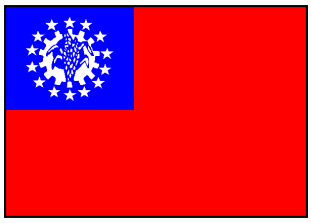
**Regional Environmental Technical Assistance 5771**
**Poverty Reduction & Environmental Management in Remote Greater Mekong Subregion (GMS) Watersheds Project (Phase I)**



# TIMBER TRADE AND WOOD FLOW–STUDY

# Myanmar

By

**Tuukka Castrén**

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**Abbreviations used**

| | |
|---|---|
| AAC | Annual Allowable Cut |

| | |
|---|---|
| ADB | Asian Development Bank |
| C&I | Criteria and Indicators [for sustainable forest management] |
| FD | Forest Department |
| FPJVC | Forest Products Joint Venture Company |
| FREDA | Forest Resource Development Association |
| fy | fiscal year (in Myanmar 1st April - 31st March) |
| GDP | Gross Domestic Product |
| GMS | Greater Mekong Subregion |
| GoM | Government of Myanmar |
| HEP | Hydroelectric Power |
| JV | joint venture |
| kton | thousand metric tons |
| LKS | Lesser Known Species |
| MSS | Myanmar Selection System |
| MTE | Myanma Timber Enterprise |
| NGO | Non-Governmental Organisation |
| NWFP | Non-wood Forest Product |
| RWEDP | Regional Wood Energy Development Programme in Asia |
| USD | United Stated Dollar |

# 1. Introduction

## 1.1 Background

The current study on wood demand and supply, and forest industries in the Union of Myanmar is a part of the *Poverty Reduction and Environmental Management in Remote Greater Mekong Sub-region Watersheds* project and its *Timber Trade and Wood Flow*-study. This study is one of six country studies – one for each project country – that are produced during the project. A separate regional report studies the cross-border issues and opportunities in the whole of the subregion.

This report – like all the national reports – deals with three interrelated topics:

i. general pattern of wood use and demand/supply in the country

ii. timber trade to/from the country

iii. forest industries and the role of forest industries in national industrial strategies

The study was carried out by Mr. Tuukka Castrén (Indufor Oy) in February 1999 – March 1999. Some additional data were collected and the report produced later in 1999. A national team was put together to collect information and provide background information. The national team on this study consisted of Mr. Myint Kyu Pe (Myanmar Timber Enterprise) and Mr. Htin Latt.

The work of the consultant was supervised and assisted by Mr. Stephen Devenish, the team leader of the project.

## 1.2 Data

The intention of the study is not to assess detailed volumes and structure of trade, but rather to facilitate the visualisation of the pattern in wood and primary wood product trade. Taking into consideration the accuracy of data available in all the project countries, any attempts to gain detailed information on actual volumes traded would be fruitless for, among others, the following reasons:

- inaccuracy of official statistics,
- much of wood consumption is local, household level utilisation goes largely unrecorded,
- domestic subsistence use does not even pass through market mechanisms, *viz*. products are not valued in monetary terms,

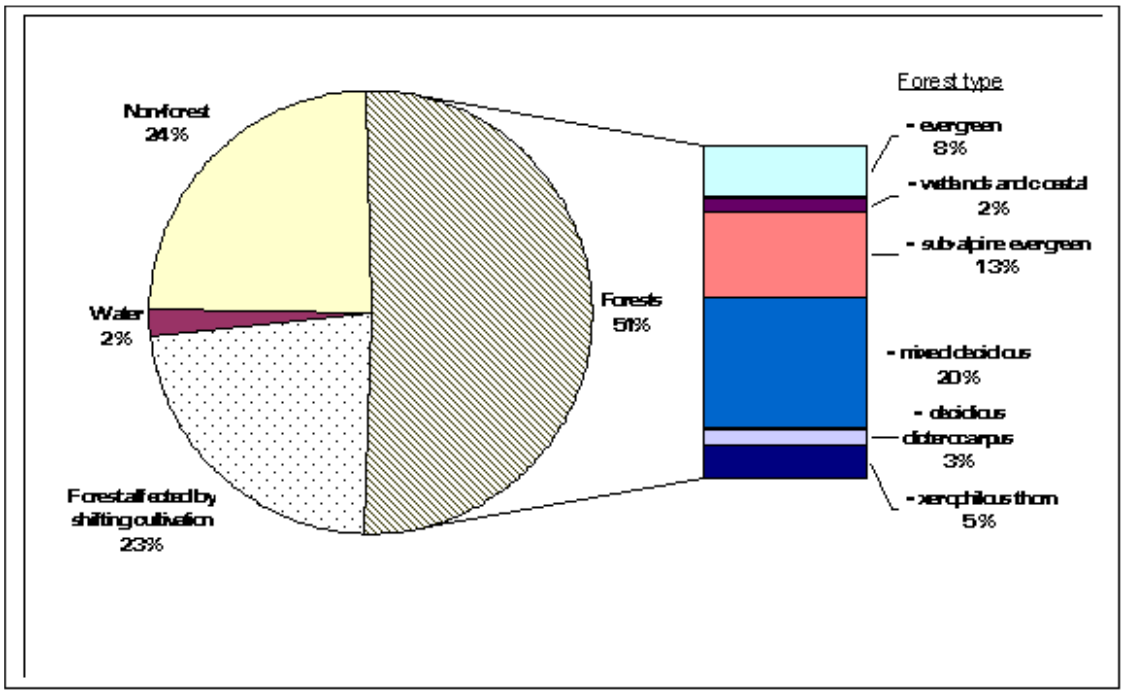
- the data has been collected from a number of sources, from both official statistics and informal communications with various stakeholders. The official sources have consisted of, among others, trade, industrial and other economic statistics. The forest inventory data, though limited, has proved to be a valuable source of information. The consultant has also interviewed a large number of people who have shared their knowledge of the forest utilisation in the country. The list of personal contacts is presented in Annex 1. Mr Castrén produced the report and all conclusions and recommendations.

## 2. Forest Resources

### 2.1 Natural Forests

Myanmar is the most forested country in the GMS; forests cover 51% of the total land area of 676 000 km2. The national forest estate is in relatively good condition as 85% is closed forest and only 15% is ranked degraded. Myanmar has even in global terms notable forest resources and the country holds 70% of the world's remaining teak (*Tectona grandis*) resources. Teak is one of the most valuable tropical hardwoods and is used in places requiring both lightness and durability. For example, in high-end yacht construction teak is the preferred choice.

**Figure 2.1: Land Use Pattern**




Source: MTE (1999), Forest Department (1996)

No recent deforestation estimate is available, an estimate was made in 1990 assessing the forest cover loss in a 14-year period, 1975 to 1989. In that period the average annual loss was estimated at 220 000 ha, or 0.64% of the forest estate. Deforestation is not distributed evenly in the country; in the upland states of Kachin, Shan, Chin, Kachin and Sagaing there was no forest cover change meaning that in the other, lowland states the rate was more than double the national average. The forest loss may be contributed to a number of factors, the most notable ones being – like in many countries – permanent agricultural encroachment, shifting cultivation and illegal logging. Usually the last factor, by removing the largest trees, paves way for the two types of agricultural expansion.

Not only is forest area large, but the Myanmar forests are also well stocked. The total volumes is estimated 2 248 mill. $m^3$ (excl. bamboo forests of 9 630 $km^2$, or 3% of the national forest estate) making the average stocking 67

$m^3$/ha. (Table 2.1)

**Table 2.1: Volume of the Growing Stock**

| Forest type | Productive forests | | Unproductive forests | | Total |
|---|---|---|---|---|---|
| | mill. $m^3$ | $m^3$/ha | mill. $m^3$ | $m^3$/ha | mill. $m^3$ |
| Closed broad-leaved | 1859 | 90 | 357 | 30 | **2216** |
| Mangrove | 12 | 31 | 4 | 10 | **16** |
| Coniferous | 16 | 142 | – | – | **16** |
| **Total** | **1887** | | **361** | | **2248** |

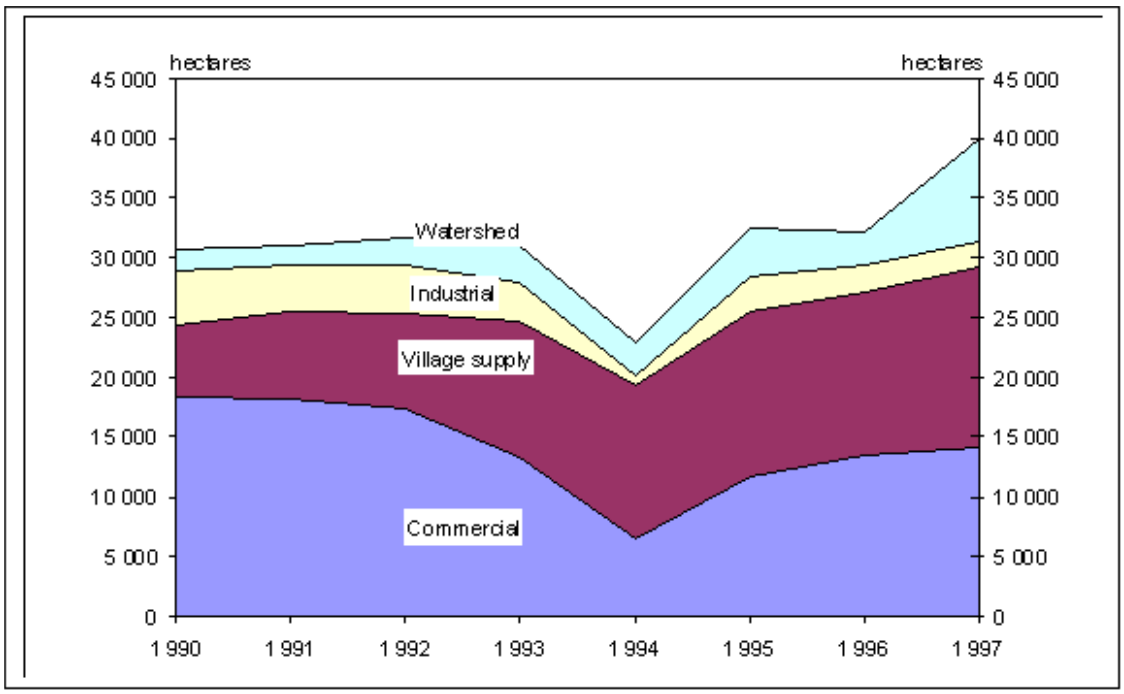
Source: Forest Department (1996)

The protected areas network in Myanmar is limited and covers 13 650 km2. The areas are divided into two categories a) 23 wildlife reserves (7 580 km2) and b) 5 national parks (6 110 km2). There is no information on how much of the land is forested but as the areas cover only 2% of the total land area, it may be assumed that only little otherwise productive forest is included.

