

International Trade in African Blackwood

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Published by Fauna & Flora International, Cambridge, UK

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Citation: Jenkins, M., Oldfield, S. and Aylett, T. (2002) *International Trade in African Blackwood*. Fauna & Flora International, Cambridge, UK

ISBN: 1-903703-05-0

Produced by: Fauna & Flora International, Cambridge, UK

Layout by: Cambridge City Council, City Services Design & Print for
Fauna & Flora International

Cover photo: Mpingo tree, African blackwood – Fauna & Flora International

Printed by: Cambridge City Council, City Services Design & Print

Available from: Fauna & Flora International
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Cambridge CB1 2TT, UK
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This document is printed on chlorine-free and 100% recycled paper.

Table of Contents

Acknowledgements	4	5.3 Estimating amounts of wood used for musical instrument manufacture	22
Summary		5.4 Other uses	23
Zusammenfassung	5	6- Value of African blackwood trade	25
Background	6	7- Conclusions and recommendations	27
1- Introduction	7	References	29
2- Production and exports - Tanzania	11	Appendix I: FFI questionnaire on African blackwood	31
2.1 Distribution and status	11	List of Tables and Boxes	
2.2 Production system - harvesting controls	11	Table 1 – Export of sawn timber of African blackwood from Tanzania	
2.3 Export controls	11	Table 2 – Export of African blackwood carvings from Tanzania	
2.4 Production of billets for export	12	Table 3 – 2002 harvest quota for African blackwood by province in Mozambique	
2.5 Export of roundwood	13	Table 4 – Export of African blackwood from the Province of Cabo Delgado, Mozambique	
2.6 Carving	13	Table 5 – Countries importing African blackwood from Cabo Delgado in 2001	
3- Production and exports - Mozambique	15	Box 1 – The Mwenge wood carving market - Dar es Salaam	
3.1 Distribution and status	15	Box 2 – National forestry policies in Mozambique and Tanzania	
3.2 Production system - harvesting controls	15		
3.3 Export controls	16		
3.4 Production of billets for export	16		
3.5 Export of roundwood	17		
3.6 Carving	17		
4- Production and export from other countries ..	19		
5- Use of African blackwood in export markets ..	21		
5.1 Importing countries	21		
5.2 Musical instruments	21		

Acknowledgements

The FFI *Sustainable Production and Trade in African blackwood* project, of which the production of this report forms part, has been generously financed by the Bundesamt für Naturschutz (German Federal Agency for Nature Conservancy). Fauna & Flora International is most grateful for this support.

The authors of this report would like to thank all the people consulted who generously provided information for the study and those who facilitated the collection of information through advice and assistance with arrangements. Support from government agencies in Tanzania and Mozambique is gratefully acknowledged with special thanks to: Professor Said Iddi, Director, Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism, Tanzania; Mr F.M. Mkeya, Forest Officer Utilisation, Forestry and Beekeeping

Division; Arlito Cuco, Director, National Directorate of Forestry and Wildlife, Mozambique; and Alima Issufo, Head of Forestry Research Center, Mozambique.

Particular thanks are also due to: Adriana Dinu, FFI/EarthVoice Partnership; Hubert Kwisthout, Forest Management Foundation; Josephine Mrembi and Simon Milledge, TRAFFIC East/Southern Africa; Susanne Schmitt, WWF UK; Hajo Schmitz-Kretschmer, Bundesamt für Naturschutz; Peter Sumbi, WWF Tanzania; Martin Weischmann, Theodor Nagel GmbH; and Vernon West, the Cambridge Mpingo Project.

In addition the contributions to the study from all the respondents to the questionnaire surveys and the participants in the technical workshops held in Mozambique and Tanzania are gratefully acknowledged.

Summary

African blackwood *Dalbergia melanoxylon* is a valuable timber in international trade used mainly in the manufacture of high quality musical instruments. It is also used extensively for the production of carvings. Concern has frequently been expressed in recent years about the status of the species in the wild. This report provides information on international trade in African blackwood based on recent study supported by the Bundesamt für Naturschutz (German Federal Agency for Nature Conservancy). It provides, for the first time, a comprehensive overview of the trade, concentrating on supplies for the musical instrument industry, drawing on detailed research in Mozambique, Tanzania and the main countries of import.

The report concludes that the international trade in timber of African blackwood has been relatively stable for many decades and that there is no immediate cause for concern about the species as a result of harvesting for musical instrument production. However, the lack of extensive inventory data and measures of annual increment of harvestable timber, mean that it is impossible to be confident about the sustainability of future supplies. Forest management practices which fully involve local people in southern Tanzania and northern Mozambique need to be put into place now for this globally important tree species.

Zusammenfassung

Das afrikanische Schwarzholz *Dalbergia melanoxylon* ist ein wertvolles Nutzholz im internationalen Handel, das hauptsächlich zur Erzeugung qualitativ hochwertiger Musikinstrumente sowie zur Herstellung von Holzschnitzereien verwendet wird. In den letzten Jahren wurden Stimmen laut, die Besorgnis über den Zustand dieser Art in ihrem natürlichen Habitat zum Ausdruck brachten. Der vorliegende Bericht enthält Informationen über den internationalen Handel mit afrikanischem Schwarzholz. Er basiert auf einer aktuellen Studie, die vom Bundesamt für Naturschutz unterstützt wurde und bietet erstmals einen umfassenden Überblick über den Handel mit diesem Holz, wobei die Versorgung der Musikinstrumenteindustrie im Mittelpunkt steht. Ausführliche Forschungsergebnisse aus Mozambique, Tansania und den wichtigsten Importländern lieferten die Grundlagen für den Bericht.

Der Bericht kommt zu dem Schluss, dass der internationale Handel mit afrikanischem Schwarzholz über viele Jahrzehnte hinweg relativ stabil verlaufen ist. Der Schlag von Schwarzholz zur Herstellung von Musikinstrumenten stellt allem Anschein nach keinen unmittelbaren Grund zur Besorgnis für die Art dar. Da allerdings ausführliche Bestandsdaten und Messungen über den jährlichen Zuwachs an schlagbarem Holz fehlen, kann die zukünftige Versorgung unmöglich mit Sicherheit garantiert werden. Um den Schutz dieser global wichtigen Baumart sicherzustellen, müssen jetzt Forstwirtschaftspraktiken eingeführt werden, die die einheimische Bevölkerung Südtansanias und Nordmozambiques umfassend mit einbeziehen.

Background

African blackwood *Dalbergia melanoxylon*, also referred to as ebony or grenadilla, has been a well-known timber in international markets for over a century, and is particularly renowned as the best timber for the manufacture of woodwind instruments, especially clarinets and oboes. In the past few decades concern has been frequently expressed regarding its status in the wild and the possible deleterious impacts of harvest on wild populations. In 1994 proposals were submitted by Kenya and Germany to the ninth meeting of the Conference of the Parties to CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) to include the species in Appendix II of the Convention. If these proposals had been accepted, international trade in the tree or its products between Parties would have been subject to monitoring and regulation.

Following discussion with the range states during the 1994 CITES meeting, the proposals were withdrawn to allow for more extensive consultation. In 1995 an international workshop, *Towards conservation and responsible use of Dalbergia melanoxylon*, organized by Fauna & Flora International (FFI) and hosted by the Government of Mozambique's National Directorate of Forestry and Wildlife (DNFFB), was held in Maputo, Mozambique. The objectives of this meeting were to review information on the species, prepare a regional conservation and management strategy and consider the appropriateness of CITES listing. The workshop noted the paucity and unreliability of data on trade in African blackwood. Such information on the nature and extent of the trade is clearly important in formulating policy for the conservation and sustainable use of this valuable timber, both nationally and internationally, and for providing advice to consumers of wood products.

