigenous hardwood logs and three-quarters of processed hardwoods (sawn wood and billets) exported between July 2005 and January 2006' (Milledge *et al.* 2007). Significantly, however, the study finds that China is not the principal market for all grades of Tanzanian timber exports. During the period July–December 2005, some 99% of the country's exports of teak logs and three quarters of the country's softwood sawn timber were shipped to the United Arab Emirates. Similarly, India accounted for 100% of Tanzania's exports of sandalwood. The increased demand from China and India has not only resulted in increased volumes of timber production, but also a significant shift in demand for particular

BOX 10

COPING WITH HIGH DEMAND FOR FOREST PRODUCTS: THE CASE OF TOBACCO IN MALAWI

Managing high demand for forest products is not a challenge only faced from the outside; domestic industries can also exert high levels of pressure over forest resources. An estimated 200 000 hectares of woodlands are cut annually to support tobacco farming in southern Africa, accounting for 12% of deforestation in the region (WWF 2005). Tobacco alone is estimated to account for 5% of deforestation in Africa and 20% in Malawi (Geist 1999). In Malawi, where tobacco has constituted 77% of Malawi's export earnings (Poitras 1999), this booming industry has contributed to one of the highest rates of deforestation in the world—much of it on customary lands where communities have received short-term benefits but have lost long-term productive functions of miombo woodland. The government has tried a number of responses to minimise the negative ecological effects of the tobacco industry. One policy response has been to require a minimum of 10% forest cover on large estates. Another has been to introduce new varieties of sun-dried tobacco that do not require flue curing. Tobacco companies continue, however, to use flue-cured tobacco because it fetches a much higher price in the market. Producers also continue to use wood for fuel given the higher price of coal (Figure B). In Katete Plantation, a 3 240 ha government-owned eucalyptus plantation supplying firewood to Lilongwe and tobacco companies, demand for wood increased by more than 50% from 2006 to 2007 due to the high price of tobacco in Mozambique. Plantation managers, observing the resulting degradation of the plantation, placed a ban on the sale of firewood and limited sales to poles (Figure A). When demand outstrips supply, this pressure often spills over into forest reserves. Full accounting of wood fuel demand by tobacco companies, small-scale tobacco producers and urban residents can help the government plan for sustainable sourcing of wood fuel from either farmers' fields or large-scale plantations. Negotiated agreements between companies and smallholder timber growers can also convert an environmental problem into a socio-economic opportunity for poor farmers in Malawi.

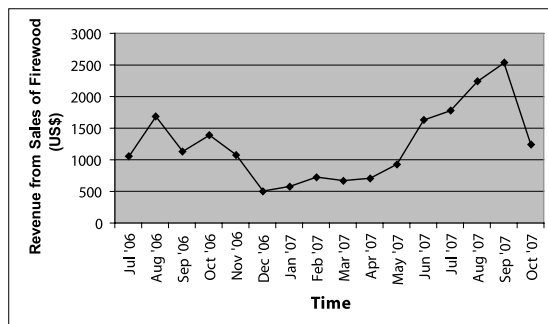


Figure A: Revenue from fuelwood sales at Katete Plantation, Malawi



Figure B: Wood stockpiled at a tobacco estate in Malawi (October 2007)

species. In many cases, Chinese and Indian buyers have purchased species that previously had no commercial market.

It is important to recognise that the expansion of forest trade between African countries and China is not occurring in a strictly sectoral context. On the contrary, China has pursued an aggressive strategy in recent years to secure long-term supplies of energy and raw materials across a wide range of sectors. At the same time, China has also sought to expand access to markets for its industries, as well as to broaden the

nation's political economic influence within strategic regions. Within this context, according to Rich (2007), China has 'recently surpassed Britain to become Africa's third biggest trading partner, behind the United States and France, and aims to increase annual trade with the continent to US\$100 billion in 2010'. Moreover, China's increasing integration into the global financial system has meant that it is emerging as a significant source of foreign direct investment as well as development lending. Rich (2007) summarises China's emerging role as follows:

By 2010, China's Export-Import Bank and Sinosure (the state overseas investment insurance agency) will be lending and guaranteeing more than \$70 billion annually for large scale investments in developing countries and economies in transition. China will be by far the biggest international public financial player in developing countries, dwarfing the largest development agencies, such as the World Bank, with lending of \$25 billion a year, and the largest competing export-import banks, those of the United States and Japan, which consistently lend between \$12 and \$18 billion annually.

These trends have a number of important implications for forest governance. In many cases, it appears that China's forest-related investments are linked to much broader trade and investment agreements. In these agreements, the producer country frequently agrees to export not only timber, but also oil, gas, minerals, and/or agricultural products. In exchange, China often agrees to build or expand roads, ports, railways, and other infrastructure; to build schools, hospitals, and stadiums; and to sell low-cost manufactured goods. With the value of such agreements often reaching several billion dollars, there is a critical need to better understand how such agreements are structured and to analyse their potential implications both for forests and for the people whose livelihoods depend on them.

In addition to exploring means to respond to negative trends in the sector, COMESA should support member states in identifying opportunities where expanded trade will help rather than undermine environmental protection and rural livelihoods—and in putting into place the necessary conditions for such 'win-win' outcomes to occur. In Sudan, for example, gum Arabic is perhaps the one commodity that can foster soil stabilisation in the Sahel given its unique adaptation to drought-prone regions and its critical function within an integrated farming system (as a source of fodder and shade for livestock, and contributions to soil fertility through nitrogen fixation) (Figure 10a). A severe drought in the early 1980s led to the loss of a large number of these trees, destabilising the system. A recent drop in prices also affects farmers' willingness to invest in reforestation

activities. Strategic investments to expand trade have the potential to generate revenue, improve farmers' livelihoods and combat desertification, provided certain conditions are met. Investment in the private sector can benefit rural livelihoods and induce farmers to invest in gum Arabic production, provided it improves farm gate prices and it is sourced from rural communities across the Sahel as opposed to private-sector plantations. To realise this potential, farmers may need technical and financial support to capture market opportunities. Government investments in capacity building (e.g., for local processing, monitoring), community organising (to manage the resource base sustainably, to govern collective marketing) and credit (e.g., for gum storage to sell when prices are good) can go a long way in ensuring farmers have the capacity to capture emerging market opportunities and manage resources sustainably (Figure 10b) (Jylhä 2007, Romano 2007). Co-ordination and regulatory functions of government could also help to create favourable conditions for linking private sector investments to rural communities for mutual benefit, while lending institutions can also set conditions for investment that support rural livelihood benefits (e.g., minimum levels of gum Arabic sourced from communities as opposed to plantations). Such opportunities need to be actively sought in the COMESA region and integrated investments provided to enable their potential to be realised.

Implications for COMESA

Implications of the expanding influence of emerging markets from China and India may include the following.

- Supporting better understanding (as a means to advise member states) of the effects of emerging markets on the region's economy and natural resources, namely,
 - the extent to which issues related to sustainable and equitable forest management are incorporated into the terms of trade and investment agreements and whether these terms are monitored and enforced;
 - the extent to which trade and investment agreements that China and other emerging



Figure 10a: Sahelian livestock depend on gum Arabic for shade and fodder.

Figure 10b: The Umruba Forest Circle of the Sudanese Forest National Corporation (FNC) supports gum Arabic producers' associations to restore and market gum Arabic in the Sahel. A pilot experiment to support the organization of small-scale producers was established in the early 1990s by FNC with Dutch funding to restock the gum belt following a period of devastating droughts. This project has led to the formation of 2670 producers' associations involving nearly 1.9 million families, with women constituting one third of the members (Ibrahim 2002, Gaafar and Eltigani 2007).

economic superpowers are negotiating exacerbate the region's long-term debt crisis, and the implications of this on forests;

- the extent to which such agreements facilitate the expansion of illegal logging and forest corruption, especially in countries with weak forest governance; and
- the likely impacts on forests of the infrastructural development that often occurs under such agreements.
- Support member states in their efforts to evaluate the consequences of trade deals up for negotiation through a common framework that explores the likely direct and indirect consequences of these deals at the planning stage.
- Explore the possibility of a regional negotiating block, or lobbying for forest sector participation in national negotiations on trade, to secure more favourable trade deals for the sector and stakeholders depending on it.

2. ILLEGALITY, CORRUPTION AND CONFLICT

Illegal Logging and Conflict

Given the aforementioned treatment of illegal logging in the context of promoting sustainable trade in timber, this section focuses instead on the linkages between illegal logging and conflict. Illegal logging activities in Africa have been widely reported to be a major factor causing conflicts between communities, companies and governments involved. In contrast with Asia and Latin America, however, Africa has not witnessed high intensity conflicts associated with grievances over forest exploitation and revenue sharing. A positive explanation for this is that population pressure on African forests is smaller, and that governments have not embarked on policies that favour mass migration into forest areas at the expense of local populations. A negative explanation is that forest-dwelling populations, despite their marginalisation,



Figure 11: Countries rich in natural resources such as oil, minerals and timber often suffer from armed conflict. Better policies can weaken this linkage between resource wealth and conflict by directing resource wealth into education, health and poverty reduction.

lack the political power and organising capacity to challenge forest policies and practices that damage their interests.

In recent years Africa's tropical forests have, however, been home to high intensity conflicts which have featured the forest in other rather instrumental ways. The cases of conflict timber from DRC and Liberia are well known in this regard (Baker *et al.* 2003, Bannon and Collier 2003). Research conducted since the mid-1990s has demonstrated that natural resources play a key role in triggering, prolonging and financing civil wars (Ross 2003). While natural

resources are never the only source of a conflict, with poverty, ethnic or religious grievances and unstable governments often playing major roles, studies consistently find that natural resources heighten the danger that a civil war will break out and that the ensuing conflict will be more difficult to resolve (Ross 2003). Research has shown that natural resource-dependent economies grow more slowly than resource-poor economies, that resource-rich governments do an unusually poor job of providing education and health care for their citizens and that governments receiving greater revenues from oil, minerals and timber are more likely to be corrupt, weak and unaccountable (Ross 1999, 2001, 2003). In most Central African countries, neglect by logging operators of agreements to invest in rural community development and/or pay local communities a share of earned revenue has also caused low-level conflict in many forest concessions. Africa seems to be particularly vulnerable to natural resource-induced conflict (Box 11, Figure 11).

