FOREST GOVERNANCE IN ZAMBÉZIA, MOZAMBIQUE:

CHINESE TAKEAWAY!

FINAL REPORT FOR FONGZA

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NOTE TO READERS

This paper describes the current practices and problems of forest management in the province of Zambézia, Mozambique, and their economic, social and ecological consequences. The target audience is primarily national civil society, and the purpose of the report is to raise awareness and to provide material for citizens to use in demanding governance reforms. Forestry issues are quite technical and complex, and understanding of them amongst the general public is low. A full report has been prepared which attempts to provide basic background information on forests and forestry to help people to understand the problems from first principles. It is, as a result, quite long. This summary report presents an overview of the main arguments and directs the reader to appropriate sections of the main report for further information.

ACRONYMS

AAC	**Annual Allowable Cut**
ADIMAZ	**Associacao de Industrias Madereiras de Zambézia (Zambézia Wood Industries Association)**
AFLEG	**Africa Forest Law Enforcement and Governance**
AMAZA	**Associacao de Madereiros de Zambézia (Zambézia timber cutters' association)**
CFM	**Compania Ferrocaril de Mozambique (Mozambique Railways Company, port owner, Quelimane until 2005)**
CIF	**Cost Insurance Freight (export price paid when seller covers freight)**
DBH	**Diameter Breast Height (standard diameter measurement for trees)**
DDA	**Director Distrital de Agricultura - District Director of Agriculture**
DPA	**Direccao Provincial de Agricultura – Provincial Directorate of Agriculture**
DNFFB	**Direccao Nacional de Florestas e Fauna Bravia - National Directorate of Forests and Wildlife**
EU	**European Union**
FAO	**Food and Agriculture Organisation (United Nations)**
FOB	**Free on Board (export price paid, when freight charges paid by buyer)**
GIS	**Geographic information system**
GoM	**Government of Mozambique**
IAF	**Inquérito aos Agregados Familiares (Household Survey for PARPA).**
IFI	**International financial institutions**
IFM	**Independent Forest Monitoring**
ITTO	**International Tropical Timber Organisation**
MADER	**Ministerio de Agricultura e Desenvolvimento Rural - Ministry of Agriculture and Rural Development**
MADEMO	**Madeiras de Mozambique (Post-independence State forest enterprise)**
NEPAD	**New Economic Partnership for Africa**
NGO	**Non-Governmental Organisation**
NR	**Natural Resources**
NRM	**Natural Resources Management**
NTFP	**Non-Timber Forest Product**
ORAM	**Associacao Rural de Ajuda Mutual - Rural Mutual Assistance Association**
PARPA	**Plan de Accao de Reduccao de Pobreza Absoluta - Action Plan to Reduce Absolute Poverty**
PFE	**Permanent Forest Estate**
PMSR	**Projecto Maneio Sustentado de Recursos (Sustainable Resource Management Project, DNFFB-Ministry for Foreign Affairs of Finland)**
PROAGRI	**Agriculture Sector Programme**
RWE	**Round Wood Equivalent (measure used in wood products trade)**
SFM	**Sustainable Forest Management**
SML	**Sociedade Moveis Licungo (a concession operator in Zambézia)**
SPGC(Z)	**Servicios Provincias de Geografia e Cadastre de Zambézia (Provincial Geographic and Cadastral Services – of Zambézia)**
SPFFB(Z)	**Servicios Provincias de Florestas e Fauna Bravia (de Zambézia) - Provincial Forests and Wildlife Services of Zambézia**
UIF	**Unidade de Inventario Florestal (Forest Inventory Unit, of DNFFB)**
UNCED	**United Nations Conference on Environment and Development**
UNDP	**United Nations Development Programme**
WTO	**World Trade Organisation**

FOREST GOVERNANCE IN ZAMBÉZIA:

CHINESE TAKEAWAY!

SUMMARY

While accounts of illegal logging in southeast Asia's and central Africa's tropical forests to supply the booming Chinese economy are increasingly common, this report presents one of the first studies to document the "Chinese takeaway" from the forests of Southern Africa. Asian timber buyers, local business people and members of the Government of Mozambique and their forest services are colluding to strip precious tropical hardwoods from these slow-growing, semi-arid and dry tropical forests at a rate that could see the resource exhausted in 5-10 years. The timber is exported as unprocessed logs, undermining local industry and transferring most of its potential benefits from one of the poorest countries in the world, to what is becoming one of the richest. In China, this timber fuels burgeoning furniture and wood products industries, to feed equally burgeoning market demand domestically, and in the United States, Europe and Japan for low-cost imports. This report focuses on what is happening, as a consequence, in the forests of Zambézia; the same or worse is happening in Mozambique's other timber producing provinces, particularly Cabo Delgado, Nampula and Niassa.

The volumes involved in this trade are far below those from the humid tropical producing countries, and this has led to the relative neglect of this issue internationally[1]. However, while the volumes are small, the impact on the economy of this poor country is considerable. This report does not call for an end to logging, but for measures to bring the forests under sustainable management and to harness them for the development of poor rural communities. It proposes a moratorium on log export, that would promote industrial development and local jobs in the long-term - and perhaps most importantly, that would fulfil a government's promises to its people.

The Government of Mozambique and its donors have subscribed to a wide range of policies and programmes to support the country's expressed goals of sustainable economic development and poverty alleviation. The Action Plan for the Reduction of Absolute Poverty (PARPA), the National Agricultural Programme (PROAGRI, phases I and II), and the policy, law and regulations for the forestry and wildlife sector, formulated between 1999 and 2002, all set out the requirement for sustainable forest management and the development of forest industries for combating rural poverty. In 2003, the GoM signed the Yaounde Ministerial Declaration on African Forest Law Enforcement and Governance (AFLEG), committing itself, internationally, to the fight against illegal logging and hunting, trade and corruption, and to promote sound forest governance.

This report demonstrates how the Government – and by association – the donors who support it, have thus far failed to deliver on these commitments. The report compares Government rhetoric with the reality of forest management practices in Zambézia, and finds not so much a lack of technical capacity or resources in the forest service, or even a "lack of political will". Rather, it reveals a direct conflict between the public responsibilities and private interests of some government officials – notably in the National Directorate and Provincial Services for

[1] The legal annual logging quota for Mozambique is 500,000 m^3, compared to 5.4 million m^3 for Indonesia, where industrial demand of about 42 million m^3 annually is filled overwhelmingly by illegal timber. http://www.forestandtradeasia.org/files/Indonesian%20Government%20Plan%20to%20increase%20logging%20quota.doc

Forestry and Wildlife (DN/SPFFBZ) and Provincial Directorate of Agriculture (DPA) - and others, including senior political party members. Together with local business interests and Asian traders, these public servants constitute a "timber mafia". Instead of combating illegal logging, they are, through measures including the manipulation of forest regulations, technical information and statistics, accepting bribes and personal involvement in logging, actually facilitating and personally benefiting from this "Chinese takeaway".

The international community parades Mozambique as a success story of African development and governance – a socialist state reformed into a model democracy that has embraced capitalist development and a free market economy. However, more critical analysts (Lundin 2000; Hanlon 2004a,b; Spector et al 2005) present a rather different story – one in which many of its leaders, corrupted by the payoffs and negligence of donors and international financial institutions, are busy cashing in whatever natural resources they can, lining their pockets at the expense of their impoverished populace. Impressive 8% annual economic growth rates are fuelled by a few big private projects and disguise continuing high rates of rural poverty (Ministerio de Planeamento e Financas et al, 2004). Donors pursuing politically-correct budget support mechanisms for aid delivery impose only loose performance targets on the government and have largely lost touch with what is really happening outside the main cities. Consulting companies, contracted by donors to implement the few projects that remain, close their eyes to abuses or even collude in them, to keep on the right side of the GoM for future project opportunities. Donors stress "enabling environments" and fund numerous policy reviews, governance debates and reform exercises, but history shows these processes can be dragged out almost indefinitely and implementation delayed or thwarted. Meanwhile, degradation of the forest resource continues and by the time real change takes place, its economic potential will have been lost to a generation. This report also calls donors to account – for the sake of the poor of Mozambique, and the donor's own domestic tax-payers.

Three cornerstones of sound forest sector management for long-term local development, should be:
i) a system for limiting the annual cut to levels that can be sustained in the long-term,
ii) forest concessions (with management plans) of sufficient areas to be economical, and
iii) in-country processing with industrial capacity in balance with forest productivity.

Following the major scandal in Zambézia in 2000, of almost totally unlicensed forest exploitation, the forest services have been obliged to organise production around sustainable annual quotas. At the time, the available data from the national inventory of 1994 (Saket 1994), indicated an annual allowable cut of currently marketable species in Zambézia of around 18,000 m^3. However, SPFFBZ repeatedly authorised over 28,000 m^3 per year, and the quota for 2004 was nearly 50,000 m^3. New inventory data has recently been published, after much delay, which supports an even higher quota, but the work is open to question on many levels and should be subject to independent review.

The majority of the quota is allocated, not to existing industries, to support local jobs and development, but to small operators. This situation is being driven by the presence of Asian buyers in the port of Quelimane, who provide credit to these small operators, who could not otherwise afford their licences, and who then assure the buyers a supply of logs for export. The small operators are all Mozambican nationals, but there are so many of them (over 125 in 2003), their activities so uncontrolled, and their reinvestment in the sector so low, that they have become part of the problem of forestry rather than part of the solution. On average, each is licensed for 112 m^3 of timber per year, but a single chain saw can fell this volume in only a week, and the season lasts 9 months. Operators admitted to cutting 4-5 times their quota, and

to paying bribes to SPFFBZ to get their illegal timber past the checkpoints, having already paid bribes to get their licences in the first place. The small operators are a diverse group, but united in the belief that exploiting the country's forests is their right, rather than a privilege granted to those with the proven capacity and commitment to manage the forests sustainably. The SPFFBZ does not prepare a consolidated record of areas logged and volumes taken, rendering control of the harvest, and the long term management of the resource, almost impossible.

The forest concessions system, required by policy and law, is taking years to establish. Over 40 concession applicants, including Asian buyers, other foreign investors, local industrial operators and local business interests, some only fronts for members of the forest services or government, have applied for over 50% (1.5 m ha) of the remaining productive forest. Very few have prepared the management plans or established industries required by law, but all are given licences to harvest in their areas, meanwhile. The few management plans that have been approved do not even pretend sustainability, but rather propose to strip all the commercial timber in 5-10 years, making a mockery of the notion that concessions can be the basis of long term forest development.

Rural communities, who fought a long battle to gain rights to their land, have no rights to the timber growing on that land, except for subsistence. With few alternative sources of employment, they are reduced to working for licensed operators for less than the minimum wage (often paid late or never paid at all), or to harvesting logs illegally to supply other dealers. Although communities are supposed to receive 20% of licence fees, the mechanism for is delivery is still being formulated, and the total amount any one community would receive is, anyway, small. More radical reform is needed to give communities title to their forest resources, if they are to benefit from timber exploitation.

The quotas and licences issued officially by SPFFBZ give little indication of how much timber is really being harvested or from where. Although operators do now pay for a substantial proportion of their licences, there is only one real checkpoint, under-reporting is systematic and widespread, inspection is lax, bribes are common, and the computer-based control system of licensing and transport, introduced by SPFFBZ in 2001 is largely cosmetic. In 2002, the quota was set at 42,000 m^3, but SPFFBZ reported licensing only 33,200 m^3 and the export of only 28,400 m^3. But that year, 17 bulk carriers and 27 container ships loaded logs in the port, and the port authorities recorded export of 51,000 m^3. The other government departments involved in forest sector (Port, Customs, Industry) all return contradictory figures.

The greatest problem - because it drives the whole system - is the continued export of logs. According to the Forestry and Wildlife Regulations, passed by the Council of Ministers in 2002, the main commercial species (Class 1) must be processed prior to export. However, just as the regulations were coming into force in May 2003, the Ministry, under pressure from loggers and their Asian backers, passed a special regulation (Ministerial Diploma), reclassifying the commercial timbers to permit their export as logs and to enable the "Chinese takeaway" to continue.

In short, too many operators, large and small, are being allowed to take too many logs, from too many places, employing unprofessional methods in a way that wastes the resource and renders it unmanageable in the longer term. The current system abuses the rights of local communities, denying them opportunities for vitally needed employment and skills development that would come from sustainable forest management, processing industries and community-based enterprise. Export of logs, largely illegal in terms of the 2002 regulations,

is starving local industry and threatening local jobs. The DNFFB and SPFFBZ are presiding over and colluding with these abuses, in ways that makes a mockery of the notion of "governance": taking bribes for issuing licences, approving management plans, concessions and export permits, getting timber through checkpoints and through personal involvement in the sector. There can be no excuse for the personal enrichment and public loss on the scale that is taking place.

The purpose of the study is not only to document and raise awareness of these problems, but also to
propose solutions. The main report provides technical details of practices in the forest sector, to explain and justify six key reforms and interim measures to transform crude forest exploitation into sound forest management.

The main proposed reforms and immediate measures:

i) Implementation of existing policies for sustained forest industrial development and job creation, initiated through a moratorium on the export of logs,
ii) Reform of simple licence logging, initiated through a moratorium on these licences
iii) Reform of the concession system, initiated through a moratorium on concession approvals and the independent review of any management plans approved to date.
iv) Identify corrupt practices and root out corrupt officers, initiated through a detailed
v) investigation and enquiry into forest practice in all forestry provinces
vi) Further promote high standards of forest governance, initiated through Independent Forest Monitoring,
vii) Empowerment of communities to manage their own forests, initiated through a revision of legislation to give communities rights to the timber on their own land

Real reform is a complex process. A series of other measures is proposed for each of the main stakeholder groups, including the development of graduated taxation systems to encourage processing, promotion of certification programmes, the revision and simplification of management planning systems and the development of the adequate road and energy infrastructure and support for small business development, needed to enable operators to work within the law. In the meantime, those harvesting operations linked to industries might continue, subject to independent monitoring, or if certified by an independent third party as sustainable, in order to preserve jobs and supply domestic timber needs. It is vital that forest operations, not linked to permanent quality jobs, are stopped, to create the time and incentives needed to bring the sector under control. As problems are successfully addressed, moratoria can be gradually lifted, until all activities are once again permitted. Donor-funded infrastructure schemes are proposed as compensation measures to minimise the impacts on the provincial economy during the transition to sound forest governance.

Donors and the international financial institutions will be instrumental in creating the incentives for the GoM to implement its own policies, to in turn motivate operators and communities to work sustainably, for the benefit of the nation and themselves.

Importantly, the report calls for international action to put pressure on the Government of China to take responsibility to ensure that its own economic boom does not rob poor, vulnerable countries of the resources they need for their own development. Pressure must also be put on the countries (esp United States, Japan and EU member states) that import Chinese forest product manufactures and have generated the current enormous market demand, to insist on the use of legally harvested timber.

FOREST GOVERNANCE IN ZAMBÉZIA:

CHINESE TAKEAWAY!

1. INTRODUCTION

The forestry sector in Zambézia has been out of control since the mid-1990s. Concerned donors funded informative reviews (Brouwer et al 1999, Kloek-Jensen 1998), which revealed a widespread corruption and over-logging and caused alarm amongst NGOs and other civil society observers. However, for various reasons action was not possible. Since then, new forestry laws and regulations have been passed, and some reforms have taken place, but the laws are not enforced and the reforms have been largely cosmetic and the fundamental problems have continued to grow. This report was commissioned to provide an update on the situation and equip civil society with the necessary information to demand an end to the abuse, and the establishment of sound governance of this valuable resource. A reconnaissance mission was carried out in November 2003 (Mackenzie 2004), followed by three months of field work in April-June and October 2004 to substantiate earlier findings and help civil society in Zambézia to organise in opposition.

This report presents a summary of the findings of this work, and is available in both Portuguese and English. The full account of the study, over 150 pages long, will be made available as a separate document on the internet (site to be determined, search under the same title), but only in English. Both accounts follow the same structure, and this summary can be used as a guide for accessing more detailed information in the full report.

2. BACKGROUND

2.1 PEOPLE AND POVERTY IN ZAMBÉZIA

Mozambique is one of the poorest countries in the world, ranking 168 out of 177 countries in the 2005 Human Development Report, with an HDI value of 0.379[2]. The per capita GDP is US$ 1117 p.a. and life expectancy is 41.9 years (UNDP 2005). Nearly two-thirds of its estimated 15.8 m rural people live in absolute poverty.

Zambézia is one its poorest provinces. The 2002-2003 household consumption survey (Ministerio de Planeamento e Financas, et al, 2004) estimated that 58% of Zambézia households live below the poverty line. Social indicator scores for Zambézia also remain low, in part reflecting the province's past upheavals, from the 18th and 19th century slave trade, the independence and civil wars and floods of the 20th century, to the present struggle for economic development. The presence of more than 10 different ethnic groups, in a population of only about 3 million, adds to the challenges. Approximately 47% of children are malnourished, primary school enrolment is only 60% and 60% of adults are illiterate. About 30% of households are female-headed[3]. The prevalence of HIV/AIDS is 13%[4]. Local administration and organisations have been strongly influenced by historical factors, and formal (government) and informal (traditional) authority systems operate side by side, often creating confusion and conflict. Leadership is often not representative, and governance often ineffective. The need for poverty alleviation and economic and social development here is urgent.

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[2] An increase over its 2000 HDI of 0.341 (Compton 2000).
[3] Data from the baseline survey of ZADP (Projecto de Desenvolvimento Agricola da Zambézia), in 1998.
[4] (UNICEF: http://www.unicef.org/mozambique/Zambézia.htm)

Amongst the few valuable and accessible resources in rural Zambézia are the forests. Although the densest forest areas generally support the lowest populations (compare Table 1 with Map 2), forest areas are part of traditional community territories, and while the Land Law enables communities to obtain secure tenure to their land simply through traditional occupancy (GoM 1997), the Forest and Wildlife Law provides only subsistence rights to the forest resources on that land (GoM 1999). Communities must compete with outsiders for rights to the commercial use of forests. Apart from an ill-defined number of communities

Table 1: Population of Zambézia, by District, 1997

District	Population	Density *
Alto Molocue	185,224	29
Chinde	129,115	29
Gile	126,988	13
Gurue	197,179	35
Ile	224,167	40
Inhassunge	87,396	130
Lugela	106,770	6
Mocuba	214,748	30
Maganja da Costa	229,230	34
Milange	335,728	25
Mopeia	71,535	9
Morrumbala	243,751	19
Namacurra	160,879	79
Nicoadala	198,451	31
Namaroi	95,257	56
Pebane	135,275	13
Cidade de Quelimane	150,116	1220
TOTAL	2,891,809	

* hab/km^2

Map 1: Districts of Zambézia

engaging in illegal logging, it is almost exclusively people from outside the communities who exploit, misuse and benefit from the forests, while poverty in the forest communities themselves persists.

2.2 The Forests and Timbers of Zambézia

The forests of Zambezia belong to a semi-arid savannah woodland formation, found widely across Southern and Central Africa, known commonly as *miombo,* a term which refers to forests dominated by tree genera of the Caesalpinoidae legume sub-family: Brachystegia, Julbernardia and Isoberlinia (Campbell 1996, Campbell *et al.* 1996; http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0704_full.html).

Different types of *miombo* are recognised, based on their structure (height, diameter and number of trees, canopy cover, etc) as well as their species composition and degree of

deciduousness. The distribution of these different formations depends mainly on rainfall and soil depth, texture and fertility, but also on human factors, including fire, agricultural clearance and grazing. Mature undisturbed miombo, in high rainfall areas (> 1000 mm/yr) has up to 150 trees per hectare[5], with a single canopy at 12 – 20 m, up to 80% canopy cover, and with total commercial timber volumes up to 150 m^3/ha. Typically, only 75% of trees are deciduous, and there is a broadleaf shrub and grass understorey beneath. In low rainfall areas the forests tend to have lower stature and fewer species than in higher rainfall areas, and over 90% of trees are deciduous (Chidumayo and Frost 1996). Zambezia has approximately 3 million ha of forest, covering about 30% of the land area (10 million ha). The distribution of this forest is shown in Map 2. Table 2 presents a comparison of four sets of data on distribution of the main forest cover types of Zambezia, that will be discussed further below (Section 4.2). The relative scarcity of the highest value dense lowland forest (3.7 - 6% of total forest area) in part indicates the pervasive effects of human activity (Campbell 1996; Campbell et al. 1996; Frost P 1996.).

Across the southern African region, these forests support over 100 million people, providing food, fuel, building materials, medicines and water. Population densities are, however, generally low due to the poor quality of the soils, widespread prevalence of tsetse fly and, in some places, low rainfall. The *miombo* also contain some of the world's most precious and expensive hardwood timbers. But while the forests are extensive, high quality forest is rare, and productivity is generally low (< 1 m^3/ha/yr). The dominant species, the *messassa* (Brachystegia, Isoberlinia and Julbernardia), are not currently in commercial demand. In practice, only seven species, including *pau ferro*, (Swartzia madagascariensis), *pau preto* (Dalbergia melanoxylon), *umbila* (Pterocarpus angolensis), *chanfuta* (Afzelia quanzensis), *mondzo* (Combretum imberbe), *jambirre,* (Millettia stuhlmannii) and *muaga* (Pericopsis angolensis), are currently marketable internationally, and these are much less common in the forests, typically comprising only 5-20% of total volume. Further, trees of exploitable diameters are few (Geldenhuys 2005, PSMR 2005).

Ecology and management of *miombo*

The ecology and management of *miombo* forests are still not well understood, particularly for the ecological conditions prevailing in Mozambique, and the detailed information on the ecology and population dynamics of the main commercial species, which is required for the sound management of these high quality hardwood timbers, is largely lacking. Some basic information is provided in Table 2.

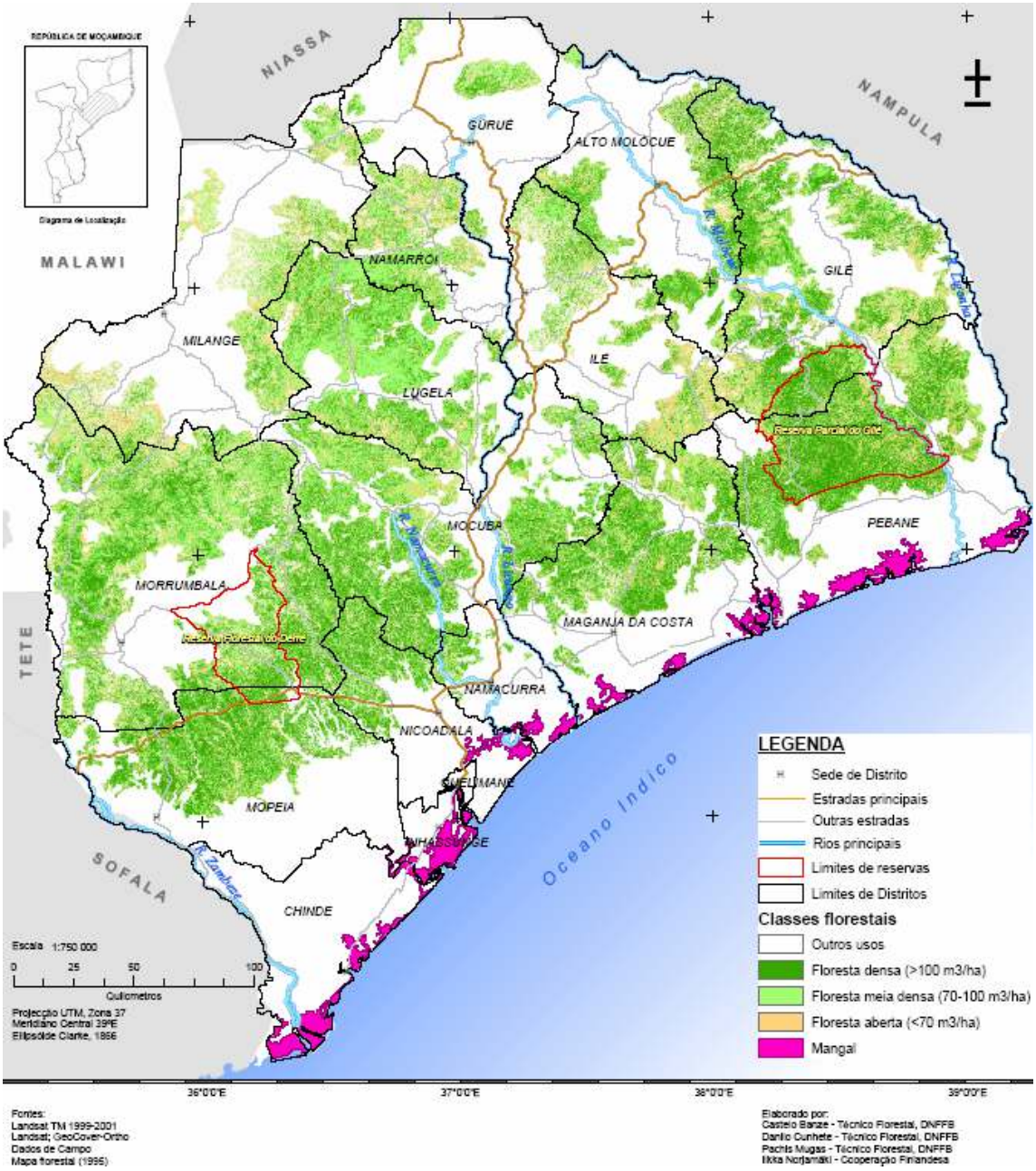
Although several volumes have been published on the management of semi-arid forests in Southern and Central Africa in the last two decades[6], these focus primarily on socio-economic, institutional and policy issues, and some general ecology. One of the main references is Miombo ecology and management (Chidumayo 1997), but it includes almost no information on management for timber. In addition, the Finnish-funded Sustainable Resource Management Project (*Projecto Maneio Sustentado de Recursos*, PMSR) has recently produced a report entitled Basic Guidelines for Silvicultural and Forest Management Practices in Mozambique (Geldenhuys 2005), but this has not yet been published. Most other management-related information is scattered in technical or academic journals, project reports, out-of-print books, meeting proceedings and student theses (eg Albano, 2001; Boaler 1966; Trapnell 1955, Calvert 1974; Calvert and Timberlake 1993), and is not easily accessible

[5] Trees greater 20 cm dbh.

[6] Including Piearce and Gumbo (eds) (1992); Bradley and MacNamara (eds) (1993); Mushove, Shumba and Matose (eds) (1996); Campbell (ed)(1996).

to forest managers. Further work is required to collate existing knowledge into a single practical volume.