The current international trade study was undertaken between April 2001 and March 2002 as part of the *Sustainable Production and Trade in African blackwood*

project. The overall aims of this project, generously supported by the Bundesamt für Naturschutz, were to investigate in detail the international trade in African blackwood and to establish the basis for a sustainable supply of the timber through locally appropriate management practices and forest certification.

In addition to this report, project outputs include *Guidelines for sustainable production of African blackwood* and a discussion document on forest certification in Mozambique and Tanzania. All outputs will be available on the Global Trees Campaign website www.globaltrees.org.

The international trade study involved extensive desk-based research as well as consultation and field observations in the two main exporting countries, Mozambique and Tanzania. A questionnaire survey was conducted with suppliers and users of African blackwood around the world. Over 80 questionnaires were sent to known suppliers and users and followed up by telephone calls or e-mails. Copies of the questionnaires are given in Appendix I of this report. In addition, interviews were held with companies in Europe and the USA and major clarinet manufacturers were approached at the International Clarinet Association annual festival (the "ClarinetFest 2001") held in New Orleans, USA, in August 2001.

In Mozambique and Tanzania sawmills processing African blackwood were visited. Interviews were conducted with sawmill managers or owners, government officials involved in forestry and regulation of timber exports, non-governmental organizations concerned with conservation and management of national resources, and some of those involved in the wood-carving industry. In addition, technical workshops were held in both Mozambique (Pemba, 25-26th February 2002) and Tanzania (Dar es Salaam, 8-10th October 2001) to discuss issues relating to sustainable production of African blackwood with a range of national stakeholders.

Introduction

1

African blackwood *Dalbergia melanoxylon* is a small, heavily branched deciduous tree in the Family Leguminosae (=Fabaceae) that is widespread in sub-Saharan Africa. It normally reaches a height of 4–8 m, very occasionally 19–20 m, and often has multiple trunks. Old trees may have a trunk diameter at breast height (DBH) approaching 1 m, although few trees at present have a DBH over 50 cm. The tree and its timber have many different local and trade names. The most important local names are mpingo (a Swahili name used in Tanzania, Kenya and elsewhere in East Africa) and pau preto (Portuguese for “blackwood”, used in Mozambique). Within the timber trade, the wood is often referred to as ebony or grenadilla, although both these names are also widely applied to other timbers.

The species occurs in a wide range of woodland habitats on soils that vary from loamy sands to black cotton soils (clayey vertisols). It does not generally occur on volcanic, saline or very loose sandy soils. It needs light and a good supply of moisture during the growing season, reportedly growing best in areas with annual rainfall (often distributed in a bimodal pattern) of 700–1,200 mm. Mean minimum temperature within its range is 18°C and the maximum 35°C. The species will not regenerate under heavy cover and is fire-sensitive in its early stages (Bryce, 1967).

According to Lock (1986), indigenous populations of African blackwood occur in: Angola; Botswana; Burkina Faso; Central African Republic; Chad; Côte d’Ivoire; Democratic Republic of Congo; Ethiopia; Kenya; Malawi; Mozambique; Nigeria; Senegal; South Africa;

Tanzania; Uganda; and Zimbabwe. The species is also reported to occur in Benin, Cameroon, Eritrea, Ghana, Guinea, Mali, Togo and Zambia. Early reports indicate that the species has been naturalised in India, and possibly elsewhere in Asia, although the current status of such populations is unknown.

The heartwood of African blackwood may be extremely dark and dense, capable of reaching a density as high as 1.3 g cm⁻³. It is close-grained and naturally oily and is widely considered to be the finest of all timbers for turning, cutting very precisely and capable of being finished to a brilliantly polished lustrous surface (Bryce, 1967). Because of its hardness it is difficult to saw or plane, rapidly blunting cutting edges, and cannot be screwed or nailed without first drilling (Moore and Hall, 1987).

The colour of the heartwood varies from black through purplish-brown to brown, apparently reflecting wood density, with the paler wood being less dense. The cause of the variation has been the subject of much speculation, although it seems most likely to be linked to the rate of growth of the tree, with the paler wood, in which growth rings are generally visible, believed to be the result of faster growth. The rate of growth is itself almost certainly very largely a product of moisture availability and soil fertility – indeed the paler wood is sometimes referred to colloquially as “water mpingo” (Schmitt and Hamilton, 2001). However, to date no studies have been carried out to determine whether there may be any genetic component in this variation or if it is entirely environmental.

The heartwood is surrounded by a ring of cream-coloured sapwood, around 2 cm thick, with a density of around 0.75 g cm^{-3} . This is significantly less resistant to insect and fungal damage than the heartwood, although large trees often suffer from heart-rot or fire damage. The heartwood is also attacked by at least one species of boring insect, the larva of a cerambycid beetle.

As with virtually all other tropical trees it is extremely difficult to age mature African blackwood trees as growth rings, when these are present, cannot generally be related directly to calendar years. It is therefore not possible to determine the average age of trees at harvest. It is evident that the tree is slow growing, certainly at maturity, and a figure of 80 years is widely quoted as the minimum age of a harvestable tree. However, as Gregory *et al.* (1999) point out, this figure seems very likely to be derived from general statements in forestry textbooks concerning the age to harvest of many tropical hardwoods.

Uses of the timber

The single most important export market for African blackwood timber is that to supply manufacturers of musical instruments, principally woodwinds and particularly clarinets but also oboes, bagpipes, wooden flutes and, in lesser amounts, other instruments or their parts.

Because of the demands placed on them, very few woods are considered suitable for the manufacture of woodwind instruments. The wood must be flawless, even-grained and capable of being worked to very fine tolerances. It must also resist the stresses of playing: when blown into, the air inside the instrument changes in humidity and temperature, creating stresses between the inside and the outside of the instrument which may cause the wood to distort or split at points of weakness, such as between the keyholes. The dense, close-grained nature of African blackwood and its natural oiliness ensure that it meets these criteria better than any other known timber.

In addition to its use for musical instruments, it is sought after for other purposes. In East Africa it is the timber preferred by the Makonde people of southern Tanzania

and northern Mozambique for their ceremonial carvings. Originally intended only for local use, such carving (usually in highly derivative and simplified form) has become the subject of an important export industry, now centred on Kenya. Most carvings produced in Kenya are now made from other woods, but it appears that carvings in Mozambique and Tanzania are still largely made from African blackwood.

Outside its countries of origin, the wood is used by specialist craftspeople, both amateur and professional, for turnery, some inlay work and small constructed items such as jewellery boxes. Its properties make it unsuitable for large-scale furniture construction or joinery. It has apparently been used for flooring in the Far East, although this usage does not appear ever to have been very extensive, and there is no evidence of any current exploitation of the wood for this purpose. Until the mid-1970s there was evidently a major market for African blackwood in Japan for the production of sorobans – the traditional Japanese abacus routinely used for financial calculations in shops and elsewhere. It is reported that perhaps 1,000 tonnes of roundwood logs were imported annually by Japan to meet this demand. However, the introduction of electronic calculators during the 1970s has led to the complete disappearance of this market (Beale, 1995).

