

IMPLICATIONS FOR FORESTS AND LIVELIHOODS

中国与亚太地区国家林产品贸易研究

**CHINA'S IMPACT ON PAPUA
NEW GUINEA'S FORESTRY
INDUSTRY**

Yati Bun

Timothy King

Phil Shearman



COLLABORATING INSTITUTIONS

Forest Trends (<http://www.forest-trends.org>): Forest Trends is a non-profit organization that advances sustainable forestry and forestry's contribution to community livelihoods worldwide. It aims to expand the focus of forestry beyond timber and promotes markets for ecosystem services provided by forests such as watershed protection, biodiversity and carbon storage. Forest Trends analyzes strategic market and policy issues, catalyzes connections between forward-looking producers, communities, and investors and develops new financial tools to help markets work for conservation and people. It was created in 1999 by an international group of leaders from forest industry, environmental NGOs and investment institutions.

Center for International Forestry Research (<http://www.cifor.cgiar.org>): The Center for International Forestry Research (CIFOR), based in Bogor, Indonesia, was established in 1993 as a part of the Consultative Group on International Agricultural Research (CGIAR) in response to global concerns about the social, environmental, and economic consequences of forest loss and degradation. CIFOR research produces knowledge and methods needed to improve the wellbeing of forest-dependent people and to help tropical countries manage their forests wisely for sustained benefits. This research is conducted in more than two dozen countries, in partnership with numerous partners. Since it was founded, CIFOR has also played a central role in influencing global and national forestry policies.

University of Papua New Guinea Remote Sensing Centre (<http://www.rsc.upng.ac.pg>): The University of Papua New Guinea Remote Sensing Centre is a teaching and research facility that provides access to remotely sensed satellite data and GIS products concerned with land-cover and land-use in Papua New Guinea. The aims of the Remote Sensing Centre are several. It is currently offering Geographic Information Systems (GIS) and Remote Sensing Courses to undergraduate students and is supervising several postgraduate degrees. In 2005, the Centre will be also providing the opportunity for people outside of the University (Government and NGO employees) to attend short practical courses on the application of GIS and Remote Sensing to their areas of work. In addition to its teaching role the Remote Sensing Centre serves as a portal for wider civil society to gain access to both PNG datasets and spatial analysis services.

Foundation for People and Community Development (<http://www.fpcd.org.pg>): The Foundation for People and Community Development facilitates the improvement of people's quality of life by alleviating poverty, promoting good health, education and sustainable resource use through share commitment and long-term partnerships with local communities.

Forest Information Services: Forest Information Services is a not-for-profit company that provides research and analysis on forest issues in the Pacific and South East Asia. The company does work for a wide variety of clients and is particularly recognized for its extensive knowledge of forest uses in Papua New Guinea.

SPONSORING INSTITUTION:



¹ While the Department for International Development has provided financial support for this publication, the findings and views presented do not necessarily reflect UK government policy.

CHINA'S IMPACT ON PAPUA NEW GUINEA'S FORESTRY INDUSTRY

by Yati Bun, Timothy King and Phil Shearman

China's Impact on Papua New Guinea's Forestry Industry
© 2004 Forest Trends.
ISBN 1-932928-04-9 Reproduction permitted with attribution.
Cover photo by Remote Sensing Centre, University of Papua New Guinea.

TABLE OF CONTENTS

OVERVIEW OF FORESTRY SECTOR WITH SUMMARY STATISTICS	2
Total Forest Area of Papua New Guinea	2
Natural forest area under production by geographic region.....	3
Institutional structure of forest ownership and management	4
Description of key policies	6
Summary of major trends related to deforestation and/or forest degradation	7
A SHORT HISTORY OF EXPORT LOGGING IN PAPUA NEW GUINEA	9
DESCRIPTION OF COMMERCIAL TIMBER PRODUCTION AND LOG EXPORTS TO CHINA AND HONG KONG	11
Summary	11
Institutional structure	11
Timber resources.....	12
Timber concessions	12
Logging companies	13
Log production and export volumes.....	13
Log export markets	14
Future trends	14
DESCRIPTION OF DOMESTIC WOOD PROCESSING AND EXPORTS TO CHINA AND HONG KONG BY INDUSTRY SEGMENT.....	20
Summary	20
Institutional structure	20
Processed wood exports	21
Processed wood export destinations	21
Projected export trends	22
DESCRIPTION OF KEY GATEWAYS, CHAINS OF CUSTODY AND ACTORS INVOLVED IN SHIPMENTS TO CHINA AND HONG KONG	25
Summary	25
Main gateways, volumes and trends	25
Log export buyers	26
DESCRIPTION OF PLANTATION DEVELOPMENT AND LINKS TO CHINA AND HONG KONG	30
Summary	30
Government policies.....	30
Plantation developments	31
Plantation species and projected volumes	32

Plantation log exports	32
Plantation log export destinations	32
Plantation log export prices	32
EXISTING IMPACTS OF EXPORT TRADE ON NATURAL FORESTS IN PRODUCER COUNTRIES AND IMPLICATIONS OF PROJECTED TRENDS....	37
Implications for Governance.....	39
PRELIMINARY ASSESSMENT OF POLICY IMPLICATIONS OF THE EXPORT TRENDS	41
PRELIMINARY ASSESSMENT OF LIVELIHOOD IMPLICATIONS OF CHINA'S DEMAND FOR LOW INCOME COMMUNITIES.....	42
Illegal logging.....	42
No Government support to communities.....	43
Government Policies.....	43
Need for cash	43
REFERENCES	44

LIST OF TABLES

Table 1: Natural Forest Area by Geographic Region	2
Table 2: Natural Forest Area under Production by Geographic Region	4
Table 3: Active Timber Production Areas.....	15
Table 4: Ownership of Timber Production	16
Table 5: Top Timber Production Companies by PNG Log Export Market Share	16
Table 6: Size of Active Timber Concessions	17
Table 7: Volume of Annual Log Production 2000-2002	17
Table 8: Volume of Annual Log Exports 2000-2002	17
Table 9: Source of Log Exports February 2002 to January 2003	17
Table 10: Volume of Log Exports by Concession 2000-2002 (cubic meters)	18
Table 11: Volume of Log Exports by Country of Destination 2000-2002 (cubic meters) ..	18
Table 12: Market Share of the Six Largest Export Destinations 2000-2002 by Volume	19
Table 13: Annual Log Export Volumes (cubic meters).....	19
Table 14: Current Production Areas that Will Be Exhausted by 2006	19
Table 15: Volume of Processed Timber Exports 1999-2002.....	23
Table 16: Value of Processed Timber Exports 1999-2002	23
Table 17: Sawn Timber (Lumber) Export Destinations 1999-2002 (cubic meters)	24
Table 18: Balsa Wood Export Destinations 1999-2002 (cubic meters).....	25
Table 19: Main Chinese Entry Ports for Log Exports from Papua New Guinea 1998 –2002	27
Table 20: Main Chinese Entry Ports for Lumber Exports from Papua New Guinea 1998 – 2002	27
Table 21: Main Chinese Entry Ports for Veneer Exports from Papua New Guinea 1998 – 2002	27
Table 22: Chinese Buyers of Log Exports from Papua New Guinea 2000–2002	28
Table 23: Plantation Development Areas.....	33
Table 24: Plantation Development History - Summary	33
Table 25: Plantation Development History – Cumulative Plantings	34
Table 26: Plantation Ownership by Sector.....	34
Table 27: Plantation Resources by Species in 2001	34
Table 28: Estimated Gross Volumes of Existing Plantation Stock Expected at Maturity	35
Table 29: Plantation Log Exports by Grade and Revenue 2002.....	35
Table 30: Plantation Log Exports by Species 2002	35
Table 31: Plantation Log Exports by Destination 2002.....	36
Table 32: Plantation Log Prices by Destination 2002	36

LIST OF FIGURES

Figure 1: The Historical Expansion of the Timber Industry.....	9
Figure 2: Expansion of Concessions	10
Figure 3: Cutting Rates Expressed as Percentage of 40 Year Rotation	38
Figure 4: Estimated Life Expectancy of Concessions Projected to be Exhausted by 2010 and Operating between 1993 and 2000	38
Figure 5: The Extent of Logging in West New Britain – 1996 and 2002	40

AUTHOR CONTACTS

Yati Bun (yabun@date.net.pg) is the Executive Director of the Foundation for People and Community Development.

