

**Forest Governance and Timber Trade Flows  
Within, to and from Eastern and Southern  
African Countries**

**Mozambique Study**

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## Abbreviations

AAC - Annual Allowable Cut

CBD – Convention on Biological Diversity

CITES – Convention on the international trade in endangered species of wild fauna and flora

COMESA – Common Market for Eastern and Southern Africa

CTV - Centro Terra Viva

DNAC – National Directorate for Conservation Areas

DNTF – National Directorate of Lands and Forests

EU – European Union

FAO – Food and Agriculture Organisation (of the UN)

FAS – Sustainable Amazonas Foundation of Brazil

FCPF – Forest Carbon Partnership Facility

FLEGT - Forest Law Enforcement Governance and Trade

FSC – Forest Stewardship Council

GoM – Government of Mozambique

IIED – International Institute for Environment and Development

IUCN – International Union for Conservation of Nature

MICOA – Ministry for Coordination of Environmental Affairs

MRV - Monitoring, Reporting and Verification

PRM – Policia de Republica de Mocambique

REDD – Reducing Emissions from Deforestation and Forest Degradation

RWE – round wood equivalent

SADC – Southern African Development Community

UNCCD - United Nations Convention to Combat Desertification

UNFCCC - United Nations Framework Convention on Climate Change

## Background

This study of timber flows within, to and from Mozambique has been prepared as a part of a wider study that covered nine countries in Eastern and Southern Africa, with an identical objective in each to these countries that consisted of two main parts:

1. To provide a baseline of the wood based trade flow information
2. To provide an overview and analysis of the regulatory framework for timber production, processing and trade.

The study is quite timely considering that widespread illegal logging in recent years has had a devastating effect on the valuable forest resources in the countries in this part of Africa, which has had not only environmental consequences but also economic and social ones. The response by the European Commission has been the introduction of FLEGT, the Forest Law Enforcement, Governance and Trade Action Plan, to provide a set of measures to prevent illegally harvested timber from reaching the European markets. With the European Union Timber Regulation, EUTR, the placing of illegal timber on the European market has been prohibited starting from 3 March 2013.

Against this background, it becomes important to understand the dynamics of the timber trade flows not only in Mozambique but also in Eastern and Southern Africa, including the volume and value of the trade, within, to and from these countries, and the potential interest that individual countries might have in improving forest management and entering into VPAs. This study has therefore identified many burning issues that need to be addressed to prevent illegal logging and trade in illegally harvested products, in Mozambique as well as in the other countries of the study.

The study has produced nine comprehensive country reports, each of 50-60 pages, covering Burundi, Kenya, Madagascar, Mozambique, Rwanda, South Africa, Tanzania, Uganda and Zambia, in addition to one Summary Report. This particular country report, on Mozambique, was prepared by Catherine Mackenzie.

## Executive Summary

Mozambique is forested to about 51%. Miombo forests are the most extensive formation. They are characterised by the predominance of the leguminous “messassa” genera *Brachystegia*, *Julbernardia* and *Isoberlina*, but there are still typically 20-30 different species per hectare. In higher rainfall areas, the forest canopy may reach 18 m in height.

The first exotic plantations were established in Portuguese colonial times, based on pines and eucalypts, to supply the domestic market with construction timber. Following decades of neglect and reliance on softwood imports, there has been a resurgence of interest from a few international companies, such as Green Resources, Portucel and the Global Solidarity Forestry Fund who have applied to obtain a total of 2.1 million ha of land for tree plantations, with the intention of incorporating carbon offsets. In 2010 the area of plantations had reached 62,000 ha.

Mozambique’s export of timber sector products doubled during the last decade, having evened out at around 160,000 m<sup>3</sup>/annually since the middle of the decade, only to be followed by a sharp increase in 2011. The trade flows are predominantly to China, and to some extent to South Africa. Timber from dark, heavy hardwood species are logged almost exclusively for export to China, primarily to be made into reproductions of Ming and Qing Dynasty furniture, other high unit value ornamentation, and, to a lesser extent, flooring.

Mozambique exports a small, declining volume of timber to the countries that are the subject of this study. During 2010, those volumes amounted for a very small proportion of the total which Mozambique exports. South Africa accounts for the great majority of these exports. China is the final destination for most, of the timber that Mozambique reports as exports to other countries in East Asia. The volumes exported to the EU are similarly insubstantial, almost zero during 2010.

There has been an abrupt change in the nature of Mozambique’s timber exports, from primarily logs in the period 2000-2007, to the dominance of sawn timber from 2008 onwards.

Mozambique imports an increasing volume of processed softwood timber, mainly from neighbouring South Africa and Malawi (depending on which part of Mozambique). Pine is favoured in Mozambique for house construction. Treated eucalyptus is widely used for transmission poles, and imports account for much of volume used. The current building boom in Mozambique is also leading to the import of high quality joinery products, such as doors, windows and their frames. In terms of import value, furniture is the second most significant of Mozambique’s imports of wood-based products after paper. Roughly half of that (increasing quantity of) furniture is supplied from South Africa, and the rest from China and Europe.

The production forests in Mozambique are administered by the National Directorate of Lands and Forests (DNTF), of the Ministry of Agriculture. Forests in National Parks and Game Reserves are under the authority of the Ministry of Tourism, with protection and law enforcement the responsibility of the recently created National Directorate for Conservation Areas (DNAC).

The Forest Policy is from 1998. The Forest and Wildlife Law from 1999 establishes two regimes for the exploitation of forests: i) simple (annual) licences for a maximum of 500 m<sup>3</sup> exclusively for Mozambicans, who can demonstrate they have the necessary equipment and that they have the approval of the local community; and ii) concessions, for up to 50 years, requiring an inventory and approved management plan and processing industry, as well as local community approval. These are open to international investors.

The system of licences, permits and taxes that governs the production, transport and export of timber in Mozambique is perfectly adequate to ensure timber legality, but is not well enforced. Several agencies are involved in the supervision of the export of timber from Mozambique, including the Department of Industry and Commerce, Provincial Forestry and Wildlife Service (SPFFB) of the

Department of Agriculture, Customs, the police and the port authorities. What is missing is the political will to enforce the Laws.

The forest sector is not transparent, in the sense that key data related to forestry is not freely accessible to stakeholders and the general public. No data on inventory, quotas, licensing, production, processing, industrial output and employment or export is publically available.

Currently, there are three FSC-certified forest operations in Mozambique; one FSC-certified natural forest, LevasFlor Ltd in Sofala Province, exporting parquet to Europe, one plantation, the Niassa Green Resources plantation, and one controlled wood certificate for blackwood (pau preto, *Dalbergia melanoxylon*).

Mozambique is heavily reliant on wood-based fuels for domestic cooking, with charcoal dominating in urban areas. A study in 2007 estimated national charcoal production at 5 million sacks/year or 165,000 m<sup>3</sup>. The total value of this production is in excess of USD 50 million per year. The preferred species for charcoal are the valuable dark heavy hardwood species, particularly chacate and mondzo, but acacias are also used.

Both concessionaires and simple licensed loggers have to apply for timber harvesting licenses each year. Government policy is to promote concessions over simple licenses, and the number of fully approved concessions had reached over 100 in 2011. However, the number of simple operators remains high, at over 450. Actual harvesting levels have been difficult to assess.

Although there is little information on Mozambique's forest industry, the domestic timber demand contributes to a significant portion of the forestry activity and is growing rapidly with local production not satisfying the demand. This segment of the market is being partially satisfied by imported pine.

Total forest cover in Mozambique continues to decline, primarily because of shifting cultivation and charcoal production, while the area of plantations is set to increase dramatically.

Logging in Mozambique continues to increase, because of escalating demand from China and more recently, India. At the same time, transparency in the sector is declining, so it is increasingly difficult to understand exactly what is happening. Particularly the export of a small number of heavy hardwood timber species to China continues to drive logging. Although illegal logging and its economic consequences have been subject to public outcry for nearly a decade, forest governance has not improved.

Illegal logging is threatening the future of the forestry sector. Something needs to be done in Mozambique. Support for independent forest monitoring in the forestry provinces might be a powerful measure against illegal logging, but is not likely to receive political backing. Similarly, a strong signal from international donors that corruption in and mismanagement of the forestry sector is unacceptable, and additional support to civil society for advocacy, may also have an impact. As a first step in transparency, funding could be provided to the enable the establishment of a forest governance website, where all the basic data and maps on operators, concessions, licensing, exploitation, industry and export could be posted.

## 1. Introduction

This paper presents a profile of the forestry sector in Mozambique, focusing on its participation in regional and international trade in wood-based products, and examining the current state of forest governance from the perspective of the three recognised pillars: the legislative and regulatory framework, administrative, planning and decision making processes and law enforcement, drawing from but not strictly following the detailed framework of FAO/PROFOR (2011). The paper is part of a nine-country scoping study in Eastern and Southern Africa for the European Union (EU) Forest Law Enforcement Governance and Trade (FLEGT) programme.

Following a brief introduction to Mozambique and the role of the forest sector in the national economy, the paper examines the forest estate, the administration and the regulatory framework, and then more concrete and outcome-oriented topics, relating to the fuelwood market, forest utilisation and forest industries, and importantly, Mozambique's trade in forest products. An attempt was made to present data from 2000 – present, in order to identify and analyse trends. The report ends with a discussion of key trends and issues, and evidence for the nature and extent of illegal logging, before drawing conclusions and recommendations relating to the FLEGT Programme of the EU. This is the standardised reporting structure followed by all nine country reports in this study.

The report is the output of a 12-day assignment, focused on a field visit to Mozambique in May 2012 for data collection and stakeholder interviews, and a review of the available literature. Because it took most of the field visit to obtain any quantitative data, it was not possible to discuss the findings with senior officials of the national directorate of lands and forests (DNTF).

### 1.1 General background

Mozambique has a total area of nearly 80 million ha, and an estimated population of approximately 24 million people (FAOSTAT 2009). Mozambique is a large, but poor country. This is partly the legacy of the bitter 10-year independence struggle (1964-1974) followed closely by a 15-year civil war (1977- 1992). But with the assistance of international donors, refugees were resettled development has been promoted, and the economy remodelled along western free market lines. Nevertheless, in 2011, Mozambique ranked only 184 out of 187 countries in the Human Development Index, with 80 % of population considered poor according to the multidimensional poverty index, and 60 % of the population living on less than \$1.25 per day. Although the economy is now the 10<sup>th</sup> fastest growing in the world (at 7.2 % pa) with an estimated GDP of USD 10.5 billion, poverty alleviation has stalled. Foreign debt, relieved in 2005, is now rising again to worrying levels. Foreign aid still finances 50% of the state budget.

Mozambique is a presidential representative democratic republic, with a multi-party political system, in which the President is both head of state and head of government. Executive power is exercised by the government, while legislative power is vested in both the government and the Assembly of the Republic. Decentralisation has been gradual since 1997, and remains partial. There are 10 provinces, with 126 districts, but elected local leaders and assemblies are only present in 33 cities and 10 towns; elsewhere there is “deconcentration” of central government agencies. Provincial governors and district administrators are all appointed.

### 1.2 Contribution of the Forest Sector to the National Economy

The forest sector, including a network of forest reserves and industries in many of the provinces, was established in Mozambique during colonial times, providing domestic timber and exports to Europe and South Africa. During the civil war, the sector more or less collapsed, and since the peace accord in 1992, has been slowly rebuilding. For the last 15 years, industrial logging has been primarily for export to the Chinese market, driven by the presence of Asian traders in all Mozambique's forest provinces and timber ports. The traditional South African market for Mozambican timber still exists,

as does the very small market in Europe. Illegal logging has been rampant since the late 1990s, and, largely unaddressed, has continued to grow year on year. As the Chinese market prefers logs, Mozambique's forest industries have been neglected and even strangled, despite government policy to promote them (see below). While illegal logging attracts a lot of attention, fuel wood removals exceed industrial round wood removals by an order of magnitude. The annual rate of deforestation 1990 – 2005 was 0.58% (Sitoé 2011).

Mozambique's economy, though traditionally dominated by agriculture, has recently seen rapid development in electricity, coal and minerals, and oil and gas, which by 2011, together represented 24% of GDP and 70% of exports. South Africa remains Mozambique's most important trading partner, but trade with China is growing very rapidly (Economist Intelligence Unit, 2010).

Forestry in Mozambique is estimated to contribute less than 5 % to GDP<sup>1</sup>, and to provide only 1.5 % of exports by value, earning USD 56 million in 2010. These figures exclude fuel wood and other timber and non-timber forest products directly consumed by the rural population or sold in local markets. In 2011, the GOM earned approximately USD 10 million from timber and wildlife licences and USD 800,000 from forest sector fines. Forest resources could contribute substantially more to long term economic development, particularly in rural areas, but instead illegal logging is stripping the forests of their valuable timber, denying government its revenue and as most timber is exported with little or no value-addition, denying people jobs.

## 2. The Forest Sector

Different forest inventories in Mozambique have employed different methodologies, generating very dissimilar data, misleading subsequent analysis (Cuambe 2010). The national inventory of 1990 estimated the forest cover of Mozambique to be about 20 million ha. An update of this inventory, completed in 2005, and now providing the basis for forest management in Mozambique, controversially employed a looser definition of forest<sup>2</sup>, and estimated forest cover to be 40 million ha or 51% of the country (Marzoli 2007). Of this, 26.9 million ha were classified as productive forests, 4.2 million ha were considered "legally inaccessible" as they fall within different types of conservation area, and the remainder (9 million ha) was considered "topographically or ecologically inaccessible", for reasons of slope or inundation. The provinces with the greatest extent of productive forest are Niassa (6 m ha), Zambézia (4.1 m ha) Tete (3.3 m ha) Cabo Delgado (3.1 m ha) and Nampula (2.3 m ha). A map showing this Mozambique's productive forest areas is provided in the Annex.

Rainfall in Mozambique ranges from around 200 mm to over 1250 mm annually, with a dry season historically, of up to 7 months. Miombo forests are the most extensive formation. They are characterised by the predominance of the leguminous "*messassa*" genera Brachystegia, Julbernardia and Isoberlina, but there are still typically 20-30 different species per hectare. In higher rainfall areas, the forest canopy may reach 18 m high with up to 120 trees greater than 30cm in diameter per hectare. In lower rainfall areas this reduces to 10 m, with fewer than 80 trees per ha, but denser ground cover of grasses. In the driest areas, in Tete and Gaza, mopane forests are found, along with baobabs (FAO 2003).

There are some 120 commercial species in these forests, which have been classified into five grades (in descending order): Precious, Class 1, 2, 3 and 4. The grades generally reflect the current demand and commercial value of the timbers and they attract different taxes and export regulations. The *messassa* species are Class 2 and currently of limited commercial interest, but scattered amongst

<sup>1</sup> <http://www.indexmundi.com/facts/mozambique/natural-resources-contribution-to-gdp>

<sup>2</sup> As an area of >10% cover of woody vegetation; previously, it had been >20% cover.

them, at varying densities, are Precious and Class 1 dark heavy hardwoods of very high value for furniture, flooring, general and heavy construction, and very much in demand on the Chinese market.

Mozambique's forests have an estimated actual total commercial volume<sup>3</sup> of 123 million m<sup>3</sup> and the provinces with the largest volumes per hectare are Zambézia (7.7 m<sup>3</sup>/ha), Cabo Delgado (7.3 m<sup>3</sup>/ha) and Sofala (7.1 m<sup>3</sup>/ha). In terms of commercial timber grades, 4% of the total volume is in precious timbers, 21% in Class 1, 44% in Class 2.14% in Class 3 and 17% in Class 4 (Marzoli 2007).

The appropriate annual allowable cut (AAC) for Mozambique is a matter of considerable debate. Little is known about the growth rates of Mozambique's timber species. Clearly some, like mondzo, are very slow growing – taking up to 200 years to reach harvestable size while others, like umbila, may take only 60 years. Until 2005, the work of Saket (1994) was used. The AAC for the 118 potential timber producing species, including the framework *messassa* species, which can account for 50% of the stand, was set at 500,236 m<sup>3</sup>. In 2005, the AAC was revised, based on a new, but contentious, national inventory (see Mackenzie 2007 for details). The new AAC was calculated on the basis of two different growth assumptions over a generalised mixed stand (see Annex 4 and Marzoli 2007), and estimated at between 520,000 and 640,000 m<sup>3</sup>, but only for the 25 Precious and Class 1 species, which represent about 25% of a miombo stand. Effectively, the AAC was increased fourfold. Annex 4 Table a) compares these three estimations of the AAC, by province.

The AAC also establishes quotas for each species, and typically these are also broken down by province, so each provincial forest service knows how much of each species it can license. Table b) in Annex 4 provides these species quotas<sup>4</sup> (at national level). Selective logging, focused on exploiting some dozen species in demand on Asian markets is the main forest management regime. Much of the topography of the forested area is gently rolling, and because the forests are relatively low and open, timber can be extracted simply using agricultural tractors.

In the decade to 2010, an estimated 217,000 ha of forests were lost annually due to shifting cultivation, bushfires and forest exploitation particularly for energy purposes (FAO, 2010).

The first exotic plantations were established in Portuguese colonial times, and there was another period of planting in the 1980s, mainly in Manica, based on pines and eucalypts, to supply the domestic market with construction timber. Following decades of neglect and reliance on softwood imports, there has been a resurgence of interest since 2000. Now, as part of a wider "land grab" (Hanlon and Tandon 2011) international companies, such as Green Resources, Portucel and the Global Solidarity Forestry Fund have applied to the GoM to obtain a total of 2.1 million ha of land for tree plantations (Matavel et al 2011). Many applicants intend to incorporate carbon offsets. In 2005, there were only 24,000 ha of plantations. By 2010, this had risen to 62,000 ha (Cuambe 2010, FAO 2003).

Mozambique's forests and lands are under public administration. Management rights and responsibilities can be transferred to individuals, cooperative, companies and communities, based on different time-limited leases and management agreements (see below). Land tenure does not confer rights to the forests on that land. Tree plantations are considered privately owned (Cuambe 2010).

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<sup>3</sup> The actual commercial volume means all commercial species of harvestable diameter. Harvestable diameter varies from 20 – 50 cm depending on species; for most species it is 40 cm.

<sup>4</sup> Table b) includes the messassas, showing their importance in the forest, but since they are Class II, they not included the AAC calculation shown in Table a.

### 3. CITES

Mozambique is signatory to numerous multilateral environmental agreements, including CITES (1981), UNFCCC (1995), CBD (1995), UNCCD (1995) and CMS (2009)<sup>5</sup>. None of Mozambique's timber species are protected under CITES.

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<sup>5</sup> Years given are year of ratification. Full details available at:  
[http://iea.uoregon.edu/page.php?query=country\\_members&country\\_preferred=Mozambique](http://iea.uoregon.edu/page.php?query=country_members&country_preferred=Mozambique)

## 4. The Forest Administration

The production forests of Mozambique are administered by the National Directorate of Lands and Forests (DNTF), of the Ministry of Agriculture<sup>6</sup>. Forests in National Parks and Game Reserves are under the authority of the Ministry of Tourism, with protection and law enforcement the responsibility of the recently created National Directorate for Conservation Areas (DNAC).

DNTF is mainly responsible for policy, information management and supervision, but also handles licensing of any large investments. In 2008 it had 128 staff, of which 49 had a university degree qualification or equivalent (FAO 2010). An organogram of DNTF from 2012 is provided in Annex 1; an organogram of the Department of Forestry was requested, but not provided. Implementation, including licensing and forest law enforcement, is largely in the hands of the Provincial forest and wildlife services (SPFFB) which report to DNTF. At the district level, forestry sits in District Services for Economic Activities, and reports both to the local government and DNTF. In 2011, there were only 458 forest guards working across the whole country, or an average of 50 per province, or 1 guard per 58,000 ha of forest.

DNTF is widely considered to be a weak agency, suffering from a lack of strategic vision for the sector, understaffing and resourcing, poorly motivated staff, and the flight of its more qualified people to the private sector and NGOs. Low government salaries leave staff vulnerable to bribes. A full institutional analysis of DNTF has recently been published as part of a wider monitoring study of the governance the environment and natural resources (Centro Terra Viva 2012).

DNTF and the provincial services are very reliant on donor funding for its activities. For at least a decade, considerable funding was available through PROAGRI I and II, the multi-donor sector-support programme for agriculture. Only one large externally-funded project remains current - the APRONAF (Support to the National Forest Programme, 2010-2014)) for which Finland has budgeted €11.4 million. This project has run into some financial problems and funding is currently suspended awaiting an auditor's report. There are one or two other small projects in the provinces and at DNTF.

Good forest governance requires the active and transparent participation of key stakeholders in the development and implementation of forest policy. Under PROAGRI 1, the Forest Governance Learning Group (FGLG) worked with the then DNFFB, to facilitate the establishment of a National Forest Forum, a multi-stakeholder platform that met periodically from 2002 to debate key issues. It later broadened to include provincial fora, but then lapsed when PROAGRI ended in 2008, and FGLG moved to the NGO sector, working with Justica Ambiental, Centro de Integridade Publica, Centro Terra Viva and others (see below). The Forum now meets irregularly. The influential Asian (primarily Chinese) traders and companies are notably absent from these meetings.

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<sup>6</sup> In 2005, the previous Ministry of Agriculture and Rural Development was reorganised (Presidential Decree 13/2005).

## 5. The Regulatory Framework for Timber Production and Harvesting, Processing, Transport and Marketing

### 5.1 The Legal Framework for the Sector

The legal framework for the forestry sector includes the Law and the Regulations, both requiring parliamentary approval, and Council of Ministers Decrees, Ministerial Diplomas, and Departmental Despatches, drawn up and approved at these lower levels. Laws and regulations of other sectors are also relevant to the forestry sector.

The Forestry and Wildlife Law dates from 1999. It establishes that forests and wildlife are in the public domain and owned by the State, and states the objectives of the Law to protect, conserve, develop and utilise these resources in a rational and sustainable way for the economic, social and ecological benefit of the present and future generations of Mozambicans. It promotes the establishment of forest industries, and the gradual increase in exports of manufactured products. It states that land use rights do not confer rights to the commercial exploitation of the forests. There is no “permanent national production forest estate” as such, in which all concessions fall; licences can be issued for forest exploitation anywhere except in conservation areas.

The 1999 Law establishes two regimes for the exploitation of forests: i) simple (annual) licences for a maximum of 500 m<sup>3</sup> exclusively for Mozambicans, who can demonstrate they have the necessary equipment that the area they propose to harvest has timber, and that they have the approval of the local community; and ii) concessions, for up to 50 years, requiring an inventory and approved management plan and processing industry, as well as local community approval. These are open to international investors. Concessions up to 20,000 ha in area can be approved at provincial level, but those 20-100,000 ha are referred to the Ministry of Agriculture and above 100,000 ha to the Ministerial Council. Licences are discussed in more detail in Section 6.

The Law also establishes the principle of participatory management of forest resources, with provisions for the creation of Local Management Councils and the sharing of forestry revenues from concessions and simple licences with local communities. There are no special arrangements for communities to obtain concessions or logging licences; they must apply in the same way as anyone else. The Law recognises only one forest crime – that of setting fire to forests – all other infractions are punishable only by fines. However, non-payment of fines is a criminal offence, so forest offences can end in prison. There is now pressure to revise the law, in part to make punishments more of a deterrent.