To be sustainable, management must ensure that harvested forests maintain their ecosystem functioning and that harvested species re-establish themselves and grow on to provide timber for subsequent harvests. The *miombo* forests are not well understood, but in common with other forests, different species are known to have different ecological requirements for their re-establishment and onward growth. Forest management, particularly the intensity of cutting, has significant impacts on forest ecological conditions, and thus the interaction between harvesting and regeneration must be given careful consideration (Geldenhuys 2005:22-24).



Source: PMSR 2005

Map 2: Forest distribution in Zambézia, 2001

Table 2: Comparison of forest and other vegetation cover estimates for Zambézia, 1994, 2004 and 2005.

Inventory >>>	**Saket 1994 ****		**PMSR 2004***		**PMSR 2005 including reserves**		**PMSR 2005 excluding reserves**	
Forest Type	**% Cover**	**Area ha**	**% Cover**	**Area ha**	**% cover**	**Area ha**	**% cover**	**Area ha**
Lowland high density, LF1	>75	187,500	>70	112,711	>70	152,300	>70	130,600
Lowland moderate density, LF2	50-75	597,410	40 – 70	866,092	40 – 70	1,093,600	40 – 70	993,000
Lowland low density, LF3	25-50	1,146,959	10 – 40	1,836,590	10 – 40	2,014,400	10 – 40	1,830,400
Thicket, tall, T	20-40	1,142,455	< 10	202,879	< 10	309,300	< 10	277,900
SUB TOTAL FORESTS		**3,074,324**		**3,018,272**		**3,569,600**		**3,231,900**
Other Thicket		**2,788,851**		**n/a**		**n/a**		**n/a**
Wooded Grassland	< 20	1,756,757		**n/a**	< 10	482,000	< 10	447,700
Grassland		435,248		**n/a**		47,900		44,500
Agriculture		2,045,045		**n/a**		234,100		224,900
Other vegetation types		170,397		**n/a**		n/a		n/a
TOTAL		**10,270,622**		**(3,018,272)**		**(4,333,600)**		**(3,949,000)**

* (FIU, pers comm..) unclear if figure includes or excludes reserves

** area includes forest reserves

Table 3: Main commercial timbers of Zambézia and their characteristics

Family/Species	Commerical/ common names	Tree characteristics	Distribution	Timber Class and Uses	Other Characteristics
FABACEAE PAPILIONACEAE					(SG = specific gravity)
Dalbergia melanoxylon	*Pau preto*	5-10 m; med-low altitude, thickets, mixed woodland	C-N Mozambique, Zimbabwe, N Botswana	*Precious class;* Musical instruments, turnery, carving	SG = 1.1; yields little timber
Millettia stuhlmannii	*Jambirre, panga-panga*	To 20 m, low altitude, high rainfall areas and along rivers	C-S Mozambique	*Precious (prev Class 1)* Furniture, flooring, decorative work	SG = .8; Dense, durable, stable
Pterocarpus angolensis	*Umbila;* kiaat (SA), mukwa	Fire resistant; coppices strongly; light demanding	C Mozambique, Zimbabwe, Botswana to Namibia	*Precious (prev Class 1)* Furniture, joinery veneer, carvings, turnery, canoes.	SG = .7; Durable; red, sticky sap; medicinal properties
Swartzia madagascariensis	Pau ferro, Snake bean	5-15 m, med-low altitude, wooded grassland, and deciduous woodland	Widespread from W Africa to Mozambique	*Precious (prev Class 1)* Heavy construction, sleepers, floors, turnery, carving	SG = 1.0; durable, termite resistant; Root medicinal, powdered pods = insecticide
Pericopsis angolensis (Afrormosia)	*Muaga,* Muanga,	10-20 m; med-low altitude, woodland and wooded grassland	C Mozambique, Zimbabwe; low-medium altitude	*Class 2* Indestructible timber, panelling, floors.	SG = .82; Leaves, bark, roots medicinal
FABACEAE CAESALPINACEAE					
Afzelia quanzensis	*Chanfuta*; pod mahogany	12-35 m; low altitude dry forest or woodland.	C-S Mozambique, Zimbabwe, Botswana	*Precious (prev Class 1)* Frames, stairs, doors, marine	SG = .75; Beautiful, hard, marine durable
COMBRETACEAE					
Combretum imberbe	*Mondzo* Leadwood,	7-15 m; low altitude, mixed woodland, esp along rivers.	S-C Mozambique, Zimbabwe, Botswana, Namibia, S Africa	*Precious (prev Class 1)* Carving, turning, heavy industrial, mining, sleepers etc	SG = 1.1; Very hard, diff to work, blunts saws, turns well

Source: Palgrave (1988); http://biodiversity.uno.edu/delta/wood/

Some species seed frequently and establish readily within the shaded conditions of a natural or lightly logged over forest. Their populations typically include trees of all sizes, from seedlings and saplings to small trees growing on to provide the next crop. They may require no particular management after harvesting. Other species have populations mostly of mature trees, and need a lot of light for their seeds to germinate and grow on, and regenerate better in more heavily logged forests. Seeds and seedlings of some species are destroyed by fire,while other species require fire for their germination. Many miombo species resprout from their cut stumps, but require management to reduce the number of new stems to one or two good ones, to prevent the regrowth from becoming shrubby. Still other species actually require replanting and tending of seedlings to provide the next crop (Chidumayo, Gambiza and Grundy 1996).

Photo 1

Photo 2

Photo 3

Photo 1: Pau Ferro – Swartzia madagascariensis
Photo 2: Umbila - Pterocarpus angolensis
Photo 3: Jambirre – Millettia stuhlmannia

2.3 THE HISTORY AND ROLE OF FORESTRY IN THE ECONOMY OF ZAMBÉZIA

During the Portuguese colonial period, forestry in Mozambique was largely in private hands, and management was not an important issue politically. Although the first forest reserve was created as early as 1912, by 1975 there were still only 15 of them, and their function was production, rather than management, provision of environmental services or conservation. The Forest Regulations of 1965 created a concession system, which required loggers to establish industries, and by 1969 there were 122 concessions covering 820,000 ha nation-wide, largely serving the domestic and Portuguese markets. These were abandoned at Independence in 1975, when most Portuguese left.

Table 4: Timber licensing and production volumes in Zambézia, 1994-2004

Year	Total No Operators[1]	No. Licences[2]	Authorised Volumes m^3
1994	n.a.	n.a.	6,625
1995	n.a.	n.a.	5,150
1996	n.a.	n.a.	3,400
1997	n.a.	n.a.	16,140
1998	n.a.	40	11,737
1999	n.a.	36	5,875**
2000	30	126	28,143
2001	55	276	32,822
2002	124	336	42,175
2003	160	706	31,744
2004	146	863	35,870 [3]

Source: SPFFBZ annual reports unless otherwise noted; ** DNFFB; n.a.: not available

[1] includes both industrial and simple licence operators

[2] prior to 2001, an operator's entire quota was issued on a single licence. Since then, different species are given separate licences and an operator's total quota can be split up into more than one licence, thereby spreading payments over a longer period.

[3] reported as pertaining to 1st and 2nd class timbers only. Since *jambirre, chanfuta, umbila, pau ferro and mondzo* were reclassified as "precious" class, these would be excluded, but it is hard to see how such volumes could be reached without them.

By 1980, the government was confronted with a crisis in timber supply and nationalized what industries remained, creating the state enterprise MADEMO. Licensing again reverted to annual permits, and after some years of punishing civil war and mismanagement, MADEMO too fell into crisis. Under the National Economic Reforms of 1987, a process of privatization then began. At the same time, the current National and Provincial Forest and Wildlife services (DN/SPFFB) were created, but with the sector still largely in government hands, its role was rather unclear, and its work in regulating the sector was ineffective. The civil war served to limit exploitation and the forests enjoyed a period of protection and regeneration. However, after the 1992 Peace Accord, rural areas became safer, and as Table 4 illustrates, the number of forest operators began to increase again and with them, the rate of forest exploitation - and the need for good forest governance.

Investors and operators began trying to secure land for forestry. Different legislation was used over the years. Table 5 tracks the history of this. Under the Land Regulations of 1987, citizens were entitled to request 50 year land leases for various purposes. In Zambézia, over 3,200 parcels, totalling over 3.6 m ha (35% of total land) had been requested by 1999, with forestry accounting for 2.2 m ha (62% of area requested). But the Peace Accord had also given rise to a new debate over land, and a civil society Land Campaign was launched, which, after a long and dedicated struggle, secured legal protection of community land rights, and led to cancellation of most of these applications.

Table 5: Applications for forestry land leases and concessions in Zambézia, 1992 - 2004

Year	Old Land Law	New Land Law	Forest Law		
	Ha. requested	Ha. Requested	Ha requested	No. applications	No. companies
1992 & before	153,580			n/a	n/a
1993	22,628			n/a	n/a
1994	58,916			n/a	n/a
1995	411,361			n/a	n/a
1996	219,320			n/a	n/a
1997 (1st half)	246,125			n/a	n/a
1998				n/a	n/a
1999		2,200,000		124 + 2	n/a
2000			n/a	22	n/a
2001			339,000	9	6
2002				27	19
2003			1,500,000	48	30
2004				42	24

Sources: Kloeck-Jenson 1998; SPFFBZ annual reports, pers comm.

Unlicensed small scale logging took off – and by 2000, it is estimated that over 250 operators were engaging in hit and run exploitation (L Chomero, Governor of Zambézia, pers comm.), although officially licensed operators were only 30 (see Table 4). Meanwhile, larger investors turned to the 50-year concessions possible under the new Forestry and Wildlife Law (1999) and Regulations (2002) and applications for these began to accelerate. Concerns over communities' rights were once again raised. The new laws protected only community subsistence rights to resources, and obliged them to compete with all other operators for rights for commercial use. Government figures are contradictory, but it appears that whereas in 1999 there were only 2 concession applications Zambézia, by June 2004, there were 30 operators, with applications for 48 concession areas – totalling 1.5 m ha, or 51% of the province's forest area.

To date, however, only a few concessions have actually been granted. The approval process is far from transparent and DNFFB practices make the required inventories and management plans very expensive. Those concessions that have been approved in Zambézia do not guarantee sustainable management, rather they openly state their plan to harvest all valuable timber in 5-10 years, and provide for no serious post-harvest treatments or protection to ensure the next crop of timber trees. And meanwhile, operators whose applications are still in process are being allowed to exploit their areas under simple licences. The hit and run forest exploitation mentality is being perpetuated by current forest governance.

In mid-2000, the scandal of unlicensed logging in Zambézia was exposed in the local and national media, resulting in a big shake up of provincial officials. The head of SPFFBZ was suspended, disciplined and then demoted and appointed to Chinde as punishment. In March 2001, Jorge Manjate, the current head, and member of the Chissano family took over the post. The Provincial Director of Agriculture (DPA), Papaseco, was suspended and then returned to his previous job in the Cotton Institute (*Instituto de Algodao*). Many junior staff were also replaced. The Asian buyers, however, were not required to leave. It is said that they could not be touched, because they were politically protected and their activities were obscured by local Mozambican front men.

Under Manjate, SPFFBZ began its internal reforms. More qualified senior and trained field staff were hired and posted to districts, as well as in Quelimane. Salaries were increased. Through the national agricultural programme, PROAGRI, vehicles were obtained, including motorcycles for the mobile inspection team. The system of licensing was computerised. The Asian buyers were required to remove their log parks from the port, and a forestry checkpoint was created there instead.

When the whistle was finally blown, it was also found that a lot of wood had been left abandoned in the forest. The Governor created a Provincial Timber Commission[7], which declared an amnesty, and invited illegal loggers to declare the timber and purchase special licences (*guia de circulação*), which would enable them to bring the wood into town for sale - effectively licensing the illegal cut, ex-post. It is estimated that 10,000 m^3 was recovered this way, earning the government around US$150,000. The Commission continued to be active during 2002, but declined after this, as the two timber associations (ADIMAZ and AMAZA) organised themselves as interlocutors between operators and government.

As the rest of this report will document, all these reforms and measure really mean is that some of the previously illegal, indiscriminate and uncontrolled cutting has been licensed, and become "legal", indiscriminate and superficially-controlled cutting.

Today, according to official statistics, forestry in Zambézia represents 27% of national log exports and is worth approximately US$4 million per year, making it the second most important export, after shrimps. It contributes around US$825,000 annually to the national purse, and accounts for about 0.5% of national exports. Although this might not appear important, in real terms, it is significant, as the sector employs a large number of local people, and much of the money circulates in the local economy. Unsustainable and corrupt management, however, threatens these livelihoods, prevents the sector from realising its full economic potential and penalises those who would otherwise operate honestly.

2.4 MOZAMBIQUE, CHINA AND THE INTERNATIONAL TIMBER TRADE

China, as a timber consumer, is playing a key role in driving the current situation in Mozambique's forests. China's economy is booming. As the pace of development increases, domestic demand for timber (along with cement, steel, glass etc) to help construct its factories, shopping malls, offices and other infrastructure is burgeoning. At the same time, the spending power of millions of households is increasing, and with it, consumer demand for forest products, from furniture and flooring to toilet paper.

China has also become a major manufacturer and exporter of forest-based products. For example, plywood production has increased from 2.6 m m3 in 1994 to 21.0 m m3 in 2004. China's forest product exports tripled in volume between 1997 and 2004, rising from 12.7 to 36.2 m m3 RWE, and increasing in value four-fold, to US$ 13.1 billion. (White et al 2006). In the last 8 years, China has captured nearly one third of the global furniture market (White et al 2006). Wooden furniture, primarily seating, bedroom, office and kitchen furniture, accounts for one-third of China's annual forest product exports, driven by strong markets for low-cost processed wood products in the United States, Europe and Japan.

Where does all the timber come from? Since China instituted a ban on logging its own national forests in 1998, domestic timber production halved to from 80 million m3/yr to 40

[7] Consisting of the police, customs, commerce, agriculture and Criminal Investigations Unit of the Police

million m3, and in 2002, the deficit was estimated to be 60 million m3/year (China Daily February 19, 2002). To meet this demand, China has become the world's largest importer of timber. Total forest product imports increased from 40 million m^3 round wood equivalents (RWE) in 1997 to 120 million m^3 in 2004.The nature of imports has also changed. Ten years ago, forest product imports into China were largely processed products for domestic consumption, but now, they are raw materials for transformation and sale on the domestic market or re-export. Thus, in the same period, log imports have increased from 4.5 million m^3 RWE to 24 million m^3 RWE (Canby 2005, White et al 2006, Global Timber 2005). Although in 2005, 56% of log imports were of Russian softwoods, China is now the world's largest importer of tropical hardwood logs (Canby 2005), with the main suppliers being Malaysia (mostly illegal logs from Indonesia), Papua New Guinea and Gabon. All logs suppliers except Russia are experiencing rapid depletion of their forests, and it is predicted that at current rates of exploitation, resources will be gone within 15 years (Canby 2005). China's economy is predicted to continue growing at least 8% for the next decade, and its national logging ban will remain in force until 2010. The consequences for the world's forests will be enormous, and we can expect other emerging economies, such as India, to have similar impacts.

China's principal interest is logs. *Global Timber* reports that China tends to pay low prices for timber, in international terms, and asserts that this represents conscious commercial strategy, actively driven by the Chinese government, to exploit low cost sources of wood, in countries where governance and the rule of law are weak. China canceled import tariffs of log and sawnwood in 2002, but import tariffs on finished and semi-finished timber products range from 15-22%, although it is proposed to decrease these to 2-3 % in the coming years. China thus import logs and protect their own processing industries, at the same time as pre-empt competition from established and emerging manufacturers in tropical developing countries. It is estimated that half of China's imports are illegal, and that one third of this timber is subsequently re-exported after processing – amounting to timber laundering. (See http://www.globaltimber.org.uk/ChinaIllegalImpExp.htm a map sketching the illegal import and export streams, and preliminary analysis.)

Mozambique's timber is said to be used by the Chinese primarily for furniture making. Only one-third of China's furniture production is exported. Unfortunately, available analyses do not distinguish the types of imported timber used in domestic and export furniture markets. Much of Mozambique's fine timber may end up in the domestic furniture market, where ornately carved pieces from dark heavy hardwoods are status symbols and family heirlooms.

Mozambique is one of the countries that, given support and investment, could probably establish wood-using industries to supply high value markets, and even to supply components to Chinese furniture makers. However, the government appears to be collaborating with the Chinese to promote log export, rather than supporting its own citizens to promote domestic job creation. Given the global rates of forest exploitation and demand for wooden furniture, the market for fine tropical hardwoods is very likely to improve, and the potential for short-term gain should not blind Mozambique to the greater gains that can come from sustainable management and industrial development, in the longer term.

China's growing economic influence is being felt globally, and not just in forestry. China now consumes 30% of world oil production. World over, the Chinese are entering investment agreements for the development of ports, roads, railways and pipelines, to give them access to raw materials and to promote the import and distribution of their own manufactures. Such investments have the potential to contribute to the long-term development of the host economies, but countries like Mozambique need to be aware of the scope for long-term

damage to their societies, governance systems, economies and environments, from short-term unsustainable exploitation of resources, and particularly from selling off their national forest heritage. China, as an increasingly important player in the global community[8], should be more responsible and accountable for its dealings with developing countries. At the same time, countries which import manufactured timber products from China also have a responsibility to ensure the original timber is legally and ethically sourced, and individual consumers should be aware that the furniture, decorative moldings and plywood they buy are likely to be composed of timber from poor developing countries and that the cheap prices they pay are directly linked to the exploitation of some of the poorest people in the world and the destruction of their forests (White et al 2006).

2.5 THE STAKEHOLDERS AND STRUCTURE OF FORESTRY IN ZAMBÉZIA

The forest sector in Zambézia involves a large and diverse group of people, from labourers in remote villages, to Asian traders in Quelimane and ruling party members in Maputo. Table 7 provides a breakdown of these stakeholders, identifying three main categories: those directly involved in forest production (primary stakeholders), those using forest products or supporting the forest industry (secondary stakeholders), and the institutional stakeholders, and gives details of their identity, activity, interests and linkages. Below, short discussions of the major stakeholders are provided, considering also their relative power, and how they would be affected by the proposed reforms and sustainable forest management.

Producers include operators working under two different licences: simple licences and concessions. **Simple licence holders** (see Section 4.4) must be Mozambicans, and in 2003 and 2004 there were around 125 operating in Zambézia. Although they represent themselves as poor and lacking livelihood alternatives, analysis of licence application forms showed that most were traders, business people, office workers, forest industry workers or professionals (including a pharmacist, a naval pilot, an engineer, a health technician and an industrialist), attracted to forestry by the chance of making relatively large amounts of money, relatively quickly. Considering the tough physical and commercial environment, a surprising number (22%) were women. About 20% were groups, including some charitable organisations. In 2003, over 25% were newcomers, with no experience in forestry. An undisclosed number were (said to be) fronts for staff of the provincial forestry and agriculture services, whose participation in the sector is officially illegal.

The majority of small operators are only able to enter the sector by obtaining credit from the Asian timber buyers, to cover their licence fees, deposit and other operating costs. About 40 are members of the loggers' professional association AMAZA, which functions to lobby government for larger quotas and lower taxes, and to negotiate with buyers for better prices, terms and conditions. Many spend their profits on luxury consumption, although some have re-invested in their businesses to buy equipment, trucks and even processing equipment. As many of these operators engage in illegal and unsustainable practices, they would lose in the short-term from improved forest governance.

However, this is not to discredit all *simple licence* operators. Some told inspiring stories of enterprise and hard work in building up their forest operations (see Box 1), and it is clear to see how they get caught up in the *status quo*: by simply taking advantage of a commercial opportunity, they end up operating illegally, unethically and unsustainably, simply by conforming to the corrupt system in which they find themselves. Such operators might respond to improved regulation and support sustainable forest management, if given the

[8] and the same admonishments may well be directed at India too.

opportunity. Part of the tragedy of the current situation is that the efforts of such people cannot be harnessed for the wider benefit of the economy and society.

Box 1: The Story of Sr X, a simple licence operator

Sr X is a middle-aged man, native of Zambézia. He first got involved in timber-related business in the 1980's, working for a local construction firm, cutting and delivering timber to their 3 carpentry workshops. When the company was bought out in the late 1990s, he started his own carpentry using *umbila, jambirre* and *chanfuta* to make doors and windows for the local market. At this time, he got his first licence to cut timber. Because of theft of his timber by his staff, he closed his carpentry few years later, and started selling timber to the big local sawmills. Prices were relatively low and he usually had to wait 30 days to be paid. Then in 2001, the Asians appeared. They gave higher prices and paid immediately. He developed a relationship with one particular firm and has worked exclusively with them ever since. They give credit enabling him to pay licence fees, transport and other expenses. He has re-invested his profits and now owns a lot of his own equipment: a new chainsaw and a second hand tractor and 7 tonne truck.

He has cut in a number of different places in the province. He keeps moving around, not because timber finishes, but because communities want more. They start hiding the wood. They direct you to one area, and don't show you another. If you don't give them what they expect, they close down on you.

As a first step in getting a licence, he sends someone on reconnaissance into an area where he has heard, one way or another, that there is timber potential. If this is confirmed, he will go in and talk to the local leader and perform the necessary ceremonies. If no other logger is in the area, he will go to provincial cadastral service to reserve the location. The next step is to conduct the community consultations. He goes personally for this, and pays for a forestry technician from Quelimane and district and administrative post officials to accompany him. The official costs are relatively high – 300,000 Mt/person/day for local staff, and 480,000/person/day for people from town, plus transport – so operators working in the same general area usually club together and all have their consultations done on the same day. A consultation typically takes 2 hours, depending on who says what. In 2003, people wanted a school, well, a bridge, 30 axes and 500,000 Mt. In 2004, in the same place, a different *regulo* just wanted to eat and drink and ensure the roads were maintained. There was no agreement as such.

In 2003, he was licensed to cut 200 m^3. His team worked from end of August til end of December. He personally went in a couple of times a month, to take supplies. Otherwise, he left his *gerente* in charge. This is always a risk, and it does happen that a *gerente* side-sells timber on his boss. Generally speaking, he had to send 3 trucks a week (60 logs, 25 m^3) in order to break even, so the official quota finished in a couple of months.

His main buyer got into financial problems, so he sold his wood to second buyer in Quelimane and just rolled over his debt. The second buyer used to pay the best, and also was fair with the log measurements. In 2001, he was paying US$360/ m^3 for *pau ferro*. But then the other Chinese put pressure on him, and now the price is US$250/ m^3.

Transport is his biggest expense. Prices have gone up and up. The cost should be calculated in terms of tonnes/km, but it is standardised. Now its 10 million Mt ($400), for whatever distance, just for a 7 tonne truck. Chinese sometimes facilitate, with their own trucks and charge 8-9 million MT. Often the Chinese pay the transport in advance and cut the cost from the timber payment.

Two years ago, there were buyers in the port. Now you have to unload in buyers' log parks elsewhere. Operators are at a disadvantage. Once you are there with your wood, the pressure is to sell – because there is nowhere else to go with it. The timber cutters' association (AMAZA) may be getting its own wood yard.

The Governor is very supportive of the operators. He facilitates things a lot, helping people get their licences.

Forest Concessions are open to anyone, national or foreign (see Section 4.5). In 2003, there were 30 applicants for 48 areas amounting to 1.5 million ha, and 2 had approved management plans and begun operations. In 2004, only 22 applicants for 36 areas totalling 1.3 million ha remained, and 5 management plans had been approved (SPFFBZ 2004) and started operations. It is difficult to monitor the concession sector, as data from SPFFBZ and DNFFB are incomplete and quite contradictory.

Amongst the concession applicants are 6 identifiable groups:

- long-established medium-scale industrial operators
- small local operators with some industrial capacity
- national investors
- Asian buyers with influential national partners
- independent Asian buyers
- other international investors

The majority of applicants are foreigners, or Mozambicans with foreign partners. Some are collaborations between foreign buyers and local politicians, government officials or elites. Table 4 presents the members of the Green Crown Group, who operate in partnership with Cheng Kee Meng, previously a buyer for Timberworld. This group has an approved concession in Lugela, which represents the majority of the best remaining forest in Zambézia.

Table 6: The Green Crown Group in Lugela, Cheng Kee Meng and Partners

Company	Partner	Concession Size (ha)	Connections
International Business Assistance	Cristina Cipriano	35,733	
World Forestry	Cristina Cipriano	22,157	FRELIMO members, including Chissano family
Timber World	Cristina Cipriano	22,840	-"-
World Investments	Cristina Cipriano	19,641	-"-
Green World	Eduardo Sergio Popinsky	26,872	
Eco-Florestal	Sebastiao Serrio Cuco	~18,000	Brother of director DNFFB
Bonifacio Grueta Massamba	BGM	43,695	First governor of Zambézia
TOTAL		**188,938**	

The medium-scale industrial operators have also requested a large total area. There are unconfirmed reports that some forestry operations are fronts for tax evasion and money laundering, in some cases, possibly involving organised criminal networks from South Asia and the Far East. Most operators are only interested in log export, because of the quick and easy profits. Incomplete concession regulations and their lax implementation mean that applicants can exploit timber even without preparing management plans or establishing industries. The interests of these operators would clearly suffer through improved forest

governance, although in the longer term, concessions could be profitable, especially if linked into manufacture of finished wood products.

Industrial operators include concession applicants, discussed above, as well as smaller operators harvesting trees under simple licences, and both large and small carpentries without forest operations. Some of the medium-sized industrial operators made major investments in new equipment in anticipation of the obligation to process timber in country and have been ill-served by the recent change in regulations permitting log export. Others are operating with older equipment. Some concession applicants are establishing sawmills with poor quality second hand equipment, simply to fulfil the official requirement to establish an industry, but at least one has actually imported new equipment for this purpose. Currently, the only export products are sawn timber and parquet. Some exporters are endeavouring to fulfil their obligation to local processing by sawing low grade timbers for the local market. Local carpentries produce generally low – medium quality doors, windows and furniture, and construction timbers, that represent a poor use of these quality hardwoods. There is, however, great scope for upgrading this production. Most industrial operators would benefit in the medium term, from investment in sustainable forestry.

None of the operators interviewed had any interest, or felt any responsibility to promote social and economic development in the province. Some operators reported the difficulty in doing business legally, given the competition for logs, the need to bribe officials, the slow and often obstructive government bureaucracy and the lack of basic infrastructure. The main industrial operators would benefit from the reforms proposed here, as they would have a secure and adequate supply of timber for their mills and better support from government. The carpentry workshops would benefit from commitments to in-country processing and the production of higher quality goods.