The mountainous forests of the Albertine Rift have, over the past 15 years, harboured numerous rebel movements opposing governments in Burundi, DRC, Rwanda and Uganda. Presently eastern DRC suffers most from uncontrolled militias, break-away government soldiers and bandits, who are able to act with impunity in remote forest areas that United Nations forces and regular armed forces cannot entirely control. These irregular armed forces have relied mainly on subsoil resources like diamonds, gold and coltan to finance their activities, but timber has also featured in the Congolese war economy in areas controlled by regular armed forces of Uganda and Rwanda (UN 2001, Baker *et al.* 2003, Global Witness 2003, 2004). High-value species have found their way to Europe and Southeast Asia by air from Kampala and Kigali, and through Kenya's Mombasa port. The total volume of 'conflict timber' trade from the DRC during foreign military presence is unknown. The International Court of Justice, however, holds the Ugandan State responsible for unlawful exploitation of resources (including timber) and human rights abuses by its armed forces operating in the eastern DRC (ICJ 2005).

Natural resource dependence never makes conflict inevitable. Better policies can reduce the

BOX 11

NATURAL RESOURCE WEALTH AND VIOLENT CONFLICT IN AFRICA (ADAPTED FROM ROSS 2003)

Globally, armed conflict is linked to a number of natural resources, including oil, hard-rock minerals (coltan, diamonds, gold and other gemstones), timber and drugs. Of 17 recent violent conflicts linked to natural resources, 9 are in Africa. Of all the world's regions, conflicts in Africa show the most worrisome trends. Between 1992 and 2001, the number of armed conflicts outside of Africa fell by half, while in Africa they stayed roughly the same in number and became more severe.

likelihood that resources will generate conflict by directing resource wealth instead to education, health and poverty reduction. Bannon and Collier (2003) highlight a number of strategies that can be utilised to weaken the linkage between resource wealth and armed conflict. The first is to foster strong reporting systems to monitor revenues that governments receive, including formal reporting of revenues to a particular body, audits and reconciliation procedures, and requirements to make such information publicly available. The second is to design and implement commodity-specific tracking regimes, which share common principles but must be adapted to the nature of the commodity and international legal instruments used to impose controls (Crossin *et al.* 2003). A third instrument is to 'follow the money' from the finance of illicit resource extraction, including instruments for financial institutions to 'know one's customers' and to share information pertaining to illicit activity with regulators, law enforcement and one another; instruments for tracing such funds; and instruments for fostering mutual assistance among countries in enforcing domestic laws (Winer and Roule 2003). Finally, enforcement instruments for controlling cross-border trade in natural resources that finances armed conflicts²³—while unlikely to halt the mobilisation of natural resources in armed conflict—may assist in reducing trade in otherwise legal resources by raising production and transaction costs (Le Billon 2003).

Corruption

Corruption—the misuse of public office or public resources for private profit—is widespread in the timber trade. Corruption is also found in many

countries. Although difficult to quantify, a widely respected method is used to rank the degree of corruption among different countries. Transparency International annually produces this ranking known as the Corruption Perception Index (CPI). CPI scores range from 10 (completely clean of corruption) to 0 (very corrupt), with a score of 5.0 considered the borderline figure distinguishing countries that do and do not have a serious corruption problem. In the 2006 survey, Finland, Iceland, and New Zealand were rated the world's least corrupt countries. In the COMESA region, while Mauritius and Seychelles demonstrate relatively strong performance, all member states have scores below 5.0 (Transparency International 2006).

Conditions for corruption are created through a mix of social, cultural, economic and administrative factors. Solutions to corruption are also social rather than technical (Milledge *et al.* 2007). In many cases, corruption is seen as part of everyday life, stemming from factors such as social pressures from extended family members. Many African civil servants feel, for example, that taking advantage of one's position to assist family members or oneself is not necessarily wrong (Andvig *et al.* 2000). Where civil service pay is low and inflation high, bribes and gifts (colloquially termed *chai kidogo*, or 'small tea', in East Africa) can make up a significant percentage of a civil servant's income. The problem is that 'small tea' does not remain small. In many cases, senior civil servants are

23. These include trade sanctions; judicial, certification and corporate conduct instruments; aid conditionality; advocacy; and other transboundary resource and environmental governance instruments (Le Billon 2003).

involved, extending cases far beyond petty corruption. Illegal de-gazetting of large areas of the Mau Forest Reserve in Kenya is one of many examples.

Illegal logging is integrally linked to overlapping forms of corruption such as bribery, kickbacks, fraud, favouritism and patronage (Milledge *et al.* 2007). Even though corruption is not always behind illegal forest practices, the correlation between corruption and forest crime is high (Contreras-Hermosilla 2001). What is required is for anticorruption strategies to holistically cover all forms of corruption, as strategies to counteract the most obvious form of corruption—bribery—will not only remain ineffective against other forms (such as nepotism), they may stimulate growth in more damaging forms of corruption. What is also required to improve forestry governance is more effective stakeholder participation, including stronger links between partners (local communities, forestry departments, local leadership and law enforcement). In contrast to the global-level CPI, TRAFFIC has developed a ‘timber trade bribery index’ that ranks the relative frequency and scale of corruption at different stages of the timber trade chain.

Learning Lessons from the Past: Implications for COMESA

Possible implications for COMESA include the following:

- Explore mechanisms for regional co-operation that can assist in mitigating the role of forest resources in fuelling armed conflict.
- Support peacekeeping efforts of the African Union and United Nations.
- Foster full accounting of the forestry sector’s contribution to economic development, lobby for increased funding to the sector, and utilise this revenue to improve salaries of forestry officials and funding of anticorruption measures.
- Develop a framework for regular monitoring of forest governance (see Knowledge Management, below), and support member states in its application.
- Support forest-based enterprise development and community forest management, both necessary to provide economic opportunities in marginalised and war-devastated forest areas. Drawing on earlier

experiences in Mozambique, integration of ex-combatants in commercial (agro)forestry sectors may become part of disarmament, demobilisation and reintegration strategies pursued in countries like Burundi, DRC and Sudan.

3. INTELLECTUAL PROPERTY RIGHTS: ACCESS AND BENEFIT SHARING

Medicinal plants and other natural products, like micro-organisms, insects and marine organisms, are also the basis of many pharmaceutical drugs that contribute significantly to pharmaceutical company revenues (Newman *et al.* 2003). The discovery of new natural products has been radically changed due to the availability of molecular biology, rapid screening methods and genomic sciences (Drews 2000). In many ways, the biotechnology industry has become a major tool of the industry. New antibiotics are a good example of health links to new natural products, with 5 000 to 10 000 new antibiotics discovered from bacteria and fungi since the 1950s and 1960s, when well-known drugs such as tetracycline were discovered (Challis and Hopwood 2003). The bulk of these have come from *Streptomyces* species, which are saprophytes found in soil, marine sediments and plant tissues. Endophytic micro-organisms, which are commonly found on plants (including many wetland species), produce a diverse range of compounds with potential use in medicine, agriculture and industry, including new antibiotics, antimycotics, immunosuppressants and anticancer compounds (Strobel and Daisy 2003). The most promising habitats to search for endophytes with commercial potential are high-diversity tropical forests.

Industrial sectors involved in what is widely termed ‘bioprospecting’ include agriculture (for new fungicides, for example), biotechnology, waste management and the pharmaceutical and cosmetics sectors. Development of commercial products from naturally occurring genetic resources or biochemical processes is typically a long, expensive and uncertain process, with a chance of about 1 in 10 000 that a plant species will yield a blockbuster product (Laird *et al.* 2000). COMESA member states have, however, made some progress in recapturing intellectual

property from 'stolen' brands—as exemplified in the Ethiopian government's efforts to assert intellectual property rights over brands of Ethiopian coffee widely consumed in the West (The Guardian 2007).

There is potential for public–private partnerships in the COMESA region in the development of products from the region's diverse plant and animal species. The pioneer in this area was Costa Rica, which entered into an agreement with the US pharmaceutical company Merck to look for plants with potential pharmaceutical applications, with part of the proceeds (from compounds that prove to be commercially valuable) going to the Costa Rican government. The Costa Rican government has guaranteed that some of the royalties will be set aside for conservation projects (Laird 2002). In 2001, for example, Givaudan, one of the world's top four fragrance and flavour companies based in Switzerland (with a 2006 revenue of CHF2.9 million), sent a team to look for new exotic smells and flavours in Madagascar under a profit-sharing agreement with local communities through conservation and development initiatives. Based on this survey, Givaudan researchers chemically tweaked these to produce 40 aromas with commercial potential. Given policy support through the CBD for access and benefit sharing (Laird and Wynberg 2005), COMESA countries could consider similar strategies to support conservation by enhancing economic returns from their rich biodiversity. There is also need to patent forestry products produced in the region as a means of asserting intellectual property rights.

4. CERTIFICATION

The 1990s saw a rapid rise in the popularity and application of certification and ecolabelling to timber and wood products. Following the late-1980s era of tropical timber boycotts, certification was seen as a constructive way to reassure the consumer that timber was coming from sustainably managed sources (Bass et al. 2001). In general, boycotts penalize forest owners or concessionaires, timber-related businesses and their employees and do not lead to the active management of forests. The start of forest certification was followed by a proliferation of certification and ecolabels, some of which made doubtful, unsubstantiated claims

of sustainability of wood products. In an effort to provide independent, third-party certification, the Forest Stewardship Council (FSC) was set up in 1993. Under the FSC system, certification agencies are accredited and regularly audited by FSC. The FSC certification agencies assess the environmental, social and economic sustainability of forest management against 10 international principles and criteria (www.fiscoax.org/principal.htm). To ensure the traceability of certified logs from forest to retailer, a certifier also assesses the chain of custody. Major conservation NGOs (e.g., Friends of the Earth, Greenpeace, WWF) and many governments endorse the FSC. The other major timber certification system is the Pan European Forest Certification (PEFC) system.

In the context of COMESA, it is important to explore the viability of certification prior to making costly investments. Although it was hoped that forest certification would be an effective incentive to tropical deforestation, this has not been the case. By late 2003, although 164 million ha of forests had been certified worldwide, this only represented 4.2% of the world's forests (Van Kooten et al. 2004). Today, most of these are in either North America or Europe, with very few certified forests in Africa, Asia or Latin America (Figure 12). Furthermore, getting certification to work requires a 'caring market' prepared to pay premium price for certified timber.