The Environmental Law of 1997 states the intention to pass subsidiary law creating environmental crimes, but 15 years on, this still has not happened, mainly because the Penal Code, which dates from 1886, would also need to be changed to create a category of environmental crimes. A new Conservation Law is currently being drafted, which will officially create a network of reserves, and a number of crimes against fauna, flora and rivers. It is still being debated whether this Law will apply only to conservation areas, or more broadly to biodiversity and habitats throughout the country. In August 2011, the Government submitted to Parliament a new Penal Code. However, this was done without any public consultation. Many organisations protested both the process and the product, which was considered incomplete and inadequate. The proposal included only one environmental crime (setting forest fires) and was very weak on corruption. The process was to be reopened, including public consultation in 2012.

The Land Law of 1998 is also very relevant to Forestry Sector. Like the forests, land is held by the State. Companies, individuals and communities can obtain certificates for the long term use of land (DUATs). However, rights to land do not confer rights to the commercial use of forest resources on the land (or the mineral resources under the soil). This has serious implications for REDD+,

threatening a separation of land, forest and carbon rights which could alienate these rights from local communities and even leave them vulnerable to eviction, on the grounds of interfering with a third party's carbon rights.

The Forestry and Wildlife Regulations of 2002 have recently (2011) been revised and sections are gradually being published and implemented. The revision was ordered by President Guebuza, driven by civil society demands, and has been completed quickly, involving a high degree of public consultation. Key changes have been a rationalisation and dramatic increase in forestry fines (see also paragraph 4.8), and a radical revision of the system of annual cutting licences that have proven so difficult to control, into five year licences for larger areas, requiring simplified management plans.

The Decrees, Diplomas and Despatches issued at Cabinet, Ministerial and Departmental levels are used to change aspects of regulation, such as timber royalties, the classification of timbers, processing requirements, quotas for specific products etc. Various of these measures have been controversial, such as the 2004 Diplomas phasing in the processing requirement for Class 1 timbers over a period of 3 years, and then just as this was about to be brought into force, Diploma 142/2007, abolishing the need to produce full squared planks, and permitting the export of roughly sawn slabs (pranchas). These changes undermined the government policy to promote local industry, but benefited the Asian traders and local loggers. It is widely believed that special lobbying and bribes were involved in the decision.

## 5.2 Other Institutional Stakeholders

The Police (Policia de Republica de Mocambique, PRM) have a special Forestry and Wildlife Unit that is supposed to help the Forest Services in their protection work. It has around a dozen staff, briefly trained, who are said to lack the means to do their work. The Ministry for Coordination of Environmental Affairs (MICOA) plays a role in forests through its responsibility for environmental impact assessment. Its role has become increasingly prominent since the advent of REDD+, for which it is the appropriate national authority. Ministry of Energy has a role in forest assessment and policy, as firewood and charcoal are the principle fuels for over 80 % of households. Forest enterprises are registered and monitored by the Department of Industry and Commerce.

The Department of Customs, of the National Tributary Authority, oversees the export of all commodities and manages all export data. It is notable that in 1997, Customs had such corrupt practices that trade was being negatively affected. The GoM appointed the British Crown Agents to take over the operations for come in for ten years to sort the problems out. The "Modernisation Programme"<sup>7</sup> transformed port operations, computerised information systems, reduced clearance times, reformed legislation and increased revenues by 350% while reducing tariffs. However, since the end of the programme 2006, there has been a gradual slide back into corruption.

## 5.3 Main Actors

The Government's role in forestry has been discussed above (Sections 3; 4.2).

Simple Licence loggers, as mentioned above, should be Mozambican nationals, and their quota is limited to 500 m<sup>3</sup>. Probably because of their repeated failure to implement their policy to reduce the number of simple licences, DNTF has stopped reporting on the number of annual simple licence licensees but in 2009, there were 479. This is far more than the provincial services are able to monitor and control. Some of the licensees are professional loggers, but many have been from many other walks of life, attracted into forestry by the possibility of high profits. In 2001, Asian traders were paying USD150 – 300/ m<sup>3</sup>, depending on the species. Thus a logger with a quota of 500 m<sup>3</sup>, might easily clear USD 50,000 in a season, even with costs taking 50% of gross profits, *Pau ferro* and *chanate* now command USD 500-550/ m<sup>3</sup>, which explains the current frenzy of cutting. Increasingly

<sup>7</sup> <http://www.crownagents.com/Projects/Mozambique-A-radical-plan-for-transformation.aspx>

over recent years, licences are obtained with the specific intention of selling them on to a professional logger, or to a trader.

Industrial Operators are companies, mostly foreign-owned (traditionally from Europe and South Africa), with an established processing industry, and history of supplying sawn timber and finished items to the domestic, regional and international markets. Most now also have concessions, but some buy logs from other operators. When the Chinese traders arrived, some moved into selling logs, as payment was on a cash basis and more profitable.

Concession Operators are companies with logging concessions. Under law, they should have a processing industry, but many maintain their concession applications “in process” and are allowed to log in their proposed areas under simple licences, without establishing an industry and even though they are not Mozambican nationals. In 2009, there were 92 active concessions, and a further 75 “in process”.

Forest operators have national and provincial trade associations, typically separate for simple licence and industrial/concession operators, lobby for their members with provincial and national authorities.

“Furtivos” are unlicensed loggers or timber buyers who take timber wherever they can find it, and typically sell them on to exporters. Some furtivos supply the domestic market.

Traders/exporters have been the most important actors that influence the sector. The Asian buyers, in particular, created a cash market for raw logs primarily to supply the Chinese market, and also provided finance for people to obtain simple licences. Over time, their investment in the sector increased, first importing trucks to expand into the lucrative log transport business, and finally into the more expensive business of concession management. Many have established their own simple sawmills to carry out the rudimentary processing required for export, creating a false impression of greatly expanded forest industrial sector. There remains considerable turnover of small foreign (mainly Asian) timber traders in Mozambique, with a core of longer-term interests. They never attend any national forestry meetings.

Politicians and civil servants, including serving MPs, provincial governors, but particularly influential members of the governing political party, are said to be deeply involved in the timber business, as they are in many other spheres of national economic life.

Forest adjacent or resident communities are involved in the sector in various ways. Men can be employed as manual labourers by forest operators, women sometimes support the logging camps. In some communities, groups of men, often under the direction of the local leader, cut the timber on their own initiative and then try to sell it, or respond to log orders from illegal buyers. Since 2006, the government has been implementing the requirement to pay 20% of license fees to local forest adjacent communities. The funds should be used for local development projects, and are also intended to provide an incentive to communities to protect their forest resources from illegal logging (as this will not generate 20%). Payments are being made, but there have been problems with transparency and accountability by government, and governance of the funds at community level.

Mozambican branches of international NGOs, such as WWF and IUCN, have been working on forestry issues for a number of years, but appear unable to take up positions critical of the government. A small number of national NGOs, such as Centro Terra Viva, Centro de Integridade Publica, Justica Ambiental, ORAM and their coalition “Amigos da Floresta”, have taken more active roles advocating improved forest governance and exposing illegal logging and corruption (Mosse 2008, Mackenzie 2006, Mackenzie with Ribeiro 2009, Ribeiro and Nhabanga 2009). This is discussed further in Section 10.1 below.

Donors have been withdrawing their support from the forest sector over recent years, particularly since the end of the agriculture sector support programme, PROAGRI II in 2009. Now Finland remains

the only donor to DNTF. Some donors continue to support civil society organisations engaged on forest governance issues; the EU and Netherlands have been supporting the Forest Governance Learning Group, and the Swiss, the Centro de Integridade Publica.

Increasingly influential are foreign investors seeking large tracts of land for agricultural or forestry development. Plantation developers are being encouraged to adopt a mosaic approach, avoiding the clearance of natural forest and promoting outgrower schemes with local households, but a few reports are emerging of villagers being removed from their land to make way for private planting (Overbeek 2010).

A detailed account of the stakeholder in the commodity supply chain from Cabo Delgado in Mozambique to China is provided in Sun et al (2008).

#### **5.4 The Legality Assurance System**

The system of licences, permits and taxes which governs the production, transport and export of timber in Mozambique is perfectly adequate to ensure timber legality, but is not yet conceived of locally as a “legality assurance system”, and is not well enforced. Some of the five key elements recognised by FLEGT, relating to the three pillars of sustainability (environmental protection, social equity, economic viability) are in place.

1. A definition of “legal timber” is embodied in a range of laws and regulations, but the sector has not yet teased out the key elements into a legality standard. An annual allowable cut has established quotas for particular species at provincial level. Licensing of concession and simple licence operators is for specific areas, species and volumes, based on management plans and site visits respectively, and intended to keep the harvest within sustainable limits. Transport permits are required to move timber (see below). There is a system of fees and fines. The environment is protected through prohibition on cutting during the (historically approximately) three- month rainy season. There is a regulation requiring the sharing of 20% of licence fees to local communities.

2. The weakest element is the system to control the movement of timber. According to regulations, all timber should be marked by the operator with his/her unique symbol, and a unique log number. Transport permits should be accompanied by a log-list giving the unique number, species and volume of each log, and total volumes for each species. These documents should accompany a load of timber from the forest to the final user, be it industry or export. A copy of the permit should be returned to the provincial forest service to control against the operator’s quota. Typically, the operator is issued with a few or even a book of permits, which can be completed by them, unsupervised. Under-recording of volumes and misnaming of species is common. The permits can get sold on to third parties and also often to get reused. Their control is particularly weak where timber is transported across provincial boundaries, and the link between licensing of harvesting and licensing of export is broken. “Protected operators”, with political connections such as those revealed in the EIA report (2013) can move timber without permits. In practice, it is very difficult to tell where timber has come from.

3. The DNTF and their provincial offices are government agencies legally responsible for licensing and forest law enforcement. 50% of a fine is returned to the officer concerned, as an incentive. There is a lot of illegal licensing both for simple licences and concessions, and much law enforcement is avoided through the payment of bribes at different levels.

4. The provincial forest services are responsible for inspecting and authorising timber exports. An additional inspection is conducted jointly by forestry, customs and the police, at the time of stuffing and sealing the containers, or loading the ship. Again, there are a lot of irregularities in these processes, particularly regarding species, volumes and whether the consignment is logs or sawn timber, and bribes are common place. As mentioned above, timber arriving from other provinces tends to be accepted as “legal”, and automatically authorised for export. A recent investigation (EIA

2012) has documented how interventions by government Ministers or ex-Ministers enable exporters to bypass all regulation, and export raw logs.

5. There is no independent monitoring of the whole system. In 2006, Global Witness explored the possibilities of including Mozambique in their DFID funded “Making the Forest Sector Transparent”, but this was not taken forward. Occasional “investigations” have taken place under the auspices of local and international NGOs (Mackenzie 2006, Mackenzie with Ribeiro 2009; Ribeiro and Nhabanga 2009; EIA 2012 and 2013), revealing the nature and extent of the illegal timber harvesting and trade, yet the practices continue, and if anything, become more widespread and extreme.

The main element that is missing is the political will to enforce the laws, largely because so many government officials and politicians are directly involved in the trade.

### 5.5 Timber Tracking

A pilot project to develop a timber tracking and control system for Mozambique was conducted by Savcor/ Indufor in 2006 under a programme of the Forest Governance Learning Group (Norjamaki et al 2007), but due to public outcry over illegal logging, the companies involved in the pilot withdrew, and the scheme has not been rolled out across the country (Amigos da Floresta 2010). The only timber tracking in Mozambique happens in relation to FSC chain of custody, as described below. The problems relating to controlling timber as it moves around the country were discussed above (4.4).

### 5.6 Trade Agreements

In 1999, Mozambique approved the Southern African Development Community (SADC) Trade Protocol, which aims to establish a free trade zone among more than 200 million consumers in the SADC region. Implementation began in 2002 and had an overall zero-tariff target set for 2008; however, Mozambique's country-specific zero-tariff goal is currently 2015. Mozambique joined the World Trade Organization (WTO) in 1995. Mozambique is not a member of the ITTO, although the possibility of joining has been discussed for some time.

### 5.7 Requirements for Export of Forest Products

Several agencies are involved in the supervision of the export of timber from Mozambique, including the Department of Industry and Commerce, Provincial Forestry and Wildlife Service (SPFFB) of the Department of Agriculture, Customs, the police and the port authorities. The Department of Industry and Commerce licences businesses to engage in export of different merchandise. A licensed timber exporter submits a request for export, including a log list and summary to the SPFFB. The SPFFB is then responsible for inspecting the consignment to verify the species, volumes and legality of timber, and granting authorisation for export. Once this authorisation has been issued the timber can be loaded into containers. Depending on the port authority, this may or may not take place outside the port. Various other documents, including proof of purchase, certificates of origin, and phyto-sanitary certificates are also required for verification by Customs. Containers are inspected by a joint team from SPFFB, Customs and the Police, before they are sealed and authorised for embarkation. In Nacala, in 2011, a Special Export Terminal was established outside the port for this inspection because space was said to be lacking inside the port. Interestingly, the facility was built and is run by a private company, part-owned by Chinese and employing Chinese staff. The recent EIA study has revealed that the Chairman of the Mozambican company that part-owns the terminal is Tomas Mandlate<sup>8</sup>, the ex-Minister of Agriculture, now exposed as a collaborator in the illegal export of logs to China (EIA 2013).

In 2010, a new law (No 7/2010) was passed by the National Assembly, instituting a new value-added tax on timber exports, ranging from 3-20% of the FOB price, depending on the extent of processing it has undergone. The highest rate is applied to raw logs (see Table 1). The tax is intended to promote

<sup>8</sup> <http://www.miningreview.com/node/20275>

in-country timber processing and revenues are intended to be used for reforestation, forest law enforcement and the control of wildfires, as well as the state budget. It is not clear whether these are yet being implemented.

**Table 1 Value Added Tax for timber (2010)**

HS Code	Type of Product	Tax %
4403	Logs, (raw, debarked, or squared )	20
4404	Poles/stakes (not sawn longitudinally)	20
4407	Slabs and boards (rough sawn; not squared)	15
4406	Sleepers	5
<b>4409</b>	Boards fully squared; laths, parquet blanks	5
<b>4418</b>	Beams (diverse construction timber)	3

Source: Law 7/2010. Boletim da Republica 32, Series 1

### 5.8 Law Enforcement

Law enforcement is primarily the responsibility of the SPFFBs, and they sometimes work in collaboration with police, military and customs officials. There are currently 459 forest guards for the whole country, but DNTF considers that 765 are required to do an adequate job. These guards are divided amongst provincial headquarters, various checkpoints and mobile units. The Finland funded APRONAF project (see above), is supporting law enforcement through provision of cars and motorcycles to increase the number of mobile units and enable them to police the actual areas of harvest.

As Table 2 indicates, not only are the number of fines applied increasing, but recovery of fines is also improving, from 60-70% in 2006-2009, to 80% in 2010-2011. Logs and sawn timber seized are resold at public auction.

**Table 2 Official data on Forestry and Wildlife fines**

	2006	2007	2008	2009	2010	2011
<b>Fines applied</b>	998	1043	1254	776	1376	1,283
<b>Total value (MTN)</b>	13,559,779	26,606,911	n/a	17,453,069	30,923,013	30,540,200
<b>Approx USD Value</b>	484,000	950,000		623,000	1,104,000	1,104,000
<b>% fine value paid</b>	71	62	n/a	56	80	80
<b>Logs seized m<sup>3</sup></b>	n/a	n/a	n/a	903	1,615	10,077
<b>Sawn timber seized</b>	n/a	n/a	n/a	117	154	48

Source: DNTF annual reports; USD conversion using 2012 rate: 28 MTN = USD 1; includes wildlife offences

The new forest regulations have greatly increased the fines for forest infractions. While it is hoped that the 50% share received by the arresting officer will prove sufficient incentive for law enforcement, many worry it will simply raise the cost of bribes. There still remains only one forest "crime" - that of setting forest fires. Failure to pay a fine is also a criminal offence, but while only about half of the forestry fines applied in any one year is actually paid, prosecution rarely ensues.

Corruption is also a crime, but is rarely treated as such. The most serious penalty a government servant suffers is being fired but usually, a person is simply transferred to another post, or demoted. Recently, the Head of the Provincial Forest Services in Zambezia was accused by the Minister of Agriculture (Jose Pacheco) during a public meeting of the forestry sector, of colluding with an international criminal gang for timber export, and was fired. However, he is still working in the same Provincial Agriculture Department. The recent EIA study (2013) alleges that Pacheco himself has been

colluding with Chinese companies since he was Governor of Cabo Delgado (2000-2005), up to today, facilitating the illegal export of timber.

NGOs are training communities on forestry regulations, so they can supervise loggers working in their areas and combat illegal logging. Communities have a double incentive from the 20% of licence fees that they obtain from licensed timber, and the 50% of the fine which they should share. However, the outcomes have been disappointing, because, communities believe, the operators pay bribes to the forest officers and the cases get dropped, and no fines get paid. They complain they get no real support from the government.

Since 2000, Centro Terra Viva has been involved in providing training to the provincial and national judiciary on the enforcement of forestry and environmental laws enforcement, and has been encouraged by the level of seriousness and commitment encountered.

The national parks and nature reserves have their own regulations and many more park guards per unit area than forestry, possibly because the ministry is better funded. For instance in Sofala, there are 150 guards for two conservation areas, including 8 fixed posts, compared to 35 guards and 2 fixed posts for forestry.

## 5.9 Information and Monitoring Systems

Currently, provinces report to DNTF on a three-monthly basis, and teams from the Department of Planning of DNTF visit the field offices a couple of times a year to assess the data and help the provincial teams with reporting. Despite this, the structure of annual reports from the different provinces varies considerably, both in relation to each other, and from year to year in the same province and at national level. Differences include whether licensing, harvesting and production are all reported, the extent to which production figures are broken down by species, reporting on activities of local industries and reporting on species, volumes and products being exported. DNTF typically reports on total licensing in each province, in relation to the annual allowable cut (AAC). However, in practice, licensing involves about a dozen commercial species, while the AAC relates to 30 precious and Class 1 species. These techniques serve to obscure the most important things happening in the sector.

A new interlinked national data management system, capable of real time communication and updates is currently under development. However, as far back as 2003, SPFFB Zambezia had a computerised system for recording licensing and extraction, from which the quotas of individual operators and the whole province could be monitored. This system is said to have broken down and was never re-established.

## 5.10 Certification

Forest certification efforts began in Mozambique in early 2000s. The first Mozambican concession to be FSC certified was the Catapu concession of TCT Dalman, in Sofala province in 2005. The company also led the first attempt at establishing a Mozambican FSC standard, but in the end, used the international system. In 2010, they suspended their certification, because of the expense and lack of commercial benefit. They continue to uphold high standards of management.

Currently, there are three FSC-certified forest operations in Mozambique: one FSC-certified natural forest, LevasFlor Ltd, also in Sofala, exporting parquet to Europe, one plantation, the Niassa Green Resources plantation, and one controlled wood certificate of Mpingo Madeiras Lda, for blackwood (pau preto, *Dalbergia melanoxylon*). A company already influential in the forest sector, the multi-national commodity trading company OLAM has recently entered into an MOU with DNTF to obtain large forest concessions to manage under FSC certification.

A new attempt to establish a national standard started in 2010, and FSC Denmark supported the formation of a local NGO, AGREF (Associação pela Gestão Responsável das Florestas em Moçambique) to lead the process and eventually become the FSC National Organisation.

## 5.11 Transparency in the Sector

The forest sector is not transparent, in the sense that key data related to forestry is not freely accessible to stakeholders and the general public. The Ministry of Agriculture has a website, and the DNTF has a webpage within it, but the only information available is copies of the Law and Regulations and a brief overview of the Directorate. No data on inventory, harvesting quotas, licensing, production, processing, industrial output and employment or export is publically available. DNTF's own annual reports are also not posted on the website. Since 2011, the multi-stakeholder "Growing Forest Partnerships" initiative, involving DNTF, the NGO Centro Terra Viva (CTV) and other Mozambican civil society organisations, and facilitated by FAO, IUCN, IIED and the World Bank has established a new website<sup>9</sup>. It incorporates a data base of key documents, studies, project reports but the most recent annual reports are from 2008, and it still fails to disclose the basic sector information mentioned above.

DNTF officials were open to the EU FLEGT scoping mission, to interviews and to requests for detailed data but in the end, only annual reports were provided. Official letters, in addition to the letters of introduction provided by the EU Delegation, were requested by the SPFFB and Customs in each province, and these were provided and followed-up. Customs provided raw data at national level on some but not all requested forest products. SPFFB in Zambezia provided incomplete summary data. In Cabo Delgado, it was possible to read but not obtain copies of the annual reports. The other SPFFB offices contacted, Sofala and Nampula, did not provide any information. At the time of writing, the National Tributary Authority had not given authorisation for provincial level customs offices to provide their data.

From 2002-2006 under the agricultural sector support programme, PROAGRI, a National Forest Forum convened annual multi-stakeholder meetings, but these have only been held irregularly since then. The last meeting was in 2011. In Sofala (and perhaps other provinces), SPFFB apparently holds annual meetings for stakeholders, at which statistics on sector performance are presented and discussed. Data are not otherwise made available to the key stakeholders. Communities are supposed to receive 20% of the value of forest licences issued in their area, but the provincial authorities do not tell them what licences have been issued (species, volumes, locations) – so it is impossible for the communities to police the loggers or to know whether they are receiving their full entitlement. Concession management plans are not available to the public.

Over the years reporting by DNTF has become increasingly weak and uninformative. In 2001, the annual report had numerous sections, including many detailed tables providing data from the provinces, naming the forest industries and their production and detailing exports in terms of product, species, volume and destination. In the last two years, DNTF has stopped disaggregating data at the provincial level in its national level reports, and in 2011, the annual report had only three sections dealing with licensing, production, processing and export, totalling four pages.

Repeated requests were made to Customs for export data broken down by port, but this was not provided, despite the intervention of the EU Delegation.

## 5.12 FLEGT activities to date

Mozambique attended the African Forest Law Enforcement and Governance (AFLEG) Ministerial Meeting in Cameroon in 2003 and signed the Yaoundé Declaration committing to 30 intentions and 42 indicative actions to combat illegal logging. The GoM did not publicise its undertakings to AFLEG, and to date, activities to implement them have been very limited.

In October 2011, SADC FLEGT ran a regional workshop in South Africa to discuss elements of a regional FLEGT programme. This will be finalised at a workshop in July 2012. FAO is providing USD 2.9

<sup>9</sup> <http://www.parceriasflorestais.info>

million for a FLEGT-related initiative in DNTF entitled “Building Political Will and Generating Trust to Implement the Forest and Wildlife Participatory Law Enforcement Strategy”. Its main outputs relate to awareness-raising about the importance of forestry amongst political decision makers, opinion leaders and the general public, the creation of a National Forest Control Unit, and a computerised national administration and control system for forestry. It includes a forest law enforcement module, piloting the use of community forest guards. So far, seven guards have been trained. The funding for this pilot is currently suspended. ACP FLEGT is supporting a project at the national university (UEM), to establish a quantifying illegal logging and domestic timber consumption (using wood balance estimations), to develop a system on-going monitoring of illegal logging and trade, and make recommendations on how to tackle it.

Additional support to strengthen forest law enforcement is coming from the Finnish Forestry Support Programme, APRONAF (see Section 2).

During this study, none of the DNTF or SPFFB staff interviewed expressed any interest in EU FLEGT or requested any additional information.

