

**FOREST
HARVESTING
CASE-STUDY**

22

**Pitsawn timber production in natural forests of
Uganda**

by

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Foreword

This case study is one of a series of publications produced by the Forest Products Service of FAO in an effort to promote environmentally sound forest harvesting and engineering practices. The purpose of these studies is to highlight both the promise of environmentally sound forest harvesting technologies as a component of sustainable forest management, and the constraints that must be overcome in order to assure widespread adoption of those technologies.

The study benefited from extensive collaboration with the GCP/INT/808/UK: Strengthening Participatory Approaches in Forest management in Uganda, Ghana and Guyana – a joint FAO DFID programme aimed at reducing poverty in two African countries, Uganda and Ghana, and in the Caribbean in Guyana, through sustainable use of community based natural assets.

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The report was prepared by Geoffrey Odokonyero and FAO Forestry Officer Simone Rose managed the preparation of the report for publication in the FAO Forest Harvesting Case Study Series.

Executive summary

The case study was conducted to highlight the impacts of pitsawing in Uganda and the approach of policy-makers to this industry. This report provides an assessment of current forest management practices, forest policies and laws with regard to pitsawing.

The current Uganda Forest Policy provides for the development of forest-product processing industries with regard to both pitsawing and sawmilling. A strategic sector plan sets out goals and strategies that will implement the forest policy. The policy objective is to promote a modern, competitive, efficient and well-regulated forest-product processing industry in the private sector. The 2003 National Forestry and Tree Planting Act provides legal support for the implementation of the Uganda Forest Policy and the National Forest Plan. In order to promote the development of the forest industry in Uganda, attempts are underway to transform pitsawing in its present form or phase it out all together. In this regard, the National Forestry Authority is already restricting pitsawing and has piloted the use of chainsaw sawmills.

The report also analyses the prevailing policies that have indirectly encouraged the emergence of the industry. The management policy has favoured the promotion of pitsawing in Natural Forest Reserves, with licences to operate up to four saws per sawyer under a strict zoning policy. There are many mobile sawmills, but all are licensed and working in the softwood plantations. However, there is a ban on the use of chainsaw and any motorized tool in timber production in natural forests.

The report provides an analysis of the local and export timber markets. The supply of timber from natural forests is declining and forest continues to be lost at an alarming rate. Uganda's forests have a total economic value of about US\$1070 million. Of this, only 7 percent (US\$75 million) is derived from sawn timber with pitsawing providing about 90 percent of the sawn timber on the local market. The size of the local timber market is estimated at 240 000 m³ from current harvesting of roundwood, which is twice the sustainable annual allowable cut. The domestic market has been the major market for Ugandan timber for the last 50 years. Despite a ban on timber exports, Kenya is main market for Ugandan hardwoods. The forest resource is too small to sustain a large export trade in timber and other primary wood products. However, there are possibilities for a lucrative trade in secondary wood products.

The limited production of sawn timber by registered pitsawing and sawmills has kept the demand high, so encouraging illegal processing and trade mainly in chainsawn timber including illegal imports from the Democratic Republic of the Congo.

The study evaluates the effect of pitsawing operations on the community adjacent to the Kalinzu Central Forest Reserve in western Uganda. It examines the livelihood systems of the pitsawyers and the target community, and also analyses changes, opportunities and constraints to livelihood systems if pitsawing activities were to be stopped. Farming and pitsawing are the main sources of livelihood for the local community. The community allocates most of its income to basic daily needs, investing little in other enterprises. Pitsawing sustains livelihoods for several categories of people (e.g. supervisors, sawyers, carriers, sellers and buyers).

This report contains recommendations for follow-up on pitsawing. It concludes that support is required to identify and develop alternative livelihood options to offset any short-term drop in income felt by poorer households.

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List of acronyms

AAC	Annual allowable cut
BAPWUA	Bushenyi All Pitsawyers and Wood Users Associations
CFM	Collaborative forest management
CFR	Central Forest Reserve
EC	European Commission
EI	Exploratory Inventory
FD	Forest Department
FID	Forestry Inspectorate Division
FMP	Forest Management Plan
FNCMP	Forest Nature Conservation Master Plan
FNCMP	Natural Forest Management and Conservation Project
FORRI	Forestry Resources Research Institute
FR	Forest Reserve
FRMCP	Forest Resources Management and Conservation Programme
GDP	Gross domestic product
ISSMI	Integrated Stock Survey and Management Inventory
KCFR	Kalinzu Central Forest Reserve
MFPED	Ministry of Finance, Planning and Economic Development
NFA	National Forestry Authority
NFP	National Forest Plan
NFTPA	National Forestry and Tree Planting Act
NHF	Natural high forest
PEAP	Poverty Eradication Action Plan
PFE	Permanent forest estate
PMA	Plan for the Modernization of Agriculture
PSRP	Public Sector Reform Programme
TEV	Total economic value
THF	Tropical high forest
U Sh	Uganda shilling
UBOS	Uganda Bureau of Statistics
UFP	Uganda Forest Policy
UNBS	Uganda National Bureau of Standards
UWA	Uganda Wildlife Authority
VAT	Value added tax

Chapter 1

Forest management practices and the advent of pitsawing

BACKGROUND TO FOREST MANAGEMENT PRACTICES

In Uganda, tropical high forests (THFs) cover 924 000 ha, which is 3 percent of the country's land area. Of this, 33 percent is found in gazetted areas or Central Forest Reserves (CFRs), 29 percent in national parks under the management of the Uganda Wildlife Authority (UWA), and 38 percent on private and customary land holdings. The National Forestry Authority (NFA) manages the CFRs. The NFA is an autonomous body created in 2003 to take over from the Forest Department (FD), which had managed the Forest Reserves (FRs) since their establishment in 1898. Table 1 shows the institutional distribution of the THF, and Figure 1 shows the location of the main FRs in Uganda.

TABLE 1
The institutional distribution of Uganda's THF

Institution	Tropical high forest (ha)
NFA	305 634
UWA	266 913
Local government	545
Unprotected	350 936
Total	924 028

Of the FR total of about 300 000 ha covered by THF, about 100 000–200 000 ha can be considered “productive” forest. This is a result of the degradation in recent years, mainly caused by encroachment and overharvesting. Out of this figure, an estimated 50 000 ha are

exploitable. The rest is degraded and will have to be protected for at least another 20 years.

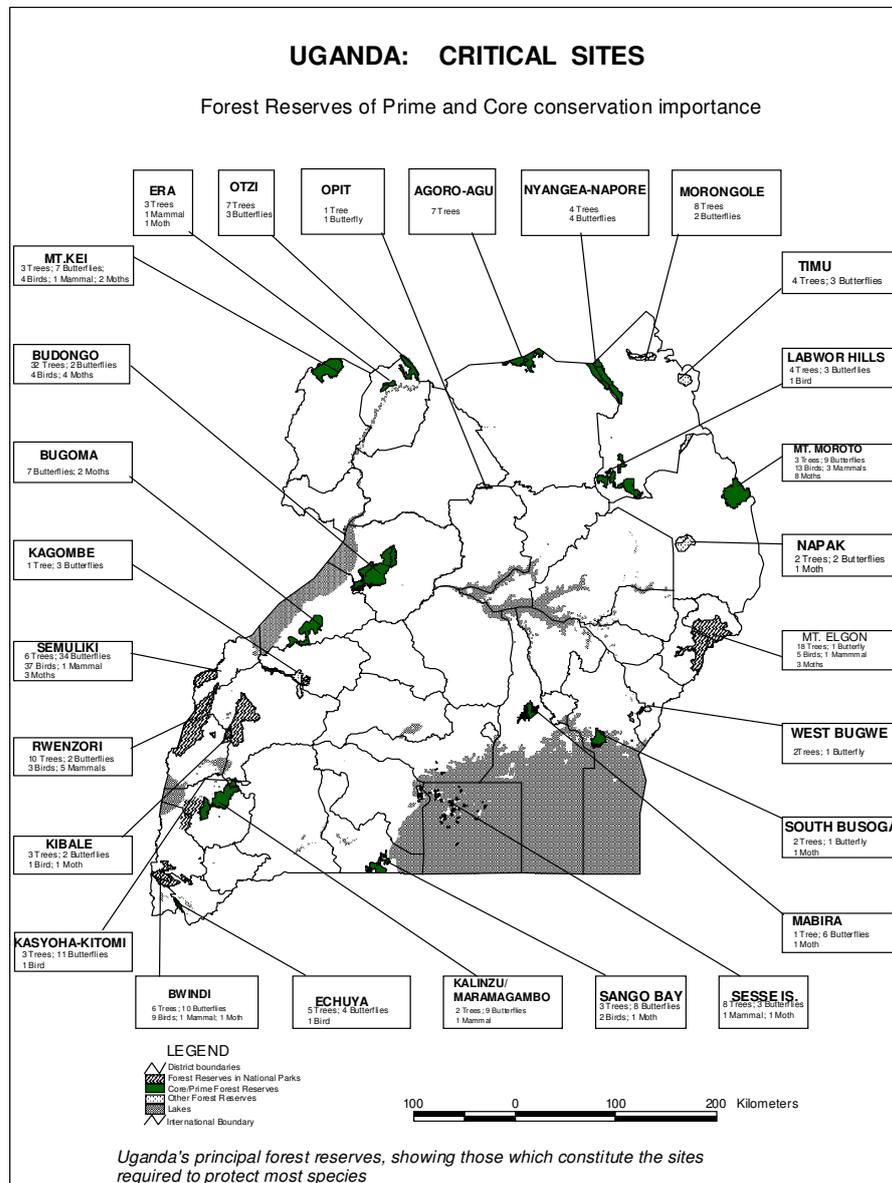
In the past (20–30 years ago), the estimate of usable natural forest yields was about 3 m³/ha/year. Latest expert estimates assume an increment of 1 m³ of harvestable species, of which only 0.3–0.6 m³ is attributable to commercial species (Falkenberg and Sepp, 1999).

The implementation of the Forest Nature Conservation Master Plan (FNCMP) by the FD since 1988 has resulted in the setting aside of 20 percent of the CFRs as strict nature reserves and 30 percent as buffer zones in which, respectively, no production and non-timber utilization are allowed. The remaining 50 percent is scheduled as production zones for forest harvesting. These now total about 140 000 ha. The production zones aim to provide a maximum sustainable yield of high-quality hardwood timber. In practice, pitsawing is restricted within the production zones under planned timber harvesting and tight control of operations.

The 2002 National Forest Plan (NFP) has a planned annual allowable cut (AAC) of 70 000 m³ from NHF. The issuing of licences and partnerships for harvesting CFRs by pitsawing and possibly small-scale sawmilling in NHF is one of the core activities of the NFA. Licensed harvesting in NHF by pitsawing is currently a major threat to biodiversity conservation and is, therefore, restricted. This is because such operations are difficult to control and regulate. The method is selective in species harvested and wasteful timber-handling practices also cause considerable damage to the forest. It is the most common method of timber harvesting and sawmilling in Uganda. Most operators work without a licence. The THFs are seen as being home to

critical sites with rare and endangered species of both plants and animals to protect. Thus, the CFRs are of prime and core conservation importance (Figure 1).

FIGURE 1
The distribution of tropical high forests in Uganda



An immediate priority is to develop strategic forest management plans (FMPs) for all the CFRs in an open and participatory manner. These strategic plans are cost-effective and relatively quick to produce. An FMP for the KCFR has been put in place for the period 2003–2013. From the FMP, more detailed operational plans are drawn up for a specific set of activities to address the agreed strategic management objectives. Guidelines for producing both types of plans are developed with emphasis on participatory processes, and rapid and cost-effective collection of forest resource information. The Exploratory Inventory (EI), the Integrated Stock Survey and Management Inventory (ISSMI), and permanent sample plots are important sources of in-forest information necessary for operational planning and decision-making on activities such as pitsawing.

THF management in Uganda

Most of the THFs in Uganda were first gazetted in the 1930s, when the aim was to establish an adequate forest estate in each district/region of the country. From the 1940s to the 1970s, the FD developed a sound forest management planning system, which was internationally recognized. This involved the drawing up of a ten-year FMP for every FR or a group of similar FRs, commonly known as a management plan area. These FMPs dealt broadly with the strategies to be followed in the management of the FRs. These strategies would then be the basis for detailed annual works programmes for the actual implementation of the FMPs.

However, from the end of the 1970s and through much of the 1980s, the system of planned management of FRs was disrupted and many of them were encroached upon and degraded. Since 1988, there has been a steady return to the planned management of FRs.

RESEARCH AND DEVELOPMENT OF TIMBER-PROCESSING TECHNOLOGIES

The advent of pitsawing in the country can be traced back to the introduction of commercial timber exploitation at the beginning of the last century in Budongo FR. Originally, it provided employment and timber to local communities. With the importation of sawmill machinery and equipment, and the granting of long-term concessions to sawmills, the practice of pitsawing was progressively discouraged. In the 1930s, licensed harvesting of timber by sawmillers was started by Asians and the British, thereby alienating the local communities. Following the expulsion of the Asians in 1972 (who had dominated the sawmilling industry) and the collapse of sawmills, pitsawing started again in large numbers in 1976 by encroaching on FRs. The 1980s saw the beginning of massive illegal pitsawing to supply the much-needed timber for the construction boom in the country. There was also an increase in timber harvesting for export. Therefore, the FD had no option but to license and restrict pitsawing. Pitsawing, along with illegal activities, reached a peak in the early 1990s. A total of 3 000–4 000 pitsawing licences were issued. Many more players were operating illegally as the activity was difficult to monitor and control.

Since 1988, pitsawing has been seriously restricted through controls, regulations, concessions and licensing conditions. Although the number of registered pitsawyers has declined, it is the dominant means of converting roundwood into sawn timber. Pitsawyers work largely independently and in an uncontrolled/unrestricted way, mainly on unprotected private land without FMPs, which covers 70 percent of forestland.

The KCFR management plan for 1932–1946 and the annual report of 1938 refer to an individual running a small pitsawing trade in Mbarara. This business was stopped the same year to avoid competition with the government-sponsored Uganda Timber Sales Ltd., which obtained timber from Budongo FR. This marks the beginning of the negative impacts of this practice and the high-handed approach of policy-makers in their dealings with the industry. An enumeration was done in 1938 for a possible small-scale sawmill exclusive licence to a tin miner, but the individual concerned did not follow up the initial enquiry (Sizomu-Kagolo *et al.*, 2003).

The 1947–1959 KCFR management plan issued casual licences to pitsawyers in parts outside the exclusion licences area, but the annual volume cut was small. However, volume rose sharply from less than 50 m³ to 340 m³ in 1958, of which 142 m³ was *Entandrophragma* and *Newtonia buchananii*. The low conversion efficiency achieved by pitsawyers made them selective in the species and sizes of logs cut.