Timothy King (tim@global.net.pg) is affiliated with Forest Information Services in Papua New Guinea.

Phil Shearman (shearman@upng.ac.pg) is a Research Associate at the University of Papua New Guinea where he heads the Remote Sensing Centre.

GLOSSARY

DEC	Department of Environment and Conservation
FIMS	Forest Inventory Mapping System
FMA	Forest Management Agreement
JANT	Japan and Niugini Timber Company
LFA	Local Forest Area
NFCAP	National Forest Conservation Action Plan
NFS	National Forest Service
PFD	Proposed Forestry Development
PNG	Papua New Guinea
PNGFA	Papua New Guinea Forest Authority
Sq km	Square Kilometers
TA	Timber Authority
TRP	Timber Rights Purchase
US	United States

EXECUTIVE SUMMARY

Papua New Guinea has significant forest resources that have been commercially exploited in industrial scale developments since the 1970s. While much of the richest and most accessible tropical forest areas have already been harvested, Papua New Guinea still has some five million hectares of natural forest that are suitable for logging. Papua New Guinea also has a number of timber plantations, although the development of this sector has been slow and somewhat piecemeal. There are currently some 60,000 hectares of plantations almost equally divided between State and private ownership.

The harvesting and export of timber forms an important part of the Papua New Guinea national economy, and China is one of its most significant trading partners. Papua New Guinea exports round logs, sawn timber, wood chips, veneer and plywood. Of these, it is raw logs that provide most of the export volume and value, although sawn timber and veneer have become increasingly important in the last three years. China is the principal market for round logs from Papua New Guinea; it imported over one million cubic meters of logs from PNG in 2002. China's imports of sawn timber and veneer from Papua New Guinea are currently insubstantial, and China does not currently import wood chips or plywood from PNG. Papua New Guinea has the potential to supply greater volumes of round logs and processed timber products to China in the future.

This resource availability needs to be carefully balanced against the profoundly negative social and environmental impacts of current forestry projects in PNG and the likelihood that most large-scale logging activities are not operating within the law. If Papua New Guinea is to take a greater role in supplying China's demand for wood and wood products, a considerable investment in the planning and monitoring of forest operations must be made and much greater account must be taken of the needs and rights of local resource owners.

OVERVIEW OF FORESTRY SECTOR WITH SUMMARY STATISTICS

TOTAL FOREST AREA OF PAPUA NEW GUINEA

The most recent inventory of Papua New Guinea's forest resources was undertaken in 1996¹ and concluded that there was a total of 26.1 million hectares of forest estate in Papua New Guinea.²

Of this area there were:

- 11.7 million hectares of potential production forest – an area that did not have physical constraints to logging.
- 15 million hectares of non-potential production forest – an area that should not be logged due to serious or extreme physical constraints.³

The division of these forest resources by province (**Table 1**) shows that the majority of unconstrained resource occurs in the Western, Gulf and West Sepik Provinces. With the majority of resources outside of these provinces already allocated to the logging industry, it is the allocation of those concessions within these three provinces that are now the focus of most attention.

Table 1: Natural Forest Area by Geographic Region

Province	Area of Province (km ²)	Gross Forest Area 1996 (km ²) (a)	Area with No Constraints (b)
Western	98,452	36,963	30,689
West Sepik	36,054	29,313	14,872
Gulf	34,801	23,508	13,755
East Sepik	43,813	20,269	6,474
Morobe	33,933	19,810	4,451
Southern Highlands	25,748	18,695	6,477
Madang	29,095	18,682	7,483
Central	29,872	17,549	7,065
Oro	22,772	14,899	5,523
West New Britain	20,456	10,609	3,305
East New Britain	15,344	10,082	2,673
Milne Bay	14,264	8,501	3,615
Enga	11,824	7,149	400
North Solomons	9,433	6,321	3,284
Eastern Highlands	11,205	5,352	1,331
New Ireland	9,610	4,739	2,450
Western Highlands	9,141	4,118	614
Chimbu	6,134	3,548	1,445
Manus	2,150	972	927
Total	464,101	261,079	116,833

(a) Gross area not logged or converted to some other form of land-use by 1996; (b) No constraints means absence of both extreme and serious constraints; 1 square kilometer = 10,000 hectares.

¹ Hammermaster and Saunders 1995.

² This was largely a desk top exercise with very little ground verification of the data; therefore, the results should be treated with some caution

³ An area is defined as possessing physical constraints to logging if it is either permanently or near-permanently inundated, over 30 degrees in slope, or is polygonal limestone.

NATURAL FOREST AREA UNDER PRODUCTION BY GEOGRAPHIC REGION

Of the total forest area of Papua New Guinea (26.5 million hectares), 7.1 million hectares, or 27%, had been allocated to forestry operations by 1996. By the year 2002, 11.2 million hectares, or 42%, were either allocated to working concessions or earmarked for forestry in unallocated concessions. While 14.9 million hectares remain unallocated of the total forest resource available in 1996, only 11.7 million hectares were suitable for forestry operations. Of this area of unconstrained forest some 6.7 million hectares, or 57%, have been allocated to the forestry sector. When these figures are adjusted to equate to log volumes per hectare, approximately 70% of the total timber resources have already been allocated to the timber industry. The reason is that the most attractive areas in terms of access and timber volumes have already been logged.

The corollary of these facts is that much of the area currently in concessions may not be suitable for industrial logging on the basis of sustainability or environmental protection, and a high proportion of the remaining forest areas are probably unsuitable for logging. With a few exceptions, the vast majority of accessible and high volume forest has already been allocated and harvested. The remainder, which forms the bulk of the unallocated estate, consists of largely remote, inaccessible and often highly constrained forest.

As can be seen in **Table 2**, the majority of forest area unallocated in 2002 has been enclosed in areas defined as Proposed Forestry Developments (PFDs).⁴ Many of these areas are in reality probably not feasible for timber harvesting due to physical restrictions to access. The discrepancies in some provinces where there exists a greater area of PFDs than actual unallocated forest is due to several of the PFDs containing non-merchantable vegetation types.

There has not been a national- or provincial-level forest inventory, and even in areas allocated for logging the sampling intensity is often only 1% at best. Thus, most forest harvesting activities are based on very poor resource data.

⁴ Forest Authority 2000.

Table 2: Natural Forest Area under Production by Geographic Region

Province	Gross Forest Area 1996 (sq km) (a)	Total Allocated to Forestry in 2002	Unallocated in 2002	Area of PDFs
Western	36,963	20,593	16,370	15,385
West Sepik	29,313	7,008	22,305	30,478
Gulf	23,508	17,095	6413	2,075
East Sepik	20,269	7,462	12,807	9,883
Morobe	19,810	3,972	15,838	1,976
Southern Highlands	18,695	1,624	17,071	9,348
Madang	18,682	5,463	13,219	1,297
Central	17,549	5,848	11,701	6,508
Oro	14,899	5,815	9084	7,658
West New Britain	10,609	19,724	0	1,334
East New Britain	10,082	6,735	3,347	3,924
Milne Bay	8,501	3,116	5,385	1,977
Enga	7,149	416	6,733	1,643
North Solomons	6,321	948	5,373	0
Eastern Highlands	5,352	0	5,352	0
New Ireland	4,739	4,742	0	1,987
Western Highlands	4,118	1,303	2,815	,0
Chimbu	3,548	0	3,548	0
Manus	972	527	445	1,479
Total	261,079	112,390	148,689	96,952

INSTITUTIONAL STRUCTURE OF FOREST OWNERSHIP AND MANAGEMENT

The PNG Forest Authority (PNGFA) and the Department of Environment and Conservation (DEC) are the two agencies with primary responsibility for forest management. The activities of other resource development agencies, in particular the Department of Agriculture, also impact forest management. As in many other countries, considerations of biodiversity conservation are not well integrated into the planning and management systems of line resource development and protection agencies.