In terms of appropriate strategies for COMESA, two key questions need to be answered. First, given the emergence of China and India as major importers of tropical timber, what are the chances of acceptance of either FSC or PEFC certification? Second, how do the economic institutions and the social context of COMESA countries influence the likelihood of certification? The answers to these questions are not promising for FSC or PEFC certification of tropical timber. In a regression analysis of forest certification, Van Kooten *et al.* (2004) showed that the economic institutions and social context under which firms and forest landowners seek certification certainly matters. Equally important was the ability of citizens to influence the political process. The likelihood that firms or forest owners certify their forest practices is significantly reduced in places where people have very little voice in civil society. Weak governance, widespread corruption and the dominance of the 'global

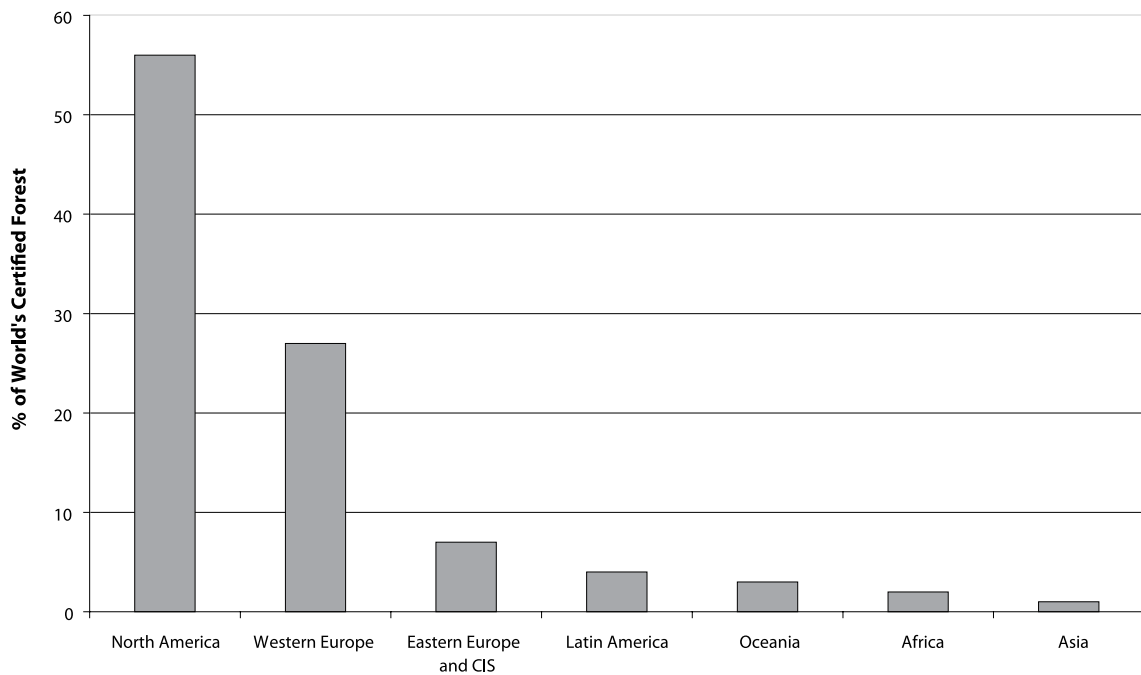


Figure 12: Comparison of geographical distribution of total certified forest area in various regions for 2007 (UNECE/FAO 2007)

East' as a market concerned about quality and price, but less concerned about ecological sustainability, raise questions about the efficacy of forest certification in the COMESA region. The scope for certification is promising in the case of woodcarvings exported to Europe and North America, which have been FSC certified in Kenya (Schmitt and Maingi 2005), and with FairTrade or organic certification of some NTFPs (fragrances and cosmetic oils). If the adoption of FSC or PEFC timber certification is unlikely, then other incentives for sustainable forest use need to be investigated.

5. KNOWLEDGE MANAGEMENT

For trade to lead to positive outcomes for poverty alleviation and environment, social and environmental considerations must be integrated into the negotiation, design and implementation of trade policies and trade agreements. There are many examples of weak policies and policy enforcement, and failure to mitigate the

negative social and environmental effects of expanded trade, that have led to the economic and ecological collapse of industries based on resource extraction or primary production (Clark 1973, Roughgarden and Smith 1996). The lack of standardised forest management plans, together with inadequate reporting on harvest levels and performance to forestry departments, undermines the ability to analyse and undergo adaptive management. As a result, timber harvesting ends up being influenced almost exclusively by private-sector interests (Milledge *et al.* 2007).

Yet good design, based on a sound evidence base, anticipatory planning and monitoring, can go a long way in fostering synergies between economic development, equitable benefits capture and environmental sustainability. As knowledge management is a fundamental but potentially costly foundation of sustainable trade, investments should be matched to strategic aims such as economic viability and competitiveness, equitable benefits capture and environmental sustainability. These outcomes emerge through both the inherent properties of the forest

products and services chosen for strategic investment, and the intentional design of policies, institutional arrangements for resource access and use, and product development and marketing strategies. While the ultimate goal is a stronger synergy among these outcomes, most choices will involve trade-offs. These trade-offs must be known in order to adequately plan and adapt strategies that lead to ‘more wins’ and ‘fewer losses’ across economic development, social justice and sustainability goals. Information plays a fundamental role in guiding decision-making through synthesis of lessons from past experience and through monitoring of changes resulting from policy and institutional reforms and trade agreements.

This section approaches the issue of knowledge management from three angles. The first is the role of information in planning, so that lessons from past experience can be adequately captured and the risks associated with imperfect foresight minimised. The second is the role of information in monitoring changes resulting from specific trade and investment deals, policy reforms or institutional and market innovations (among forestry officials, government planners or forest-dependent communities), so that change can be managed adaptively. This information is critical for enabling timely adjustments in rules and practices so that the challenges that inevitably arise from any policy or behavioural innovation do not lead to failures, and for ensuring that unanticipated negative social or environmental outcomes of expanded trade are captured and addressed. Finally, regular information capture is required to support improved governance throughout the sector, which is a foundational element to economic development, social justice and sustainability goals.

Knowledge Management for Planning

The first step in designing a strategic knowledge management strategy is to have a clear vision that underpins decision-making in the forestry sector. For COMESA and CAADP, this vision might be, ‘sustainable trade in forest products and services, building on strengths of member countries to create employment and capture revenue without degrading the environment’. Inherent in this vision is the need to proactively utilise information to make economic,

social and environmental considerations explicit in the identification of opportunities and in the negotiation and design of implementation plans.

To evaluate the economic feasibility and likely social and environmental effects of alternative policies, investments and trade deals, a number of important steps may be taken:

1. *Design and apply a standard framework for evaluating trade deals and investment alternatives.* This step would entail identification of a set of common criteria for evaluating strategic options in the sector in terms of the trade-offs (benefits vis-à-vis costs) (see Box 12 for an example). In the context of negotiating trade deals, the framework would be utilised to assess whether the benefits outweigh the costs (whether to approve or reject the deal) and to design them in ways that maximise the benefits and eliminate or compensate for costs. In the context of strategic investments in product development and marketing for specific forest products or services, this framework could be utilised to evaluate those options for which diverse goals can be achieved. Rather than base these assessments on conjecture, it is important to ground them in a comprehensive and balanced literature review. Rapid scoping studies in areas where similar investments have been or will be made can assist in identifying trade-offs so that these can be reconciled in planning processes (e.g., identifying customary land uses in areas targeted for biofuel plantations). Where knowledge is lacking, anticipatory planning using scenario analysis tools can be used to anticipate the likely consequences of different alternatives or of the incorporation of specific design features into trade deals or investment strategies. Participatory scenario analysis involving multiple stakeholders can help to nuance this assessment with a diverse set of interests, in recognition that science can support decision-making but that policy decisions are ultimately a political process.
2. *Select forest products with inherent characteristics that help reconcile diverse goals.* The process of selecting which forest products to invest in can start with the identification of inherent characteristics that support economic, social and environmental aims. This task involves identifying characteristics

BOX 12

EXAMPLE OF CRITERIA TO EVALUATE CONTRIBUTIONS OF TRADE AND INVESTMENTS TO DIVERSE GOALS

Goal 1: Enhance forest sector contributions to economic development

- Contributions of trade deals, policies and innovations to revenue generation
- Flows of forest revenue to national development, and related economic impacts
- Number of jobs created
- Effects of legality and full accounting (including bioenergy) on forestry's contribution to the economy
- Effects on 'internalising' the value of environmental services and their contribution to the economy

Goal 2: Enhance sustainable forest management in the context of expanded trade

- Effects of trade deals, policies and innovations on:
 - Natural forest cover
 - Stocks of forest products (timber, NTFPs, bush meat) in target areas
 - Environmental service provision (water, biodiversity, carbon) from target areas
- Off-site environmental effects (effects on forest products and services elsewhere, effects on other sectors)

Goal 3: Ensure equitable benefits capture and minimise social risks of new opportunities

- Proportion of forest revenue going to local communities and its distribution within local communities
- Changes in tenure and use rights for local communities
- Displacement of customary land uses and related effects on income and vulnerability
- Effects on forest products and ecosystem services of critical importance to local communities and diverse stakeholders

that support one goal without undermining others. In the case of *economic viability*, these might include product uniqueness, presence of a stable niche market, product shelf life, ability to ensure consistently high quality, ability to ensure stable supply (quantity), transportability and the presence of few policy bottlenecks (for example, national or international bans on harvesting). In the case of *social benefits*, these might include the potential for local value addition, the ability to produce surplus over local needs (or selection of a product that does not compete with local needs), absence of cultural or economic barriers for women to participate in production and marketing, and opportunities to capture niche markets for FairTrade or 'culturally branded' products. For *ecological sustainability*, product characteristics might include high price per volume (to maximise returns from any given unit of product extracted), the tendency for low-impact harvest (e.g., leaves, fruits and bark rather than roots) and opportunities for product certification.

3. *Identify 'caring' markets and give them preferential trade status.* Forest product trade in a number of specific markets is conditional on good practice for the harvest and marketing in source countries. This can represent an important opportunity for aligning trade with social and environmental goals in areas with weak governance, given that the costs of compliance are borne by the buyers. Regional frameworks and national trade deals could be negotiated in ways that give these markets preferential trade status. Caring markets encompass particular companies attuned to social and ecological standards of corporate responsibility (e.g., Aveda, The Body Shop), particular policy and legal instruments (FSC certification for timber, FairTrade and organic market certifications, and certification of geographic origin) and, in some cases, particular types of products (cosmetic oils, flavours and fragrances). In other cases, 'caring markets' could be fostered as a means to ensure sustainable trade of valuable forest products (Box 13). There may be such an opportunity for regional

co-operation among COMESA member states to negotiate more 'favourable' terms (including local value capture, and social and environmental standards) for new bioenergy deals (Lewandowski and Faaij 2006, Mathews 2007).

4. *Identify opportunities for value capture at local and national levels.* Currently, there are few timber and NTFP markets where COMESA has the technological, industrial and business capacity to outcompete others in the global market. Until then, partnerships with foreign investors that have captured these markets (e.g. China for timber; France for gum colloids, flavours and fragrances) are essential. Investments in processing and value addition can also improve national benefits derived from existing trade networks. Efforts to capture intellectual property rights under the WTO can also be used to capture greater value nationally from existing trade, as illustrated by recent efforts by Ethiopia to assert its intellectual

property rights to brand names of coffee having its origin in Ethiopia. Certification instruments for geographic origin are the only certification instrument that recognises traditional knowledge and may be used to help local communities capture value within national and international markets. One area where COMESA could actively seek to compete with other regions is biofuels, yet this opportunity would need to be accompanied by strategic investments in research and infrastructure (for productivity, processing) and policies to mitigate its potential negative effects. There may be more limited scope for capturing niche markets that have not yet been captured by international actors, but Costa Rican experiences with public-private or NGO-private sector partnerships for bioprospecting (Laird 2002) (e.g., InBio; <http://www.inbio.ac.cr>) can be built upon in exploring the viability of such an option in the COMESA region.