The 1960–1970 KCFR FMP expired and was not revised. This created a management problem because there was no systematic approach in its management until the current FMP (Sizomu-Kagolo *et al.*, 2003). A uniform management system with a single conversion-felling cycle of 80 years was adopted. Pitsawyers were limited to salvage old, dying and dead trees outside the exclusive licence and nature conservation areas.

The Integrated Selection Management System

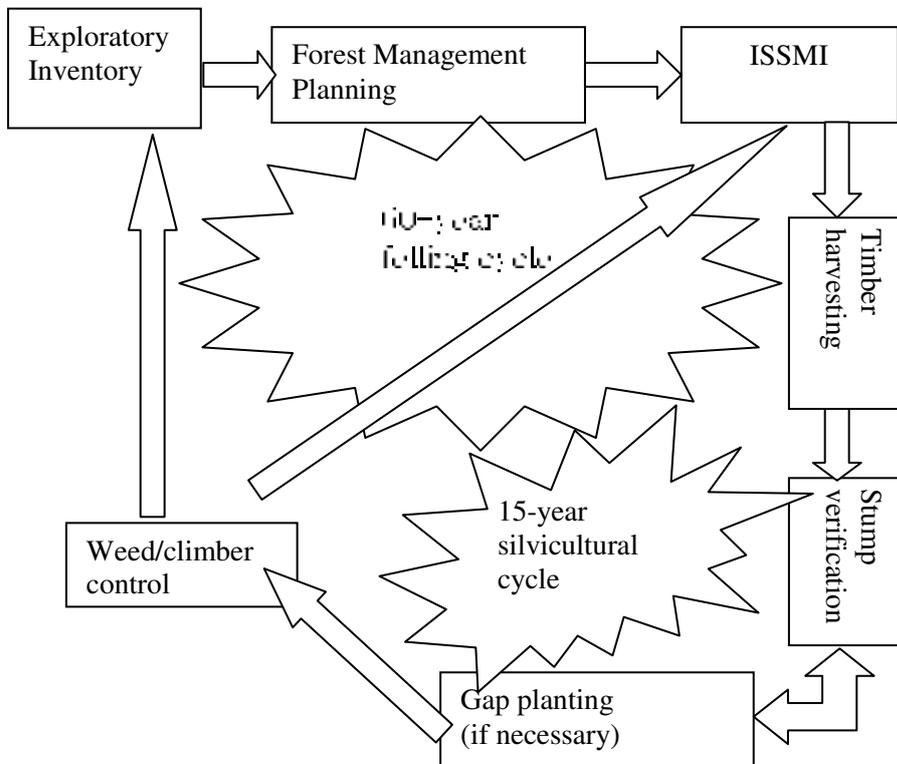
Development of the Integrated Selection Management System is based on the ISSMI started in 1998 by the Forest Resources Management and Conservation Programme (FRMCP) of the NFA (formerly the FD) with funding support from the European Commission (EC). It builds on the older, uniform forest management system, which had been used since the 1950s with varying levels of success. The system is composed of a silvicultural cycle of 15 years and a felling cycle of 60 years (Figure 2).

Selective harvesting is part of a silvicultural operation for stand improvement. Only a few scattered trees (often of poor quality and form, or defective or overmature trees) are selected for harvest with 1–2 logs. Species selected include those that are unpopular on the market or recalcitrant (difficult to process and handle). The rest are protected as reserved trees or seed trees, including all prime timber species. The operation of the forest management practices is as follows:

- A 4-ha block is the smallest unit for silvicultural management.
- During the first felling of a compartment, only blocks of the highest stocking are selected for felling (average 5–6 trees \cong 15 m³). This is based on a conservative yield estimate of 1 m³/ha/year.
- Felling is followed by other silvicultural operations (felling damage repair, utilization of lop and top, gap planting, weed control, and climber cutting). Fifteen years later, the operations are repeated (silvicultural cycle).
- After 60 years, the blocks that were felled first can now be felled again (felling cycle).

FIGURE 2

The Integrated Selection Management System – silvicultural and felling cycles



In brief, as adopted and practised on a trial basis, the ISSMI is in principle capable of providing an effective inventory and control system. It is at present designed to operate with a short 15-year polycyclic felling system throughout all blocks and be operated by pitsawyers (Osmaston, 2000). However, more fundamental modifications may be required to use it with a

static sawmill, for which it would be uneconomical and damaging to regeneration to revisit the same coupe. In the field, the stationary sawmills no longer function, partly because their operations are not cost-effective; a possible indication that the system cannot be adhered to. On the other hand, pitsawyers have been able to supply *Strombosia scheffleri* structural timber to the British High Commission in Kampala. The legal origin has to be verified and from a sustainable managed forest (FRMCP, 2004a). This certification is a measure of how success is determined and an indication that the system is being adhered to.

The ISSMI, forest certification, partnerships, harvesting by pitsawyers of the Bushenyi All Pitsawyers and Wood Users Associations (BAPWUA), and adjacent community livelihoods are all being practised by the FRMCP in the KCFR (FRMCP, 2004b), the area selected for this case study.

THE KALINZU INITIATIVE

The FRMCP has played key roles in the management of Uganda's forest by addressing the following main areas:

- biodiversity conservation in key FRs with natural forests;
- sustainable management of production areas in natural and plantation FRs;
- timber plantation establishment, largely by the private sector;
- improved infrastructure (e.g. offices, transport, and information systems) in selected areas;
- skills training in the areas mentioned above.

The FRMCP also provides for short-term consultants to help develop capacity among national staff and improve forest management technologies. Under the current annual work plan, the programme has focused on improving forest management practices in 11 CFRs with tropical moist forests covering 249 543 ha. The KCFR, the study area selected and described here, is one of these.

The total reserve area of the KCFR is 14 126 ha. It is a medium-sized FR by Ugandan standards. The forest management plan for the KCFR for the period from 1 January 2003 to 31 December 2013 was prepared in a participatory manner with all key stakeholders. The plan provides for a production management circle. This is an area of the forest set aside for production of timber and other forest products. It covers 7 003 ha. Other management circles deal with: biodiversity conservation (strict nature reserve and buffer zones), covering 4 565 ha; adjacent community livelihoods (11 parishes adjacent to the FR); recreation covering, 2 458 ha; and research (cutting across all the management circles). The Kalinzu Initiative deals with timber production in the production management circle by pitsawing.

The KCFR is gazetted as a CFR in The Forest Reserves (Declaration) Order (Statutory Instrument 1998 No. 63) with an area of 14 126 ha. Map Sheet reference No. 76/3 and Boundary Plan No. BP 1518 describe its location in Uganda.

The Forest Management Plan

The 2003 National Forestry and Tree Planting Act (NFTPA) requires a responsible body (the FD/NFA) to prepare an FMP, which *inter alia* states the type of activities to be carried out in the forest. The same section binds "all persons having dealings with or interests in the forest". The current FMP was prepared in a participatory and collaborative manner involving the local communities adjacent to the KCFR and pitsawyers. It was approved in accordance with Subsection 3 of the NFTPA. Prescription No. 2 of the FMP provides for its participatory revision every three years in order to cope with the fast-changing developments in forest management.

The FMP management objectives for the KCFR are:

- Vision: A biodiversity rich and sustainably managed FR that contributes significantly to the improvement in livelihoods of the surrounding communities.
- Immediate objectives (3–5 years):
 - Bring the production zone under planned timber harvesting and subsequent silvicultural practice.
 - Integrate communities surrounding the FR into collaborative/participatory forest management.
 - Develop an integrated approach to biodiversity conservation through linkages between research, education and utilization.
- Medium-term objectives (5–10 years):
 - Diversify the economic benefits from the FR to include non-timber forest products as a significant component
 - Develop the research agenda to a level where the FR is a major destination for domestic and international researchers in tropical high forests.
 - Maintain the FR as an important home for Uganda’s biodiversity with a significant role in environmental conservation in the region.

Existing partnerships in plan implementation

As direct and indirect beneficiaries, the local communities are major stakeholders whose actions and activities may cause positive or negative impacts on the forest resources. These communities were involved in developing the present FMP. They are involved in planning activities and encouraged to take up roles and responsibilities in the management of the KCFR.

They participate in the management of the KCFR by helping to curb illegal activities, providing labour and preparing the annual work programme. This participation is through an active collaborative forest management (CFM) programme. The NFA is committed to providing benefits to local communities through CFM agreements.

The pitsawing association (the BAPWUA) is also a partner in managing the KCFR. It supports sustainable forest management by adopting efficient harvesting and utilization of trees, regularly paying royalty fees and taxes, and assisting in detecting illegal activities in the KCFR.

Production management circle

Pitsawing is restricted to a designated coupe of a stock-mapped compartment (Compartment 34), i.e. where an ISSMI has been carried out. Trees selected for harvest, reserved trees and all other tree species to be protected during the harvesting operations are marked with different colours in order to facilitate identification. In the KCFR, although the AAC has not been established, an interim annual volume for harvesting is as shown in Table 2.

TABLE 2
Interim annual volume for harvesting in the KCFR

Timber class	Volume (m ³)	Percentage
I	216	6
II	1 767	49
III	1 617	45
Total	3 600	100

Pitsawing is restricted in harvesting the already overexploited high-quality timbers in Class I such as *Khaya* and *Entandrophragma* species (mahoganies), *Milicia excelsa* (mvule), *Lovoa* species (nkoba), *Olea* species (elgon olive/teak), and *Hallea stipulosa* (nizngu).

Pitsawing has in the past selectively harvested these species and they are now targeted by illegal sawyers.

Adjacent community livelihoods management circle

The community livelihoods management circle for the KCFR consists of 11 parishes (the second-lowest administrative unit) under respective subcounties. The objective of this cycle is to help these communities not to depend on the KCFR for their entire livelihood by aiming at:

- providing basic needs and alternative sources of wood products;
- planting trees and engaging in other activities for income generation and other socio-economic benefits.

CONSEQUENCES OF REMOVING RESTRICTIONS ON PITSAWING

There may be several consequences (positive and negative) of removing the current restrictions on the pitsawing industry. However, the negative effects are likely to outweigh the positive ones, especially on sustainable forest management.

The positive consequences of removing the current restrictions on the pitsawing industry are:

- The current restrictions entail control and regulation on the industry to harvest the forests sustainably. Removing the restrictions will increase public concern and outcry at the inefficiency in conversion and overharvesting by pitsawing.
- There may be short-term gains, e.g. increased ability of the poor to raise income by using more saws as each registered pitsawyer will not be restricted to a maximum of four saws.
- Increased commitment and support by communities and pitsawyers to protecting the forest and curb illegal activities on their own in order to ensure that they keep using the forest and make a living without destroying it.
- Local governments and communities may strive to generate adequate revenues sustainably by instituting measures that ensure wise utilization of forest, and harness it through practices and programmes that conserve it for now and for posterity.
- Increased demand for new species as the current restrictions would encourage the use of more timber species, but at the expense of repeated re-entering of already harvested blocks, i.e. shorter felling cycles.
- It could promote the utilization of lesser-known species that are normally neglected by pitsawing, difficult to saw or easily perishable, after depleting the prime species.
- It may encourage value-adding through secondary processing, so enhancing the pitsawing business.
- It could encourage natural regeneration or enrichment planting of the prime hardwood species that have been selectively harvested; it could lead to the restoration of lost or overexploited high-quality timbers species.

The negative consequences of removing the current restrictions on the pitsawing industry are:

- There could be uncontrolled, unregulated harvesting (and overharvesting) in the NHFs. There would be an increase in pitsawing (both registered and unregistered), employing more pitsaws and even the use of chainsaws, which is currently prohibited.
- Selective felling of the best trees and high-value species may lead to an increased proportion of defective, mature and oversized trees and unsaleable species.
- There could be greater difficulties in terms of the supervision, control and regulation of the industry because of the inadequate number of forest staff and facilities and the high costs
- There could be a reduced regeneration of high-quality timber species that are in great demand on the market, which have been overexploited in the recent past and are now targeted by illegal pitsawyers. This is seen in the monodominant *Cynometra* forest in the Budongo CFR and *Parinari* in the KCFR in Uganda. These are recalcitrant species, which have proved difficult for the pitsawing industry to harvest and handle.

- Large quantities of cheap pitsawn timber could distort the timber market and discourage the development of sawmilling, as evidenced in Uganda today.

INPUTS TO ADDRESS THE CONSEQUENCES OF REMOVING RESTRICTIONS

In order to address the negative consequences and enhance the positive aspects of removing current restrictions, the following inputs may be required:

- Policy change and support for the pitsawing industry. There is a need to influence policy change to include pitsawing in the priority area. Some of the funding through the Poverty Action Fund can be channelled to pitsawing, which has become the major vehicle for directing funds into the priority sectors. This policy change could help in the following areas:
 - drawing more external attention and technical assistance (grants, capacity building, advisory, training and consultancies) from international organizations such as FAO, so reaching deeper into local economies and bringing direct benefits to local communities.
 - developing new tools for harvesting and processing lumber and improving traditional tools such as axes and handsaws that are often inadequate or in a bad condition owing to poor maintenance.
- Support is required to identify and develop viable alternative livelihood options to offset any short-term drop in income to poorer forest-adjacent households. This is because the need to bring the current rate of harvesting down to sustainable levels through forest conservation/protection will reduce the well-being of households in the short-term.
- There needs to be investment in adding value to sustainable harvesting by pitsawing, i.e. selling less timber for more money.

Chapter 2

Forest policies and pitsawing

The Uganda Forest Sector Reform (developed by the Government of Uganda through the Ministry of Water, Land and Environment and supported by multiple donors) ran from 1999 to 2004. It undertook a number of processes, including: a forest review, and development of the Uganda Forest Policy (UFP) in 2001, the NFP in 2002 and the NFTP in 2003.

THE UGANDA FOREST POLICY

The current UFP (MWLE, 2001) provides for the development of forest-product processing industries with regard to both pitsawing and sawmilling: “A modern, competitive, efficient and well-regulated forest processing industry will be promoted in the private sector” (Policy Statement No. 4). This is set within a higher-level policy statement on forestry on government land: “the Permanent Forest Estate under government trusteeship will be protected and managed sustainably” (Policy Statement No. 1).

The UFP was put into place in order to address the issues of poverty eradication, prosperity, harmony and beauty. It sets the vision for Uganda’s forest as “a sufficiently forested, ecologically stable and economically prosperous Uganda.” It also sets the forest policy goal as “an integrated forest sector that achieves sustainable increases in economic, social and environmental benefits from F&T by all people of Uganda, especially the poor and vulnerable.” The policy provides new directions for sustainable development of the forest sector given concerns about the deteriorating state of forestry in the country, wider policy and legal changes, and given the importance of forestry for the country and its people.