### **5.13 REDD+**

Mozambique began work on REDD+ in 2008 with the submission of the R-PIN to the Forest Carbon Partnership Facility (FCPF). A working group, including DNTF but lead by MICOA (Ministry of Coordination of Environmental Affairs), was formed in 2009 to prepare the Readiness Preparation Plan (R-PP). This work was supported by a multi-institutional partnership called “South-South REDD” involving the Sustainable Amazonas Foundation (FAS) of Brazil, University Eduardo Mondlane and IIED of the UK, with funding from the Norwegian Embassy in Maputo. Consultations were held throughout the country between February 2010 and July 2011. The third draft of Mozambique’s R-PP was approved in March 2012. Work began in May 2012 on preparing a legal framework for REDD+, and designing a project to prepare the national REDD+ strategy. In addition to the USD 3.6 million from FCPF, JICA (Japan International Cooperation Agency) will provide USD 10.5 million for equipment and training to establish reference emissions levels and the MRV system. This work will be done by DNTF’s inventory department. Pilot sites have been selected in five provinces, to explore key challenges in land management. The pilot in Zambezia is intended to explore REDD+ under conditions of weak forest governance and information management (MICOA 2012).

Currently there are some 20 proposed or on-going forest carbon projects in Mozambique, covering an area of 15 million ha (MICOA 2012). In addition, many plantation investors are looking to REDD+ to enhance their revenues.

## 6. The Fuelwood Market

Mozambique is heavily reliant on wood-based fuels for domestic cooking, with charcoal predominating in urban areas, and firewood in rural areas. The official statistics for firewood production for 2007-2011 are shown in Table 3. These figures represent production by commercial operators who have obtained licences to produce and transport firewood and charcoal to supply urban markets. However, charcoal and firewood are important sources of income for many rural households. It is estimated that over 95% of fuel wood is produced at this level, but this tends to be unlicensed, and not reflected in national statistics (Cuambe 2008). The comparison of these figures with those for industrial round wood production (as seen in Table 4) shows that forest exploitation for fuel wood exceeds that for industrial round wood by an order of magnitude. This reflects the selective nature and under-reporting of timber harvesting, and the heavy reliance of the population on woody biomass for fuel.

**Table 3 Official production statistics for firewood and charcoal, 2007-2011**

	2007	2008	2009	2010	2011
<b>Firewood</b>					
No. Licences	318	195	177	67	161
Stacks licensed	46,952	46,486	37,326	29,655	49,385
Stacks produced	n/a	<b>35,912</b>	<b>24,552</b>	<b>20,964</b>	<b>25,868</b>
Estimated RWE <sup>10*</sup> (m <sup>3</sup> )		<b>35,912</b>	<b>24,552</b>	<b>20,964</b>	<b>25,868</b>
<b>Charcoal</b>					
No. Licences	1330	1189	1743	932	1533
Sacks licensed	781,566	996,066	1,345,007	1,284,514	1,019,011
Sacks Produced	n/a	<b>602,311</b>	<b>1,149,010</b>	<b>538,244</b>	<b>363,227</b>
Estimated RWE** (m <sup>3</sup> )		79,505	151,669	71,048.	47,945

Source: DNTF annual report (2012) \*using conversion factor of 4, 1 stack = 1 m<sup>3</sup>; \*\*1 sack = 33 kg, 1 ton = 1 m<sup>3</sup>

Various studies have attempted to produce more accurate data on actual fuel-wood consumption. A FAO study (2003) estimated annual fuel wood production at 16.7 million m<sup>3</sup>/ year, of which some 3 million m<sup>3</sup> is converted to charcoal. Brouwer and Falcao (2004) estimated wood fuel consumption in Maputo at 0.96 m<sup>3</sup> per capita per annum. A study in 2007 estimated national charcoal production at 5 million sacks/year or 165,000 m<sup>3</sup>. The total value of this production is in excess of USD 50 million per year.

According to the forest regulations of 2002 licences are required for the harvesting and transport of charcoal and firewood, and it is illegal to use precious, first, second or third class species for this production, unless the tree is deformed or otherwise not suitable for timber production. However, the preferred species for charcoal are the valuable dark heavy hardwood species valuable as timber, particularly chacate and mondzo. The wholesale clearance of forest for charcoal production, particularly by organised gangs in the orbit of towns and cities almost undoubtedly involves these species and is perhaps the biggest problem in forest management, particularly for concession operators. A study of small- and medium-size forestry companies indicated that 99% of about 151,000 charcoal enterprises and 96% of about 9,350 firewood enterprises are not registered and operate without a licence (Anonymous. 2011, cited in Sitoé et al 2012). At the level of rural households, most charcoal comes from field clearance for agriculture. Rural households themselves use firewood.

A small amount of high grade coconut shell charcoal is exported to India and Europe.

<sup>10</sup> Round Wood Equivalent is an estimate of the volume of logs required to make a given quantity of defined product. Different conversion factors apply to different products.

## 7. Forest Utilization

The official DNTF national level statistics on forest utilisation for the years 2000-2011 are summarised in Table 4, providing figures on licensing, production, processing and export. Inconsistency in data reporting from year to year and province to province makes it difficult to discuss trends, and suggests the data may be unreliable.

### 7.1 Licensing

Both concessionaires and simple licence loggers have to apply for timber harvesting licences each year. For concessionaires, an AAC for specific species is established in their management plans. Simple licence loggers prepare a proposal for a particular area, and request specific volumes and species. The provincial forest services are supposed to inspect the proposed logging area and confirm the presence of the timber the logger has requested. It used to be that the licence fee for the entire quota would have to be paid up front, and the Chinese traders drove the system by providing credit to cover these fees. It is now possible to pay the fees in two or more instalments, as the season progresses. Concessions do not currently pay any annual land tax, although this has been talked about for some time.

**Table 4 Current and Proposed Licence Fees, by grade of timber**

Grade	Current Value (established 2002)		Proposed Value	
	(MTN/m <sup>3</sup> )	USD*	(MTN/m <sup>3</sup> )	USD
Precious	2,000	72	4,000	144
Class 1	500	18	2,600	93
Class 2	300	11	1,000	36
Class 3	200	7	500	18
Class 4	100	4	300	11

Source: Source: Law 7/2010. Boletim da Republica 32, Series 1. \*USD 1 = MTN 28

Licensing for forest exploitation averaged about 170,000 m<sup>3</sup> between 2004 and 2009, but then increased quite sharply to 270,000 m<sup>3</sup> in 2011. Given the annual allowable cut for 39 Class 1 and Precious species, established through the 2005 national inventory is over 500,000 m<sup>3</sup>, the government points out this is well within sustainable limits. However, Table 5 shows that in 2008, only nine species accounted for over 90% of licensing. Although quotas are established for each species in each province, these are no longer reported on at national level, nor in most provinces, and it is clear that for certain species, notably pau ferro, mondzo and metacha, these quotas are being substantially exceeded. For unknown reasons, DNTF stopped reporting on the licensing and exploitation of forests by species in 2009.

**Table 5 Species and timber class composition of forest licensing at national level, 2008**

Common Name	Latin Name	Timber Class	% of total licensing
<i>Jambire</i>	<u>Millettia stuhlmannii</u>	1	17
<i>Chanfuta</i>	<u>Afzelia quanzensis</u>	1	16
<i>Umbila</i>	<u>Pterocarpus angolensis</u>	1	15
<i>Mondzo</i>	<u>Combretum imberbe</u>	1	13
<i>Messassa</i>	<u>Brachystegia spiciformis</u>	2	9
<i>Pau ferro</i>	<u>Swartzia madagascarensis</u>	1	7
<i>Chanato</i>	<u>Guibourtia conjugata</u>	1	5
<i>Muaga</i>	<u>Pericopsis angolensis</u>	1	3
<i>Metacha</i>	<u>Bridelia micrantha</u>	3	3
<i>Pau preto</i>	<u>Dalbergia melanoxylon</u>	Precious	2
<i>Chacate preto</i>	<u>Colophospermum mopane</u>	1	2
<i>Metonha</i>	<u>Sterculia quinqueloba</u>	2	1
<i>Muimbe</i>	<u>Julbernardia globiflora</u>	2	1
<i>Mecrusse</i>	<u>Androstachys johnsonii</u>	1	1
<i>Namuno</i>	<u>Acacia nigrescens</u>	3	1
<i>Mutiria</i>	<u>Amblygonocarpus andongensis</u>	2	1

Source: DNTF, 2008

Government policy is to promote concessions over simple licences, and the number of fully approved concessions rose very slowly to 11 in 2004, but by 2011 had reached over 100. However, the number of simple operators remains high, at over 450. In 2009, 35% of the licensed volume still went to simple licence operators.

## 7.2 Production

Actual harvesting levels are more difficult to assess. Until 2008, DNTF reported timber production by province, as volume of “logs extracted”, and compared it to the volume of logs that had been “licensed” in the same year. Typically this ran at about 80%. The logs extracted were then broken down into those exported as logs, and those processed and exported. As Table 4 shows, from 2009, this changed to production of logs, compared to production of sawn timber of different categories, and these are no longer broken down at provincial level. In the last three years the data shows the volume of sawn timber produced<sup>11</sup> as exceeding that of logs produced, and of the volume licensed. In 2010, for instance, DNTF reports that 244,000 m<sup>3</sup> of timber were licensed, but only 168,000 m<sup>3</sup> were actually extracted (Table 3). However, it also reports that around 195,000 m<sup>3</sup> of processed timber were produced, of which 177,000 m<sup>3</sup> were exported, along with another 23,000 m<sup>3</sup> of logs.

<sup>11</sup> Since DNTF does not distinguish between fully squared boards and the rough sawn “pranchas” (Photo 1), it is difficult to provide a RWE for these figures.

## 8. The Forest Industry Sector and Domestic Timber Market

### 8.1 Forest Industry

There is little recent information on Mozambique's forest industries or domestic timber markets. The national forest policy (1998), law (1999) and regulations (2002) are all aligned to promote the development of domestic forest industries, for their employment generation and value addition. However, DNTF last reported on forest industries at national level for the year 2006, and data requested for this study has not been provided. In 2005, there were a total of 179 processing units, but only 123 of these (69%) were still operational. No figures were given for the types of sawmill, their capacity, outputs, ownership, employment or the markets for their products.

Processing has mostly focused on producing fully squared sawn timber for the domestic market, and rough sawn timber of the main export species to comply with the 2002 regulations, finally brought into force in 2007. A supplementary regulation in that year eliminated the export requirement for fully squared timber, and permitted export of rough sawn green timber (see Photo 1). Some analysts have supported these moves, reporting that sawmilling "can destroy value", as logs tend to fetch a higher price in China than sawn timber, and also attract a higher government royalty (Ogle and Nhantumbo 2006). However, this is largely due to a total lack of strategic marketing, as some successful exporters of fully processed timber to China have demonstrated. The rebates on royalties of 25% for processed timber and 40% for veneers and parquet, meant to encourage value-added processing (Ogle and Nhantumbo, 2006), are apparently very difficult to reclaim (anonymous, personal communication).

Investment in modern tertiary wood processing (e.g. kiln drying, plywood, mouldings, joinery and furniture) has been limited, but Mozambique's portfolio of processed timber products as sawn timber, railway sleepers, poles, parquet (finished and blanks), furniture, doors and window and their frames and artisanal decorative items (Nhacale et al, 2009). Veneers are produced in Manica. (Nhacale et al 2009). There are a few secondary wood relatively large furniture making enterprises, selling their products on the domestic and intermittently on the international markets. This includes at least one fully-integrated concession, sawmill and furniture factory in Sofala, and an interesting enterprise producing of designer furniture and artisanal objects, powerfully demonstrating the potential of forestry to generate jobs, skills and revenues. No significant export of furniture has been recorded, but Mozambique imports around USD 13 million of furniture from South Africa and elsewhere (see below).

A surprisingly high quality of furniture is produced by roadside carpenters in villages and towns. Using only hand equipment, they process sawn timber brought by clients or purchased from sawmills, and sell the furniture either on commission or in local markets. They receive no government support.

### 8.2 The Domestic Timber Market

The volume of timber consumed on the domestic market is not reported by DNTF, and is extremely difficult to assess from other available data. According to a commodity chain study (Sun et al 2008), prior to the virtual log export ban, Mozambique's exports in log form were 48- 58 % of the total log cut, suggesting 42-52% was consumed on the domestic market. According to Nhantumbo and Ogle (2006), in 2005, 38% of sawn timber production was exported. Although very incomplete, these figures indicate that domestic timber demand is important and contributes to a significant portion of the forestry activity. Studies in other African countries with similar GDP levels suggest domestic consumption is likely to be in the region of 0.09 m<sup>3</sup> /person/year. However, most of these studies have focused on urban populations, where timber consumption is likely to be higher. Applying this to

Mozambique, domestic consumption is estimated at 830,000 m<sup>3</sup> (urban population only) and 2.1 million m<sup>3</sup> (entire population).

Table 6 shows the difference between the reported total production of sawn timber, and the reported total export of sawn timber, which should represent the volume available for the domestic market, but this is unlikely to reflect reality. Nhantumbo and Ogle (2006) further note that in 2005, the domestic market for primary and added-value wood products was growing rapidly and local production was not satisfying the demand. Market development by saw millers has been poor. Little cutting and market-testing of lesser-known species is carried out to fill the construction timber market. This segment of the market is being partially satisfied by imported pine. UN Comtrade statistics show that an average of approximately 10,000 m<sup>3</sup> of sawn wood was imported annually from South Africa between 2006 and 2010. Sawn timber is also known to be imported from Malawi (see above).

Most of the timber on the domestic market is apparently illegal, because, it is said, licence fees make it too expensive for nationals to buy.

**Table 6 Summary of official statistics on forest utilisation, 2000-2011**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
No. Simple Licence loggers					495	461	630	637	616	479	n/a	n/a
No. Concessions*	1/1	33/3	53/na	82/na	95/11	101/38	127/63	137/72	156/84	167/92	n/a	200/105
Total No. Licences issued	878	1144	n/a	n/a	n/a	862	n/a	n/a	681	n/a	801	870
Total Vol. Licensed					168,195	134,886	177,833	197,133	166,781	162,954	244,156	270,825
<b>Log Production m<sup>3</sup></b>	<b>117,361</b>	<b>122,204</b>	<b>163,214</b>	<b>113,125</b>	<b>152,711</b>	<b>102,627</b>	<b>143,587</b>	<b>128,353</b>	<b>124,869</b>	<b>112,574</b>	<b>167,955</b>	<b>175,871</b>
Logs processed m <sup>3</sup>	88,600	98,200	54,100	79,100	42,600	35,930	72,371	105,867	91,310	145,109	139,858	
<b>Processing:</b>												
Sawn Timber m <sup>3</sup>	19,392	29,600	24,302	45,167	28,121	32,334	36,424	50,511	96,401	114,244	192,271	211,518
Parquet m <sup>2</sup>	9,269	3,937	n/a	n/a	n/a	4,374	3,263	2,306	1,025	4,043	2,762	2,253
Plywood m <sup>3</sup>	764	664	n/a									
Sleepers m <sup>3</sup>	n/a	n/a	n/a	n/a	n/a	1,914	1,074	1,174	2,134	5,008	3,014	447
Veneer m <sup>2</sup>	826	913	n/a	n/a	n/a	n/a	n/a	27,600	88,500	195,000	152,000	134,000
<b>Export</b>												
Logs m <sup>3</sup>	n/a	33,600	65,000	59,000	72,600	60,000	107,657	55,982	19,002	21,264	22,846	36.013
Processed m <sup>3</sup>	n/a	980	1,847	1,208	8,366	12,388	30,323	30,930	85,435	93,596	177,613	175.982
<b>Estimated Domestic Consumption m<sup>3</sup></b>	n/a	26,162	22,455	43,959	19,755	19,946	6,101	19,581	13,100	25,656	17,627	35,983

Source: DNTF Annual reports; \* Concessions: Application Approved/With approved management plans and operational; \*\* = processed sawn timber – exported sawn timber. 2011 data from M Nakala.

**Table 7 Production of logs by Province 2000-2008, and production of all timber 2009-2011 (m<sup>3</sup>)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>By province</b>												
Maputo	685	1,082	495	30	123	36	5	70	277			
Gaza	300	878	4,704	3,760	3,068	1,273	2,049	501	5,475			
Inhambane	3,147	7,083	9,372	3,952	3,084	2,089	3,228	7,433	5,850			
Sofala	39,289	28,372	26,214	18,768	30,240	22,387	33,148	45,529	44,567			
Manica	12,201	15,719	20,442	13,536	15,099	13,784	14,121	10,184	6,701	Data no longer disaggregated by province		
Tete	1,260	660	1,145	3,097	2,770	8,608	20,650	15,743	7,394			
Zambézia	28,000	26,622	33,200	25,395	23,932	25,084	24,765	14,533	20,692			
Nampula	10,680	13,266	15,714	9,869	10,985	7,851	22,418	9,087	8,041			
Cabo Delgado	21,440	27,683	51,456	34,376	63,062	21,167	22,193	23,856	25,478			
Niassa	359	839	472	342	348	348	741	1,418	392			
<b>TOTAL</b>	<b>117,361</b>	<b>122,204</b>	<b>163,214</b>	<b>113,125</b>	<b>152,711</b>	<b>102,627</b>	<b>143,587</b>	<b>128,353</b>	<b>124,869</b>	<b>112,574</b>	<b>167,955</b>	<b>175,871</b>
<b>By product</b>												
<b>Sawn Timber m<sup>3</sup></b>										<b>114,244</b>	<b>192,271</b>	<b>211,518</b>
<b>Sleepers m<sup>3</sup></b>										<b>4043</b>	<b>2762</b>	<b>2253</b>
<b>Parquet m<sup>2</sup></b>										<b>5008</b>	<b>3014</b>	<b>447</b>
<b>Veneer m<sup>2</sup></b>										<b>195</b>	<b>152</b>	<b>134</b>

Source: DNTF annual reports. 2000-2005 quoted in Ogle and Nhantumbo (2006)

The implications of such domestic consumption for the assessment of total illegal logging are staggering.

#### **Wood balance (2011), with lower-end estimate of domestic consumption**

$$\begin{aligned}\text{Unlicensed logging} &= (\text{domestic consumption}^a + \text{exports}^b) - (\text{licensed harvest}^c + \text{imports}) \\ &= (830,000 \text{ m}^3 + 440,000 \text{ m}^3) - (190,000 \text{ m}^3 + 185,000 \text{ m}^3) \\ &= 1,270,000 \text{ m}^3 - 375,000 \text{ m}^3 \\ &= 895,000 \text{ m}^3\end{aligned}$$

Implied illegality rate when compared to official licensed harvests = 79%

<sup>a</sup> estimate based on per capita consumption in other African countries, adjusted for GDP and population; <sup>b</sup> uses figures from importing countries; <sup>c</sup> uses actual harvest, typically 80% of licensed harvest

#### **Wood balance (2011), with upper-end estimate of domestic consumption**

$$\begin{aligned}\text{Unlicensed logging} &= (\text{domestic consumption} + \text{exports}) - (\text{licensed harvest} + \text{imports}) \\ &= (2,110,000 \text{ m}^3 + 440,000 \text{ m}^3) - (190,000 \text{ m}^3 + 185,000 \text{ m}^3) \\ &= 2,550,000 \text{ m}^3 - 375,000 \text{ m}^3 \\ &= 2,175,000 \text{ m}^3\end{aligned}$$

Implied illegality rate when compared to official licensed harvests = 92%

Sources: Falcao and Lawson (in prep), based on SPFFBZ data. NB: Figures vary slightly from those in Fig 1 below.

The analysis for 2011 thus suggests that somewhere between 0.9 and 2.2 million m<sup>3</sup> of timber was illegally logged in Mozambique that year, and that between 79% and 92% of all harvesting is illegal (unlicensed). Further, by either estimate, harvesting even of these dozen or so selected hardwoods exceeded the AAC for all Precious and Class 1 species (515,700 m<sup>3</sup> - see Annex 4). The sustainability of forestry in Mozambique is thus highly compromised.

## 9. The Timber Trade

### 9.1 Overview

The trade data presented here and in Annex 5, are obtained from the UN database Comtrade, but ultimately provided by the Customs Department of the GoM. In addition, a detailed set of all export consignments for the years 2000-2011 was provided directly by the Customs service. Although the trade values provided by UN Comtrade and the Customs Department are similar, a lot of the statistics for weight and/or volume is anomalous and/or, in the case of Comtrade, has simply been estimated. These weaknesses reflect the need to strengthen or reform the relevant institutions (and to collaborate with China's Customs service) before any confidence could be invested in FLEGT-licensed exports from Mozambique (see above 4.2).

The unit of measure used in some of the figures and tables - roundwood equivalent volume (RWE) - is an estimate of the volume of logs required to make a given quantity of product. This study assumes that 1.8 m<sup>3</sup> of logs is used in making one cubic metre of sawn wood, reflecting the standard suggested by, or implicit in, publications by the FAO and others. However, regulations permit the export of roughly sawn timber (see Photo 1), and for this product, RWE is nearly 1 m<sup>3</sup>. Mozambique's customs data do not permit distinguishing between the volume of rough sawn and fully-squared sawn timber. So, there are likely to be inaccuracies in these figures.

Figure 1 presents an overview of Mozambique's imports and exports of wood based products. It indicates that, in terms of roundwood equivalent volume (RWE), Mozambique's trade in timber sector products<sup>12</sup> doubled during the last decade, but since the middle of the decade the trend has been flat. However, China's counterpart data presented below (Figures 4 and 5), tell a different story, of continuing high annual increases, following a slight dip during the global economic crisis of 2008. In terms of RWE, Mozambique's imports of paper sector and timber sector products actually exceed the exports.

Figure 2 maps the main trade flows of specific wood-based products to and from Mozambique during 2011, reflecting the above mentioned dominance of the Chinese market. It also illustrates the importance of South Africa as a source of imports – mainly plantation sawn-wood and paper products. The data shown are based on statistics reported by importing countries - which better reflect local knowledge and are less likely to exclude quantities fraudulently declared or smuggled.

Also illustrated is the small but largely illegal trade in logs and sawn timber from Cabo Delgado into Tanzania. Some of the timber supplies the domestic markets in Tanzania and possibly Kenya, but is said to be exported to China; this is not shown on the map.

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<sup>12</sup> i.e. wood-based products other than chips, pulp and paper – defined for this study as Paper Sector products – and fuel wood.