The industrial operators are represented by ADIMAZ (*Associacao de Industrias Madereiras da Zambézia*) which currently has 22 members. They lobby government for larger quotas, but are also attempting to organise to provide members with professional services, such as management planning and inventory.

There are some tensions between the primarily foreign concessionaires and large industries on the one hand, and the Mozambican simple licence operators on the other, for shares in the annual timber quota. Private sector investment does run the risk of being dominated by foreigners with capital and marginalising local operators, but provides permanent jobs and the prospect of long-term development. Simple licence operators demand a higher proportion of the timber quota, citing rights of nationals and the need to invest in their businesses. Few however, actually reinvest in forestry or provide jobs.

Timber buyers and exporters have included some 42 individuals or companies over the last few years. Exporters can be categorised by product (logs or processed), by nationality (Mozambican or foreign) and by affiliation (representatives of commodity and furniture manufacturing firms, independent brokers or independent buyers), but the categories are somewhat blurred. Most of the exporters are foreign and specialise in sending logs to China, Hong Kong and Malaysia. Sawn wood exports are insignificant.

The community of foreign buyers is quite dynamic, in terms of numbers and personalities, with people coming and going from year to year, since the late 1990s. They come from China, Taiwan, Singapore, Burma, Indonesia, Mauritius, India as well as South Africa. Most of the buyers apparently sell to the same few companies in the Far East, including Chung Tai Ltd, Today Trading, South Pacific, Harley Timber and Chong Sun Wood Products.

According to official statistics, the largest exporters from Quelimane in 2003 were Madeiras Alman, Green Timber, Peter Yu and Timberworld (Cheng Kee Meng).

The Asian buyers obtain their logs by extending credit to small operators. Some also have fleets of trucks for bringing the timber in from the forests. Dubious practices include under-measuring logs, expensive hire purchase agreements with small operators for equipment (both of which serve to keep operators in debt), under-reporting exported timber, bribing officials to avoid fines and to secure policy change, and transfer pricing to avoid tax. From their own typically cynical comments, the buyers have no interest in the sustainable development of the sector or local economy (see Box 2). They are in Zambézia to make profits and when the easy money is finished they will go elsewhere. If forest governance were improved, the majority would probably leave.

Box 2: The story of Mr Z, a timber buyer.

Mr Z, an Asian man, came to Quelimane from Pretoria in 2001, where he had been in the importing business, bringing mixed goods from the Far East. He first started buying timber in Zambézia from there, in 1991. He also operates from Pemba. He's not the boss – just a worker. He sells his timber to one or two buyers in the wholesale market in Guandong.

Mr Z has applied for two concessions in Zambézia. One of the concessions has a management plan; it was written by staff from SPFFBZ. He doesn't have a local partner. Timberworld has partners, in order to have protection and get their licences quickly. Last year Mr Z didn't buy much timber, but had paid licences for 15 people. He was cutting himself in his concession area, with 8 chain saws and 80 people, but gave up because it was too tough; too much stealing – everyone, everywhere. This year he is cutting on a small-scale, one chainsaw only and paying licences for over 25 people.

Currently he has US$40,000 in bad debts, including US$8000 to one guy who was supposedly going to buy a truck, but he ended up just buying a pick-up and the rest of the money disappeared.

"Fuck AMAZA" (the loggers' association, and their attempt to strike for higher log prices). I'm still getting my timber through Nicoadala anyway – 6 trucks since the (strike) meeting. "Who is going to buy their timber? What else is happening in Quelimane? It's the only source of money. If they insist on higher price, the buyers will just leave – and then where will the operators be? Who will help them with their problems?"

Ships are booked from China, not here, using same shipping company (Chinese government owned), but different ships. It usually takes 1.5 – 2 months to arrive and costs US$300 - 400,000, to carry around 4,000 logs. Its recently gone up by US$80,000, due to fuel price rises. This makes it about US$120/ m^3 to ship to China as loose logs compared to US$135/ m^3 for containers. He loaded a boat last year from Pebane, using a barge to take timber to ship, 6 mi offshore. It took 2 weeks to load 3000 logs because of the high seas. He's not going to do again.

Mr Z pays the lowest prices for logs of all the buyers in Quelimane – but always gets his timber. People sell to him, because he listens to their problems and tries to help. He filled 10 ships in 2002.

Salaries, at SPFFBZ are 8 m MT/mo ($320), for senior people, and 2m MT/mo ($80) for junior officers. Of course they ask for bribes! And the DPA and the Police - all of them! But

not the Governor; he's a good guy; you can sit down and tell him your problems. He'll try to help. Mr Z pays at least 2 m MT/day in "additional fees" to other people. He also helps his operators with their fines. They ask him to go and convince DPA that the operator can't pay, and to make it less.

Its not his concern what happens after the timber finishes. "Fuck them. It's their fault if there's nothing else left." They have to solve the problems:
i) laziness
ii) stealing – the only thing on their mind is how to steal from company
iii) corruption – everyone wants to get rich quick.

Traders are now exchanging lists of their simple licence operators, to stop the side-selling. And also now if someone with your timber goes to another yard, you can go and get it back. But in the height of the season, it's very difficult. Too many trucks coming and going. Then, if a ship is coming in and you haven't enough timber to fill it – you put up the price to attract in the timber, and the side-selling starts for real.

"Now everyone wants to buy trucks. They think they're going to transport timber. But when it's gone, what are they going to transport? And when there's nothing to transport, who are they going to sell the truck to?"

"No one wants to invest here. Do you want to know why there's no factories? Because there's no infrastructure, no electricity. It's not a labour problem – that's cheap."

"We're in business. We're not Jesus trying to save people. We do business, and when business is finished, we go away. Everyone has to live."

Communities are both formal and informal stakeholders in the forest sector. Formally, they provide labour to concession and simple licence operators, but the jobs are few (in relation to number of community members), seasonal and often pay below the minimum wage. Women rarely receive employment and are typically disadvantaged by the loss of their spouses' labour in agriculture and lack of control over the wages earned. The law requires that communities be consulted in the process of licensing both types of operators, and that they should benefit from the operations, but the consultations are often perfunctory and involve pay-offs to community leaders. Commitments made by operators for such things as road and bridge repair, school rehabilitation and well construction are rarely fulfilled. Communities should also get 20% of the royalties of any operation in their area, but in practice this does not amount to very much money, and the National Directorate of Forestry is still working out the delivery mechanism. They assure communities that in the interim, their shares are being deposited in a special fund, for later disbursement.

Informally, an ill-defined number of communities are involved in illegal logging, supplying timber directly to simple licence operators who either have not bothered with field operations of their own, or who want additional logs. Log prices range from 50-200,000 MT ($2-10) each, depending on species, size and quality. Local leaders often act as gatekeepers, whom operators must pay to gain access to timber, and community members are employed to locate valuable trees. It is clear that communities have considerable knowledge and capacity in forestry, that could be developed in community-based forest management initiatives.

Transporters. It was estimated in 2000, that 80% of the trucks in Quelimane were involved in transporting timber through 6-9 months of the year (Norwatch 2000). Many people, who previous operated as loggers under simple licences, are now buying trucks, attracted by high

prices they can charge (around US$40/m3) and the low risk. They do however incur relatively high maintenance costs, and competition from the Asian buyers who import their own second hand trucks from Asia, and undercut on prices. When the timber runs out, the transporters will be in trouble, as there are not sufficient other commodities to occupy all the trucks. Sustainable management would provide secure business, but for far fewer transporters.

Table 7: Simplified Analysis of Stakeholders in the Forests of Zambézia

Stakeholder Group	Social identity/practices	Interests	Linkages/conflicts
PRIMARY			
Simple Licence Loggers	Mostly nationals and Zambezians, small business men and women, government workers, associations interested in whatever economic opportunities available, presently forestry. Includes some liberation war veterans.	Short-term profits for personal income / expenditure or to provide capital for further forestry operations or (more often) other investments	Some government officers Some receiving credit from trading companies or industrial concession holders Some acquire but do not use licences, instead buying timber from village cutters, and from workers in other operations, and stealing directly from other operators. Attempt to associate to promote interests. Many trapped in debt.
Industrial Concession Holders	Mostly Mozambicans of foreign heritage or foreigners. Some acting as fronts for national politicians	Ostensibly sustainable supply of timber for processing industries, but profits currently maximised by exporting logs	Well connected Some with legitimate industrial operations, others without.
Timber buyers/export companies	Foreigners, mainly Asiatic	Buying and exporting timber to supply clients in Asia Providing credit to simple licence for licences fees, equipment, operating costs, transport and personal loans, to entrap them with debt and thereby secure log supply and control commodity chain. Takes "interest" through hire purchase arrangements, under-measuring and under-pricing timber	Price fixing cartel Side selling to other clients. Fomenting disunity in local operators through paying different prices.

Stakeholder Group	Social identity/practices	Interests	Linkages/conflicts
Village and other local leaders	Often hereditary Traditional chiefs, cell leaders, political party representatives	Negotiate with outsiders on forestry issues, on behalf of community and or themselves. Some act as middle-men/ gatekeepers taking commissions from business people wanting to obtain timber from rural areas, or local people wanting to supply them	Some linked to particular business people in long term relationships. Potential conflict between communities adjoining forest areas, for access to revenues. Self-interest leads to conflicts with own people
Village households	Mostly poor, subsistence agriculturalists	Forest products for subsistence Low paid job opportunities w/ loggers Benefits from loggers operating in their areas, and theoretically, the 20% return from tax revenues	Household labour diverted Food security reduced Competition for jobs leading to internal conflicts
Village wood workers	Local craftsmen and sawyers	Secure accessible supply of hardwood timber for sawing and making furniture and doors	
Town based skilled and unskilled labour	Includes migrants from rural areas	Low and irregular income from chain saw operating, and loading logs	Compete with rural
SPFFBZ Officers	Educated, local and extra-local	Supervise and administer provincial forestry operations. Impose fines for transgressions, obtaining 50% of sum (or share thereof).	Negotiate bribes with operators and buyers in exchange for avoiding fines. Personal involvement in logging via front wo/men Family and other links to politicians
SECONDARY			
Wood-based industry	Small local and large (originally foreign) companies	Supply of timber to keep sawmills running Good markets for sawn wood products	Links to Asian buyers, to sell logs, excess to requirement to fill orders for processed wood
Truck owners	Independent local owners, small companies, parts of foreign operations	Continued logging to provide demand for transport services	Compete with Asian and other buyers who have imported trucks.

Stakeholder Group	Social identity/practices	Interests	Linkages/conflicts
Shipping agents and companies	Quelimane based national and multi-national firms handling log shipments	Business from logging interests	Collude on illegal log shipments to keep customers.
Equipment and Tractor owners	Local investors	hire their tractors and equipment to simple licence loggers	
Approved Management Plan/inventory consultants	National academics Government officers Ex-government officers	Concession system provides demand for their services.	Some companies owned by key government officials
INSTITUTIONAL			
President's office	Senior politicians	Opportunities to influence policy and legislation	Opportunities for bribes and personal involvement in logging
Council of Ministers	Senior politicians	Approves concessions over 100,000 ha.	Opportunities for bribes and personal involvement in logging
DNFFB National Directorate for Forests and Wildlife	Senior civil servants.	Determine policy, enforces laws.	There are allegations of policy changes favouring foreign investors being made in exchange for direct bribes or share in forest exploitation operations. Provides consultancy services unofficially through private arrangements, or through linked consultancy firms. Regulates to enhance returns from above.
MADER Ministry of Agriculture and Rural Development (National, provincial)	Senior national and provincial civil servants	Provincial Director of Agriculture can approve concessions up to 10,000 ha; Minister of Agriculture approves concessions of 20,000 – 100,000 ha	There are allegations of extracting rents from operators and traders for favourable consideration
Governor's office	Senior civil servants	Can approve concessions between 10,000 and 20,000 ha	There are allegations of extracting rents from operators and traders for favourable consideration.

Stakeholder Group	Social identity/practices	Interests	Linkages/conflicts
SPFFBZ, Zambézia Provincial service of forestry and wildlife;	Civil servants and contract employees, including 5 professionals, of which 3 graduates, partly through PROAGRI support, 29 forest guards operating at Nicoadala and in districts.	Provide technical appraisal of management plans, issue licences and cutting permits, enforce laws, supervise forest operations, movement of forest products, including entry into port and export. Generate state forest revenues	Generate personal revenue by facilitating operators' and traders' avoidance of regulations. Illegal preparation of management plans, and other consultancies.
SPGC	Provincial service for geology and cadastre	Register and map concession and simple licence areas	
Alfândega (Customs)		Export of logs to generate legitimate and illegal revenues	Under-record logs entering port, collude on under-recording of logs leaving port.
CFM (Port authority)	Nationals, civil servants, elites	Export of logs, to generate legitimate and illegal revenues	Under-record logs entering port, collude on under-recording of logs leaving port.
Industry, Commerce and Tourism	Nationals, civil servants, elites	Register and licence companies to operate industrially and/or commercially.	
Police	Nationals, civil servants, elites	Inspect timber vehicles.	Accept bribes
NGOs	National and international non-governmental organisations	Promoting economic and social development through diverse initiatives, including investigative studies and project implementation. Representing views of civil society, including local communities, particularly in participating in national democratic processes by monitoring government action and demanding good governance.	Some constrained through direct (self) or indirect (family, friends) links to forestry mafia or by fear of them. Comparatively high salaries of staff (in local terms) depend on studies and projects financed by foreign sources. Have interests in maintaining demand for studies or scope for switching to other areas of donor interest.

Stakeholder Group	Social identity/practices	Interests	Linkages/conflicts
International Financial Institutions	IMF, World Bank, African Development Bank.	Making and recouping loans. Maintaining relations with host governments	Due diligence in loans not always exercised
Donors	Bilateral (DGIS, MFA Finland, BMZ, DFID) and multilateral agencies (FAO, IFAD, UNDP)	Much support now through SWAP and budgetary support. Seeking to influence sector/promote sustainable management through policy process; some field projects aimed at poverty alleviation through sustainable forest management, implemented by consultancy firms and NGOs.	Interact with each other, government and stakeholders to some extent via interagency Forum on Forests. Competing/conflicting aid agendas. Mutually benefiting with the GoM, NGOs and consulting companies from the delivery of aid budgets.
Consultancy companies	National and international companies.	Implement studies and projects funded by donors.	Some national firms have links to DNFFB. Personal interests in not rocking the boat, in order to maintain healthy relation with GoM and ensure future contracts and continued very high salaries. Mutually benefiting with donors, in turning a blind eye to governance abuses, to maintain donor budget expenditure and consultant incomes.
INDIRECT			
Local traders	Foreigners and Mozambicans, many of Lebanese, Algerian and South Asian origin	Wholesalers and retailers of wide range of goods required for forest sector or consumed by forest operators.	Links to politicians and forest operators Cash spent by forest sector important component of income
Local service providers	Foreigners and Mozambicans, many of Lebanese, Algerian, South Asian and European origin	Provide range of services in local economy, directly to forest sector or consumers.	As above

3. POLICY, LAW, REGULATION AND AGREEMENT: HOW FORESTS IN MOZAMBIQUE ARE SUPPOSED TO BE MANAGED

The Government of Mozambique's commitments regarding the forest sector are set out in 3 main policy areas: the national agenda for economic development, international environmental and forestry agreements, and national forest policy, law and regulations.

3.1 PARPA AND PROAGRI

The Action Plan for the Reduction of Absolute Poverty 2001-2005[9] (RoM, 2001) is the main strategic document which binds the of the Government of Mozambique to the objective of poverty alleviation, sets out and directs its activities, and provides the framework for development assistance by bilateral and multilateral donors. This is critically important, as donors currently provide over 50% of the government's budget.

The PARPA analyses poverty in Mozambique and sets out a large number of objectives contributing the overall goal of poverty alleviation. It recognises that poverty is essentially a rural phenomenon and that strategies to address it should be based on the resources within the command of rural people (Cuco et al 2002: 2). It commits Mozambique to striving for social and environmental sustainability[10] and identifies sustainable management of natural resources and the raising of productivity as key strategic objectives[11]. With specific regard to forestry, PARPA recognizes the importance of forests for rural livelihoods and their potential to act as an engine for rural development[12] (RoM 2001).

The Agriculture and Rural Development Programme set out in PARPA[13] includes for forestry, the expansion of the participation of communities, private sector and other producers in forestry, with "due attention to the long-term sustainable use of the resource"[14]. Interestingly, however, the three principal measures included to achieve this objective do not really relate to sustainable management regimes, rather they are: i) to operationalise the national and provincial inventory system; ii) to rehabilitate reserves (presumably destroyed in the war years) and iii) to reforest and restock these reserves. In addition, there are research objectives, for the promotion of sustainable forest management.

PROAGRI is a multi-donor agricultural sector support programme, started in 1998, and later incorporated into the broader framework of the PARPA (Garrido-Mirapeix J and A M Ribeiro, 1998). The first phase ended in 2003 and a second phase started in 2004. The DNFFB has summed up the Forestry and Wildlife Component of PROAGRI thus:

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[9] PARPA – known as PRSP (Poverty Reduction Strategy Paper) in most countries.
[10] Paragraph 160
[11] Paragraph 163
[12] Paragraph 154
[13] Paragraphs 164-
[14] Paragraph 170.1

"The challenge of forest and wildlife sector development of Mozambique is consequently two-fold: (i) to stop the deterioration of this important resource base and achieve its sustainable management and conservation, and (ii) to formulate and implement effective strategies to tap the potential of the forest and wildlife resources for the benefit of the rural poor." (DNFFB 2003)

Forestry activities under the first phase of PROAGRI however included mostly capacity building of the provincial services – obtaining new vehicles, equipment, uniforms, and buildings - rather than any strategic measures for law enforcement, sustainable resource management or development of the sector, and thus deterioration continued as before.

3.2 AGENDA 21

UNCED, the Rio Earth Summit in 1992, produced several key multilateral environmental agreements, including Agenda 21[15], the linked Rio Declaration on Environment and Development and the "Non-legally Binding Authoritative Statement of Principles of the Global Consensus on the Management, Conservation and Sustainable Development of all Types of Forest (Forest Principles), all of which derived from the basic "right to socio-economic development on a sustainable basis" (UN 1992, Annexes 1 and 3). Mozambique committed itself to the 27 principles of the Rio Declaration and the15 Forest Principles. Although these principles were not binding, as part of a new global partnership for the environment initiated at UNCED, countries were supposed to implement them promptly, and indeed, Mozambique's Forest Policy of 1999 framed its objectives explicitly in terms of Chapter 11 of Agenda 21 (Combating Deforestation). Thus, these principles should represent the earliest "statement of intent" by the Government of Mozambique to its people and the international community regarding the global and national environment, and in particular to the rational, scientific management of Mozambique's forests and the promotion of their role in integrated, sustainable development.

3.3 AFLEG

African Forest Law Enforcement and Governance (AFLEG) is an international undertaking to combat illegal logging, which Mozambique signed up to in 2003, committing itself to 30 intentions and 42 indicative actions including fair and equitable enforcement of forest laws, and immediate and coordinated regional and international action to combat illegal logging, hunting and trade, and corruption. It also called for transparency by forest agencies, awareness-raising amongst national constituencies and partnerships between governments and civil society for monitoring. AFLEG has since been adopted as a part of the New Economic Partnership for Africa (NEPAD). The government has not publicised its undertaking to AFLEG, and has done little to implement any of them. (see Global Forest Watch 2003: http://www.globalforestwatch.org/english/about/afleg)

[15] Agenda for the 21st Century.

3.4 NATIONAL FOREST POLICY, LAW AND REGULATION

For Forestry and Wildlife, Mozambique has National Policy (GOM 1997, Resolution 8/97 from 1 April), Law (GOM 1999) and Regulations (GOM 2002), which provide the rationale and the conceptual and legal frameworks for sustainable forest management. Various modifications have been made to the regulations since then, through decrees, diplomas and despatches, and these will be discussed below.

Policy

The Policy situates the sector in terms of the national macro-economy and presents a long-term vision for the role of forests in national development and for development of the sector itself,. It identifies forestry's main opportunities and constraints, including many of the problems discussed in this report:

- the proliferation of inexperienced small operators dispersed across wide areas,
- the consequent uncontrolled logging, the weakness of it own law enforcement,
- the lack of a permanent forest estate,
- the emphasis on log exports
- the accompanying lack of support to industry
- the lack of community benefit,
- that only 10-15% of the 500,000 m^3 annual allowable cut actually comprises commercially interesting species, and,
- an industrial capacity more than sufficient to process all logs harvested.

The Policy is framed upon the Government Programme and the Policy and Implementation Strategy for Agriculture (MAP 1995), which commit the government to supporting:

"the rational and sustainable utilisation of forests and wildlife to serve the national economy in general, and the interests of the local communities, in particular."

The Policy explicitly undertakes:

- to encourage forest exploration directed at industrial transformation, through concessions guaranteeing sustainable management (Art. 47 (ii))
- to reduce the export of timber as logs, and offsetting this with increase in finished and semi-finished products, (Art. 47 (iii))
- to value forest resources increase their value added by increasing their degree of transformation, and making complete and rational use of these resources (Art. 48)
- to promote the introduction of new industries in raw material producing areas. (Art. 48).

Economic, social, ecological and institutional objectives are identified, stressing full sustainable use of resources, private sector and community participation, resource conservation and rehabilitation, and good governance.

The Forests and Wildlife Law (MAP 1999) is the legal umbrella for the forest sector, and like other laws, had to be debated and passed by Parliament. It includes 9 chapters and 47 articles, covering protection, regimes for forest and wildlife exploitation, restocking of resources, resource management, supervision and law enforcement, and infractions and penalties.

Most of these provisions are sound and indeed progressive. Of particular relevance to the discussion which follows are the articles below and their requirements:

Article 3 a):	Defines forest and wildlife resources as property of the State
Article 5:	Definition of national forest estate: conservation, production, multiple use
Article 8:	Promotion of processing industries
Article 16.2:	Concessions to guarantee processing timber
Article 17.1:	Concession area to be related to processing capacity (amongst other criteria)
Article 18:	Safeguarding third (ie local community) party rights
Article 31.1	Creation of local councils for the management of resources
Article 33:	The possibility for the State to delegate powers for resource management to local communities or the private sector, while retaining rights to supervise these activities
Article 36:	International conventions and treaties (*such as AFLEG*) as fundamental instruments in forest law
Article 37.2:	The Role of ALL CITIZENS in vigilance, protection, enforcement of forest laws.

A key issue to which we will return in later sections, is that the forests are considered property of the state, and that Article 18 only safeguards communities' subsistence use of resources. Article 33 on the delegation of powers, has scope to give rights to communities, but regulations, recently finalised, are not yet being promulgated or applied.

Regulation of the Forest and Wildlife Law (MADER 2002), elaborates on measures to implement the **Law**, and includes 119 Articles, structured around the same 9 chapters as the Law. It sets out in some detail, the requirements for application, rights and obligations of the two main regimes of forest exploitation, the Simple Logging Licence (Section II) and the Concession (Section III), but does not include operational details for harvesting, transport or export.

The Regulations also prescribe :

- priority of concessions over simple licences in the longer term
- transfer of rights to local populations
- adequate consultations between operators and communities, prior to exploitation
- local councils to make resource management decisions, including community representatives, private sector and local government.

The problems of the forest sector in Zambézia, examined in greater detail in the following chapters, are essentially the failure to implement or act on these existing commitments.

4. PRACTICES: HOW FORESTS IS ZAMBÉZIA ARE MANAGED CURRENTLY

4.1. OVERVIEW OF THE STATUTORY PROCESSES OF FOREST MANAGEMENT

Sustainable management of forest resources involves four main elements: definition of the objectives of management, assessment of resource, control of the harvest and measures to ensure the next crop. For readers not familiar with forest management, a more detailed background discussion is provided in the full report.

The stated **objectives** of forest management in Mozambique are to provide a sustainable supply of raw materials, to support industries and provide jobs, while maintaining important environmental services, such as watershed management, biodiversity, soil conservation, and the amelioration of climate.

The basis of sustainable resource management is to harvest the resource at rate equal to or below the rate at which that resource grows or replaces itself. The first step in SFM is thus **resource assessment** or forest inventory, to determine, in detail, how much resource there is (species, number of trees, size and quality classes), where it is (district, forest type and area), and how fast it is growing.