Within its range, the wood and other parts of the tree are put to a variety of uses in addition to carving. The wood is used to make a range of household implements including hoes, combs and pestles. Roots are used for traditional medicine to treat various ailments and the smoke is inhaled to treat headaches and bronchitis. The pods and leaves are used as animal fodder. For all these uses there appears to be a range of acceptable substitutes. Charcoal is made from African blackwood but household surveys have reported that women tend not to prefer it as it burns too intensely and frequently damages cooking pots. In general, the difficulty of felling the tree and working the timber, and its tendency to blunt cutting instruments, means that where available other tree species are likely to be preferentially used for most purposes. This has resulted in African blackwood trees sometimes being left standing in plots that have otherwise been cleared for farming (Bryce, 1967; Gregory *et al.*, 1999; Sharman, 1995).

Production of blackwood timber

The only evidence of large-scale harvest of African blackwood for export out of Africa, either as roundwood or as semi-processed timber, is in Mozambique and Tanzania.

Estimating quantities

African blackwood is a high profile species renowned for its distinctive qualities and famed for its uses worldwide. This has led to interest in the status of living stocks of the tree, the quantity of timber in trade and the impacts of the trade on wild populations. Estimating amounts of African blackwood in different contexts and in particular relating volumes in trade to standing stock of trees is not straightforward. This is chiefly because of the highly variable loss of wood (the conversion ratio or recovery rate) at each stage in the production chain, from standing tree to finished product. It also arises because different units are used, mainly volume and weight, but also numbers of pieces or sets of pieces.

Standing crop of trees

It is customary to measure standing crop of timber in terms of volume of roundwood (i.e. useable trunks, generally given as merchantable volume overbark) per unit area, normally m^3ha^{-1} . This is calculated from the mean DBH, itself normally taken from measurement of circumference at breast height (CBH) on the assumption that the trunk has an essentially circular cross-section and an estimate of the mean length of useable trunk of the tree species concerned in that area. However, African blackwood is a species with a highly variable and often irregular growth form. Trunks are rarely circular in cross-section, and are indeed often extremely irregular, making it very difficult to relate CBH accurately to volume. Moreover, trees are very likely to have heart-rot or damage from fire or insect infestation, further limiting the amount of useable timber in the trunk. Some of this may be evident in the standing tree but much may only become apparent once the tree is felled. Overall, this means that the actual volume of useable timber in a log is often considerably less than the apparent volume.

Furthermore, the definition of useable or merchantable volume, and indirectly what constitutes a tree worth harvesting is not fixed, being dependent on a host of variables, of which the likely recovery rate is only one. Other variables include the intended use of the timber and the costs involved in harvest and transportation to the processing site, including any official and unofficial fee payments. Thus those intending to use timber locally for carving or turning to produce household goods are very likely to take a wider view of harvestability than those seeking to produce export quality billets at a sawmill some distance away from the source of the timber. Even if the timber is structurally sound, it may not be considered of sufficient quality for export (mainly because it is not dense enough and too light in colour).

Recovery rates in processing of billets for export

The billets exported for the musical instrument industry are highly standardized products that should theoretically be straightforward to quantify. Estimating the amount of wood used in their production is much more problematic and depends very much on the quality of the roundwood logs and the efficiency of the processing used. Estimates of percentage recovery rates will also depend to some extent on the units used. Conversions based on weight will tend to give a slightly higher percentage than those based on volume. This is because in processing the less dense bark and sapwood are discarded, so that the density of the processed wood will be somewhat higher (perhaps 10%) on average than that of the roundwood. Also calculated volume of roundwood will not take into account hollows (normally associated with heart-rot) at the centre of the trunk.

Where only high quality logs are used and processing is efficient, recovery rates from roundwood logs to semi-finished billets may reportedly reach or even exceed 20% by weight. Where mixed quality logs are used and processing is less efficient, estimated recovery rates by volume appear frequently to be 5% or less.

The recovery rate to finished product – in this case a musical instrument – should also take into account changes after export. It is estimated that musical

instrument makers discard perhaps 20% of exported billets owing to concealed flaws (although some of these billets may be reprocessed for other purposes). In addition, consignments of billets reportedly lose 10% or more of their weight, through drying out, during sea transport from East Africa, again affecting overall figures if these are calculated by weight. However, in some compensation, overall rates of recovery may be increased by using pieces discarded at various stages in processing for other purposes (carvings, turnery, cutlery handles etc.).

Carving

Estimating quantities of African blackwood used for wood-carving is difficult and has to rely on a series of extrapolations, each one of which is problematic. In the first instance, there is no such thing as a standard carving nor is it easy to determine the average size of carvings, which range in size from a few cubic centimetres to, exceptionally, a cubic metre or more. The larger carvings are generally high quality and are produced in small quantities, being very labour-intensive - a large (say 1.5 m tall by 40 cm diameter) Makonde “life-tree” carving may take a skilled artist a year to make. The smaller carvings are of generally lower quality and are produced

in large numbers for the local tourist trade (notably in Tanzania) and, significantly, for export both to consumer destinations in western Europe, North America and the Far East, and to other parts of Africa with a major tourist trade (notably Kenya and South Africa). One seven-man co-operative in Kibiti, Tanzania, was calculated in 2001 as processing around 3 m³ of roundwood each month in 2001, producing c. 600-700 relatively low-grade carvings from this amount. Extrapolation would indicate that each carver was theoretically capable of processing some 5 m³ of roundwood annually. However, this figure is very likely to be near the maximum production rate. It seems that few carvers work constantly throughout the year and the carvings produced by this co-operative were predominantly of a style (elongated standardized figures) that is undoubtedly one of the quickest to produce.

Relating use of African blackwood for carving to that for processing and export as billets is also problematic. Where possible carvers evidently like to use high quality wood - that is the same timber as is processed for export as billets. However, they will also use lower-grade timber, obtained from areas such as Rufiji District in Tanzania where export-grade timber has reportedly been logged out.

2.1 Distribution and status

In Tanzania African blackwood has a widespread but generally scattered distribution. Despite its economic importance, detailed information on its national distribution is not available. Bryce (1967) describes it as “occurring in most of Tanzania’s forest types except mountain forest and desert scrub, most frequent in the mixed deciduous forests and the savannah of the coastal regions, and less commonly in the western *Brachystegia* (or miombo) forests.” An inventory of five forest areas, Kilimanjaro, Tabora, Tanga, Kilombero, and Mtwara, carried out in 1971-1973, recorded African blackwood in all these areas with the exception of Kilimanjaro. It occurred most commonly in open miombo woodlands (Schultz, 1973). Subsequent forest inventories have been undertaken in southern Tanzania, the part of the country where African blackwood remains most abundant (in part because of low human population and limited infrastructure) and where most commercial exploitation currently takes place. Inventories were undertaken in 1979 in Lindi and Mtwara Regions (Poyry Jaako, 1979) and the Rufiji Basin in 1980 (Poyry Jaako, 1980). Specific African blackwood inventories have been undertaken in: Makumi National Park (Hawkins *et al.* 1996); Nachingwea and Kilwa districts in Lindi Regions (Malimbwi *et al.* 2000); and Mitarure Forest Reserve, Kilwa (Gregory *et al.* 1999).

Various concerns have been expressed about the conservation status of African blackwood in Tanzania based mainly on the apparent decline of commercially valuable stocks. The most significant threats to the species within the country are thought to be

uncontrolled fires and shifting cultivation practices. The relative impact of commercial exploitation remains difficult to quantify because of the lack of detailed knowledge of distribution and abundance. There is general agreement, however, that commercial stocks have been exhausted in various parts of the country.