The development of forest policy

Need for policy change

There was a clear need for a new forest policy. The country’s first forestry policy had been written in 1929. Forestry policy had undergone a series of changes since then, alternating between stricter conservation and more liberal economic use of forest resources. The last policy review had been in 1988, but it lacked guidance on principles and strategies for implementation, on forests outside the gazetted reserves, and on the balance between production and conservation. It was also silent on the roles of government, the private sector and rural communities in forestry, and the linkages with other sectors and land use.

Diversity of stakeholders

The current policy was put into place through a highly participatory process with key agencies, organizations and individuals at national, district and local levels (Figure 3).

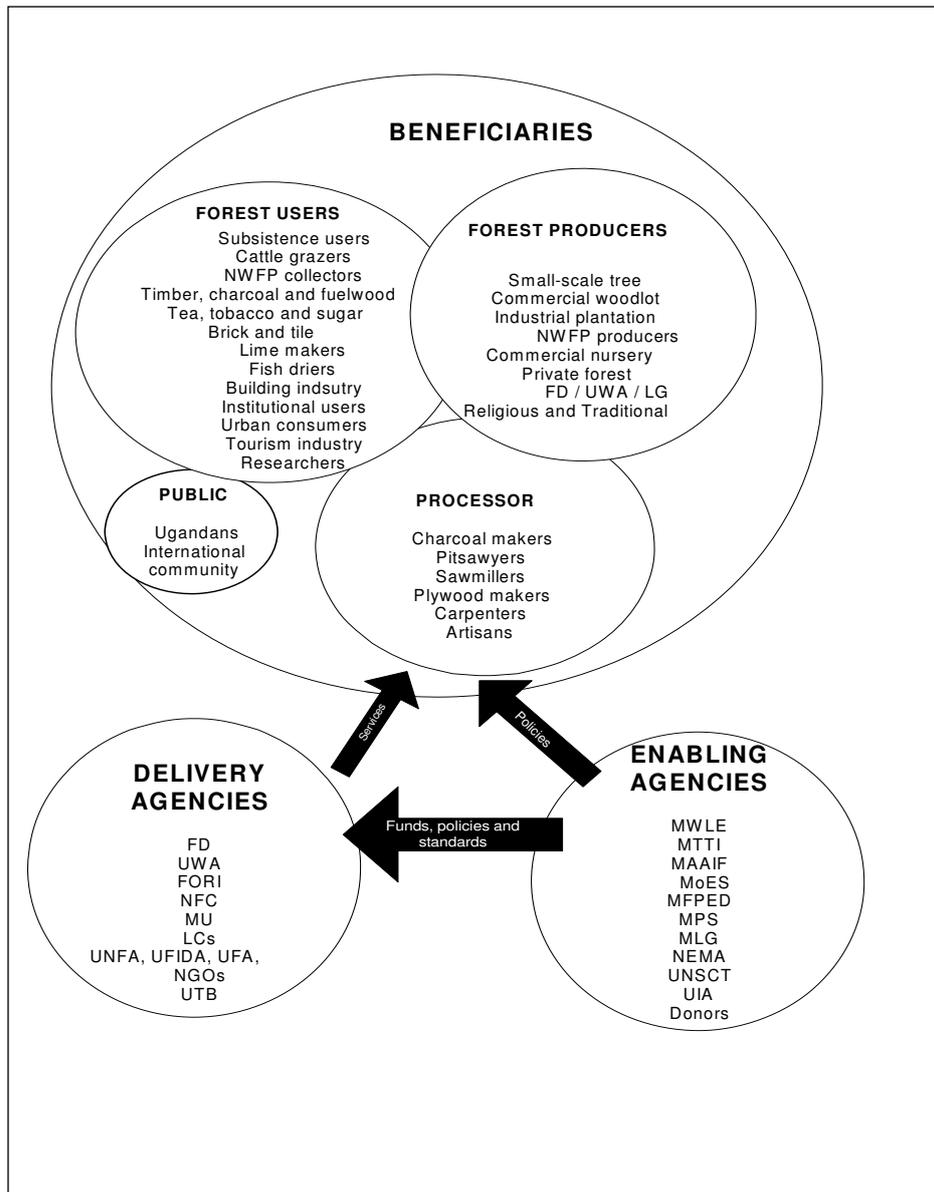
The Government recognizes that a wide range of people have a stake in the forest sector, people whose interests are not being fully addressed, and whose role and responsibilities need to be defined and coordinated. The many interested parties include forest-resource processors (charcoal makers, pitsawyers, sawmillers, artisans and traders). Pitsawyers are recognized as the key player in the wood-processing industry.

Importance of forestry

Uganda’s forests and woodlands are central to the three pillars of sustainable development: the economy, society and the environment. In the past, this sector had not been given adequate priority. The country’s forest resources provide energy, forest and tree products, employment,

livelihood support, government revenues, business opportunities, environmental functions and services, and they maintain ecological integrity. Forestry contributes about 6 percent of Uganda's gross domestic product (GDP).

FIGURE 3
Stakeholder diversity in the forest sector



Source: UFSR (2001).

National development initiatives

There were also a number of significant new development initiatives and policy and legal changes that had to be taken into account. The forest policy was made to be consistent with the national vision articulated in the 1997 Poverty Eradication Action Plan (PEAP), the 2000 Plan for the Modernization of Agriculture (PMA) and the Public Sector Reform Programme (PSRP). The PEAP sets out a broad strategy for poverty eradication in Uganda, and the PMA provides a holistic framework for eradicating poverty through multisectoral interventions that enable people to improve their livelihood in a sustainable manner. The PMA includes forestry as one of the main sectors that contribute to the livelihoods of poor people, along with agriculture. Agriculture is the backbone of Uganda's economy and 85 percent of Ugandans live in rural areas and earn their living

directly or indirectly from agriculture. The PSRP led to the FD (under central government control) becoming an autonomous body, the NFA, charged with managing the CFRs.

THE NATIONAL FOREST PLAN

In 2002, a strategic sector plan was formulated: the NFP 2002. This sets out goals and strategies to put the 2001 UFP into action. It redefines roles and responsibilities to reflect the new policy direction, and outlines an investment programme for sector development. The UFP sets the following policy objectives, which the NFP will turn into action:

- The permanent forest estates (PFEs) or CFRs under government trusteeship will be protected and managed sustainably.
- A modern, competitive, efficient and well-regulated forest products processing industry will be promoted in the private sector.

The NFP is a landmark for forest management in Uganda. However, it lacks effective implementation on the ground. The policy framework clearly articulates in Programme 2 National Agencies that the NFA, local government and communities should develop effective investment and partnerships for the management of PFEs.

THE NATIONAL FORESTRY AND TREE PLANTING ACT

The 2003 NFTP provides legal support for the implementation of the UFP and NFP. The provisions include the following prescriptions:

- conservation, sustainable management and development of forests for the benefits of Ugandans;
- enhancement of the productive capacity of the forests;
- trade in forest produce;
- establishment of the District Forestry Office under the Forestry Inspectorate Division (FID) and the NFA from the FD;
- repeal of the 1967 Forest Act (Cap. 246) and the Timber (Export) Act (Cap. 247).

THE NATIONAL FORESTRY AUTHORITY

The NFA is an autonomous body created with a mission to manage and supervise all CFRs (about 1.45 million ha) on a sustainable basis and to supply high-quality forest products and services in accordance with sound financial and commercial practices and the 2003 NFTP.

Unlike most government authorities in Uganda, the NFA is not a regulator of the sector, but it will encourage partnerships and private investments in forestry through contracts/concessions and management agreements. The aim is to increase sustainable economic activities and prosperity.

The NFA is clearly mandated in the legal and policy frameworks to provide a more efficient management of the 516 CFRs, in partnerships with local government, forest businesses and local communities. This will:

- improve protection and biodiversity conservation;
- increase investments in planting, harvesting, and tourism development;
- provide benefits to local communities through CFM agreements.

The NFA is expected to promote the development of the forest industry in Uganda. In this regard, it is already restricting pitsawing. Pitsawyers are selective in trees and species cut, and crude and wasteful in their operations. Their inadequate tools limit them to handling recalcitrant, hard species and large logs. Pitsawyers also lack skill in saw maintenance; as a result the quality of the sawn timber is poor. Suitable techniques and strategies need developing in order to improve on technologies to supply high-quality forest products and reduce waste in timber harvesting and processing.

Pitsawing is a low-impact harvesting method but it can be wasteful where it is not properly controlled and regulated, in effect, restricted. However, the NFA is a lean organization. It furnishes too few supervisory staff, and too many inexperienced personnel for the effective control and monitoring of harvesting operations, together with training activities. It faces a great challenge to promote and attain the policy objective of creating a modern, competitive, efficient and well-regulated forest-products processing industry in the private sector (MWLE, 2001).

INEQUITABLE POLICIES

There are a number of inequitable policies that indirectly encourage pitsawing.

The Poverty Eradication Action Programme

The 1997 PEAP provides a comprehensive development framework for Uganda and guides the formulation of government policy. The goals of the PEAP are intended to address major concerns of the poor, and reduce the number of Ugandans living below the poverty line to fewer than 10 percent by 2015. The poverty-reduction targets specify that GDP should grow at 7 percent/year in real terms over the next 17 years and that growth should be equally distributed. World Bank projections indicate that such growth is feasible but will only be achieved if policy reforms are put in place to encourage and increase private investment and to reduce the cost of public utilities. To make sure that economic growth is evenly spread, it will be essential to promote agriculture and off-farm activities such as pitsawing in rural areas where more than 85 percent of Ugandans live.

In the 1997 PEAP and in its 2000 revision, forests and the forestry subsector were not fully considered in the planning framework. This was partly because the value of the environment and its role in livelihoods was poorly understood (Bush *et al.*, 2004).

The current revision process has been a much more inclusive process including forests and fisheries as specific subsectors. However, evidence of the importance of forests within the revision process is mainly qualitative and points towards a lack of disaggregated data on which to base quantitative judgements about the role of forests in poverty alleviation.

Management policy and pitsawing

Although the UFP provides for the development of forest-product processing industries, it sets a higher-level policy statement on forestry on government land providing for the PFEs under government trusteeship to be “protected and managed sustainably.”

There are many mobile sawmills, but all are licensed and working in the softwood plantations. Current conservation sentiment in Uganda is opposed to large static sawmills. Hence, despite being very wasteful and very selective in species harvested, pitsawing is seen as a viable “ecofriendly” alternative and pro-poor (Osmaston, 2000). The management policy has favoured the promotion of “low-impact harvesting practices” (in effect pitsawing) in FRs. This is simply because pitsawing does not require heavy and expensive tractors for roads and skidding or special log-transporter trucks. Timber is converted at the stumps and headloaded from forest to roadside. Uganda’s degraded NHF could be used to contribute to poverty reduction by raising the income and quality of life of pitsawyers and of the small-scale primary wood processors, who are mainly rural stakeholders. Being a labour-intensive method, pitsawing also helps to combat rural unemployment and reduces the need to import expensive sawmilling machinery.

The performance of the many mobile sawmills has been so poor in the plantations that this has kept them out of the NHF. Inefficiencies in harvesting and sawmilling have persisted. There is an excessive waste of resources, poor investment in the wood industry and no replanting strategy. Poor planning and control, weak regulation, and inappropriate processing technology have resulted in the unsustainable harvesting and degradation of the resource base. The shortage of saw logs is rapidly nearing crisis level.

The stationary sawmills in the NHF are not operating because the equipment is obsolete and spare parts are lacking. There are also problems with log supplies because the forests are small, scattered and restricted for conservation. The AAC (about 150 000–200 000 m³) can only sustain small mobile sawmills and pitsawing. It is inadequate to meet the country's current timber requirements. The sawmills have not been licensed to work in the NHF but in the plantations. Management policy favours the licensing of pitsawing in the THF and not the sawmills. Pitsawyers have also been restricted in their operations through strict administrative, legal and technical requirements in the licensing systems.

The Forest Nature Conservation Master Plan

The European Union funded the FNCMP. The predecessor to the FRMCP, the FNCMP has been effectively involved in the rehabilitation and management of natural forests since 1988. However, it has overemphasized biodiversity conservation and environmental aspects of forestry at the expense of production in key FRs with natural forests.

The implementation of the FNCMP by the FD from 1988 has resulted in the setting aside of 20 percent of the CFRs as strict nature reserves and 30 percent as buffer zones, in which, respectively, no production and only non-timber utilization are allowed. The remaining 50 percent, scheduled as production zones for forest harvesting, totals about 140 000 ha. The production zones aim to provide a maximum sustainable yield of high-quality hardwood timber. The FNCMP has favoured the promotion of low-impact harvesting practices (in effect, pitsawing) in natural FRs.

The FNCMP prescribes that the regeneration of logged areas must be ensured by reducing logging intensities to within the limits determined by the natural regeneration capacity of the forest. It also prescribes that commercial charcoal production, using logging wastes and/or non-commercial species in the concession area, will not be permitted. The logging intensities, as well as the felling gaps left by pitsawing, are seen as less damaging than those made by sawmilling, so tending to favour pitsawing over sawmilling.

ISSMI support for pitsawing

There are two key requirements for the success of the ISSMI.

First, the polycyclic felling must be light and tightly controlled. Typically, about 15 m³/ha in bole volume, or 5-6 trees/ha, is the maximum that may be removed. This short 15-year polycyclic felling system throughout all blocks can only be operated by pitsawyers. In the KCFR, pitsawyers are able to operate under this system. Low productivity in pitsawing (sawn timber output of 25–50 m³/year) and the low level of capital investment in two-person saws of about U Sh100 000 appears suitable for the above limit. The mobile sawmill that was licensed to operate in the KCFR left owing to the difficulty of obtaining quality timbers from the few trees selected for harvest. Therefore, more fundamental modifications will be required to use a static sawmill. However, it would be uneconomical and damaging to regeneration to revisit the same coupe.

Second, logging must be restricted to low-damage systems. The largest machinery permitted in the forest should be agricultural tractors or light skidders. Skid trails should be planned carefully. In this regard, pitsawing and the use of mobile circular saws are good systems in view of the minimum extraction system and small gaps left by the few trees harvested.

Chainsaw ban

There is a standing ban on the use of chainsaws in timber production. This also indirectly encourages the occurrence of the pitsawing industry. The pitsaw is widely seen in the narrow context that it cuts smooth, expertly-cut boards with a very narrow kerf, whereas the chainsaw cuts with a wide kerf and leaves rough marks. However, people overlook the fact that it is the

current method of using the chainsaw in Uganda that is wrong and the reason behind the ban. Operators who hold and lift the chainsaw in their hands (without the help of a guiding frame) cannot make accurate and straight cuts. Moreover, only the rounded tip of the bar is used in cutting, leaving very rough marks of the saw teeth on the timber.