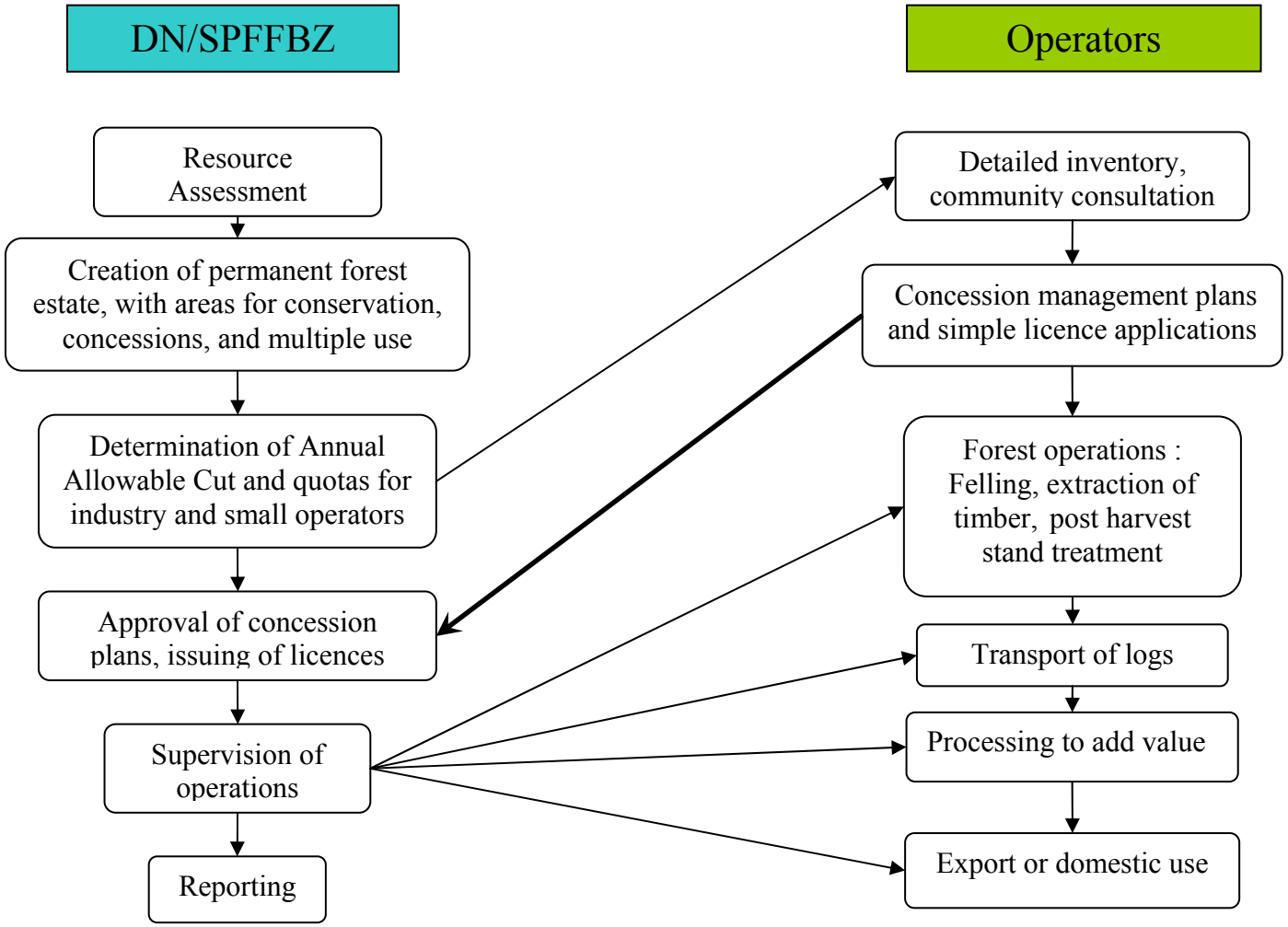
Based on the resource assessment, a **harvesting control system** is established. This has dimensions in both space and time. The best areas of forest are set aside as a permanent forest estate. The timber inventory combined with growth data then enables calculation of the volume of timber that can be cut every year from the estate, without degrading the resource (Annual Allowable Cut, AAC). Based on the AAC, harvesting quotas are allocated amongst the various logging interests as set out in government policy, and individual operators apply to the forest services for licences to log the forest. To complete the licence application, an operator must conduct a more detailed inventory and obtain the consent of communities in the forests they intend to log. After licences are issued, the forest services are responsible for supervising and controlling operations, to ensure operators comply with the species, volumes and areas they have been allocated, and that appropriate methods are used in harvesting and to ensure the next crop. Forest services also oversee the export of timber, ensuring that only designated species and volumes are exported as logs. All the main commercial species should be processed before being exported, to comply with government policy to promote industrial development and job creation.

Harvest should be followed up by **post-harvest treatments** to ensure regeneration of the next crop, and thus the long-term sustainability of resource management.

Below, Figure 1 sets out the process according to national policy and law. Figure 2 contrasts this with a summary of what actually happens in forest management in Zambézia at the present time. The following sections (4.2 – 4.10) will examine the steps of Figure 2 in more detail, highlighting the abuses in planning, management, control and regulation.

Figure 1: Overview of the Statutory Process of Forest Management

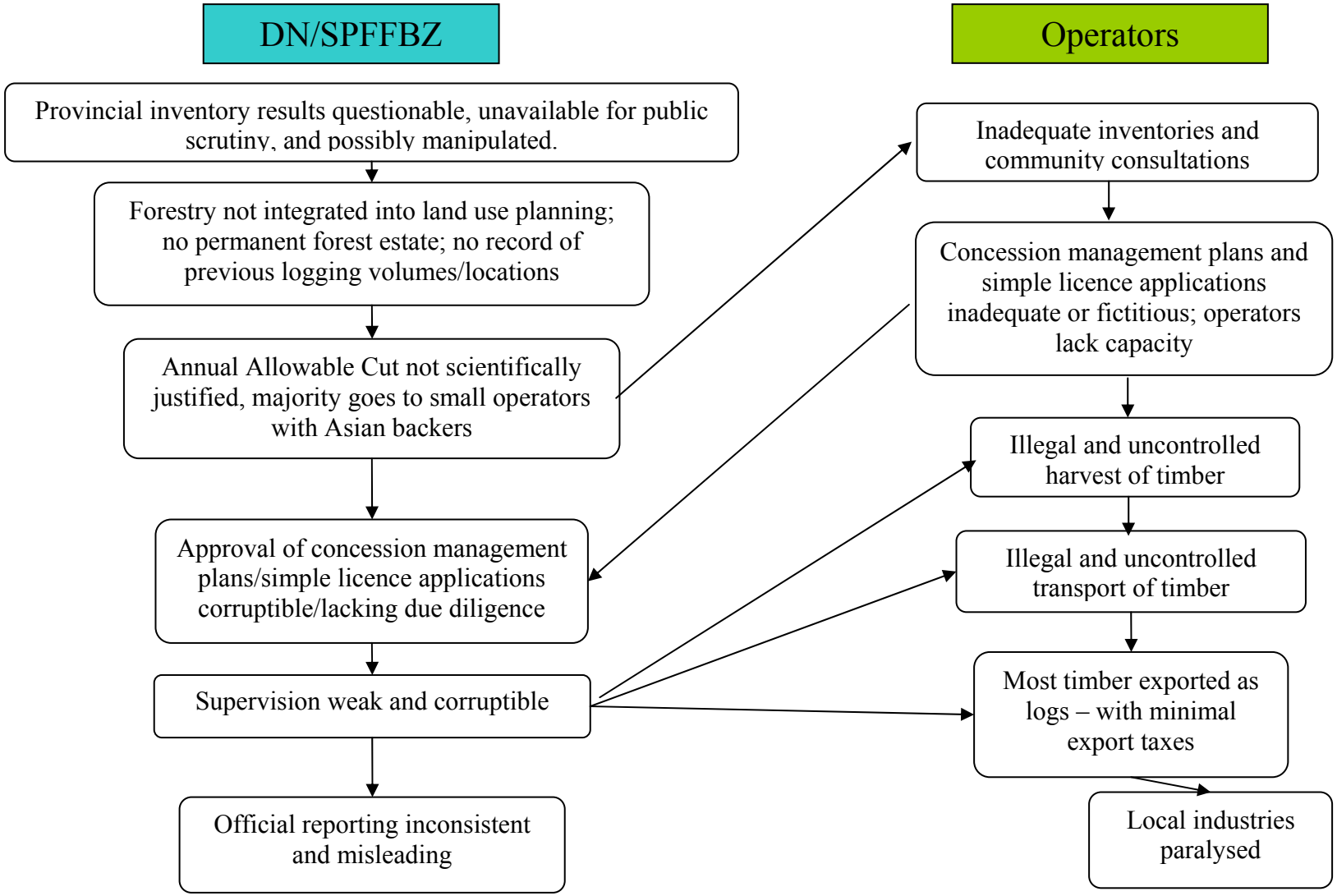
Management Objectives = sustainable supply of raw materials for industry and jobs; environmental services



Result: Sustainable Management + Economic Development

Figure 2: Overview of the Actual Process of Forest Management

Apparent objective = strip the forests of valuable timber as quickly as possible to benefit the few



Result = private benefit for few, degraded resource, lost jobs, sustained rural poverty for many

4.2 RESOURCE INVENTORY, YIELD ASSESSMENT AND FOREST PLANNING

Forest inventory and yield assessment tell us the volume of timber or non-timber forest products (NTFP) that can be cut each year and from where; they are fundamental in providing the ecological basis for sustainable forest management. Readers not familiar with these topics, should refer to the main document for an introductory discussion.

There have been 3 main forest inventories for Zambézia, two as parts of national level inventories, and one focusing on the province itself[16].

i) Exploratory National Forest Inventory, 1980

In 1980, UNDP/FAO funded an exploratory National Forest Inventory to provide information on national commercial timber potential, as a basis for planning forest management and the development of the wood industry (Malleux 1980). The study used LANDSAT MSS images from 1972-73 to prepare a forest type map at 1:1,000,000. Commercial timbers > 25 cm dbh were then inventoried in the high potential lowland forest types. Results, summarised in Table 8, were presented by forest type, with timbers grouped into four quality classes, but were not broken down by province or species. Due to limited personnel and time, the work was considered to have relatively low precision (Saket 1994).

Table 8: Results of the Exploratory National Forest Inventory, 1980

Forest/Vegetation Type	% cover	Area (ha)	Total Vol m^3/ha DBH > 25 cm	CV m^3/ha DBH > 40 cm	Stems/ha
Lowland dense	> 75	917,000	53.98	2.91	95
Lowland mod density	50 – 75	3,107,000	43.76	1.46	89
Lowland low density	25 - 50	6,742,000	23.10	0.72	57
Thicket high	20 - 40	7,754,000	17.27	0.96	51
ALL MOZ FOREST		79,200,430			

ii) Updating of the Exploratory National Forest Inventory, 1994

In 1994, UNDP/FAO funded an updating of this national inventory and the creation of a permanent Forest Inventory Unit (UIF) at DNFFB. Satellite imagery from 1990/91 and extensive field reconnaissance in ten provinces, including new data from 108 inventory plots of 0.5 ha, were used to reclassify forest cover and then recalculate available timber volumes (Saket 1994). Although this new data sample was too small to be representative, until very recently, this work provided the basis for national forest planning, including setting the national annual allowable cut and the provincial quotas.

Zambézia was found to have about 3 million ha of forest, of which less than 200,000 ha were high value, dense lowland forest (Table 5). An annual allowable cut (AAC) of 88,000 m^3 was recommended on a 30 year cutting cycle, for 118 usable species in accessible forest (Table 6). When the AAC was recalculated to include only the 6 main commercial species, the figure reduced to 17,600 m3 (Brouwer et al 1999).

[16] None of these has included an assessment of NTFPs.

Table 9: Results of the 1994 updating of the national forest inventory for Zambézia

Forest types	Area	area	density	CV* m^3/ha	CV m^3
	(ha)	%	Stems/ha	> 40 cm	Total
Lowland dense	187,500	1.8	123	2.9	538,125
Lowland mod density	597,410	5.8	101	2.1	1,230,665
Lowland low density	1,146,959	11.2	49	1.0	1,146,959
Thicket high	1,142,455	11.1	51	0.7	845,417
TOTAL COMMERCIAL FOREST	**3,074,324**	**29.9**			**3,761,166**
TOTAL AREA PROVINCE	**10,270,622**	**100**			

Source: Saket (1994); * Commercial volume

Table 10: Annual Allowable Cut (AAC) estimates for Zambézia, 1994

Measurement	Volume (m^3)	Assumptions
TOTAL Commercial Volume	3,761,166	
AAC 118 species	98,615	30 yr cutting cycle
AAC accessible	88,014	90% accessibility
AAC 6 commercial spp	17,600	6 spp represent 20% of total CV*

Source: Saket (1994); Brouwer et al (1998).

Although most buyers and government staff complain that this figure is too conservative, some operators remarked that the figure is actually still an over-estimate of the sustainable harvest, since commercial species only represent 5-15% of commercial volume. They argue further, that growth rates are also much slower than Saket assumed, and the cutting cycle should be 40 years or more.

There were definitely limitations to the Saket inventory. As mentioned above, it involved very few measured plots and cannot be considered representative. More importantly, detail on species distributions in different forest types, in different districts and by diameter class were lacking, so the harvest of timber could only be set quite crudely, based on indicative volumes for each species across whole provinces. A much more detailed and systematic inventory for the province was clearly needed, and following the illegal logging crisis in Zambézia in 1999-2000, there was sufficient public interest and political will to agree a new project – the *Projecto Maneio Sustentado de Recursos* (PMSR), supported by the Finnish government and employing Finnish technical assistance.

iii) Inventory of *Projecto Maneio Sustendado de Recursos (PMSR)*, 2001-2005

PMSR began in 2001, and the field work for a new and more detailed inventory for Zambézia was conducted from 2001-2003. First, in 2001, a pilot inventory was conducted in the Derre Forest Reserve, sampling 131 ha of forest in 82 clusters, in three forest types (PMSR 2001). In the main provincial inventory which followed, the first step was to map the forests, reassessing forest type and forest cover, based on new satellite imagery from 1999-2001 (Landsat TM and ETM). However, only the most heavily forested 4.3 m ha was examined for this purpose, not the entire province. Then, 989 clusters of inventory plots in 14 districts

totalling 720 ha were selected and enumerated[17]. The inventory employed a stratified random sample, designed to permit analysis of resources by forest type, species and district, to provide a powerful tool for forest management. This has been by far the most detailed forest inventory ever conducted in Mozambique (DNFFB, 2005).

In October 2004, preliminary forest cover data were released (see Table 11). These revealed that the new inventory had downgraded the criteria for classifying different forest types[18], making comparisons with Saket's inventory impossible and potentially masking forest degradation. Even so, the data show a reduction in both total forest area and high quality forest area (see Table 7). These inventory data were not officially released, as it was felt that the figures were unrealistically high (UIF, pers comm.). Indeed, serious problems were found with the data and its analysis and a consultant had to be brought in to resolve them (Tokola 2004). Nevertheless, as early as 2002, SPFFBZ began to use these provisional data to justify a greatly increased AAC (see below).

The results of the inventory were finally published in late 2005, over two years after the completion of the field work. The results surprised observers, by increasing the forest cover figures again and by confirming the new SPFFBZ quota (Table 8). While it is possible that the new results are accurate and the differences with Saket are due to improved methods and increased sampling intensity, various aspects of the methods and results, some of them identified by the consultant (Tokola 2004), call the reliability of the inventory into question. These are discussed in detail in the main report, and summarised here.

Various methods were changed from those used in the Saket inventory, including:

- method for identifying the areas included in the inventory;
- downgrading the criteria used to classify forest types, resulting in apparent increases in forest area;
- reducing the lower diameter limit of trees included in the inventory, resulting in higher apparent timber volumes;
- changing the commercial timbers classes of several species, resulting in an apparent increase in precious quality timbers.
- using different criteria for the forest type classification for the inventory and for the forest map;

[17] This total includes the plots from the pilot inventory. However, only data from 840 plots was used for the analysis.

[18] Reducing the percentage cover required to attain each class and thus giving a greater apparent area in each class; ie dense forest reduced from 75% to 70% cover; thicket from 20-40% to 10% cover.

Table 11: Comparison of forest and other vegetation cover estimates and AAC for Zambézia, 1994, 2004 and 2005.

Inventory >>>	**Saket 1994 ****		**PMSR 2004***		**PMSR 2005 including reserves**		**PMSR 2005 excluding reserves**	
Forest Type	**% Cover**	**Area ha**	**% Cover**	**Area ha**	**% cover**	**Area ha**	**% cover**	**Area ha**
Lowland high density, LF1	>75	187,500	>70	112,711	>70	152,300	>70	130,600
Lowland moderate density, LF2	50-75	597,410	40 – 70	866,092	40 – 70	1,093,600	40 – 70	993,000
Lowland low density, LF3	25-50	1,146,959	10 – 40	1,836,590	10 – 40	2,014,400	10 – 40	1,830,400
Thicket, tall T	20-40	1,142,455	< 10	202,879	< 10	309,300	< 10	277,900
SUB TOTAL FORESTS		**3,074,324**		**3,018,272**		**3,569,600**		**3,231,900**
Other Thicket		**2,788,851**		**Not given**		**Not given**		**Not given**
Wooded Grassland	< 20	1,756,757		**Not given**	< 10	482,000	< 10	447,700
Grassland		435,248		**Not given**		47,900		44,500
Agriculture		2,045,045		**Not given**		234,100		224,900
Other vegetation types		170,397		**Not given**		**Not given**		**Not given**
TOTAL		**10,270,622**		**3,018,272**		**4,333,600 *****		**3,949,000 *****
Recommended AAC, 7 spp (m3/yr)		**17,600**						**72,533**

* (UIF, pers comm.) unclear if figure includes or excludes reserves; ** area includes forest reserves; *** Forest mapping only examined 4.3 m ha, so figures for wooded grassland, grassland and agriculture are much lower than Saket (1994).

Table 12: Comparison of the national inventory data of 1980, with data for Zambézia, from 1994, 2001 and 2005

Inventory >>>	**Malleux 1980**			**Saket 1994**			**PMSR 2001 (Derre)***			**PMSR 2005****		
Parameter >>> **Forest Type** VVVV	**Stems/ ha**	**TV m^3/ha >25cm**	**CV m^3/ha >25cm**	**Stems/ ha >25cm**	**TV m^3/ha >25cm**	**CV[1] m^3/ha >40cm**	**Stems/ ha >30cm**	**TV m^3/ha >20cm**	**CV[2] m^3/ha >40cm**	**Stems/ ha >5 cm**	**TV m^3/ha >20cm**	**CV[3] m^3/ha >20cm**
Lowland high density	95	53.98	2.91	123	73.0	2.87	45.3	82.9	2.21	451	133.3	42.4
Lowland medium density	89	43.76	1.46	101	51.0	2.06				382	112.8	38.8
Lowland low density	57	23.10	0.72	49	17.0	1.0		59.0	1.53	325	87.0	28.1
Thicket, tall	51	17.27	0.96	51	17.4	0.74				267	40.1	11.9
Wooded Grassland	n/a	n/a	n/a					n/a		132	35.7	10.8
AVERAGE								**49.26**				

[1] for 118 species; [2] for approximately 16 spp; [3] all species; * pilot study in the Derre Forest Reserve

There were various methodological problems. The most important of these was:

- Tree health and quality and silvicultural set-asides (reductions) were not considered for the AAC calculations.

Other methodological problems included:

- sampling intensity was reduced by 50% half-way through the inventory
- use of species groupings in the report is inconsistent.
- there was no uniformly structured database. The different consulting companies applied different methods and used different databases for entering the data, including use of many separate Excel files in various formats.
- seedling data were collected, but not necessarily saved to Excel sheets
- species coding was unreliable, because the spelling of scientific names varied.
- taking and inputting GIS coordinates of sample plots was inaccurate and combined with the MODIS remote sensing data made forest delineation and use of detailed remote sensing data impossible (Tokola 2004).
- failure to distinguish between total commercial stock, and that which is in stands of commercially exploitable densities[19]. It is likely that only LF1, 2 and 3 and possibly thicket are really commercially exploitable forests, as admitted in the inventory report (DNFFB 2005:17).
- use of private companies, with vested interest future commercial forest inventory work and links to DNFFB, to conduct the inventory.

Lastly, a small, but very interesting reporting problem:

- the omission from the inventory report of the distribution map for *pau preto* (Dalbergia melanoxylon) – at over $1200/m^3, the most valuable species in the forest.

The methodological problems bring the results of the new inventory into question, and the methodological changes from the previous inventories make it very difficult to use them to understand forest dynamics. As Table 8 shows, the total forest cover has apparently increased by 28.5%, despite 10 years of intensive logging and land clearance since the Saket inventory. Data on commercial stockings rates are not presented clearly, and when teased out, it appears the rates from the new inventory (1.21 m^3/ha) are over 30% higher than the pilot inventory in Derre. However, Derre is a Forest Reserve, and one would expect to find higher stocking rates here. For the valuable species, *pau ferro* (Swartzia madagascariensis), the stocking rates are 650% higher[20] outside the reserve. The AAC has been increased by 400%.

However, if we return to PMSR's provisional forest cover data and extrapolate for the whole province using the Derre inventory stocking figures for the nine most important species[21], the

[19] Much of the forest is low density woodland, thicket and wooded grassland, so much of the timber is too dispersed in the forest to make it economically exploitable.

[20] Although extrapoloations from the pilot inventory to the main inventory can only be "indicative", it is also indicative that the new results also are approximately twice as high as those recently obtained in an inventory in Sofala (Levasflorestal 2006) , and consistently higher than the results returned in forest management plan inventories (Brunster 2002, Pereira 1998).

[21] (0.92 m3/ha), and the original forest cover figures obtained by PMSR for LF1, 2 and 3, of 2,815,393 ha, then total commercial stock decreases from 4,788,742 m3 to 2,590,616 m3 – which would result in a 45% reduction in the annual allowable cut.

AAC reduces by 45%. If we then take into account the other methodological problems, we need to reduce the AAC by 20% for stem quality (Tokola 2004), by a further 5 % for the incidence of heart-rot, and typically another 10% for management set asides, and we end up with an AAC about 50% above that of Saket (or around 26,000 m^3).

Given the importance of the inventory for the future of forestry in Zambézia, when DNFFB makes the complete digital inventory data set available on CD, it should be subjected to a thorough re-analysis, including re-measurement of a sample the original survey plots. Analysis and reporting should also include:
i) for at least each of nine main commercial species: quality and health classes; size class distributions per hectare and per forest type; total and average (per hectare) commercial stocking and commercial volume by district; and total and average commercial stocking and commercial volume by forest type, a distribution map (esp for *pau preto*, omitted from original report).
ii) for each main forest type: map and area; an inventory of the species, a distribution of the stock over species, diameter class and area in each forest type, and a distribution of the number of the individuals in a species per hectare per diameter class.

Forest planning
The inventory should be used, in consultation with communities and other stakeholders, to carry out a zoning exercise, and set aside areas for conservation, production and multiple use, as a permanent forest estate (PFE). Such planning is fundamental to rational land use and resource management, and is specified in the forest policy, but it has never been carried out. Meanwhile, concession applications for over 50% of Zambézia's forest area have run ahead of the official PMSR inventory work, effectively pre-empting the possibility that the PFE will ever be established. Effectively, concession and logging applications are being made without reference to reliable data on the distribution of the resource[22] or other development criteria, including the interests of other stakeholders. When combined, as described below, with the failure to compile a history of past logging, the basis for a sound and sustainable forest management in Zambézia is being lost.

4.3 TIMBER VOLUMES AND OPERATORS ACTUALLY LICENSED

Based on the results of the resource inventories and licence application processes discussed above, the annual timber harvest is determined and allocated amongst the operators and across the 11 forestry districts of Zambézia.

According to the DNFFB, until the new inventory had been finalised, Saket's results, and thus an AAC of 17,600 m^3 for the main species, should have been used. However, as shown in Figure 3, between 2000 and 2004 licensing proceeded at 1.6 – 3 times that figure. In 2003, the Provincial Forest Services (SPFFBZ) started citing the unpublished results to justify an AAC for 6 of the main species of over 60,000 m^3 per year[23].

Table 13 presents figures from the SPFFBZ database on the timber licensing for 2003, broken down by species. It illustrates several points:

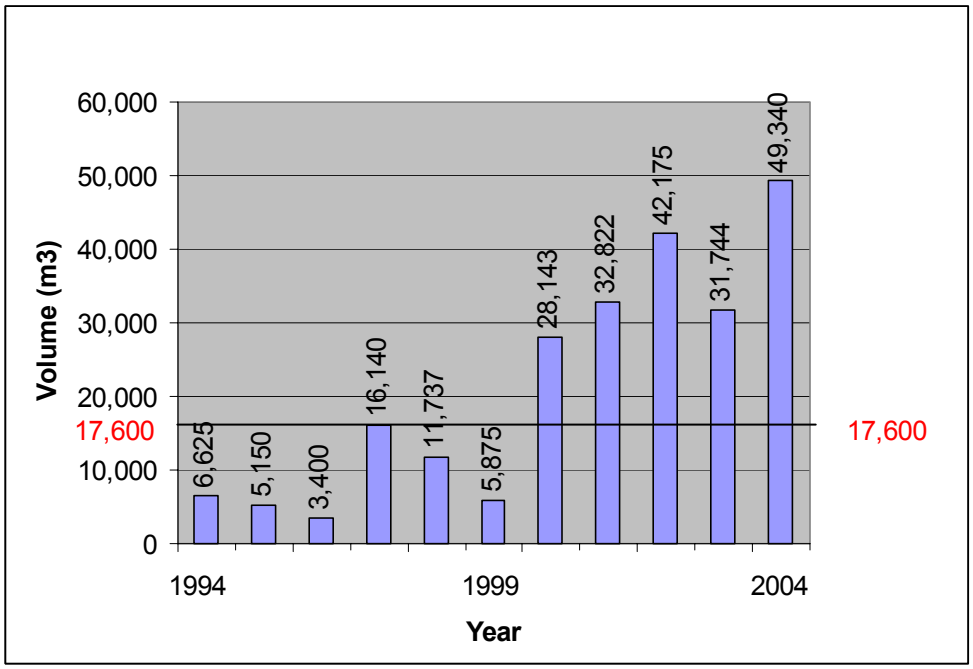
[22] Big concessions, applied for by companies with strong political connections, are being awarded that may have had inside information regarding the location of the best remaining stands.
[23] SPFFBZ held public meeting in 2003 to argue for these increased levels of cutting, but presented specious data, exploiting the lack of critical understanding in the audience.

i) as mentioned above, the trade focuses on very few species.
ii) over-cutting of mondzo.
ii) terms, such "quota" (from AAC), "licensed (licenses actually issued)", "authorised (sometimes used like quota, sometimes like licensed)", "harvested" (should mean actually cut, but in reality means recorded at SPFFB checkpoint)" are not used consistently or accurately, making it unclear what exactly is being discussed, and making comparisons difficult.
iii) different categories are used in reports in different years (see also below)
iv) some species are not reported.

It is interesting to note that although SPFFBZ annual reports always provide the annual quota for each species, figures for actual licensing and harvesting are presented for all species lumped together: in recent annual reports, the species breakdown was only provided in 2001. This allows over-cutting of one species to be hidden by under-cutting of other species.

Another anomaly is the reporting of *pau preto*, the most valuable hardwood species, used in making musical instruments. During a workshop in 2004, villagers from the area around Mocuba reported lively cutting of this species taking place in several areas, only 17 m^3 was officially licensed in 2003 and 33.5 m^3 in 2004, and no export has been reported.

Figure 3: Authorised volumes for timber harvesting in Zambézia 1994-2004



Source: SPFFBZ reports, except 1999 (= DNFFB)

Table 13: Timber licensing by species, 2001 and 2003, and proposed licensing for 2004, compared with the new Annual Allowable Cut (AAC)

	Volume (m^3)								*New*	
Species	**Licensed 2001**	**%**	**Author'd 2003**	**%**	**Licensed 2004**	**%**	**Author'd 2004**	**%**	***AAC (PMSR)***	*%*
Umbila	10,880	33	10,854	34	20,300	41	16,499	46	***24,752***	*34*
Pau ferro	9,015	27	8,426	27	8,000	16	7,395	21	***11,713***	*16*
Jambire	2,915	9	3,450	11	4,760	10	3,889	11	***9,855***	*14*
Chanfuta	3,387	10	2,284	7	2,700	5	3,005	8	***3,780***	*5*
Mondzo	4,715	14	4,518	14	2,000	4	3,535	10	***899***	*1*
Muaga	-	-	1,850	6	8,900	18	1,454	4	***20,176***	*28*
Outros	1,640	5	75	0	2,680	5	50	0		
Pau preto	?	?	17[24]	0	?	?	43	0	***1,358***	*2*
TOTAL	**32,822**	**100**	**31,474**	**100**	**49,340**	**100**	**35,870**	**100**	***72,533***	***100***

Sources: SPFFBZ, annual reports 2001, 2004, presentation; database 2003;
NB: figures for licensing by species were not provided in SPFFBZ annual report 2002.