2.2 Production system – harvesting controls

The primary forest legislation in Tanzania is the Forest Ordinance (CAP. 389) as amended. The Forests (Amendment) Rules, 2000, specify the royalties payable on timber species. *Dalbergia melanoxylon* is categorized as a Class 1 species, with a royalty of Tsh 70,000 m⁻³ where the produce is cut and removed by the licensee. The procedure for felling African blackwood involves obtaining a licence from the District Forest Officer, permission from the appropriate village council and monitoring of the felling of hammer-marked trees by a local Forest Officer. A transit pass is required for transport of the log to the sawmill. Compliance with the controls is reported to be weak in some areas, in part because of limited forestry personnel to cover large areas of land.

2.3 Export controls

Export of African blackwood from Tanzania is subject to licensing by the Division of Forestry and Beekeeping. The exporter is required to apply for an annual export permit specifying the details of products to be exported. Various documents are required to be submitted with

export permit applications including a copy of an export trading licence from the Ministry of Trade and Industries, a copy of the order or enquiry from the importer and a copy of the certificate of registration to trade (from the Ministry of Natural Resources and Tourism). Export certificates are subsequently required for each consignment of African blackwood. In order to obtain a certificate, harvesting licences and receipts or documents used to procure the timber and transit passes have to be indicated on the packing list or invoice. Inspection to check quantities and payment of harvesting fees and grading to satisfy quality are undertaken prior to the export certificate being issued. In 2001 six companies were registered for the export of African blackwood, including one registered under two trading names. Export is primarily through the port of Dar es Salaam.

2.4 Production of billets for export

In 2001 there were known to be five sawmills that actively processed African blackwood for export. All but one of these concentrated almost exclusively on this one species, although they would process other species, such as mvule *Milicia = Chlorophora excelsa* on a secondary or incidental basis. One sawmill regarded processing of blackwood as a secondary concern, concentrating instead on muhuhu *Brachylaena hutchinsi*. The specialized nature of the primary export market and the difficulty in processing the wood make it highly unlikely that any general sawmills process African blackwood in significant amounts.

Table 1.

Export of sawn timber of African blackwood from Tanzania

Year	Volume (m ³)	Value (USD) in '000
1991/92	55.0	682.1
1992/93	55.0	584.9
1993/94	61.2	799.6
1994/95	83.3	1037.2
1995/96	74.2	923.9
1996/97	28.6	355.0
1997/98	107.5	1357.6
1998/99	122.3	1193.2
1999/2000	75.7	825.2

Mills reportedly either have their own teams felling and collecting round-logs or obtain logs from intermediaries. The major source of timber of exploitable size is said to be the south, notably the districts of Liwale, Rwangwa and Nachingwea, in the last of these particularly in the region of Lionja Forest Reserve. The mill in Tanga reportedly obtains its supplies from the Arusha region.

There is consensus that the source of supply has shifted over the years (chiefly southward), evidently because more accessible areas – for example the Rufiji District (where the Ikwiriri sawmill is based) – have been effectively harvested out.

The vast majority of the production in four of the five sawmills was seen to be in the form of semi-processed billets for the musical instrument industry although one, which processes lighter-coloured wood not in demand for clarinets, divides its production between specialist craft supplies and billets for bagpipe manufacture.

Activity appears to be seasonal, at least in the mills in Dar es Salaam and Ikwiriri, owing to difficulties obtaining supplies during the wet season (November to May).

Annual declared exports of sawn timber reported by the Ministry of Natural Resources and Tourism are given in Table 1. These averaged around 80 m³ each year during the period 1995-2000. Assessing how accurate this figure is entails estimation of the amount processed annually by the five operating mills. This is problematic as some operators were reluctant to discuss quantities in detail and others indicated that export did not follow any regular pattern. The two largest mills were evidently

functioning at much less than full capacity at the time of the visit, almost certainly because it was too soon after the end of the rainy season for adequate supplies of timber to have become available. It was therefore difficult to calculate throughput rates at these mills.

One mill reported exporting around 4-5 shipments a year, each comprising 6-7 m³ of billets (roughly 30,000 pieces). This would amount to 24-35 m³ annually. Another mill (not visited) reported export of around 12-20 m³ annually. A third mill reported obtaining on average 3-4 lorry-loads per month, each load comprising 20-25 logs of around 2 m in length and taking about 10 days to process fully. At a very rough approximation, each lorry-load may comprise around 3.5-4.5 m³ of roundwood (40-50 m length, with an average overbark circumference of, say, 100 cm). This would indicate somewhere around 10-20 m³ processed each month, giving at a 5% recovery rate somewhere between 6-12 m³ produced for export annually.

It is reasonable to assume, therefore, that these three mills export in the region of 40-70 m³ annually. The two other mills are larger concerns. Each clearly produces several tens of cubic metres of billets annually. Taken together it is reasonable to assume that perhaps somewhat over 100 m³ is exported on average each year at present. This estimate must be treated with caution. It is somewhat higher than, but of a similar order of magnitude to, the average annual declared exports. It is possible therefore that there is some under-declaration of exports, but this is not likely to be very great.

Table 2.

Export of African blackwood carvings from Tanzania

Year	Quantity (pieces)	Value (USD) in '000
1991/92	-	-
1992/93	20,914	77.2
1993/94	131,417	356.4
1994/95	117,216	305.6
1995/96	165,483	557.8
1996/97	52,197	104.9
1997/98	264,512	891.5
1998/99	253,124	967.6
1999/2000	169,870	238.3

2.5 Export of roundwood

Export of roundwood timber of native hardwoods (with the exception of pau rosa), including African blackwood, is banned in Tanzania. It is not thought likely that any illegal export of roundwood by sea takes place. However, there is believed to be some land-based smuggling of logs from Tanzania to Kenya to supply the carving industry in the latter. This is reputed to take place mainly inland in the Arusha region, rather than along the coastal route from Tanga to Mombasa.

2.6 Carving

Moore and Hall (1987) speculated that there might be around 1,500 wood-carvers active in Tanzania and thought that each might use around 1 m³ of roundwood annually. Observations above indicate that the figure for individual wood use might be somewhat low, but is certainly likely to be of the correct order of magnitude. Assuming no great change in the number of carvers in the past 15 years, it is plausible, therefore, to speculate that carvers in Tanzania use around the same volume of roundwood (say between 1,500 and 5,000 m³, and probably nearer the former than the latter) as is processed for export as billets.

Two sawmills (under the same ownership) in Tanzania employ carvers on a casual basis to make use of African blackwood discarded during production of billets for export. Each had around 20 carvers present at any one time, although numbers evidently fluctuated seasonally. The quantities of African blackwood carvings exported from Tanzania are shown in Table 2.

Box 1 – The Mwenge wood carving market - Dar es Salaam

The Mwenge wood-carving market is situated in central Dar es Salaam and is promoted as one of the city's tourist attractions. The plot for the market was allocated to carvers by the Tanzanian government for a period of 99 years from 1984. Carvers were granted this land on the condition that they set up a co-operative and elected a leader; in 1987 the Carvers Association was formed and a Chairman elected. The site was offered as compensation to those forcibly ejected from Oyster Bay to make space for road construction. However, the good transport links and buoyant prices together with the considerable size of the plot encouraged the voluntary relocation of carvers from many small outlets in the Dar es Salaam area. Subsequently, retailers and merchants (i.e. non-carvers) have moved here to set up stores.