The PNGFA is established with the objective of pursuing the “management, development and protection of the Nation’s forest resources and environment in such a way as to conserve and renew them as an asset for succeeding generations.”⁵ While the PNGFA is responsible for developing a National Forest Plan, the plan relates to forest resources rather than to forests as an ecological system.⁶

The Department of Environment and Conservation exercises functions related to environmental protection through the approval of development proposals. All development activities are required to go through some form of environmental approval process, although the precise legal basis for this is unclear. Legislation administered by DEC also provides for the protection of individual species and the protection of habitats through the establishment of protected areas.

⁵ Forest Authority 1991, Section 6(a).

⁶ Forest Authority 1991, Section 47(1).

Most of Papua New Guinea is owned according to undocumented customary tenure. To acquire legal approval for log extraction from customary owners, the Government has developed several pieces of legislation over the past 20 years. Prior to 1991 the state was able to acquire rights for the development of forest resources through Timber Rights Purchases and the provisions of the Private Dealings Act.

Timber Rights Purchases (TRP), which were the main instrument for large scale timber extraction, enabled the state to obtain the rights over the resources of a given concession area and to issue a permit to a selected industry participant to develop it. Conditions of forest management, environmental protection and royalty payments are all elements of a permit. The royalty was variously divided between the landowners and the provincial and national government. Under the TRP system, Department of Forestry officers would go into the field, consult the owners and purchase timber harvesting rights for a period of years by gaining the signatures of all customary owners. Following this activity, the minister would then grant a permit to exploit the timber subject to appropriate conditions on the permitted timber company.

The allocation and management of forest forests was closely examined in a Commission of Inquiry in the late 1980's that was headed by Justice Barnett. The damning findings of the Inquiry prompted a complete legislative overhaul in the forestry sector. In response to the Commission of Inquiry, a National Forest Policy was published in 1990 and a new Forestry Act (1991)⁷ was passed, superseding the Private Dealings Act, and the concept of TRPs was replaced with the structure of Forest Management Agreements. These reforms were an attempt to bring forest exploitation within the boundaries of a rational National Forest Plan and to bring future concessions into a 40-year rotational regime.

Despite a reasonable legislative framework, actual forest management in Papua New Guinea has not improved since the introduction of the new Forestry Act. Overseas logging companies continue to 'mine' the forests at an alarming rate. Across PNG, logging operations have resulted in profoundly negative social and ecological impacts and have been contrary to both PNG's Constitution and the long-term economic, ecological, socio-cultural and security interests of PNG and the majority of its citizens. Overall, the logging has undermined the resource base and has had significant negative economic, social and cultural impacts for the medium and long term. In March 2001, a PNG Forest Authority economist stated that "notable problems within the industry include:

- Still virtually no sustainable forestry projects
- Poor logging practices with little compliance to the Logging Code of Practice
- Widespread environmental damage
- Very few long-term benefits, causing social upheaval
- Corruption a persistent problem at all levels of the industry
- Minimal domestic processing investment
- Many proposed projects too small to be viable."⁸

⁷ The Forestry Act regulates the carrying out of forest industry activities. It is an offence to engage in forest industry activities without being registered as a forest industry participant (Section 114). A timber permit, license or authority is required in order to carry out any forest industry activities (Section 55(2)). Forest industry activities are defined as: *any commercial activities within Papua New Guinea connected with: (a) harvesting or processing timber or rattan; or (b) buying unprocessed timber or rattan for processing or export; or (c) selling timber or rattan.*

⁸ McRae 2001.

Other problems can be added to this list, such as the failure of logging companies to implement their agreement obligations and the failure of government to properly fund and manage forest management institutions such as the Provincial Forest Management Committees.

DESCRIPTION OF KEY POLICIES

In the early 90s, the government undertook a major forestry reform program under the auspices of the National Forest Conservation and Action Program (NFCAP) to address forest management problems in PNG. The international community, bilateral and multilateral organizations and the NGO community played a major role in supporting the government initiative by providing financial and technical assistance. As part of this reform effort, a new Forestry Act and Forest Policy were developed, and the PNG Forest Authority (PNGFA) was reconstituted and given the mission “to promote the management and wise utilization of the forest resources of Papua New Guinea as a renewable asset for the well-being of present and future generations.” As part of its new mandate, the PNGFA was charged in the 1991 Forestry Act with producing “a detailed statement of how the national and provincial governments intend to manage and utilize the country’s forest resources.” In response to this law, the PNGFA released the National Forest Plan (the Plan) in June of 1996.

The National Forest Authority is currently of the opinion that the Plan will remain in force until it is revised at some point in the future. The National Forest Plan has received criticism from many quarters due to deficiencies in the areas listed below.⁹ Nevertheless, the plan was not revised before it expired in 2001.

- a) The plan portrays PNG’s forest resource, or some 70% of the country’s land area, solely in terms of its potential for industrial logging. As a result, no consideration is given to existing or potential alternative development opportunities of the forest, for example uses which would provide economic and other benefits at a lower environmental and social cost than industrial logging.
- b) It suggested allocating the nation’s forest resource to industrial logging prior to any agreement with resource owners, ignoring the constitutional reality of customary ownership of PNG’s natural resources. While the intention to “acquire” rights to forest resources was reiterated in the Plan, its designation of forest areas and projections for timber production in areas where local communities were yet to articulate their own management preferences, undermined the reality of customary ownership, and, in many cases, precluded the consideration of other options.
- c) The plan did not incorporate existing conservation areas or landowner petitions for development options other than industrial logging. There remains a persistent lack of governmental capacity to process and assist in the establishment and implementation of community requests for development alternatives or conservation initiatives such as Integrated Conservation and Development Areas or Wildlife Management Areas.

⁹ Arentz et al. 1998.

- d) The Plan ignored the analysis of the PNG Conservation Needs Assessment,¹⁰ which identified areas of primary biological importance.
- e) The plan underestimated the effects of industrial logging on the sensitive and complex forest ecosystems found in PNG. The 35-year cutting cycle used to make the plan's projections still do not reflect the latest scientific consensus on forest management and regrowth.
- f) The Plan did not comply with the Forestry Act. The requirements of the Act are that the Plan "be consistent with the National Forest Policy and relevant government policies." In presenting an unsustainable management regime for PNG's forests, the Plan clearly violates the Fourth Goal of the Constitution and the goals of the National Forest Policy (i.e. "protection of the nation's forest resources as a renewable natural asset"). In addition, the Plan was altered between the first and second edition, despite the legal requirement that the Plan be approved by Parliament.
- g) The Plan has not included proper consultation at the local or provincial level, and the provincial Forest Management Committees have not been proactively involved in the Plan's development.

The closest that Papua New Guinea has in the recent past come to the delineation of a policy on natural resource management has been the Somare Government "Export-Led Recovery Strategy". This strategy was announced as the method whereby PNG would halt a recession through the acceleration of exports of predominantly agricultural products and raw materials and plans to open trade missions in Taipei, Shanghai, Brussels and Brisbane. Now in its second year of implementation, it is apparent that the strategy has not yet brought about a substantial change in the volumes of exports.