HARVESTING OF FOREST PRODUCE

The 2003 NFTPFA allows a responsible body (the NFA), subject to the management plan, to grant a licence to harvest forest produce from an FR, and prescribe (in accordance with regulations) terms, conditions, rights, and fees. However, the NFTPFA carries forward the Forests Rules (Statutory Instrument No. 246-2) and the Forest Produce Fees and Licences (Statutory Instrument 2000 No. 16) from the repealed 1967 Forest Act.

In accordance with Legal Notice No. 6 of 8 August 2003, a technical licensing committee was established to advise the minister responsible on matters of licensing. This committee only managed to process licences for members of the BAPWUA to enable them to resume their harvesting activities in the KCFR. The time required for processing licences for pitsawing by the NFA has become long and the procedures for bidding for concessions too complicated for pitsawing in other parts of the country.

The format for a licence to harvest is prescribed in the Second Schedule of the Forests Rules (S.I. 246-2). Additional special conditions have been developed by the FD to cover legal, technical, administrative and social aspects that are important in sustainable forest management. There are no national or regional guidelines and standards to improve on the harvesting practices. The process of developing national standards for “the sustainable management and utilization of forests” (Section 92, Subsection 2o) and “certification of forests and labelling of forest produce to verify its legal origin from sustainable sources of supply” (Section 92, Subsection 2v) are still being discussed within the programme and the FID.

LICENCE CONDITIONS FOR PITSAWING

After approval of an application for a licence, the intending licensee must comply with all terms and conditions of the licence. The licence conditions for pitsawyers include:

- Payments:
 - Registration fee of U Sh350 000 per year per pitsawyer, and issued licence for a concession in a particular FR.
 - Timber royalty fees, payable in full before trees are felled. The fees vary by class as follows: IA, U Sh100 000; IB, U Sh45 000; II, U Sh 28 000; and III, U Sh17 000.
 - Felling fee of U Sh4 500 per tree.
 - Timber grading fee of U Sh22 000/m³ (not being applied).
 - Timber movement permit of 15 percent of the value of sawn timber.
 - The licensee deposits a specified amount of money in a security bond against and illegal operations.
- Each registered pitsawyer is restricted to using a maximum of four saws only.
- The licensee is restricted to using only manual saws, i.e. ripping, crosscut and axes. The use of chainsaws or any motorized tool is prohibited.
- Pitsawing is restricted to a designated coupe of a stock-mapped compartment, i.e. where the ISSMI has been carried out.
- Selection of trees to harvest is based on ISSMI criteria and a forest officer must mark the trees.

CHANGES IN POLICIES, LAWS AND REGULATIONS

Sudden changes in policy and poor regulations, i.e. bans, restrictions or suspensions on harvesting have disrupted supply and distorted prices, and encouraged illegal harvesting mainly by pitsawing. Serious investors in sawmilling are reluctant to commit funds when the

investment climate is risky, and when administrative procedures, concession allocations and tenure are so uncertain.

At the time of this study, harvesting was suspended in an attempt to implement a new system of bidding for concessions. Licensed pitsawyers have left the CFRs, turned to illegal harvesting or gone to operate in private forests on public land. Bureaucratic bidding procedures, probable rapid increases in fees, royalties and taxes, and the undermining of legal timber by that from illegal sources will discourage investment in the industry.

A sealed-bid auction held by the NFA in mid-2004 achieved average royalties of about U Sh50 000/m³ of standing volume of pine, compared with the historical price paid of U Sh28 000, the same amount paid for Class II hardwoods. This equates to an almost 80-percent increase in real value compared with previous royalty, which is considered too high by pitsawyers. Prices offered might have gone much higher if an open auction had been held. It is likely that a similar experience may emerge with hardwoods from the natural forest.

The new system of bidding for concessions and royalties introduced to try and raise more funds may be too complicated and unaffordable for the local pitsawing majority. Pitsawing is likely to be outcompeted by mobile sawmills if they are allowed in the NHF. A mobile mill was licensed to operate in the pitsawing concession (Compartment 34) within the KCFR, the site selected for this study. The result could have been bad for the pitsawyers because the sawmiller was willing to pay about U Sh50 000/m³ of standing volume for Class II hardwoods. However, as mentioned above, the sawmiller has since left the forest.

IMPACTS OF POLICY CHANGES

Forest policy has evolved to take into account the existence of the industry. It may be too early to evaluate the impacts of these policy changes. The impacts of policy changes in natural resource management are likely to be realized only over a relatively long time. However, they will definitely transform pitsawing in its present form or phase it out all together. There are clear indications for greater restrictions and a ban on handsawing, which is seen as primitive under the PMA.

With the FRMCP, the NFA has piloted the use of complete chainsaw mills by involving the BAPWUA (FRMCP, 2004b). The study was conducted as a first step to phasing-out pitsawing in the NHF. The milling trial reported a marked increase in recovery from 25 to 55 percent, productivity up from 0.02 to 0.25 m³ per effective hour, and a better grade of sawn timber from poorly formed trees and branch wood. The BAPWUA is a very viable and well-managed association, which works very closely with the FRMCP. Through this relationship and support, it has already acquired and is operating complete chainsaw mills. It remains to be seen whether the other pitsawing associations and individual sawyers are ready and able to buy and operate these mobile mills.

Chapter 3

Local and export timber market

This chapter provides a quantitative and descriptive analysis of the local and export timber market, in terms of demand and supply. It also highlights the contribution of pitted timber to the market.

The present review is based on information and data collected from various sources to determine the actual size of the local timber market in terms of demand and supply and chains/flows. Various reports and documents were studied and several national institutions and key persons were visited and interviewed, including: the NFA, the FID, the Biomass Study Project, and the National Environment Management Authority. An evaluation of the size of the pitted timber market as opposed to the sawmills was also made. Pitted timber, sawmills, traders from Kampala's main timber yards, construction firms and furniture makers were interviewed. They were asked about: species used, sizes cut, quantities marketed, source of timber supply and demand, prices of different species, and sizes sold (see Annex). Potential measures were identified that may be put in place to reduce the demand for pitted lumber.

THE LOCAL TIMBER MARKET AND RECENT ECONOMIC TRENDS

Uganda's per capita GDP is US\$320. Measured in constant prices, it rose by an average of 3.2 percent/year from 1990 to 2000 (Bush *et al.*, 2004). Economic growth rates have averaged 6 percent/year in the last decade. Generally, Uganda is seeing a shift from the firmly agriculture-based economy of 1986 towards construction, manufacturing and regional trade distribution (MFPED, 2004).

The size of the local timber market is estimated at 240 000 m³ from current harvesting of roundwood (equivalent to 800 000 m³ of logs per year at a 30-percent recovery in conversion), which is twice the sustainable AAC. As it has been for the last 50 years, the domestic market is the major market for Uganda's timber. The forest resource is too small to sustain a large export trade in timber and other primary wood products. However, there are possibilities for a lucrative trade in secondary wood products, such as furniture and parquet flooring for export.

GDP growth is estimated at 5.8 percent and projected to rise to 5.9 percent for fiscal year 2004–05. Uganda's population of 24.7 million people is growing at a rate of 3.4 percent/year. This makes it one of the fastest-growing populations in the world (MFPED, 2003). Therefore, it is suggested that timber demand will continue to rise through both a population and income effect.

Urbanization is occurring with 16 percent of the population living in urban areas in 2000 and forecasts predicting this will rise to 22 percent by 2010 (National Biomass Study, 2003). An increasingly urban population will lead to higher volumes of timber being transported from rural forests to urban areas.

The construction industry represents the largest market for sawn timber in the country. There is also a preference for sawnwood from broad-leaved species for some jobs. At the same time, production to meet the current demand by registered pitted timber and sawmills is low throughout the country. This has kept demand high and encouraged illegal processing and trade (mainly in chainsawn timber). The only estimates available concern the supply and demand for the local

central timber markets in Kampala City. Information for an overview of regional differences and variations in the market prices of sawn timber is not compiled. Detailed information does exist on the number of operating and non-operating legal/registered pitsawing and sawmills. At the time of this study, only one pitsawing association and a few sawmillers were cleared to operate by the NFA. However, timber continues to flow freely and illegally into the market. This is partly because the NFA has delayed establishing itself on the ground and controlling illegal activities effectively. There is no information concerning illegal operating and non-operating pitsawyers.

Supply of timber from natural forests

The supply of timber from natural forests is declining, and forest continues to be lost at an alarming rate. Production zones for timber harvesting in the THF now total about 140 000 ha in 21 FRs. Geographically, these major reserves are largely located in the west of the country (Table 3 and Figure 1).

TABLE 3

Production areas of timber supply from the THF

District	CFR	Area (ha)
Masindi	Budongo	24 000
Hoima	Bugoma	26 000
Bushenyi	Kalinzu	14 000
	Kasyoha-Kitomi	23 000
Mukono	Mabira	21 000
Kabarole	Itwara	5 000
	Matiri	5 000
	Kitechura	2 000
	Muhangiri	2 000
Kalangala	5 CFRs	5 000
Mpigi	6 CFRs	14 000
Total		141 000

The supply of timber from these THF reserves is limited to 280 000 m³ per year (Table 4). Current harvesting of roundwood is about 800 000 m³ of logs to give a total sawn timber supply of 240 000 m³ per year.

Considerably more than 30 percent of the THF in Uganda is now degraded, with private forests shrinking more rapidly than government-managed ones. As the predominantly rural populations have sought to maintain their livelihoods, two factors may be seen as

the major causes of deforestation in the last century in Uganda: clearing forest for agriculture; and overharvesting for fuelwood, timber and charcoal.

TABLE 4

Estimated sustainable yields

Forest type	Estimated annual sustainable yield (m ³)
Woodland	19 300 000
THF	280 000
Plantations	100 000
Total	19 680 000

It is estimated that about 800 km² of forest has been lost in western Uganda since the mid-1980s. Although this loss has occurred primarily outside the FRs and national parks, it will lead to increased pressure on the reserves in future.

Timber revenues

Sources of public revenue from the forestry subsector include:

- sale of forest products, licences and concession fees (U Sh1 400 000 for sawmillers, and U Sh350 000 for pitsawyers);
- fees for trade and transport/movement permits for timber;
- value added tax (VAT) at 17 percent for sawmillers, and 15 percent for pitsawyers, whose operations fall below the VAT threshold of U Sh50 million in total annual sales.

All VAT-registered sawmillers are required to keep VAT accounts, purchase and sales records, debits and credit notes, cash records, stock and manufactured records; and to retain orders and delivery notes, annual accounts and bank statements, and payment records. Pitsawyers are not required to keep such records as their turnover is below the VAT threshold.

Of the revenues collected at district offices, there used to be a legal requirement to transfer 60 percent directly to the treasury and 40 percent to the relevant districts. Today, 100 percent of the revenues are now collectable by the NFA. However, the NFA could voluntarily share revenues in return for certain activities (e.g. some forest protection measures from local government) under a contractual arrangement.

Revenues generated by the FD for fiscal year 1999–2000 were about US\$5 million (MWLE, 2001). Less than 10 percent of the expected revenues and volumes harvested are recorded and the data from the FD are inaccurate and unreliable.

Falkenberg and Sepp (1999) suggested that, based on wood consumption in the formal sector, potential revenue could be estimated at US\$4.5 million from sawlogs. According to the most recent study (Bush *et al.*, 2004), sawn timber accounts for 7 percent of the total economic value (TEV) of Uganda's forests. The TEV is the summation of values from all of the direct, indirect and non-use values associated with a resource.

SUPPLY OF PITSAWN AND MILLSAWN TIMBER

Virtually, all timber harvesting and conversion from the NHF is by pitsawing or handsawing. Sawmilling collapsed during the economic decline of the 1970s, leaving pitsawing as the main harvesting method in the NHF. Pitsawing accounts for about 90 percent of supply of sawn timber (Table 5). An overwhelming 70 percent of Uganda's forest resources are on private land and not in national parks, game reserves, district or local forest reserves or strict nature reserves. Most of the forest on private land is made up of woodland. The majority (70 percent) of timber harvested by pitsawing comes from woodland, natural forests on former public land and private lands, rather than from protected areas or plantations. On average, 58 percent of this produce is consumed in the household and 42 percent is traded.

TABLE 5

Comparison of the pitsawing and sawmill markets

Market type and number	Volume of timber supplied (m ³ per year)	Percentage
Pitsawing Operating = 35 Non-operating = 2 965 Total registered = 3 000	216 000	90
Sawmill Operating = 15 Non-operating = 82 Total registered = 97	24 000	10
Total	240 000	100

Given the number of registered pitsawyers and assuming that they use a maximum of four saws and cut 0.22 m³ per saw per day for 250 days in a year, the study suggests that the number of illegal pitsawing operations could be double that of

the registered ones. An estimated 720 000 m³ of logs are sawn to give 216 000 m³ of timber in a year from natural forests. Most of the timber supplies are in hardwood Classes II and III (Table 6).

High-quality/valuable timbers such as mahogany and mvule have been selectively cut or overharvested. They are now reserved species and the last concession to harvest them was terminated in 2000. However, they are still widely exploited by pitsawyers because of their high

timber value and supplies from private land. Increasing quantities of eucalyptus timber are being supplied by pitsawyers for use in high-class furniture as well as for construction.

Sawmills saw an estimated 68 000 m³ of logs to give 24 000 m³ of timber (Table 6). The softwood timber supplied by the sawmillers comes mainly from:

- *Pinus caribaea*, *Pinus patula*, *Pinus oocarpa*, and pine;
- *Cyprinus lusitanica*, cypress, and East African cypress.

At the time of this study, 15 sawmills were operating after being issued harvesting licences. This has limited the supply of softwood in the local market. The new harvesting procedure established by the NFA that involves competitive bidding for concessions has dissuaded most sawmillers (82) from operating.

TABLE 6

Volume of timber production in different classes by pitsawyers and sawmillers

Timber class	Pitsawyers (m ³)	Sawmillers	Total volume	Percentage
I – High-quality/valuable timbers, e.g. mahogany & mvule	31 200	-	31 200	13
II – Construction hardwoods and softwoods (pine & cypress)	88 800	24 000	112 800	47
III – Light construction hardwoods	96 000	-	96 000	40
Total	216 000	24 000	240 000	100

TIMBER DEMAND

The current size of the local timber market is estimated at 240 000 m³. This is valued at U Sh48 000 million at the current average Kampala market price of U Sh200 000/m³. According to the National Biomass Study (2003), the demand is expected to grow to U Sh80 000 million in 2006.

The demand for sawn timber has generally grown at 7 percent/year, exceeding the rate of economic expansion through the 1980s and 1990s. Large volumes of timber (an estimated 800 000 m³/year) are used for construction, furniture-making and other manufactured goods. Timber demand is projected to double in volume by the year 2010 (Table 7 and Figure 4).