The community at Mwenge is registered and recognized by the Government under the name Chawasata (Chame eha Wasanii Tanzania). Traders form two separate groups: Mwenge Handicrafts Village and Mwenge Arts. Mwenge Handicrafts Village is the name given to 36 carving co-operatives whose interests are protected by the Carvers Association; Mwenge Arts comprises traders who exploit business opportunities. Carvers are legally required to be members of the co-operatives. Each co-operative pays the Association a membership fee of TSh 10,000 (US\$ 12) per year, from which the Government is paid for use of the plot. Strictly speaking only paying carvers are members but, *de facto*, the Association represents all the carvers at Mwenge.

African blackwood is the most commonly used wood at Mwenge with other popular species being *Pterocarpus angolensis*, *Brachylaena hutchinsii* and *Khaya nyasica*. Carvers often buy African blackwood logs directly from harvesters; 30% of carvers questioned in a recent survey only buy ready-made (pre-finished) pieces; 35% only buy off the lorries at Mwenge, whilst 15% sometimes buy at source and transport the wood to Mwenge themselves. African blackwood comes from a variety of sources, the most frequently cited being Bagamoyo, Mtwara and Tanga.

The price of a 2 m log can vary enormously depending on the log circumference. TSh 7,000 (US\$ 8.5) is a commonly quoted price but logs can be as expensive as TSh 30,000 (US\$ 36).

The carvers that go into the bush to fell carve at source. This reduces transportation costs and avoids the need to have logs certified and stamped by Government. The procedure is to pay the District Officer of Natural Resources for a licence, which costs a flat rate of TSh 100,000 (US\$ 120).

The majority of sales from Mwenge are to tourists. Important tourist groups come not only from Europe and North America but also Asia, South Africa, Kenya and Uganda. Exports of all carvings are subject to licensing but it is unclear how the quantities sold relate, if at all, to the figures in Table 2.

Source: Vernon West based on an interview on 15 March 2001 with the Chairman of the Mwenge Carvings Association, Mr. Focus, and questionnaire survey of carvers and traders.

3.1 Distribution and status

African blackwood is widely distributed in Mozambique, occurring as wild populations from Gaza province in the south to Cabo Delgado province in the north on the border with Tanzania. The species is most abundant in the north, particularly in Cabo Delgado. There are also believed to be commercial stocks in Niassa Province. There is no accurate inventory of standing stock of African blackwood in Mozambique. However, the national forest inventory carried out in the early 1990s noted that the species principally occurred in two forest types under the classification system adopted in the inventory, each of which covered a total area of some 1.2 million ha. African blackwood accounted for roughly 3% of standing trees with DBH > 5 cm in one of these and roughly 5% in the other.

A series of different estimates for standing stock in Cabo Delgado province ranged from 0.2 m³ ha⁻¹ to 1.0 m³ ha⁻¹ although it is difficult to extrapolate from these to the country as a whole.

Concerns about the conservation status of African blackwood in Mozambique led to the species being recorded as rare due to intensive exploitation (Gomes e Sousa, 1967) and more recently to it being included in a preliminary list of threatened plants for the country (Bandeira *et al.*, 1994). Its classification as a precious species under legislation passed in 1981 reflects both its value and scarcity. There is general agreement that the species is not endangered in the country but that greater distances need to be travelled from the coast to reach commercial stocks.

3.2 Production system - harvesting controls

In 1997, the Mozambican Parliament approved a new Forestry and Wildlife Development Policy and in 1999 the Forestry and Wildlife Act (Lei No. 10) was passed. Under the new legislation, commercial forest resources can be harvested either according to simple licences or under a concession system. Mozambique nationals can get a simple cutting licence whereas foreigners are required to apply for a concession designed to ensure longer-term investment in forestry.

African blackwood is classified as a precious species under Decree No. 12/81, which regulates the logging of listed species. The Ministry of Agriculture and Rural Development sets a national harvest quota for the species. In 2002 this quota amounted to 1,000 tonnes of roundwood, allocated to seven provinces, with 60% going to Cabo Delgado (Table 3). Permission to cut is granted through annual licences. Companies submit their bids to the Governor of the Province via the Provincial Department of Agriculture and Rural Development (DPADR). It distributes the cutting licences according to criteria that vary from province to province. In recent years the full quota has not been taken up.

Licence fees have remained unchanged since 1998 and stand at 105,000 Meticaís m⁻³ of African blackwood plus 15% surcharge (equivalent to a total of US\$ 5.3 m⁻³ at January 2000 levels).

Table 3.

2002 harvest quota for African blackwood by province in Mozambique

Province	Quantity (tonnes)
Cabo Delgado	600
Nampula	60
Zambezia	100
Sofala	100
Manica	100
Inhambane	20
Gaza	20
Total	1000

Current market price, which is effectively set by the one sawmill that processes African blackwood in Mozambique, is around US\$ 650 tonne⁻¹ for first grade roundwood logs, US\$ 510 tonne⁻¹ for second grade and US\$ 475 tonne⁻¹ for third grade (Moisés, 2002).

3.3 Export controls

Licensed exporters complete a transit form supplied by the DPADR specifying the quantities to be exported. Verification is carried out by the Provincial Service for Forestry and Wildlife (SPFFB). Phytosanitary certificates are required and exports are subject to customs inspections.

3.4 Production of billets for export

The only sawmill currently processing African blackwood for export in Mozambique is that established by the timber company, Theodor Nagel in Montepuez, situated approximately 250 km inland from Pemba in Cabo Delgado Province. The sawmill provides employment for around 50 local people. Three foremen employed at the sawmill have received training from the company both locally and in Germany. Training included identification of the best stands of African blackwood to be cut and processed for clarinet production. One of the main benefits has been a significant decrease in the number of rejected trees at the sawmill.

At the beginning of every year Theodor Nagel informs

SPFFB in Pemba of its market demand for the year. SPFFB, based on information received from the field and from DNFFB, establishes a provincial quota. An export licence for the agreed quantity can then be applied for. Cutting licences for the agreed quantity are then granted by SPFFB to local communities or to logging companies.

The sawmill buys African blackwood from local communities. In 2001 cutting licences were granted by SPFFB to 20 villages in the area. Each village has a team of about eight people responsible for cutting African blackwood. A trained foreman from the sawmill goes into the field with each village to identify the trees for felling. Felling is a labour-intensive process as it is undertaken by handsaw.

The round logs are inspected by staff from the sawmill and then tagged and transported to Montepuez by road. After cutting, the round logs are treated with wax to prevent insect attacks and splitting. The villagers are paid by weight of timber.

Table 4.

Export of African blackwood from the Province of Cabo Delgado, Mozambique

Year	Quantity (m ³) roundwood equivalent
1990	768
1991	998
1992	1070
1993	614
1994	490
1995	576
1996	619
1997	474
1998	720
1999	861
2000	732

Theodor Nagel controls over 90% of the trade in African blackwood in Mozambique. The rest is divided between several small South African logging companies. In 2001, one of these exported African blackwood to the UK and Japan, and in the previous year the same company exported a small quantity to Saudi Arabia.

Importing countries for African blackwood from Mozambique in 2001 are given in Table 5. In January 2002, 56 m³ of roundwood timber were exported to Hong Kong, although this was reported to be a speculative import.

Table 5.

Countries importing African blackwood from Cabo Delgado in 2001

Importing country	Quantity (m ³)
South Africa	71
Germany	73
Spain	27
Portugal	20

3.5 Export of roundwood

Until the late 1990s, exports of African blackwood from Mozambique were predominantly in log form, with processing of billets taking place in Germany. The establishment of the blackwood sawmill at Montepuez has changed the situation so that now the majority of processing takes place in Mozambique. However, Nagel still import some roundwood, with around 100 tonnes shipped to Hamburg in 2001.