SUMMARY OF MAJOR TRENDS RELATED TO DEFORESTATION AND/OR FOREST DEGRADATION

In Papua New Guinea, deforestation, in the FAO definition of complete conversion, has in the past largely been driven by subsistence agriculture. Wunder,¹¹ in his summary of the available literature on the topic, has concluded that PNG has a fluctuating annual range of deforestation of between 50,000-70,000 ha per annum. This assessment was based on the Forest Inventory Mapping System (FIMS) data that constitutes the only national assessment to date.

Since the FIMS data became available, it has often been stated that PNG has a comparatively low rate of deforestation because "increasing land use intensity of land already in use, rather than expansion has been the main response to the need to increase food production."¹² This intensification has been forced by both physical and social constraints on area expansion as well as the constraints inherent in the customary land tenure system that have reduced effective access to land for 'externally-led land-use initiatives.'¹³ While this is

¹⁰ Department of Environment and Conservation 1993.

¹¹ Wunder 2003.

¹² McAlpine and Freyne 2001. In the early 1980s around 20-25% of land area was affected by agricultural use, half of which was intensive. Between 1975 and 1996 intensive land-use expanded at 0.7 %/yr. but total land-use only increased by 0.2% annually, a rate far below that of rural population growth rates (around 2%).

¹³ Wunder 2003.

certainly close to the truth, the conservative nature of the FIMs process in its reliance on dominant forest/land use classes and difficulty in classifying secondary vegetation types meant that it is still an approximation, albeit a good one. It should also be noted that the FIMs methodology poses major difficulties in its replication and updating.

One of the key dangers in relying upon FIMs deforestation data is in its assessment and treatment of logged over areas. The FIMs deforestation assessment was done using Landsat pictures from the mid-1990s. As stated by McAlpine and Quigley (1998), this work suggested that out of the 2,784,000 ha logged between 1975 and 1996, only 355,000 ha (12%) were converted to other land uses while the remaining 88% are 'regenerating'. The nature of this regeneration is a crucial question, given that many of these areas were logged over repeatedly in the late 1990s. In addition, an area of approximately 1,200,000 ha has been logged in the period 1996-2002, representing an increase in the area logged per year from 140,000 ha/yr. between 1976 and 1996 to 200,000 ha/yr. between 1996 and 2002.¹⁴

Emerging evidence from analysis of recent satellite imagery by the University of Papua New Guinea shows that the intensity of logging in the last 7 years has been significantly greater than in the previous period; areas previously logged have been worked over repeatedly, and large areas, particularly in the islands region, that were logged in the early 1990s were subject to large fires in the 1997/1998 drought. The combination of these factors is likely to have dramatically increased the rate of forest conversion as a direct result of forestry activities. If it indeed turns out that a significant proportion of the 4 million hectares logged between 1976 and 2002 is not 'regenerating' but instead has been converted to a grass/scrub disclimax or has been irreparably invaded by exotic species,¹⁵ the figures for deforestation for this period will need to be revised upwards and logging will no longer be viewed as a benign factor in the literature on deforestation.

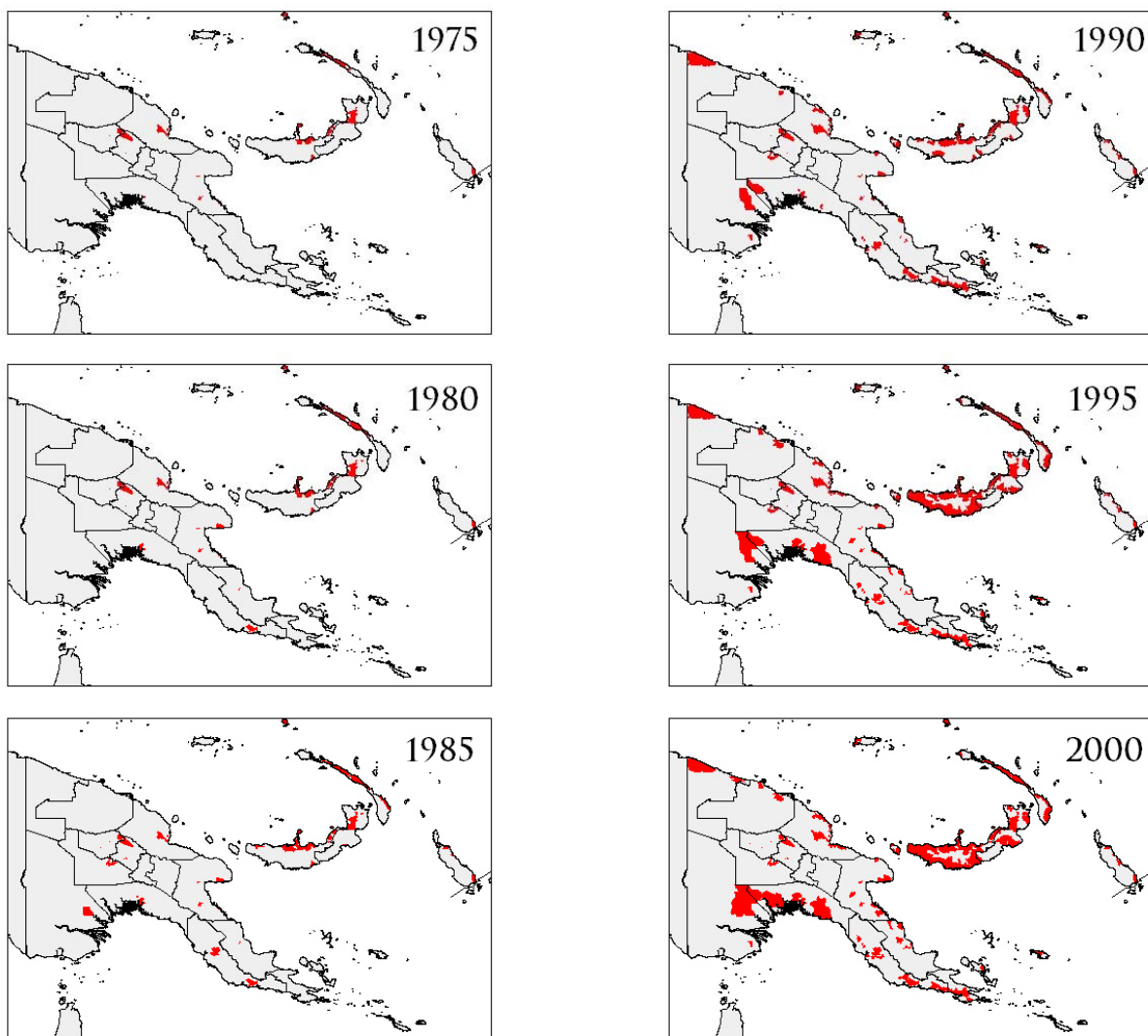
¹⁴ Based on unpublished UPNG data. Personal Comm. Shearman. This figure is likely to increase by about 10% as the analysis is finished.

¹⁵ It is now becoming apparent in many parts of Papua New Guinea that disturbances and fragmentation associated with logging are making forests vulnerable to the invasion of exotics plant species. In parts of the Islands region, regeneration is being effectively prevented through the invasion of *Merremia peltata* that cloaks and eventually kills remnant trees. In the Vanimo area, *Chromolaena odorata* is proving to be an aggressive invader, effectively delaying the process of natural succession in secondary forests by up to a decade.

A SHORT HISTORY OF EXPORT LOGGING IN PAPUA NEW GUINEA

The Papua New Guinean export logging industry began prior to the country receiving independence in the early 1970s. Initially the industry consisted of a small number of predominantly Australian companies operating in both the New Guinea Islands and the Highlands region. After the country had reached independence in 1976, the number of concessions began to gradually rise, and by 1985 operations were occurring in most provinces. By 1990, the rate at which new concessions were designated and coming into production had accelerated, and by 1992 increased demand from Asian markets and the impending reform of the PNG forestry sector caused most of the highly productive concessions in the country to be brought on-line. This trend can be seen in the figure series below.