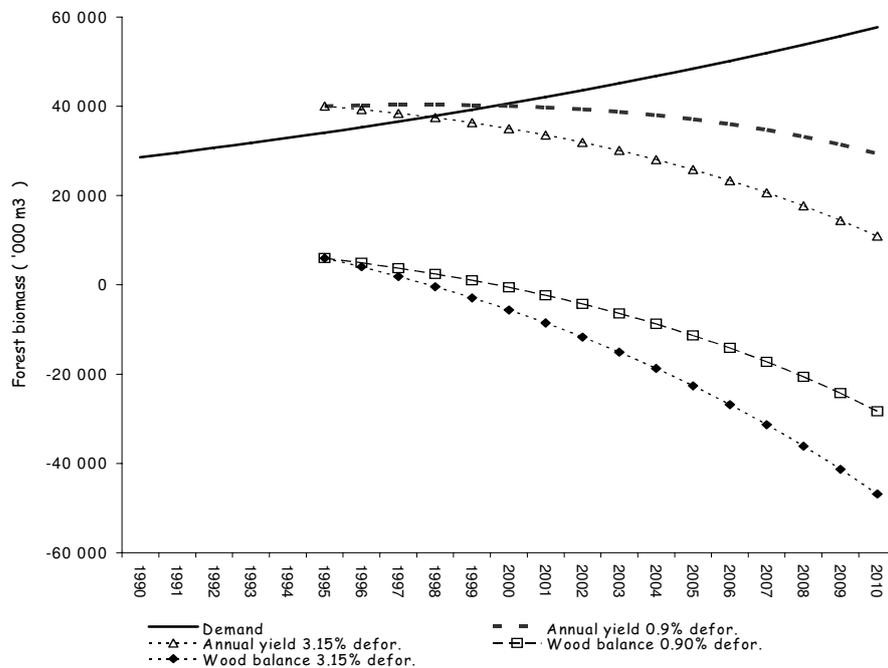
TABLE 7

Demand for saw logs in Uganda, actual and projected

Year	Volume (m ³)
2000	650 000
2001	730 000
2002	760 000
2003	800 000
2004	850 000
2005	960 000
2006	1 100 000
2007	1 280 000
2008	1 350 000
2009	1 500 000
2010	1 600 000

The country will face a timber deficit by 2010 at the current levels of harvesting unless a massive afforestation is not undertaken immediately and the available resource used more efficiently. Figure 4 shows the wood balance by deforestation. Current timber harvesting/consumption by rural households is unsustainable. Sustainable levels of harvest may be only 25 percent of current offtakes.

FIGURE 4
Wood balance by deforestation in Uganda



Sources: data from MFE PD (1998), NBS 1996, MFPED 1996, FAO (2000).

MARKETS FOR TIMBER

Markets for timber in Uganda fall into two broad categories:

- commercial markets (mainly Kampala City, and the municipalities of Entebbe, Masaka, Jinja, Mbale, Mbarara, Gulu, Arua, Kabale, Fort Potal, Soroti and Tororo);
- ad hoc and spot markets (local markets and towns near forests).

Pitsawyers generally headload the timber to a roadside by the forest edge and then transport it on 7-tonne trucks to local markets for sale to organized timber dealers (traders/transporters). However, much of the trade in the local markets is illegal, unregulated and prices are very low. On average, 126 000 m³ of pitted timber is traded in the local market and consumed in the household, and 52 000 m³ reaches the central markets. Goods are then transported in 20-tonne trucks to central markets for sale in large volumes. This type of marketing is subjected to some control and regulation through the application of taxes on harvest, movement permits and market taxes. The timber dealers make huge profits on the pitsawing by hiking up the timber prices in the central markets. The timber traders interviewed cited increased transport costs for a 20-tonne truckload up to U Sh1 200 000 from U Sh800 000 charged per trip previously in June 2004.

Timber markets for raw materials and goods from the natural forests of Uganda are important to local livelihoods. Considering all forests types, 58 percent of the value of timber harvested by pitsawing is from sales in local markets. In fact, many of the “pitsawyers” (licence holders) are small-scale businesspersons and civil servants who never go into the forests. They providing financing and each of them employs up to 20 others as *fundis* (actual pitsawyers who stand all day pulling a saw through a log), timber carriers and a supervisor. At present, each

pitsawyer has a small rented timber shed/store/shop in the local markets and towns near the forests.

The pitsawyers interviewed are very much interested in some means of improving the sales organization but they do not have the capacity to break through into the central markets, which are in the hands of timber dealers from Kampala. Many of the sawmillers operate on a larger scale (1 000–1 500 m³ of sawn timber per year) and transport their timber for sale in commercial markets in Kampala, where quality timbers are in demand and fetch higher prices. They can afford to own trucks for timber transport, rent timber yards, and pay for movement permits and market taxes.

Very little timber is treated with preservative. The cost of the treatment is 20–40 percent of the cost of construction timber. This extra cost is small as the treatment:

- adds value to low-quality timber;
- widens the range of species and allows sapwood to be used;
- gives a longer life to all timber and reduces the frequency of replacing timber in service.

Most timber yards visited were closed buildings, commercial premises or shops (without the free air circulation required for seasoning) and open places without sheds with fresh timber from the forest piled without stickers. The resulting deterioration is considerable, particularly for the less durable timbers. Timber is sold and used without proper seasoning and this decreases the quality of products.

Pitsawn timber for the local market is systematically undersized because the width of the kerf is not taken into account in making the cuts. The actual thickness and widths measure 5–10 percent less compared with the nominal ones. After drying, the timber is even more undersize. The sawn timbers are given no tolerances for shrinkage and machining losses. They often have rough surfaces and are stained/discoloured/decayed and distorted by poor handling practices. Such poor-quality timber can only command very low prices in the local market, which has no standards or alternative source of timber.

Market prices

The three main timber markets in the suburbs of Kampala were visited, namely: Ndeeba, Bwaise and Kireka. It is suggested that these three markets represent about 50 percent of total timber consumption in Kampala. Table 8 shows the market prices for different categories of timber at Kampala central market and local markets. The FRMCP has been monitoring Kampala market prices since August 2002. Figures 5 and 6 show the trends in softwood and cabinet timbers.

Valuable furniture timbers (mahogany and mvule) make up only about 10 percent of all timber in the market. Secondary furniture timbers (30 percent of all timber sold) are such as *Uapaca guineensis* (uapaca), *Albizia coriaria* (mugavu), and *Aningeria altissima* (nkalati), including an increasing quantity of eucalyptus species.

Construction timbers (60 percent of all timber sold) are sold in three categories: heavy, > 750 kg/m³; medium, 380–750 kg/m³; and light, < 380 kg/m³. More than two-thirds are pitsawn medium-construction hardwood timbers for use in general structural elements for building; the list includes:

- *Maesopsis eminii* (musizi),
- *Blighia unijugata* (nkuzanyana),
- *Chrysophyllum albidum* (mululu) monkey star apple,
- *Piptadeniastrum africana* (mpewere), dahoma,

- *Newtonia buchananii* (muchenche), Newtonia,
- *Hallea stipulosa* (nzingu), mitragyna, abura,
- *Bosquiea phoberos* (mugwi),
- *Markhamia platycalyx* (musambya),
- *Strombosia scheffleri* (strombosia),
- *Albizia species* (nongo),
- *Celtis species* (lufugo),
- *Symphonia globulifera* (munyenye).

The prices of light construction timbers (all pitsawn) have remained the lowest and these timbers are widely available in the market. Many of the less durable species are rejected for structural applications in building and permanent construction because of the failure to apply a preservative treatment. They are mainly used for shuttering and concreting in building constructions; they include:

- *Antiaris africana* (kirundu),
- *Alstonia boonei* (mujwa) stoolwood,
- *Ficus mucoso* (mukunyu),
- *Canarium schweinfurthii* (muwafu) incense tree.

Heavy construction timbers are in very limited supply and their prices are higher. They are demanded for specialized products: bridges, sleepers, pit props, and decking. Pitsawyers cannot handle such recalcitrant timbers, which are difficult to process with handsaws. They include:

- *Erythrophleum suaveolens* (mumara),
- *Mildbraediendron excelsum* (muyati),
- *Cynometra alexandri* (muhimbi), Uganda ironwood,
- *Parinaria excelsa* (mubura),
- *Prunus/Pygeum africanum* (ntasesa).

The prices of cypress and pine have been increasing as controls on sawmillers have tightened and also as the efforts at curbing timber cutting have had an impact. With the introduction of competitive bidding for concessions, the prices per cubic metre of cypress and pine have reached U Sh500 000 and U Sh480 000, respectively. This has mainly been caused by the increase in the royalty rate from U Sh28 000 to U Sh60 000 and U Sh55 000 for 1 m³ of standing volume of cypress and pine, respectively.

TABLE 8
Timber prices for different categories of timber

Species/ categories of timber	Cutting method	Kampala central markets (U Sh/m ³)	Local markets near forests	Availability
Mahogany & mvule	Millsawn	-	-	< 10%, rare
	Pitsawn	560 000	240 000	
Secondary furniture	Millsawn	-	-	Available
	Pitsawn	380 000	160 000	
Cypress & pine	Millsawn	480 000	320 000	Available
	Pitsawn	-	-	
Heavy construction	Millsawn	480 000	320 000	Rare
	Pitsawn	-	-	
Medium construction	Millsawn	450 000	300 000	Most abundant
	Pitsawn	200 000	120 000	
Light construction	Millsawn	-	-	Available
	Pitsawn	120 000	80 000	
Eucalyptus	Millsawn	320 000	300 000	Increasing
	Pitsawn	250 000	200 000	

Prices can be expected to continue rising as the supply of softwood timber becomes limited in the near future and demand remains high. The timber dealers claim that production and marketing costs have risen since June 2004. Fuel prices rose in early October 2004 following the sharp rise in global prices: diesel rose to U Sh1 470/litre from U Sh1 400/litre. In November, diesel rose again to U Sh1 520/litre. The price of sawblades has risen from U Sh100 000 to U Sh300 000; timber transport costs (for a 20-tonne truck) have increased from U Sh800 000 to U Sh1 200 000 on average.

The price of mvule has been steadily increasing as it has become scarcer. Demand seems to have overtaken supply, as large mvule trees are becoming a rare sight in Uganda. Currently, *Milicia excelsa* (mvule), *Albizia coriaria* (mugavu) and other hardwoods have found a new market in Kenya and they are being exported illegally. Until the recent upturn, the price of mahogany had remained steady, largely because of timber from the Democratic Republic of the Congo substituting for the increasingly scarce mahogany of Uganda.

FIGURE 5
Trends in softwood timber prices in Kampala

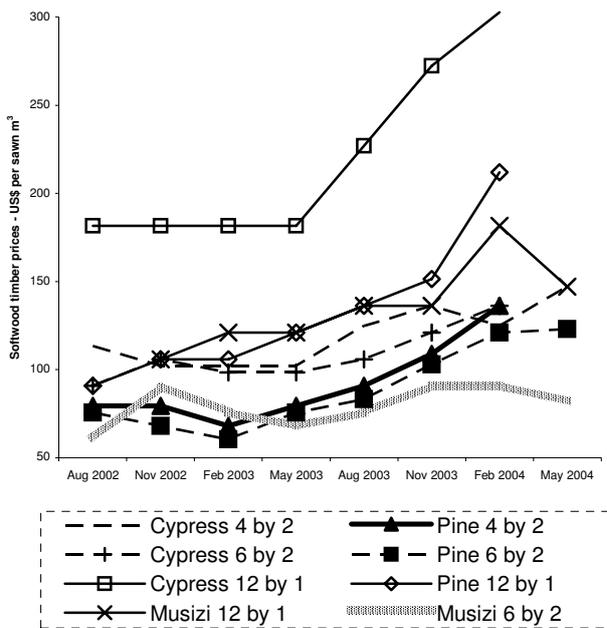
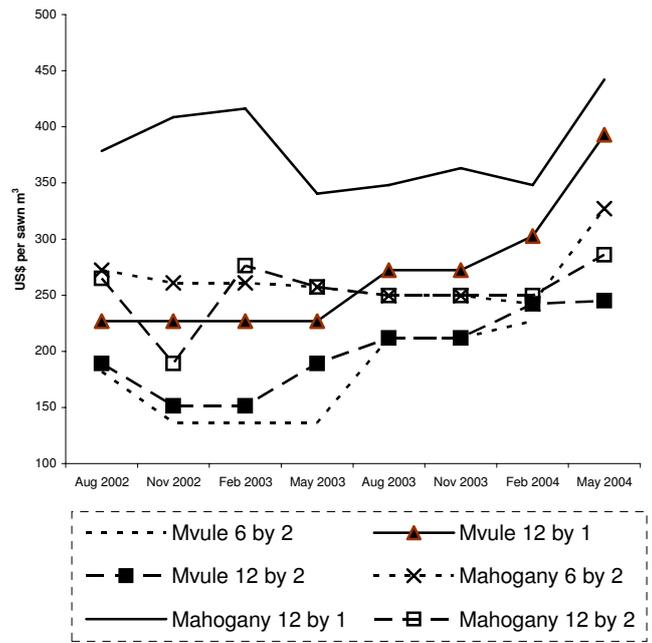


FIGURE 6
Trends in cabinet timber prices in Kampala



Building and construction industry

The building and construction industry represents the largest market (60 percent of all timber sold) for sawn timber in the country. The combined effect of high economic growth and high population growth has had, and will continue to have, a dramatic impact on the construction industry. After 15 years of civil war and very little construction activity, there was a building boom between 1985 and 1995, when the sector experienced annual growth rates of 10–20 percent. Table 9 shows the GDP contribution of this sector.

DEMAND FOR LUMBER OF A LOWER QUALITY THAN MILLSAWN TIMBER

There is an active and highly competitive domestic market in wood products, particularly in the construction and manufacturing sector. With the current political stability in most parts of the country and the growth in the national economy coupled, the demand for sawn timber (currently estimated at 240 000 m³) is expanding fast. The supply of millsawn timber (about 24 000 m³) is

too small to meet this large demand. Following the expulsion of the Asians in 1972 (who dominated the sawmilling industry), pitsawing, which was disappearing before the closure of the sawmills, regained importance in filling this supply gap.

TABLE 9
GDP contribution of the building and construction industry

Years	GDP contribution (1991 prices) (million U Sh)
1985/86	56 000
1986/87	75 000
1987/88	93 000
1988/89	94 000
1989/90	97 000
1990/91	103 000
1991/92	106 000
1992/93	118 000
1993/94	138 000
1994/95	163 000

In the last three decades since the sawmills closed down, pitsawing has profitably and effectively provided most of Uganda's sawn timber, albeit mostly illegally. Although pitsawn timber is usually lower in quality, it has out competed millsawn timber on both availability and price. Pitsawn medium-construction timber costs U Sh200 000/m³ while millsawn timber costs U Sh450 000/m³ in Kampala's central markets (Table 8). Most Ugandans consider the lower-quality roughsawn pitsawn timber as good enough for construction work. Moreover, the timber is often further processed on wood-working machines before use, i.e. sawn and planed to the required thickness and smoothness for use in making doors, windows and other furniture items. The

large amount of wood waste in shavings does not seem to bother the users as the price of timber is very low.