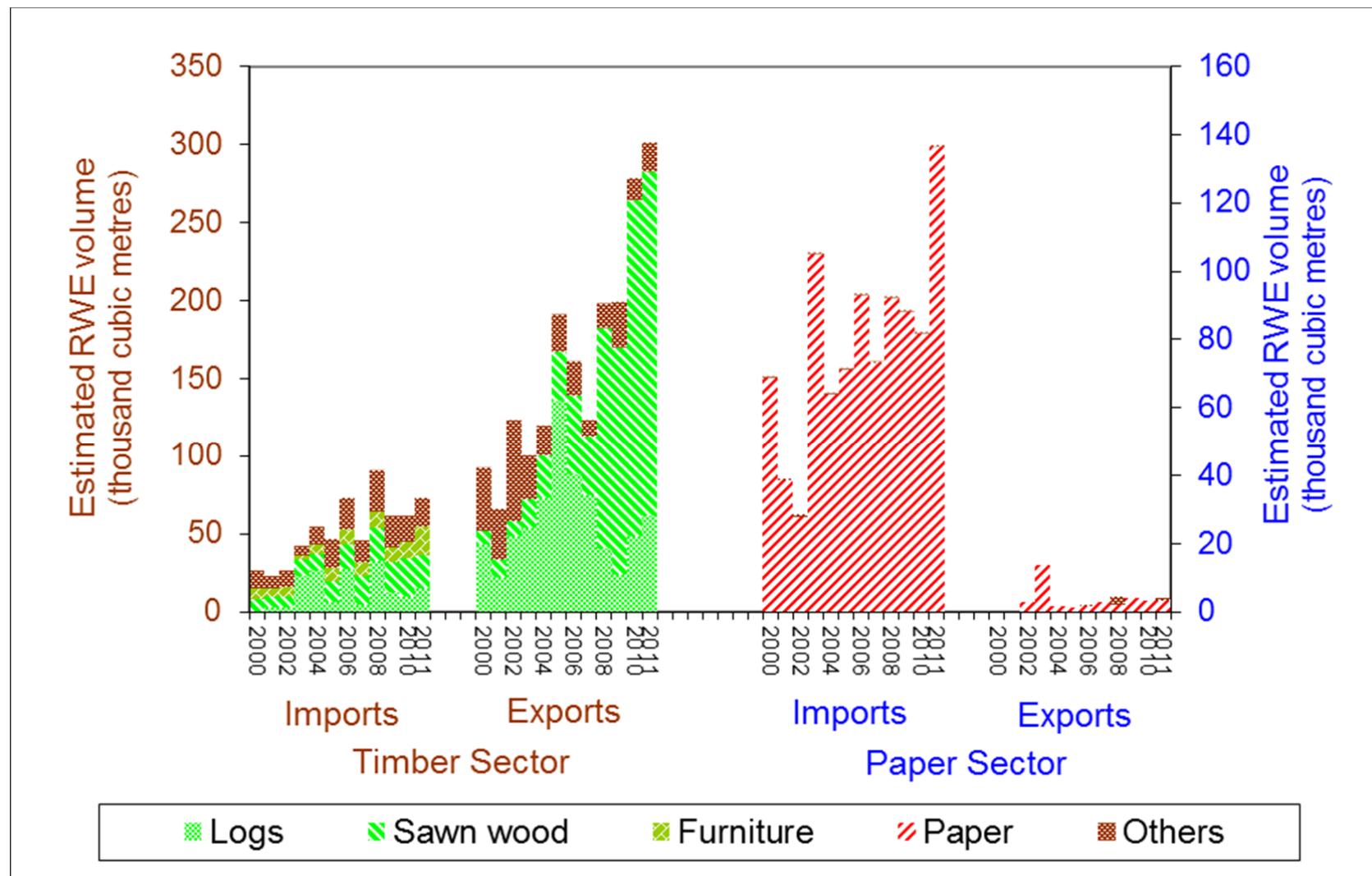


Figure 1 Mozambique's trade in wood-based products

Source: based on UN Comtrade, 2012

## 9.2 Trade Infrastructure

Mozambique has a number of natural ports. Three of these, Beira (Sofala), Nacala (Nampula) and Pemba (Cabo Delgado) are particularly important for timber export, the latter being a deep water port. Beira is the most important, as it is the closest port for timber from the provinces of Inhambane, Manica and Tete. There is also a small river port in Quelimane in Zambézia Province. It used to receive bulk cargo ships and handle most of the timber from the province, but now the port only provides a feeder service for the port in Nacala. This service is expensive, so instead, during the last few years, most timber from Zambézia has been trucked north to Nacala for export, or since the bridge over the Zambézia River was opened in 2009, south to Beira. All Mozambique's timber exports are now containerised, and this presents excellent opportunities for concealing illegal timber (and other illegal commodities such as ivory) and for fraudulently classifying logs as sawn wood.

Road links are important for Mozambique's two-way trade with South Africa, and the import of sawn softwoods from Malawi. The opening of the Unity Bridge between Mozambique and Tanzania during late 2010 has provided an easier route for the smuggling of illegal timber from Mozambique into Tanzania, but much of that illegal trade continues to be taken by canoe or carried across the Rovuma River into Tanzania, where the road network is better.

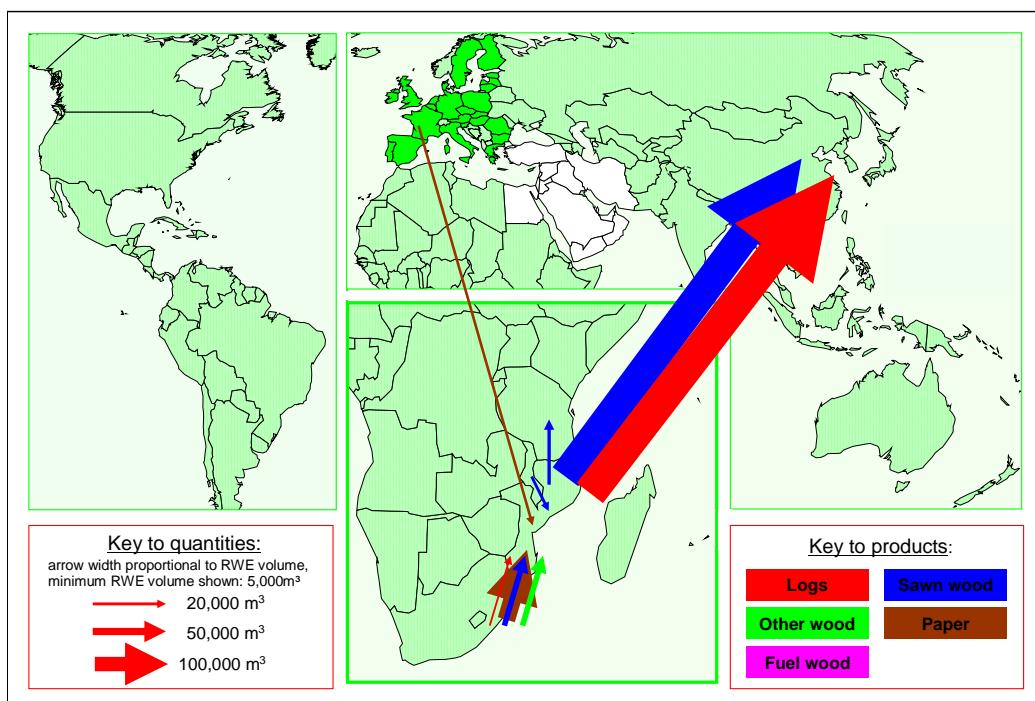


Figure 2 Map showing Mozambique's trade in wood-based products (2011)

Source: based on data reported by Mozambique's partner countries, particularly general Administration of Customs of the People's Republic of China Customs, Eurostat and UN Comtrade, 2012

## 9.3 Exports

Mozambique's timber exports are largely dark, heavy hardwood species, which are sent mostly to China where they are primarily used to manufacture reproduction Ming and Qing Dynasty furniture, high value carving and ornamental goods, and, to a lesser extent, flooring. A small amount of this flooring might be exported to Europe, but it is unlikely that much of that furniture is exported. Paler, slightly lighter hardwood species, such as umbila, chanfuta and jambire, are marketed in South

Africa and Europe, for use in parquet, doors, windows and some furniture. Importers in China prefer logs, because they do not attract the 4-5% tariff imposed on sawn timber imports, and because logs can be sold quickly and in large volumes on the wholesale log market, where demand is highest. Although markets for imported sawn timber definitely exist in China, accessing them requires marketing and processing efforts to identify end-users and meet their specifications. Logs are easier. Figure 3 presents Mozambique's export data, showing the RWE of core VPA products (logs, sawn timber, plywood and veneer) between 2006 and 2011 amounted to an annual average of 140,000 m<sup>3</sup> (and a maximum of 153,000 m<sup>3</sup> in 2006), with an average export value of approximately USD 40 million, and a maximum of USD 58 million in 2010. However, importing country counterpart figures for the same period, presented in Figure 4, indicate a substantially higher average of 243,500 m<sup>3</sup>/ yr. and a maximum of 374,000 m<sup>3</sup> in 2011, with 93% of the total going to China. Figure 5 compares Mozambique's and China's data, showing that in 2012, China declared the import of nearly twice the volume of Mozambican timber, as Mozambique declared to have exported globally. EIA estimates that 48% of Mozambique's trade with China is undeclared and illegal (EIA 2013), with a loss to revenues of tens of millions of US dollars.

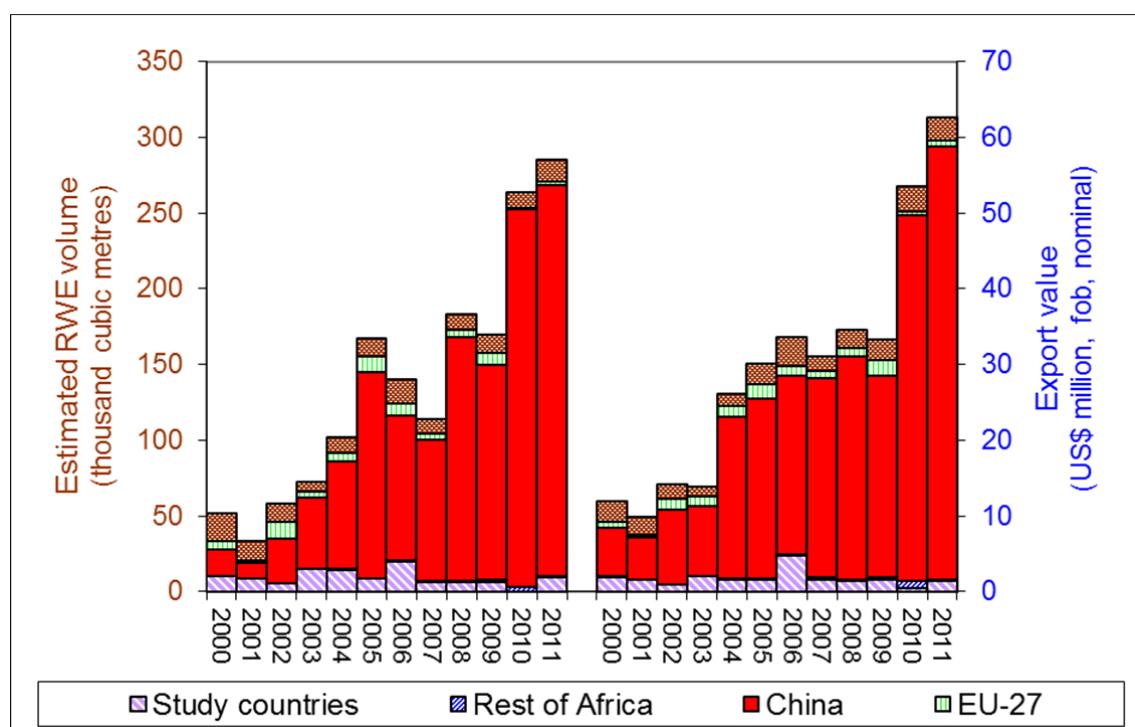


Figure 3 Mozambique's exports of VPA core products (by destination country)

Source: estimates from UN Comtrade, 2012

Besides the trade with China, Mozambique exports a small and declining volume of timber to the other countries included in this study (Figures 3 and 4). South Africa, with its developed economy, accounts for the great majority of the regional trade (a roundwood equivalent volume of between 10,000 and 20,000 m<sup>3</sup> during each of the last few years), even if one excludes the unreported volumes destined for Tanzania (mentioned earlier in this Section). China is probably the final destination for some, perhaps most, of the timber which Mozambique reports as exports to other countries in East Asia (primarily Singapore, which reports negligible quantities of timber imports from Mozambique).

The volumes exported to the EU are similarly insubstantial – almost zero during 2010 – having risen rapidly during the late 1990s to a peak of about 10,000 m<sup>3</sup> of sawn wood and 2,000 m<sup>3</sup> of logs. Figure 8 in Annex 5 illustrates trends in the total volumes of logs and sawn wood which the current Member States of the EU have imported since 1989. Three main European Union countries are or have been importers of Mozambican timber, Germany, Portugal and Italy over the last 20 years, and more recently France. As Figure 13 in Annex 5 illustrates, Germany and Portugal have imported both logs and sawn timber and Italy almost exclusively sawn timber. The annual average exports to Europe of 5000 m<sup>3</sup> represents less than 4% of Mozambique's total exports of core VPA products. However according to counterpart statistics, Europe's imports from Mozambique averaged are even lower - only 1.9% of Mozambique's total exports. Reasons for the recent decline are unclear, but poor governance and a related inability to make sufficient profit appear to be factors. Given the scale, unsustainability and illegality of export-oriented logging during the last decade or so, it is unlikely that the EU's imports from Mozambique will increase significantly, even if, in the future, a VPA were being implemented.

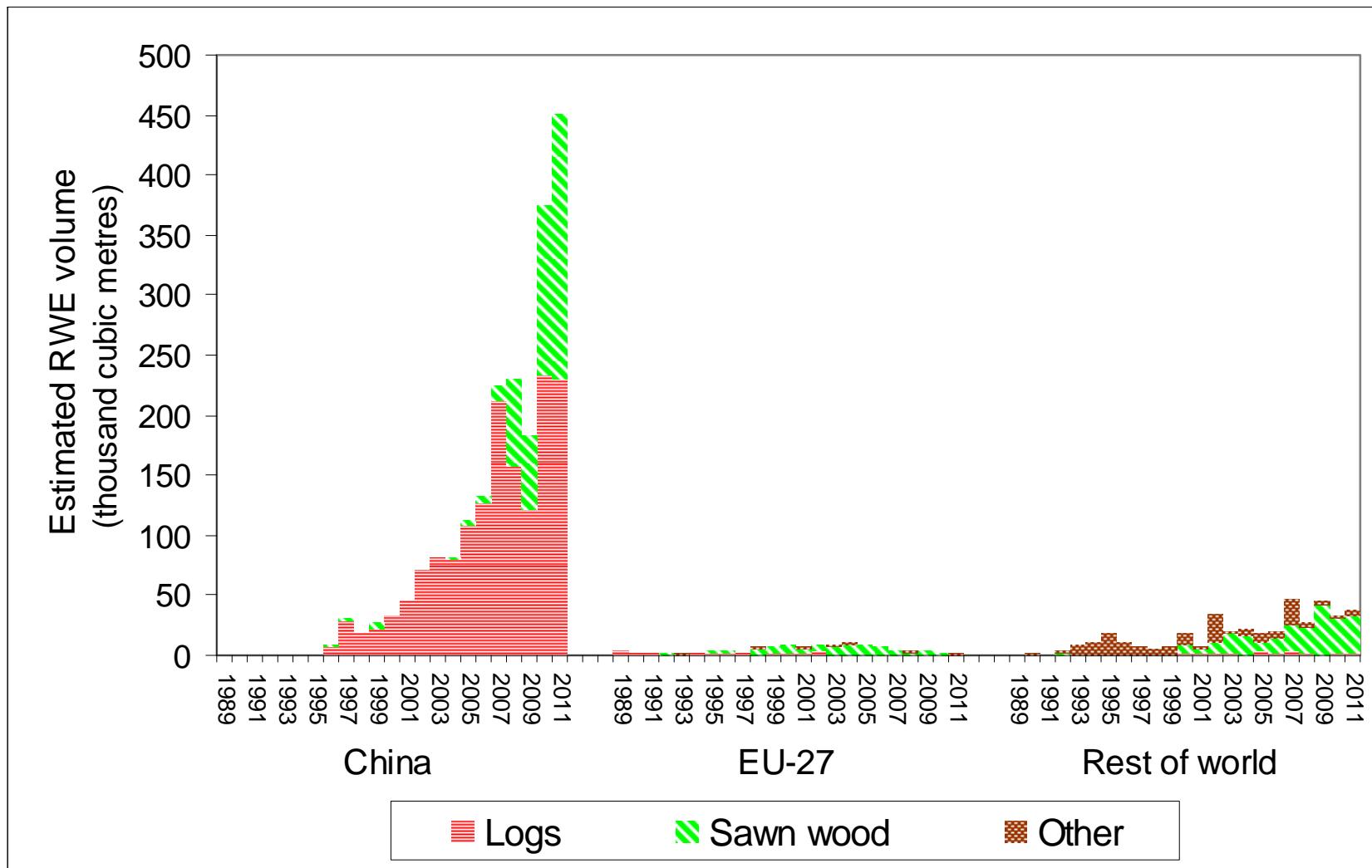
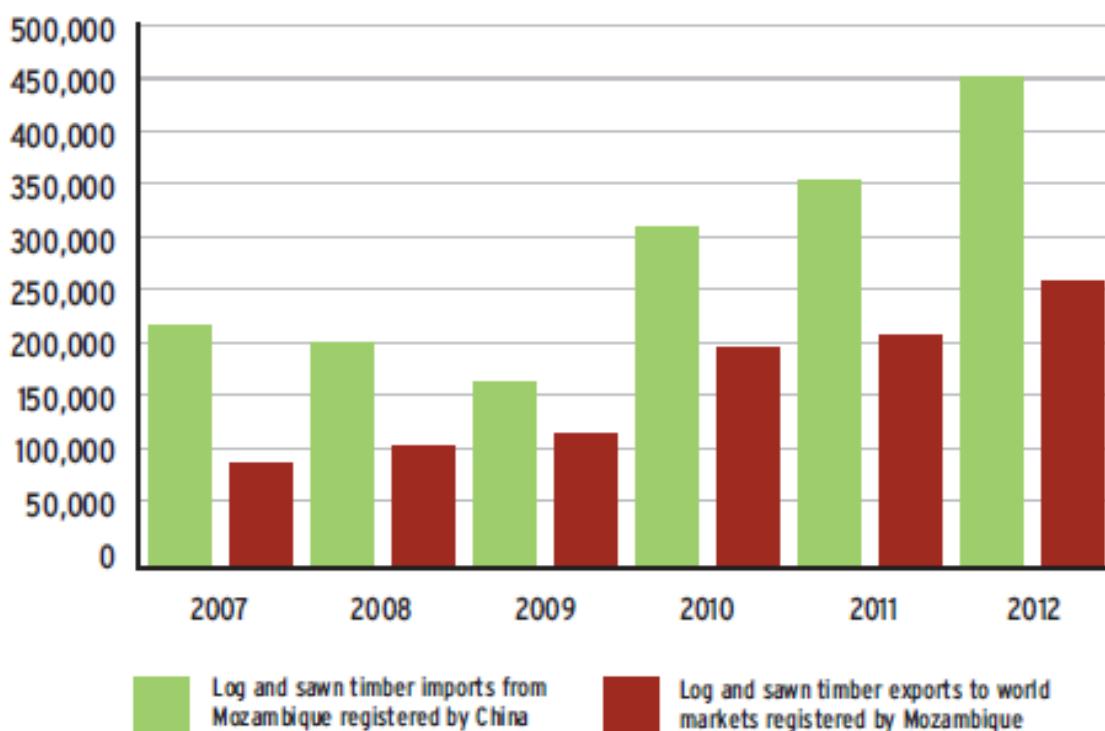


Figure 4 Destination country data on import of key timber sector products from Mozambique

Sources: Customs of the People's Republic of China, Eurostat and UN Comtrade, 2012

UN Comtrade data indicate that other Asian countries and the Indian Ocean islands of Reunion and Mauritius account for most of the rest of Mozambique's exports. Tanzania reports significant imports of sawn timber from Mozambique since 2008 and substantial imports of logs from 2010. Mozambique does not report this trade, probably because it is illegal. The volume and marketing chains of this trade are not currently understood, but a study is underway, funded by WWF's Coastal East Africa Network Initiative. Tanzania's statistics suggest that, since mid-2008, Tanzania has imported substantial volumes of sawn wood from Mozambique (typically in the order of 10,000 m<sup>3</sup> each year) as well as, during 2011, approximately 2,000 m<sup>3</sup> of logs. All this is presumably illegal given that the quantity of timber which Mozambique reports as exports to Tanzania is negligible. India has recently appeared as a destination for timber exports. Much depends on the nationality of individual traders and investors who come to Mozambique.



**Figure 5 Mozambique's timber exports: Comparison Chinese Customs data on imports from Mozambique, and Mozambique Customs data on its global exports.**

Source: EIA, 2013



**Photo 1** A regulation issued in 2007 permitted these roughly-sawn “pranchas” to be classified as “sawn timber” and exported (Quelimane 2009)

Source: C Mackenzie, 2009

Figure 1 also illustrates an abrupt change in the nature of Mozambique’s timber exports, from primarily logs in the period 2000-2007, to the dominance of sawn timber from 2008 onwards. In 2007, the regulation requiring the processing of all Class 1 timber before export, in order to promote domestic forest industry, was finally fully implemented. However, at the same time, Ministerial Diploma 142/2007 was issued, which changed the specifications for processed timber to include roughly sawn timber (see Photo 1), so the claimed promotion of industrial development is rather specious. It is likely that this arrangement enables the timber to pass Chinese Customs as “unprocessed” and thus avoid import tariffs, and probably accounts for the discrepancies over “logs” in the mirror statistics of Mozambique and China.

Further discrepancies in Mozambique’s timber export data are revealed by comparing the data of different agencies. Table 8 compares the export data of the provincial forest service (SPFFB), provincial customs and the port authority, for the port of Quelimane in Zambezia. In 2011, the port managers reported handling a volume of timber three times greater than the SPFFB authorised for export, and twice the volume registered with Customs. Quelimane port is privately operated and has the greatest incentive of all three agencies to account for all the timber it handles.

**Table 8 Timber export from Zambezia (2009-2011): Discrepancies in the data of three key institutional stakeholders, SPFFB, Customs and Port Authority**

Agency	Unit	2009	2010	2011
Provincial Forest Service	m <sup>3</sup>	18,663	32,199	21,083
Provincial Customs	m <sup>3</sup>			33,122
Port Authority	Metric tons	29,058	59,197	67,644

Sources: SPFFBZ data; register of despatches; port authority annual reports.

Mozambique exports negligible quantities of pulp, paper or fuel wood. However, several large tree plantations and related mill projects in Mozambique have been proposed by Portuguese, Brazilian and other investors (see Section 2 above). It is unclear whether any of these will come to fruition, and whether any of their production would be exported.

## 9.4 Imports

Figures 6 and 7 illustrate Mozambique's imports of wood-based products from 2000-2011, broken down by product and by country of origin. Figure 6 shows that between 2006 and 2011, imports amounted to an annual average RWE of 150,000 m<sup>3</sup> (maximum of 180,000 m<sup>3</sup> in 2008), with an average import value of USD 72 million/year, and a maximum of USD 87 million in 2008.

Paper accounts for 55% of imports by value, and 56 % by RWE volume; over 70% of this comes from South Africa. However, several large plantation and related mill projects are planned by Portuguese and Brazilian investors which could turn Mozambique into a paper exporter by 2025.

Furniture is the second most important wood-based import by value, worth an average of USD 13 million/year in the same period, accounting for 18% of imports by value. About half of it comes from South Africa, and the rest from China and Europe. Much of this has an MDF core, with wooden, plastic or paper veneers. Although imported furniture is more expensive than even top quality domestically produced furniture, it is however favoured because of its lighter weight and colour and of the cache of its foreign origin.

Mozambique imports an increasing volume of logs and processed softwood timber, mainly from neighbouring South Africa and Malawi (depending on which part of Mozambique). Pine is favoured in Mozambique for roofing rafters, joists and battens, particularly as lengths of up to 6 m are available. Treated eucalyptus is widely used for transmission poles. The current building boom in Mozambique is also stimulating the import of high quality joinery products, such as doors and windows and their frames. Most of these come from South Africa by road.