## 2.2 Plantations

Production plantations play only a marginal role in Myanmar forestry; most of the planting done has been enrichment planting in and around natural forests and in due course the planted areas become part of the natural forest. After 40 years they are officially classified as natural forests. The enrichment planting is done in order to a) increase the share of commercially attractive species in natural forests and b) rehabilitate degraded lands. Recently some areas have been planted to establish commercial plantations but their areas are still small and they do not have a role in the national wood supply strategy. Other categories of plantations are village supply plantations producing fuelwood and construction wood, industrial pulpwood plantations and watershed production plantations. (Figure 2.2)

**Figure 2.2: Annual Plantation 1990-97**



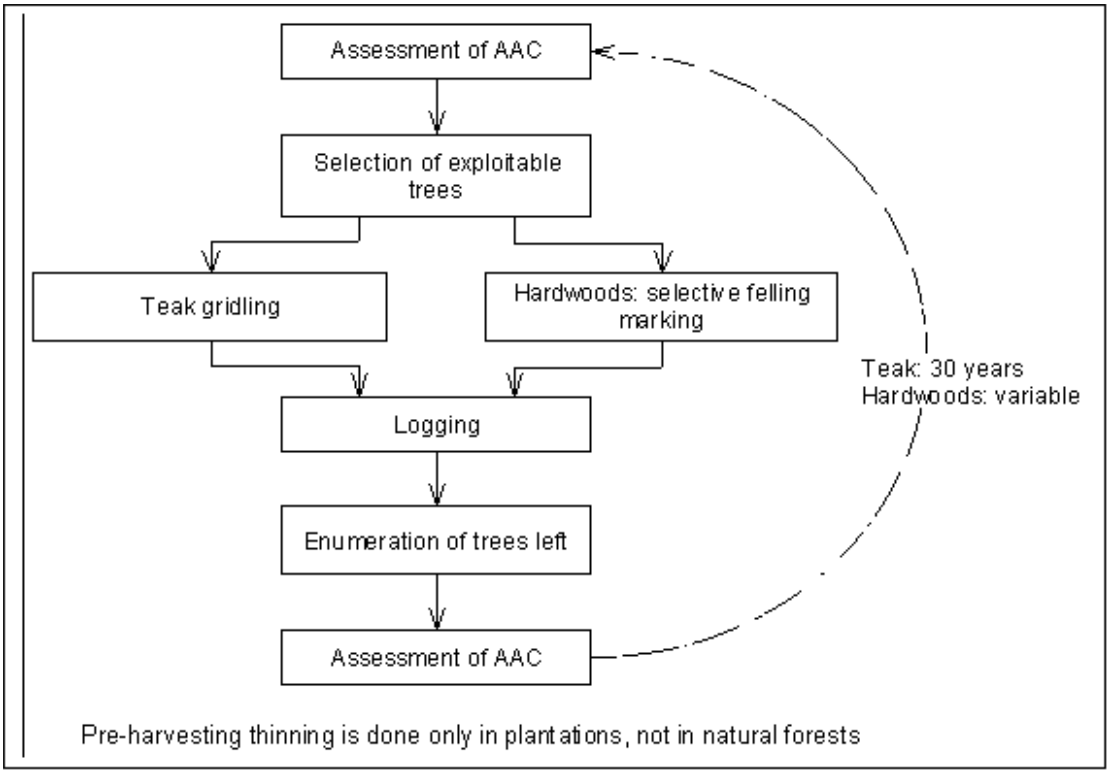

Source: Forest Department (1998)

In Central Myanmar a large forest rehabilitation project commenced in 1994-95 and it is still on-going. The *Greening the Nine Arid Areas*-programme is based on environmental protection and will also have a limited role in commercial wood supply. The wood grown will be used by the households.

### 2.3 Production potential

Myanmar – or Burma as the country was previously known – has followed scientific forest management for the longest time in the region. In 1856 the colonial forest authorities started to manage the forests following the Brandis Selection System, later known as Myanmar [Burma] Selection System, MSS. The system is based on selective logging of mature trees. The same basic approach is used for other hardwoods, though naturally modified to meet the specific requirements of various species. (Figure 2.3)

**Figure 2.3: Myanma Selection System**




Source: based on Forest Department (1997)

A notable feature in MSS is the essential role of *mixed* forests as opposed to homogenous even age structure. There have been trials on transforming mixed forests to uniform teak forests but they were deemed both silvicultural and financially infeasible.

Based on the number of juvenile trees surveyed during the logging operations under the MSS, the annual allowable cut (AAC) is established both for teak and other hardwoods. The AAC was in 1971-1997 609 500 $m^3$ for teak and 2 463 600 $m^3$ for other hardwoods. Due to imbalances in logging (over-logged teak and below AAC logging for other hardwoods) the AACs were adjusted from fy. 1996/97 onwards. AAC for teak was lowered to 409 100 $m^3$ and for other hardwoods respectively raised to 3 236 100 $m^3$.

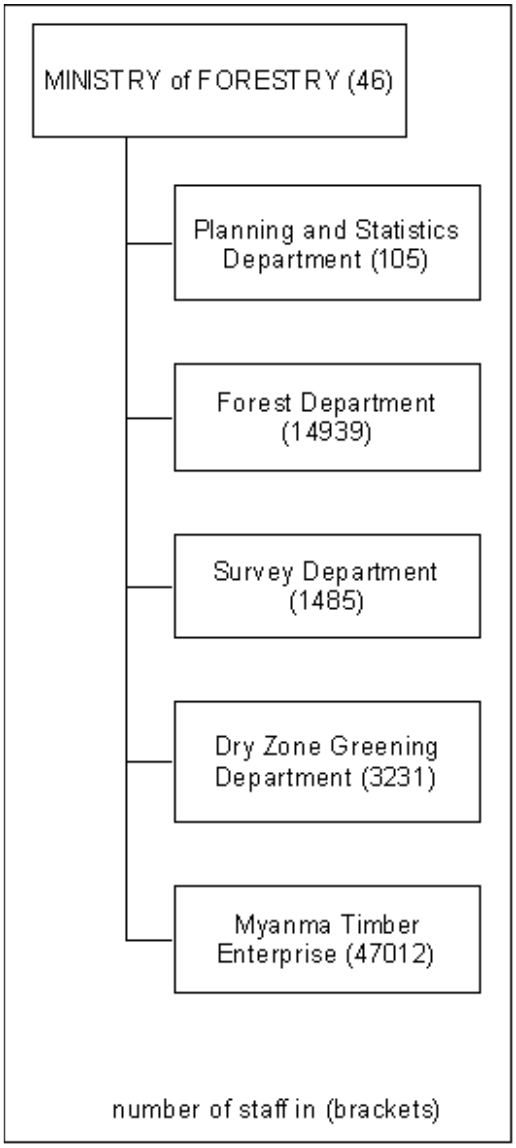
## 3. Utilisation of Forest Resources

### 3.1 Legal Framework

**Harvesting of Forest Produce**

All the natural forest resources are owned by the state and are managed by the Forest Department (FD) while extraction is vested in Myanma Timber Enterprise (MTE), both organization are divisions of the Ministry of Forestry. (Figure 3.1) Additionally, based on the Forest Law, *all* teak trees found are state property, even on private land, which obviously discourages private investment in teak plantations.

**Figure 3.1: Ministry of Forestry Organisation**




Source: Forest Department (1998)

The FD is in charge of the management of the MSS and its practical application. This process includes a) selecting the mature trees, b) marking the trees, and c) girdling of the trees (if not sold as green logs). According to the Forest Law:

18: In permitting the extraction of forest produce the Forest Department shall use the competitive bidding system if the extraction is for commercial scale. However, extraction for the following purposes may be permitted without using the competitive bidding system : -

(a): where extraction of forest produce and sales in and outside the country are carried out as State-owned enterprise; …

Despite the requirement of competitive bidding for logging rights, the MTE is the sole provider of logging services in the country and has a log monopoly in the country. Private enterprises may be sub-contracted to perform parts of the production chain. More than half of felling and most of haulage is subcontracted to outsiders.

Until 1993 there were forest concessions and the last ones were granted to Thai companies on the Myanmar-Thailand border areas. The concession holders, however, did often not respect the agreements and over-logged.

Consequently, the GoM decided to cancel all concessions in the country.