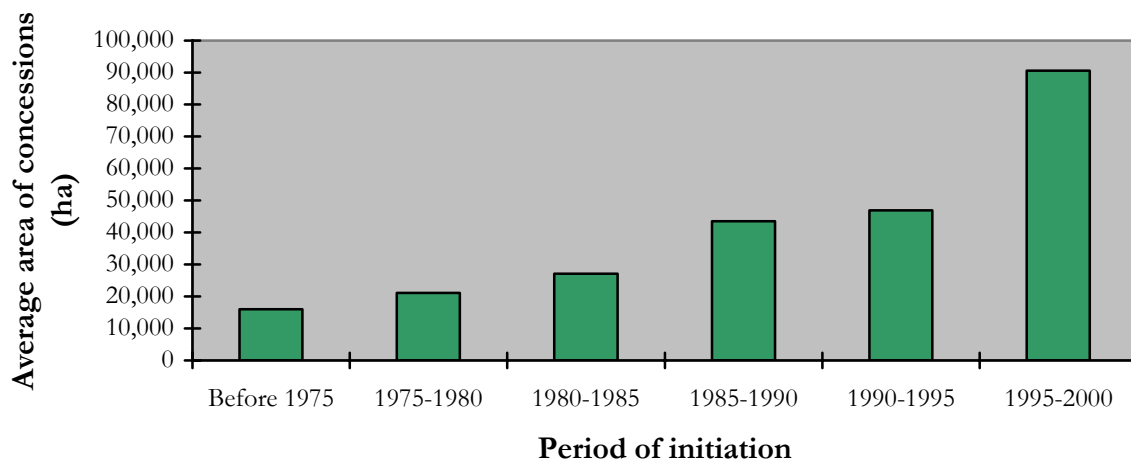
Figure 1: The Historical Expansion of the Timber Industry



In all of Papua New Guinea, the Islands region possessed the highest stocking density of commercial timber species.¹⁶ In addition, access to these resources was relatively simple through the construction of wharf facilities along the coastline of each concession. These factors combined kept logging revenues high and costs low, delivering large profits for the logging companies.

The development of logging concessions on the mainland came later and gained pace as opportunities for new logging concessions in the Islands region evaporated. Slim profit margins due to a lower density of high value species and poor access over much of the mainland meant that concessions were only attractive if they could take advantage of existing markets and roads or were close to the coast, or alternatively if they achieved economies of scale by covering a huge area. By 1992, with the majority of concessions in the Islands region already designated, the industry switched attention to the acquisition of large concessions on the mainland, and particularly in the southern lowlands. **Figure 2** shows that increasingly large areas were allocated to the forest sector over the past 25 years.

Figure 2: Expansion of Concessions



Between 1993 and 2000 very few new concessions came into operation. This was a consequence of a number of factors including the fact that the PNG Forestry Authority (PNGFA) focused on the implementation of new forestry measures and on the establishment of forest monitoring operations at every project in the country, a moratorium on concession allocation (1993-1995) and the arduous processes of the new legislative and regulatory requirements for forest acquisition and allocation. Nearly all of the concessions that were designated during this period have only recently been mobilized due to the more recent moratorium (1997-2001) on new licenses.

However, by 2002 a large proportion of the available timber resources of Papua New Guinea had been designated for forestry use, with the notable exception of the resources in Western and West Sepik provinces. These areas were left until last mainly because of their low timber volumes, poor access and swampy ground. To date, for the entire country, a total of 217 TRPs, LFAs or FMAs have been allocated covering some 10,501,605 ha.

¹⁶ Hammermaster and Saunders 1995.

DESCRIPTION OF COMMERCIAL TIMBER PRODUCTION AND LOG EXPORTS TO CHINA AND HONG KONG

SUMMARY

Commercial timber production is concentrated in natural forest areas; tree plantations are only of marginal significance. Most timber is exported as raw logs. There are 29 forest concessions currently in production, covering a total area of 3.5 million hectares. All concessions are operated by private companies with Malaysian ownership predominating. One company, Rimbunan Hijau, controls over 45% of log exports. Total export volumes peaked in 1997 at three million cubic meters; one point eight million cubic meters were exported in 2002. Log exports go to eleven countries, all in the Asia region. More than 80% of log exports go to just three countries, Korea, Japan and China/Hong Kong. China/Hong Kong has grown in importance as a market for PNG logs, increasing its market share from 35% to 60% over the past 3 years. Total log export levels are unlikely to increase significantly in the foreseeable future and it seems therefore there will be only limited scope for China to increase its consumption of logs from Papua New Guinea.

INSTITUTIONAL STRUCTURE

Customary land ownership is legally recognized and protected in Papua New Guinea, and local people communally own about 97% of the land. This means local people own and control most forest resources, although there are a few small and scattered areas of forest plantation on leased or state land. Commercial¹⁷ forest management and timber production are controlled by the state under a legislative and regulatory framework. The primary statutory instrument is the amended version of the Forestry Act of 1991. This statute established the Papua New Guinea Forest Authority (PNGFA) as the body to “manage, develop and protect” forest resources. The government funds the Forest Authority through annual budget allocations. A National Forest Board governs the Forest Authority. The Board has appointed representatives from three government departments (Forests, Conservation and Planning), two representatives from industry (Chamber of Commerce and Association of Foresters) and civil society (PNG Eco-Forestry Forum and National Council of Women) and one each to represent landowners (Resource Owners Association) and provincial interests. The National Forest Service (NFS) is the body within the Forest Authority that is responsible for its day-to-day functions of forest resource planning and allocation, as well as monitoring and enforcement. A Managing Director heads the NFS. Its headquarters are in the capital, Port Moresby, and regional and provincial offices across the country. A National Forest Policy and National Forest Plan are the primary instruments intended to guide the commercial use of forest resources.

¹⁷ The Papua New Guinea Forestry Act defines ‘commercial’ as being any harvesting operation that cuts more than 500 cubic meters of timber in a calendar year. Operations involving less than 500 cubic meters are not regulated.

TIMBER RESOURCES

Commercial timber production in Papua New Guinea comes from both natural forest areas and tree plantations. Timber production in natural forest areas is carried out in geographically defined concessions under legal instruments that transfer timber-harvesting rights, either directly or indirectly, from the local landowners to the logging company. A number of different legal models have been used over time to grant logging companies access to forest resources. The current Forestry Act (amended in 1991) uses two models, Forest Management Agreements (FMA) and Timber Authorities (TA). Under the FMA model, only the state can acquire industrial-scale timber harvesting rights from customary landowners. The state then negotiates the project guidelines with the landowners before selecting the logging company and issuing a logging permit. Timber Authorities are permits issued by the state for smaller-scale timber harvesting, specific agricultural clearances or road-line developments.¹⁸

Most current timber production, however, is from areas allocated under previous legislation that used Timber Rights Purchases (TRP)¹⁹ and Local Forest Management Areas (LFA) (**Table 3**).²⁰ In case of TRPs, the state purchased the timber rights from customary landowners and then granted a harvesting permit to a logging company. The landowners received a prescribed royalty but had no say over which company held the permit or what obligations were imposed on it. In case of LFAs, customary owners were allowed to sell timber privately. This usually involved a local company acquiring the timber rights from the landowners and then selling these rights to a foreign logging company. There was no timber permit and therefore minimal state supervision. The first plantation developments in the 1960s and 70s were primarily state-owned, but new planting by private companies in the 1980s and 90s has now reduced the proportion of state ownership to less than 40%. Some current plantation harvesting is still being carried out under old Timber Rights Purchases, but most is now regulated by Timber Authorities. (For further information on timber plantations see the section “Description of Plantation Development and Links to China and Hong Kong”).