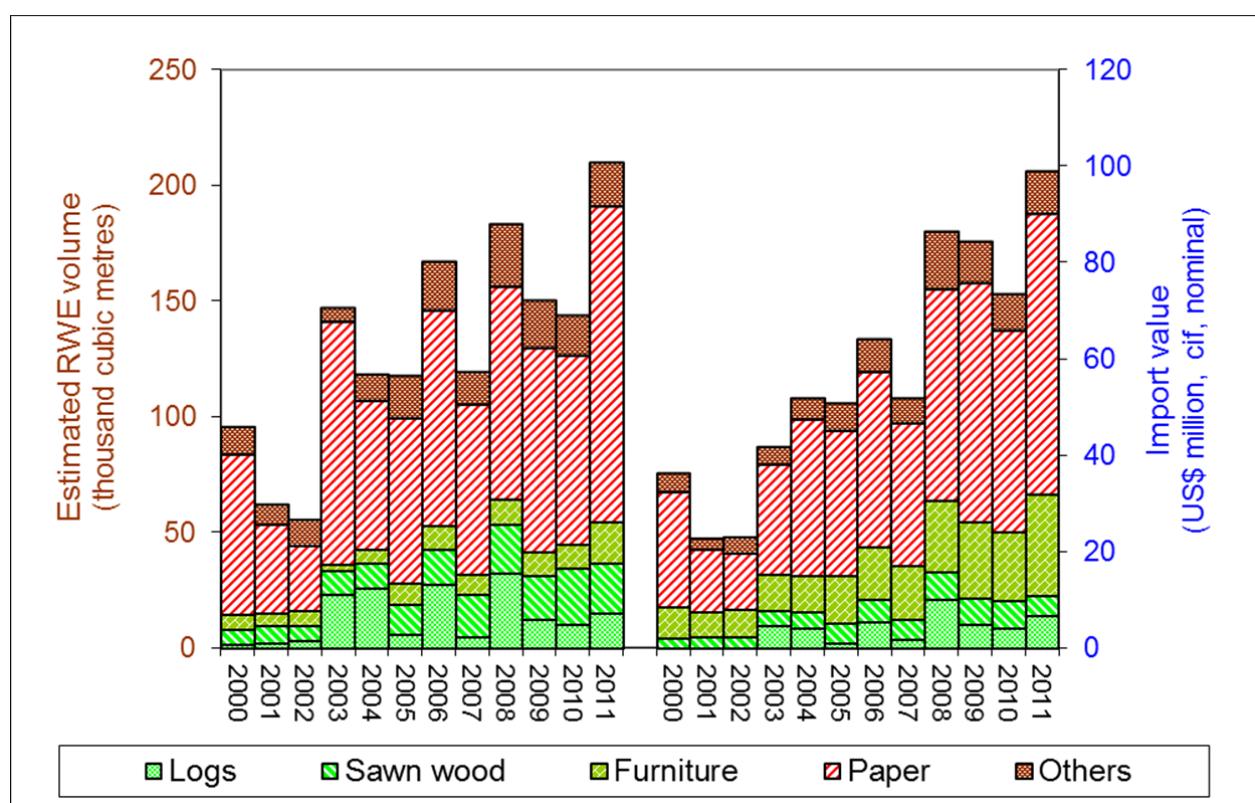


Figure 6 Mozambique's imports of all wood-based products 2000-2011 (by product)

Source: based on UNComtrade data, 2012

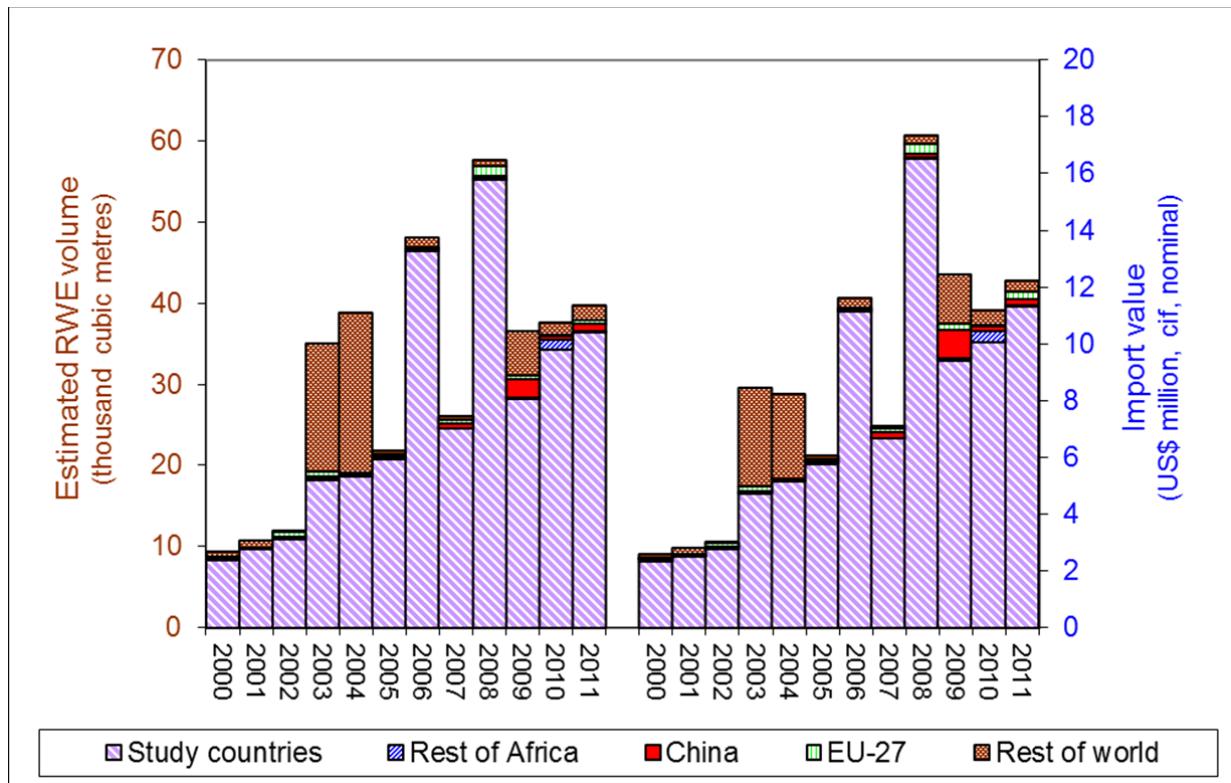


Figure 7 Mozambique's imports of core VPA products, by supplying country, 2000 - 2011

Source: based on UN Comtrade data, 2012

## 10. Trends and Key Issues

Total forest cover in Mozambique continues to decline, primarily because of shifting cultivation and charcoal production. The area of plantations is set to increase dramatically, as part of the phenomenon of “land-grabbing”, but if not carefully controlled, this will be largely at the expense of the natural forest and small-holder agriculture

Logging in Mozambique continues to increase, because of escalating demand from China and more recently, India. At the same time, transparency in the sector is declining, so it is increasingly difficult to understand exactly what is happening. Government figures suggest that both licensing and fines, and (implicitly) government revenues are increasing, but indications are that illegal logging is also increasing.

The export of a small number of heavy hardwood timber species to China continues to drive logging. Prices of the most sought after species are increasing. For instance pau ferro has increased from USD 280/ m<sup>3</sup> in 2008 to USD 550 in 2012. The main commercial species in the natural forests of the traditional timber provinces are being exhausted, and operators are predicting an end to this market within 5-10 years. However, some provinces, previously less important or accessible for forestry, such as Tete and Niassa, are being newly exploited. Together with one or two new species entering the market as substitutes for the “traditional” species, they constitute a final wave in this first phase of forest exploitation. It is difficult to predict what will happen in the forestry sector in next 10-20 years. If there is a “second phase” after the dark heavy hardwood species of interest to the Chinese market are exhausted, demand may come from lower value species like the messassas, from the more rapidly regenerating species like umbila, or from plantation species. Some products from this kind of forestry may have potential markets in Europe, making a VPA more attractive to the industry and the GoM.

Although illegal logging and its economic consequences have been subject to public outcry for nearly a decade, forest governance has not improved. Cosmetic measures have been taken to create the appearance of government commitment to its own policies and the rule of law, but meanwhile illegal logging increases, and a culture of corruption and disregard for the law have spread from the top down. Forest adjacent communities are increasingly involved, seeking to gain at least some benefit from the assets that outsiders are taking.

One aspect of illegal logging has been the lack of spatial control over where logging takes place. Although licences relate to particular areas, in practice, timber has often been taken from anywhere. This combined with doubts about the accuracy of the 2005 national inventory, means that there is now great uncertainty regarding the volume and location of remaining timber stocks.

Illegal logging in national parks and nature reserves has increased significantly over the last five years, as timber in the main forest areas is exhausted. At the same time there has been a significant increase in wildlife poaching, both elephants for ivory, and other species for commercial bushmeat. Helicopters are often used to extract the ivory, so it is believed that the trade is sanctioned at high levels. Ivory is said to be traded openly in markets in Maputo. Ivory and logs are often smuggled out in the same containers.

The trans-boundary smuggling of timber from Cabo Delgado province into Tanzania started around 2008, and, along with elephant and other wildlife poaching, has increased dramatically, since the opening of the Unity Bridge over the Ruvuma River in late 2010. In Tanzania, a ban has recently been imposed on the export of Tanzanian timber as logs. However, Mozambican logs can still be exported through Tanzanian ports. Not only is this continuing to happen, but logs harvested in Tanzania are acquiring Mozambican documents, to permit their export. An MOU between Tanzania and Mozambique was signed in very recently (April 2012), to help fight illegal trans-boundary logging and related timber trade in which Mozambican timber is cut and exported through Dar es Salaam. Provisions include establishing joint law enforcement units within the boundaries, sharing intelligence and establishing check-points in the border areas.

The recent advent of REDD+ is bringing hope to some observers, but others recognise that extensive and innovative approaches to land husbandry in rural areas, where there has been little impact even on poverty alleviation, will not be possible without a sea-change in forest governance.

Bush fires, charcoal and fuel wood production, shifting cultivation and plantation developments remain greater threats to the forests than illegal logging, but illegal logging continues to represent a greater loss of revenue to the government, and a greater missed opportunity for economic and social development and poverty alleviation, while spreading a dangerous disregard for the law.

## **11. Anecdotal information on volumes of undocumented and illegal harvesting and trade, major types of illegal logging cases**

### **11.1 Previous studies and actions against illegal logging**

The problems of forest governance in Mozambique were first reported over a decade ago and different aspects have been investigated and publicised steadily since then (Brouwer et al 1999, Barne, 2001; Bila and Salmi, 2003; Mussengue, 2001 and 2002; Nhantumbo and Macqueen, 2003; Reyes, 2003, TCT 2003, Macqueen and Bila 2005; Sun et al 2008, EIA 2012). Del Gatto (2003) estimated that between 1997 and 2001 35-70% of forest production was “unauthorised”. Taconi et al (2003) also reported that 50% of Mozambique’s forest harvesting is illegal according to its own national laws. However, detailed analysis is patchy, and illegal logging is only well-documented in

Zambezia and Cabo Delgado (Brouwer et al 1999, Mackenzie 2006, Mackenzie and Ribeiro 2009, Sun et al 2008, Ribeiro and Nhabanga 2009, EIA 2012).

The recent undercover research by the Environmental Investigations Agency (EIA) (2012) in Cabo Delgado and Beira revealed the collusion of past and present Ministers of Agriculture with Chinese timber companies, enabling the companies to obtain large concessions and to export raw logs, in blatant contravention of national laws. (See 10.2 for more details). The advent and development of corruption in Mozambique has been described by Hanlon (2004) and the Mozambican Centre for Public Integrity (CIP) produces detailed studies on corruption in different sectors, including forestry (Mosse 2008) and customs (Mosse and Cortez 2010), as well as annual reports on the control of corruption across all government departments (e.g., CIP 2009). All of these studies have pointed out serious problems in the forestry sector and the impact it has on state revenues and local economies. A recent Country Report on Mozambique by the Economist Intelligence Unit also spoke of the urban poor's increasing resentment of Frelimo for its" apparent indifference to domestic and international criticism of its hegemonic grip on the country's political system and economy" and "a string of blatant abuses by Frelimo of both the spirit and the letter of policies regarding respect for independent institutions, political fair play and governance", which led to an unprecedented "donors' strike" followed by cuts pledges of assistance officially noting that Mozambique "could no longer be treated leniently as a post-conflict country after enjoying 20 years of peace and stability". (Economist Intelligence Unit 2010)

Several respected research centres have focused on China's role in Mozambique's forests, economy, development and governance, including Centre for Chinese Studies of Stellebosch University (Jansson and Kiale 2009), the South African Institute of International Affairs (Roque 2009), and the Centre for international Forestry Research (CIFOR) (German and Wertz-Kanounnikoff 2012). All report the continuing illegality in the sector, and the role of powerful Mozambican business people and government officials and politicians in facilitating it.

Civil society actions against illegal logging began in the early 2000. In Zambezia, the national NGO ORAM alarmed by observations of rampant logging in the areas where it worked, commissioned a study that first revealed the role played by Chinese traders in driving forestry activity and illegal logging and trade (Mackenzie 2004, 2006), The report, "Chinese Takeaway", was widely reviewed and discussed in national newspapers and radio, and subsequently debated in Parliament. At the same time, the Forest Governance Learning Group, which started in 2003, working through government, began working more intensively with civil society and helped the formation of the "Amigos da Floresta", a coalition of national NGOs interested in forest issues. For several years regular "letters" were produced on forest governance issues. The impact of civil society actions has been mixed; in Maputo, there is now a well-informed and vocal lobby for improved forest governance, which has had some success in influencing government policy, most noticeably, in insisting the government implement its regulations and policy limiting the export of logs, and promoting long-term forest concessions. However, in many respects, the regulatory changes are only cosmetic, and in the provinces, little really changes and illegal logging has continued to grow. Further details are available in Macqueen and Bila (2006) and Amigos da Floresta (2009).

The most recent EIA report "First Class Connections" is currently (February 2013) generating a lot of civil society anger and debate in Mozambique<sup>13</sup>. On the basis of an undercover investigation, EIA alleges that numerous Chinese companies, including MOFID, Senlian, Fa Shi, Pingos Marinho, Verdura Ida, Green Timber and Oceanique have bribed past (Tomas Mandlate) and present (Jose Pacheco) Ministers of Agriculture or Customs officials to facilitate the illegal export hundreds of

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<sup>13</sup> See <http://www.clubofmozambique.com/solutions1/sectionnews.php?secao=business&id=27703&tipo=one>

contains a year of Mozambican logs to China. Most seriously, some of these companies, and many others, are Chinese State-owned Enterprises, or their subsidiaries.

Other findings include:

- Links between government collusion on illegal logging and the funding of political campaigns.
- “In 2010 Mozambican export figures recorded USD 49 million worth of timber being shipped to China. Chinese import figures show USD 134 million of timber entering the country from Mozambique, meaning that USD 85 million went missing.”
- “In 2012 the Mozambican Government registered 260,385 m<sup>3</sup> of log and sawn timber exports to world markets, including China, while China alone registered 450,000 m<sup>3</sup> of log and sawn timber imports from Mozambique.”
- “Timber VAT Law number 7/2010 requires timber exporters to pay 20% on the f.o.b. price on log exports, and 15% on sawn timber. Assuming a 50% logs and 50% sawn timber scenario of unlicensed exports EIA estimates that around \$22,896,011 in avoided tax may have been lost to State-revenues from total 2012 unlicensed exports to China worth around \$130,834,350.”

These issues, which imply that high ranking government officials are effectively stealing national resources and revenues for personal and political gain, have been the subject of two television documentaries and several newspaper articles in February 2013, and is prompting an official investigation by the Public Prosecutor's Office into the individuals and companies named in the report. Public and donor pressure must be maintained to ensure these investigations are properly conducted and appropriate actions are taken.

## 11.2 Main types of illegality

Most of the forestry regulations that exist are currently being broken or at least bent, so it is likely that most timber is illegal in one way or another.

The main type of illegality is unlicensed logging, and this includes:

- Completely unlicensed loggers
- Licensed loggers cutting:
  - outside their authorised area
  - species not included in their quotas
  - volumes in excess of their quotas

Many simple licences are awarded, although the applicants do not fulfil the minimum required criteria. Often, these licences are then sold on for use by other operators, to increase their quotas.

Many concessions are authorised on the basis of bogus management plans (see below 10.10), or without establishing the required industry.

Legality of the timber aside, export itself is also often illegal, in terms of falsified documents which:

- misrepresent the species exported (particularly claiming a Class 1 timber, which requires processing before export, to be another class - typically Class 2, 3 or 4 – which can be exported as logs.)
- under-report the volume exported
- misrepresent the value (often as a kind of transfer pricing)

The illegal export of logs of Class 1 species is still common, and is facilitated by corrupt government officials and political patrons, in exchange for bribes.

Other types of illegality include breaking of labour laws, particularly with the import of Chinese labourers to work in concessions and sawmills, and the illegal transit and onward purchase of timber.

### 11.3 Inconsistent data and lack of transparency in the forest sector

A recent government report on the performance of the agricultural sector highlighted the inconsistency of the data presented by the DNTF, SPFFBs and the Department of Agriculture, and the lack of any reliable indicators to assess performance on forest law enforcement (Ministry of Finance 2010). Data provided in Sections 6 and 7 above also demonstrate how reporting has become less transparent and accurate since 2009.

### 11.4 Inconsistent and contradictory data on timber export

Section 8 above presented details of the inconsistent data on timber export from Mozambique – both amongst responsible agencies in Mozambique, and between Mozambique and China Customs.

**Table 9 Comparison of statistics for Chinese imports and Mozambican exports of logs and sawn timber (2007-2012)**

Years	2007	2008	2009	2010	2011	2012	Total
<b>Log and sawn timber imports from Mozambique registered by China (m<sup>3</sup>)</b>	219,000	197,000	155,000	311,000	351,000	450,000	1,683,000
<b>Log and sawn timber exports to world markets registered by Mozambique (m<sup>3</sup>)</b>	86,912	103,087	114,178	199,418	211,995	260,385	975,975
<b>Discrepancy (m<sup>3</sup>)</b>	132,088	93,913	40,822	111,582	139,005	189,615	70,7025
<b>% of Chinese imports that exceed licensed exports</b>	60.3	47.7	26.3	35.9	39.6	42.1	42.0

Sources: EIA 2013 (SPFFBZ data; China Customs data).

For emphasis here, a comparison of China's statistics on imports of timber from Mozambique with Mozambique's statistics on its timber exports to China (so-called "mirror statistics") are presented showing significant divergence in reported values, volumes and composition, with China reporting values and volumes far exceeding Mozambique's total timber exports (German and Wertz-Kanounnikoff 2012, EIA 2013). Table 9 summarises Figure 5, showing how China's records of log and sawn timber imports from Mozambique exceeds Mozambique's own reported total global exports of the same products by an average of 42% over six years.

### 11.5 Commercial extinction of pau ferro

*Pau ferro* (ironwood, *Swartzia madagascarensis*) is one of the most valuable and sought-after of Mozambique's timber species. After only seven years of "sustainable harvesting" in accordance with the 2005 inventory and national quotas, many stakeholders are complaining that this species is now being cut at diameters well below the legal limit of 30 cm, a strong indicator that it is nearly commercially extinct.

### 11.6 Seizures and subsequent exports of illegal timber

Every year there are one or two dramatic seizures of containers of logs in the ports, but typically, the timber gets exported anyway.

For example, in 2008, an inter-agency inspection team investigating corruption among customs officials found over 750 containers of illegal logs worth about USD 7 million, belonging to several different Chinese companies, in a port of Nacala. The customs tribunal issued fines totalling USD

556,000, but the companies were still allowed to export the wood, worth USD 7 million (Roque, 2009).

Last year (2011), the same thing happened. Over 500 containers with illegal logs (approximately 9,000 m<sup>3</sup> owned by eight Asian traders) were discovered, following a tip-off, at Nacala port. The logs were seized, the companies were fined, but they bought back their logs at auction, sawed them into rough planks, and exported them as usual. The companies continue to do business. This is normal procedure. Such illegal consignments are thought to be the “tip of the iceberg”, and the seizures only made to help forestry keep up the appearance of law enforcement (see 10.11 below).

### **11.7 Log parks near the port of Beira, Sofala Province**

Many informants drew attention to the enormous number of log parks along the main road leading into the port of Beira. Google Earth imagery from September 2011 reveals nearly 30 of them (Photo 2) and study of earlier imagery indicates that most of them have been established in the last three years. Each park is thought to contain 3-7,000 m<sup>3</sup> of timber, and the turnover within the parks is said to be in the order of weeks rather than months. Although the Zambia country study for the present report indicates that at least some of the timber is likely to originate in this landlocked neighbouring country, most of the export is nevertheless believed to be from Mozambique and illegal. NGO and other forest sector observers are demanding a detailed study of timber movements through Beira port.

The current situation in Sofala presents a dramatic contrast with a decade ago. In the early 2000s, there was a very positive commitment and collaboration amongst the Governor, the chief of Provincial Forest Services and the Director of Agriculture, who together were able to enforce a complete ban on log exports from the port of Beira. It demonstrated the importance and effectiveness of political will in controlling illegal activities. However, this only lasted a couple of years. The officials were soon transferred elsewhere and replaced with less committed people, and the governance began its decline to the current parlous state.

### **11.8 Increase in “Furtivos” and the involvement of local communities in illegal logging**

In the mid-2000s, illegal logging was mainly the result of licensed loggers exceeding their quotas. Over the last 3-5 years there has been a dramatic increase in the number of completely unlicensed loggers (“furtivos”). They typically work with local communities, often paying a bribe to the community leader to gain access to the forests, and then buying the timber from community loggers. Increasingly, villagers are doing their own logging, and approaching buyers themselves. “Furtivos” also typically work with Chinese exporters, as evidenced by the dramatic increase in modern trailer trucks of Chinese origin, which are used to transport the timber.

### **11.9 Problems with existing donor funded forestry initiatives**

International donors have supported the Ministry of Agriculture, and the DNTF for years, through programmes such as ProAgri (budget support based), but this support has gradually been withdrawn, now leaving only a small sector-support programme in Zambézia (PRODEZA), the Finnish-funded Support to the National Forestry Programme (APRONAF), and an FLEGT programme on community-based law enforcement. Both the latter programmes have been experiencing serious problems with management of funds. During 2011 and 2012, Finland’s Ministry of Foreign Affairs initiated two forensic audits of its forest sector support and in October 2012, suspended APRONAF and all activities with the Ministry of Agriculture, because of the irregularities revealed, and further, are now attempting to recover hundreds of thousands of Euros of their funding from the GoM.<sup>14</sup>

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<sup>14</sup> <http://www.finland.org.sa/Public/default.aspx?contentid=261249&nodeid=40847&contentlan=2&culture=en-US>

## 11.10 Government measures to combat illegal logging: “So pra ingles ver” (“just for the English to see”)

There is some question amongst NGO stakeholders whether the recent high profile seizures of illegal timber (see 10.7 above and EIA (2013) for details) represent a genuine improvement in forest governance and political will, or something staged to create an impression of commitment, while the government actually continues to condone and collude in illegal activities. In Portuguese, this is dubbed “so pra ingles ver” (“just for the English to see”, or “just for appearances”).

There is similar scepticism amongst NGOs, about the new forestry regulations. They introduce two major changes, a dramatic increase in fines for forest infractions and a change to the simple license regime, converting them from one year to five years in duration, and requiring a simple inventory and management plan. This is presented as a kind of “mini-concession”, helping small operators to graduate to full concessionaire status. However, sceptics point out that the new fines will simply result in larger bribes, and that the full concessions are currently totally out of control and not an example to be emulated.

## 11.11 Quality of management plans

In 2000, there was only one approved forest concession in Mozambique, that of Madal Ltda, in Zambezia. Interest grew rapidly and by 2001, there were 33 applicants, and a considerable uncertainty regarding what was expected of a concession management plan. So, concession management manual was prepared in 2002 (Sitoé and Bila 2002) although not finally published until 2005. The manual is basically an annotated table of contents for a management plan indicating the kind of information that needs to be presented. There is little technical guidance, particularly on the requirements for the concession inventory.