As the commercial arm of the Ministry of Forestry, MTE is the income generating body and has been able to achieve a more favourable position in terms of political influence and resources compared to the FD which is in charge of the sustainability of forest utilisation. However, there is evidence that the MTE business interests have become paramount to the application of the of the MSS. This has been stated even by the FD itself:

However, existing institutional capacity is unable to enforce scientific logging or to control heavy logging waste or loss of timber in transit.

The inadequate resources have led to, *e.g.* girdled trees being left behind and never harvested, loss during transport, and illegal logging. The relative weakness of the FD as compared to MTE may also be seen in the increasing the proportion of green logs, as opposed to girdled, in the total harvest.

**Forest and Forest Produce Industry**

The private sector may establish wood industries and have also done so. There are three categories of wood processing industry:

i. MTE sawmills and plywood mills; the enterprise has also some down stream processing facilities
ii. private enterprises, and
iii. joint ventures with foreign partners

Myanma Paper and Chemical Industries, a parastatal or State Economic Enterprise – term used for parastatals in the country, is the main paper producer in the country; there are also some waste paper-based cottage industry paper makers in the country.

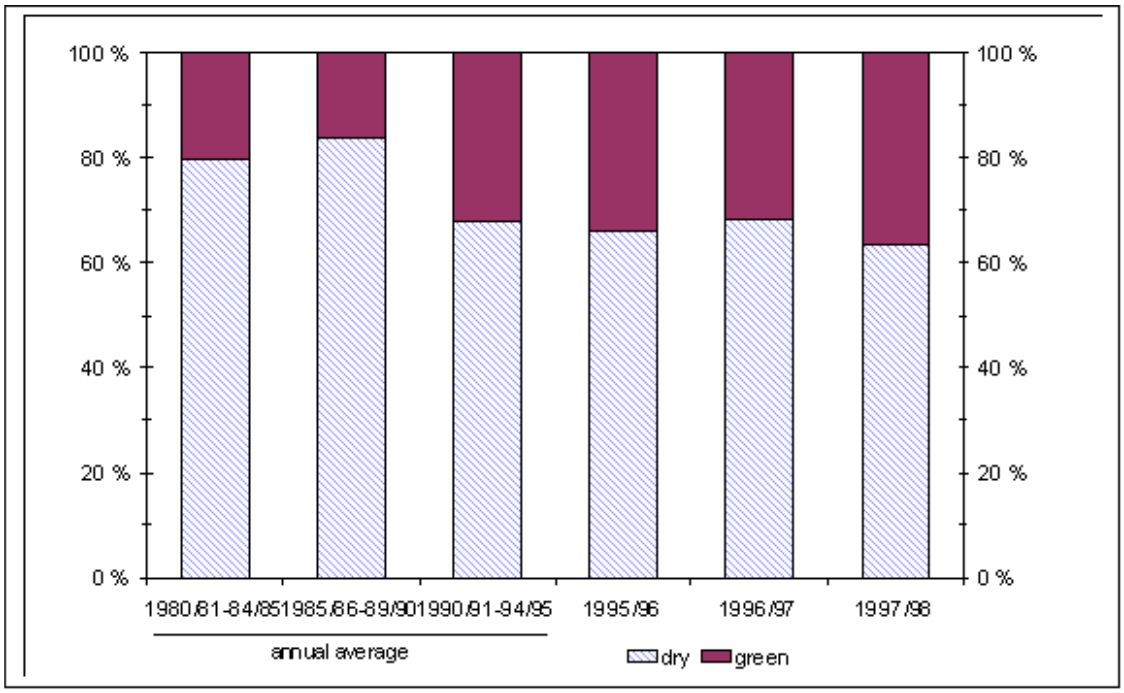
Mills with MTE ownership are allowed to process teak, the most valuable species, whereas the private mills may process the other woods. For a private sawmill to be able to purchase teak logs, it has to act *as if* foreign buyer and pay for the logs in US dollars. There has been no clear justification for this practise and it is not explained in the Forest Law. Both in harvesting and processing MTE has the privilege of operating with teak. This naturally benefits the enterprise but may lead to lower value added compared to fully competitive teak log market. Competition for this scarce resource would create an incentive to improve efficiency and share of value added production.

## 3.2 Harvesting

The Myanmar logging scene is well divided into two segments: teak and other hardwoods; this distinction is made both in the administrative set-up and operational planning. Logging usually takes place through a "two pass system", *i.e.* teak is harvested first and other species later. The road of teak from the forest to the market is slow; first, after girdling the trees are left to dry for at least three years but normally the logs are floated and it takes some 6-8 years. In total the time between a logging decision and entry on the market may be up to 9-11 years, in that time the markets will likely have changed a great deal.

This extremely long time span may be one reason behind the increased share of un-girdeled, green logs in the market. This way increased market demand may be met by utilising both the previously dried trees and the green logs; this naturally leads to decreasing volumes later on or respective over-logging. This *fast-track* to increased log income may also contribute to inadequate resources in the FD; MSS is labour intensive and since the management input is from the FD rather than from MTE, the authoritative comparison is in imbalance: MTE brings in money while the FD just spends it. (Figure 3.2)

**Figure 3.2: Green and Dry Teak Logs, 1980/81-1997/98**




Source: Forest Department (1998)

Official logging volumes have roughly been within the limits set by AAC; for teak since World War II there have been occasional years when the limit has been exceeded whereas from logging year 1974/75 until 1981/82 there was persistent over-logging until the situation was reversed thereafter, since 1982/83 until the latest information (1997/98) logging has been below official capacity. Individual years with over-logging are not problematic; one should actually analyse moving averages rather than single years. The analysis is, however, not as simple as first appears. The sustainability of Myanmar logging may be questioned for the following reasons:

a. *internal instability I:* Previously the whole country was not under Yangon government control and large forest tracts were unsafe or inaccessible to FD/MTE-controlled logging. Nevertheless, the AAC was not adjusted and the logging was carried out on much smaller forest estates than for which the AAC analysis was made.
b. *internal instability II:* There is no information on the volumes logged by insurgent armies and various warlords. The neighbouring countries report log import volumes much greater than the Myanmar export figures. This indicates that imports from the Myanmar territory are bigger than the MTE exports or that other illegal logs are labelled as Myanmar logs.
c. *illegal logging:* Even within GoM controlled areas there is notable illegal logging. This is made possible by institutional deficiencies in the administration and by simple poaching. The illegal logging may be both household/domestic logging and commercial logging for further processing or export. There are allegations that the forest authorities over-log due to financial difficulties within GoM, evidence, however, is scarce. In discussions with forestry stakeholders a figure of 20-30% was mentioned as the share that should be added on-top of official figures. It may be estimated that for teak illegal logging may take place for direct export whereas for other hardwoods domestic processing is also a possibility.
d. *concessions:* Concession arrangements were cancelled 1993 due to concessionaire misbehaviour. There is no information on the volumes over-logged in those areas.
e. *border areas:* Brunner *et al.* (1998) presents a large number of non-teak logging arrangements in the northern parts of Myanmar by the Chinese border; for example, various ex-communist armies would have been issued logging rights for export to China in exchange for a cease-fire. These logging rights are not officially acknowledged and the information available on these alleged arrangements is greatly conflicting.

The principal sales channels are transparent and market oriented. There are some differences between sales arrangements between teak logs and other hardwoods, the main one being that *all* teak logs have to pass through Yangon depots, and this has naturally led to a concentration of teak sawmills in and around the capital city. For other hardwoods local forest authorities are entitled to arrange sales, only export logs need to go through Yangon.

Pricing is based on competitive bidding by frequent sealed bids. There are some long term contracts, in these arrangements the price is not negotiated but based on the average of the prices paid in the past six months' auction sales. This approach applies both to domestic and foreign buyers and, despite the importance of forest exports, there is no MTE representation abroad. However, the MTE mills naturally do not have to compete for the

logs.

The auction system is seen as effective and a fair way of allocating logs. For example, Thai furniture makers see Myanmar as a reliable and easy-to-deal-with supplier of raw material compared to other countries in the region that have more administrative processes.

A peculiarity in the log trade scene is the Forest Products Joint Venture Corporation Ltd. (FPJVC), an enterprise owned by MTE (45%), FD (10%) and private investors (45%, usually members of the political and forest sector elite). The company is entitled a quota of hardwoods (no teak, latest quota 180 000 $m^3$, 12% of the total other hardwood logging in 1997/98) by the Minister of Forestry and it also pays administrative transfer prices based on extraction costs and not related to auction prices. They export 40% of the logs and the remainder is sold locally or processed by the company. In comparison to MTE, the FPJVC does not appear to offer any additional benefits to the country. It may be assumed that the enterprise has become a way to allocate the margin between transfer prices and market prices to the shareholders of the company, this advantage is obtained by administrative orders and not by the competitiveness of the company.