BOX 13

AFRICAN BLACKWOOD: TOWARDS SUSTAINABLE TRADE THROUGH 'CARING MARKETS' (Jenkins *et al.* 2002)

African blackwood, *Dalbergia melanoxylon*, is renowned as the best of all timbers for the manufacture of woodwind instruments. In recent decades, concern has been expressed over the status of the tree in the wild and the possible deleterious impacts of harvest for musical instrument manufacture. As part of the 'Sustainable Production and Trade in African Blackwood' project, Fauna and Flora International conducted a study to investigate the international trade in African blackwood and to establish the basis for a sustainable supply through locally appropriate management practices and forest certification. The trade study involved visits to the sawmills in Mozambique and Tanzania and a survey of traders and users of African blackwood worldwide.

Between 150 m³ and 200 m³ of blackwood is used in the musical instrument trade annually. Recovery rates for production varied from 5% (or less) to 20% in select cases. If an average of 10% is assumed, between 7 500 and 20 000 trees a year are estimated to be sourced for the musical industry. As accessible areas are 'mined out', the source of supply tends to move to more inaccessible areas. As there is no acceptable alternative to blackwood, the market is relatively unresponsive to increased cost and resource depletion. Commitment is growing within both Mozambique and Tanzania to work towards management arrangements for sustainable trade, largely under community forest management policies. Chain of custody certification under FSC standards can be promoted to ensure value is attached to origin and benefits flow to local communities. The musical instrument industry can also be encouraged to provide financial support for the sustainable production of the species, given its fundamental importance to the industry and high value of processed instruments.

To ensure the sustainable international trade in African blackwood, quotas for export of the species should be based on knowledge of the distribution and abundance of the species in the areas of harvesting, clear rights to access coupled with responsibilities for forest protection (whether by government or local harvesters) and active monitoring systems (to monitor populations and hold people accountable to agreements).

5. *Support better efficiencies and economies of scale.* More efficient processing methods can foster better use of existing resources, while greater competitiveness (and, under certain conditions, increased equity) can be achieved through efforts that support increased economies of scale. A study of timber concessions in the Congo basin found that national concessions tend to have higher processing rates and often create more employment, but findings on forest impact and productivity per hectare by origin and size of company were found to be highly variable (Ruiz Pérez *et al.* 2005). By reporting on such indicators, however, governments can proactively identify opportunities for policies and standards that help achieve economic, social and environmental aims. Economies of scale, often achieved by the wealthier sectors of society, can also be an outcome of community-based efforts—provided the necessary support services are available to support the governance requirements of community-based organising and marketing.

Ex-post Monitoring for Adaptive Management

Given the indeterminacy of policy and trade outcomes, using a solid information base to support planning is inadequate. For specific trade deals and investments in the sector, periodic monitoring of performance is fundamental. Such monitoring can help identify unanticipated social, economic and environmental costs and inefficiencies, and help identify opportunities for identifying means to promote more wins and fewer losses within existing or new policies and trade deals. For this monitoring to be useful, it must be fed back directly into decision-making. Identification of a common framework for evaluating trade deals, policy reforms and investments in the sector can go a long way in fostering identified economic, social and environmental goals through enabling adaptive and evidence-based management of change. A framework similar to that outlined in Box 12, operationalised through a set of specific indicators, could be used as a monitoring tool—to contrast anticipated with actual outcomes. Not only can this approach serve as a tool for improved accountability of public and private

actors to policies and terms of trade, but it can also help fuel more strategic decision-making throughout the sector. Expansion of a generic version of this framework to other sectors can also help governments make strategic decisions across sectors on the basis of their contributions to economic development and social and environmental goals. The promise of job creation through private logging concessions would be undermined if such monitoring were systematically done in the Congo basin, given recent estimates of mean and median employment by concessionaires (2.7 and 1.2 workers/1000 ha, respectively). Having a common framework that applies across COMESA member states could be useful in identifying opportunities for improved performance in the sector, as illustrated by the observed impact of national regulations and their enforcement on corporate practice among Congo basin states (Ruiz Pérez *et al.* 2005).

Regular Monitoring for Improved Forest Sector Governance

In addition to the application of a framework for evaluating specific trade deals, policy reforms or investments in the sector, there is need for sector-wide monitoring for improved governance in support of economic development and social and environmental objectives alike. Different instruments may be used at national and international levels. Following a detailed study of corruption and illegality in the forestry sector of Tanzania, Milledge (2007) identifies national-level strategies for improving forest-sector governance, which are likely to be generally applicable within the region. These include:

- mechanisms to strengthen accountability within forestry departments (for details, see Box 14);
- strategies to promote wider government involvement in forestry issues²⁴;

24. This includes involvement of parts of government dealing with financial integrity, politics, corruption and ethics. It may entail using instruments that require public officials to disclose assets and wealth; parliamentary oversight of the sector; awareness events for civil society on corruption facing the forestry sector, outlets for citizen complaints and protection for whistleblowers; national audits of public income and expenditure in the sector; and civil service management to curtail nepotism (Milledge *et al.* 2007).

BOX 14

MECHANISMS FOR INTERNAL ACCOUNTABILITY WITHIN THE FORESTRY SECTOR

1. **Monthly reporting:** On a monthly basis, relevant officers in charge at each stage of the trade chain submit summary reports to senior management that specify type of forest product (using standardised categories), quantity (e.g., volume), origin (e.g., forest area, sawmill, town), destination, value and ownership.
2. **Management oversight:** At minimum, senior forestry management requires three levels of scrutiny of these reports on a quarterly basis:
 - *By source forest* (i.e., comparison of actual harvesting with forest management and harvest plans);
 - *By trader* (i.e., comparison of actual logging, processing or transport with approved licenses); and
 - *By overall quantity* (i.e., enabling reconciliation of total volumes with revenue information, and enabling a general oversight into landscape-level harvesting, processing and trade dynamics).
3. **Inspections:** Inspections, while resource intensive, are required to enable checks and balances on the above-mentioned standard monitoring mechanisms. Inspections should be carried out using three methods:
 - *Systematic inspections* (i.e., periodic, planned inspections to verify accuracy of reported information) of all stages of the trade chain using one of two methods: (i) comparing reported information against source documents using standard audit methods; and (ii) independent truth-checking using field counting;
 - *Ad hoc inspections* (i.e., unscheduled visits) of all stages of the trade chain; and
 - *Targeted inspections* (i.e., following provision of specific intelligence).

Inspection results should be used to help verify levels of compliance (legality) and, importantly, results of the three techniques should be compared to help assess the most cost-effective compliance monitoring methods.
4. **Audits:** Routine monitoring and oversight of revenues and expenditures at central and local government levels through ongoing audits, with additional emphasis on monitoring the established mechanism for remittance of money (accrued from diverse categories of forest reserves), and a review of expenditures to enable public officials to be confronted with their expenditure choices.
5. **National task force:** National task forces on forest law enforcement and governance to facilitate cooperation and information sharing and follow-up on the Indicative List of Actions of the 2003 AFLEG Ministerial Conference.

- initiatives that promote transparency and knowledge sharing in the sector; and
- support for the development of independent forest monitoring capacity.

To simplify the task, COMESA could assist member states in developing a framework for annual reporting of relevant logging, timber trade, processing and export statistics among member states. This might include a combination of routine data collection from

different sources (Figure 13) in combination with systematic inspections for verification purposes, information from the registration of new forestry-related businesses (e.g., certificates of registration, bank returns), harvesting (harvest licences), transport (transit licences, checkpoint monitoring), processing (e.g., monthly accounting of forest products received and processed outputs) and export (customs documentation).

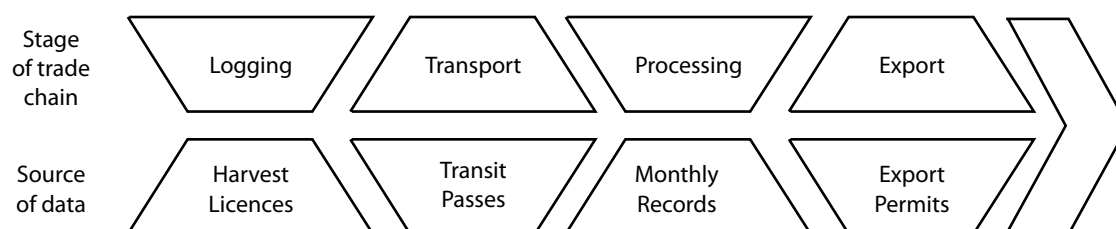


Figure 13: Illustration of primary sources of monitoring data at different stages of the trade chain (Milledge *et al.* 2007)

International instruments can also be instrumental in supporting national efforts of improved forest governance. EU nondetriment findings, for example, provide a vehicle for halting imports of forest products for which unsustainable levels of harvest can be proven. Efforts under development by the World Resources Institute to develop a Forestry Transparency Initiative are another such instrument (Morrison et al. 2006). Use of new technologies such as bar codes, microchips and tracer paints to tag forest products and track them to their origins (Brack *et al.* 2002) could be used in combination with broader anticorruption measures at national level to keep products from being rebranded to assert erroneous origin (geographical, or in terms of ethical forestry practice). Negotiated 'biopacts' may also present an opportunity to shift some of the costs of compliance to importing countries through trade deals conditional on favourable benefits-sharing arrangements and social and environmental standards (Mathews 2007).

E. DISCUSSION AND CONCLUSIONS

The COMESA region is home to a wide range of valuable timber and non-timber forest products and forest ecosystem services. While a number of significant trade barriers do exist, trade in timber forest products (tropical logs, woodcarvings), NTFPs (colloidal gums, flavours, fragrances, medicinal trees) and agroforestry products (vanilla, ylang ylang, coffee, tea) are already globally significant. The region's biodiversity hotspots of global significance bring in large sums of revenue for conservation. Markets in other forest ecosystem services (carbon, water) and biofuels are nascent, but represent important opportunities for forest-based economic development.

A host of challenges, however, jeopardises the significant promise of sustainable trade in forest products and services. Forestry departments in most countries are grossly underfunded to effectively fulfil their mandates. Illegal trade and corruption are rampant in many COMESA member states, as indicated by global governance indices. Such influences permeate the forestry sector and undermine efforts to capture value from the sector for local and national economic development. Where governance is weak, the pressure exerted on forestry products

from emerging global markets is difficult to manage, with foreign business interests capturing much of the sector's value and undermining efforts at sustainable forest management. Absence of strong monitoring and reporting systems has also contributed to a paucity of information on which to base policy and management strategies, prioritise investments or evaluate trade deals. Community involvement in forest resource management, while an important contributor to forest governance, is inadequately recognised and valued by forest departments.