DNTF does not make management plans available to the public on the grounds that they are commercially sensitive. However, in 2008, SPFFB Zambézia permitted the review of 20 concession management plans which had been approved by DNTF. The study found that 62 % of the plans had been prepared by a single consultant. The overall format and particularly the technical management prescriptions were all standardised too. So, although forest scientists are agreed that the cutting cycle in Zambézia should be at least 30 years, all the management plans were based on a 20-year rotation, and many proposed to take all the presently valuable timber in the first 5-10 years. When asked about this, the consultant admitted that the cutting cycle was too short. He explained that if the proper rotation were used, the profit would be too low for the businesses concerned. Furthermore he said that the previous head of DNTF, Arlito Cuco, had agreed with this shorter rotation. Once this precedent was set, all other concessions followed. When asked why the concessions were not simply made larger he replied that large concessions were expensive to establish (especially the cost of management plans), difficult to control, and investors didn't want them. So, in short, “the sustainability of forest management was being sacrificed to commercial convenience and profit” (Mackenzie with Ribeiro 2009).

There are many other problems with the management plans. The high cost of doing inventories means few were done well. A relatively small number of consultants, accredited by the DNTF, are permitted to conduct these inventories and management plans. They often use data provided to them from the Department; largely this is obtained from the national forest inventory data (Sun et al 2008), and often massaged to provide the investor with the desired figures (Nhantumbo and Ogle 2006). Environmental impact assessments and community consultations are typically done poorly, if at all. Annual production blocks are not coherent management units, reflecting the timber density, ecology and topography of the concession, but are simply a superimposed rectilinear grid. In short, concession management plans are a prime example of “so pra ingles ver”.

## 12. Stakeholder perceptions of illegal logging, challenges and the way forward

The DNTF readily admits there are problems in the forest sector. As in any sphere of activity, they reflect, there are people who do not respect the law. The DNTF and provincial services are constantly trying to improve their enforcement, but they lack staff, transport and equipment. They feel that the way forward involves greater investment and capacity building.

Civil society is increasingly well-informed, vocal and influential in its advocacy against illegal logging, but currently action has been limited to the national level in Maputo. Very little is happening in the provincial capitals or the timber producing districts. Consequently, while policy and legislation are improving, the field reality is changing little. Most NGOs are not membership-based, and critics have pointed out that they therefore do not represent the voice of the people. Amigos da Floresta and the Forest Governance Learning Group (FGLG), facilitated by IIED, discussed above, have been key initiative. Their programme in 2012 will include elements of education and information, advocacy and specific studies, as well as participation in public fora on forestry issues.

Concession operators complain that their concessions are now impossible to protect, from illegal loggers and in concessions close to urban areas, from charcoal producers.

NGOs are sceptical of some private sector operators. The multinational commodity trading company OLAM has forestry operations in four provinces and was previously implicated in illegal log exports. They now assert not only that they have stopped buying logs from third parties and only deal in logs from their own concessions, but are also pursuing certification of their concessions, and have an MOU with the GoM, regarding two large concession areas in northern Mozambique. However, informants report that they are continuing illegal operations, and have simply moved their log yards to less visible locations and started working through front companies.

Communities were initially hopeful that illegal logging in their own areas could be combated by empowering them to participate in policing, but have been disappointed by the lack of SPFFB support and follow-up when they have caught illegal operators.

Other informants commented: "Timber is like scrap metal – everyone knows the amount is limited and it's going to run out. The strategy is to get as much as you can as quickly as you can, before it is exhausted."

"There is no point in trying to stop this – too many powerful people are involved; there is simply no political will. The government is very dependent on the Chinese. Better to let them take the valuable timber they want, and then try to re-establish a forest industry based on lesser value species, after they have left."

"FRELIMO (governing political party) is heavily involved or implicated in illegal logging and export. But the forest sector is the tip of the iceberg. FRELIMO would like to establish a one party state, and is meanwhile ensuring its domination in all key economic sectors to prevent rise of any powerful opposition. Foreigners, and Mozambicans of foreign origin are allowed to participate in the main economic sectors, since, by some implicit agreement, they are not active politically."

Strategies suggested by stakeholders to address illegality in the forest sector include:

- The need to make forest infractions into crimes, imprison any nationals and expel (and prevent re-entry of) any foreigners convicted of forest offences
- Independent forest monitoring by an NGO or international agency
- Review of all existing forest concessions or applications, and cancellation of any that are in any way illegal or not performing.

- Donor pressure. Many informants decry the lack of donor condemnation of or even attention to illegal logging over the last 10 years, which has helped allow the problem to escalate.
- Moratorium on timber exports while necessary reforms are made.

Many stakeholders see the situation as hopeless, citing the same high level political involvement in the forest sector, as in the other main productive sectors of the economy (mining, fisheries, telecommunications), and linkages between government, business and organised crime.

### 13. Conclusions and Recommendations

Illegal logging in Mozambique started in the mid-1990s, and illegality in the sector is now multi-faceted, widespread and increasing. Most regulations that exist are being broken or at least bent, from the verification of a simple licence operator's non-existent harvesting equipment and the approval of suspect inventories and concession management plans that are patently "unsustainable", cutting outside one's allocated area, to the bribing of officials, issuance of fake licences and timber transport permits and the illegal export of raw logs. So, while it might be said that the government's assertions that Mozambique's overall timber harvest is within the established total annual allowable cut, this is only because they are deliberately ignoring the species quotas, which are individually exceeded. While many individual timber consignments appear to be accompanied by appropriate licences and transport permits, falsified documents are easily obtained, and conceal the fact that the timber is in one way or another illegal. It is also clearly part of what is overall, a totally unsustainable harvest, particularly when domestic timber consumption is considered.

Although illegal logging and its economic consequences have been subject to investigation, public outcry, donor supported interventions, and government statements of commitment for over a decade, forest governance has not improved. Cosmetic measures are taken to create the appearance of government commitment to its own policies and the rule of law, but meanwhile a culture of corruption and disregard for the law have spread widely. Turning this situation around now represents a huge challenge.

Something needs to be done. Illegal logging is threatening the future of the forest sector. A small group of conscientious operators potentially interested in exporting sustainably produced forest products to the EU is struggling to survive commercially and legally in the current climate. It is not clear, however, that a FLEGT VPA would be an effective measure. Only about 5,000 m<sup>3</sup> (1-2%) of Mozambican timber goes to Europe each year, while over 90% is exported to China, where it is consumed on their domestic market, rather than being processed for subsequent export to European markets. So, unless the markets change dramatically, FLEGT will not be relevant for addressing illegal timber harvesting and trade here. Several of the traditional export species are nearing commercial extinction, and while some new species are now entering the market, they have similar wood qualities, are destined for the same Chinese markets, and they are not abundant. The most abundant species, the messassas, are low value and while commercial interest in them for parquet and railway sleepers is increasing, it is unlikely to become significant. The future of the sector is very much in doubt, as is the relevance of FLEGT.

FLEGT is predicated on the political will of the government. Given current problems with high level government corruption, lack of transparency, accelerating rates of logging and the abuse of donor funds in the forest sector, a VPA, as envisaged up until now (i.e. a government managed programme) would also be extremely unlikely to deliver the required legality assurance. Although a FLEGT programme may help put illegal logging back on the national agenda, the negotiations to

achieve a VPA would require some investment from the EU, there is clearly no political will to address the problem of illegal logging and little prospect of a change in government. Any funds channelled through government will be vulnerable to abuse. This would be challenging and frustrating, and damage FLEGT's credibility internationally.

It is always possible to recommend further investigations, but the essential nature of forest governance problems in Mozambique have been sufficiently well-known for years and what has been lacking is strategic action. Support for independent forest monitoring in all the forestry provinces might be the most powerful measure against illegal logging, but is likely to be resisted by the GoM on the grounds of sovereignty, and will not help the good operators in the short term. Similarly, a strong signal from international donors to the GoM that corruption in and mismanagement of the forestry sector is unacceptable is overdue and may be useful. Additional support to civil society for advocacy may also have an impact, by keeping up the pressure on the government. As a first step in transparency, modest funding could be provided to enable DNTF and civil society to establish a forest governance website, where all the basic data and maps on operators, concessions, licensing, exploitation, industry and export could be posted. More practical and less contentious might be a programme of support to enable operators to establish and maintain FSC or other certification, or support for strategic marketing of legally produced Mozambican value-added wood products on European and Chinese markets. It would be interesting to explore these and other mechanisms to support conscientious operators, who could in the future constitute a core of sustainable forest management and timber trade, which might eventually spread elsewhere across the country.

Many previous studies (see 10.1 and 10.2) have made recommendations, to GOM, donors, NGOs, civil society. Some of these recommendations are repeated here.

#### **To the Government of Mozambique:**

- i) Take corruption seriously. It is or involves theft and should be treated as such. Make all types of corruption, at all levels, imprisonable and criminal offences.
- ii) Investigate the accusations made in the EIA report against past and current Ministers of Agriculture, and customs officials and prosecute those people accordingly. Fine them to recover lost revenues and use the revenues to support training in forest management and forest industries.
- iii) Revise the penal code to make illegal logging and illegal export of timber criminal offences. They also constitute theft.
- iv) Prosecute and imprison foreigners who break forestry laws, cancel any concessions, disband any companies, expel them after release and prohibit their return.
- v) Implement a moratorium on ALL logging until the situation is cleaned up.
- vi) Review all existing forestry concessions and cancel any whose management plans do not meet sustainable forest management criteria or that have been operating in any way illegally.
- vii) Reconfigure the concession system into fewer larger concessions that can be sustainably managed and at the same time, be economically viable.
- viii) Establish concessions for supply of the domestic timber and charcoal markets.
- ix) Pass regulations to (once again) require fully-squared processing of Class 1 timbers prior to export, in order to promote real forest industries
- x) Require Asian traders to demonstrate customers for processed timber.

- xi) Require DNTF (and their provincial offices) to report comprehensively and transparently on timber quotas, licensing (simple and concession), harvest, processing and export by species and province.
- xii) Require Customs to report on timber export by species, volume, processing status, by port, using consistent formats for volumes and values.
- xiii) Institute independent forest monitoring in key provinces by NGOs or an international agency.

**To the EU and other donors:**

- xiv) Donors have to stop turning a blind eye to the blatant and outrageous corruption in Mozambique's forest sector. Donors should cooperate with each other to suspend all development aid programmes until the forestry sector (and other corrupt sectors receiving development assistance) demonstrably has been cleaned up, in line with the recommendations above and elsewhere.
- xv) Explore scope for bringing international criminal proceedings against corrupt government officials.
- xvi) Support a study of the domestic timber market, and proposals to reform so that Mozambique's timber can be legal and affordable to Mozambicans.
- xvii) Support the development of HS codes for regional timber and timber-based products, and illustrated manuals and training to accompany them, (or the total reform of the HS system for timber and timber-based products.)
- xviii) Most clearly, but perhaps most controversially, with GoM, put pressure on the Chinese Government to institute a comprehensive prohibition on the import of illegal timber, and to enforce it strictly, starting with the state-owned enterprises. The EU could assist the Chinese government, timber and manufacturing associations to make the transition to legal procurement, manufacturing and export, to ensure access to European markets of Chinese wood-based products.

**To Asian traders**

- xix) Develop direct market links with end-users of fully sawn timber and semi-processed items (furniture parts, etc.).

**To NGOs**

- xx) Study the supply chain of timber entering Mozambique from Zambia.
- xxi) Study the links between logging and mining, particularly in Tete.

**To the Government of China**

- xxii) Establish preferential tariffs (no tariffs) on fully-processed and semi-manufactured timber products from countries that have been struggling with illegal export to China (in study region and beyond).
- xxiii) Prohibit the import of illegal timber, starting with state-owned forestry enterprises and their subsidiaries, including forest product importers to prohibit illegal trade and import of illegal timber.
- xxiv) Provide "untied" financial support for the development of local processing industries in Mozambique

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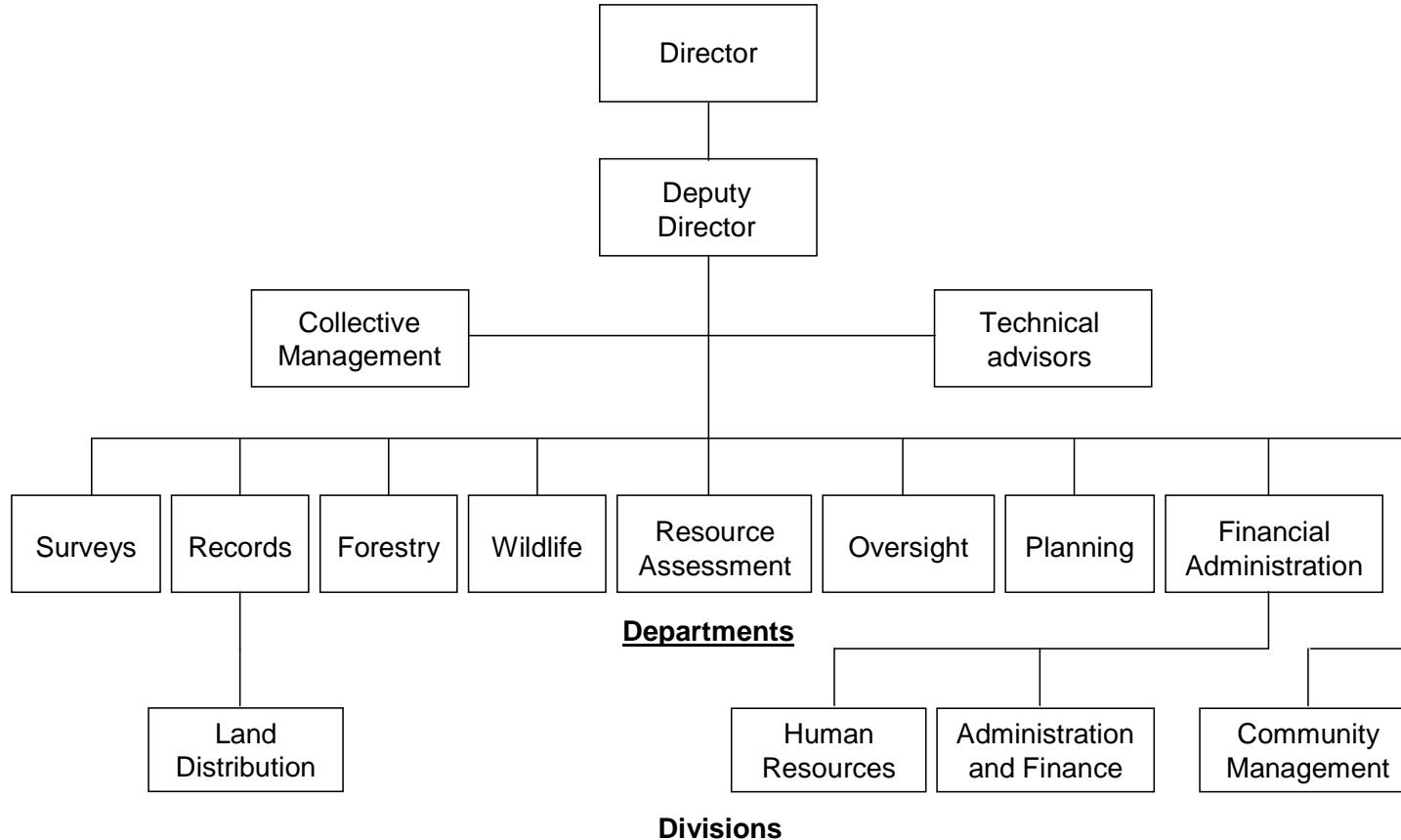
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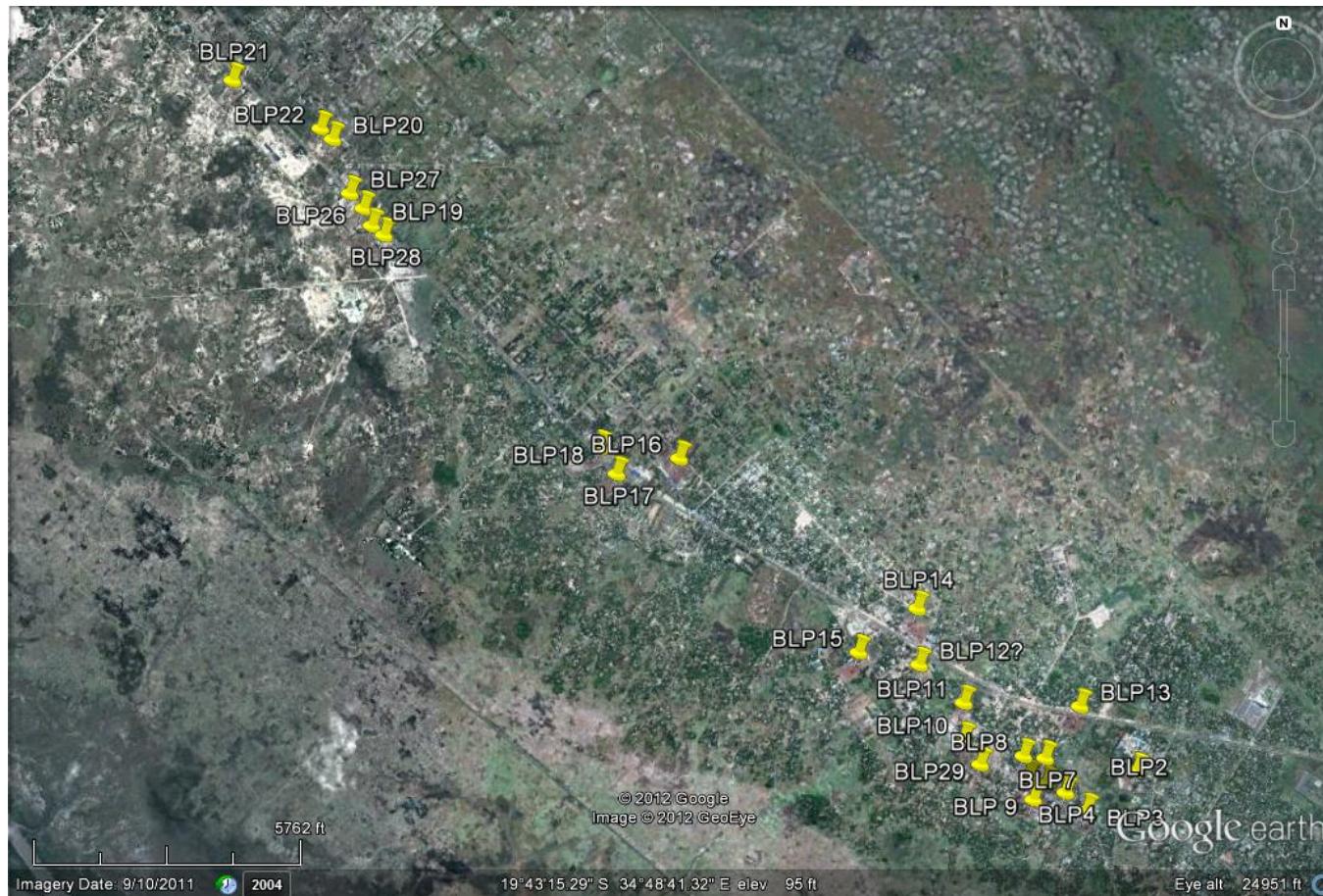
## Annexes

### Annex 1 Organogram of the National Directorate of Lands and Forests (DNTF)



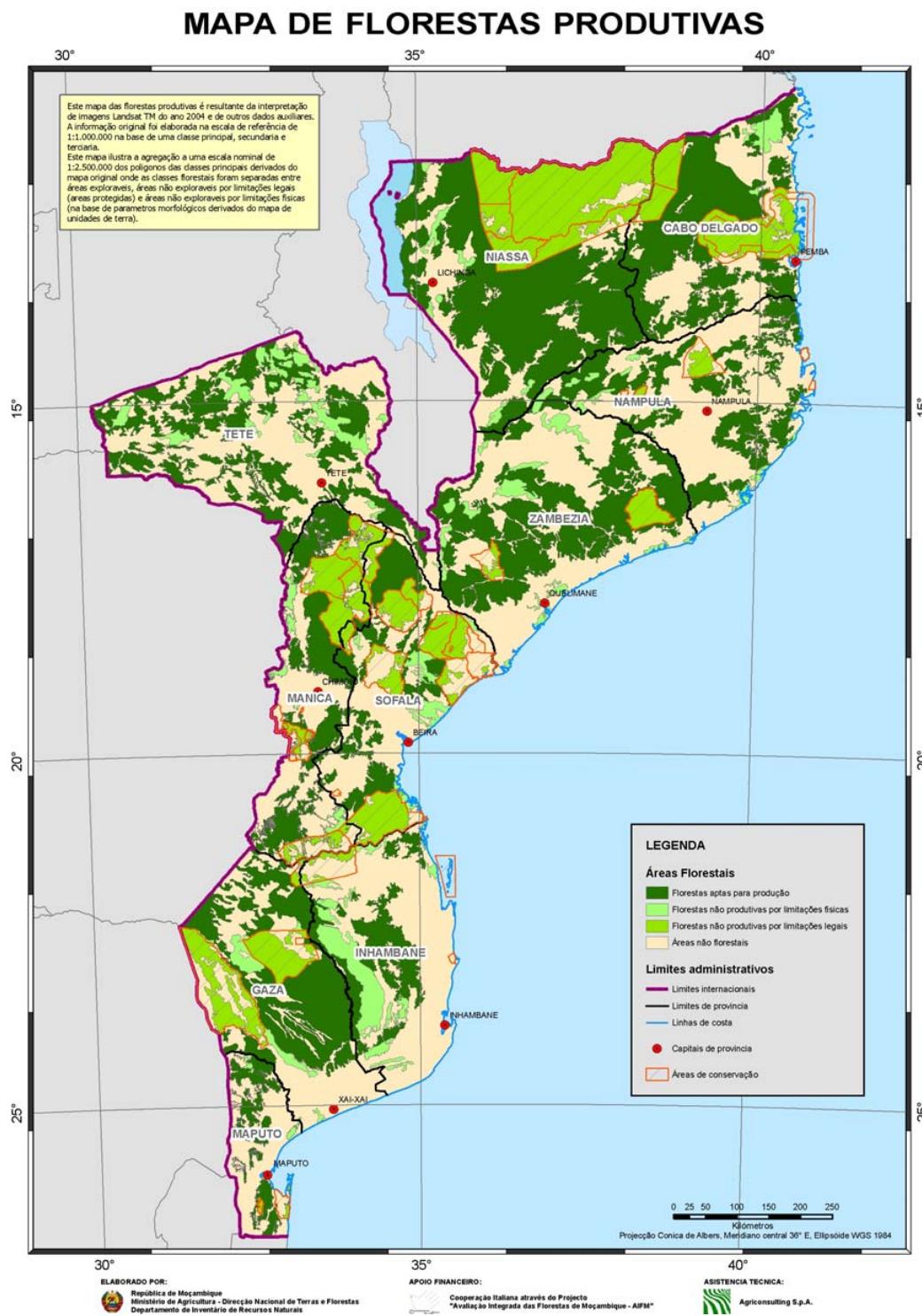
Source: DNTF powerpoint file dated 2012

**Annex 2 Satellite image showing concentration of log parks along the route into the port of Beira**



Source: Analysis of Google Earth, image dated August 2011

## Annex 3 Map showing the Distribution of Productive Forests in Mozambique



Source: Marzoli (2007)

## Annex 4 Annual Allowable Cut

a) by Province, following Saket (1994) and Marzolis (2007) (two methods of estimation) \*

Province	Saket (1994) 118 species	2005 inventory (Precious and Class 1 – 25 species)	
		(method 1)	(method 2)
		('000m <sup>3</sup> )	('000 m <sup>3</sup> )
Cabo Delgado	67.6	84.1	120.4
Gaza	13.1	62.8	113.9
Inhambane	20.8	28.2	33.3
Manica	21.4	49.0	64.2
Maputo	3.5	10.6	10.1
Nampula	54.4	42.6	57.1
Niassa	108.9	31.5	21.2
Sofala	93.6	53.3	81.2
Tete	28.9	31.9	48.0
Zambezia	88.0	121.6	91.2
<b>Total</b>	<b>500.2</b>	<b>515.7</b>	<b>640.5</b>

Source: Saket (1994), Marzoli (2007).