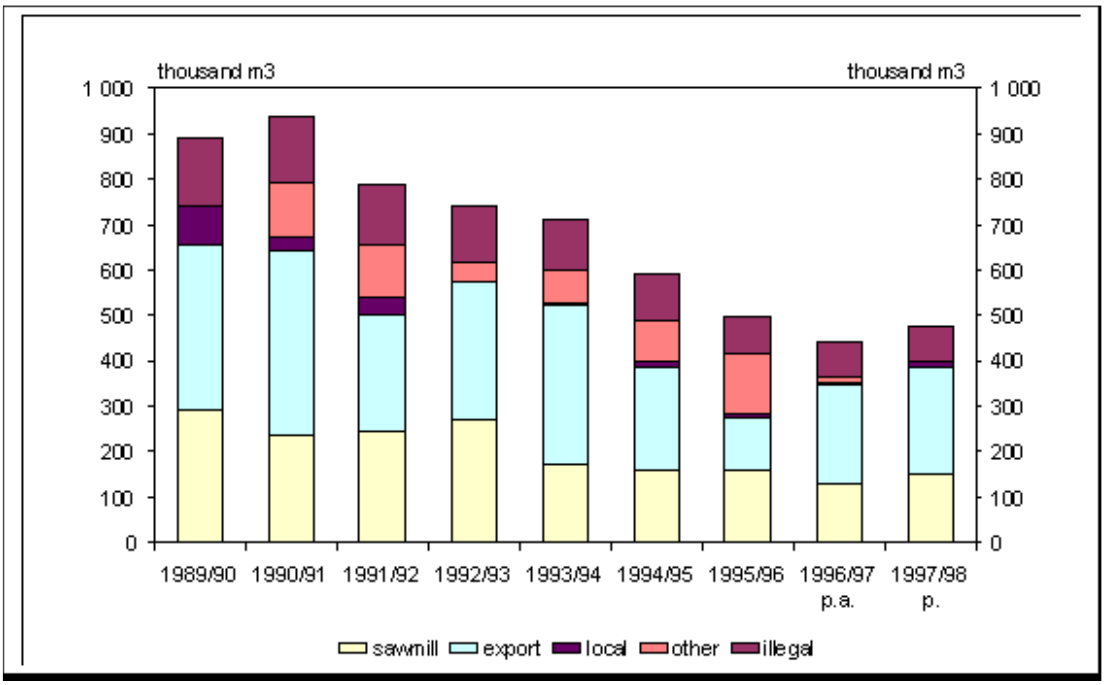
### 3.3 Logging Volumes

Logging volumes have been steady particularly in teak but also in other hardwoods. Teak has been a high end product and has had good demand also during economic recessions. In fact, the production volumes of teak have remained at the current level since before independence. For example, in the 1930's the average annual teak logging volume was 422 000 $m^3$ and hardwood logging was 724 000 $m^3$. The limits of teak logging have been set by the available supply and there always has been adequate demand to absorb the demand.

The illegal logging in the country has been estimated to be in the range of 20-30% of the legal cut but due to lack of reliable industrial statistics in the region – in Myanmar and the neighbouring countries – accurate estimates are not feasible without extensive field observations. The teak market is heavily monitored in Myanmar and it may be safely assumed that illegal logging at teak is in the lower end of the scale. There is no information on the volumes of teak logged by the Thai companies in their concessions until 1993.

The official teak removals have in the 1990's been fluctuating from levels around 800 000 $m^3$ to an estimated 360 000 $m^3$ and have had a declining trend. Assuming some additional 20% being illegally logged the total volumes have been reduced from 950 000 to 450 000 $m^3$. (Figure 3.3)

**Figure 3.3: Logging Volumes – Teak (1989/90-1997/98)**

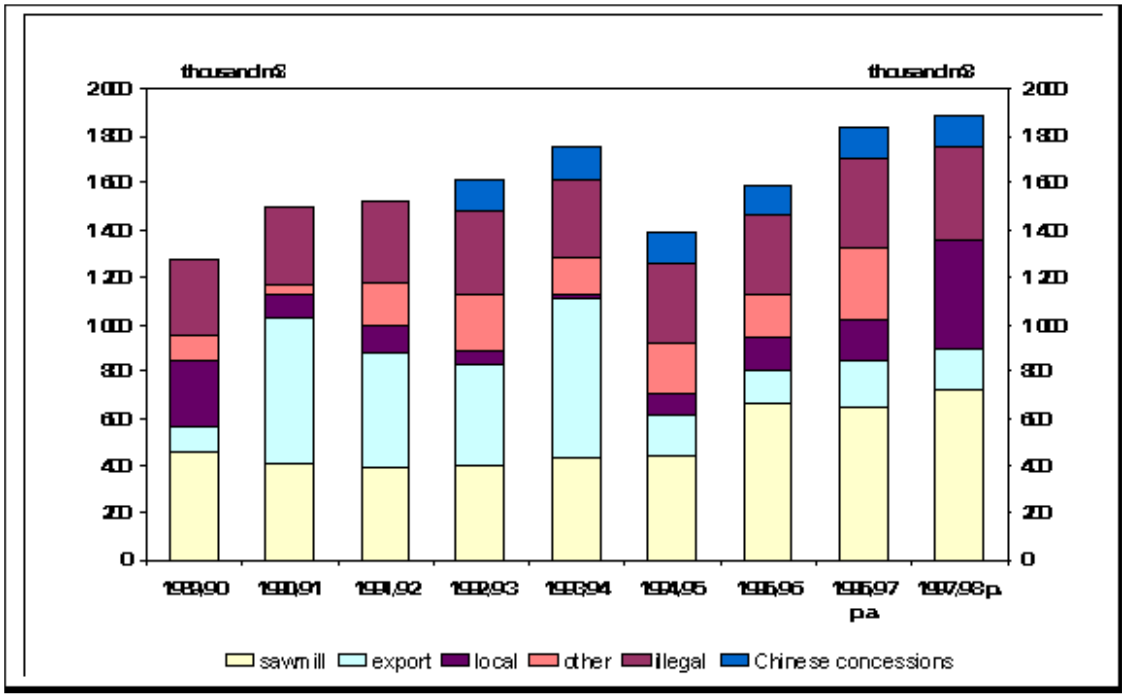



Source: Based on Union of Myanmar (1997) and consultant estimates

Most of the wood has been exported. There is no information on the markets of the illegally cut logs but it may safely be assumed that they are both exported in log form and processed locally for sawnwood exports.

The other hardwoods category has experienced much higher logging volumes; even legal volumes have been well above 1.0 mill. $m^3$. Additional logging takes place a) illegally (assumed here to be roughly 30%) and b) alleged concessions granted to Yunnanese (China) companies near the border with China. The concessions are not acknowledged by the Myanmar authorities (their existence would be against the declared policies) but have been reported by some independent observers. There is no information available on the volumes logged, but it may safely be assumed to be more than 100 000 $m^3$ annually. The volumes are likely to increase as Yunnan becomes wood deficit area from being an wood exporting province. (Figure 3.4)

**Figure 3.4: Logging Volumes – Other Hardwood (1989/90-1997/98)**




Source: Based on Union of Myanmar (1997), Brunner, J. *et als* (1998) and consultant estimates

## 3.4 Prices

The Myanmar forest sector has been lucky to be endowed ample teak resources. Teak is a high-end species and will be able to maintain an attractive price level even during economic downturns like the current Asian economic crisis. The situation in the country is also eased by the situation with trading partners: the most important importer of Myanmar wood is India, which has not been as hard hit as the South-east Asian countries.

For the price level in non-teak sales the crisis has had devastating impact and prices have less than halved in only four years. (Table 3.1)

**Table 3.1: Average Tender Price of Logs 1994/95-1997/98**

| | 1994/95 | 1995/96 | 1996/97 | 1997/98 |
|---|---|---|---|---|
| | | – USD/log – | | |
| Teak | 1 438 | 1 363 | 1 233 | 1 304 |
| - index | 100.0 | 94.8 | 85.7 | 90.7 |
| Hardwoods | 580 | 487 | 366 | 213 |
| - index | 100.0 | 84.0 | 63.1 | 36.7 |

Source: Export Milling and Marketing Department, MTE

### 3.5 Forest Policy

The GoM has produced two documents describing the official forest policy development strategy in Myanmar; Forest Law was issued in 1992 and the Forest Policy three years later in 1995. The forest policy emphasises the role of forests both in terms of environmental and economic value.

The Policy recommends improved efficiency and better planning in the management of forest operations. However, the policy is vague in terms of forest management and logging operations.

The existing institutional arrangements in forest industries and the role of MTE in particular are subject to much criticism in the Policy:

> In general the industry is plagued with problems of inadequate infrastructure, inappropriate investments, outdated technology, shortage of skilled labour, inefficiency, and high transport costs. Private industries in addition to these limitations are confronted with uncertainty the availability of raw material supplies as MTE which has the first charge on the logs produced, export the round logs, and only the surplus is made available to the industry.
>
> ….
>
> Due to inefficient facilities, the average unit value of lumber export when converted to the corresponding log input is lower than those of unprocessed logs.

The Policy recommends more market oriented approaches in log allocation and removal of state ownership in processing industries. The Policy is, however, somewhat inconsistent by proposing specific mills to be established; if the investment process was fully market oriented the investment decisions would be made by private investors rather than the state. The Policy also recommends log allocation quotas for the small mills. This proposal should not be implemented as it will lead only to increased inefficiency and excess capacity since the ability to get raw material would not depend on financial performance. It would also be difficult to combine with market based, non-administrative pricing of the logs.

Particularly the analysis and some of the recommendations on forest industries are worth implementing. The policy development processes appears to have been halted half way; the level of policy implementation and the commitment of the authorities is lacking consistency, and the document has not led to a nation-wide consultative process as should be the case.

### 3.6 Certification of Forest Management

The Myanmar forest authorities have identified the importance of the certification of sustainable forest management and its increasing role in the marketing of forest products, particularly in Europe and North America. Myanmar exports large quantities also to India and other Asian countries; in these markets environmental pressures have not yet emerged. However, the Myanmar exporters have already felt the impact of appeals for sustainable forest management in their export endeavours.

The first steps in the establishment of a national, Forest Stewardship Council approved certification scheme were taken when a national working group consisting of the FD and Forest Resources and Environment Development Association (FREDA, a forest sector NGO) drafted national guidelines on the criteria and indicators (C&I) of sustainable forest management.