The number of operators licensed should be consistent with the capacity of SPFFBZ to provide the necessary supervision, and should also ensure that each operator receives an economically viable quota. In his study of commercial logging in Mozambique, Fath (2001:38) estimated that a quota of about 2,000 m^3/yr would be required, in order for operators to cover costs (see below 4.6)[25]. Under the law, simple licence operators can only cut up to 500 m^3 per year, but in practice, the number of operators is now so large that each one receives far less than this maximum. In 2003, the average volume issued to non-industrial simple licence operators was 112 m^3, and the maximum quota received by any one operator was only 375 m^3.

Informally, SPFFBZ classifies operators and allocates quotas accordingly. It is theoretically quite sound, although it is not consistently applied and reinforces the small quotas. New operators, working the forest for the first time, should receive a maximum of 100 m^3, Class C operators with one year's experience receive (with one or two exceptions) up to 150 m^3, Class B operators, who have a couple of years' experience may receive up to 200 m^3, and Class A operators, who typically have been in the business quite a few years and own some or all of their own equipment, generally receive over 200 m^3. Table 4.7 shows SPFFBZ's statistics on the number of operators in each class in 2003 and the average allocation received.

Table 14: Number of operators in each class and average quota received, 2003

Class of operator	No. of operators	Average quota (m^3)	Total quota
Class A	25	229	5725
Class B	33	151	5015
Class C	23	123	2840
New	13	65	840
TOTAL	**94**	**153**	**14420**

Source: SPFFBZ (interim data set from May 2003.

[24] According to other statistics, 140 m3 of pau preto were authorised in that year.
[25] in addition to improved operational efficiency,

Forest policy explicitly calls for the promotion of forest industry development. However, in 2003, industrial operators only received 3.5 times more timber than the average simple licence operator. In 2004, it was proposed to increase the quota to simple licence operators, such that the average logger received more than an industrial operator (Table 15), even though it was known that all these logs were destined for export and not for processing

Table 15: Allocation of the Provincial Quota (m3) between Simple licence and Industrial operators, 2003 (Actual) and 2004 (proposed).

	No.	Actual Allocation, 2003 (m^3)	% of total	m^3/ operator	Proposed Allocation 2004 (m^3)	% of total	m^3/ operator
Simple licence	138	15,419	55	112	28,655	58	494
Industrial	27	10,337	37	382	20,685	42	492
Concession	2	2,267	8	1134	n/a	-	
TOTAL		28,023	100		49,340	100	

Source: SPFFBZ summary table (Quota final para operadores aprovados).

SPFFBZ does not maintain a consolidated record of past harvesting. Similarly, SPGCZ maintains no record of the logging areas for which it has prepared maps (*croquis*). A master register of allocated areas is prepared on a set of provincial topographic maps in the course of each year as applications are made, but it is done in pencil and erased at the end of the year, for reuse the following season. Although SPGCZ has GIS capability, the information is not compiled. Thus, there is no spatial record, and thus no control of harvesting.

4.4 LICENSING OF OPERATIONS I: SIMPLE LICENCES

Regulations

The simple licence system governs the collection of relatively small volumes of timber, as well as of the principal non-timber forest products (poles, charcoal and firewood). The licence is annual, and for timber, the maximum volume permitted in any one year is 500 m^3, as mentioned above. This must be from a single, specified area, usually less than 5000 ha in extent, and volumes are stipulated for each species to be harvested. Only Mozambican nationals or Mozambican companies are eligible for this kind of licence. Until 1999, most large companies with permanent staff and industrial investments and small cutters alike worked on these annual cutting licences. According to the 2002 Regulations, people applying for simple licences must submit an application between 2 January and 15 February, for the year's logging campaign, which lasts from 1 April – 31 December. The application is officially made to the Governor, via the SPFFBZ, and includes amongst other things, proof of citizenship and technical capacity, a map of the proposed area with a simplified inventory and management plan, a record of the consultation with local communities and a declaration that no other applications have been made for this campaign. SPFFBZ is required to make a field inspection to the proposed site, attend the community consultation and verify all the other information, before approving the licence (MADR 2002: Art 16-24, 35-36).

Simple licence operators must repeat this procedure every year – so every year there is, theoretically, a competition for good cutting areas, and a struggle to get documents together for approval.

Practice
In 2003, 146 *simple licence* operators were licensed and the application forms of 59 of these were reviewed to understand actual licensing practices. Several of these operators and people from communities where logging had taken place, were interviewed, to obtain further details.

The application documents superficially appeared complete, but on closer inspection many details were missing or inaccurate. The maps showing the proposed logging area are very often inaccurate, which can create conflicts between operators in the field. The operators' inventories are apparently invented and the simplified management plans show little understanding of forest management. Similarly, SPFFBZ's technical inspections (*vistoria*), if done at all, are mere point checks within logging areas averaging 5000 ha. The operator is required to pay all the field expenses of the inspection, and we were told that a small payment to the field staff will bypass the field check altogether. Thus, in practice, both the inventory data as presented by the operator and checked by SPFFBZ, are often fictions – "*so para ingles ver*". The consequences are that operators often end up going outside their licensed areas to obtain their quotas for some or all species. Since no record is kept of the areas where simple licences are issued each year (see 4.3 above), areas get relogged much too soon.

Operators are permitted to hire equipment, so all they require for their application is a rental agreement. It is impossible to guarantee that operators really have access to the equipment they need, or to ensure that the equipment is in working order. In only a few cases was the application denied because of problems with equipment.

Applicants are required to conduct formal community consultations in settlements in the proposed logging area. The application forms revealed that these all followed the official format, but again, only superficially. The number of community members attending ranged from 3 to 95, averaging around 30. The forms recorded communities' desperation for employment of any kind, as well as numerous bad experiences with previous operators (late or non-payment, use of outside labour). The section where operators have to specify their commitments was left blank in most cases. Communities told us operators never fulfilled their promises, and they received few benefits besides limited and low paid wage labour.

Most operators feel that providing direct benefits, in addition to paying licence fees, is double taxation and that rural development is the responsibility of the government. They also complain that they lack the capacity to construct schools and health posts or even dig wells, and obliging them to do so is unreasonable. However, in other places, operators work effectively with communities and simple provision of basic materials, such as cement or roofing sheets, is often enough to enable communities to complete self-help construction projects.

The district government is required to sign off on the logging application, following its approval by the community and administrative post. In one district, the applications of four operators were rejected by the local government, either because of complaints from communities about failure to honour promises in previous years, or because District Agriculture Department felt they were unable to supervise any additional operators. The rejections were all over-ruled by the provincial or central government authorities – and subsequently, there was a big illegal logging scandal in the district.

Several informants stated that in addition to the requirements discussed above, most operators have to pay between 8-10,000,000 MT (US US$320 – 400) in bribes to SPFFBZ officials in order to obtain their simple licence. It is unclear who in SPFFBZ receives this money, or whether it is shared amongst the staff at different levels.

The majority of operators request the maximum quota of 500 m^3, even though no one ever receives this (see above, 4.3). Overwhelmingly, people request the most valuable species, *pau ferro* and *mondzo*, followed by *umbila, jambirre, chanfuta* and *muaga*. There are very few formal requests for the valuable *pau preto*, although we know from villagers around Mocuba that this species is actively logged. It may be that the trade in this species is predominantly illegal.

Once an application has been approved, the operator then has to pay licence fees of from 250,000 MT to 1 m MT/ m^3 ($10 - US$40/ m^3) depending on the species, and a security deposit equal to the total licence fees of the operator's entire annual quota. Most of the operators get credit from Asian buyers to pay these expenses. The availability of this credit is the main factor driving the logging boom, and attracting unqualified and unskilled people into the sector. Up to one third of operators do not repay their debts, and this cost is passed on to other operators, in lower prices paid for the timber.

The greatest problem is clearly the large number of applicants relative to SPFFBZ and SPGC staff. In 2003, there were only 30 staff across the whole province, only a few of whom are qualified to do technical inventory required to process applications.

4.5 LICENSING OF OPERATIONS II: CONCESSIONS

Regulation

A concession application can be made at any time of year, by a citizen of any country, to request control of an area of forest, identified by the applicant, for a period of 50 years[26]. The application forms for concessions are similar to those for simple licences (including the map, outline management plan, community consultation), but demand more details. In addition, because the purpose of a concession is to support industry, there must be an industrial development plan. Initial applications can be submitted any time of year. Concessions less than 20,000 ha can be approved at the provincial level, but over this, they have go to the Minister, and over 100,000 ha, to the Council of Ministers. After approval, the operator is supposed to submit a management plan to SPFFBZ within 180 days or lose the concession. Once the management plan has been approved by SPFFBZ or DNFFB, the operator is required to install the industry, physically lay out the annual coupes in the concession, prepare and submit an annual management plan including a detailed inventory, and pay all the licence fees and deposits for the year, before commencing harvest (MADR 2002: Art 25-36).

Practice

SPFFBZ did not allow us to examine any concession applications documents, but one operator allowed us to see his and discussed the process with us. We were also able to review two management plans, both of which have now been approved.

[26] In Sofala, a provincial level inventory in the mid-1990s led to the delineation of forest blocks, which applicants then requested as concessions. (Sitoe 2003)

The main problems relating to the initial concession application are:

- **Lack of time limit**: Many applications have been "in process" for over 3 years.
- **Inadequate preliminary inventory**: A detailed inventory is not required for the initial application, so operators don't really know if the area they want to request has adequate timber to support their industrial business plan.
- **Harvesting before approval**: Operators are allowed to continue logging, based on annual licences, so there is little incentive to bear the considerable cost of preparing the inventory and management plan, which would also oblige the operator to establish a processing industry, and risk incurring a ground tax of perhaps another US$1/ha/annum.
- **Community consultations**: Although the impact of a concession on local communities is high and long-term, no special consultation procedures are required (MADR 2002: Art 35-36). , and communities (or their leaders) are making deals signing away their resource access for 25 years, in exchange for very little. Concessionaires also show no greater commitment to a genuine process of consultation than the simple licences operators. Hanlon (2002) recognised that inadequate and dishonest consultations are the main way in which peasants are being cheated out of their land rights, and Norfolk and Soberano (2000) document some of these cases. In a recent high profile case, the Green Crown group managed to secure community approval for nearly 200,000 ha of prime forest (see above), through the distribution of 5000 axe-heads (worth about US$7,500).
- **Government transparency regarding status of concession applications**: The number and status of individual applications and the overall concession situation are difficult to determine, because SPFFBZ does not report in a consistent and transparent manner. As Table 16 demonstrates, their data conflicts with the official reports and presentations of DNFFB, which are themselves internally inconsistent.
- **Failed applications:** Operators who have lost their concessions, through failure to submit plans have been issued with up to three simple licences, in compensation, (Anonymous, pers comm.) although it is illegal to have more than one in any year, and there is no need for such compensation.

Table 16: Number and status of concession applications in Zambézia Table 16: Number and status of concession applications in Zambézia 2001-2004, highlighting inconsistencies between data different sources

	2001[1]	**2002[1]**	**2003[2]**	**2003[3]**	**2004[4]**	**2004[5]**	**2004[1]**
Concession Applications	9	27	49		44		36
Companies	6	17	30		30		22
Total area ('000 ha)	339	1,132	1,564		1,449		
Edital published	??	??	15		15		
1st approval of application	?	17	30	19	30		
Management Plans in preparation	?		?	?	?	8	
Management Plans submitted	?		4(10)**			3	8
Management Plans approved	?	1	2	4	3	4	5
Contract signed	2						5

Sources: [1] annual reports, [2] SPFFBZ data base, [3] DNFFB presentation, [4] SPFFBZ pers comm., June 2004; [5] SPFFBZ, presentation, October 2004; ** includes Green Crown project, which submitted a consolidated management plan for 7 concession areas in Lugela

Box 3 Management plan of Timberworld in Pebane

Timberworld is a Singapore-based company that began working in Zambézia in the mid-1990s as a trading company, buying timber from local companies and simple licence operators. They quickly moved to providing "interest-free" credit to simple licence operators, to ensure their timber supplies, and since 2002, have applied for 8 forest concessions, totalling over 220,000 ha, primarily in Lugela. Since the total area of high and medium density forest in 1994 was only 750,000 ha, this holding actually represents the vast majority of the best forests in Zambézia (see Table 2.11).

Timberworld's plan for their 41,600 ha concession in Pebane (Bunster 2002) gives an indication of their approach to managing this resource. In accordance with the law, the objective of management is stated as "*the sustainable production of wood on which to base an industrial transformation unit*", which will produce high quality saw timber of 5 species, and secondary species of saw timber for the domestic market and handicrafts. The plan recognises the importance of working with local leaders, and commits to giving locals first priority for jobs, paying salaries above the regional average, providing training, supporting kindergartens, and doing other good things.

Miombo forests are typically a fine mosaic of different forest sub-types (relating to soil, fire, previous use, etc), and Timberworld's inventory shows only 26,000 ha (62% of concession) of productive forest, of which less than one third (6,400 ha) is high quality dense lowland forest. The total commercial volume was estimated at 439,946 m^3, but the forest is dominated by the less commercial *messassa* (Brachystegia) and only 30,000 m^3 are of top quality logs of the four main commercial species: *umbila, chanfuta, jambire,* and *pau ferro*. The plan assumes a forest growth rate of .3 mm/year, and calculates the cutting cycle should be 30 years. This is calculated to yield only 1,000 m^3per year of timber. However, the industrial plan proposes a sawmilling capacity of 5,000 m^3. They therefore propose to reduce the cutting cycle to 10 years, thereby yielding 3,000 m3/year. To make up the 2,000 m^3/year short-fall in supply for the industry, they then propose to take an extra 2,000 m^3/year during the first five years. After year 5, when all the presently commercial timber is gone, they propose to start marketing the Brachystegia, and other species such as *muaga*. Therefore, rather than managing the resource sustainably over the whole 30 year cutting cycle, they propose to take all the valuable timber in 5 years!

For the purposes of harvesting, the forest is divided into 26 blocks defined by map coordinates at an interval of 3'75". This, they claim, is only provisional, and the blocks will later be based on natural boundaries. The proposed silvicultural treatment involves leaving seed trees, and protecting and encouraging natural regeneration. Areas are set aside for protection, but these are bush-fallow lands with little conservation value.

This plan, which effectively proposes logging at 7 times the sustainable rate and cleaning out the valuable timber in 5 years, was approved by DNFFB. Furthermore, Timberworld was permitted to start operations in 2003, before installing any industrial capacity, and without proper annual harvesting plans. With only 4 years remaining, it is questionable whether this consortium has any intention to process its logs; it appears they intend to continue to export logs and let all the timber processing jobs be created in China.

The main problems relating to the subsequent preparation and approval of management plans are:

- **Lack of clear agreed guidelines:** The 2002 Regulations require that guidelines be developed, and although there has been a national workshop and a draft manual for concession management plans (Sitoe and Bila 2002), and a consultant has prepared a draft silvicultural and management guidelines (Geldenhuys 2005) at the moment, still no generally accepted silvicultural and forest management norms or guidelines exists in Mozambique.
- **Cost of management plan preparation:** DNFFB only permits consultants it has officially approved to prepare management plans, and currently, there are only about 10 of these consultants. With demand for plans far outstripping the capacity of approved consultants to prepare them, they can ask high prices, and currently charges are running at about US$1/ha for the combined management plan and inventory, or US$10,000 - US$100,000 per concession. This is too great an investment for many interested operators, particularly when the status of the resource is so uncertain and governance of the sector so unsound. Some of the consultants have close links with DNFFB, and others actually use SPFFBZ staff in the field - to some extent just acting as fronts for SPFFBZ to prepare the management plans themselves. This puts the forest service in the role of both implementer and supervisor and is illegal.
- **Approval of unsound management plans**: Concessions have been approved on the basis of management plans that do not demonstrate even basic understanding of or commitment to sustainable forest management. Timberworld's management plan, for its concession in Pebane, shows that, far from guaranteeing the sustainability of the resource, they want to exploit all the valuable timbers within 5-10 years (see Box 3) Similarly, the management plan for Grupo Madal proposes a cutting cycle of only 15 years, and this on the basis of extracting about 2 m^3/ha, despite the admission that previous logging in their concession between 1996 and 2001 removed 25-90% of the commercial volume (see Box 4).
- **Approval without prior establishment of an industry**: The Timberworld plan was approved, and logging commenced within the concession, before a sawmill was constructed, and all the timber was being exported as logs. Subsequently, Timberworld brought in a couple of second hand bandsaws, and attempted to bring in Chinese labour to set it up. The current status of this operation is unclear, following the firing of the local Asian manager by the parent company, for side-selling.
- **Approval without local councils for resource management**. Local councils for resource management (COGEP) are supposed to be involved in concession approval, but none of these councils yet exist in Zambézia.
- **After approval**, the operator is supposed to submit annual logging plans, and obtain felling licences, but there was no evidence of these plans, and operators themselves say that once they have a concession, they can do what they like. Effectively, there is no difference between concessions and simple licences.

Box 4 Management Plan of Grupo Madal in Nhafuba

Madal is one of the oldest companies operating in Zambézia. Founded in 1903 as a coconut plantation enterprise, the company passed into Norwegian ownership in 1913. It suspended activities during the civil war (1975-92) and afterwards, experienced financial difficulties re-establishing many of its operations. In 2000, *Norfund* (Norweigian State fund for development) the invested US$ 2 million in the company, and became a shareholder (Norwatch, 2000:4). Today, despite continuing difficulties, Madal is the largest landowner in Mozambique, with diverse interests in copra, livestock, shrimp farming and forest exploitation.

Madal only diversified into forest operations in the mid 1990s and obtained its main 50 year concession of 94,000 ha in Nhafumba in 1996. In 1997, they made a US$ 3.5 million investment in harvesting equipment, trucks and a sawmill. By 2000, the forestry operation employed 230 people in the field, and a further 75 in the sawmill. The management plan was prepared in 2001, based on an inventory conducted over 7 days in 1996 (Pereira, 2001). The inventory was a 0.2 % sample (total 208 ha), stratified random design, covering three distinct zones that had been identified using maps.

The plan admits that only 74,250 ha of the 94,000 ha concession (80% of the total area) was productive forest. Further, in the 5 years since the 1996 inventory, 8 different companies had cut timber within the concession, and an estimated 25, 50 and 90% of the commercial volume had already been extracted from the three different blocks.

The cutting cycle proposed in the plan is not of 30 – 40 years, as recommended in the literature, but of only 15 years. Incredibly, this was justified as "local knowledge" on tree growth rates of indigenous leaders, although it apparently actually reflected the frequency with which loggers had been observed to come.

The plan proposes to harvest 4,950 ha/year over the 15 years, and sets the annual allowable cut of 10,297 m^3 -12,360 m^3, despite the fact that a total of 144,552 m^3 is available. Despite the fact that the inventory did not show any significant stands of *pau ferro,* the management plan sets an annual allowable cut of 624-700 m^3/yr.

Madal's plan divides the concession into rectilinear blocks, based on the map grid, which bear no relation to natural features or to the distribution and abundance of timber. It cannot, therefore, be used as a basis for managing the concession, and since Madal does not prepare annual logging plans, it must be concluded that there is no real management of this concession.

Madal's sawmill has a capacity of 8,000 m^3/year, but between 1998 and 2001, the mill produced only 700 – 1300 m^3/year, and the plan proposes to increase this only to 3,800 m^3/yr. However, Madal's manager felt that sawn timber was no more profitable than logs, and in 2004, only produced 1008 m^3 of sawn timber (C Silva, pers comm).

Both annual licences and initial concession approvals are being issued by SPFFBZ without due diligence, and in numbers which far exceed their capacity to supervise and control operations.

Conclusions:

- SPFFBZ lacks sufficient manpower and evidently the will to manage the licensing system involving the current number of operators. A rational solution would be to greatly reduce the number of licences issued each year to a number that SPFFBZ can adequately license and supervise. A set number of logging areas each year could be auctioned each year. Fewer operators would mean that each operator could then receive a realistic quota. Participation in the forestry sector should not be seen as a "right" and open to all – but as a privilege, granted to people with appropriate training, experience and demonstrably high standards of performance.
- The concession system is not being implemented satisfactorily in Zambézia, and there appears little real commitment to the underlying objectives of sustainable management and industrial development that concessions. DNFFB should be assisted to develop and disseminate sound concession regulations, and to clear the back log of management plans awaiting approval. Concession management plans that have already been approved, should be subject to independent review.
- More consultants should be licensed to prepare management plans, and a stakeholder consultation should be held to discuss reasonable rates for this work. If necessary, DNFFB should enforce a ceiling on these rates.
- Communities need more help to understand their legal rights and more support in their actual negotiations with operators.

4.6 HARVESTING AND TRANSPORT OF TIMBER

Regulation

Although international standards for timber harvesting are well developed, as mentioned above, as yet Mozambique's only guidelines are found in two documents: the draft manual for concession management plans (Sitoe and Bila 2002), and draft silvicultural and management guidelines (Geldenhuys 2005). These are not entirely consistent with each other, and it is unclear whether they will be adapted for use by simple licence operators.

The manual admits that concession management plans should be followed up by medium term (5 year) management plan and annual harvesting plan on the basis of which the cutting licence is issued, but as yet detailed guidance is not available. An area to be cut should be subject to a 100% pre-harvesting inventory in which all exploitable trees marked and, ideally, mapped. Logging roads, skidding trails, log landings and tree felling should be well-planned both to work the stand efficiently (and reduce costs) and to minimise disturbance and damage to the forest. Operations should include construction and rehabilitation of roads and bridges, climber cutting prior to felling and directional felling. No more than the licensed volume or annual allowable cut should be harvested. Once this volume is reached, operations should be suspended.

Practice

The lengthy rains of 2004 delayed the start of logging and made field visits during the study period impossible. However, interviews with the main stakeholders and other published accounts of logging in Zambézia and elsewhere (Kloeck-Jenson 1998; Fath 2001) revealed the following main problems:

Photo 4: Extraction of logs using an agricultural tractor (photo courtesy R Lautelienan).

- *Unplanned, and unprofessional operations within licensed areas*

Simple licence operators work without any prior systematic planning. Concession operators do not prepare medium term or annual logging plans. If they have a strategic management plan, it is not used, and activities are not recorded. Basically, there is little difference between simple licence logging and concessions: felling teams work through the forest relying on the memories of the tree spotters, cutting timber where they find it. Logs are dragged out to landings by agricultural tractors (see Photo 4) Fath (2001) showed that all stages of forest operations are inefficient, usually in an attempt to reduce cash costs. Felling is not directional, and often damages the log.

- *Lack of supervision by SPFFBZ*

SPFFBZ has only one motorcycle-mounted mobile inspection team capable of visiting felling areas, and they spend most of their time on the road network, intercepting and inspecting timber trucks: effectively forest operations are unsupervised.

- *Poor recovery rates and abandoned timber*

Typically, only one log is recovered per felled tree and a lot of usable timber gets left to waste in the forest. This is because SPFFBZ does not control minimum diameter in the forest, but only at the Nicoadala checkpoint and there is no system for recording and proving second logs from single trees. Also timber buyers discount the price of smaller diameter logs. Much timber is also left abandoned at the end of the year, usually because the operator is unable to extract it, or because the quota has been exceeded.

- *Lack of spatial record of harvesting*

None of the loggers, concession operators, SPFFBZ or SPGC maintains a record of where logging has taken place, or what timber has been removed in previous years. Thus, there are no spatial records of how the forest resource has been used. This is damaging, because sound forest planning and management are based on knowledge of the resource and this form of uncontrolled and unrecorded exploitation is destroying the knowledge base, effectively rendering rational management impossible.

- *Over-harvesting due to low quotas, and high inherent capacity operators to cut trees*

On average a simple licence operator received a quota of 112 m^3 for a felling season lasting 9 months. A single chain saw can fell 30-40 trees, or 12 - 20 m^3 per day (in a good area). Even considering late starts to the season, stoppages due to various reasons, and low timber densities, the average operator is capable of cutting much more than his or her quota and all of our interviews confirmed that operators regularly exceed their quotas, some by 4-5 times.

- *Harvesting outside licensed areas*

When operators are unable to find the timber they have been allocated, many resort to cutting outside their licensed areas. Other strategies include stealing timber or buying timber from the labourers of other operators, or from illegal cutters, particularly if this enables them to reduce their transport costs.

- *Illegal harvesting by communities*

Operators also supplement legitimate harvesting by buying timber directly from communities; some operators fill their entire quotas this way (Kloeck-Jenson 1998).

- *Lack of post-harvest treatments.*

The government collects a 15% reforestation surcharge from operators, but does nothing to ensure regeneration of the timber resource. Although certain post-harvest treatments, like tending coppice regrowth, spot weeding, canopy opening and pruning are well known for miombo species, no operators currently practice them, and SPFFBZ does nothing to encourage them.

- *Exploitation of local labour by operators*

Our survey revealed that operators employ local labour typically at 500,000 MT/month ($20), substantially less than the minimum wage of 982,717 MT. Workers reported irregular payment, partial payment, and even complete non-payment. Men keep working because there are few alternative sources of cash income in the rural areas. Women are rarely employed by forest operators; men control the income they earn, and tend to spend it on themselves rather than their families. Women are further disadvantaged by the loss of their husband's labour for agriculture and household tasks.

Transport has become one of the most expensive components of a forest operation, and one that is difficult for operators to circumvent. Elsewhere, transport is charged by volume and distance, however in Zambézia, truckers charge a flat rate depending on truck size: 8-9 m MT for a 7 tonne truck, and 18 m MT for a 25 tonne semi-trailer.

- *Use of obsolete transport*

In an attempt to reduce transport costs, some operators employ obsolete vehicles. These are low in cash cost, but also slow, suffer frequent breakdowns and vastly lower the efficiency of operations, thereby increasing other costs.

- *Damage to rural roads and bridges*

Numerous communities complained that heavy logging trucks destroyed local roads and bridges, cutting people off, and this was confirmed in our field visits. That said, some operators were reported to have opened up new roads, and maintained them, thus greatly improving the rural transport situation.