\* Method 1 – following Saket inventory data (1994) the AAC calculation is based on annual increments for each province, from 0.4 mm/yr in Gaza to 2.1 mm/yr in Zambezia.

Method 2 – following the Zambezia and Sofala inventories of 2005 (PMSR 2005), AAC is based on an annual increment of 2.5 mm/yr, offset by a mortality factor of 0.8.

b) Actual volume licensed in 2008 by species compared with new (2007) Annual Allowable Cut

Species	Volume licensed 2008 (m <sup>3</sup> /year)	Method 1		Method 2	
		Estimated AAC (m <sup>3</sup> /year)	Percentage exploited [a]/[c]	Estimated AAC (m <sup>3</sup> /year)	Percentage exploited [a]/[b]
		[a]	[c]	[b]	
<b>Precious</b>					
Pau-preto	1,030	18,132	6	22,520	5
Tule	5	4,847	0	6,020	0
Chacate Preto	4,035	6,602	61	8,200	49
Sandalo	629	8,390	7	10,420	6
<b>Sub-total</b>		<b>37,971</b>		<b>47,160</b>	
<b>Class 1</b>					
Jambire	29,741	67,633	44	84,000	35
Umbila	28,009	90,499	31	112,400	25
Chanfuta	25,890	40,483	64	50,280	51
Pau-ferro	12,425	14,734	84	18,300	68
Mondzo	16,462	10,628	155	13,200	125
Missanda	950	9,549	10	11,860	8
Muaga	16,868	30,016	56	37,280	45
Umbaua	837	7,778	11	9,660	9
Mutondo	1,293	9,791	13	12,160	11
Mecrusse	1,663	23,414	7	29,080	6
<b>Sub total</b>		<b>304,525</b>		<b>378,220</b>	
<b>Class 2</b>					
Mepepe	793	3,494	23	4,340	18
Mucarala	514	33,994	2	42,220	1
Mutiria	545	644	85	800	68
<b>Messassa</b>	<b>10,241</b>	<b>373,817</b>	<b>3</b>	<b>464,280</b>	<b>2</b>
<b>TOTAL</b>		<b>754,445</b>		<b>937,020</b>	

Source: DNTF Annual Report 2008 (using Marzoli 2007)