Despite such shortcomings, a number of opportunities exist to capture value from the sector. In certain circumstances, certification can help to foster benefits capture by rural communities and foster sustainable forest management. Formal recognition of intellectual property rights over natural products at the international level can help recapture value where benefits flow to foreign investors. And the emergence of regional political, economic and research organisations represents an important opportunity for fostering economies of scale, facilitating shared transaction costs associated with information-intensive planning and investments, and negotiating more favourable (profitable, sustainable, equitable) policies and trade agreements with foreign actors. COMESA has an important role in assisting its member states in the capture of such opportunities so as to harness the economic potential of the sector. Regional frameworks to assist member states in evaluating different policy and investment options and trade agreements ahead of time, and monitoring them during implementation, can go a long way in supporting decisions that maximise benefits to different stakeholders and minimise costs. They also have a role to play in supporting the identification of strategic infrastructural and technical investments for forest-based product development and marketing, and supporting regional understanding on the potential benefits and precautions for emerging opportunities in the sector (biofuels, carbon sequestration). Regional frameworks and co-operation in operationalising forest law enforcement and governance at local, national, regional and international levels can also help to capture the sector's contribution to local and national economic development and sustainable management of forest products and services.

Chapter III

INSTITUTIONAL TERRAIN FOR FOREST TRADE AND MANAGEMENT IN THE COMESA REGION



A. MATCHING INSTITUTIONAL ARRANGEMENTS TO GOVERNANCE CAPACITY AND AIMS

AN ANALYSIS OF the institutional terrain for sustainable trade in forest products and services should begin with the aims of forest management, followed by an analysis of the overall context of governance for supporting these aims. Since few forests are single stakeholder landscapes, multiple interests must often be accommodated in the definition of aims. Historically, many economically important natural resources have been treated as the domain of 'public interest', with local interests overlooked in the name of the greater societal good (Edmunds *et al.*, 2004). The fact that natural resources are a significant source of wealth for governments and national elites has made it particularly challenging for local people to assert their interests and rights over these resources, with forests often a focus of struggle between rural people and these elites (Ribot and Larson, 2005). The historically disadvantaged status of these local communities and the power imbalances shaping their interactions with outside actors require special attention to support the articulation of local interests in forest management. Whether one starts from the bottom line of protecting national interests in forest management (see discussion by Larson and Ribot, 2005) or of securing local livelihoods first and foremost while supporting incremental gains in the protection of the public interest (as in Edmunds and Wollenberg, 2004), mechanisms must be in place to support equitable negotiation of the underlying objectives of forest management among the state, the private sector and diverse interest groups within rural communities. The aims of forest management could be based largely on local stakeholders' priorities, or on multiple (and often competing) aims emanating from diverse local interests, the government and the private sector. A host of tools are available to foster communication among stakeholders with diverse interests to help define a framework for joint decision and action (Maarleveld and Dangbégnon 1999, FAO 1999, Rescher 1993, Evans *et al.* 2006).

Once stakeholder interests are defined, the institutional arrangements for fostering diverse aims then come into play. Here the principle of subsidiarity, which states that matters ought to be handled by the lowest competent authority, should serve to orient institutional choices. In other words, central authorities should perform only those tasks which cannot be performed effectively at a more immediate or local level. Where local communities are the primary stakeholders or where local management arrangements do not undermine broader public interest (e.g. watershed protection), the most important contextual factors are found within local systems of governance. Here, the perceived legitimacy of local management bodies, rules and decision processes by diverse local groups (as defined by class, caste, gender, race or other factors), and the status of rural livelihoods as defined by local residents themselves, will help to determine whether any outside involvement by the state or other actors is needed. In cases where public interests are undermined by current forest management practices or diverse stakeholder interests are clearly at odds, external mediation is often required. In these situations, the current governance context is likely to play a strong role on conditioning the effectiveness of government responses and conventional models of forest management (in which the state plays a strong role in regulating access, governing revenue capture and ensuring sustainable harvest). A typology of three idealised situations can help to assess the type of solutions appropriate for different governance contexts (Table 1).

In states with weak governance, as determined by global governance indices (Annex C)²⁵, financial and technical capacity and political will, efforts by national institutions to mediate multi-stakeholder decision-making and effect control over forest resources through state-owned forest reserves are unlikely to be effective due to insufficient capacity or will and ineffectiveness in monitoring forest condition

25 The 'Failed States Index' compiled by the Fund for Peace (www.fundforpeace.org) and the 'Corruption Perception Index' compiled by Transparency International are two such indices for assessing the effectiveness of national governance.

Table 1: Implications of overall governance context on appropriate institutional arrangements for forest management

Governance Scenario	Institutional Characteristics	Implications for Institutional Arrangements for Forest Governance
1. Strong governance	State regulatory systems for controlling forest use, monitoring forest condition and equitably allocating forest revenue are strong. Local institutions represent an important resource for forest governance, depending on the extent to which traditional institutions have been eroded or influenced by external interests, and current levels of local empowerment.	Where important conservation values exist and are compromised by community or private sector practices, access can be made conditional on minimum environmental standards being met, which are in turn actively monitored. Responsibility for forest management may be fully devolved to local communities in other areas, but technical and financial support services for organising, marketing, participatory monitoring and enforcement of locally formulated rules for governing the resource base may be needed to help them capture market opportunities and manage the resource sustainably.
2. Medium-level governance	State regulatory systems may benefit from relatively well-trained personnel but are weakened by insufficient funding, corruption and/or failure to adapt to changing circumstances. Local institutions represent an important resource for forest governance, depending on the extent to which traditional institutions have been eroded or influenced by external interests and current levels of local empowerment. NGOs, the private sector and the global community each have a stake—and relative strengths and shortcomings—in natural resource management.	Exploit synergies and the opportunity for checks and balances among government, local communities, NGOs, the private sector and the global community towards two aims: (1) enhancing the contribution of forestry to local and national economic development and (2) improving national systems of governance for sustainable forest management. Synergies between local communities and the state can be fostered by building upon customary institutions and/or locally negotiated rules for collective marketing and forest management (so that rules are perceived as legitimate), while ensuring state responsiveness in the form of demand-driven service provision and supportive enforcement of local rules. Synergies among communities, the state, the private sector and NGOs can be used to foster innovation in forest product development and marketing while helping to maximise local benefits capture and sustainable forest management. The international community, through ‘caring markets’ and agreements, can also help communities and governments cope with demands from powerful outside actors.
3. Weak governance	Regulatory systems may be nonexistent, very weak or inequitable. Where regulatory systems are very weak, state-owned resources often become de facto open access due to ambiguous or poorly enforced forest laws and tenure arrangements, leading to rapid degradation. Where governance is inequitable, forest resources may be channelled to national or international elites. Local institutions, NGOs, the private sector and the international community must be relied upon for forest governance.	In such cases, inadequate resources and technical capacity undermine the capacity of the state to manage forest resources effectively. Two important opportunities exist for ensuring a reasonable level of forest governance. Local communities represent an important resource for protecting forest resources, provided their customary rights are protected and manipulation by external actors is minimal. Where present, NGOs can assist in empowering them to take full advantage of these rights and adapt to opportunities and challenges of a changing world. To control external manipulation (economic, political), NGOs or research organisations may play a ‘whistleblower’ role in exposing forest crimes. Governments can assist by giving preferential treatment to ‘caring markets’ as trade partners, helping to shift the burden of costly forest governance to the international community.

and enforcing forest laws (e.g., prohibited practices). In these cases, efforts to devolve maximum control to local communities, the historical custodians of these resources—combined with NGO and international market and policy instruments—may be most effective in fostering sustainable forest management. This may be best illustrated by remote regions of the DRC, where longstanding conflict has eroded institutions of government (requiring community-based management) and enabled actors from neighbouring countries to capture natural resource wealth, largely through illegal forest resource exploitation (requiring regional and international support) (UNSC 2002). As institutions in these countries become stronger, governments can opt to secure legal protection for customary management of forests. In areas of high conservation value under threat, alternative management systems (e.g., collaborative management, market-based instruments) may be required to ensure minimum environmental standards are met.

In countries with strong governance, state institutions and regulatory systems for controlling forest use, monitoring forest condition and managing forests for the well-being of multiple stakeholders and society at large are relatively strong and can be relied upon to manage forests with high value for timber or forest ecosystem services. This may be seen,

for example, in Indian Ocean member states such as Mauritius and Seychelles, which have relatively small forested areas of high biodiversity value that can be effectively governed by state actors on behalf of society. This strong government presence is supported by the tourism revenues derived from conservation. In these areas, this value has enabled them not only to protect remaining tracts of forest, but to engage in forest rehabilitation efforts. States characterised by strong political will can also go a long way in fostering sustainable use of forest resources, as illustrated by Rwanda's recent efforts to protect critical catchment areas and watershed functions (Box 15).

In countries with medium levels of governance, as in the case of the majority of COMESA member states, local communities, government, NGOs and to some extent the private sector (where regulated by 'caring markets') need to provide complementary roles in harnessing the economic potential of forests for local and national economic development while ensuring their sustainable use. Community Based Forest Management (CBFM) in Tanzania provides one of the best examples where community-state synergies have been achieved in balancing local income generation from forests with forest conservation (Alden Wily 2001, Hamza and Kimwer 2007). Successes have largely been due to increased

BOX 15

THE ROLE OF POLITICAL WILL IN WATERSHED PROTECTION: THE CASE OF RWANDA (Rutabingwa, personal communication)

The Rwandan government has taken the protection of critical watershed functions seriously through political commitment that has emerged from lessons learnt the hard way. Gishwati, a mine whose effluents drain into Lake Kivu, had induced high levels of water contamination in the lake, undermining fisheries and human health alike. The government took the difficult action to close down the mines in the area. Mines are now required to conduct environmental impact assessments prior to startup, and to implement mitigation measures. In another case, lakes were drying due to catchment area disturbance from deforestation and cultivation, and a hydropower plant operating in the area was forced to shut down. The government has since banned cultivation within sensitive areas, and water seems to be coming back. Excessive water consumption by eucalypts has also led the government to prohibit eucalypt cultivation in all marshland. Finally, steep hillsides undergoing clearing for agriculture experienced a large landslide in 2007, killing 20 people. The government has resettled people and is placing focused attention on the area for the 2007 Tree Week. Clearly, political will has a role to play in ensuring protection of catchment functions. In select areas, payments for ecosystem services (e.g., hydroelectric companies paying smallholders to reduce erosion and water consumption on their land) could offer an alternative means to ensure catchment protection while also ensuring that livelihood needs of farmers are met.

tenure security to local communities, a phased approach to titling involving capacity building and monitoring, and clear benefits sharing arrangements. The poor condition of the forests devolved to local communities and corruption of local officials, however, have undermined the contribution of CBFM to poverty alleviation (Brockington 2007, Romano 2007). In Uganda, NGOs and local communities have increasingly played a role in providing checks and balances on actions perceived to be against the public interest, as evidenced by the effective protests raised against the proposed transfer of Mabira Forest to the sugarcane industry (Birdlife International 2007). This combination of an active civil society and government responsiveness to societal demands can prove to be an effective combination in cases where competing interests over land are perceived to undermine local interests or the collective good. The private sector can under certain conditions play complementary roles in ensuring sustainable and equitable forest resource management, as illustrated by certification efforts and the emerging 'caring markets' of the European Union for sustainably sourced timber (EC 2005).