TIMBER CONCESSIONS

Papua New Guinea has 29 large-scale commercial timber concessions that are currently producing timber (**Table 3**).²¹ In addition there are also a number of small-scale timber production areas under Timber Authorities that are limited in production (to less than 5,000 cubic meters) or area (to 50 hectares) and in time (to less than 12 months). These 29 concessions are distributed across 10 different provinces and are located in each of the three coastal regions of Papua New Guinea (Papua – the southern coast; Momase – the northern coast; and the Islands). There is no significant commercial timber production in the fourth region of Papua New Guinea, the Highlands. The 29 concessions cover a total area of 3.5 million hectares (**Table 6**).

¹⁸ Small-scale TAs are limited either in extent and time or extent and purpose (to less than 5,000 cubic meters in volume and twelve months in period or a road-line of less than 12.5 kilometers in length or an agricultural clearance of less than 50 hectares). Large-scale TAs can be granted for agricultural clearances in excess of 50 hectares or road-lines in excess of 12.5 kilometers in length but are subject to much more stringent planning and development procedures than small-scale TAs.

¹⁹ Forest Authority 1991.

²⁰ Forest Authority 1979.

The size of the concessions ranges from 4,000 up to 420,000 hectares. The average size of a concession is 122,000 hectares. Generally the smaller concessions are in the Islands region where stocking densities of commercial timber species are highest. These were the first areas to be developed for timber production (1970-1990). The larger concessions are in the Papuan and Momase regions where stocking densities are lower. These areas have been developed more recently (1990 onwards).

There are 17 plantation developments in Papua New Guinea with a total area of some 61,000 hectares. This is a relatively small area when compared with the total amount of natural forest under production and the output from plantations is rather insignificant, providing only 7.25% of total log export volumes and 4.65% of log export values (**Table 9**). (For further information on timber plantations see the section “Description of Plantation Development and Links to China and Hong Kong”).

LOGGING COMPANIES

Privately owned companies control all commercial timber production from natural forest areas. There is no involvement of the state. Companies that are directly or indirectly owned or controlled by Malaysian multinational companies dominate commercial timber production (**Table 4**). Although 10 companies have been identified as being involved in commercial timber production, one company dominates almost 50% of log exports and 5 companies together control over 80% of the market.

The largest timber production company by log export market share is Rimbunan Hijau which controls at least 45% of total log export volumes (**Table 5**).²² Rimbunan Hijau has logging operations in Western Province, Gulf Province, East and West New Britain, Milne Bay and Central Province. The next four largest companies in terms of their market share are WTK,²³ Samling,²⁴ Kerawara²⁵ and Innovision who together control about 34% of log exports (respectively 10%; 9%, 8% and 7%). WTK has logging operations in West Sepik and Madang Provinces, Samling in Madang, Western and West New Britain, Kerawara in East and West New Britain and Central Provinces. Innovision has one logging operation at Makapa in Western Province.

LOG PRODUCTION AND EXPORT VOLUMES

Annual log production in the period 2000-2002 averaged 2,060,000 cubic meters (**Table 7**). In the same period, annual log exports averaged 1,800,000 cubic meters (**Table 8**). These figures indicate that Papua New Guinea was exporting some 87% of its timber production in round log form. Log export volumes from individual concessions during the period 2000-2002 ranged from 16,000 to 618,000 cubic meters (**Table 10**).

²¹ “Currently producing timber” is defined here as the export of logs during 2002.

²² The Tiong family owns Rimbunan Hijau; their commercial base is Sarawak, Malaysia.

²³ WTK is owned by another branch of the Tiong family from Sarawak.

²⁴ The Samling group in PNG includes both Bismarck Industries and Concord Pacific.

²⁵ The Kerawara group of companies includes SSG Services, Hugo Sawmilling and Richard Gault Industries.

The largest log exporting concessions from 2000 to 2002 were Turama Extension (618,000 cubic meters), Vanimo (489,000 cubic meters), Wawoi Guavi (428,000 cubic meters), Kiunga Aiambak (397,000 cubic meters), Makapa (374,000 cubic meters) and Vailala Blocks 2&3 (344,000 cubic meters). Of these largest log-exporting concessions, three are located in Western Province (Wawoi Guavi, Kiunga-Aiambak and Makapa), two in Gulf Province (Turama Extension and Vailala) and one (Vanimo) in West Sepik Province. The average log export volume from an individual concession in the period 2000-2002 was 166,000 cubic meters.

LOG EXPORT MARKETS

11 countries have received log exports from Papua New Guinea during 2000-2002; all are in the Asia region (**Table 11**). The most important countries of destination by market share have been China/Hong Kong (receiving an average of 51% of Papua New Guinea's log exports), Japan (with 29%) and Korea (13%). The other importing countries are India, Indonesia, Malaysia, Philippines, Thailand, Taiwan and Vietnam. None of these countries import more than 3% of Papua New Guinea's total log exports (**Table 12**).

In the period from 2000-2002, log exports from Papua New Guinea to China/Hong Kong increased from 741,000 cubic meters (37% of total exports) to 1,148,000 cubic meters (62% of total exports). This increasing market share has mainly been at the expense of Japan, Korea and the Philippines who have collectively seen their share of log exports from Papua New Guinea fall from 58% of the total to 34% in the period 2000-2002.

FUTURE TRENDS

Log export volumes from Papua New Guinea have remained fairly consistent from 2000 to 2002, ranging from 1.6 to 2.0 million cubic meters (**Table 8**). This short-term stability suggests that log export volumes will not rise significantly in the next few years. This is confirmed by an analysis of longer-term export trends. Log export volumes from Papua New Guinea reached a peak in 1997 when export prices reached their highest levels in more than a decade. The subsequent collapse in market prices saw export levels fall by almost 50% within 12 months. The current export volume (2002) stands at just 61% of the peak reached in 1997 (**Table 13**).

Future fluctuations in export volumes will not just be determined by fluctuations in international log prices. The area of forest under production is likely to be an important determining factor of log export volumes.

Of the current 3,536,000 million hectares of allocated forest area under production, more than 990,000 hectares (30%) are expected to be logged out within the next three years (**Table 14**). This will have the effect of removing 670,000 cubic meters (37%) from log export volumes. It would seem that a substantial decrease in log export volumes (of around 35% to 1.2 million cubic meters) could only be fully averted through the development of new forest production areas.

The government has declared its intention to allocate four new concession areas in the immediate future (East Awin, Amanab Blocks 1-4, Asengseng and Rottock Bay). These concession areas have a total loggable area of 618,000 hectares and a potential annual production of 439,000 cubic meters.

Table 3: Active Timber Production Areas

Name	Concession Type	NFA Number ²⁶	Province
Alimbit Andru	Local Forest Area	14-08	West New Britain
Ania Kapiura	Timber Rights Purchase	14-52	West New Britain
Bakada Mededua	Timber Rights Purchase	14-41	West New Britain
Buhem Mongi Busega	Forest Management Agreement	13-38	Morobe
Cape Orford	Timber Rights Purchase	15-56	East New Britain
Central Arowe	Timber Rights Purchase	14-54	West New Britain
East Kikori	Timber Rights Purchase	02-15	Gulf
Kumil	Timber Rights Purchase	12-22	Madang
Iva Inika	Timber Rights Purchase	03-27	Central
Jaha (South Coast)	Local Forest Area	18-01	Manus
Kali Bay	Local Forest Area	18-02	Manus
Kapuluk	Timber Rights Purchase	14-50	West New Britain
Kiunga Aiambak	Timber Authority	01-24	Western
Kula Dagi	Timber Authority	14-11	West New Britain
Makapa	Timber Rights Purchase	01-09	Western
Manus West Coast	Timber Rights Purchase	18-02	Manus
Ome Ome	Timber Rights Purchase	03-35	Central
Open Bay	Timber Rights Purchase	15-53	East New Britain
Sagarai Gadaisu	Timber Rights Purchase	04-03	Milne Bay
Seraji and Extension	Timber Rights Purchase	15-58	East New Britain
Simbali	Timber Authority	15-61	East New Britain
Tokoi Matong	Timber Rights Purchase	15-45	East New Britain
Turama Extension	Forest Management Agreement	02-12A	Gulf
Vailala Block 1	Timber Rights Purchase	02-14	Gulf
Vailala Blocks 2&3	Timber Rights Purchase	02-16	Gulf
Vanimo	Timber Rights Purchase	10-08	West Sepik
Wawoi Guavi	Timber Rights Purchase	01-07	Western
West Arowe	Timber Rights Purchase	14-53	West New Britain
West Kaut	Timber Rights Purchase	16-45	New Ireland

'Active timber production' refers to those concessions that exported timber during 2002 (as this is the only reliable data available on where logging companies are active).