Photo 5 Timber Transport 1: Ancient 8 t flatbed truck used by small operator to haul logs to town. SPFFBZ checkpoint, Nicoadala.

Photo 6 Timber Transport II: Mechanised loading of semi-trailer at Madeiras Alman, for transport to port at Quelimane

4.7 CONTROL OF HARVESTING AND TRANSPORT BY SPFFBZ

Regulation

In 2002, following the scandals of 1999/2000, SPFFBZ computerised the system for controlling the harvest to ensure that individual operators do not exceed their quotas and thus the annual allowable cut is respected. Effectively, the system is still based on the same two key documents, the felling licence and the transport permit (*guia de transito*) used prior to computerisation.

All licences have unique numbers and are recorded in the SPFFBZ data base, giving the operator's name, species, volume, location, and also the fee paid. Copies must be available for inspection by SPFFBZ in the cutting area, must accompany any load being transported.

During transport, timber must also be accompanied by a transport permit (henceforth *guia*). *Guias* are purchased from SPFFBZ[27], and one is completed (in quadruplicate) at the logging camp for every truckload of logs. It must show the number of logs and total volumes of each species, the felling licence number to which they relate and the vehicle registration number of the truck. Each log on the truck must bear the name or emblem of the company and a unique serial number, which should correspond with an entry in the operator's own field register, and ideally, with a number painted onto to the cut stump in the forest. Each *guia* is accompanied by a detailed log list, recording the serial number and dimensions of each log being transported. Without these documents, the driver is liable to a fine.

To control volumes harvested, copies of all the licences of all the operators are filed at the main forestry check point in Nicoadala. A driver bringing logs to town must stop, show the licence

[27] for 6,000 MT each, typically a book of 50 for 300,000 MT.

and hand over the log list and two copies of the *guia* to the forestry guards, who should then inspect the load, to verify the information on the *guia*. If incorrect, a fine can be imposed, and the *guia* is amended. If correct, the volume is recorded on the Register of Forest Products for that operator, and the "balance" volume remaining on the licence is calculated, ready for the next shipment. Once the balance reaches zero, the licence is declared expired. If the operator has not yet used her/his entire annual quota, s/he can pay the fees for the new licence and continue cutting, and the countdown begins again. One copy of the *guia* and the register are kept on file at the check point, while the other copy and the log list are sent to SPFFBZ HQ in Quelimane for recording in the harvesting database.

Practice

The computerised control system looks sound on the surface, but like any other is only as good as the data that is entered in it. In practice, it conceals a systematic under-reporting of timber volumes being transported. Falsified documents and illegal payments at check points and in government offices, permit large quantities of timber to pass unrecorded to the foreign buyers or local sawmills. A case study is given in Box 8, and two further cases are documented in the main report. These practices not only divert state revenues into private pockets, but also disguise over-harvesting of the forest and reduce the chances of Zambézia's forests being managed sustainably.

The policing that is done is unfair, focussing on villagers with small volumes of hand-sawn timber and established industrial operators, but allowing operators well-connected to politicians, SPFFBZ and the Asian buyers to escape.

Apparently certain well-connected operators do not declare their loads at all, and several people told us that payments of between 5 and 10 million MT ($200-400) was all that was needed for the less well-connected operators to take loads through undeclared. Asian buyers have also been seen on the road at Nicoadala directing their trucks to pass through the checkpoint without stopping for inspection. Clearly this system of "control" provides ample opportunity for abuse by operators and SPFFBZ alike.

When the logging season ends in December, typically a lot of timber remains in the forest, either because there was not time or capacity to extract it, or because the timber was found to have defects. Timber can be declared as "felled, but not yet extracted" (*em estancia)* and permits can be issued for its later removal, but otherwise these timber volumes are not included in annual harvesting figures, although they reduce the standing volume in the forest, and have consequences for long-term management.

<u>Harvesting statistics</u>

Despite these abuses of the control system, available SPFFBZ data show that the total volume of timber extracted each year runs consistently at about 80% of the total volume licensed, as shown in Table 18. As mentioned above (4.3), SPFFBZ sets and reports annual cutting quotas for <u>each species</u>, against which licences are issued. However, in most years, when reporting on the actual harvest, SPFFBZ lumps all the species together, so it is impossible to see whether the individual species quotas have been enforced. This may be an oversight, but more likely it is a strategy to conceal over-exploitation of key species.

Box 5: Under-reporting of Transported Timber

A truck belonging to EMACADE, the Provincial Directorate of Education's carpentry workshop arrived at the checkpoint carrying 14 logs of umbila. Each log bore the required operator name and serial number. The log list which accompanied the *guia* listed all 14 logs. It showed two interesting things:

i) all logs had an average diameter of less than 40 cm. The fact that logs of illegal diameters were actually declared on the forms is an indication of the extent of problems in the system.

ii) the total volume was only 4.113 m^3. A priori, we know that this is likely to be an under-estimate. Transport represents one of the highest operational costs, and whenever possible trucks will be despatched with full loads. The truck in question was a 10 ton Mercedes, capable of carrying 8 – 10 m^3 of timber, so there is little likelihood of it coming to town with only 4 m^3. Then, a quick glance at the photo is all that is needed to confirm that 4 m^3 is a substantial underestimate.

However, we also counted the number of logs, checked the diameters of several and calculated the volumes of one. The results, shown in Table 17, indicate an under-reporting of 50%. Translated across the whole load – gives a total of 4 m^3 undeclared volume.

Table 17: Example of falsified data on transport permit

Log Dimensions	Measurements	
	declared	**this study**
Diameter 1 (cm)	36	55
Diameter 2	35	40
Diameter 3	35	53
Diameter 4	36	42
Average Diameter	.355	.475
Length (m)	2.7	3.3
Volume (m^3)	.27	.58

Source: transport permit, log list and original measurement

An inspection of the other *guias* for this operator revealed that 8 loads of between 3.2 m^3 and 8 m^3 had been transported, and that the company already had 4 previous infractions for under-recording its volumes. However, only once had a fine been imposed. We were told that normally the first two infractions incur a "call to attention" (*chamada de atencao*), and only on the third occasion would a fine be imposed. This is typically 2 million metacais ($80). If the infraction we observed was standard, then this operator had already passed Nicoadala with up to 12 m^3 of undeclared timber, of which only 1 m^3 was captured in the alteration of the *guia.* Thus around 11 m^3, worth US$2000 to the company, and US$110 to the state in fees went unrecorded.

Table 18: SPFFBZ statistics for authorised and harvested timber volumes, 2000-2004

	Volume (m^3)		
Year	**Authorised**	**Extracted**	**%**
2000	28,043	n/a	
2001	32,822	26,622	81
2002	42,175	33,200	78
2003	31,744	25,395	79
2004	49,340	n/a	

Source: SPFFBZ Annual reports.

4.8 TIMBER SALES

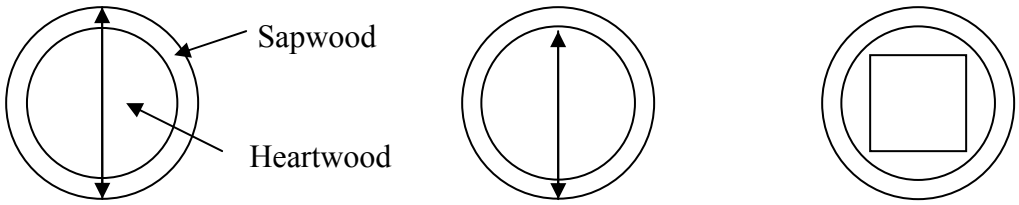
Regulations

Once logs have passed through the checkpoint at Nicoadala, they proceed to the operator's own facilities (in case of industrial operators), or in case of *simple licence operators*, to the log park of the buyer, where they are sold. In the log park, the buyer remeasures the timber and calculates the payment. Once the logs have been bought, the buyer's brand and a unique code number are painted onto the log butt, next to the producer's brand and log number, to permit verification, and theoretically, enabling the log to be traced back to its stump. These logs are stored in the buyer's log park, awaiting processing or inspection by SPFFBZ prior to export. The remaining two copies of the *guia de transito* (of the original 4) are taken by the buyer. If the logs are to be exported, one copy is sent to SPFFBZ, along with a log list, for export clearance. Export is dealt with in the Section 4.6 below.

Practices

Most log sales take place in the timber yards of the main Asian buyers. Many small operators accuse the buyers of cheating, both by declaring logs to be of inferior quality, and by re-measuring using a method that excludes all or part of the sapwood, thereby reducing the measured volume and the price paid. However, because most operators are in debt to the buyer and have nowhere else to take the logs, once they are in a buyer's yard, they have little bargaining power, so they are forced to sell.

Figure 4: Three methods for measuring log diameters



Full diameter Half-white Inside square

Operators who are selling to their creditors often receive only a small cash payment, and the remainder of the load value is used to pay off their loan. The proportion of cash received appears to depend on the operator's relationship with the buyer. Operators who are cheated by the buyers, are often forced to return to the forest and to cut more that their quotas in order to pay off their debts. This kind of debt bondage is common in resource harvesting system controlled by Asians (Warner 1994).

4.9 TIMBER PROCESSING AND FOREST INDUSTRIES

Regulations

The next destination for the harvested timber of most species should be domestic wood processing industries, to supply local and international markets with finished and semi-finished products. Under the law, (GoM 1997: Article 16:2) concessions, in particular, are intended to guarantee the processing of forest products. The Forest and Wildlife Policy (GoM 1997: Articles 47, 48) is very clear on the importance of timber processing industries, specifying the government's commitments to industrial development, value addition and the reduction of log exports.

According to the Forests and Wildlife Regulations (2002), all of the main commercial species are classified as Class 1, and must be processed in Mozambique before being exported. However, in 2003, just as the new regulations were coming into force, lobbying by operators resulted in MADR issuing a Ministerial Diploma to reclassify the five most important species (*umbila, jambire, chanfuta, pau ferro* and *mondzo*) as Precious Class, whose export as logs is permissible. The government issued a *Despacho* soon after, requiring that 40% of *umbila*, *jambirre* and *chanfuta* be processed in-country in 2003, rising to 50, 60 and 100% of timber by year 2006. However, *pau ferro* and *mondzo*, the two most valuable species were excluded from this *Despacho*, leaving them free to be exported as logs. These and other changes in regulations favouring exporters are further discussed in Section 4.11.

Practice

Sawn wood production

Table 19 provides SPFFBZ data on the production of sawn wood in Zambézia from 2001-2004. It shows processing has increased steadily from 2336 m^3 - 4941 m^3/year and, when this data is analysed, it appears now to represent around one-half of total log production[17] . However, once again, species data are not reported, so it is probable that low value timbers are being processed,

rather than the export species. The figures for Exported Sawn wood (Table 19) are a better guide, and these indicate the proportion is around 10%. Further, it is interesting to note that although under the Ministerial Diploma, clear targets are set for sawn wood production, SPFFBZ does not report against them; the data in Table 19 had to be calculated independently. There are other reasons for doubting these figures (see below), but nevertheless, it is clear that sawn wood production is still woefully little and the policy for processing timber in country is not being implemented.

Table 19: Sawn wood production and export in Zambézia, 2001-2004 (including production as percentage of estimated total log production[28])

Item (m^3)	**2001**	**2002**	**2003**	**2004**
Sawn wood	2,336	3,215	4,205	4,941
Exported logs	18,417	28,461	20,084	11,432
Log equivalent of sawn wood @ 35% recovery	*6,674*	*9,186*	*12,014*	*14,117*
total production @35%	*25,091*	*37,647*	*32,098*	*25,549*
logs sawn as % of total logs	***27***	***24***	***37***	***55***
Log equivalent of sawn wood @ 45% recovery	*5,191*	*7,144*	*9,344*	*10,980*
total production @45%	*23,608*	*35,605*	*29,428*	*22,421*
logs sawn as % of total logs	***22***	***20***	***32***	***49***
Exported sawn wood	**929**	**948**	**1494**	**2004**

Source: annual reports, SPFFBZ

Various reasons are given by operators and SPFFBZ to justify the continued export of logs:

- *Lack of processing capacity, especially for hard timbers*

Exporters claim that processing equipment in Zambézia is obsolete and incapable of processing indigenous hardwoods. However, recent surveys of industrial installations showed that primary breakdown equipment in Zambézia had a technical capacity of 51,384 m^3/yr (Table 20) (SPFFBZ 2000), capable of sawing at least 35,000 m^3 of local hardwoods (A Schwarz pers comm), and the majority of main saws in Zambézia were found to be in good or better condition (Chitara 2001). Indeed Madal and SRZ recently made big investments in modern equipment to fulfil obligations for in-country processing in the 2002 regulations.

The real problem may become excess capacity: if all 30 concession applicants were to establish the required industries, even using the smallest Wood Miser horizontal bandsaw, total capacity would increase by at least 50,000 m^3/yr. While sawmill development is good in principle, unless it is planned rationally and the capacity to process timber is kept in balance with the forests' capacity to produce that timber, there will be pressure for illegal harvesting, which will compromise the sustainability of harvesting.

[28] Since sawn wood is reported as a finished product, it must be converted to determine the volume of logs represented. Log equivalents are calculated using SPFFBZ's production figures, and on two different conversion factors, and show that between 32% and 37% of timber harvested in 2003 was processed, rising to 49-55% in 2004.

Table 20: Processing capacity of principal forest industries in Zambézia, 2000

LOCATION	INDUSTRY	CAPACITY (m^3/YR)
Quelimane	Grupo Madal	12000
	Serrações da Zambézia (SZ)	9000
	Madeiras da Zambézia	5000
Nicoadala	Serrações Reunidas da Zambézia	10500
	J. Domingos e Marques	11500
Mocuba	Madeiras de Mocuba	500
	Sociedade Moveis Licungo	384
Pebane	Sima	2500
TOTAL		**51384**

Source: SPFFBZ Annual Report 2000

The argument that highly specialised equipment is needed to saw the harder timbers (*mondzo, pau ferro*) is also not borne out:

> "Often the perception is that "technology" requires the importation of the latest US$2,000,000 computer controlled machine. However nothing could be further from the truth. … The technology we require is often the lower cost, well-tested technology being abandoned in the nations with high labour costs" (TCT 2003:9).

Another experienced operator asserts that sawing hard timbers just takes longer, and requires more frequent saw doctoring and a system for cooling the blades (A Schwarz pers comm).

- *Low prices for processed timber*

Export prices for round wood and processed timber for the range of Zambézia species are provided in the main report, and up-to-date prices can be obtained from ITTO's Market Information Service (see www.itto.org/: . While the margins for processed timber over round-wood are not great, given the costs of processing and the recovery rates for processed timber, they are certainly adequate, and with improved finishing and marketing, could be even greater.

Table 21: Log and Sawnwood prices, ex-Quelimane international buyers, 2004

Species	Item	Price $/m^3	Market	Max log price Quel, $/ m^3	Intl price/ Quel price %
Pterocarpus angolensis ***(Umbila, kiat)***	Kiat round log	250	S Africa	180	138
	SG Long board	410	S Africa		228
	SG Long scantling	360			200
	B/w kiat, short board	220			122
	SG 25 mm	550	S Africa		306
	SG 50mm	600			333
	SG short 25	455			253
	GR2	365	Quelimane		203
			Maputo		228
Millettia stuhlmannia ***(Jambirre)***	Parquet	650-700	Beira	220	218
	Parquet	1035	To Belgium		370
Afzelia quanzensis ***(Chanfuta)***	Parquet	533-657	To Italy	150	338
Dalbergia melanoxylon ***(Pau preto)***	Logs	1440	China	n/a	n/a

Source: Customs documents, various exporters
SG = super grade
Gr1 = grade one
Gr2= grade two
FAS = first and second grade

Table 22: International Log and Processed wood prices for related and other species, compared to Quelimane prices, 2004
Source: ITTO MIS September 2004
http://www.chinaforestry.com.cn/ensite/prices.asp?id=181; GMS – general market specifications

Species	Trade name	Mozam Equivalent Species	Item	Price ($/m3)	Market	Max log price Quel. $/m3	Intl price/ Quel price %
Afrormosia elata	Asamela	*Muaga*	Log	471	Ghana FOB	140	362
		(Pericopsis angolensis)	Parquet	1488	Ghana		1145
			Sawnwood	1050			808
Millettia laurentia	Wenge	*Jambirre*	logs	660	Shanghai wholesale	220	300
		M. stuhlmannii	Sawnwood, assorted sizes	7361	Retail, USA, delivered,		3346
			Parquet	893			406
Afzelia africana	Apa	*Chanfuta*	Parquet	780			650
		A quanzensis					
Pterocarpus macrocarpus	Padauk	*Umbila* P. angolensis	Sawnwood FAS	768	Burma, Laos, for China	180	427
Chlorophora exelsa	Iroko	n/a	FAS GFM	680	Ghana	Max 320	378
		n/a	scantling	592			329
		n/a	strips	340			189
		n/a	log Ghana	435			242
		n/a		396			220
		n/a	Log 80cm	600	UK		333
		n/a	Sawn FAS	756	UK		420
Entandophragma cylindricum	Sapele	n/a	Sawn FAS	768	China wholesale		427
Shorea spp	Red meranti	n/a	Mouldings GA	610-630	China		350
		n/a	Mouldings GB	525-530			294
Myroxylon balsamum	Santos mahogany	n/a	Parquet	1400-1420	Peru, for Asia		789

- *Low demand for sawn timber in Asia*

The fact that many Chinese manufacturers make ornate pieces that cannot be standardised is often cited as a reason for not selling sawn timber. However, the majority of ornate pieces still start as blocks of standard sizes, and we have seen that some logs sold in Quelimane go first to China for sawing, and the pieces produced are then exported to Singapore for shaping and assembling, before being returned to China for finishing. Some Chinese industry also imports components from the United States, for assembly and re-export. Given the right market research[29], support and investment, Mozambique could be involved in these other stages of production, and the current low quality furniture, doors and frames produced for local markets could be brought to international export class.

- *Risk*

Exporters also complain that no one will pay in advance for sawn timber, because of the risk of receiving products that are low quality or otherwise unsuitable. Likewise the exporter is reluctant to ship sawn wood, in case it gets rejected. Once it is sawn, then the probability of finding another buyer is drastically reduced. With a log, it is argued, it is often possible to sell it to someone else. These problems primarily reflect the poor governance and reputation of Mozambique's timber industry. With improved practices and professionalism, including well-established arbitration and grading procedures and timber certification, Mozambique could become a trusted exporter of processed wood products.

Range of Products from Zambézia's Industries

In 2003, over 99% of production was simple sawn planks and the rest parquet flooring and *barrotes,* of which 35% was exported. Over 80% of sawn wood production was *Umbila;* the most valuable species *pau ferro* and *mondzo* are not processed at all (SPFFBZ 2004). In 2004, approximately 67% of production was *umbila*, and 27% *chanfuta*, and 40% was exported; at least 78% of production was planks[30] (SPFFBZ 2005). There is clearly great scope for further finishing of wood products.

Employment

Forest industries provide great potential for the creation of permanent, full-time, well-paid and skilled jobs. In 2001, there were 2077 people employed by industrial operators, and in 2003, an estimated 2500 jobs provided by simple licence operators. However, while simple licence loggers provide more jobs in rural areas, these tend to be basic manual jobs, demanding little skill, and are seasonal, with no security, training or benefits. Pay tends to be below the legal minimum wage of US$30/month.

As discussed above, some processing of *umbila, jambire, chanfuta* and *muaga* (as well as some non-export species) does occur, but SPFFBZ has no system in place to ensure that any target volume is exported, and furthermore, it does not report against this target. By manipulating statistics and lumping all species together, it would also be possible to substitute one species for another in the report, so processing could be 100% lower quality species, to permit 100% of higher quality timbers to be exported as logs.

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[29] See Pool et al 2002 for examples from Latin America.

[30] In the annual report, both species and product breakdowns included mixed classes, ie Umbila + Chanfuta, and planks + parquet, so it is not possible to be more precise.

The legality of the log exports are further considered in the next section.

4.10 EXPORT

Theoretical Process and Regulation

The principal end point in the management of Mozambique's forests should be the sale of finished or semi-finished products on the international export market (after domestic needs are satisfied). This important objective of forest policy maximises value-addition, state revenues, foreign exchange and job creation.

Timber export from Zambézia takes place primarily from the port of Quelimane by containers, and as loose cargo in bulk carriers, but an unknown volume of timber also crosses the land border into Malawi and leaves from minor ports. Export involves a wide range of stakeholders, including the operators, the exporters, Customs, the Port Authority (CFM), Clearing and Shipping Agents, Inspection Companies, the Provincial Directorate of Industry and Trade, the Provincial Directorate of Agriculture and SPFFBZ, and a complicated process of forms, inspections and payments. This is described in detail in the full report.

Put simply, there are three main steps:

1 **Clearance through SPFFBZ:** The exporter must first clear the shipment with SPFFBZ, to verify that the logs are legal. A numbered log list specifying volumes, producers and felling licences, and accompanied by original *guias de transito* (see above), is submitted for cross-checking, and SPFFBZ inspects the load in the exporter's log park. After this, the logs can be brought to the port, where they are again cross-checked at the SPFFBZ checkpoint, and then stored to await shipment. Inside the port, the logs are handled by CFM, the port authority.

2 **Clearance with Customs:** Shipment of specific logs on a particular vessel is then cleared with Customs, usually through a shipping agent. This involves a number of documents, the most important of which is the *Boletim de Mercadoria* (Goods Note), the exporter's declaration of the cargo (number, volume and weight), its destination and the importer. Customs duties are paid, at a modest flat rate per shipment.

3 **Loading of the ship**. Following this, the logs can be stuffed into containers or loaded on the ship. Loading is verified by a team of inspectors from different agencies (customs, shipping company, exporters).

Practice

Our investigations revealed two serious irregularities: the large-scale export of undeclared timber, and the illegal practice of transfer pricing.

Evidence of illegal export includes:

- systematic under-reporting of the volume of logs being exported, by using standard logs sizes and weights on export documents.

- significant differences in timber export statistics returned by different agencies (as noted by Brouwer et al 1999)
- inconsistency in the type of data presented by different agencies and units used for recording exports, intentionally or otherwise making cross-checking difficult and time consuming.
- case studies of timber export from Quelimane, in the bulk carrier *MV Chang Ping.*

Under-reporting

Volumes of timber declared for export are based on the *Boletims de Mercadoria*, completed by the exporters themselves, which in turn are based on timber producers' original transport permits (*guia de transito*). The inspection at Nicoadala (described above) is the most thorough ever undertaken. Thus, the falsifications and irregularities that take place there are effectively exported. Thereafter, SPFFBZ carry out only a most cursory and easily corrupted spot-check of logs in the exporters' log parks, prior to authorising an export consignment. Other agencies just count the logs (see below), but no one else involved in export actually remeasures them. The other agencies (Customs, CFM) use or accept notional "standard log weights", which under-represent the volumes involved. In addition, and unknown volume of timber passes into the port completely unrecorded.

The GoM provides an incentive for the export of logs, by charging Customs duties as a flat rate per shipment, rather than on the basis of volume or value of goods exported. Customs therefore makes no check of timber volumes leaving the country.

Inconsistent export statistics and reporting formats

Table 11 presents the log export statistics of different agencies from 2001 to mid-2004. The port authority (CFM) calculates its charges and reports based on the volumes as declared on the exporters' documents. In 2002, CFM recorded export of 52,422 m^3, while SPFFBZ reported export of only 28,461 m^3. By July of 2004, CFM had recorded export of 30,447 m^3, but SPFFBZ claimed only 8,690 m^3.

CFM also reports cargo weight, but since there is no weigh station in the port, this is estimated by counting the number of logs and applying a notional "standard log weight" of 250 kg to each. On the *Boletim*, another "standard log" is used, and it is interesting to note that this is only 225 kg. Analysis of these figures shows this would imply a standard log volume of only .25 m^3 – which is below the legal minimum for most species.

We carried out random measurements of logs in the port and at the SPFFBZ check point in Nicoadala. These revealed average log sizes of 0.52 $m^3$and 0.59 m^3[31], and if we apply these figures, an estimated export volume of **three times** that reported by SPFFBZ is obtained.

[31] Fath recorded mean log sizes of .66 m3 – 1.32 m^3

Table 23: Timber Export Statistics, Quelimane, 2001 – July 2004: Comparison of Port Authority and official SPFFBZ statistics, with estimates from this study

	Port Authority (CFM)		*estimated*	SPFFBZ	*estimated* **	
Year	**Volume (m^3) "Peso Medicao"**	**Weight (kg) "Peso real"**	**Number of logs ***	**Volume m^3 ****	**Volume m^3 @ .59 m^3/log**	**Volume m^3 @ .52 m^3/log**
2001	42,352	n/a		18,417		
2002	52,422	33,111,000	130048	28,461	78,142	67,624
2003	40,640	26,704,000	102889	**20,084**	63,021	53,417
Jul-04	30,447	18,042,000	69831	8,690	42,579	36,312

* based on = CFM weight/250 kg (= CFM "standard log"); ** Source: Annual reports SPFFB; *** based on SPFFB's reported volume divided by average log volumes we found in our random measurements.

The Port (CFM), Customs and SPFFBZ should be returning approximately similar export statistics. However, we find that not only do their figures vary enormously amongst each other, but there are internal inconsistencies. Only CFM reports using the same units and analysis, probably because it is a commercial concern. Customs routinely mixes up volumes, weights and numbers of things; SPFFBZ routinely mixes up destinations, species and exporters. This makes cross-checking between agencies and detection of trends difficult.

Case study of undeclared cargo on the MV *Chang Ping*

In late October 2004, the loading of the bulk carrier MV *Chang Ping*, bound for Guandong, was observed in the port of Quelimane. The boss of the company leasing the ship stated he was picking up 2000-2500 tons of logs in Quelimane. The exporter, *Madeiras Alman* one of the principal exporters in the province, however, officially declared a total weight of only 1,074 tons (4,715 logs with a total volume of 1,602 m^3). The ship was in port loading for 10 days simultaneously into three holds for 24 hours per day, so the number of logs is also probably a significant under-reporting. Even with slow manual loading, at a rate of 20 logs/hour, and stoppages, approximately 10,000 logs could be loaded.

Table 24: Customs declarations by *Madeiras Alman* for log export shipment on the *Chang Ping*, October 2004.