After the draft C&I-process the optimal administrative and organisational set-up needed to be identified and designed. This process has been hampered by the lack of adequate financial resources. It has, however, been estimated that the current forest management approach (MSS) should be acceptable in certification. There are also considerations in the process other than just the technical management of the forests and biodiversity values. Also the rights of indigenous communities and public participation are to be considered and these need to be studied in detail in the Myanmar set-up. The current utilisation of the production forests is strongly led by the FD with little or no community participation. This needs to be taken into consideration in the forest certification schemes.

## 4. Forest Industries

### 4.1 Industry Structure

The Myanmar wood industry scene is dominated by sawnwooding and MTE sawmills in particular. Other wood industries consist of five state-owned plywood mills and another five state-owned furniture factories. In the private sector the category of *Domestic Industry* covers both furniture and other value added production, apparently with small capacities. (Table 4.1)

**Table 4.1: Wood Industry Units**

| Type of Industry | MTE | Private | Total |
|---|---|---|---|
| Sawmills | 96 | 459 | 555 |
| Recutting mills | | 1224 | 1224 |
| Domestic Industry | | 487 | 487 |
| Plywood | 5 | | 5 |
| Furniture | 5 | | 5 |

Source: Export Milling and Marketing Department, MTE

There is no information available on the total production capacity of the Myanmar sawnwooding industry. Seven of the MTE sawmills concentrate on processing teak logs for export while the remainder processes other hardwoods and domestic market teak. The total installed capacity of these export teak mills has been estimated at 285 000 $m^3$, log intake, resulting – with 35% recovery – in annual production volume of 100 000 $m^3$ of teak sawnwood, *i.e.* the average capacity would be 14 300 $m^3$.

In view of the large number of non-teak sawmills and the teak/non-teak ratio in logging, it may be safely assumed that the non-teak sawmills are smaller than the teak mills, and likely average a few thousand cubic meters per mill.

As discussed above, the MTE mills and some private able to pay US dollars for the logs are entitled to process teak. Most, almost 90%, of the legal sawnwood exports consist of teak. Thus most of the private sawmills cater for domestic markets and illegal exports. The private mills are located round the country, the largest concentration may be found in Mandalay and, interestingly enough, in the southern states and divisions near the southern Thai border: Bago, Kayah, Mon and Tanintharyi.

### 4.2 Forest Industry Production

Data on private sector wood processing is not collected, only on MTE-owned units. The enterprise has a dominating role in the sector and its data may be used as a proxy to describe developments in the country.

MTE sawnwood production has been declining since the peak year 1990/91 when the total production was 874 000 $m^3$. Current production is clearly dominated by non-teak species; only 7% of sawnwood production is teak while the plywood market is even more dominated by non-teak, only 2% is teak plywood. (Table 4.2 and Figure 4.1)

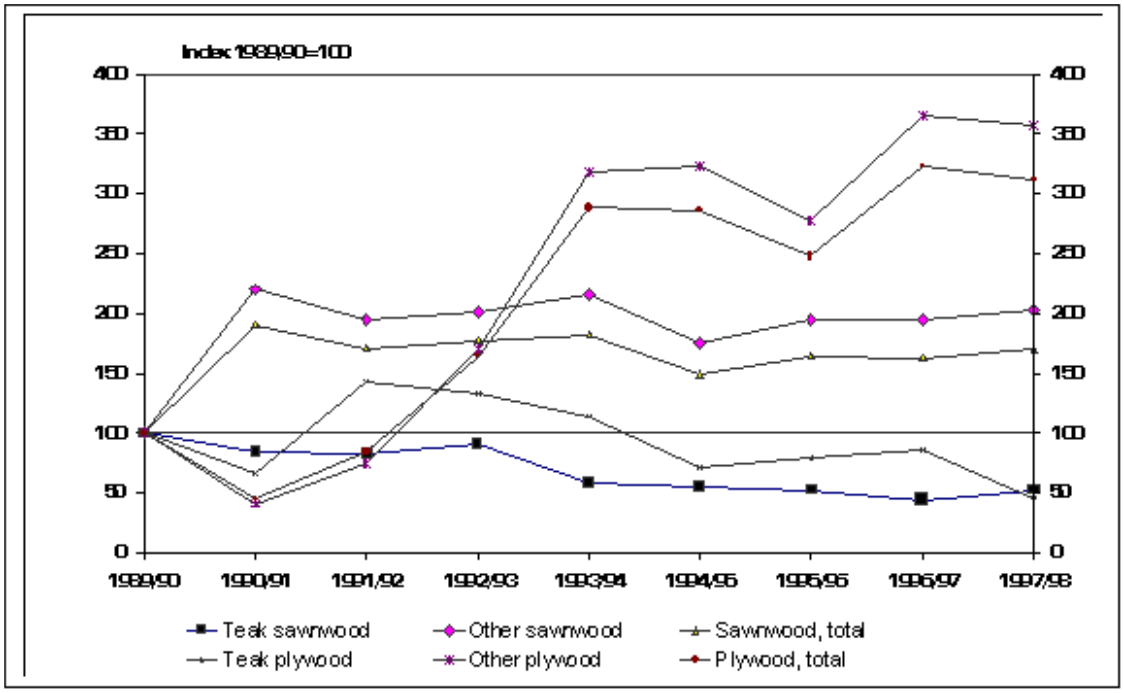
**Table 4.2: Wood Industry Production (1990/91-1997/98)**

| | 1990/91 | 1995/96 | 1996/97 | 1997/98 |
|---|---|---|---|---|
| | | – $m^3$ – | | |
| **Sawnwood** | | | | |
| | 83 500 | 51 700 | 43 500 | 51 100 |
| | 799 900 | 708 600 | 710 4008 | 737 600 |
| Sub-total | 883 500 | 760 300 | 753 900 | 788 700 |

| | | | | |
|---|---|---|---|---|
| **Plywood** | | | | |
| | 1 100 | 1 400 | 1 500 | 800 |
| | 4 100 | 27 900 | 36 700 | 36 000 |
| Sub-total | 5 100 | 29 300 | 38 200 | 36 800 |

Source: Export Milling and Marketing Department, MTE

**Figure 4.1: Wood Industry Production 1989/90-1997/98 (MTE, index)**




Source: Export Milling and Marketing Department, MTE

Capacity utilisation in teak sawnwooding is fair. The total installed production capacity is 100 000 $m^3$ while the actual production is 40-50 000 $m^3$ making the capacity utilisation some 50%. From a business management view it is low but compared to regional figures it is acceptable.

## 4.3 Pulp and Paper Industry

There are only two paper mills in the country. Originally their processes were based on utilising eucalyptus and 10 700 ha of eucalyptus plantations were established. This continued until 1993 when the pulpwood plantation establishment was discontinued.

Eucalyptus was soon replaced by bamboo as the main raw material and a pulp bamboo quota was established to guarantee a share of the total 9 million piece annual quota for the mills. Bamboo grows naturally in various parts of the country.

All bamboo to the mills comes from private sources and the FD estimates that an estimated growing stock of 21 million tons provides an annual yield of 1.1 mill. tons on a sustainable 10-year rotation. This is estimated to be adequate for the existing pulp capacity in the country.

Production volumes have remained stable throughout the 1990's: paper production has been in the range of 15 000 tons. Market pulp production ended in 1995. (Table 4.3)

**Table 4.3: Pulp and Paper Production**

| | 1988/89 | 1989/90 | 1990/91 | 1991/92 | 1992/93 | 1993/94 | 1994/95 | 1995/96 | 1996/97 | 1997/98 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | – tons – | | | | | |
| Pulp | 1760 | 3900 | 800 | 1600 | 2200 | 900 | 1200 | – | – | – |
| Paper | 8800 | 1500 | 10400 | 13700 | 13700 | 14000 | 15000 | 15600 | 15900 | 18300 |

Source: Export Milling and Marketing Department, MTE

### 4.4 Production Efficiency and Waste Management

MTE has noticed the need for improved environmental management and measures have been taken to make the personnel accept the concept by means of training courses, *etc*. However, the MTE management sees wood industries as environmentally friendly and the only harmful emissions come from the plywood industry which uses glues and polishing chemicals.

The MTE mills are old, only one of the plywood mills was built in the 1990's and none of the export sawmills. There is no information on the average log size delivered to the industries. Generally in the region they have been declining, making the older machinery inappropriate as it is designed to process larger logs. This may be the case also in Myanmar because, particularly the teak recovery rate, at 35% in sawnwooding, is low. There have been inadequate replacement investments and lack of spare parts for decades making much of the machinery, if not obsolete, malfunctioning. Production is also hampered by insecure power supply and inadequate infrastructure.

The unfavourable circumstances, if not directly leading to harmful emissions, have been contributing waste and inefficient raw material use.

## 5. International Wood Trade

### 5.1 Exports

Forest products are the main source of export earnings for Myanmar, providing 24% of the export revenue in 1996/97. The export forest produce categories and their importance in terms of export earnings are presented below in Table 5.1. Round wood is clearly the dominating product. The processed products together provide only 1/5 of the total revenue.

**Table 5.1: Exports by Category (late 1990's)**

| Category | Share of earnings |
|---|---|
| | – % – |
| Round logs | 80-85 |
| primary forest industry products (sawnwood, plywood and veneer) | 10-15 |
| value added wood industry products (floorings, mouldings, finger jointed wood and furniture) | 5 |

Source: Export Milling and Marketing Department, MTE

Teak sales are a state privilege and only the MTE can export logs from the country. This export prerogative applies both for teak and other hardwoods. Domestic market trade in other hardwoods is open to all; the private sector may only export processed other hardwoods. The local private mills may, however, act *as if* foreign buyers if they are able to buy the teak logs in United States dollars rather than the national currency; kyat. Once processed in the country teak may be exported.