²⁶ The National Forestry Authority (NFA) number.

Table 4: Ownership of Timber Production

Concession	Logging Company	Ownership of Logging Company	Origin
Alimbit Andru	Island Forest Resources	Rimbunan Hijau	Malaysia
Ania Kapiura	Grand Alliance/SBLC	Nissho Iwai	Japan
Bakada Mededua	Hugo Sawmilling	Kerawara	Malaysia
Buhem Mongi Busega	Willis Kent	Private	Malaysia
Cape Orford	Niugini Lumber	Rimbunan Hijau	Malaysia
Central Arowe	Cakara Alam	Overseas and General	Malaysia
East Kikori	Rimbunan Hijau	Rimbunan Hijau	Malaysia
Kumil	Bismarck Industries	Samling	Malaysia
Iva Inika	Hugo Sawmilling	Kerawara	Malaysia
Jaha (south Coast)	Monarch Investments	Rimbunan Hijau	Malaysia
Kali Bay	Rivergoi No.6	Rimbunan Hijau	Malaysia
Kapuluk	Bismarck Industries	Samling	Malaysia
Kiunga-Aiambak	Concord Pacific	Samling	Malaysia
Kula Dagi	Grand Alliance/SBLC	Nissho Iwai	Japan
Makapa	Innovision	Innoprise	Malaysia
Manus West Coast	Seal (Manus)	Rimbunan Hijau	Malaysia
Ome Ome	Hugo Sawmilling	Kerawara	Malaysia
Open Bay	Open Bay Timbers	Kowa Lumber	Japan
Sagarai Gadaisu	Saban Enterprises	Rimbunan Hijau	Malaysia
Seraji and Extension	SSG Services	Kerawara	Malaysia
Simbali	Hugo Sawmilling	Kerawara	Malaysia
Tokoi Matong	Niugini Lumber	Rimbunan Hijau	Malaysia
Turama Extension	Turama Forest Industries	Rimbunan Hijau	Malaysia
Vailala Block 1	Niugini International	Rimbunan Hijau	Malaysia
Vailala Blocks 2&3	Frontier Holdings	Rimbunan Hijau	Malaysia
Vanimo	Vanimo Forest Products	WTK	Malaysia
Wawoi Guavi	Wawoi Guavi Timber	Rimbunan Hijau	Malaysia
West Arowe	Cakara Alam	Overseas and General	Malaysia
West Kaut	Tutuman Development	Private	PNG

Table 5: Top Timber Production Companies by PNG Log Export Market Share

Parent Company	2000	2001	2002	Average
Innoprise	5.8	7.5	7.7	7.0
Kerawara	7.5	7.4	9.9	8.3
Rimbunan Hijau	44.0	48.8	42.8	45.2
Samling	10.2	11.0	7.8	9.7
WTK	12.8	9.1	7.9	9.9
Total	80.3	83.8	76.1	80.1

Table 6: Size of Active Timber Concessions

Name	Size (hectares)	Est. Commercial Volume (m ³)
Alimbit Andru	40,000	1,200,000
Ania Kapiura	410,000	7,100,000
Bakada Mededua	57,000	460,000
Buhem Mongi Busega	100,000	2,100,000
Cape Orford	34,000	1,800,000
Central Arowe	64,000	1,400,000
East Kikori	84,000	1,500,000
Kumil	59,000	590,000
Iva Inika	13,500	180,000
Jaha	9,000	31,500
Kali Bay	10,000	84,000
Kapuluk	170,000	3,500,000
Kiunga-Aiambak	180,000	500,000
Kula Dagi	4,000	240,000
Makapa	300,000	7,900,000
Manus West Coast	33,000	1,600,000
Ome Ome	26,000	380,000
Open Bay	211,000	3,500,000
Sagarai Gadaisu	119,000	540,000
Seraji and Extension	19,000	608,000
Simbali	12,000	172,000
Tokoi Matong	22,000	420,000
Turama Extension	383,000	3,500,000
Vailala Block 1	89,000	1,430,000
Vailala Blocks 2&3	268,000	7,300,000
Vanimo	287,000	8,135,000
Wawoi Guavi	422,000	3,229,000
West Arowe	68,000	1,617,000
West Kaut	11,000	220,000
Total	3,536,500	61,673,500

Table 7: Volume of Annual Log Production 2000-2002

Year	2000	2001	2002	Average
Quantity (m ³)	2,241,000	1,877,000	N/A	2,060,000

Table 8: Volume of Annual Log Exports 2000-2002

Year	2000	2001	2002	Average
Quantity (m ³)	1,993,000	1,566,000	1,840,000	1,800,000

Table 9: Source of Log Exports February 2002 to January 2003

Source	Volume	%	Value	%
Natural Forest	1,787,522	92.75	99,125,000	95.35
Plantation	139,742	7.25	4,830,000	4.65

Table 10: Volume of Log Exports by Concession 2000-2002 (cubic meters)

Concession	Log Exports
Alimbit Andru	185,000
Ania Kapiura & Kula Dagi	257,000
Bakada Mededua, Iva Inika, Ome Ome & Seraji	329,000
Buhem Mongi Busega	95,000
Cape Orford	159,000
Central Arowe	89,000
East Kikori	218,000
Kumil	N/A
Jaha	43,000
Kali Bay	32,000
Kapuluk	44,000
Kiunga-Aiambak	397,000
Makapa	374,000
Manus West Coast	71,000
Open Bay	219,000
Sagarai Gadaisu	157,000
Simbali	34,000
Tokoi Matong	16,000
Turama Extension	618,000
Vailala Block 1	77,000
Vailala Blocks 2&3	344,000
Vanimo	489,000
Wawoi Guavi	428,000
West Arowe	89,000
West Kaut	63,000
Total	4,827,000

NB: The three-year total for log exports from current concessions is about 600,000 cubic metres less than the total log exports for the same period. The unaccounted log exports were from concessions that ceased operations within the period studied and that are therefore not listed as 'current'.