Box 2 – National forestry policies in Mozambique and Tanzania

Both Mozambique and Tanzania have recently developed new national policies on forestry. In 1998, the Tanzanian Government published a new National Forest Policy (Ministry of Natural Resources and Tourism, 1998). This provides for wider participation in forest management through joint management agreements between central government, specialised executive agencies, private sector or local governments, as appropriate, and organized local communities or

3.6 Carving

Limited observations and reports indicate that far fewer people are involved in wood carving of African blackwood in Mozambique than in Tanzania. Moisés (2002) reported that there were nine co-operatives in Cabo Delgado Province, three in the town of Pemba (although only two appeared to be active in February 2002) and six in the Mueda district, as well as a few carvers who worked as individuals. In Montepuez, carvers are allowed to collect offcuts from the African blackwood sawmill free of charge. There are thought to be around 500 people involved in carving in the area (Weischmann, pers. comm, 2001).

The two active co-operatives in Pemba each comprised around 10 people producing carvings of considerably higher quality than the standard carvings seen, for example, at Mwenge in Dar es Salaam, Tanzania. The rate of use of wood by each carver was certainly far lower than that observed at Kibiti in Tanzania, although carvers were using in general higher quality timber than that seen used in Tanzania.

At a national level, 1,272 carving licences were issued in 2001, for 601,476 “bags”. Licensed production was 470,404 bags. The greatest volume of licensed carving production was for Sofala Province, accounting for nearly half the total (DNFFB, 2002). It is not known to what extent African blackwood is used in wood carving at a national level.

other organizations of people living adjacent to the forest. The establishment of village forest reserves managed by the village governments or other entities designated by them is also provided for. Reserves will be demarcated on the ground, management objectives defined, and forest management plans prepared covering all different forest uses.

The implementation of National Forest Policy is facilitated by the publication of a Handbook of Community-based Forest Management Guidelines (Forestry and Beekeeping Division, 2001). These



guidelines provide a step-by-step manual for the preparation and implementation of forest management plans. Furthermore, they are an extension guidebook for forestry advisors implementing the reservation and management of forest resources, through villages, Village Councils and Regional Councils.

The new National Forest Policy and the CBFM Guidelines offer major opportunities for improving the management of forest and timber resources within Tanzania but there are major constraints. At present the Policy and Guidelines are not reinforced by legislation, although this is being drafted, and resources for implementation are limited. There are currently few CBFM schemes in areas of African blackwood - examples are thought to be restricted to the recently initiated DANIDA - funded Utumi project with two miombo woodland sites. The process for developing CBFM is slow and there is concern about creating “project islands”. There is no guarantee that CBFM equates with sustainable forest management or that local communities will preferentially manage individual species such as *Dalbergia melanoxylon*. If African blackwood remains a reserved species under national legislation there may be little incentive for local communities to manage the species sustainably.

In Mozambique, a new policy and strategy for forests was published in 1999 (República de Moçambique, 1999) and legislation to implement this, the Forestry and Wildlife Act (Lei No. 10), was passed in the same year. A system of forest concessions is established under this legislation. The advantage of the concession system is that there is a long-term management obligation on concessionaires and a requirement to process the timber locally, thus adding in-country value. According to the law the concessionaire must have a management plan, based on a detailed forest inventory. It remains uncertain how the concession system will work in practice for high value tree species with a patchy distribution such as African blackwood.

Community forest management is a new experience in Mozambique and the legalization of community lands has only recently begun. Also required is the legalization of community associations which then have the rights to forest resources - subject to licensing. Facilitation is important, as in many areas there is a basic lack of community capacity because of language, remoteness and lack of experience in negotiation. At present there may be conflicts between the granting of concessions and development of community forestry in some areas.

Production and exports from other countries

4

Despite its widespread distribution, export of African blackwood timber from other countries is not currently thought to take place. There is, however, regional trade in African blackwood carvings within Africa and export to other continents from various African countries.

Kenya

Carving for the tourist trade in Kenya is on a far larger scale than that in Tanzania or Mozambique, with many thousands of carvers working largely in co-operatives. Estimates place the annual export value of Kenyan carvings at US\$ 20 million. African blackwood has been one of the three preferred timbers used for carving in Kenya. Supplies of African blackwood in the country are now said to be virtually exhausted, although it is not clear how large these stocks ever were. The vast majority of carving uses a range of other native and introduced species. There are reports of illegal harvest of African blackwood from protected areas such as Tsavo National Park and there is also said to be notable cross-border trade in roundwood logs (also illegal), from Tanzania into Kenya (Mutiso, 2000).

Malawi

Malawi has a significant export market for wood carvings, exporting to 45 countries, the most important of which are South Africa, UK and the USA. African blackwood is one of the three preferred and most heavily exploited species used for carving (Marshall *et al.*, 2000). According to Kamundi (2000), protective legislation is

inadequate for the species in Malawi 'leading to unabated selective logging'. Reduced timber supplies within the country have reportedly led to harvesters focusing on supplies in neighbouring Mozambique (Marshall *et al.*, 2000).

Senegal

According to Lapido (1994) African blackwood is the most important *Dalbergia* species in West Africa where it is a major trade commodity in savannah areas, particularly in Senegal. The main use was reported to be small carvings. African blackwood is protected by law in Senegal but timber of standing dead trees can be felled subject to permission from the Service des Eaux et Forêts and payment of a royalty fee. A recent study has shown that illegal felling is taking place to supply the demand for carvings (France-Lanord, 2001).

South Africa

As mentioned in Section 3.4, several South African companies are involved in exploitation of African blackwood in Mozambique. One timber company in South Africa has purchased three shipments of African blackwood logs or timber pieces over the past 20 years, mostly for sale within the country. One of the uses of the timber sold is for furniture inlay. South Africa has a significant trade in wood carvings for the tourist market. African blackwood carvings are predominantly imported from other countries in the region.

Use of African blackwood in export markets

5.1. Importing countries

Quantitative information on imports of African blackwood is not recorded in any official statistics of importing countries. As with many other speciality timbers, African blackwood is included under general customs tariff headings for tropical hardwoods. Based on the questionnaire surveys of suppliers and users of the timber undertaken for this study and on information from the exporting countries, it is apparent that Germany is the main importing country. Re-exports of small quantities take place to a range of countries for use in musical instrument manufacture and the craft trade. According to Weischmann, (pers. comm, 2001) the clients for African blackwood can be found principally in North America (10%) Europe (70%) and Asia (Japan, Korea, Singapore, China) (20%).

In the UK, at least three companies import African blackwood to sell for use in crafts and musical instrument manufacture. One company imports directly from Tanzania and one from South Africa. One company in Spain imports African blackwood from Tanzania and Mozambique, and exports mainly to other European countries and Asia.

5.2 Musical instruments

The musical instrument most frequently associated with African blackwood is the clarinet. At present it appears that virtually all high-quality clarinets are made of African blackwood. Historically, other timbers have evidently also been used, notably cocuswood *Brya*

ebeneus, boxwood *Buxus* spp., and reputedly ebony *Diospyros* spp. However, the dominance of African blackwood appears to stretch back at least until the start of the 20th century, when commercial export of the timber from both Mozambique and Tanzania began. At least one major manufacturer notes that it has used African blackwood for over 75 years. Lower-grade clarinets, chiefly for the student market, are made out of plastic. Production of these evidently outnumbers that of blackwood clarinets by several to one. In addition, one company manufactures a clarinet out of ground blackwood suspended in a resinous matrix, which is said to have very similar tonal qualities to a blackwood clarinet². Occasionally, other woods are used, chiefly cocobolo *Dalbergia retusa*, which is said to produce instruments with a softer tone, kingwood *D. cearensis* and Honduras rosewood *D. stevensonii*. Production of clarinets for the international market takes place primarily in France and Japan.