Teak export sales are arranged two using two options:

1. *primary* Round wood is sold by auction and sawnwood based on a price-list
2. *secondary* Slow moving sawnwood inventory may also be sold by auction. A specific concern is given to apply floor prices near list prices; this is to protect customers who have bought wood on price-list prices.

The non-teak hardwoods are sold by tender. Their current market situation is, however, weaker due to the current crisis and fierce competition from other countries in the region. This has led to a declining and discouraging price level.

Practically all exports go through Yangon, only some 5% are shipped from the other ports: Pathein and Bokepyin. From February 1999 experimental sales by MTE directly to Yunnan were allowed on a temporary basis.

The main markets for Myanmar logs and sawnwood are found in neighbouring Thailand and India. It may be safely assumed that much of the wood going to Hong Kong ends up in the Chinese market, particularly as the exports are dominated by non-teak as opposed to all non-Chinese markets (Table 5.2)

**Table 5.2: Exports 1997/98**

| | Logs | | Sawnwood | | Total, rwe | | Total | |
|---|---|---|---|---|---|---|---|---|
| | teak | other | teak | other | teak | other | | |
| | – $m^3$ – | | | | | | | – % – |
| India | 106 600 | 166 400 | 0 | 100 | 106 600 | 166 600 | 273 200 | 61 |
| Thailand | 35 800 | 29 600 | 3 300 | 400 | 45 200 | 30 600 | 75 800 | 17 |
| Singapore | 19 100 | 400 | 10 100 | 0 | 48 000 | 400 | 48 400 | 11 |
| Hong Kong | 6 000 | 17 200 | 2 600 | 1 700 | 13 400 | 21 200 | 34 600 | 8 |
| Europe | 4 800 | 0 | 1 800 | 0 | 9 900 | 0 | 9 900 | 2 |
| China, PR | 3 000 | 0 | 0 | 0 | 3 000 | 0 | 3 000 | 1 |
| **Total** | **175 300** | **213 600** | **17 800** | **2 200** | **226 100** | **218 800** | **444 900** | **100** |

Source: Export Milling and Marketing Department, MTE. Recovery rates teak 35%, others 42%.

The exports are dominated by logs; it is apparent that the customers wish to process the logs themselves. This may be due to a) own processing provides more flexibility and b) the produce from Myanmar mills may be of inadequate quality. The neighbouring countries prefer logs whereas other markets prefer sawnwood. The close markets are more price sensitive and have tariffs protecting domestic processing. (Table 5.3)

**Table 5.3: Export Structure**

| | Logs | | Sawnwood | | Others | Total |
|---|---|---|---|---|---|---|
| | Teak | Others | Teak | Others | | |
| | – % of exports – | | | | | |
| India | 90 | 8 | 2 | 0 | 0 | 100 |
| Thailand | 82 | 8 | 9 | 0 | 0 | 100 |
| Hong Kong | 67 | 11 | 21 | 0 | 0 | 100 |
| Singapore | 49 | 1 | 45 | 0 | 5 | 100 |
| Europe | 40 | - | 53 | 0 | 7 | 100 |
| China, PR | 8 | 32 | 57 | 0 | 3 | 100 |

Source: Export Milling and Marketing Department, MTE. "0" means less than 1% and "-" means no trade.

### 5.2 Imports

Forest sector imports to Myanmar are very small. The bulk of the imports consist of paper industry products and other consumer goods. For wood industry products the imports consist of both high end consumer goods and special construction structures. The imports are based on lack of appropriate processing technology in the country rather than raw material base.

## 6. Demand–Supply Balance

### 6.1 Commercial Utilisation

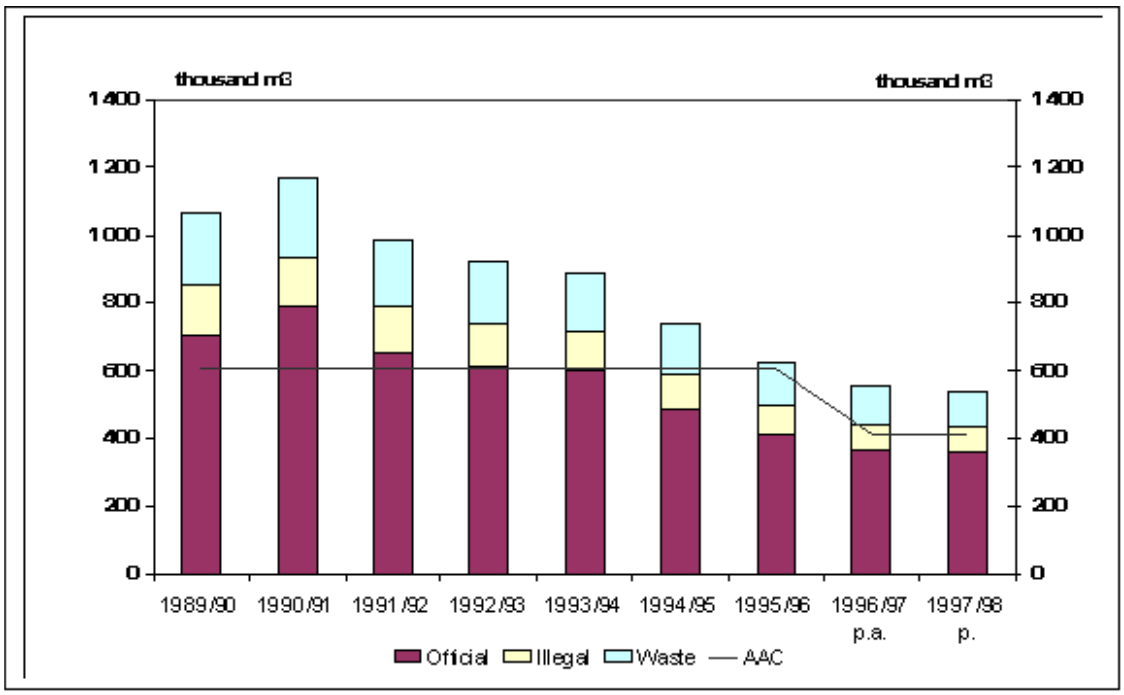
Commercial logging comprises both pure commercial logging and the non-fuelwood household wood utilisation. The Myanmar forestry is managed in two separate lots; teak and other hardwoods and also the demand–supply-balance is analysed accordingly.

**Teak**

Teak is by far the most important species in forestry in Myanmar and it has been sought after for centuries. The allowable cut is based on *removals* whereas the production figures include only *wood marketed*. During the long path there are losses and waste that has to be included in the analysis. Both MTE and FD see logging and transport waste as a major problem and it may be assumed that the waste level may be at least 25% of the final production, *i.e.* in order to market 100 $m^3$ of logs 125 $m^3$ need to be harvested.

The teak scene in Myanmar has been on the edge of sustainability throughout the 1990's but only once has the estimated total removals been below the AAC. In the early years of the decade even official production was above the sustainable level. Since then volumes have decreased. In 1996/97 AAC was lowered, setting the actual removals again above the sustainable level. (Figure 6.1)

**Figure 6.1: Teak – Utilisation vs. Annual Allowable Cut**




Source: Export Milling and Marketing Department, MTE, Forest Department (1998) and consultant estimates

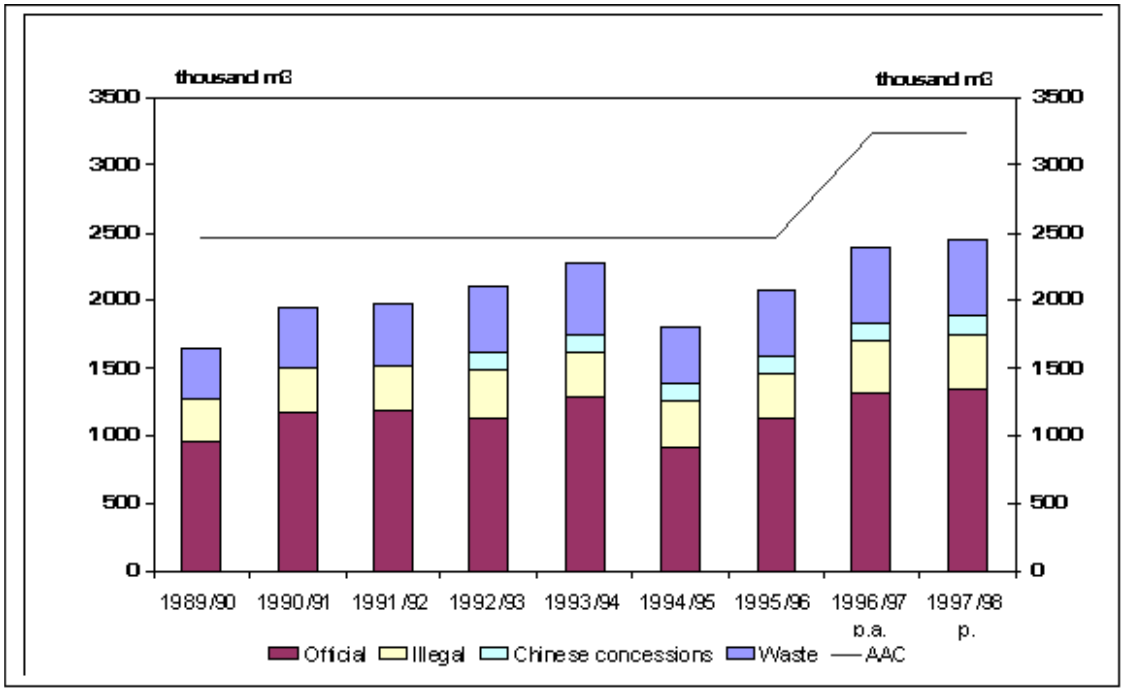
**Other hardwoods**

Decline in teak volumes have been compensated for by an increase in the utilisation of other hardwoods. This

has been justified by the "under-utilisation" of the resource. As this category is less valuable and less thoroughly controlled the wastage rate has been estimated at slightly higher at 30%.