Millsawn softwood products are priced higher than pitsawn hardwoods in many applications, such as: general structural elements for buildings; non-structural general joinery; and utility furniture. There is a demand for pitsawn timbers because they offer different varieties to choose from (more than 40 suitable species), allowing for preservation possibilities. In contrast, millsawn timbers are mainly limited to *Pinus species* and *Cypressus lusitanica*. Pitsawyers undercut sawmillers in the market by selling their timbers cheaply. Moreover, their timbers are hardwoods, which the sawmillers do not have.

High-quality/valuable timbers

In Uganda, valuable hardwood timber species have traditionally been used unnecessarily for general purposes. In the process, they have been overexploited. There has been and will be further substitution for high-quality timbers by softwoods and eucalyptus species. However, the demand for high-quality and specialized timbers for appropriate uses has also always been high in Uganda. Living standards are now rising fast and this demand is growing. Examples of overexploited high-quality timbers include *Khaya* and *Entandrophragma* (mahoganies), *Milicia excelsa* (mvule), *Lovoa* (nkoba), *Olea* (Elgon olive/teak), *Hallea stipulosa* (nizngu) and *Podocarpus* spp. (podo). Currently, the research emphasis is on widening the species range and increasing the knowledge about the potential uses of alternative lesser-used and lesser-known species.

TIMBER IMPORT/EXPORT MARKET

Although the NFTP A repealed the 1967 Forest Act Cap. 246 and the Timber (Export) Act Cap. 247, the ministerial ban on timber export imposed in 1992 has not been lifted. Ugandan exports of wood products are negligible (Table 10).

The 6 515 m³ of sawn timber exported was valued at US\$2 040 690. Most of the timber exported was through barter trade arrangements whereby timber was exported for manufactured goods. However, the value of goods imported into Uganda amounted to US\$944 015, leaving a balance of US\$1 361 807 unaccounted for. The lack of data on supplies of hardwoods, particularly mvule and mahogany, and the rate of legal and illegal exports as well as limited earnings, prompted the Government to suspend or ban the export of timber (Plumptre and Carvalho, 1991).

TABLE 10
Ugandan sawn timber exports, 1988–1990

Year	Destination	Licensed exports (m ³)	Actual volume exported
1988	Kenya	10 066	3 512
	United Kingdom	3 776	651
	Rwanda	1 116	204
	Egypt	1 000	337
1989	Kenya	2 643	1 220
	United Kingdom	986	82
1990 Jan.–Sept.	Kenya	1 078	366
	United Arab Emirates	150	35
	Saudi Arabia	160	108
Total		20 975	6 515

About 96 percent of the timber exported goes to Kenya mainly in the form of bulk timber, where it is resawn to required sizes or sliced into decorative veneers. The timber exported from Uganda is predominantly mvule and mahogany. The demand for these Ugandan timbers has remained high, as indicated by timber exports licensed amounting to 20 975 m³ against the actual recorded supply of 6 515 m³ (Table 10). Most of the timber exported is pitsawn because the Kenya market accepts timber bulks of roughsawn valuable hardwood timber species. Despite the ban on timber exports, timber is still being exported both illegally and legally (cleared as timber in transit from the Democratic Republic of the Congo).

Currently, in Uganda, the timber rules or standards for grading timber are not taken seriously. They are hardly ever applied and few people are trained in grading timber. Standards are left to the seller and buyers to discuss. There is no enforcement of grading rules by the NFA/Uganda National Bureau of Standards (UNBS)/Uganda Revenue Authority to ensure that standards are maintained.

Pitsawn timbers are not well and evenly cut. They have very variable dimensions, with non-uniformity in thickness and widths, non-parallel edges. The main reasons for sawing inaccuracies are the poor condition of the saws and poor workmanship.

For pitsawn timber, no undersize is allowed, unless the buyer's specification states otherwise, in which case the timber will be graded as Fourth or Specified Grade. The quality of pitsawn timber cannot conform to any market standard specifications, not even the 1967 Uganda Timber (Export and Grading) Rules, or standards for grading timber that have been repealed.

WHO PROFITS FROM THE PITSAWING INDUSTRY?

Pitsawyers are small-scale businesspersons who start off as humble pitsawyers. Eventually, some save enough money out of their profits to buy small-scale mobile sawmills. They then transfer to forest plantations as sawmillers leaving behind the less-affluent pitsawyers, who are trying hard to break even and sell in ad hoc and spot markets. Thus, harvesting in natural forests has continued to be dominated by pitsawing.

Pitsawing in its current form is not a profitable business in Uganda. However, it provides about 90 percent of sawn timber on the local market, and employment to several categories of people, e.g. supervisors, sawyers, carriers, sellers and buyers. The low recovery rate of 25 percent was identified as the major cause of inefficiency in sawing. In addition, the pitsawyers work very intermittently. Productivity per saw is estimated at 25–50 m³/year. If all the operating costs for the concession/licence fee, royalty and transporting timber were covered, the cost of pitsawing would be U Sh275 800/m³. At the current average sales price of U Sh200 000/m³, the pitsawyer is probably making a loss of U Sh75 800/m³ (Odokonyero, 2003).

The little money made (U Sh2–3 million/pitsawyer), mainly illegally, is switched to other sectors providing basic needs rather than being re-invested for the development of pitsawing. The sawyers claim the profit would be too small to improve the sales organization and break through into the central markets, let alone save enough money to buy small-scale mobile sawmills. Almost 90 percent of the money goes on: family upkeep, subsistence, leisure, health and education for dependants, trading, and clearing the forest for agriculture.

MEASURES TO REDUCE THE DEMAND FOR PITSAWN LUMBER

Potential measures for reducing the demand for pitsawn are:

- Development of the sawmilling industry to supply the much-needed timbers, which are in high demand. The improved supply of millsawn timber could substitute pitsawn lumber in the market. This would require investment in the sawmilling industry, and programmes to implement improvements in efficiency, productivity and marketing. The prices should be affordable and the users should receive value for money.
- Policy improvement; awareness creation; promotion; and sensitization of the users on the need for and benefits of using sawmill-quality sawn lumber.
- The use of the complete chainsaw mill, which has been piloted by the NFA with the FRMCP involving the BAPWUA, should be promoted and extended to other areas of the country (see Chapter 2).
- The ban on timber export should be lifted. This would encourage the production of quality lumber to meet export standards, along with the implementation of timber grading, seasoning and treatment. It could promote value addition through the processing of available secondary hardwoods to supply a lucrative trade in secondary wood products such as furniture and parquet flooring for export.

PROBLEMS IN REMOVING PITSAWN LUMBER FROM THE MARKET

A number of problems may be encountered when trying to remove pitsawn lumber from the market.

Encroachment for the purpose of cultivating food crops was identified as the most serious threat to the sustainable management of the forests. The local communities are most likely to clear the forest for agriculture to replace pitsawing, which has been a major source of their income and livelihood. Problems of sabotage, burning the forest, and hostility and harm to the forest staff may be encountered.

Illegal activities and uncontrolled harvesting of the forest are other major threats. Removing pitsawn lumber from the market ignores the national need for sawn timber and the certainty that this demand will be met illegally and harmfully if it cannot be met legally under control through regular inspection and patrol of pitsawing sites.

Resistance and a lack of cooperation can be expected from the public and local communities. Whenever pitsawing has been suspended, there has been the problem of increased illegal pitsawn timber flowing into the market. This would be reduced if the pitsawyers were allowed to operate and if the local communities and the registered pitsawyers became active partners in controlling illegal activities. The forestry staff could face considerable resistance, threats and lack of cooperation in trying to confiscate illegal timber. There would also be the problem of financing various tasks such as the impounding of timber, the seizing of saws and vehicles, and the taking of legal proceedings.

Chapter 4

Livelihoods and pitsawing

This chapter examines the livelihood systems of the pitsawyers and the target communities adjacent to the KCFR. It also analyses related changes, opportunities and constraints if pitsawing activities were to be stopped.

Owing to the limited scope of the study, the study focused on six subcounties adjacent to the KCFR (Table 11). Nevertheless, the study offers insights into the potential impacts of pitsawing operations on the neighbouring communities.

TABLE 11
Parishes adjacent to the KCFR

Subcounties	Population			Parishes selected
	Males	Females	Total	
Kyamuhunga	20 255	20 782	41 037	Mashonga, Kyamuhunga, Kabingo and Swazi
Ryeru	18 071	20 110	38 181	Ndagaro, Mushumba, and Nyakiyaja
Kiyanga	7 014	20 110	27 124	Rwoburunga, Kiyanga
Bitereko	11 031	11 900	22 931	Nyakashojwa
Kichwamba	11 888	11 673	23 561	Rumuri
Nyabubare	17 107	18 128	35 235	Nyarugote

THE STUDY AREA

The KCFR is managed subject to the provisions of the NFTP (NFTP, 2003) and its management and control are vested in the NFA. The reserve, covering an area of 137 km², lies in western Uganda (Figure 7). It is contiguous to the Maramagambo Forest, which is a part of Queen Elizabeth National Park, and the total area of these two forests is 580 km². The area is geologically complex. The underlying rocks including quartzite, schists, gneiss, shales and pyrites of the Karagwe-Ankolean and Toro systems. Soils derived from these rocks include ferralitic sandy-clay loams, Podzols (on Lubare Ridge) and younger, weakly developed Lithosols of moderate fertility. There are two rainy seasons (from mid-March to late May, and from mid-September to late December), and two relatively dry seasons (from early January to mid-March, and from early June to mid-September).

The vegetation of the Kalinzu Forest is broadly classified as a medium-altitude, moist evergreen forest. The Nkombe Sawmill, a logging company, began logging mechanically in the northeast of the forest in the early 1970s, mainly harvesting *Parinari excelsa* selectively. Local people have been logging some useful trees, such as *Carapa grandiflora* and *Funtumia africana*, in some areas near villages and roads. These logging activities have created some patches of secondary vegetation in the Kalinzu Forest.

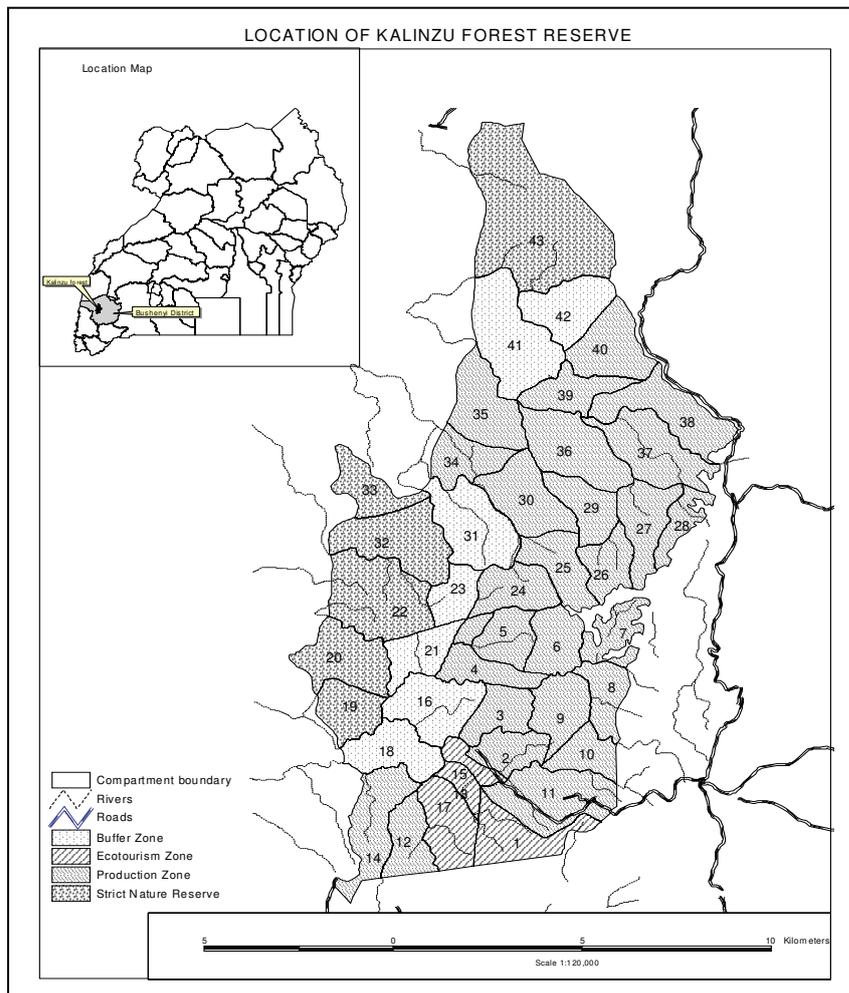
The reserve was first gazetted as an undemarcated crown forest in 1932 and demarcated in 1948. The area has an average altitude of 1 400 m above sea level. The boundaries of the FR have been surveyed and re-demarcated with corner beacons, earth cairns and directional trenches.

METHODOLOGY

The study made use of basic data collected in the field and an analysis of livelihood systems. Field research was conducted in the six target subcounties adjacent to the FR.

The field research applied the participatory action research method, which emphasizes local knowledge and enables local people to make their own appraisal, analysis and plans. Sixty respondents including 30 pitsawyers and 20 non-pitsawyers were selected. Subcounty chiefs and local council officials also participated. Basic data were collected through semi-structured questionnaires (see Annex) and interviews with respondents as well as meetings using participatory tools such as community mapping and pair-wise ranking. An emphasis of the analysis was placed on selected aspects of livelihoods systems, such as forest use and management, benefits, and the effect of pitsawing operations on pitsawyers and local communities. The use of research results from past studies facilitated dynamic analysis.