The stresses placed on woodwinds such as clarinets mean that, unlike some stringed instruments such as violins, they do not improve with age and indeed have a limited life – around six years in the case of a professional quality instrument. This means that even if the number of players does not increase, there is steady demand for replacement instruments.

Oboes

Oboes, like clarinets, are reported to be currently made either of African blackwood, blackwood-and-resin mix or plastic. The market for oboes is much smaller than

that for clarinets, with an estimate of perhaps 1,000 of the former sold annually in the UK compared with some 20,000-25,000 clarinets. One of the largest European manufacturers reportedly makes almost all its oboes from blackwood-and-resin mix.

Flutes and piccolos

The term flute is used for a range of modern and historical instruments from around the world that characteristically lack a reed or reeds. In Europe and North America wooden flutes were common until the mid-20th century, but have now very largely been superseded by metal flutes. Wooden flutes are still produced for specialist markets. African blackwood is reportedly the preferred wood, although boxwood, Honduras rosewood, Indian rosewood, maple, fruitwoods (apple and pear) and ebony are reportedly used in small quantities.

Piccolos were apparently traditionally made of cocuswood. Modern piccolos are reportedly made either of African blackwood or plastic. Demand for piccolos is much lower than that for metal flutes.

Bagpipes

The typical bagpipe has a bag that is inflated by mouth, with the air pushed through reeds and then expelled through a number of pipes where the sound is generated. Highland bagpipes typically have three drone pipes and one chanter on which the melody is played. There are a number of variations, of which the best known is the Northumberland pipe, which is not inflated by mouth.

African blackwood is the main wood used for the construction of Scottish bagpipes. Hornbeam, holly, apple, boxwood and ebony have all also reportedly been used but are less satisfactory because of their tendency to split. One manufacturer currently makes bagpipes out of oak *Quercus robur* and believes these to be the only oak bagpipes produced anywhere at present. Northumberland pipes are subject to fewer stresses than Scottish bagpipes and can be made of a number of different woods, including yew, boxwood, laburnum, plane, blackthorn, ebony and cocuswood. They are made in far smaller quantities than Scottish bagpipes. One

Tanzanian sawmill currently specializes in production of billets for bagpipes.

Parts of other instruments, for example the chin-rests of violins, black keys of harpsichords and wedges that hold the reed in place in reed organs may also be made of African blackwood, although in most cases other kinds of wood may be substituted. Castanets and Spanish flutes have also traditionally been made from African blackwood.

5.3 Estimating amounts of wood used for musical instrument manufacture

Production of woodwind instruments is dominated by a small number of large manufacturers, each producing several thousand instruments annually. There are also a number of smaller-scale manufacturers who may make anything from a few to a few hundred instruments annually.

Globally there are four large manufacturers of clarinets and oboes. The largest reports producing just over 30,000 wooden clarinets annually. On the basis of wood used, the second largest probably produces around two-thirds of this number of clarinets and oboes combined. The other two producers are considerably smaller scale, producing in the order of 6,000-7,000 clarinets each annually. The combined output of the smaller-scale clarinet and oboe manufacturers is very unlikely to exceed 1-2,000 wooden instruments annually.

The figures indicate that over 65,000 African blackwood clarinets and oboes, but almost certainly under 100,000 are produced annually, with clarinets greatly outnumbering oboes. Each clarinet requires billets totalling a volume of 0.0015 m³, although with wastage from hidden defects running as high as 25%, the volume of billets used to manufacture each instrument may be as high as 0.0019 m³. Manufacture of clarinets and oboes therefore probably accounts for anywhere between 120 and 190 m³ of exported billets annually, with the figure likely to be nearer the former.

Manufacture of other instruments from African blackwood is evidently on a much smaller scale. Production of bagpipes probably accounts for most use

after clarinets and oboes. There are around 12-18 bagpipe manufacturers in the UK and a number elsewhere, although the UK appears to dominate the market. The largest UK manufacturer reportedly produces around 1,300 sets annually with the others producing a few hundred each at most. One US manufacturer produces around 60 full sets plus some 300 chanters annually. From this it may be speculated that a few thousand (but almost certainly fewer than 10,000 sets) of African blackwood bagpipes are produced annually worldwide. Each complete set reportedly uses slightly more wood than a clarinet (around 0.002 m³, not accounting for wastage), indicating that the maximum amount of African blackwood used may be around 20 m³, with 10-15 m³ being a more likely amount.

Manufacture of other musical instruments or parts of musical instruments may account for a similar amount in total. One flute maker in the UK who responded to the questionnaire uses roughly 0.5 m³ annually.

5.4 Other uses

Crafts, turning and inlay

Professional and amateur woodworkers use African blackwood for a variety of specialist purposes, notably for turning to produce small craft objects (e.g. knife-handles, pens, bowls, vases and boxes) and for inlay. The amounts used individually are usually small and often, reputedly, rejected billets originally cut for musical instrument manufacture. One UK company reports supplying around 1 m³ annually for craftwork and one US company 1-1.5 m³. Two companies in Canada and Australia each reported supplying the equivalent of around 0.5 m³ annually. The total amount used seems very unlikely to exceed 10-20 m³ annually.

Flooring

There is evidence that African blackwood has been used for parquet flooring in the Far East. One sawmill in Tanzania had a few discarded small rectangular pieces roughly 6 x 3 x 1.5 cm; pieces of this size had reportedly been exported to Japan in the past for use in flooring, but no longer. One of the major processors of African blackwood states that it is difficult to use satisfactorily

in flooring, particularly in combination with other woods, because of problems in gluing it. There is no evidence of any current use of the wood in any significant quantity for this purpose.

How much is in trade?

Although all estimates are approximate, and it is difficult to tell exactly how much double-counting there might be, most notably in the use of rejected musical instrument billets for other purposes, it is reasonable to assume that on average between 150 and 200 m³ of blackwood is used in the various trades enumerated above. This figure accords well with the rough estimates of exports of semi-processed billets from Mozambique and Tanzania combined, averaging something over 100 m³ from Tanzania and something under 100 m³ from Mozambique.

Recovery rates for production of these billets vary from 5% or less to a reported 20% in some cases. Assuming the average is around 10%, this usage translates to around 1,500 to 2,000 m³ of roundwood. A typical harvested tree may, it appears, yield perhaps 0.1 to 0.2 m³ of roundwood indicating that anything between 7,500 and 20,000 trees a year may be used for this purpose.

Figures for use of African blackwood in carving are even more speculative, although from the findings discussed above it is possible that, in terms of roundwood, usage is of a similar order of magnitude to that used for production of billets for export.

¹ Source: Weischmann (pers. comm.) for Mozambique; Marshall, (1996) for Tanzania

² The physics of acoustics indicates that, in fact, the thickness of the clarinet shell is sufficiently great that its composition should have no effect on the tone produced (Harby, 1998). Needless to say, musicians do not accept this. Because of their much higher price, wooden clarinets have far more effort expended in their manufacture; it would be very difficult to separate the effects from the effects of the material used in manufacture on the acoustic performance of the instrument

Value of African blackwood trade

6

As with virtually all commodities, the value of African blackwood depends on the exact circumstances in which that value is assessed, and most notably where the wood is in the supply chain. The most standardized African blackwood commodities are the semi-processed billets supplied to musical instrument manufacture. The business is dominated by a small number of suppliers (essentially five separate sawmilling companies) and end-users, with four musical instrument manufacturers accounting for between 65% and 80% of production. Individual suppliers and users often have long-standing relationships and are reluctant to discuss financial details.