B. FOREST TRADE, AND MANAGEMENT INSTITUTIONS IN THE COMESA REGION: INSTITUTIONAL STRENGTHS AND GAPS

An analysis of institutions in the COMESA region highlights a number of strengths of national-level institutions that should be actively built upon in creating strategies to foster sustainable trade in forest products and services. Customary institutions operating within rural communities have a long history of adaptive management of forest resources to meet basic livelihood needs while providing safety nets and ensuring reasonable levels of equity in benefits capture (Mamimine and Mandivengerei 2001). Efforts should be made to build upon these wherever possible, and to minimise regulatory efforts by government to bear on those cases in which local institutions have proven ineffective in protecting critical ecosystem functions or regulating access and use. A combination of incentive (e.g., payments for

ecosystem services) and regulatory (e.g., policies) schemes can be used to improve forest management where the interests of external stakeholders are compromised (e.g., water provision to downstream users). Government institutions also have a set of important competencies for forest management. In most countries in the region, government institutions have a strong grounding in technical aspects of forest management, and can provide crucial support to local communities or the private sector in their efforts to manage natural or plantation forests. Government law enforcement agencies may also prove critical in enabling communities to implement agreed self-governance arrangements, given the difficulties they often encounter in enforcing rules on their friends and neighbours. The private sector at national level is increasingly assuming a role in fostering economic innovation and in creating opportunities to link smallholders to international markets. Yet national-level institutions are weakened by the low level of funding of national forestry departments, which undermines their ability to achieve their mandate (including regulatory and service functions). Many also lack the economic and technical capacities in other areas crucial for capturing market value, fostering innovation to meet emerging challenges, ensuring equitable benefits capture and fostering sustainable management in the context of increased international pressure over natural resources.

Regional research, economic and political institutions have gained in importance in Africa in recent years and are helping to fill a number of institutional gaps. Regional economic bodies such as COMESA now offer the promise of expanding economic opportunities through regional trade, incentives for innovation, economies of scale and stronger political blocs to negotiate more favourable terms of trade with powerful external actors. Regional research bodies such as Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA); South African Development Community–Food, Agriculture and Natural Resources (SADC-FANR); Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN); West and Central African Council for Agricultural Research and Development (CORAF/WECARD); and Forum for Agricultural Research in Africa (FARA)

are strengthening the innovation capacity of national research institutions to address emerging challenges and capture new opportunities (e.g., payments for environmental services, climate change) and, to some extent, integrating economic development with sustainable management of natural resources. Africa-wide political bodies (the African Union) are helping to put Africa on the global map of political powers shaping global trade deals and to manage regional conflicts associated with poor governance of natural resources. Regional knowledge and business networks are emerging to help share information on emerging opportunities in the forestry sector of which little is known. This is evidenced by knowledge sharing networks for payments for ecosystem services (the East and Southern Africa Katoomba Group) and regional associations for the promotion of biofuels (the Southern African Biofuels Association). Yet despite efforts by national and regional institutions to cope with emerging economic superpowers' placing a stronghold on Africa's natural resources, much of the value of the forestry and other sectors continues to be captured by foreign actors and lost to the national economy (Mackenzie 2006, Broadman 2007). Weaknesses also remain in the continent's efforts to strengthen forest governance and assist smallholders to access emerging markets. The potential of research institutions to address questions of most concern to policymakers and practitioners has not been effectively harnessed.

International markets and institutions can fill some of the gaps in national and regional organisations. International development organisations like FAO, United Nations Environment Programme and United Nations Development Programme have generated global databases on forest resources and

help co-ordinate research and intervention in critical ecosystems. International research organisations such as CIFOR, ICRAF, Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), International Institute for Environment and Development (IIED) and others are engaged in global comparative research to answer strategic questions of policymakers, and are also building capacity in action research to enable the challenges practitioners face to also be addressed through research. 'Caring markets' at international level may play a role in addressing national governance failures, provided preferential treatment can be ensured for these markets—or emerging economic powers brought on board in support of social and environmental standards adopted by other global economic superpowers. International NGOs (IUCN, Transparency International, WWF etc.) have helped finance conservation efforts on the continent, support efforts to gather data in situations of conflict and governance abuses where national institutions are at risk, and develop sets of standards for good practice, good governance and corporate social responsibility. Evidence suggests that national conservation efforts may be more effective and equitable when governments partner with international conservation and development organizations (McConnell and Sweeney 2005). More work needs to be done, however, to avoid duplication of responsibilities and capture potential synergies across levels. Concerted efforts to foster complementarities and collaborative learning across levels and sectors can help to capture opportunities for forest product development and marketing, realise the potential of emerging markets for environmental services, and strengthen forest sector governance for greater value capture, equity and sustainability.

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ANNEX A: SUMMARY OF NTFPS IN THE COMESA REGION

Non-timber product (trade name, species)	Source	COMESA exporting countries	Main producers outside COMESA	Main importing countries	Notes on final use and value of trade
GUM COLLOIDS					
Gum Arabic (<i>Acacia senegal</i> and <i>Acacia seyal</i>)	Managed natural populations supplemented by planting	Sudan (44–63% of global trade) and Ethiopia (1.6%), Eritrea (0.6%) (Muller and Okoro 2004)	Chad and Nigeria	France (41%), USA (14%), India (9%), UK (9%), Germany (8%), Italy (4%), Japan (2%) (2002). China is buying from Sudan and Ethiopia in increasing quantity (2007)	Sudan exports 50–60% of the 50 000 tonnes in trade. Exports from Chad have increased, but those from Nigeria declined, following poor gum quality and a consequent US import restriction (1999). End use is in chocolates, cosmetics, soft-drinks, shoe-polish, pastries and salad dressings. Re-exports by France were worth US\$38 million (48% of global value). Colloides Naturels International is the leading supplier.
FLAVOURS AND FRAGRANCES					
Olibanum or frankincense (<i>Boswellia papyrifera</i>)	Wild trees, many with rights of tenure in some areas and lack of tenure in others, leading to overharvest	Ethiopia, Eritrea, Sudan and, to a lesser extent, Kenya	Somalia	China, Middle East and European Union (France, Germany, Switzerland, UK)	Perfumes, flavouring, chewing gums and medicines. Main use in China is for traditional medicines; in Saudi Arabia, for chewing grade ('maidil') from Somalia. France uses 50 tonnes/yr for essential oils. Over 15 000 Ethiopian churches use 2 000 tonnes/year. A resin tapper can collect 1000 to 1500 kg of incense/yr for a net income of US\$100–150/yr (Gebrehiwot et al. 2003).
Opopanax (<i>Commiphora erythraea</i> and <i>C. kataf</i>)	Wild trees	Northeast Kenya, eastern Ethiopia	Somalia	China, France, Italy, Saudi Arabia	400 tonnes/yr in international trade
Myrrh (<i>Commiphora myrrha</i>)	Wild trees	Kenya, Ethiopia	Somalia	China, France, Italy, Saudi Arabia, UK	1100 tonnes/yr in international trade (Coppens 1995)

Non-timber product (trade name, species)	Source	COMESA exporting countries	Main producers outside COMESA	Main importing countries	Notes on final use and value of trade
Eucalyptus oils (<i>Eucalyptus species</i> , mainly <i>E. smithii</i> (gully gum) in COMESA region)	Cultivated, introduced from Australia	Swaziland, possibly Zimbabwe	China, India, Nepal, Brazil, Portugal, Spain, Chile, South Africa & Australia	The European Union is the major importer	Swaziland produces 80–100 tonnes of cineole-type Eucalyptus oil/year, about 3% of global production in a trade dominated by China (over 60% of world production).
Ylang-ylang essential oils from <i>Canaga odorata</i> flowers	Cultivated, introduced from SE Asia	Comoros (80% of global supply), Madagascar	SE Asia	France	French perfumes, including Chanel #5 and aromatherapy oils. Trees in full production yield 20–100 kg of flowers/yr.
Vanilla (<i>Vanilla planifolia</i>), with two varieties produced, Tahitian and Bourbon	Cultivated	Madagascar (the world's leading vanilla producer in the 1990s, losing market share more recently), Comoros, Mauritius and, to a lesser extent, Uganda	Asia (Indonesia currently is the largest producer, followed by India, China, Philippines, Vietnam), South America (Guatemala, Costa Rica) and Pacific (Papua New Guinea, Tonga, Fiji, Tahiti)	USA (major importer) and European Union (especially France)	World trade c. 2000 tonnes/yr, but affected by price fluctuations and competition with synthetic vanilla. More positively, products such as 'Vanilla Coca-Cola' offer opportunities for market diversification.
COSMETIC OILS					
Shea butter or karité (<i>Vitellaria paradoxa</i>) seed oils. Two subspecies whose different oil characteristics determine marketing (Becker and Statz 2003)	Wild trees, managed by local communities, with rights of tenure	Sudan, Uganda	Burkina Faso (major producer), Ghana	Europe	95% used in chocolate production and only 5% used internationally in high-value cosmetics (Teklehaimanot 2004), including FairTrade products (e.g., through The Body Shop). The East African subspecies (<i>nilotica</i>) yields a liquid fat (oil) sold for cosmetics compared to West African solid butter (mainly chocolate production).