FIGURE 7
Location of the Kalinzu Central Forest Reserve



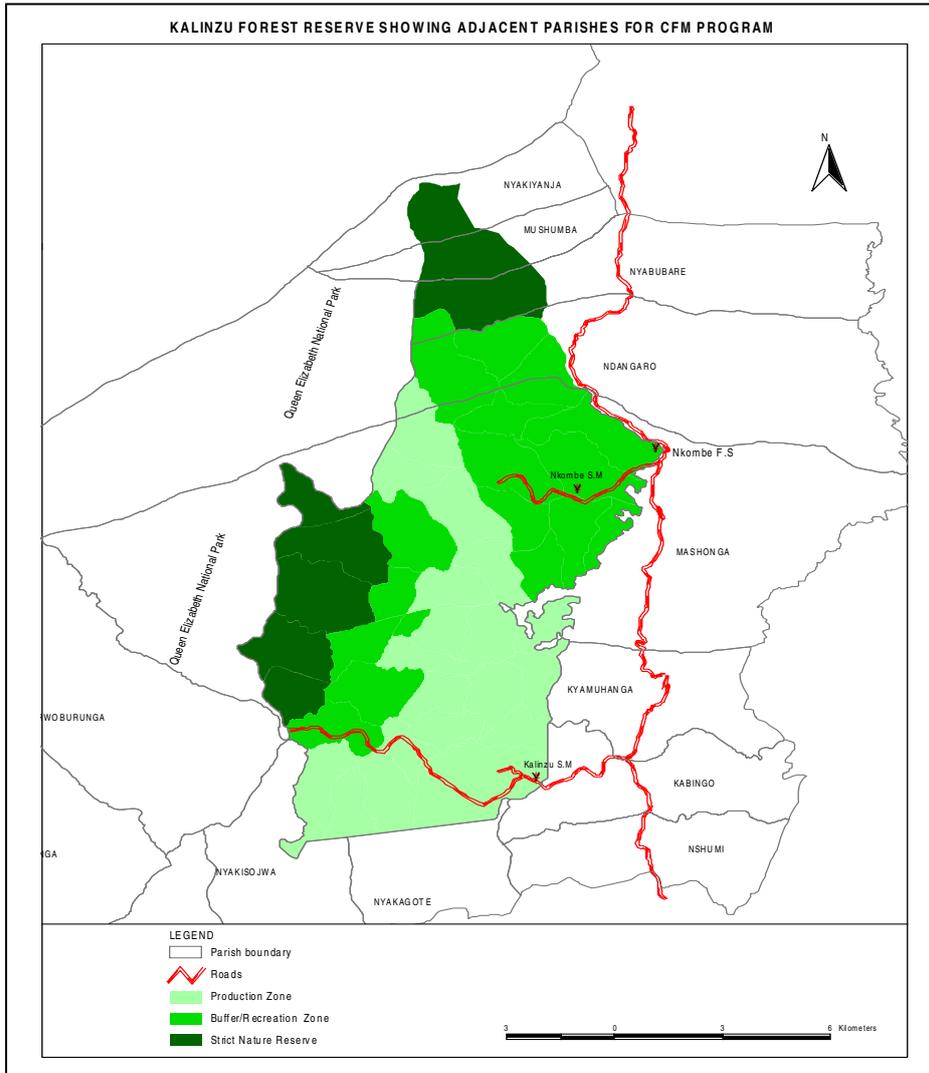
SUBCOUNTY SELECTION

This study was carried out in the parishes adjacent to the KCFR (Figure 8). At the time of this study, harvesting in all CFRs was suspended by the NFA as part of an attempt to implement a new system of competitive bidding for harvesting concessions. However, this FR was the only area where pitsawyers had resumed their harvesting activities. It has a valid FMP, ISSMI, forest certification, partnerships and CFM (FRMCP, 2004b). The area has a well-organized association of pitsawyers and wood users – the BAPWUA.

The area is also designated as the district's focal point for rural development. Thus, various development initiatives are being undertaken. Among them are attempts to rehabilitate degraded

forests and to develop sustainable land-use systems (e.g. government-led land and forest allocation). The FNCMP aims to contribute to such efforts by developing guidelines for sustainable forest management through participatory approaches.

FIGURE 8
Map showing the location of the parishes adjacent to the KCFR



LOCAL COMMUNITIES ADJACENT TO THE KCFR

The FNCMP (FD, 1999) gives a population density of 207 persons/km² for the areas around the reserve. Bushenyi District is reported to have a population density of 183 persons/km², almost twice the national average (estimated from the preliminary results of the 2002 Uganda population census). The major ethnic groupings in are Banyankole and Bakiga. They all speak different dialects of basically the same language – Runyankole-Rukiga.

According to records from the Uganda Bureau of Statistics (UBOS, 2002), the total population of the six study subcounties adjacent to the KCFR is estimated at 188 069 individuals (55 percent female).

LIVELIHOOD ANALYSIS

Socio-economic trends

The community gave information on trends in 11 socio-economic variables for the period 1964–2004 and the future (Table 12). The trendline was divided into four periods. The interviewees counted grains from one to ten and placed them on a flip chart in the box representing each period; a grain of ten indicates high availability or high occurrence.

TABLE 12
Socio-economic trend matrix

Variable/Period	1964–1977	1978–1990	1991–2003	2004–Future
Agricultural production	4	6	5	4
Business	2	3	6	8
Credit availability	-	2	3	5
Development agencies	-	2	3	5
Education	2	3	5	7
Employment	4	5	4	2
Health	1	2	2	3
Income	4	5	3	3
Livestock	7	6	4	3
Pitsawing	1	3	5	7
Population	2	4	6	8

Pitsawing activities, education and health services, as well as the population have increased since 1964 to date and will increase in the future. Thus, the community feels that development in the area has increased since independence. Livestock numbers have been decreasing since 1964 and may further decrease in the future. Business has increased throughout because of the increase in population.

Income has decreased since 1991 because of the poor marketing of agricultural produce. This situation may remain the same in the future. Development agencies and credit availability have increased since 1978 to date and will continue to do so. On the other hand, employment and agricultural production have decreased and are set to do so in the future.

Livelihood requirements

Farming and pitsawing are the main sources of livelihood for the local community adjacent to the KCFR. Banana is a staple food, grown mainly as a companion crop with robusta coffee. Other food crops grown are: beans, onions, tomatoes, pineapples, passion fruits, soybeans, field peas, maize, sorghum, sweet potatoes and vegetables. Livestock enterprises that earn money for the local people are the sale of livestock including cattle, sheep and goats. Poultry farming is less exploited, and honey is harvested from feral colonies established within the forest and to a lesser degree from locally produced hives. Some of the honey is sold for cash and the rest is consumed for medicinal purposes either directly or mixed with forest herbs.

Other sources of livelihoods for the local residents are small enterprises active in: buying and selling farm produce; charcoal burning; the sale of forest products; the production of local brews; and the hiring out labour, especially during times of food scarcity (Table 13). Table 14 shows how the community allocates its income.

Activity profile

The gender activity profile in and around the community was assessed (Table 15). Together with the calendar of seasonal activities (Table 16), this enabled a picture to be formed of what activity is done when and by whom.

TABLE 13
Sources of livelihoods for local communities around the KCFR

Livelihood sources	%
Food crops	81
Cash crops	66
Livestock production	53
Poultry	10
Pitsawing	78
Fuelwood & charcoal	74
Casual work	63
Sale of medicinal plants	60
Sale of honey	56
Merry go round (small group savings)	51
Petty trades	49
Brick making & pottery	47
Brewing	44

Women have the principal responsibility for work on the homestead, being assisted by girls. Men and boys play a major role in animal herding. Women make baskets and mats while men make spears, arrows and beehives. In the forest/bush or wetlands, men principally collect building materials, medicinal plants, honey and hunt. They also produce charcoal and pitsawn timbers.

Women are equally involved in the collection of medicinal plants, as well as basket reeds and wild vegetables. For agricultural activities, men and women share responsibility for land preparation, planting and weeding. However, women carry more of the burden in harvesting, transporting and marketing produce.

Women participate in petty trades, while men principally do casual work.

TABLE 14
Breakdown of income allocation for local communities around the KCFR

Income allocated to:	%
Schools fees	77
Clothes	73
Medical expenses	54
Farm inputs	48
Buying food	43
Exchange for labour	35
Investment in other enterprises	29
Other basic needs	22

Resources obtained by local people from the KCFR

Using a pair-wise ranking matrix, local people also listed and ranked the resources they obtain from the FR (Table 17). Every two resources were compared for relative importance to the community, and then the number of entries for each resource was counted. The resource mentioned the most on the chart is ranked first and so on. Where two resources have the same number of entries, their pair-wise ranking can determine which should rank higher.

Timber ranked as the highest priority, followed by medicinal plants, fuelwood and water. Because of the limited number of people keeping livestock (especially cattle) and the problems associated with livestock management, pasture ranked lowest.

Stakeholder analysis

The local people were asked to consider all the stakeholders around the KCFR. Figure 9 shows all the stakeholders listed, with the thickness of lines representing the extent to which they depend on the forest for their livelihoods.

Many stakeholders, especially those within the community, wanted to have more collaboration with the NFA in the management of the KCFR. The local community made the following list of suggestions during the discussion on how they would like to see relationships with the NFA:

- The NFA should help to build schools for the community living around the FR.
- The NFA should allow community members to act as tour guides.
- The community should be given a portion of the forest to plant and be allowed to sell the trees directly to schools and other institutions.

- The community should have kiosks around the forest to sell things such as poultry and vegetables to people who come to harvest timber.

TABLE 15

Gender activity profile for the local community around the KCFR

Location	Activity	Gender*
Homestead	Cooking	W g
	Cleaning	W g
	Collecting water	W g
	Milking	M b
	Fetching vegetables/fruits	W g
	Fetching fuelwood	W g
	House making	W g
	Herding	W B
	Looking after children	W g
	Building	M b
	Making spears, arrows and hives	M b
	Making baskets and mats	W g
	Receiving visitors	W m
Forest	Fuelwood gathering	W g b m
	Pitsawing	M b
	Collecting medicine	W M
	Fetching basket reeds/papyrus	W m g
	Collecting building materials	M b g w
	Keeping and harvesting honey	M w b
	Looking for vegetables (e.g. bush okra)	W g
	Hunting	M B
	Charcoal burning	M b
Agricultural land	Land prep	M B W g
	Planting	M b W g
	Weeding	W M b g
	Harvest	W m b g
	Transport	W m b g
	Marketing	W m b g
Market	Casual work	M w g b
	Petty trades	W b g
	Merry go round (local saving schemes)	W m
	Sale of farm produce	W M

m = men, w = women, g = girls, b = boys; capital letters indicate principal responsibility by respective gender.

Impact and future scenario of pitsawing

The majority (86 percent) of people in the local community depend directly on the income generated from pitsawing activities to meet their day-to-day livelihood requirements such as buying food. Part of the income is also used for medical needs and paying school fees for their children. The creation of jobs and the provision of casual employment opportunities is arguably one of the significant social benefits attributable to the pitsawing operations around the KCFR. Many people (70 percent), including school dropouts, are employed in the industry. Pitsawing activities play a significant role in maintaining the social infrastructure, sustaining local businesses and reducing the relocation of youth from rural to urban communities by attracting government attention for infrastructure provision, training and skills development. Other

benefits reported include provision of growth opportunities in other sectors and substantial indirect benefits to the government in the form of tax revenue (Table 18).

TABLE 16
Calendar of seasonal activities around the KCFR

	Activity	J	F	M	A	M	J	J	A	S	O	N	D
1	1st ploughing (land clearance)	x	x										
2	Planting/sowing seeds			x	x								
3	Weeding				x	x	x						
4	Pest control/spraying					x	x						
5	Harvesting							x	x	x			
6	Drying & sorting									x	x		
7	2nd season land preparation						x	x					
8	2nd season ploughing							x					
9	2nd season plantings/sowing								x				
10	2nd season weeding									x	x		
11	2nd harvesting/drying harvests											x	x
12	Brick making	x	x								x	x	x
13	Casual work	x	x	x	x	x	x	x	x	x	x	x	x
14	Beekeeping	x	x							x	x	x	
15	Pitsawing	x	x	x	x	x	x	x	x	x	x	x	x
16	Hunting	x	x	x	x	x	x	x	x	x	x	x	x
17	Herding	x	x	x	x	x	x	x	x	x	x	x	x
18	Gathering fuelwood	x	x	x	x	x	x	x	x	x	x	x	x
19	Marriage	x	x	x	x	x	x	x	x	x	x	x	x

TABLE 17
Pair-wise ranking of forest resources

Resource	Bushmeat	Charcoal	Fuelwood	Honey	Medicinal plant	Pasture	Poles	Water	Total	Rank
Bushmeat	-	Bushmeat	Fuelwood	Honey	Medicinal plant	Bushmeat	Bushmeat	Water	3	6
Charcoal		-	Fuelwood	Honey	Medicinal plant	Charcoal	Poles	Water	1	8
Fuelwood			-	Fuelwood	Medicinal plant	Fuelwood	Fuelwood	Fuelwood	6	3
Honey				-	Medicinal plant	Honey	Honey	Water	4	5
Medicinal plant					-	Medicinal plant	Medicinal plant	Medicinal plant	7	2
Pasture						-	Poles	Water	0	9
Poles							-	Water	2	8
Timber								Timber	8	1
Water								-	5	4

FIGURE 9
Stakeholders in the use and or management of the KCFR

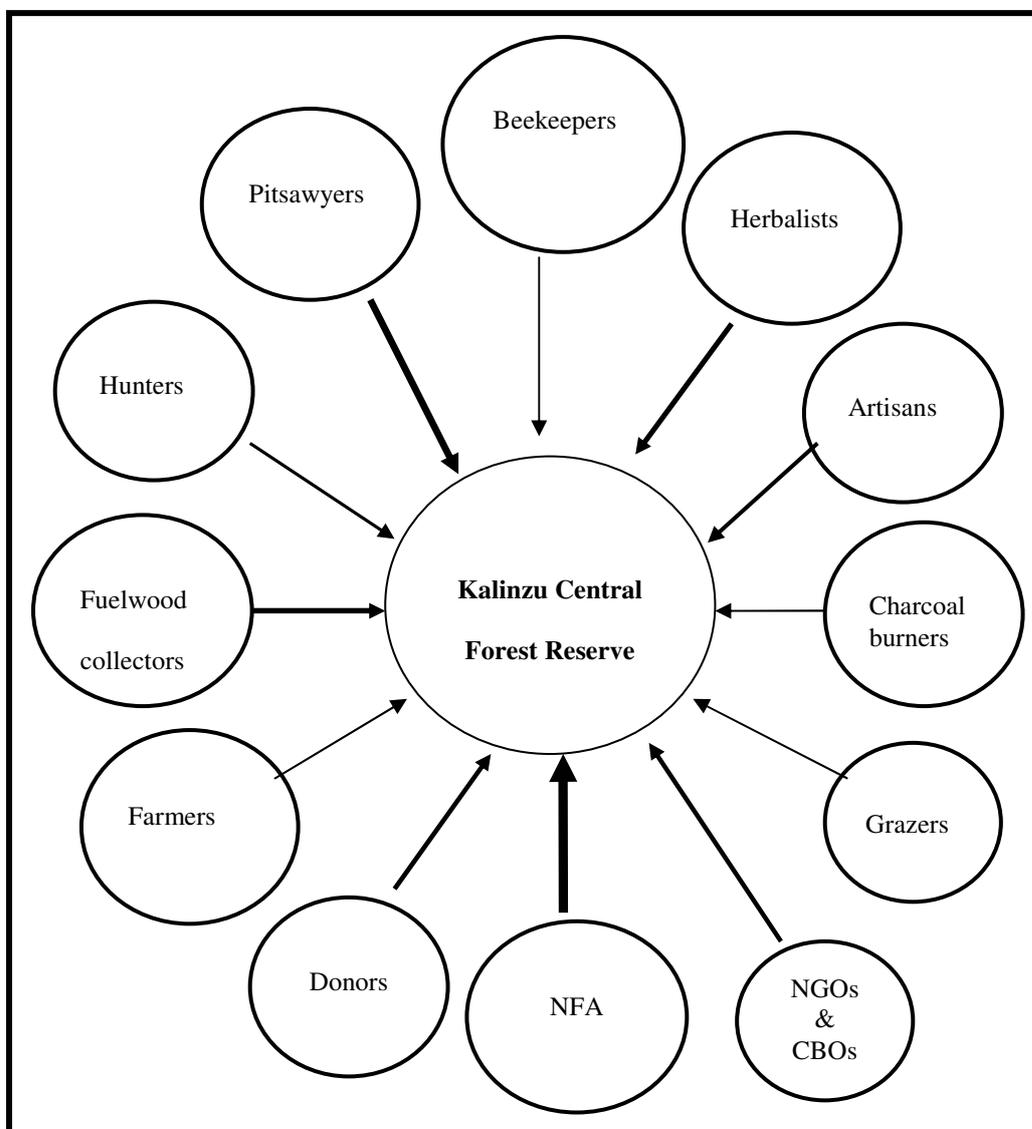


TABLE 18
Benefits of pitsawing activities

Benefit	%
Ready source of income from the sale of timber	86
Supply of cheap timber for building and other construction work	77
Source of employment	70
Provision of growth opportunities	27
Tax revenue	19