However, values of between US\$15,000 and US\$18,000 m⁻³ of first grade semi-processed billets are widely quoted. One sawmiller quoted a value FOB (free on board) of US\$16,000 m⁻³ in 1995. Although there are conflicting views, most users regard prices as having remained relatively steady for some time (up to 20 years) with increases roughly in line with inflation in the main market countries.

Smaller-scale users tend to buy individual sets for particular instruments (such as clarinets or bagpipes) from specialist timber traders who act as middlemen.

Prices charged here are, as expected, considerably higher than bulk prices. In the UK one supplier offered clarinet sets at GBP 40 and bagpipe sets for GBP 100¹. Hofstad (1997) quotes a price of around US\$70 for clarinet sets, while in 2001 prices of US\$110 for bagpipe sets and IRL 18 per flute-billet (12 x 2 x 2 in) were given by small-scale users. Although high, these figures represent only a small proportion of the price of the finished instrument, with a wooden clarinet retailing in the UK, for example, at GBP 600-1,000 (c. US\$850-1,400).

Overall value of the trade

From these figures, it can be estimated that the FOB value of the current export trade in semi-processed billets is in the region of US\$ 2-3 million. The retail value of the instruments that the majority of this wood goes into may be in the order of US\$ 100 million. The monetary value at all stages in the supply chain of the carving industry is almost certainly considerably less than this, although its impact on rural livelihoods and poverty alleviation is likely to be considerably greater.

¹ *Craft Supplies Ltd. 2002 Catalogue.*

Conclusions and recommendations

7

This study has examined the production of and trade in one of the world's most valuable timbers. Unlike many high quality hardwoods, African blackwood has the distinction of occupying a unique niche market. This factor, combined with the limited geographical source of supply of the timber and its specialized processing requirements, has enabled us to build up a reasonably comprehensive picture of the global trade. One reassuring feature of the findings is the fact that two quite independent lines of inquiry, one looking at users of the timber and one at providers, have come up with very similar estimates for the total volume of timber currently in trade and of the patterns of that trade. This provides a considerable measure of confidence in the figures, approximate though they are.

Although historical data are few, it seems that the African blackwood trade has been a relatively stable one for many decades. There is little evidence of any dramatic changes in demand or supply, with prices showing little change other than that expected from general inflationary pressures. From this it might be concluded that there is little cause for concern over future supplies. However, the lack of extensive inventory data, and measures of annual increment of harvestable timber, mean that it is impossible to state this with confidence. Indeed, the fact that the source of the timber is reported to have shifted, and to continue to be shifting, in both Mozambique and Tanzania, indicates that supply may not be able to be prolonged indefinitely. As with many other resources of this kind, it seems that accessible areas are quite rapidly "mined out", with the source of supply moving to more and more inaccessible areas. Typically, as this happens the costs of production rise until it may

no longer be economical to exploit the resource. However, in the case of African blackwood there is, it appears, no currently acceptable substitute in its major market, that for high-quality woodwind instruments. It seems likely, therefore, that the market will, if forced, absorb any such increases in price, particularly as the cost of the wood represents only a small percentage of manufacturing costs and of the retail price of the finished product. This means that there is likely to be an incentive to continue harvesting trees of merchantable quality until supplies are exhausted.

With its widespread distribution and ability to regenerate in disturbed areas, there is little question of the species itself becoming threatened with extinction in the foreseeable future and it is currently categorized as Lower Risk: near threatened by IUCN. It is, however, far less clear whether this same situation prevails for the timber as a commercially viable resource. All other things being equal, natural regeneration should in theory be replacing harvested trees at least in part. Indeed it is perfectly possible that over the whole range of the species incremental growth exceeds the volume of timber currently harvested for export. However, this does not mean that merchantable quality trees are being replaced at anything like the rate that they are being harvested. Factors militating against this include land-use changes, particularly continued burning and conversion to agriculture and, almost certainly, the felling of trees for carving before they are large enough for industrial processing. There is thus no guarantee at all that a continuing supply of merchantable timber can be maintained under present conditions.

Recommendations

- To ensure the sustainable international trade in African blackwood, quotas for export of the species should be based on knowledge of the distribution and abundance of the species in the areas of harvesting. Partial inventory data are available but these need to be supplemented and updated, particularly in Mozambique, as an urgent priority.
- There is a commitment to take forward management for sustainable production of African blackwood in both Mozambique and Tanzania based, to a varying extent, on community forest management under the terms of the recent forestry policies in both countries. Support from the international community should be provided to assist with the development of community forest management in areas of production of African blackwood and other valuable hardwoods. Mechanisms should be found to ensure that local communities benefit from the financial value of the hardwood species that they are required to manage.
- Verification of sustainable forest management is becoming an increasingly important requirement in the main importing countries for African blackwood. The priority goal in Mozambique is currently to develop sustainable forest management rather than forest certification, but the importance of certification is recognized at a national level and action is needed to develop appropriate studies and pilot schemes. Current or potential production areas in Cabo Delgado and Niassa are priorities for African blackwood.
- Production of African blackwood for export is controlled by a small number of sawmills in the two countries. Chain of custody certification to FSC standards should be promoted for these producers.
- Given the financial value of the markets for African blackwood products, the musical instrument industry should be encouraged to provide financial support for the sustainable production of this globally important tree species.

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FFI questionnaire on African blackwood (Appendix I)

A1

International Trade Survey – African blackwood SUPPLIER questionnaire

This survey is being undertaken as part of FFI's project "Sustainable production and trade in African blackwood – *Dalbergia melanoxylon*". The aims of this project are to investigate in detail the international trade in timber of African blackwood and to establish the basis for a sustainable supply of the timber through locally appropriate management practices and forest certification. Your assistance with the project is very important to its success and we thank you for sparing the time to answer the following questions:

Your company name

Approximately how much African blackwood do you use each year

What is the main use of African blackwood by your customers?

Where do you supply your wood?

Locally

Nationally

Export (where to?)

Where do you obtain your African blackwood supplies?

Country:

Supplier/s:

In what form do you obtain it?

Do you have difficulty in obtaining a reliable supply? If so, what are the main problems (quality, price, quantity,)?

How long have you been supplying African blackwood?

Has the supply changed markedly over this period? In particular how have the following changed?

Source

Quality

Amount available

Price

Other

Are you familiar with the SoundWood programme?

Contact details

International Trade Survey - African blackwood USER questionnaire

This survey is being undertaken as part of FFI's project Sustainable production and trade in African blackwood - *Dalbergia melanoxylon*. The aims of this project are to investigate in detail the international trade in timber of African blackwood and to establish the basis for a sustainable supply of the timber through locally appropriate management practices and forest certification. Your assistance with the project is very important to its success and we thank you for sparing the time to answer the following questions.

Approximately how much African blackwood do you use each year?

What do you use it for?

Do you use any other woods for these purposes? If so, which?

What markets do you supply with your products (purely local, national, export; if export, where to)?

Where do you obtain your African blackwood supplies?

Country:

Supplier/Suppliers:

In what form do you obtain it?

Do you have difficulty obtaining a reliable supply? If so, what are the main problems (quantity, quality, price)?

How long have you been using African blackwood?

Has the supply changed markedly over this period? In particular how have the following changed?:

Source (geographical and individual suppliers)

Quality

Amount available

Price