Non-timber product (trade name, species)	Source	COMESA exporting countries	Main producers outside COMESA	Main importing countries	Notes on final use and value of trade
Mafura oil (<i>Trichilia emetica</i>) seed oils (Grundy and Campbell 1993, Wyeth 2003)	Managed indigenous trees	Zimbabwe	Mozambique an exporter, but species widely distributed	South Africa	Soaps
Mongongo (<i>Schinziophyton rantanenii</i>) seed oils	Managed indigenous trees	Zambia	Species widely distributed; marketed mainly in Zambia	Regional sales (mainly within Zambia)	Hair oil, through PhytotradeAfrica member
MEDICINAL PLANTS					
Pygeum (<i>Prunus africana</i>) bark	Wild harvest; some cultivation in Kenya and Cameroon, but most bark in trade exploited from wild stocks	Madagascar, Kenya and to a lesser extent, Burundi, DR Congo and Ethiopia (recent cross-border trade to Kenya)	Cameroon (global leader in supplies, but unsustainable harvest), Equatorial Guinea and Tanzania	Belgium, France, Italy, Madagascar (imports from Cameroon), India (from DR Congo), China, Kenya and USA.	Cameroon exports c. 1500–2000 tonnes of the 3500 tonnes of bark in international trade. The Italian company Indena Spa recently bought the processing factory in Fianarantsoa from the Madagascar government. Unsustainable harvest has depleted stocks in Cameroon and Madagascar, including within Forest Reserves (e.g., Zahamena SFR). Total over-the-counter value of the final product, US\$220 million/yr (Cunningham <i>et al.</i> 1997).
Khat, qat or miraa (<i>Catha edulis</i>) leaves	Cultivation in Kenya (Meru district) and Ethiopia (e.g., Harrar) supplemented by wild harvest	Kenya, Ethiopia and, to a lesser extent, Madagascar	Yemen	Europe (UK, Holland and then illegally to Scandinavia and the USA)	The scale of this multimillion dollar trade is difficult to determine. In 1993, trade from Kenya to Somalia was reported to be worth an estimated US\$100 million (Randall 1993). The trade is illegal in Scandinavia and USA (Crenshaw and Burke 2004). However, 6 tonnes of leaves/week are imported into the UK and smuggling of <i>Catha edulis</i> into USA from UK is reportedly worth £150 million/year.

Non-timber product (trade name, species)	Source	COMESA exporting countries	Main producers outside COMESA	Main importing countries	Notes on final use and value of trade
HONEY AND BEESWAX					
Honey and beeswax (from <i>Apis mellifera</i>)	Mainly from managed hives	Kenya, Zambia, Ethiopia, Uganda	Honey is widely produced in Australia, South America and Asia. Argentina and China are the world's largest producers.	Mainly European Union	In 2006, over US\$781 million worth of natural honey was traded (nearly 410 000 tonnes/yr). On a value basis, Argentina produced 19% and China 13% of global supply (2006).
SPECIALITY FOODS					
Mopane 'worms' (Saturiid moth caterpillars)	Wild harvested	Zambia, Zimbabwe, DR Congo	Botswana, Namibia, South Africa	European Union (France and Belgium) (Tabuna 1999)	Edible caterpillars are a high value NTFP, increasingly traded from Zimbabwe to the DR Congo. In South Africa, the value of mopane caterpillars was £2850 per ha of mopane woodland, which means that South Africa's 20,000 km ² of mopane woodland is worth £57 million, 40% of earned by poor rural women (Ghazoul 2006).
Palm weevils (<i>mposse</i> in DR Congo) (<i>Rynchophorus</i> <i>phoenicis</i>)	Wild harvested	DR Congo	Also occur in Zambia, Zimbabwe and Kenya	Exported to France and Belgium as a West and Central African specialty food	Informal trade, no quantities available
Baobab fruit pulp as food additive to 'Elephant Pepper' food flavouring (http:// www.elephantpepper.com)	Managed indigenous trees	Zambia	Distributed through most COMESA countries, where fruits are in local trade	South Africa and internationally through web-based marketing	New natural product marketed internationally through Phytotrade Africa and Elephant pepper

26. Derived from trade data from International Trade Centre, Geneva <http://www.p-maps.org/Client/index.aspx> (accessed 19 Oct. 2007).

ANNEX B: THREATS AND CONSERVATION CHALLENGES FOR DIFFERENT FOREST TYPES AND ECOREGIONS²⁷

Forest type and ecoregion	Global conservation status (Olson and Dinerstein 1998)	Ecoregion occurrence	Other countries	Threats and conservation challenges
TROPICAL AND SUBTROPICAL MOIST BROADLEAF FORESTS				
Albertine Rift montane forests	Critical/ endangered	Burundi, DR Congo, Rwanda and Uganda	Tanzania (Mahale Mountains)	Amongst the highest population pressures in Africa have resulted in clearing of most Albertine Rift forests outside of Forest Reserves and Protected areas, many of which have been logged. The least known and most important remaining Albertine Rift forests are in the more eastern and southern Itombwe Mountains (DR Congo). These are vulnerable to logging and are a global conservation priority.
East African montane forests	Critical/ endangered	Kenya, Sudan (Imatong Mountains) and Uganda	Tanzania	This ecoregion consists of more than 25 montane forest 'islands' above 1500 masl, often in a 'sea' of densely populated farmland (200–300 people/km ²). At lower altitudes, most forest has been cleared for smallholder farms or tea and coffee plantations. Threats are clearing (due to corrupt land deals, as occurred in the Mau forests, Kenya), logging (pit-sawing) and hunting.

27. Note: As this report is focused on forests, Desert and Xeric shrubland types have been excluded for the sake of brevity but include globally important ecoregions. These include Madagascar spiny thickets, Madagascar succulent woodlands, East Saharan montane xeric woodlands, Eritrean coastal desert, Ethiopian xeric grasslands and shrublands, Masai xeric grasslands and shrublands and in Sudan, part of the South Saharan steppe and woodlands. At a smaller scale, riverine forests and riparian woodlands are also excluded. In some cases, such as along the Jubba and Shabelle valleys (from Ethiopia to Somalia) these are globally significant for bird conservation (Stattersfield et al. 1998). In other cases, such as the *Acacia nilotica* riverine forests growing on the Blue and White Niles and tributaries in Sudan and into Egypt, these are nationally important and are threatened by the ever-increasing demand for wood fuel resulting from deforestation in the surrounding area.

Forest type and ecoregion	Global conservation status (Olson and Dinerstein 1998)	Ecoregion occurrence	Other countries	Threats and conservation challenges
Ethiopian montane forests	Critical/endangered	Ethiopia, Eritrea and two small areas in Egypt (Jebel Elba and Jebel Hadai Aweb)	Djibouti (Goda and Mabila massifs)	Very diverse forests, from highly threatened evergreen and semi-evergreen forests dominated by <i>Podocarpus falcatus</i> and <i>Juniperus procera</i> to woodland dominated by <i>Terminalia</i> , <i>Commiphora</i> , <i>Boswellia</i> and <i>Acacia</i> species. Main threats to already fragmented forests are clearing for agriculture, logging for timber and wood fuel harvest. Origin of coffee (<i>Coffea</i>) and continued globally important source of genetic diversity for disease resistance and genetic diversity.
Eastern Arc forests	Critical/endangered	Kenya (Taita Hills)	Mainly Tanzania	Rich in endemic species (25–30% of the 200 plant species), these forests, surrounded by high rural population densities (over 300 people/km ²) are threatened by clearing, logging, fires and wood fuel collection.
Comoros forests	Critical/endangered	Comoros (Grande Comore, Moheli and Anjouan islands)	Mayotte (one of the Comoro islands, but a French dependent territory)	Most lowland forests have been cleared for agriculture, several endemic plants now being extinct. Small patches remain in higher mountains, but are threatened. The largest remaining forest is on Mount Karthala (Grande Comore) and two remaining forests on Anjouan measure only 10 km ² . These are the only habitat left for Anjouan scops owl (<i>Otus capnodes</i>) and several other species. With 2000 plant species, most of them endemic, conservation of remaining Comoros forests is a priority, particularly on Mount Karthala (Grande Comore), Mount Ntringui (Anjouan), and Mount Koukoule (Moheli).

Forest type and ecoregion	Global conservation status (Olson and Dinerstein 1998)	Ecoregion occurrence	Other countries	Threats and conservation challenges
Granitic Seychelles forests	Critical/endangered	Unique to Seychelles; small forests on some of the 42 granitic islands in this 115 island archipelago, including Mahé, the largest and tallest island (145 km ² ; 905 m)	—	Most lowland forests have been destroyed, due to 200 years of human settlement, for coconut, vanilla and cinnamon plantations. Forests at higher elevations are also affected. Coupled to forest fragmentation and invasive species, clearing has caused several extinctions. The Seychelles government, however, is doing an excellent job in dealing with forest conservation challenges. The best example is Vallée de Mai (on Praslin Island), an intact forest and World Heritage Site. Others are mist forest in Morne Seychellois National Park (35 km ²), Aride Special Reserve (0.7 km ²), Cousin Special Reserve (0.3 km ²), La Digue Veuve Special Reserve (0.1 km ²) and Curieuse National Park (15 km ²).
Mascarene forests	Critical/endangered	Mauritius (including Rodrigues)	Réunion	Forest clearing for agriculture, introduced invasive species and hunting have caused the extinction of many species, including the proverbial dodo. Many remaining endemic species are highly threatened. There is a high diversity of wild coffee (<i>Coffea</i>) species and endemic palms. The largest protected forest is at Black River.
Madagascar lowland forests	Critical/endangered	Unique to Madagascar	—	The lowland forests of Madagascar are the most diverse forests in this remarkable country. Most of the 171 palms species (97% endemic) are found in the eastern forests (Dransfield and Beentje 1995). Ninety percent of these forests have been destroyed since people arrived 2000 years ago. Today, 7% are considered well protected in reserves and 27% poorly protected in forest concessions (Du Puy and Moat 1996). The main threat is clearing for 'tavy' slash-and-burn agriculture, followed by legal and illegal logging and overexploitation of palm and <i>Cyathea ferns</i> (Lowry <i>et al.</i> 1997).

Forest type and ecoregion	Global conservation status (Olson and Dinerstein 1998)	Ecoregion occurrence	Other countries	Threats and conservation challenges
Madagascar subhumid forests	Critical/endangered	Unique to Madagascar	—	Major threats are clearing for agriculture and introduced species. Only small fragmented areas of habitat remain, with best forests in the Sambirano area, Montagne d'Ambre and parts of the northern highlands and central highland massifs such as Ankaratra and Andringitra.
Northern Zanzibar Inhambane coastal forest mosaic	Critical/endangered	Kenya	Tanzania, Mozambique	Most of these forests have been cleared for cashew, coconut or cassava, particularly in Kenya. Over 200 forest fragments are spread across the range of this forest type. Remaining patches are impacted by logging (including for the woodcarving industry) (Burgess <i>et al.</i> 1998, Burgess and Clarke 2000). Harvesting poles for construction purposes in major towns (such as Mombasa) also poses a challenge (Choge <i>et al.</i> 2005).
Victoria Basin forest, savanna mosaic	Critical/endangered	Uganda, Rwanda, Burundi and Kenya (western and northern sides of Lake Victoria)	Tanzania	Extensive conversion for agriculture and due to logging.
Central Congolian lowland forests	Relatively secure	DR Congo	—	Relatively low species richness, with 1500 to 2000 vascular plant species (c. 10% endemic). Evergreen forests dominated by <i>Gilbertiodendron dewevrei</i> . Most are largely intact, but poorly known scientifically. One very large protected area within the ecoregion, Salonga National Park (36 500 km ²), contains the second largest tropical forest national park in the world. Lomami-Lualaba areas also suggested for protection (Kamdem-Toham 2006).