When asked how their livelihoods would be if pitsawing activities were stopped, the majority of the respondents said those engaged in pitsawing activities would lose jobs and income. They thought that there would also be very little forestry tax revenue. They also thought that repressive measures would be required to make everyone obey all the restrictions, possibly threatening the physical security of households and undermining traditional rights to

forest use. Some said there would be increased vulnerability to their household in terms of food and health as they depend entirely on pitsawing activities. Forty-three percent feared that they might no longer receive the current government services associated with the pitsawing industry (Table 19).

TABLE 19
Predicted impacts of stopping pitsawing activities

Impact	%
Lost job opportunities	98
Reduced income	85
Increased vulnerability to households	67
Increased illegal pitsawing and forest degradation	66
Increased repression	54
Increased theft	46
Loss of government services associated with pitsawing industry	41
Loss of social capital	29
Very little forestry tax revenue	17

Constraints and opportunities to pitsawing industry

The respondents reported many constraints (Table 20) and opportunities (Table 21) related to pitsawing as a livelihood option. Low investment in technology by pitsawyers is leading to wastage, inefficiencies and poor-quality products. The licensee is restricted to using only manual saws. The use of chainsaws or any motorized tool is prohibited. Given that a significant quantity of wood harvested from forest areas is undertaken illegally (or under semi-legal arrangements), investment in efficient technology is minimal (because of the risk of confiscation).

High levels of wastage are also caused by rigid market standards and slow rates of adaptation. Timber buyers from Kampala do not usually accept timber of less than 14 feet (4.2 m) in length. Similarly, because the timber is transported in 7-tonne trucks, sizes tend to be standardized. This inevitably leads to increases in waste as well as decreases in the efficiency of harvesting and processing operations, which ultimately affects profit levels. Moreover, pitsawyers rarely have any form of grading system for timber, and the poor storage and drying of timber leads to further wastage and poor-quality products.

Skill levels in pitsawing operations tend to be low because of the casual employment nature of pitsawyers. Limited training opportunities coupled with limited inputs, the low quality of technology, and the limited skills base of pitsawyers, leads to further losses and inefficiencies. The fact that many of the people engaged in pitsawing activities tend to be casuals with limited levels of education also means there are limited incentives to achieve savings or produce efficiencies.

The knowledge of markets and new market opportunities remains very poor and constrains innovation. Low product quality reduces the opportunities for breaking into local high-value markets. The lack of transparency combined with unclear and bureaucratic procedures for obtaining licences undermines pitsawing activities and leads to market distortions.

There is some unfairness in the issuing of concessions, particularly on private land. Many pitsawyers operate on a semi-legal or illegal basis. This opens up possibilities for bribery and corruption while transporting timber from its place of production to the place of sale and minimizes opportunities for investments in more efficient technologies. For them, the issuing of permits involves significant financial outlays and investment, with the expectation of modest

financial returns. These hopes are currently in jeopardy. Given the fact that many of them are operating illegally (or with “informal” licensing arrangements brokered locally with FD staff), they see compliance with regulations as an additional “cost” to be weighed up and assessed just as other investments. There are few incentives to promote compliance with transparent licensing and concessionary arrangements.

Pitsawyers are typically poorly organized and networked. The failure of pitsawyers to cluster, organize or link up results in limited sharing of market information, limited opportunities for collective marketing and limited opportunities for taking part in ongoing programmes being offered by government or donor-funded projects or initiatives. This fragmentation also leads to reduced chances of forging overall production and sales “standards”. As a result, general standards remain low and the opportunities for advocacy and lobbying are limited.

Other constraints reported by the respondents included: lack capital and appropriate credit facilities; administrative inefficiency within the forest sector; and illegal imports of timber example from the Democratic Republic of the Congo.

TABLE 20

Constraints on pitsawing as reported by the respondents

Constraint	Reported by respondents(%)
Illegal imports of timber example from Democratic Republic of the Congo	81
Rigid market standards	79
Low investment in technology	76
Poor organization and networking	73
Poor storage and drying of pitsawn timber	70
Limited training opportunities	66
Lack of grading system for pitsawn timber	63
Lack of capital and appropriate credit facilities	63
Low level of technical skills in pitsawing operations	58
Lack of transparency and unclear bureaucratic procedures for obtaining licences	52
Unfairness in issuing of concession	48
Little knowledge of markets and new market opportunities	25
Administrative inefficiency within the forest sector	23

TABLE 21

Opportunities for organized pitsawing operations

Opportunity	Reported by respondents (%)
Institutional reform in forest sector in favour of private-sector investment	51
Moves by government to reduce bureaucracy in issuing licences	43
Increase donor support	35
Increase transparency in the awarding of licences	22
Reforms within other sectors of government designed to support small-scale enterprises	17

While more work is required to highlight links between pitsawyers and other stakeholders, key emerging opportunities for pitsawyers identified in this report include:

- Institutional reform processes ongoing within the forest sector, providing more favourable terms and conditions for private-sector investment in forestry.

- Moves by government to reduce bureaucracy and increased transparency in the awarding of licences to increase the efficiencies in pitsawing activities.
- Corresponding reforms within other sectors of government designed to support local small-scale enterprises and investments, and the providing of market information.
- A range of donor supported initiatives offering subsidized or free services to organize rural-based small-scale enterprises (e.g. supported by the World Bank, the European Union, and private-sector foundations).

Chapter 5

Recommendations for follow-up on pitsawing

FOREST LAWS AND PITSAWING

Policy and licensing conditions for pitsawyers need to be reviewed, especially the restriction on a maximum number of four saws per sawyer and the ban on the use of chainsaw and any motorized tool in the forest. Pitsawing should not be banned outright but restricted to a designated coupe of a stock-mapped compartment, i.e. where an ISSMI has been carried out, and its activities monitored.

The available resources (timber trees) should be assessed and stock-mapped to ensure the felling of only agreed species and sizes (diameter classes). The short 15-year polycyclic felling system throughout all blocks and operated by pitsawyers could be revised to a controlled monocyclic harvesting system (ISSMI). The AAC should be established, and realistic annual volume determined for harvesting in all reserves. In addition, the ISSMI as adopted and practised on a trial basis should be reviewed and some modifications should be made in order to ease harvesting and ensure regeneration of good trees by tending natural regeneration or gap planting.

The policy should be to phase out pitsawing in the NHF, instead using simple mechanical mills such as the complete chainsaw mills, which are affordable and use appropriate technology. Pitsawyers need to be licensed according to their capacity and ability to develop their tools, products, infrastructures and organization to raise enough income to develop the industry. Monitoring, supervision and evaluation of the harvesting activities of pitsawing within the concession area are essential, using practical guidelines and regulations. The NFA/Government of Uganda should develop practical guidelines and regulations for pitsawing covering harvesting, processing and marketing as well as a comprehensive sector policy and strategic investment plans for pitsawing in order to attract funding and improve service delivery at local/forest level. It is extremely vital that the forest-fringe communities should be involved in the process of policy-making and licensing for pitsawyers.

Similar studies of current harvesting practices should be carried out in countries of East Africa, with FAO recruiting national experts, to benefit from the work on the Regional Code of Practice for West and Central Africa (FAO, 2004).

RESOLVING ISSUES THAT MAY ARISE IF PITSAWN TIMBER IS TAKEN OUT OF THE EQUATION

Development of the sawmilling industry should be encouraged in order to supply the much-needed timber. Training should be provided for technicians (chainsawyers, tractor operators, mill operators, sawdoctors, timber graders, treatment and seasoning plant operators) and management. Once a development plan has been prepared, there will need to be investment in the sawmilling industry, with programmes to implement improvements in efficiency, productivity and marketing. Marketing programmes need to be implemented to create awareness and to sensitize users about the need to and benefits of using sawmill-quality lumber.

The ban on timber exports should be lifted. This will encourage production of quality lumber to meet export standards and the implementation of timber grading.

Timber grading should be implemented urgently by the NFA and the UNBS as a marketing strategy. It promotes efficiency, safety and economy in timbers used. It also provides a basis for trade and for the purposes of fixing prices. Other measures would be to promote: air seasoning with sticker-stacking; construction of drying sheds; easy and cheaper methods of timber seasoning such as solar kilns; timber treatment to market the available wide range of less durable timbers.

The use of the complete chainsaw mill should be promoted and extended to other areas throughout the country. FAO should consider funding this programme advance in an NFA concept paper: Increasing local community benefits from sustainable timber harvesting in natural forests.

OTHER LIVELIHOOD VENTURES

Training and encouragement should be provided for the following alternative livelihood ventures for people involved in the pitting industry (ranked in terms of priority):

- i. sawmill timber production, processing and marketing;
- ii. development of alternative income-generating livelihood ventures;
- iii. CFM;
- iv. NTFPs; and
- v. management of private forests

Steps should be taken to identify opportunities and services that may be needed to support community livelihood through forestry. Other measures should include:

- providing access to capital (start-up and working capital);
- creating an enabling environment; and
- providing business services (help with marketing, technology and management) for small-scale enterprises.

The measures may be implemented at group and household levels.

The development of sawmill timber production, processing and marketing will require the provision of a range of conditions and services, including:

- access to capital;
- improved and appropriate technology for processing and marketing, e.g. mobile sawmills;
- training in harvesting, processing, handling and treatment techniques;
- market analysis and marketing for timber that is difficult to sell;
- quality control and certification;
- transport facilities;
- construction of a road network in the forests.

The development of alternative income generating livelihood ventures will require the provision of a range of conditions and services, including:

- microfinance/funding;
- training in business management;
- market analysis and marketing;
- storage and transport facilities
- improved/technology/processing in order to add value;
- linkages with large and relevant organizations;
- organizational development;
- other critical business needs.

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Annex

Questionnaires

TIMBER MARKET SURVEY QUESTIONNAIRE

Key informant/focus group questionnaire

Interviewer:	Date:
Checked by:	Check Date:
Town/Village:	Respondent Age:
Parish/Subcounty:	Respondent Sex:
Name of Market/trading area:	

A. Sales

1. How would you best describe your involvement in the timber trade?

1) Pitsawyer/Sawmiller	2) Agent/dealer/transporter	3) Timber trader/retail
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2. Where do you sell your commodity? *Name of market/district and distance. Export?*

3. How do you transport goods to market?

4. How much does a return trip cost or time of trip?

5. What is the normal unit of trade?

6. How much do you sell a unit for? Does this price vary with season? If yes, how?

7. What is the sale price at different times of the year?

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Price												

8. What other factors affect the sale price, i.e. quality? What are the factors of quality?

9. How do your sales vary throughout the year?

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Score												

1) *Peak* 2) *High* 3) *Middle* 4) *Low* 5) *Negligible*

B. Purchases

10. Where do you purchase the timber? Source of timber supply

11. How do you collect it/purchase it?

12. How much does transport cost per load?

13. Are there any storage costs involved?

14. Are there any taxes charged to you? If yes what are they, how much per unit?

15. Does your purchase price vary with season?

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Score												

1) *Peak* 2) *High* 3) *Middle* 4) *Low*

16. At which times (*month*) of year is it difficult to obtain timber?

17. How much did you sell last year? (Quantities, species and sizes marketed and *state unit*)

18 Timber locally produced:

What are your average prices for purchase?

Size	Mahogany	Mvule	Musizi	Eucalyptus	Pine	Other (name)
4 × 3						
6 × 2						
12 × 1						
12 × 2						

What are your average sale prices?

Size	Mahogany	Mvule	Musizi	Eucalyptus	Pine	Other (name)
4 × 3						
6 × 2						
12 × 1						
12 × 2						

19 Does sale price vary with season? Why?

20. Which timber species do you most commonly trade?

Species	Sizes	Customers	Uses of timber

LIVELIHOOD/HOUSEHOLD SURVEY AND PITSAWING QUESTIONNAIRE

Key informant/focus group questionnaire/pitsawyers, communities around forest edges

Interviewer:	Date:
Checked by:	Check Date:
Town/Village:	Respondent name:
Parish/Subcounty:	Respondent Age:
Occupation:	Respondent Sex:
Education Level:	

Education level – 0) no formal education, 2) primary, 3) secondary, 4) college/university education

Occupation – 0) no work, 1) farming – including subsistence, 2) student, 3) own business, 4) wage labour, 6) salaried employee, 7) infant, 8) other – specify

1. Do people use the forest?
2. How far is it to the forest in kilometres?
3. How long does it take to walk there?
4. How does pitsawing provide you with income?
5. How does pitsawing support livelihoods?
6. What do you gain from pitsawing and how will stopping it affect you?
7. How does policy affect pitsawing?
8. What trends have you noticed regarding timber resource from your local forests or market in the last year?

Supply	
Quality	
Price	

0) Decrease, 1) Increase, 2) No change, 3) Don't know

9. What problems affect pitsawing and how can they be solved?
10. If pitsawing is stopped, what alternative activities will you do?
11. What should the Government of Uganda/ NFA do to solve the problem of stopping pitsawing?

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