In recent years, like earlier in 1992-94, utilisation has been reaching the AAC-level. The difference between the estimated removals and the AAC increased when the sustainable level was raised to reflect below AAC logging in the previous decades.

**Figure 6.2: Other Hardwood – Utilisation vs. Annual Allowable Cut**



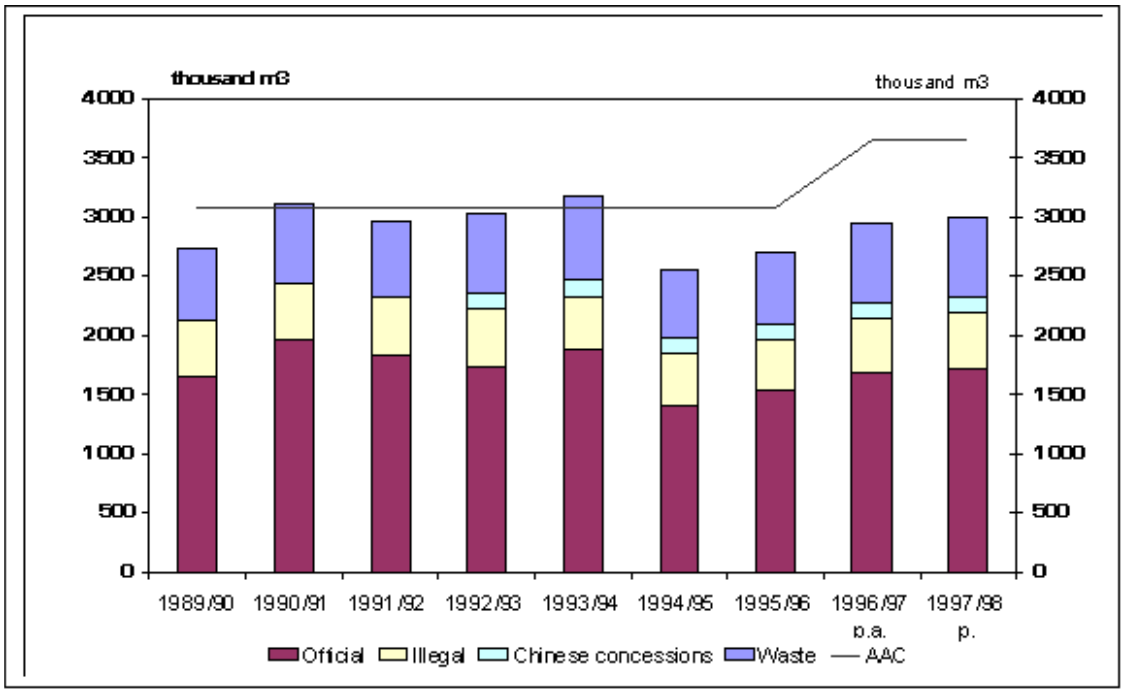

Source: Export Milling and Marketing Department, MTE, Forest Department (1998) and consultant estimates.

**Total Commercial Utilisation**

Though the AAC is set separately for teak and other hardwoods, the combined impact describes the pattern in terms of sustainability, watershed management and maintenance of forest cover.

The below potential of other hardwood logging has replaced the occasional unsustainable logging of teak. Teak and other hardwoods form mixed forests and it thus may be concluded that instead of causing notable deforestation in Myanmar, the unbalanced forest operations have caused a diversion in the structure of the forests; teak has had to give room for other, lower value species. (Figure 6.3)

**Figure 6.3: Commercial Logging – Utilisation vs. Annual Allowable Cut**




Source: Figure 6.1 and Figure 6.2

It is apparent that Myanmar logging is on the edge of sustainability and removals should rather be marginally reduced rather than increased. This does not necessarily mean lower forest production; efficiency both in forest operations and processing is low, and by concentrating efforts in efficiency improvement the sustainability could reinstated.

## 6.2 Household Utilisation

Like in all developing countries, domestic or household use of wood is, in volume terms, by far the largest category of wood demand in Myanmar. This type of demand may be classified into two main classes: wood energy (fuelwood and charcoal) and construction wood.

The Myanmar Forest Law is liberal in terms of household wood utilisation (emphasis added):

> 17 Forest produce may only be extracted after obtaining a permit. However, if it is for domestic or agricultural or piscatorial use not on a commercial scale, *forest produce may be extracted* in an amount not exceeding the stipulated [however, there is no reference to which stipulation the reference is] quantity, *without obtaining a permit*.

Thus for domestic purposes the forests are a public access domain. This should be seen as an acknowledgement of the state of facts; the rural communities have since the beginning of time utilised the resource around them and would see no reason to either obtain a license, not to mention pay any royalties for the wood. The Forest law does not dictate which type of wood may be utilised, and for what purposes, under the domestic use allowance.

The private sector logging data in Chapter 3 includes household harvest of construction wood but there is no field observation data available on the volume of non-fuelwood household demand of wood *per capita*. The logging of other hardwoods – even including illegal logging and logging waste – is clearly below the sustainable yield, thus at national level household demand should not put sustainability in any jeopardy. However, this does not always apply at local level, there local sustainability may be endangered by excessive local utilisation.

## 6.3 Wood Energy

Recent information on the wood energy pattern in Myanmar is scarce. In 1990 the woodfuel demand – including both fuelwood and charcoal – was estimated at 35.9 mill. $m^3$ (28 mill. air dry ton), annual increase from 1980 was estimated at 2%: the increase in woodfuel demand would thus follow population growth patterns, slacking only little behind due to introduction of other energy sources and more efficient wood utilisation. Charcoal is used

mainly in urban areas, and Yangon in particular; it made up only 4-5% of the total woodfuel demand.

Myanmar has a wide network of local supply plantations (*c.f.* Chapter 0) providing the adjoining villages with fuelwood and other wood demanded in the household sector. Other notable sources of fuelwood are degraded forests, areas affected by shifting cultivation and naturally also closed forest. This supply has not been seen as adequate in the country and it has led to an increasing woodfuel deficit in Myanmar. It has been estimated that the current deficit, or unsustainable supply, would be in the range of 1/3 of the total demand, *i.e.* only the remaining 2/3 of the demand would be met from sustainable sources. (Table 6.1)

**Table 6.1: Woodfuel Demand–Supply-balance (1990-2005)**

| | **Supply** | **Consumption** | **Deficit** | |
|---|---|---|---|---|
| | **– million $m^3$ –** | | | **– % –** |
| 1990 | 27.6 | 36.2 | 8.6 | 24 |
| 2000 | 26.8 | 41.7 | 16.9 | 38 |
| 2005 | 24.1 | 45.9 | 21.8 | 48 |

Source: Forest Department (1997)

The deficit problem is not however, countrywide, it has been estimated that 7-9 of the 14 states and divisions in the country suffer from the deficit while states with low people/forest area-ratio are less disadvantaged.

In order to overcome the situation GoM has initiated large reforestation and fuelwood plantation programmes but they have not been able to fully eradicate the problem. Assuming an annual growth of 14 $m^3$/ha on fast growing fuelwood plantations with low input levels, the total plantation area needed to cover the estimated 22 mill. $m^3$ deficit would be approximately 1.6 mill. ha. This objective is well beyond the current establishment pace of village/local supply plantations; only 180 000 ha have been established since 1896. In the past ten years annual establishment has been in the range of 7 000-15 000 hectares which is, by a wide margin, an inadequate rate.

The area for the extra plantations could well be found in areas currently extensively degraded by shifting cultivation. The required woodfuel would cover some 10% of this category, the advantage being that these areas a) are close to rural communities and b) the current use is extensive. Another option may be found in rehabilitation of degraded forests. In order to succeed, the role of the local communities and their ownership in the plantation establishment process cannot be overemphasised; the initiative and need have to arise from the communities and their members, top-down approaches will not achieve sustainable and long-lasting results.

The dynamics of woodfuel demand–supply are complicated and more manifold than those of commercial logging, and in the current analysis may be seen as superficial. For more discussion of woodfuel demand–supply-analysis, see Box 1.

Supply side interventions are, however, not the only path to follow, also demand may be influenced. In Myanmar attempts have been made to introduce both fuel-saving stoves and to substitute energy sources. The GoM has formed a Committee for Innovation and Distribution of Firewood Substitution Fuel for Arid Regions to promote alternate sources of rural energy. Agricultural waste has been identified to be a major source of supply of wood substituting fuel. The waste has, however, use in the agricultural sector; when expanding the energy use of agricultural waste due care needs to be made to ensure that the waste would not have fertilising use in agriculture.