	Declared Data			Derived Data		
Species	**No. logs**	**Total Weight***	**Total Volume****	**Avg volume/log declared**	**Avg volume/log (Port survey)**	**% diff**
pau ferro	2,054	462,150	500.90	0.24	0.32	25
jambirre	543	122,175	203.40	0.37	0.57	35
umbila	1,628	379,800	659.90	0.41	0.60	32
mondzo	490	110,250	237.70	0.49	0.80	39
	4,715	**1,074,375**	**1,601.90**	.33	.62	

Source: Customs Register of Despatches. * weight in kg; ** volume in m^3

Table 24 presents a summary and analysis of the data on their declaration. The average log sizes, derived for the 4 exported species, are 23-39% lower than the average logs sizes we

recorded in the port. This suggests that both the number of logs and their sizes has been falsified.

Photo 7: Containers loaded with logs, ready for export. Quelimane port.

Table 25 show the number of timber ships coming to Quelimane in recent years, and the kinds of volumes they are capable of carrying. With 28 – 40 vessels coming annually, each capable of carrying 1100 – 3200 m^3, illegal volumes of the order we suspect could easily be accommodated. This is particularly true of the bulk carriers which go straight to Asia. It is less clear what happens with containerised logs. Most containers have to be transhipped in Durban, so even if undeclared volumes of logs leave Quelimane, they could be detected there[32].

[32] Investigations in Durban might shed light on this. Perhaps if containers are being loaded onto to a chartered Chinese vessel, the checks are less stringent.

Table 25: Traffic of timber ships in Quelimane, 2000 – 2004: Ship types and maximum cargoes declared in port tons (m^3).

	Bulk carriers			Containers	Total
Year	**No. large**	**No. med**	**No. small**	**No. ships**	**Ships**
	> 5000 t	**2500-5000**	**<2500 t**	**2000-3500 t**	
2000	7	1	9	18	35
2001	3	2	4	19	28
2002	6	6	5	27	44
2003	3	4	0	31	38
To Sept 2004	7	0	1	23	31
Total	**26**	**13**	**19**	**118**	**176**

Data to document illegal practices are obviously difficult to obtain, and the information presented here is only fragmentary, but it is sufficiently strong to demand a thorough investigation requiring all relevant agencies to surrender their records for inspection and analysis and for individuals to be called to account.

Transfer Pricing

Customs documents revealed that some exporters invoice their overseas clients, often their parent company, for logs, at prices lower than the current market prices in Quelimane. This indicates transfer pricing – a widespread and usually illegal practice used by multinational companies to avoid paying taxes in countries where they operate.

Table 26: Transfer Pricing: Comparison of local purchase and export prices (2004), for selected exporters, buyers and destinations.

Exporter	**Buyer**	**Destination**	**Species**	**Price US$/m3**	
				purchase	**export**
Gordon Kenny	Chung Tai Timber	China	Umbila	160	100
	Samson Ltd	Hong Kong	Pau Ferro	290	170
			Jambire	200	120
			Mondzo	300	160
			Chanfuta	135	80
Madieras Alman	Harley Timber Pvt	Hong Kong	pau ferro	290	170
			mondzo	300	140
			jambire	200	100
			umbila	165	90
			muaga	130	90

Source: export prices from Customs documents, 2004; purchase prices from buyers, 2004.

Apparently other buyers have not even registered companies, and exporting without permit, via Mozambican firms, to avoid tax and the expense of registration.

4.11 POLICY PROCESSES: EXPORT REGULATIONS AND TAXES

As envisaged in Mozambique, forest policy and regulation should develop over time, as an on-going discussion amongst stakeholders. As part of the forest policy work of PROAGRI, a Forum on Forests was created in 2002 to promote such debate. Meetings have been held in Maputo and in the provinces, on the issues of community rights and benefits, concessions (including taxes and regulations), forest supervision and industrial incentives, and under new funding from FAO, further meetings will be held to review what has been working or not, and why. Some problems noted include: the failure to reduce the number of simple licences; failure to establish transparent criteria for issuing forest concessions and the failure to link forest law with the land laws, to gain a clearer view of community rights. A national Forest Governance Learning Group was set up in 2005, as part of a wider donor-funded initiative (IIED 2006), which will also hold regional meetings to discuss further the issues of decentralisation, illegal logging and poverty reduction.

The new Forestry and Wildlife Regulations of 2002 were a product of donor-supported policy research and national consultations (Bila 2002). Importantly, the regulations included a new system of taxes, fines and penalties (DNFFB 2002: Annex 1, Table II), to update the previous values established in 1998[33]. Table 25 summarises these changes. For Class 1, the tax increase was over 300%, from 65,000 MT ($6.50) to 500,000 MT ($20.40) and for precious class timbers, in particular, the increase was nearly 800% from 105,000 MT ($10.50) to 2 million MT ($83.33) per cubic meter. This was an important change, intended to enable the nation to invest in their forests and benefit more tangibly from them, and would also have dramatically increased the real value of the 20% of forest taxes returned to the communities (Rytkonen 2003). However, since the funds are not being used for either improved management or community development, these desired effects have not been achieved.

The way operators lobbied to change the regulation that had required the main commercial timbers to be processed before being exported, was described above (Section 4.9). Recapping briefly, these key species were reclassified from Class 1, which required processing before export, to Precious Class, which could be exported as logs. However, these new taxes made the reclassified species liable to a quadrupling of the licence fees, from 500,000 MT to the new supertax level of 2 million MT/ m^3. In testimony to the efficacy of donor-supported policy efforts, industry again lobbied hard, and as a result, in accordance with Article 100:3 of the regulations, a *Diploma Ministerial*[34] of April 2003 was issued

[33] Prior to this 1965 fine levels prevailed.

[34] There are three levels of decrees involved in these changes. At the highest level, is a *Decreto*, which is passed by the Council of Ministers. A *Decreto* was required to approve the Regulations of Forestry and Wildlife Law, and then subsequently, to permit payment of taxes in instalments, and to reduce the deposit from 3 times the total value of the taxes to the equivalent of the taxes. At the next level comes a *Diploma Ministerial*, which is issued jointly by two or more Ministries, often including the Ministry of Finance, in order to specify financial details of certain regulations. For instance, it was specified through *Diploma ministerial* that concession taxes could be paid in quarterly or monthly instalments, rather than a single lump sum. A *Diploma Ministerial* was also used to change the classification of timbers. At the lowest level, is the *Despacho,* which can be issued by a single Ministry. These are typically used to elaborate on, rather change, regulations. For instance, a *despacho* was used to introduce specific forms for licencing.

reducing all taxes by 50% for a period of two cutting seasons [35], and then another was issued reducing the taxes of *umbila, jambire* and *chanfuta* by a further 75%, on the grounds that a gradual approach to increased taxation was needed. Effectively, this reduced the taxes back to 250,000 MT/m^3, barely 75% above the 1998 level. Only *mondzo* and *pau ferro* experienced a real increase in their taxes, to 1 million MT/m^3 ($41), but this still represents only 13% of their sale price.

A *Diploma Ministerial* of 10 April 2003, gave a 40% reduction in licence fees for timber processed locally. Although this was a flat rate, to be applied regardless of the degree of processing and value added involved (ie, parquet and furniture received the same reduction in fees), it was a positive move to encourage forest industries. A proposal was developed for its implementation, but industrial operators complain that these incentives for processing have been impossible to obtain (TCT 2003). This failure of implementation probably reflects the real interests of the timber mafia to continue the export of logs. This question of legitimate incentives to good forest managers and especially to industries should be re-examined as a matter of urgency.

Table 27: Changes in timber taxes (licence fees), 1998-2003

Species Class	**1998[36]* (Mt/m^3)**	**$**	**2002[37]** (Mt/m^3)**	**$**	**2003[38]** (Mt/m^3)**	**$**
Precious	105,000	10.50	2,000,000	83.33	1,000,000	41.66
1st	65,000	6.50	500,000	20.80	250,000	10.40
2nd	45,000	4.50	300,000	12.50	150,000	6.25
3rd	30,000	3.00	200,000	8.33	100,000	4.17
4th	20,000	3.00	100,000	4.17	50,000	2.08
Construction 3rd	50,000	5.00	150,000	6.25	75,000/ estere	3.13
Construction 4th	30,000	3.00	100,000	4.17	50,000 /estere	2.08
Firewood	2,500	0.25	10,000	.41	5,000 /estere	.21
Other	25,000	2.50	100,000	4.17	50,000/ton	2.08

* 1 US$ = 10,000 MT; ** 1 US$ = 24,000 MT

The vulnerability of policy processes to this kind of hijacking by private sector interest groups, supported by government collaborators, is one of the main reasons that this report calls for donors to strengthen their resolve, and support an immediate ban on the export of logs. Without immediate action, prevarications and backsliding in the name of policy debate and development will continue until Mozambique's valuable timber resources are irretrievably degraded, and economic opportunity for poor rural people is lost for a generation or more.

[35] It is uncertain what the fate of these time-bound instructions has been, as subsequent government directives have been impossible to obtain.
[36] Regulation 38/1998
[37] Regulation 12/06/02, Annex 1, Table II.
[38] Diploma Ministerial 20/04/03

4.12 A FINAL ANALYSIS: WHO BENEFITS???

A thorough and independent analysis of the timber commodity chain, and the costs and benefits accruing to the different stakeholders who handle logs, from the forest, to the furniture factories of China, is vitally needed to fully understand the present situation and recommend reforms, but was beyond the scope of this study[39]. However, preliminary analysis is offered below.

In Mozambique, rural manual labour is often exploited by employers, with wages at or below the national minimum (around US$30/month), and when employers' profit margins decline, late or non-payment of wages is common. Manual labourers probably benefit the least from current forest practice. Their continuing interest in forestry merely reflects the lack of other income earning opportunities in rural areas.

For the main commercial stakeholders, the principal factors determining their benefit are the diversity of forest activities engaged in, the species and volumes of timber handled, the margins they make, their costs and their risks.

At the bottom rung of the commercial ladder, are the illegal village loggers, who sell logs for between US$2-$4 (>$6/ m^3), depending on species and size. It is unclear how many people are involved in a typical village logging operation, the number of logs they harvest and sell in a season, and the costs they incur, including bribes to officials and contributions paid to their local leaders. They may well earn less than a properly paid manual labourer.

For the simple licence loggers, log prices of between US$130 and US$300/m3 (gross), easy credit and quotas of up to 375 m3/year (which can easily be exceeded) mean that, in principle, substantial profits are possible. This attracts new loggers into the sector year after year. But costs and risks can also be great. Most loggers, particularly the newcomers, rely on credit from Asian buyers to cover their licence fees and deposits, and to finance their operations. Each year operators do fail, though it is unclear how many or exactly why. The main problems include theft and side-selling by field managers and undercapitalisation, combined with the use of obsolete machinery and equipment in order to try to lower costs, and the ruthless behaviour of some timber buyers. Some operators get locked into a kind of debt bondage to the buyers, and work hard without seeing much, if any, profit. However, once an operator has secure access to a reasonable resource, has paid their fees and guarantees to SPFFBZ, and has their production system of labour, equipment, transport and marketing under control – good profits can be obtained, certainly thousands of dollars each season. More can be made by exceeding one's quota. But again, it is unclear how many operators achieve these high profits.

The industrial and concession loggers have larger quotas – of up to 3,000 m^3 per year, bringing greater turnover, but also have higher overheads, in the form of permanent staff, buildings, equipment maintenance and possibly inventories, management plans and corporate taxes. They are also more vulnerable to graft.

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[39] Even in Mozambique, given the extended rainy season of 2004, and the lack of access to commercial and other data

The study of Fath (2001) provided some interesting insights into the forestry sector in the late 1990s, through case studies of five small timber companies, in Gaza, Sofala, Zambézia, Nampula and Cabo Delgado provinces. Only one company was able to generate a small profit of US$14/$m^3$, the rest lost between US$45 and US$205/m^3. The main factors affecting profitability were:

- volume of annual production. The only profitable company produced 2,400 m^3/yr. The company with the smallest deficit produced 1,600 m^3. All the others produced 600 m^3 or less.
- Organisation of harvesting and transport, for operational efficiency and best use of capital.
- Well-stocked forest. One of the least profitable companies suffered from poor stocking of commercially valuable trees, because the forest had been repeatedly logged over. The most profitable company harvested some common species with very high stocking, and a secure although local market.
- externalisation of transport costs. The only profitable company sold its logs at the forest gate. The other companies had to struggle with the high fixed and variable costs of running their own trucks.
- Productive equipment. Some companies used obsolete field equipment to reduce their capital costs, but they paid a price in much lower production volumes and labour productivity. The most profitable company employed reasonable equipment and used it sensibly.

The predominantly Asian buyers control the timber market, fixing prices and the extent to which the other stakeholders can benefit, but it is unclear to what extent the buyers themselves are controlled by the wholesale markets and other factors in China. The large buyers shift thousands of logs each season, but the margin they make on each log is not clear. They also run considerable risks, from bad debts, competition from other buyers, delays in transport, and graft. The community of buyers is quite dynamic – with individuals coming and going from year to year, and tales of intrigues, deceits, side-selling and bankruptcies not uncommon. When business goes bad, the buyers move on – to other producer countries, but what profit level defines "bad business" in the eyes of the buyers, is difficult to ascertain.

Judging by the number of people apparently buying trucks, transporters are benefiting well from forestry. The activity is also relatively straightforward and free of licence fees, financial guarantees and uncertain resources that the operators endure. They are able to exact a high rate per cubic metre transported ($40/ m^3), almost regardless of the distance travelled. Rural roads are in very variable condition, and wear and tear on the vehicles and costs of maintenance and repair can be considerable.

Forest officers, and other government officials involved in the sector are in the enviable position of benefitting up to three times from sector: the staff, senior staff in particular, receive a reasonable monthly salary and bonuses, they exploit their positions for bribes, and also act as operators in the sector, albeit behind front-people.

The preliminary conclusion is thus that the main beneficiaries of the timber trade are the foreign buyers, competent local loggers and government officials, and that benefits in rural areas are limited to a few people, getting low rates of return on their labour.

5. PROBLEM ANALYSIS

This section provides further analysis of the problems raised in the previous sections, as a prelude to the final chapter in which possible solutions are discussed. The problems are many, the situation is very complex, and many issues need to be addressed comprehensively to bring forests under sound governance.

Figure 5 presents a graphic problem analysis of forestry in Zambézia. The central problem of the sector is identified as unsustainable and inequitable use of forest resources, characterised by excessive and poorly controlled harvesting and then export of logs, and the capture of the benefits from forestry by government staff, political and private sector elites and foreign buyers. This is caused primarily by governance failure: lack of enforcement of laws and indeed government actions actually contradicting their own policies and law. These, in turn, are caused principally by corruption – the direct involvement of government staff and politicians in the sector, creating a conflict of interest between public duties and private gain – which is fuelled by availability of cash, for logs and bribes, from Asian timber buyers (fuelled, in turn, by the booming Chinese economy and market demand for their manufactures), and strong desire of local people for quick profits (in part to make up for years of deprivations during the war). The situation is compounded by a lack of donor oversight which might otherwise create the pressure for better governance, and by inadequate technical knowledge. A weak civil society and lack of community rights to the resource are contributory factors: it is difficult to redress the imbalance in benefit distribution; people have little capacity or incentive to act.

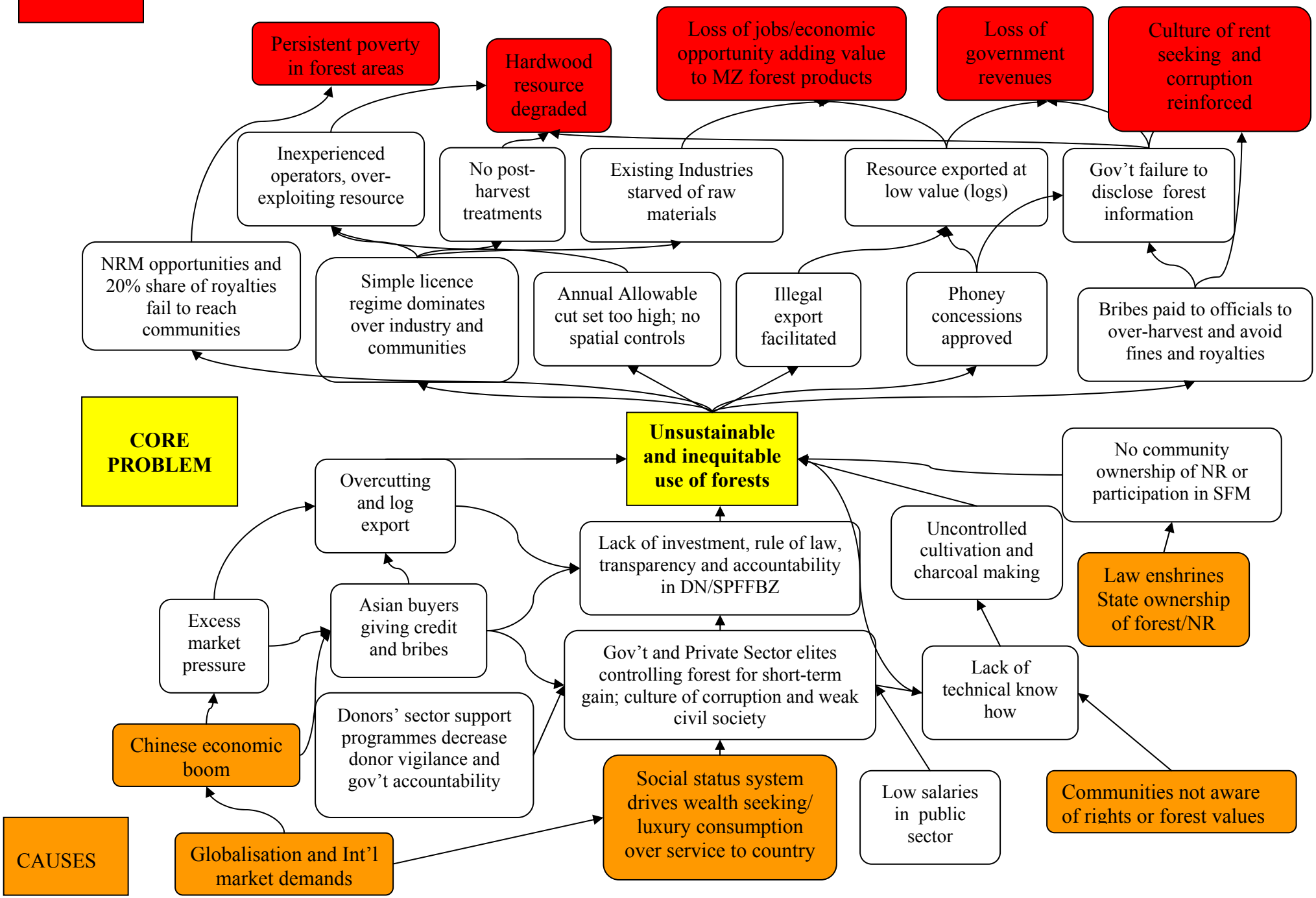
The effects of the problem are economic, social and ecological.

Economic impacts: lost revenues and opportunities

The most serious impacts of the current mismanagement of the forests are clearly economic, diverting resources needed for poverty alleviation. These take the form of:

- lost opportunities for employment, skills acquisition and industrial development;
- lost opportunities for rural communities to manage and benefit from their own resources, and grow socially as well as economically.
- lost tax and other government revenues as a consequence of the export of raw rather than processed materials, and the unrecorded illegal harvest and export, which in turn could be used for poverty alleviation.

Figure 5: Problem analysis for forestry in Zambézia



Social impacts: a culture of corruption

Although traditionally, communities in rural Zambézia have not routinely exploited large hardwood trees for their own subsistence[40], the current regime for exploitation of these species is having significant negative social consequences. More detailed study is required to understand the severity and extent of the problem, but loggers entering communities can cause social disruption, division and inequities by bribing local leaders in order to get their consent. Such corruption undermines local governance systems as well as rule of law, and, once ingrained, can affect all future development efforts in a community, sensitize people against outsiders and sabotage other attempts at poverty alleviation.

Rural women often suffer as a result of logging in their communities. The wives of men employed by loggers lose their husbands' labour for agriculture and domestic tasks, and their own work loads increase proportionally. The men typically control the cash they earn and use it for their own entertainment, or the purchase of such things as clothes and radios, rather than items that would further enhance the household economy or the well-being of the children. That said, men also typically buy bicycles and these do have an important role to play in household livelihoods, through improved marketing of agricultural and other products.

At the provincial level, the practices in the forest sector, such as payment of bribes, and exploitation of positions of authority for personal gain, have established a culture of corruption that sets a bad example for everyone else and that forecloses on legitimate investment and undermines real development. It may take years to root out.

Environmental and Ecological impacts

Although most forest exploitation is uncontrolled spatially and unsustainable in total volume, it appears from our studies, that it currently remains mostly within the legal diameter limits[41]. These species are relatively uncommon in the forest, so few timber trees are taken per hectare, and combined with the naturally more open nature of *miombo* stands, the dry tropical climate, and the light machinery and/or manual labour employed in extraction, this means that the *miombo* forests probably do not suffer the severe kind of ecological disturbance typically seen in the exploitation of more humid tropical forests[42]. The focus of harvesting on a small number of species inevitably affects the overall composition of the forest, and the removal of the best quality timbers of individual species inevitably changes the genetic composition of their populations, and some species may suffer permanent reduction in their populations and even local extinction[43].. However, it appears that the other main commercial

[40] Except for dugout canoes.

[41] There is an inherent preference in the timber industry for large diameter trees. It remains to be seen what will happen when these are exhausted.

[42] Although the matter requires detailed study, it appears that serious damage to the residual stand, advance regeneration and seedling layers due to careless logging, compaction or erosion of soils, empounding of rivers and water-logging of stands, changes in micro-climate, disruption of populations of pollinators and seed dispersers, and human settlement and forest conversion along old logging roads are relatively uncommon in Zambézia's forests.

[43] Species such as *mondzo*, whose populations are dominated by very large very old trees, or *pau preto* and *pau ferro*, which can be taken for timber at lower diameters and are also exploited by communities for polewood, are particularly vulnerable.

species are being left with at least a sufficient number of immature trees to ensure their survival and the basic integrity of the forests[44].

Thus the ecological damage to the forests is primarily short-medium term resource degradation. If current logging practices continue, the forests will remain as forests, and will eventually recover at least some of their economic value. However, if exporters start to create demand for trees below the minimum diameter, or for trees of more abundant structural species (like Brachystegia or Julbernardia), then this situation could change rapidly. For the time being, though community practices of charcoal making and shifting agriculture, including the uncontrolled use of fire, are much more damaging to the forests than logging.

6. PROPOSALS FOR REFORM

The steps required to effect reform are many and involve as many stakeholders as the problems described in the previous section. There are no quick and simple fixes. First, a vision is required.

6.1 AN ALTERNATIVE VISION FOR FORESTRY IN ZAMBÉZIA

A vision is proposed for the forest sector in Zambézia, which would bring long-term benefits the greatest number of stakeholders at the lowest cost, involves four main elements:

i) *sustainable forest management*: There are a few examples of *miombo* forest under sustainable management in Mozambique that belie the notion that these forests are not commercially manageable in the long-term. Key factors in success are limiting the harvest to what is sustainable and balancing this with industrial capacity. Primary breakdown should be in-forest, with a forest-resident operations manager, able to oversee felling, post harvest treatments and community liaison, as well as milling that ensures high levels of recovery through production of parquet and innovative products such as shingles, panels and turnery items. These could be supplemented by other income sources, such as harvesting and processing of non-timber forest products and ecotourism development. Certification of forest practices should be pursued to access the highest value markets for products.

ii) *value-added processing of forest products*: . The forest enterprise should be integrated with furniture or other manufacture. Mozambique's very fine hardwoods, should be reserved for the production of high value products, in niche markets (TCT 2003). Given the low abundance of these species, the emphasis should be on quality and not quantity. In 2003, Mozambique imported over US$ 5 million in furniture, mostly expensive particle board based pieces. In the same year, it exported less than US $ 150,000 of its quality hardwood furniture (TCT 2003). One producer estimated that 1 permanent job can be created for every 2.4 m^3 of logs harvested, given the right attention to product and market[45]. Local carpenters

[44] This said, these forests and the main commercial species are poorly understood, and natural regeneration may need to be much more intensively and carefully managed to ensure crops of good quality trees in the longer term. It has even been suggested that some species may need much more opening of the forest canopy (ie removal of more stems per hectare) to ensure their regeneration. (see section 2.2)

[45] A Schwarz, pers comm..

produce remarkably high quality joinery, considering their rudimentary hand tools and lack of training. Mozambique can afford the time to build their capacity: most trees not harvested now, can still be harvested in the future. There is no justification for selling logs.

iii) *community-based management and/or jobs for social sustainability.* As a developing country, Mozambique needs to harness all its resources to achieve its social and economic objectives. Forests represent one of the few resources in rural areas with real economic potential, and community development should thus be integrated closely with forest management. Models of forest management should embrace the full range timber and non-timber forest products, to generate income streams in the short, medium and long-term. While current regulations give communities some say in forest management and some share of the revenues from forest exploitation, they do not go far enough. The status of the land is left in limbo, and this is one reason that most stakeholders remain focussed on short-term profits, rather than long-term management. Communities should have legal rights to the forest resources on their own land, and operators should be obliged to enter into legal agreements with them, in order to access logs. In this way communities can benefit through various levels of participation in forestry, depending on their level of interest, from simply sound use of their revenues gained through agreements with operators and the entitlement to 20% of timber royalties, to local employment in forest enterprises, to full community-based management, ultimately including processing and marketing.
iv) *integration of forestry in land-use and development planning*: using GIS based tools and participatory planning, taking into account competing demands for forestry, arable and plantation agriculture, mining and other sectors. This would lead to the creation of a consensus-based forest estate, in which areas for concessions, simple licence operations and/or community-based management are delineated.

This vision is, in fact, little more than a refinement of existing policy and legislation.

A detailed conceptual model has been developed, by ORAM and Christian Aid-UK, for a community-based concession management scheme (Christian Aid, 2005). The cornerstone of the model is securing communities' access to forest resources. Under the present legislation, which denies a community's ownership of their own forest resources, this must be done first by legal delimitation and cadastral registration of their lands under the Land Law, and then by applying for a licence for a commercial concession for their forests. Each community would prepare a plan for the sustainable management of its forest area, and sell logs to a sawmill and workshop facility, located nearby the forest, and collectively owned and operated as a cooperative enterprise. Communities would benefit through direct employment of some people in the enterprises, and by the use of revenues from timber sales to implement agreed community development plans. The enterprises would be staffed by professional managers to oversee forest production, sawmill operation, workshops for value-addition and channelling revenues back to communities. Consultants would carry out national, regional and international market research and develop a marketing strategy for the enterprises. Improved governance of the forest sector would be promoted through training and exercises in participatory planning of land use, forest resources and community development. Empowerment of local government and communities, and the sustainability of initiatives

would also be encouraged through integration in processes for decentralised district planning and policy development.