## Annex 5 Supplementary Graphs on Mozambique's Trade in Wood-based Products

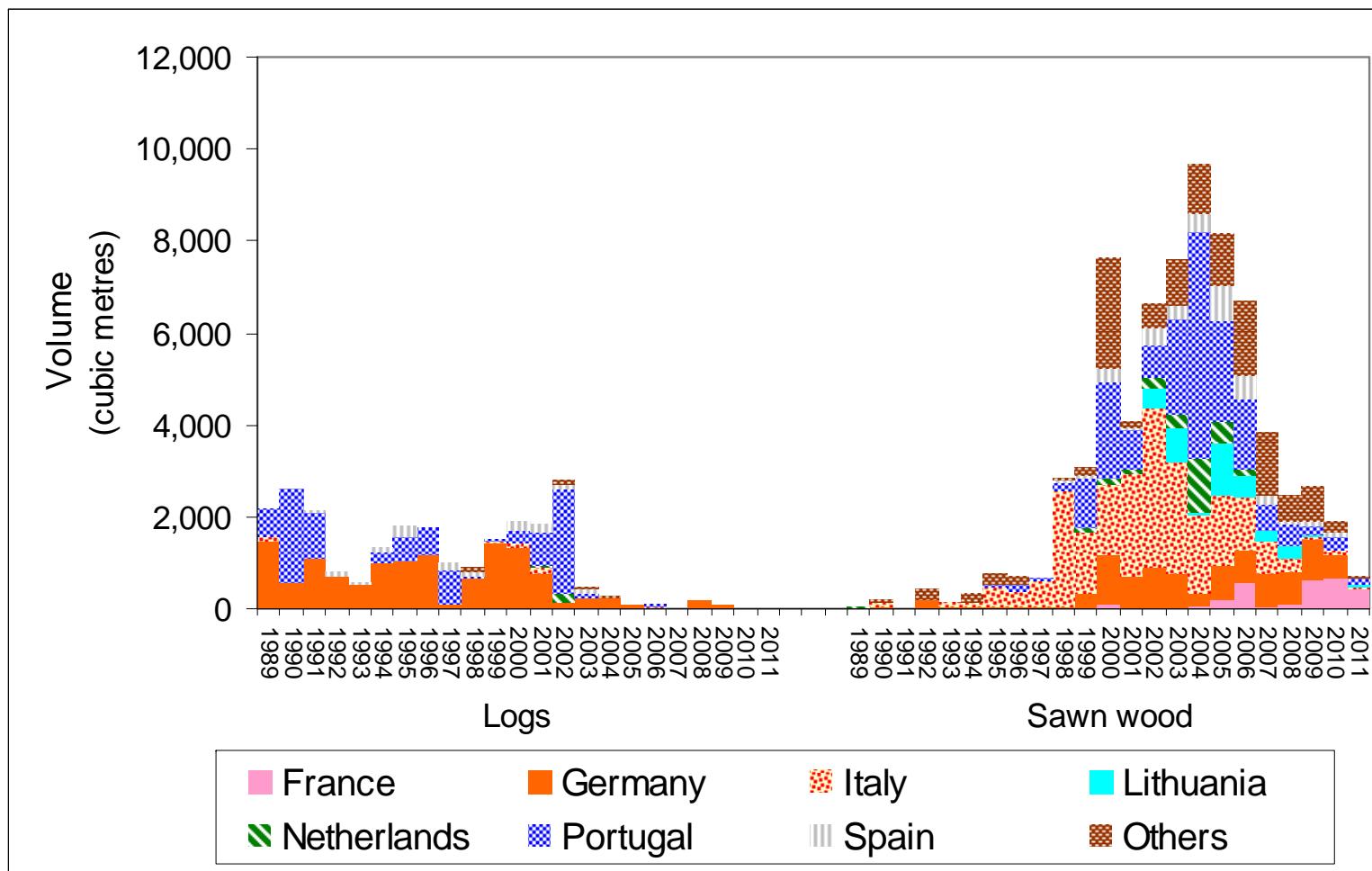


Figure 8 EU-27 Member States' imports of logs and sawn wood from Mozambique

Source: UN Comtrade, 2012

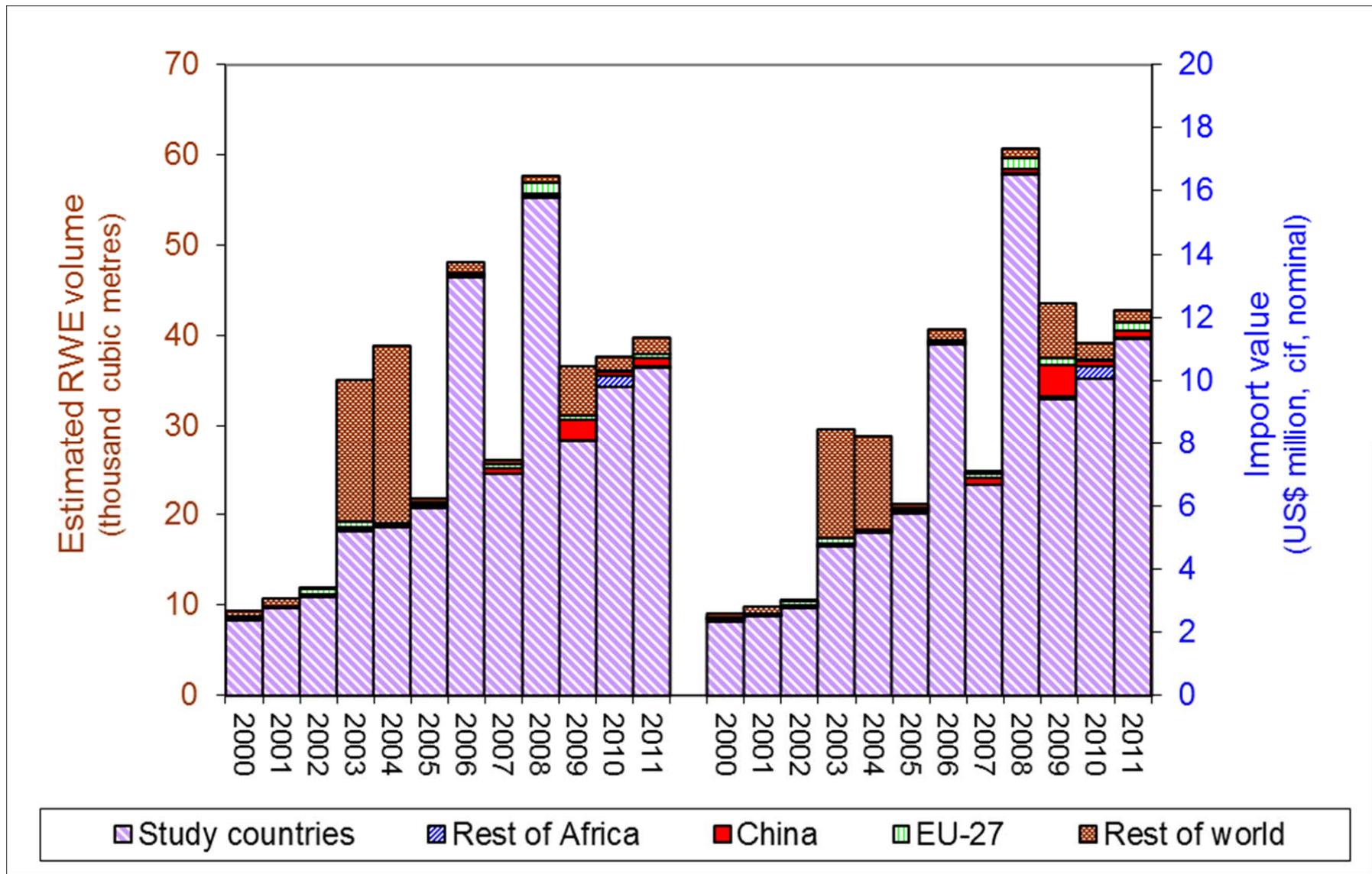


Figure 9 Mozambique's imports of VPA core products

Source: UN Comtrade, 2012

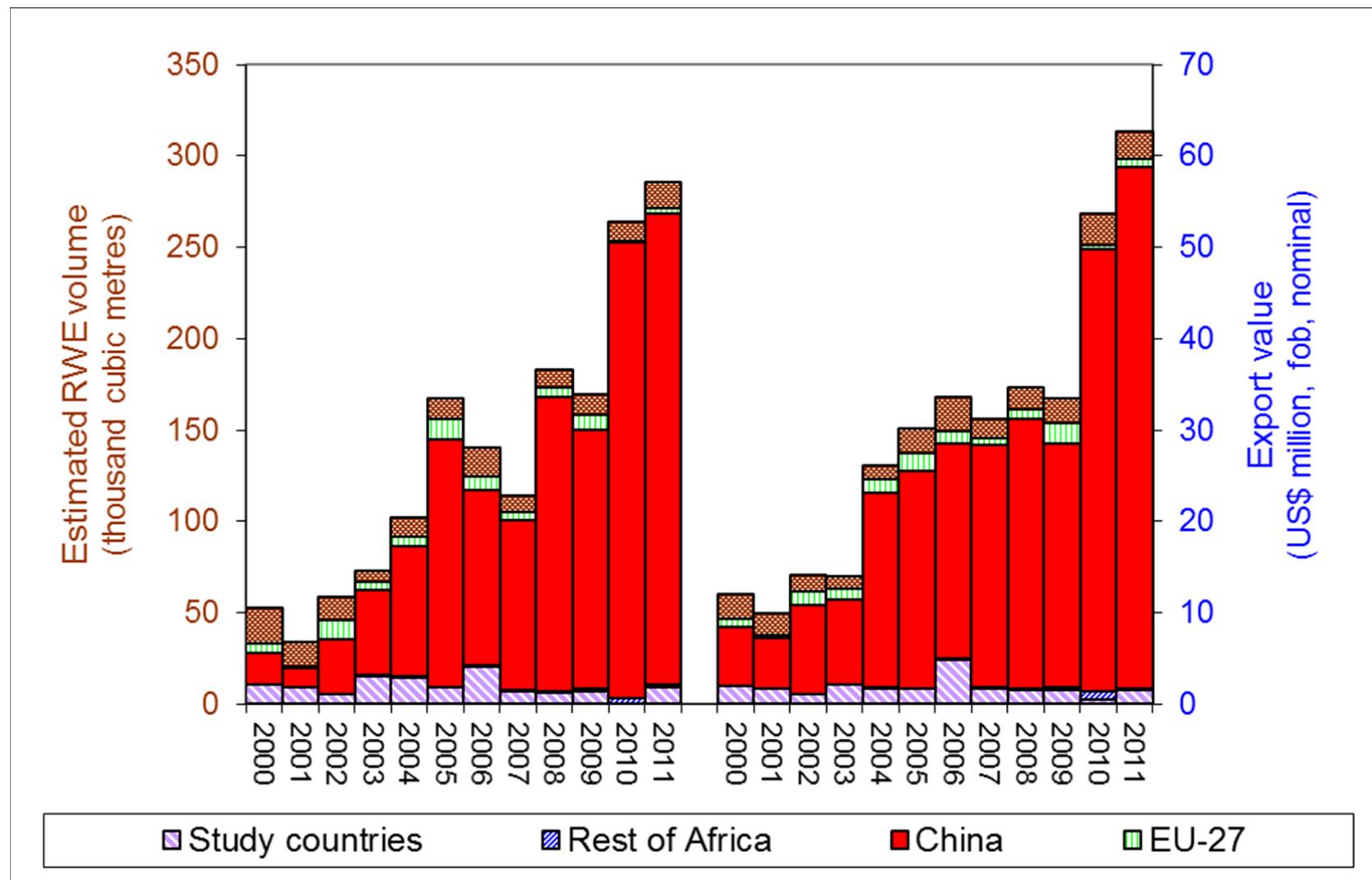


Figure 100 Mozambique's exports of VPA core product

Source: UN Comtrade, 2012

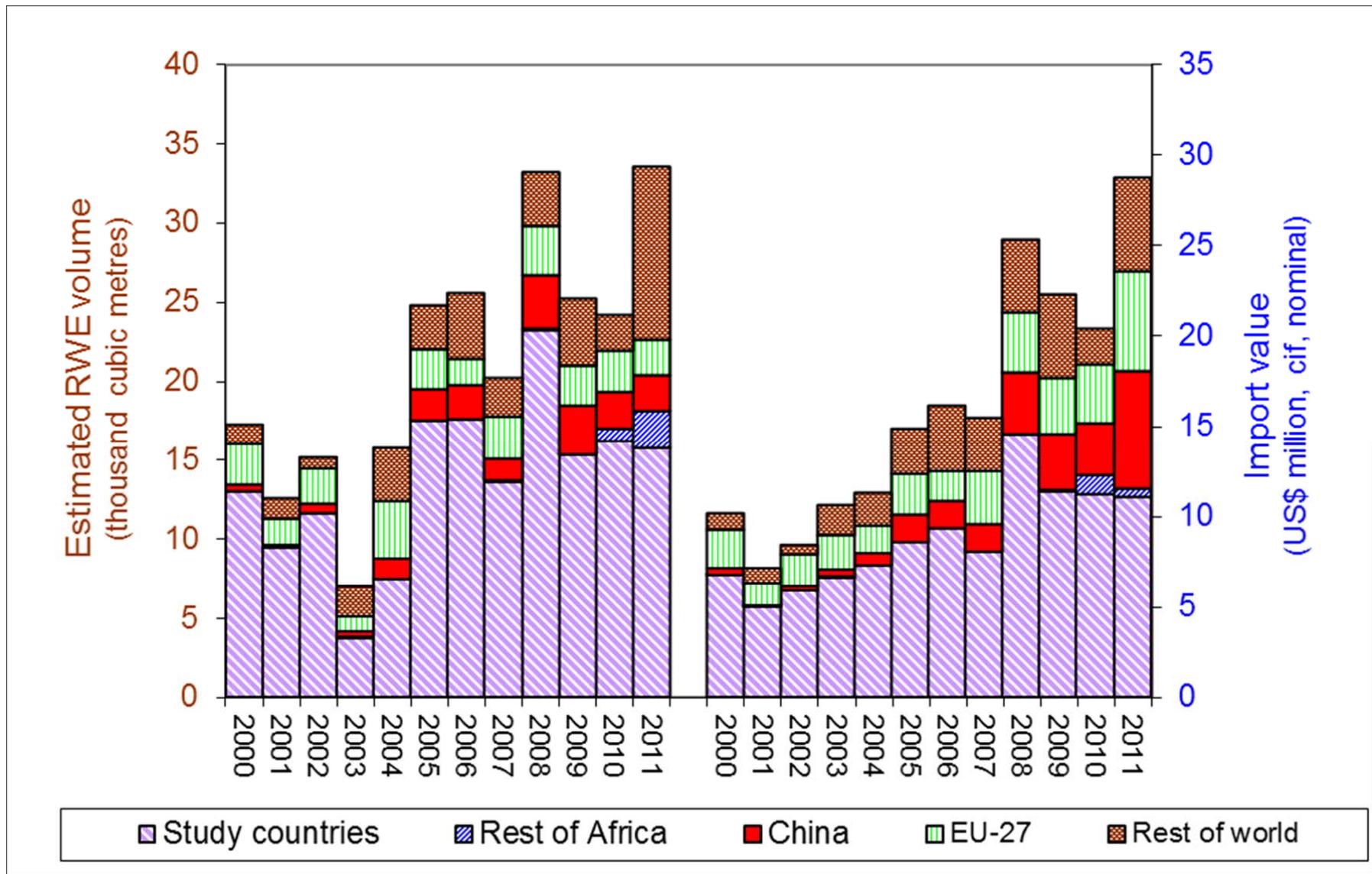


Figure 11 Mozambique's imports of other Timber Sector products

Source: UN Comtrade, 2012

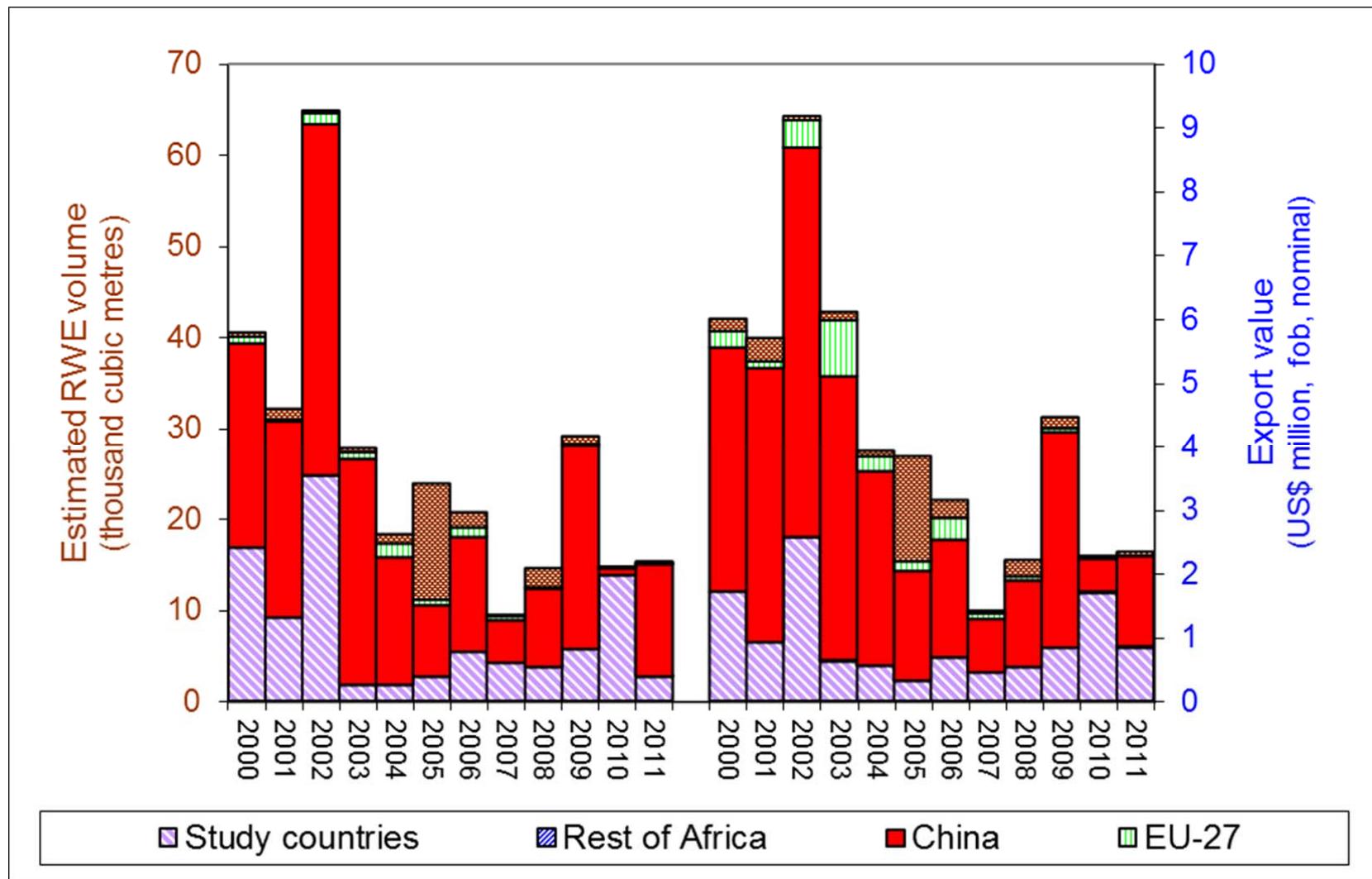


Figure 12 Mozambique's exports of other Timber Sector products

Source: UN Comtrade, 2012

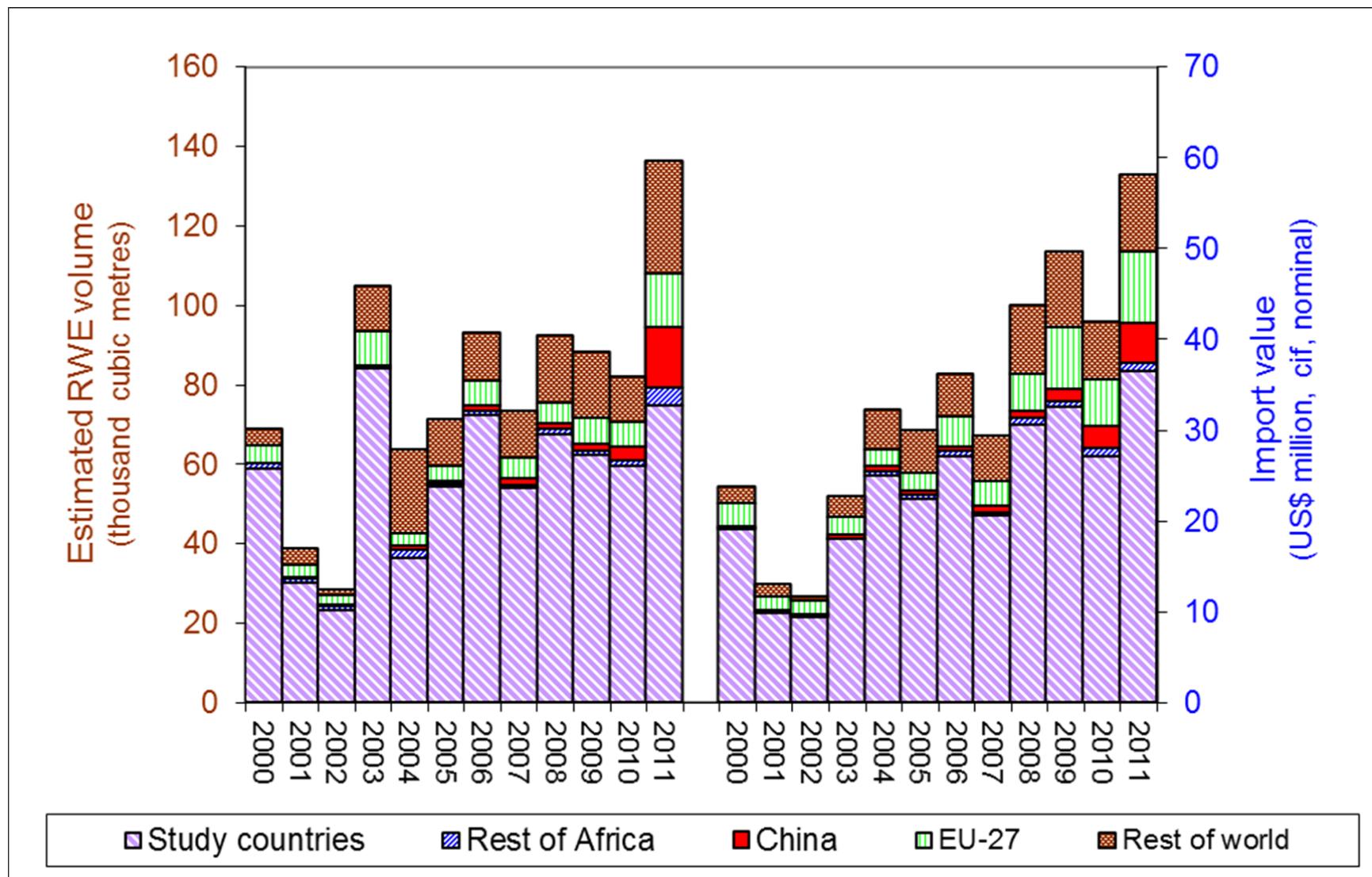


Figure 13 Mozambique's imports of Paper Sector products

Source: UN Comtrade, 2012

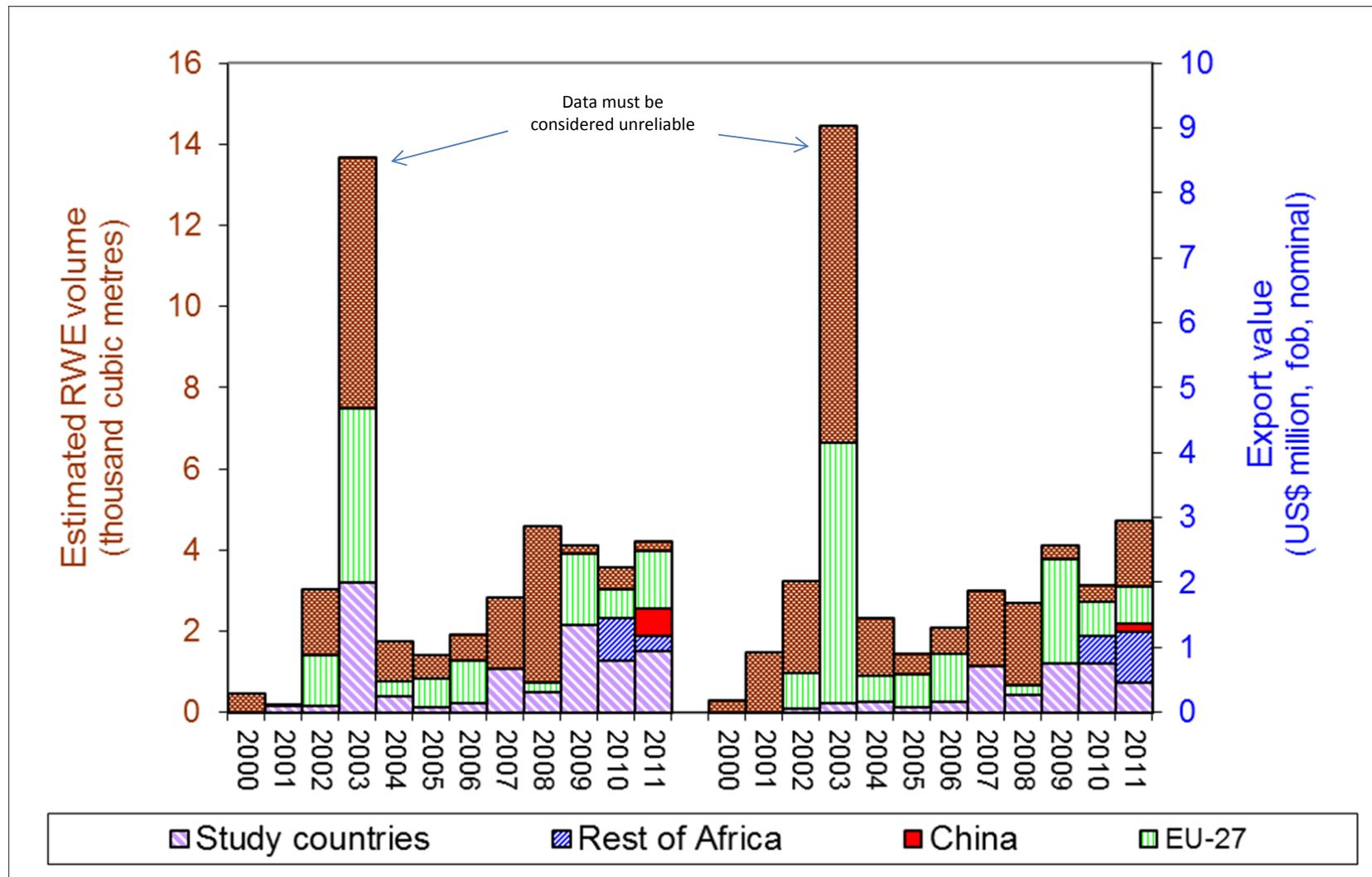


Figure 14 Mozambique's exports of Paper Sector products

Source: UN Comtrade, 2012

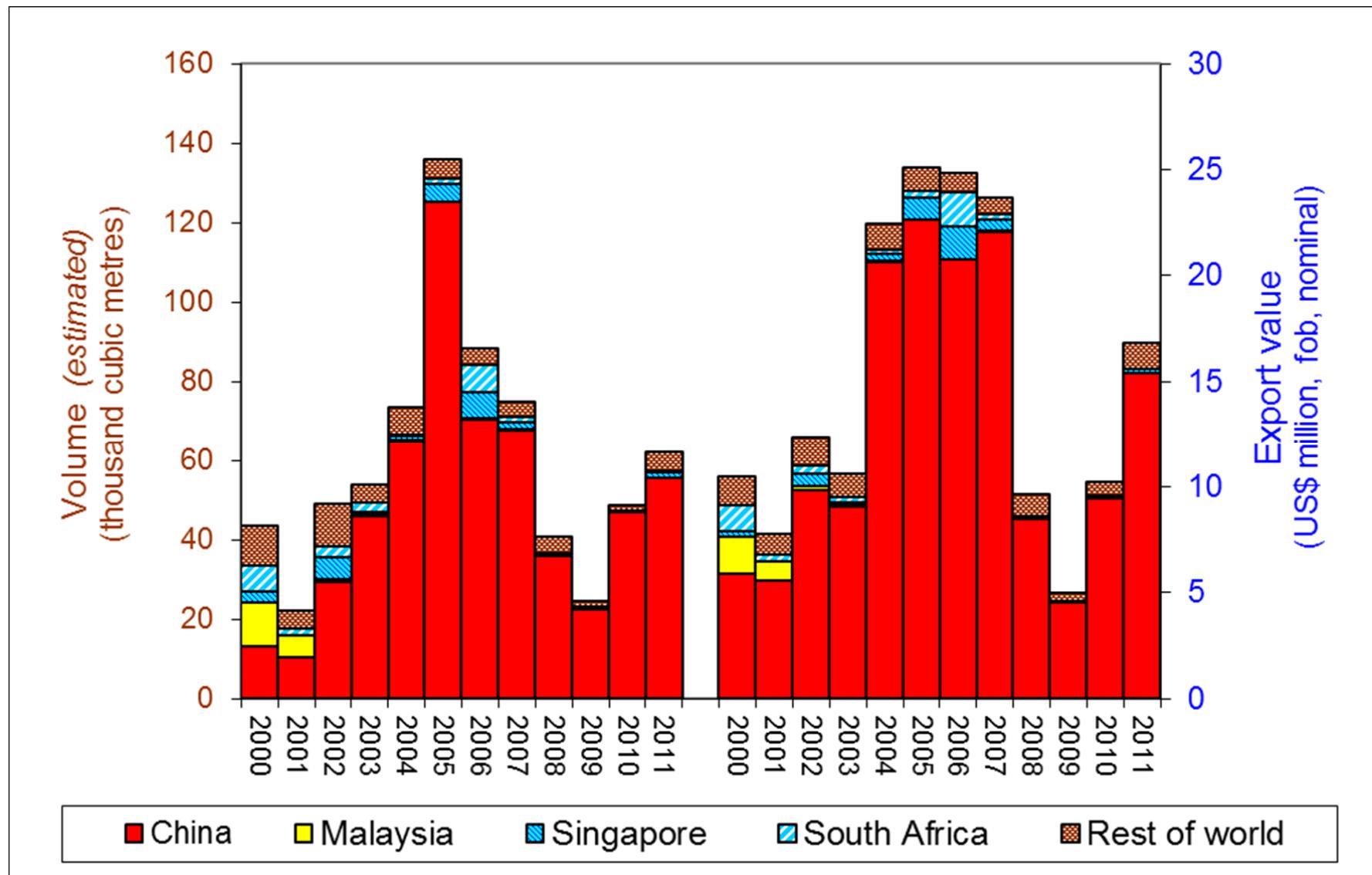


Figure 15 Mozambique's exports of logs

Source: UN Comtrade, 2012

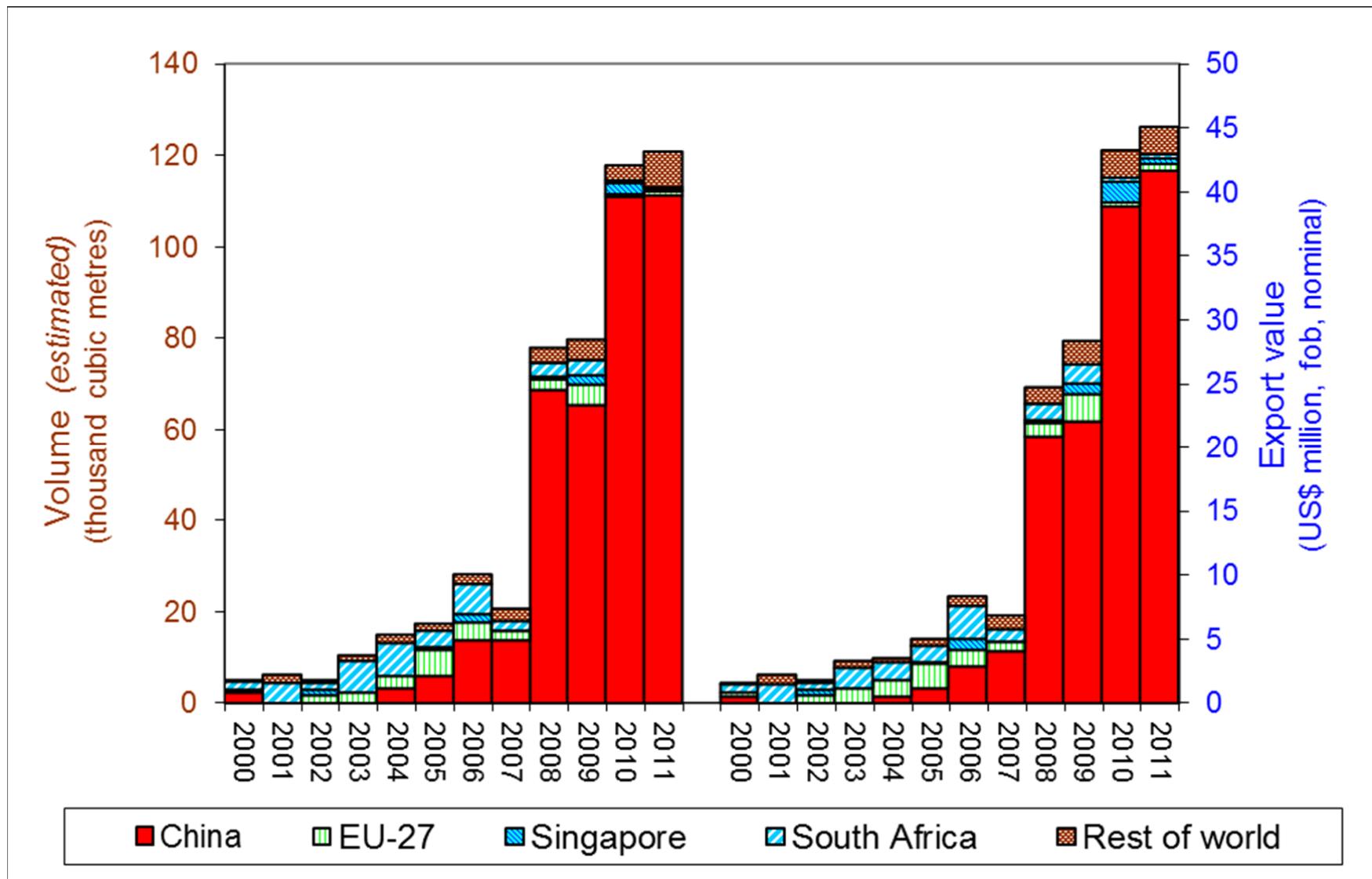


Figure 16 Mozambique's exports of sawn wood

Source: UN Comtrade, 2012

## Annex 6 Supplementary Tables on Mozambique's trade in wood-based products (all based on UN Comtrade data 2000-2010)

### a) Exports (by sector and major product group), 2000 – 2010

Product group	Estimated roundwood equivalent volume (thousand m3)										Export value (US\$ million, fob, nominal)											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Total</b>	<b>93</b>	<b>67</b>	<b>121</b>	<b>92</b>	<b>112</b>	<b>161</b>	<b>170</b>	<b>142</b>	<b>151</b>	<b>171</b>	<b>159</b>	<b>14</b>	<b>12</b>	<b>19</b>	<b>25</b>	<b>29</b>	<b>33</b>	<b>37</b>	<b>34</b>	<b>33</b>	<b>40</b>	<b>58</b>
Timber sector	90	62	118	78	110	159	168	139	146	167	155	14	11	17	16	27	32	36	32	32	38	56
Paper sector	0	0	3	14	2	1	2	3	5	4	4	0	1	2	9	1	1	1	2	2	3	2
Fuel sector	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VPA core	72	51	92	75	105	143	153	134	132	138	141	12	10	14	14	26	30	34	31	29	33	54
Logs	65	40	83	56	77	117	111	102	37	19	26	10	8	12	11	22	25	25	24	8	5	10
Sawn wood	7	11	9	19	27	26	41	30	94	118	115	2	2	2	3	3	5	8	7	21	28	43

### b) Imports

Product group	Estimated roundwood equivalent volume (thousand m3)										Import value (US\$ million, cif, nominal)											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Total</b>	<b>96</b>	<b>62</b>	<b>56</b>	<b>147</b>	<b>119</b>	<b>118</b>	<b>167</b>	<b>120</b>	<b>184</b>	<b>150</b>	<b>144</b>	<b>37</b>	<b>23</b>	<b>23</b>	<b>42</b>	<b>52</b>	<b>51</b>	<b>64</b>	<b>52</b>	<b>87</b>	<b>84</b>	<b>74</b>
Timber sector	27	23	27	42	55	47	74	46	91	62	62	13	10	11	19	20	21	28	23	43	35	32
Paper sector	69	39	29	105	64	71	93	73	93	89	82	24	13	12	23	32	30	36	29	44	50	42
Fuel sector	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VPA core	9	11	12	35	39	22	48	26	58	37	38	3	3	3	8	8	6	12	7	17	12	11
Logs	2	3	3	24	26	6	28	5	33	13	10	0	0	1	5	4	1	6	2	10	5	4
Sawn wood	6	7	7	10	11	13	15	18	21	19	24	2	2	2	3	3	4	5	4	6	6	6
Plywood	1	1	2	1	1	2	5	3	4	5	3	0	0	0	0	1	1	1	1	2	1	1
Other panels	3	2	3	3	5	6	6	4	7	5	2	1	0	1	1	1	2	2	1	2	1	1
Wooden furniture	1	1	2	1	1	2	5	3	4	5	3	0	0	0	0	1	1	1	1	2	1	1
Paper	69	39	28	105	64	71	93	73	92	88	82	24	13	12	23	32	30	36	29	44	50	42

c) Mozambique's exports of logs and sawnwood (by destination country)

Destination	Physical quantity (thousand m <sup>3</sup> or thousand tonnes)										Export value (US\$ million, fob, nominal)											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
<b>Logs (physical quantity – estimated volume)</b>																						
<b>Total</b>	<b>65</b>	<b>40</b>	<b>83</b>	<b>56</b>	<b>77</b>	<b>117</b>	<b>111</b>	<b>102</b>	<b>37</b>	<b>19</b>	<b>26</b>	<b>10</b>	<b>8</b>	<b>12</b>	<b>11</b>	<b>22</b>	<b>25</b>	<b>25</b>	<b>24</b>	<b>8</b>	<b>5</b>	<b>10</b>
Study countries	7	2	3	3	1	2	7	2	0	1	0	1	0	0	0	0	2	0	0	0	0	
Rest of Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
China	34	28	63	48	68	106	93	95	32	17	24	6	6	10	9	21	23	21	22	7	4	9
EU-27	4	0	8	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	
Rest of world	19	10	9	5	8	9	10	5	4	1	2	3	2	1	1	2	2	1	1	0	1	
Malaysia	11	6	1	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	
Singapore	3	0	5	1	1	4	6	2	0	0	0	0	0	1	0	2	0	0	0	0	0	
South Africa	7	2	3	2	1	2	7	1	0	1	0	1	0	0	0	0	2	0	0	0	0	
<b>Sawn wood (physical quantity – estimated volume)</b>																						
<b>Total</b>	<b>4</b>	<b>6</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>14</b>	<b>23</b>	<b>17</b>	<b>52</b>	<b>65</b>	<b>63</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>8</b>	<b>7</b>	<b>21</b>	<b>28</b>	<b>43</b>
Study countries	2	4	2	7	8	4	7	2	3	3	0	1	1	1	2	1	1	3	1	1	2	0
Rest of Africa	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	
China	1	0	0	1	3	3	8	10	43	51	56	1	0	0	0	1	1	3	4	17	22	39
EU-27	1	1	1	2	3	6	4	2	2	5	1	0	0	1	1	2	1	1	1	2	0	
Rest of world	0	2	2	1	1	2	3	2	3	6	5	0	1	1	0	0	1	1	1	2	3	
South Africa	2	4	1	7	7	4	7	2	3	3	0	1	1	1	2	1	1	3	1	1	0	

d) Mozambique's imports of logs, sawnwood, wooden furniture and paper (by supplying country)

Destination	Physical quantity (thousand m <sup>3</sup> or thousand tonnes)										Import value (US\$ million, cif, nominal)											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<i>Logs (physical quantity – estimated volume)</i>																						
<b>Total</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>24</b>	<b>26</b>	<b>6</b>	<b>28</b>	<b>5</b>	<b>33</b>	<b>13</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>4</b>	<b>1</b>	<b>6</b>	<b>2</b>	<b>10</b>	<b>5</b>	<b>4</b>
Study countries	2	2	3	8	7	6	28	5	32	8	10	0	0	0	2	1	1	5	2	10	4	4
Rest of Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
China	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EU-27	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rest of world	0	0	0	14	19	0	0	0	0	4	0	0	0	0	3	3	0	0	0	0	1	0
South Africa	1	1	3	8	6	6	26	4	32	7	10	0	0	2	1	1	5	2	10	3	4	
Unspecified	0	0	0	14	19	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0
<i>Sawn wood (physical quantity – estimated volume)</i>																						
<b>Total</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>10</b>	<b>12</b>	<b>10</b>	<b>13</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>6</b>
Study countries	3	4	4	5	6	7	8	10	11	10	12	2	2	2	3	3	4	5	4	6	5	5
Rest of Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
China	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
EU-27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rest of world	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0
South Africa	3	3	3	4	5	6	6	7	10	8	12	2	2	2	2	3	3	4	3	5	4	5
<i>Wooden furniture (physical quantity – estimated weight)</i>																						
<b>Total</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>7</b>	<b>5</b>	<b>6</b>	<b>8</b>	<b>7</b>	<b>10</b>	<b>11</b>	<b>11</b>	<b>15</b>	<b>16</b>	<b>14</b>
Study countries	1	1	2	0	0	1	2	1	2	2	2	4	3	4	4	4	5	4	6	7	6	
Rest of Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

China	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	1	1	1	3	2	3
EU-27	1	0	1	0	1	1	1	1	1	1	1	1	2	1	1	1	1	2	2	3	3	3	3
Rest of world	0	0	0	1	1	1	1	1	1	0	1	1	0	2	2	2	3	3	4	4	4	3	
South Africa	1	1	2	0	0	1	2	1	1	2	2	2	4	3	4	4	4	5	4	6	7	6	
<b>Paper (physical quantity – estimated weight)</b>																							
<b>Total</b>	<b>20</b>	<b>11</b>	<b>8</b>	<b>30</b>	<b>18</b>	<b>20</b>	<b>27</b>	<b>21</b>	<b>26</b>	<b>25</b>	<b>23</b>		<b>24</b>	<b>13</b>	<b>12</b>	<b>23</b>	<b>32</b>	<b>30</b>	<b>36</b>	<b>29</b>	<b>44</b>	<b>50</b>	<b>42</b>
Study countries	17	9	7	24	10	16	21	16	19	18	17		19	10	9	18	25	22	27	21	31	33	27
Rest of Africa	0	0	0	0	1	0	0	0	0	0	0		0	0	0	1	0	1	0	1	1	1	1
China	0	0	0	0	0	0	0	1	0	0	1		0	0	0	1	1	1	1	1	1	1	2
EU-27	1	1	1	2	1	1	2	1	2	2	2		3	2	2	2	2	2	3	3	4	7	5
Rest of world	1	1	0	3	6	3	3	3	5	5	3		2	1	0	2	4	5	5	5	8	8	6
South Africa	17	9	6	24	10	15	20	15	18	17	17		19	10	9	18	25	20	25	19	27	31	26