There are also other, more positive estimations on the woodfuel balance in Myanmar. An FAO sponsored *Regional Wood Energy Development Programme in Asia* (RWEDP) has analysed not only the supply from forest land but also from other, mostly agricultural land. In the project region as a whole it was estimated that the supply of woodfuel from agricultural land is about equal to that from forest land. In 1994 the various sources of woodfuel were estimated as:

- sustainable woodfuel from forest land 35% of wood fuel mass
- sustainable woodfuel from agricultural areas 31%
- sustainable woodfuel from other wooded land 3%

- waste woodfuels from deforestation 31%

There is also notable supply from crop residues which also could have use in agriculture

Based on the assumptions of RWEDP the woodfuel situation in Myanmar is less alarming than assessed by the Forest Department. According to them there would have been a notable surplus in 1994 and still in 2010, though the relative surplus would decline to some extent.

**Table 6.2: Woodfuel – Potential Supply and Estimated Consumption (1994 and 2010)**

| 1994 | | | 2010 | | |
|---|---|---|---|---|---|
| **Supply** | **Consumption** | | **Supply** | **Consumption** | |
| **– kton –** | | **– % –** | **– kton –** | | **– % –** |
| 129 935 | 23 058 | 18 | 106 930 | 31 183 | 29 |

Source: RWEDP (1997)

**Box 1 Woodfuel in National Demand–Supply-Analyses**

The dynamics of household woodfuel analysis differ from those of commercial logging. Much of the fuelwood is collected for subsistence use and consequently does not have a monetary value. Another specific characteristic is that the commodity is to a large extent non-tradable. Energy for cooking and heating is a basic necessity in human life and thus its demand must be met; consequently people will always find ways to fulfil the need. Even if this happens at the expense of production activities such as agriculture, or even if it were obviously unsustainable.

The main differences to the dynamics of commercial logging are:

- even if some species are preferred over others as fuelwood, in principle *any* woody biomass will do
- technically there is no lower limit in size of wood to be utilised; for very small pieces the economic price of collection may, however, be high. In any case, much smaller pieces are used than in commercial logging, hence the use of logging residues as fuelwood
- demand creates new supply; people have innovative approaches to meet their woodfuel needs
- in the case of a fuelwood deficit, demand will divert to ever smaller, previously under-utilised fuelwood sources. In such cases demand creates respective supply
- there is no *national,* not to mention international, market for fuelwood. Low unit value if traded inhibits long transport distances. This impact is strengthened by the generally modest monetary income of the segment of population that uses woodfuel. Ideally woodfuel demand–supply-analysis should be carried out at village or district level. At national level there a large number of localised markets rather than one single national market.

## 7. Conclusions and Recommendations

### 7.1 Current Situation

Basically as far as forest resources are concerned the forestry situation in Myanmar is relatively steady; there are abundant resources, and much technical know-how on forest management and even the deforestation rate is quite low, lower than for example in Thailand, a country that has had a logging ban for the past ten years.

The issues in Myanmar are related mainly to a fuelwood deficit and the institutional set-up in forestry and forest utilisation. A specific feature has been the insurgency groups in some border areas, particularly as some of the

groups have been financed by logging revenues. However, now most of the country should be under Yangon government control and that would enable the restarting of scientific forest management in the country.

## 7.2 Recommendations

### Information Systems and Forest Statistics

There is a need to increase the collection and dissemination of forest resource, forestry operation and forest industry information and statistical data. Information is a powerful tool in managing and analysing the sector. It is recommended that Myanmar initiates a program to collect forestry data and publish it; this process would include a national level forest inventory, research on growth and classification of forests and the economics and social aspects of forest utilisation. The research initiatives particularly needs to be started soon as obtaining results takes a long period of time. For effective and transparent forest management and forest policy implementation it is essential that forestry related statistical data be widely collected and made accessible in a consistent and coherent manner.

Development could go through a two-step process:

a. naming independent body/ies, *e.g.* a research institute or national statistical institute, responsible for such information services. The institute would have a right to collect all relevant market and forest resource information in Myanmar. They would also have access to all relevant information already collected in the country.
b. the institute[s] would publish the information in such a way that no information from a single market player would be disclosed.

All the countries in the GMS region need to strengthen their forest statistics systems and their development should be harmonised in the region. The initial stage would be to jointly agree upon the nomenclature, methodology of measurements and units of measurement. The harmonised level would form the minimum level, *e.g.* in eight-digit production and trade nomenclature harmonisation would reach six-digit level leaving two for national specifications.

In needs to be stressed that the data collection and actual statistical work would be a national responsibility, but would be based on the jointly agreed standards. The regional co-operation would have three main benefits compared to entirely national processes: a) training and training material production could be partly jointly implemented, b) development costs per country would be lower, this particularly applies to expensive and time consuming computer software development, and c) common nomenclature enables further regional co-operation in analysing and monitoring wood flows.

### Fuelwood Supply Interventions

According to the official estimations Myanmar woodfuel is in a serious imbalance; it is estimated that soon almost half of the supply will be from unsustainable sources leading either to downright deforestation or to forest degradation. Either of these would have serious impacts on a) immediate environment, b) watershed functions and c) commercial forestry.

Other research projects, however, a provide less gloomy picture and actually there would be notable surplus of wood biomass for energy. It is of primary concern to further analyse the woodfuel supply and particularly, availability in Myanmar. The studies should be carried out on a local level by interviewing people – and women in particular – on their woodfuel strategies. This would disclose potential areas of actual deficit, even if modelling did provide adequate supply.

The need for expanded woodfuel plantations has been estimated – based on GoM estimations – at 1.6 mill. ha, or equivalent to supply potential, assuming the current utilisation pattern. Assuming the plantation establishment cost of USD 200/ha the total financing needs become USD 320 mill., 145% of total forest sector export earnings in 1996-97, or 240% of the FD expenditure budget 1998-99. This may be estimated to be well beyond the means of the country.

The results of combining voluntary community activities with FD's technical know-how and extension, if not facilitation, may be obtained much more economically. This approach also ensures community ownership in the plantation schemes.

It is recommended that the GoM, together with NGOs, FD, MTE and other stakeholders, emphasise woodfuel supply issues in the community forest management schemes which are, and should be expanded. Woodfuel security may even become a primary objective of community forestry, in particular taking into consideration the

difficulties in combining MSS-based forest management with community/joint management of the forests.

An option to finance the fuelwood plantations and the rehabilitation of the degraded forests could be a fee levied on commercial logging, *i.e.* a fixed part of the royalty, to be distributed to fuelwood promotion through appropriate institutional arrangements.

**Organisational Restructuring**

The institutional set-up in Myanmar commercial forestry is not without deficiencies the major one being the two "competing" forestry institutions: FD and MTE. The forest policy proposes that:

- The role of MTE as producer and processor should be redefined to entrust responsibility for only harvesting, marketing and trade of forest produce on a commission basis
- The MTE should be assigned an autonomous status so that it runs on a business enterprise basis
- Processing units owned by MTE should be privatised…

These policy statements should be immediately implemented, and the FD, and the FD only, should become the paramount guardian of the natural forests of Myanmar. The long term objective should be that THE FD sells stumpage to the private sector for processing. If deemed necessary for law enforcement reasons, MTE could remain as a non-profit oriented parastatal logging enterprise, but it should have only a clearly defined and limited technical role; while all management and policy decisions should be made in the Ministry of Forestry and FD.

Also in the medium term a more independent status for the FD should be designed. The forest royalties are a major revenue source for the government and there may occasionally be temptations to increase revenue through unsustainable logging. An independent FD could resist such pressures more effectively than a department in a line ministry.

The private sector does currently have a role in the processing and its role should be emphasised. All unnecessary red tape and parastatal privileges should be abolished. In wood pricing the current auction based system should be maintained and all concessional pricing arrangements discontinued. This applies also to Forest Products Joint Venture Corporation Ltd. The MTE and FD ownership in the company should be liquidated and all special arrangements in the log supply discontinued immediately. The JV does not produce any value added in the production chain to justify its special status, and does not have any particular expertise not found in THE FD or MTE.

**Forest Management**

The principles applied in forest management in Myanmar are well researched and apparently encourage sustainable utilisation of forests. However, some modifications to the current implementations should be made:

- if some areas are for security or other reasons non-accessible, respective reductions in the AAC should be made
- all special logging rights in the border areas should be discontinued and the areas brought under FD management
- illegal loggers should be actively pursued and punished

**People met during the mission**

Only people specifically interviewed have been listed. Many more people, who go unlisted, also provided their valuable advice and comments.

| Institution | | Name | Title |
|---|---|---|---|
| Forest Department | Watershed Management Division | U Sit Bo | Director |
| Forest Department | Nature and Wildlife Conservation Division | U Ye Htut | Staff Officer |
| | | | |

| | | | |
|---|---|---|---|
| Forest Department | Planning | U Kyi Maung | Director |
| Juta-Htay Ltd | | U Khin Maung Htay | Executive Director |
| Myanma Timber Enterprise | Export Marketing and Milling | Myint Kyu Pe | General Manager |
| Myanma Timber Enterprise | | Htin Latt | |
| Myanmar Forest Products & Timber Merchants Association | | U Aung Lwin | Chairman |
| Shwe Yee Win Co. Ltd | | Kyaw Lwin | Chairman |
| Union of Myanmar Forest Products Joint Venture Corporation Ltd. | | U Bo Ni | Chairman |

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**Itinerary of the Consultancy**

| **1998** | |
|---|---|
| June 1 | Arrival of Mr. Devenish (the Team Leader) in Vientiane<br>Commencement of the Project |
| July 30 | Arrival of Mr. Castrén (the international consultant) in Vientiane |
| July 31- | Literature studies and initial meetings in Vientiane |
| | |

| **1999** | |
|---|---|
| February 3-5 | Mid-Term Workshop |
| February 7-12 | Field visit to Yangon by Mr. Castrén |
| March | First draft of Myanmar country report |
| June 9-10 | Final Workshop, Project ends |