Forest type and ecoregion	Global conservation status (Olson and Dinerstein 1998)	Ecoregion occurrence	Other countries	Threats and conservation challenges
Eastern Congolian swamp forests	Relatively secure	DR Congo	—	Largely intact, but poorly known. An estimated 124 000 km ² of swamp forests remain in the Congo basin (Sayer <i>et al.</i> 1992), with perhaps half in this ecoregion. Salonga National Park has the largest swamp forest area, with Lomako Reserve and Lomami Lualaba Forest Reserve also important. Habitat for endangered bonobos. Large areas within the DR Congo have been allocated for logging concessions as Congo river access makes logging viable. This heightens threats to intact forest due to unmanaged logging and hunting for bush meat.
Northeastern Congolian lowland forests	Relatively secure	DR Congo	Central African Republic	These forests are diverse, with many endemic plant and animal species including okapi and the Congo peacock. Although 6% of this ecoregion falls within protected areas (including Okapi Faunal Reserve and Kahuzi-Biega National Park), military conflict and coups pose a conservation challenge, including links to threats such as mining, logging, hunting and forest clearing for farmland, often stimulated by large-scale movements of internally displaced people.
TROPICAL AND SUBTROPICAL DRY BROADLEAF FORESTS				
Madagascar dry deciduous forests	Critical/ endangered	Unique to Madagascar	—	Since people arrived in Madagascar c. 1200 years ago, about 97% of dry deciduous western forests have been destroyed. Only isolated areas remain, mostly small fragments of 35 km ² or less, with only 55 blocks larger than 35 km ² and only five blocks larger than 500 km ² (Morris and Hawkins 1998). This includes tsingy limestone karst formations. Selective logging remains a threat. Of Madagascar's 186 resident terrestrial bird species, 131 occur in this ecoregion (Langrand 1990) as well as rare <i>Dalbergia</i> species and two of the six endemic baobab species (<i>Adansonia grandidieri</i> and <i>A. suarezensis</i>). Ankarafantsika National Park (605 km ²) and Tsingy de Bemaraha World Heritage Site (1520 km ²) are key protected areas.

Forest type and ecoregion	Global conservation status (Olson and Dinerstein 1998)	Ecoregion occurrence	Other countries	Threats and conservation challenges
Zambezian <i>Cryptosepalum</i> dry forests	Critical/endangered	Mainly Zambia (Kabompo River area)	Angola	Although fragmented, the two main blocks of <i>Cryptosepalum</i> forest to the north and south of the Kabompo River together comprise the largest area of tropical evergreen forest in Africa outside the equatorial zone (Bingham 1995). There is only one protected area, the West Lunga National Park, surrounded by game management areas. This forest is still relatively intact due to a low human population density, lack of water and poor agricultural potential.
TROPICAL AND SUBTROPICAL WOODLANDS AND SAVANNA				
Central Zambezian miombo woodlands	Vulnerable	70% of central and northern Zambia, 30% of southeastern DR Congo, western Malawi as well as Tanzania and part of Burundi	North-eastern Angola	Main threats are dryland agriculture, bush-meat hunting, wood or charcoal demand near larger towns and mining. Between 1937 and 1983, 51% of the Copperbelt (Zambia) was deforested for industrial and household wood fuel (Chidumayo 1987). Also seriously degraded in Burundi and parts of Malawi. Civil war in the DR Congo remains a threat. Overall, however, the protected area network is good, with 14 national parks, 13 game and wildlife reserves as well as numerous communally managed conservation areas in the southern African portion of this ecoregion. Over 30% of Zambia and about 25% of Tanzania are declared protected areas.
Zambezian and mopane woodlands	Relatively stable/intact	Zambia, Zimbabwe, Malawi, Swaziland	Botswana, Mozambique, South Africa	Dominated by the regionally endemic tree, mopane (<i>Colophospermum mopane</i>), but poor in other endemic plants, these woodlands hold some of the largest and most significant wildlife populations in Africa, particularly elephant and, critically, black rhino. This is due to the high level of protection in the ecoregion, with over 45% in either state or private conservation, coupled with cross-border conservation initiatives.

Forest type and ecoregion	Global conservation status (Olson and Dinerstein 1998)	Ecoregion occurrence	Other countries	Threats and conservation challenges
Eastern miombo woodlands	Vulnerable	Malawi	Southern Tanzania and northern Mozambique	This low elevation miombo woodland is dominated by <i>Brachystegia spiciformis</i> , <i>B. boehmii</i> , <i>B. allenii</i> , and <i>Julbernardia globiflora</i> . Large intact areas occur in Mozambique and Tanzania due to poor soils, tsetse and low human population densities. These woodlands are the main international source of African blackwood (<i>Dalbergia melanoxylon</i>) used in wood-wind instruments and selling for US\$20 000 per m ³ , but overexploited in Malawi and Kenya.
Southern miombo woodlands	Vulnerable	Central African Plateau (central Zimbabwe, southern Zambia, Malawi)	Mozambique	Much of this miombo ecoregion has been completely converted by cultivation, charcoal production, unsustainable logging and high fire frequencies. Although fairly well conserved in protected areas, national parks are affected by encroachment. Poaching, for example of black rhinos and elephants, is a serious concern. According to official figures, Zimbabwe lost up to 80% of its black rhino population due to poaching in a single year (Chenje and Johnson 1994). The current political and economic situation in Zimbabwe poses a threat to the extensive system of protected areas, and land invasions threaten the private wildlife conservancies.
Kalahari Acacia-Baikiaea woodlands	Vulnerable	Zimbabwe, Zambia	Angola, Namibia	More than 160 mammal species and 400 bird species occur in this ecoregion. Poaching is a serious and widespread concern worsened by civil conflict and the involvement of powerful elites in the ivory and rhino horn trade. Unsustainable logging has heavily impacted <i>Baikiaea</i> woodland and forest habitats and <i>Baikiaea plurijuga</i> (<i>mukusi</i>) stocks. Annual production of <i>mukusi</i> timber peaked at 100 000 m ³ in the 1930s and again in 1964 with railway line construction (Bingham 1995). In Zambia, a recent inventory found no more exploitable reserves in the prime teak forest areas of Sesheke, and the same applies to Zimbabwe outside protected areas.

Forest type and ecoregion	Global conservation status (Olson and Dinerstein 1998)	Ecoregion occurrence	Other countries	Threats and conservation challenges
Itigi-Sumbu thicket	Critical/ endangered	Zambia	Tanzania	This unique thicket type, with at least 100 woody species in two isolated patches in Tanzania and Zambia, is poorly studied. Half the Tanzanian portion (Kideghesho 2001) and 71% of that in Zambia is already cleared and unless urgent conservation action is taken, the Itigi-Sumbu thicket will disappear. Protected area status has not prevented removal of this thicket from Mweru Watipa National Park and Tabwa Reserve (Almond 2000).
East Sudanian savanna	Critical/ endangered	Sudan, Eritrea, western Ethiopia, northwestern Uganda and the DR Congo (small area around Lake Albert)	Nigeria, Cameroon, Chad and the Central African Republic	This <i>Combretum</i> and <i>Terminalia</i> savanna is separated into an eastern and western block by the Sudd wetland in Sudan. Large areas are still intact, although some areas are threatened by heavy grazing and hunting. In 2007, aerial surveys of Boma National Park in southern Sudan showed large remaining wildlife populations rivalling the Serengeti (WCS 2007), with significant tourist potential if peace prevails.
MANGROVE FORESTS				
East African Mangrove forests	Critical/ endangered	Eritrea, Kenya, Madagascar, Sudan	Djibouti, Mozambique, Somalia, Tanzania	Mangroves of eastern Africa and the Red Sea coastal regions are threatened in many areas by a growing human population, overuse (for construction materials, timber trade), conversion (for rice farming and shrimp aquaculture), asphyxiation (from inland topsoil erosion and oil spills) and some industrial pollution (Taylor <i>et al.</i> 2003).
Madagascar Mangrove forests	Vulnerable	Madagascar	Madagascar	Mangroves in Madagascar are threatened by erosion from loss of highland forests and conversion to rice farms or for salt production. Overharvest of mangrove trees for direct use is localized, for example to the Mahajanga and Toliara areas (Rasolofoa 1993).

ANNEX C: GOVERNANCE AND ECONOMIC INDICES OF COMESA MEMBER STATES

COMESA member state	Governance indices		Economic indices
	CPI 2007 ^a	FSI 2007 ^b	GNI 2006 (US\$) ^c
Burundi	2.5	95.2	100
Comoros	2.6	77.8	660
Djibouti	2.9	80.2	1,060
DRC	1.9	105.5	130
Egypt	2.9	89.2	1,350
Eritrea	2.8	85.5	200
Ethiopia	2.4	95.3	180
Kenya	2.1	91.3	580
Libya	2.7	69.3	7,380
Madagascar	3.2	76.5	280
Malawi	2.7	92.2	170
Mauritius	4.7	42.7	5,450
Rwanda	2.8	89.2	250
Seychelles	4.5	71.3	8,650
Sudan	1.8	113.7	810
Swaziland	3.3	81.3	2,430
Uganda	2.8	96.4	300
Zambia	2.6	80.6	630
Zimbabwe	2.1	110.1	340

- a. Corruption Perception Index of Transparency International (http://www.transparency.org/policy_research/surveys_indices/cpi/2007)
- b. Failed States Index of the Fund for Peace (<http://www.fundforpeace.org/web/index.php>)
- c. Per capita gross national income (<http://siteresources.worldbank.org/DATASTATISTICS/Resources/GNIPC.pdf>)

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SUSTAINABLE TRADE AND MANAGEMENT OF FOREST PRODUCTS AND SERVICES IN THE COMESA REGION: AN ISSUE PAPER

Member states of the Common Market for Eastern and Southern Africa (COMESA) are home to a rich array of timber and non-timber forest products and forest ecosystem services that play a crucial role in local, national and global economies. Trade in a range of these products is already globally significant, and pressure on forests is growing due to population growth, economic development (within and outside of Africa) and increased competition over land for the provision of food, fodder, fuel and ecosystem services. To confront the challenge this poses to sustainability, there is an urgent need for strategies which integrate economic growth with environmental protection in the context of expanded trade. Regional organizations are increasingly assuming a role in supporting member countries to achieve economies of scale, reduce the costs of evidence-based decision-making and good governance, and have a voice in international affairs. This issue paper explores the role that regional economic organizations like COMESA can play in fostering sustainable trade and management of forest products and services for the benefit of local communities and national economies.