The model would requires close government involvement and cooperation, and core donor support for infrastructure development and capital investment, including the sawmill, and for technical assistance. Alternatively, a private sector investor could enter into a partnership with the communities' cooperative enterprise.

6.2 IMPLEMENTING THE VISION: PROPOSED REFORMS AND IMMEDIATE MEASURES

The reform of the forest sector needed to achieve this vision will not be a quick and simple fix. Six main areas of reform are proposed, each with immediate measures across the sector to initiate the process. A series of supporting measures for each stakeholder group will also be required[46]. And there will be losers in this process, although this only need be in short-term.

The ***proposed reforms***, and the ***immediate measures*** needed to initiate the reform processes are:

i) ***Implementation of the policies for sustained forest industrial development and job creation, initiated through a moratorium on the export of logs***. These policies are fundamental to harnessing the forests for poverty alleviation. The moratorium will bring a halt to the current uncontrolled and unsustainable logging and illegal activity, stimulate local processing industries and jobs, and create the space for broader sectoral reforms to take place. It will require MADER to revoke the Decreto Ministerial of 2003 which reclassified timbers for export. Support will be required to open high value markets for Mozambique's processed and manufactured timber products. Once industries have been established and/or revitalised, limited export of logs for special purposes and markets could possibly resume, if adequate controls were in place.

ii) ***Reform of simple licence logging, initiated through a moratorium on these licences.*** Small operators in Mozambique should be able to participate in forest management, but currently, this part of the sector is, as discussed above, out of control. The Governor of Zambézia and SPFFBZ have the authority to suspend operators' activities. This will give the government and the operators the time and incentive to raise their professional standards (see below). Operators should not be permitted to resume activities again until the system has been demonstrably reformed. Operators with history of sound practice, and who are willing to accept independent monitoring of their activities (see below, v), could be permitted to continue.

iii) ***Reform of the concession system, initiated through a moratorium on concession approvals and the independent review of any management plans approved to date.*** Soundly managed concessions are key to the long-term sustainability of forestry, but present

[46] These proposals were supposed to be presented and discussed at a stakeholder workshop in Mocuba in October 2004, but the operators and buyers did not take up the invitation to attend. These measures therefore still need to be discussed with interested groups.

management plans do not provide for this, partly because there has been a lack of adequate guidelines for their preparation, and for the silvicultural management of *miombo* forests – and partly because basic planning of the forest estate has not been carried out. Until such guidelines are available, there should be a moratorium on further concession approvals through the concerted actions of the Governor of Zambézia, Ministry of Agriculture (previously MADER), the Council of Ministers, and DNFFB. Management plans already approved should be subjected to independent review and operations suspended by SPFFBZ if found lacking. The requirement for approved annual plan could be invoked if necessary. Concessions that pass the independent review should be permitted to continue operations, only if they agree to on-going independent monitoring. This will give time for DNFFB to complete reformulate and test the concession regulations, reform and make transparent the approval process, review concession fees, and develop an effective system of incentives to encourage in-country processing and transformation. The new PMSR inventory should be verified, and following that, participatory zoning of the forest estate should be conducted to identify forest areas for industrial concessions, simple licences and community management.

iv) ***Identify corrupt practices and root out corrupt officers, initiated through a detailed investigation and enquiry into forest practice.*** To reform the system, its problems need to be fully understood and admitted to. The present study should be built upon. Central Government should require all agencies and companies involved to surrender all relevant documents. Investigations should be extended from Zambézia to include Cabo Delgado, Niassa, Nampula and Sofala, and reforms addressed on the national level.

v) ***Further promote high standards of forest governance, initiated through Independent Forest Monitoring.*** IFM should be established to reduce illegality, promote sustainable management and improve government revenue collection. Initially, monitors would work with companies and operators that wish to continue production during the moratoria. After the sector has been reformed, long-term independent monitoring would ensure sustained high standards of forest management and sustained confidence in consumer countries, and could assist with certification (see Global Witness 2005, for further details).

vi) ***Empowerment of communities to manage their own forests, initiated through a revision of forestry legislation to give communities rights to the timber on their own land,*** and set ground rules for negotiations with operators who want access to that timber. DNFFB is the competent authority to conduct the review and this should involve a consultative process involving the relevant stakeholders. This final measure will initiate a fundamental reorientation for the future of the forest sector, from one dominated by unsustainable exploitation for personal gain, to one harnessed for the national good of the alleviation of rural poverty, and the promotion of sustainable economic development.

The short-term losers will be amongst the semi-skilled and unskilled labour, the transport and shipping sectors. Donor-funded infrastructure projects, themselves urgently needed by the forestry sector and the province generally, are proposed as interim compensatory measures, to avoid adverse impacts to the local economy.

6.3 SHORT-MEDIUM TERM MEASURES BY THE MAIN STAKEHOLDER GROUPS

Reform is rarely simple, and the immediate measures listed above can only start a longer term process. Various **short-medium term actions** will be required by each the main stakeholder groups in order to implement fully the 6 reforms and the long term vision. These are discussed in detail in the full report. The most important of them are:

National and Provincial Government

- To help curb the culture of corruption, Central Government and the Provincial administration should commission a detailed cross-sectoral review, ensuring that all institutional and private sector stakeholders co-operate in submitting their files for independent scrutiny. Where corruption is revealed, staff to be disciplined, prosecuted and/or fired, as appropriate. Private sector individuals found guilty of corruption should be prosecuted and sentenced, have operating and trading licences revoked, and if foreign, deported after serving their sentence.
- In consultation with stakeholders and donors, prepare and then implement a detailed action plan to support the development of forest industries and enterprises, including transport infrastructure, energy, business advice, credit, incentives and training. Special measures are needed for supporting community-based initiatives, and timber certification.

DNFFB

- Invite and collaborate with an independent forest monitoring organisation such as Global Witness to review existing management plans, cross-check the PMSR forest inventory and carry out routine monitoring in Zambézia.
- In consultation with stakeholders and IFM, simplify the concession planning process and introduce special procedures for community-run concessions, and
- Tighten up simple licensing procedures; consider auctioning of annual simple licence quotas.
- Permit a larger group of forestry consultants to prepare concession management plans and regulate the fees that it is permissible to charge.
- Review legislation to promote more integrated and diversified management of timber, NTFPs and wildlife, to optimise returns from the forests.
- Review and implement a system of graded financial incentives to encourage increasing levels of in-country processing and value addition, and other incentives to promote sustainable management (reduced fees for certified timber, etc).

SPFFBZ

- Establish a GIS data-base (in collaboration with SPGCZ) summarising all available licensing and harvesting information for the forests of Zambézia for every year since 1992 including both simple licences and concessions. Particular attention should be paid to the years since the new inventory (2003 onwards), and the inventory results adjusted accordingly. Each year the data-base should be updated, and definitive maps of the year's logging produced.
- Establish the permanent forest estate.
- Reconfigure remaining areas for concessions, to ensure a balance between AAC, concession size and industrial capacity.

Customs

Anticipating an eventual return to limited log exports:

- Remove customs incentives for the export of logs, by applying volume based levies.
- Train customs officers to identify timber species, rigorously record timber exports and detect illegal practices.

AMAZA and Simple Licence Operators

- Professional operators willing to submit to IFM to be issued with licences.
- Develop as a professional organisation: formulate and implement criteria of membership and a code of practice for simple licence logging. The first challenge is to address the perception that forest exploitation is a right, and impress on people that it is a privilege that is granted to those who have the commitment and capacity to manage the resource sustainably.
- Provide training and advice for members.

ADIMAZ and Industrial Operators, including Concession holders

- As above

In addition, they should:

- study the feasibility of relocating their sawmills closer to their concessions, to reduce transport costs and create jobs locally.
- Improve and diversify their production lines, including non-timber forest products.
- Build capacity of workers and artisans.
- Promote the role of communities and small operators in concession operations.

Foreign Buyers

Foreign buyers wishing to continue business in can contribute forest sector development by:

- Searching out new markets for processed wood products (sawn wood, flooring, furniture, handicrafts, turned products, components, moldings), underutilised timber species, and non-timber forest products (honey, medicinal plants, fibres, weaving, handicrafts) in their countries.
- Bringing in technicians to help in programme to train-up local workers.
- Bringing in investors to see actual conditions and study possibilities for establishing industries.
- Develop strategies for improving local markets and profits for basic processed wood products, like doors and windows.

Communities

Many communities already have some experience in logging and some even in basic processing. Many have been involved in illegal activities, although have profited least of all stakeholders. Amongst other things, they should:

- Reform the governance of their communities to ensure representative leadership, transparency and accountability from their leaders and broad-based participation in decision-making.

- Organise and develop cross-checking mechanisms for managing the village's share of the timber royalty.
- Seek out external support for capacity building and recognition of their rights to their own resources, including land delimitation and establishment of community concessions or collaboration with private sector operators, as desired.

Civil Society and local NGOs

Civil society (outside the NGO community) has a role to play in maintaining pressure on its elected representatives and local government, to demand good governance, enforcement of laws and delivery of agreed policies. NGOs can help mobilise and support community based management schemes, but this should be strongly linked to activities to address broader governance problems:

- Dissemination of information on laws, rights and responsibilities to communities and other stakeholders
- Organisation of regular public fora for the discussion of forestry and development issues
- Facilitation of the processes for the delimitation of village lands, village governance and development, and community concessions.
- Preparation of a pilot project on "best practices" for community based forest management
- Extension of the national network of forestry NGOs to other countries in the region: Tanzania, Zambia, Zimbabwe, and Malawi.

Donors and international partners

First and foremost, donors and international partners should put pressure on the Government of Mozambique deliver on its commitments and improve of forest governance, including insisting politicians, civil servants and party members get out of the forest. Much stricter governance targets should be made conditions of future funding, particularly for PROAGRI II. If it has been decided that the forests are to be sacrificed for some other political or development agenda, then this should be made transparent by revision to policy and legislation!

In direct practical terms, donors can provide more technical and financial support for sustainable forest management:

- Detailed economic analysis of the sector, including cost benefit analyses for major stakeholders, examining in detail the financial feasibility of the proposed reforms.
- Action research to improve the scientific bases of forest management, including "model forests" for the demonstration of best practice in concessions
- Support for establishing timber certification standards for Mozambique, and for encouraging its adoption by operators.
- Funding for independent forest monitoring and provincial advisors on forest management for private sector and communities.
- Capacity building of technicians, artisans and professional associations (AMAZA, ADIMAZ)
- Market research and development, particularly for non-timber forest products, and underutilised timber species

- Support infrastructure development schemes to substitute in the interim for logging activities for range of local stakeholders: transporters, engineers, local labour. (road building, rural electrification, urban road rehabilitation)

Donors should exercise due diligence in their funding and carry out regular and constructively critical monitoring of their budget support and projects and the organizations they support. More stringent performance criteria must be developed for the forest sector, based on analysis of the sector's problems. The work of consultant companies in the forest sector should be scrutinised. The role and strategy of donors in helping "civil society" to mature should be reconsidered.

Global Trade Partners, especially China

Lastly, but of critical importance, there is an urgent need to help the GoM (and other developing country governments) engage with international partners in the debate on global trade in forest resources. Amongst other things, the Government of China should be encouraged to develop ethical and equitable policies for exploitation of global natural resources, and US and European governments encouraged to review on their policies for the import of Chinese made furniture and other wood products, starting with their own public procurement policies. China and the importing countries should take responsibility to ensure that its own economic interests do not rob poor, vulnerable countries of the resources they need for their own development.

WTO

Under current WTO regulations, it is considered discriminatory and a "technical barrier to trade" to differentiate products based on "the way they were produced", and thus it is difficult for a country to refuse entry of logs because they are illegally harvested, or of products made from illegally harvested timber (FERN 2003). As a result, anti-illegal logging measure are reduced to ineffective voluntary agreements between country and public procurement policies. This needs urgently to change. The WTO must acquire an environmental perspective, and ensure consumers right to know about the products they buy.

6.4 PROGRAMME FOR CHANGE: NEXT STEPS

The main steps for the next few months should be:

- A multi-stakeholder meeting, including government (all relevant ministries) operators, buyers, donors, academia, civil society, to discuss this report and commence planning for the reform of the sector and the interim compensation measures.
- Immediate implementation of the short-term measures iii) moratorium on concessions and independent review of existing management plans, iv) revision of legislation regarding community rights to timber, v) detailed investigation and enquiry into forest sector governance and vi) independent monitoring of Mozambique's forestry sector.
- Implementation of short-term measures i) moratorium on log export and ii) moratorium on simple licence operations, effective for the 2007 logging season, with appropriate compensatory projects to engage disadvantaged stakeholders.

7 REFERENCE

Albano G, 2001. *Indigenous management practices and conservation of Dalbergia melanoxylon Guill & Perr. in Moçambique. A case study from two villages in southern Cabo Delgado*. MSc. thesis. Wageningen University, Environmental Sciences. The Netherlands.

Asiainfo Daily China News. "Growth needs more varied timber imports". 27/06/04.

Bellefontaine R, Gaston A and Y Petrucci 2000. *Management of Natural Forests of Dry Tropical Zones*. FAO Conservation Guide 32. FAO Rome.

Bila A and J Salmi. *Fiscalização de Florestas e Fauna Bravia em Moçambique. Passado, Presente e Acções para Melhoramento*. DNFFB, Maputo.

Bila A, 2002. *Reflecção sobre taxas de concessões florestais. Apoio ao desenvolvimento da politica florestal no ambito de PROAGRI*. DFID-IIED.

Boaler SB, 1966. *The ecology of Pterocarpus angolensis in Tanzania*. Overseas Research Publication 12, Ministry of Overseas Development, London.

Bradley PN and K McNamara (eds), 1993. *Living with trees: Policies for forestry management in Zimbabwe*, World Bank Technical Paper 210, Washington.

Brouwer R, Magane D M and J Manjate, 1999. *O sector florestal no desenvolvimento rural na provincial da Zambézia. Um possivel contributo da ORAM*. Maputo, Departamento de Engenharia Florestal da UEM.

Brouwer R and M Falcao, 2001. *Comunidades e concessões florestais: um contributo ao debate*. Unpublished manuscript, Universidade Eduardo Mondlane, Maputo.

Brunster E, 2002. *Management Plan for Timberworld Concession in Pebane*.

Calvert G.M. *Progress report on ecology and planning*. Unpublished report, Rhodesia.

Forestry Commission, Estern Region, Bulawayo.

Calvert GM and JR Timberlake, 1993. "Burning trials in Baikiaea woodlands, Gwaai, Zimbabwe", in: Piearce G.D and D.J. Gumbo (eds), 1993. *The ecology and management of indigenous forests in Southern Africa: Proceedings of an international symposium 27-29 July 1992, Victoria Falls, Zimbabwe.* Forestry Commission, Harare, Zimbabwe.

Campbell BM (ed.), 1996. *The Miombo in Transition: Woodlands and Welfare in Africa.* Centre for International Forestry Research, Bogor, Indonesia.

Canby K, 2005. *China in the middle of a global commodity chain. Presentation to the UK Tropical Timber Federation*, Chatham House, London.

Chidumayo EN, 1988. “Regeneration of *Brachystegia* woodland canopy following felling for tsetse fly control in Zambia”, in: *Tropical Ecology* 29, pp. 24-32.

Chidumayo EN, 1997. *Miombo ecology and management: An introduction*. IT Publications, London & Stockholm Environment Institute, Stockholm.

Chidumayo E and P Frost, 1996. “Population biology of miombo trees”, in: B Campbell (ed), *The Miombo in Transition: Woodlands and Welfare in Africa*. CIFOR, Bogor, Indonesia, pp. 59-71.

Chidumayo E, J Gambiza and I Grundy, 1996. “Managing miombo woodlands”, in: B Campbell (ed), *The Miombo in Transition: Woodlands and Welfare in Africa*. CIFOR, Bogor, Indonesia.

Chitara S, 2003. *Instrumentos para a Promoção do Investimento Privado na Indústria Florestal Moçambicana*. DNFFB, Maputo.

Compton J, 2000. *Case-study: Mozambique PROAGRI. "You can't learn to swim until you get into the water": policy formulation and implementation on a practical level*. Paper presented to DFID Natural Resources Advisers’ Conference.

Cuco A, 1994. Impact of structural adjustment on forest industry in Mozambique. Unasylva 179.

Cuco A, Songane F and C Matusse, 2002. *Building linkages between Poverty Reduction Strategy and the National Forestry Programme: Case of Mozambique*. Draft Paper to be presented to international workshop on forestry and poverty reduction.

Fath H, 2001. *Commercial Timber Harvesting in the Natural Forests of Mozambique*. Forest Harvesting Case Study No. 18. FAO. Rome.

FERN, 2003. *Eco-labelling, forest certification and the WTO*. http://www.fern.org/campaign_publication.html?id=4&tid=156

Frost P, 1996. “The ecology of miombo woodlands”, in: Campbell B (ed), *The miombo in transition: woodlands and welfare in Africa*. CFIOR, Bogor. pp 11-58.

Garrido-Mirapeix J, AM Ribeiro, 1998. *The National Programme for Agricultural Development (PROAGRI). The Implementation of the Programme Concept: The Way Ahead*. European Commission: Food Security Unit Mozambique.

Geldenhuys CJ, 2005. *Basic Guidelines for Silvicultural and Forest Management Practices in Mozambique*. Report FW-04/05. Projecto Maneio Sustentável de Recursos.

Global Forest Watch, 2004. http://www.globalforestwatch.org/english/about/afleg

Global Timber, 2005. http://globaltimber.org.uk/china.htm

Global Witness, 2005. *A Guide to Independent Forest Monitoring*. Global Witness, London.

Grundy I, 1995. *Regeneration and Management of Brachystegia spiciformis Benth. and Julbernardia globiflora Benth. troup in miombo woodland, Zimbabwe*. D. Phil. thesis. University of Oxford.

Hanlon, J, 2002. *The land debate in Mozambique: will foreign investors, the urban elite, advanced peasants or family farmers drive rural development?* Research paper commissioned by Oxfam GB – Regional Management for Southern Africa.

Hanlon J, 2004a. *How Northern Donors Promote Corruption: Tales From the New Mozambique.* Corner House Briefing Paper 33.

Hanlon J. 2004b. *Do Donors Promote Corruption? The Case of Mozambique*. Third World Quarterly 25 (4), pp. 747-763.

Hursh CR, 1960. *The dry woodland of Nyasaland*. International Cooperation Assistance, Salisbury.

Instituto para a Promoção de Exportações, 2003. *Estratégia para o desenvolvimento das exportações de produtos processados de madeira de Mocambique*. Maputo.

International Institute for Environment and Development, 2006. Update – January 2006. Forest Governance Learning Group.

Kigomo BN, 1995. *Management of dry forests: the case of East and Southern Africa miombo woodlands*. Consultant report. FAO, Rome.

Kloeck-Jenson S, 1998. *A brief analysis of the Forestry Sector in Mozambique with a focus on Zambézia Province*. Land Tenure Center Project-Mozambique. Draft.

Knight R, 2000. *Camponeses' Realities: Their Experiences and Perceptions of the 1997 Land Law*. Report prepared for ORAM.

Lundin I, 2000. *Africa Watch: Will Mozambique Remain a Success Story?* African Security Review Vol 9 No 3.

Lyman T, Cunliffe R, Mapaure I and I Bwerinofa, 2003. *Assessment of the value of woodland landscape function to local communities in Gorongosa and Muanza Districts, Sofala Province, Mozambique*. CIFOR, Bogor Indonesia.

Ministério de Agricultura e Desenvolvimento Rural, 2002. *Regulamento da Lei de Florestas e Fauna Bravia*. Maputo, DNFFB.

Ministério de Agricultura e Pescas, 1995. *Política e Estratégia de Implementação de Agricultura*. Maputo, DA

Ministério de Agricultura e Pescas, 1999. *Politica e Estrategia de Desenvolvimento de Florestas e Fauna Bravia*. Maputo, DNFFB.

Ministério de Agricultura e Pescas. 1999b. *Lei de Florestas e Fauna Bravia*. Maputo, DNFFB.

Ministério de Coordinação da Acção Ambiental, 2000. *Diagnostic of the State of the Environment in Zambézia Province*.

Ministério de Planeamento e Finanças, IFPRI, Purdue University, 2004. *Poverty and Well-being in Mozambique: Second National Assessment*.

De Morten Ronning, 2000. *Desenvolvimento ou exploração? Grupo Madal em Moçambique*. NorWatch, report No. 9.

Mushove PT, Shumba E and F Matose, (eds), 1996. *Sustainable management of indigenous forest in the dry tropics. Proceedings of an international conference, Kadoma, Zimbabwe, 28 May –1 June 1996*. Harare: Forestry Commission and Sida Department for Research Cooperation.

Mustalahti I, 2004. *Associação das Indústrias de Madeira da Zambézia: Steps towards a new phase*. Report prepared for ADIMAZ.

Newman J and Valentinus A, 2005. *The Last Frontier. Logging in Papua and China's Massive Timber Threat*. Environment Investigation Agency. London and Bogor.

Nhantumbo I and D Macqueen, 2003. *Direitos das Comunidades: Realidade ou retórica*. DNFFB, Maputo.

Norfolk S and D Soberano. 2000. *Overview of Land Applications in Zambézia*. Republic of Mozambique, Ministério de Agricultura e Pescas, Serviços Provinciais de Geografia e Cadastro.

Norfolk S and D Soberano, 2000a. *From Conflict to Partnership. A report on relations and land, Zambézia Province*. ORAM and World Vision.

Palgrave KC, 1988. *Trees of southern Africa*. Struik, Capetown, South Africa.

Patlis JM, 2003. *Holding the purse strings to illegal forestry activities: engagement with financial institutions and investigation of financial crimes*. Environmental Law and Law Development Associates. Report prepared for Center for International Forestry Research.

Piearce GD and DJ Gumbo (eds), 1993. *The ecology and management of indigenous forests in Southern Africa: Proceedings of an international symposium 27-29 July 1992, Victoria Falls, Zimbabwe*. Forestry Commission, Harare, Zimbabwe.

Pool TM, Catterson DJ, Molinos VA and AC Randall, 2002. *Review of USAIDs Natural Forest Management Programs in Latin America and the Caribbean*. USAID/LAC/RSD/E.

Republic of Mozambique, 2001. *Action Plan for the Reduction of Absolute Poverty (PARPA) 2001-2005* (translated from the Portuguese).

Reyes D, 2003. *An Evaluation of Commercial Logging in Mozambique for the Corporate Engagement Project*. Collaborative for Development Action. Cambridge Mass.

Rytkonen A, 2003. *Revenues from Forests in Mozambique. Improving the system of collection*. Final Draft. DNFFB, PROAGRI, IIED. Maputo.

Saket M, 1994. *Report on the Updating of the Exploratory National Forest Inventory*. Ministry of Agriculture, National Directorate of Forests and Wildlife, FAO/UNDP, MOZ/92/013.

Saket M, Tawuidir M and C Banze, 1995. *Methodology and Results of the Forestry Vegetation Mapping at 1:250,000*. Ministry of Agriculture, National Directorate of Forests and Wildlife, FAO/UNDP, MOZ/92/013

Sarkeala J and C Cuambe, 2000. *Manual de Inventário Florestal: Inventário exploratório da Zambézia*. Nota Técnica 4. Projecto Maneio Sustendado de Recursos. DNFFB, UIF, Maputo.

Schafer J and R Black, 2003. *Colonial forestry and natural resource management policy in Mozambique.* Full report of research activities and results.
http://www.regard.ac.uk/research_findings/R000223601/report.pdf

Sitoe A, 2003. *Impacts of Finnish Aid on forestry and rural development: Community impacts in Mozambican forestry*. Unpublished manuscript.
http://www.valt.helsinki.fi/kmi/research/impacts/mozambique.htm

Sitoe A and A Bila, 2002. *Manual para a elaboração do Plano de Maneio de concessão Florestal*. Unpublished report. Apoio ao Desenvolvimento da Política Florestal no Âmbito do PROAGRI. DNFFB, MADER, Maputo.

Sitoe A, Bila A and D Macqueen, 2003. *Operacionalisação das Concessões Florestais em Mozambique*. DNFFB, Maputo.

Spector B, Schloss M, Green S, Hart E and T Ferrell, 2005. *Corruption Assessment: Mozambique*. USAID.

Sun X, Cheng N and K Canby, 2005. *China's Forest Product Exports: Overview of Trends by Segments and Destination. China and Forest Trade in the Asia Pacific Region: Implications for Forests and Livelihoods*. Forest Trends, Washington.

TCT Indústrias Florestais, Lda – Dalmann Furniture, 2003. *Mozambique Timber Industry – an Industry in Crisis*. Unpublished manuscript.

Thornton A, 2005. *Chinese involvement in African illegal logging and Timber Trade*. Testimony to US House of Representatives Committee on International Relations, Sub-Committee on Africa, Global Human Rights and International Relations. 28 July 2005.

Tokola T, 2004. *Forest Inventory Data Calculation for Zambézia and Inhambane Provinces*. Consultant report for the Projecto de Maneio Sustentado de Recursos. DNFFB, UIF, Maputo.

Trapnell CG, 1959. "Ecological results of woodland burning experiments in Northern Rhodesia", in: *Journal of Ecology* 49, pp. 129-168.

United Nations, 1992. *Report of the United Nations Conference on Environment and Development.* Agenda 21, Annex 1 (Rio Declaration) Annex III (Non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forest. A/CONF.151/26 (Vol. III)).

Vail L and L White, 1980. *Capitalism and Colonialism in Mozambique: A Study of Quelimane District*. Heinemann, London.

Warner K, 1994. "Marketing, valuation and pricing of NWFPs", in: Beyond Timber: social, economic and cultural dimensions of non-wood forest products in Asia and the Pacific. Regional Expert Consultation, Bangkok. FAO, Rome.

White A, Sun X, Canby K, Xu J, Barr C, Katsigris E, Bull G, Cossalter C and S Nilsson, 2006. *China and the Global Market for Forest Products. Transforming Trade to Benefit Forests and Livelihoods*. Forest Trends, Washington.

World Wide Fund for Nature, 2001. http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0704_full.html

Wormald TJ, 1984. *The management of the natural forests in the arid and semi-arid zones of East and Southern Africa*. A report for Overseas Development Administration. Great Britain.