Table 11: Volume of Log Exports by Country of Destination 2000-2002 (cubic meters)

Country or Region	2000	2001	2002	Total
China	687,779	785,734	1,133,700	2,607,213
Hong Kong	53,183	46,831	12,945	112,959
Japan	745,612	418,235	418,486	1,582,333
Korea	323,091	224,052	171,079	718,222
India	6,481	0	4,239	10,720
Indonesia	0	8,345	33,616	41,961
Malaysia	13,274	4,192	0	17,466
Philippines	96,182	30,159	36,773	163,114
Taiwan	47,913	28,279	42,712	118,904
Thailand	8,558	0	0	8,558
Vietnam	10,455	10,390	0	20,845

Table 12: Market Share of the Six Largest Export Destinations 2000-2002 by Volume

Country	2000	2001	2002	Average
China	34.5%	50.5%	61.2%	48.7%
Hong Kong	2.7%	3.0%	0.7%	2.1%
Japan	37.4%	26.9%	22.6%	29%
Korea	16.2%	14.4%	9.2%	13.3%
Philippines	4.8%	1.9%	2.0%	2.9%
Taiwan	2.4%	1.8%	2.3%	2.2%

Table 13: Annual Log Export Volumes (cubic meters)

1994	1995	1996	1997	1998	1999	2000	2001	2002
2,734,033	2,191,065	2,650,715	3,006,152	1,616,567	1,983,853	1,992,528	1,566,221	1,840,304

Table 14: Current Production Areas that Will Be Exhausted by 2006²⁷

Concession Name	Anticipated Expiry	Size of Concession (hectares)	Cumulative 2000-02 Export Volume (cubic meters)
Alimbit Andru	2005	40,000	185,000
Bakada Mededua	2004	57,000	82,000
Cape Orford	2005	34,000	159,000
Central Arowe	2005	64,000	89,000
Kumil	2004	59,000	N/a
Iva Inika	2005/6	14,000	82,000
Jaha	2004	9,000	43,000
Kali Bay	2004	10,000	32,000
Kiunga-Aiambak	2003	180,000	397,000
Kula Dagi	2004	40,000	200,000
Ome Ome	2002	26,000	82,000
Open Bay	2005	211,000	219,000
Sagarai Gadaisu	2002	119,000	157,000
Seraji and Extension	2005	19,000	82,000
Simbali	2003	12,000	34,000
Tokoi Matong	2005	22,000	16,000
West Arowe	2005	68,000	89,000
West Kaut	2005	11,000	63,000
Total	Total	995,000	2,011,000

²⁷ Department of National Planning and Rural Development 2003.

DESCRIPTION OF DOMESTIC WOOD PROCESSING AND EXPORTS TO CHINA AND HONG KONG BY INDUSTRY SEGMENT

SUMMARY

Papua New Guinea's wood processing industries are limited in number, size and scope. The principal export products are sawn timber, wood chips and veneer, with low volumes of plywood and balsa also contributing to export volumes. The three major processing facilities are the privately owned Jant wood chip mill in Madang and Rimbunan Hijau's veneer mill at Panakawa and sawmill at Kamusie. There is also a plywood mill at Bulolo in Morobe Province. Balsa production and processing is concentrated in East New Britain. A number of small and medium sized sawmills operate across the country. There are no pulp/paper facilities. Sawn timber is exported to a wide number of countries. Wood chips are exported to Japan and plywood to a number of Pacific Island countries. In PNG's wood processing sector, China's biggest role is in the balsa trade.

INSTITUTIONAL STRUCTURE

Sawn timber production is predominantly privately owned, although the state does hold a minority of shares in a few forest operations. The largest sawmills, such as those at Kamusie in Western Province, Open Bay in East New Britain and Vanimo in West Sepik, are concession-based and take all or the majority of their logs from a single timber concession that is operated by the sawmill-owning company. A number of medium-sized sawmill operations purchase logs from a number of concessions. These sawmills tend to focus more on the domestic market, only exporting occasional containers of higher value species.²⁸

There is only one veneer plant currently operating in Papua New Guinea. It is privately owned by the Rimbunan Hijau group.²⁹ The plant is located at Panakawa in Western Province and sources its logs from the surrounding Wawoi Guavi timber concession. The Rimbunan Hijau group also operates a number of sawmills, including the largest in Papua New Guinea at Kamusie in Western Province.

Wood chip production is concentrated in a single plant at Madang on the north coast of the Papua New Guinea mainland. This operation is owned by the Japan and Niugini Timbers (JANT) Company, a subsidiary of Honshu Paper of Japan. JANT has been manufacturing wood chips since the early 1970s using timber harvested from natural forest areas (65%), tree farms (25%) and plantations (10%). Balsa production is mainly from tree lots that are privately owned by individuals and families. The balsa industry is concentrated in East New Britain Province, where two dedicated balsa mills operate. Plywood production in Papua New Guinea is on a comparatively small scale, with one mill operating at Bulolo in Morobe Province.

²⁸ Filer 2002 estimates that there are a total of about 50 sawmills in Papua New Guinea and 27 furniture factories (p.11).

²⁹ Rimbunan Hijau is the dominant player in the timber industry in Papua New Guinea. The group controls over 50% of all log exports and owns the only veneer factory and the largest sawmill.

PROCESSED WOOD EXPORTS

The volume of processed wood exports from Papua New Guinea has been rising steadily in recent years, but the quantity is small and not of global significance. There are no reliable statistics or estimates of the domestic consumption of locally processed wood products. There are five processed wood products that are exported from Papua New Guinea: sawn timber (lumber), veneer, plywood, wood chips and balsa wood. The total volume of these processed wood exports from Papua New Guinea in 2001 was 209,000 cubic meters. These exports had a total value of just over 31 million US dollars. By volume, wood chips dominate the processed wood export sector, accounting for some 50% of total export volumes (**Table 15**). But by value, veneer and sawn timber are the most significant export products, accounting for 85% of total export values (**Table 16**).

The volume of veneer exports has risen substantially in recent years, from 8,500 cubic meters in 1999 to almost 70,000 cubic meters in 2001 (**Table 15**). The rise in export value has been almost as dramatic, from 1.8 million to 10.6 million US dollars (**Table 16**). This dramatic increase has been the result of the commissioning of the Rimbunan Hijau veneer plant at Panakawa in Papua New Guinea's Western Province.

In the same period, sawn timber exports have also increased significantly, more than doubling from 20,000 cubic meters in 1999 to over 40,000 cubic meters in 2002 (**Table 15**). In the same period, the value of those exports has risen from 8.1 to 14.4 million US dollars (**Table 16**). The increase in sawn timber export volumes can be attributed to the significant decline in log export prices in the late 1990s and the favorable exchange rates, which give high kina conversions from US dollars. The species *Instia bijuga* (locally known as Kwila) dominates in the sawn timber exports (45% of all sawn timber exports). Bundles of mixed hardwood species account for a further 32% of sawn timber exports. Other significant species are *Pterocarpus indicus* (Rosewood) accounting for 7.5%) and *Tectona grandis* (Teak), accounting for 5.5%.

The volume and value of wood chip exports has remained fairly constant in recent years, averaging 100,000 cubic meters per annum at an average value of US\$5 million. Wood chips are mainly of two species, *Acacia spp.* and *Eucalyptus deglupta*. The volumes of plywood and balsa exports are comparatively low, averaging just 1,000 and 2,000 cubic meters per annum respectively with an average value of US\$330,000 and US\$1,000,000 (**Tables 15 and 16**). Plywood production is mainly of higher value marine grade products using the *Acaucaria spp.*

PROCESSED WOOD EXPORT DESTINATIONS

Papua New Guinea's most significant processed wood export is sawn timber (lumber). Sawn timber accounts for some 50% of the total value of all processed wood exports. The quantity of processed wood exports has averaged around 40,000 cubic meters per annum over the last three years (**Table 15**). Sawn timber from Papua New Guinea has a much diversified market base with 40,000 cubic meters of sawn timber being exported to over 25 destination countries each year (**Table 17**). The most significant export markets are Australia, Europe, Taiwan, Korea, New Caledonia and New Zealand. These are the only destination countries

that have consistently imported an average of over 1,000 cubic meters of sawn timber from Papua New Guinea over the last four years (**Table 17**).

In 2002, Australia imported 40% (from 25% in 1999) of Papua New Guinea's sawn timber exports and New Zealand imported 25% (from 15% in 1999) (**Table 17**). Korea increased its share from 4% to 12% (**Table 17**) between 1999 and 2002. China and Hong Kong remain a fairly insignificant market for sawn timber from Papua New Guinea. Together they have imported just 2,550 cubic meters of sawn timber from Papua New Guinea over the last four years (an average of 640 cubic meters per annum, or 1.75% of Papua New Guinea's sawn timber exports). The statistics show no trend of increasing sawn timber exports from Papua New Guinea to China and Hong Kong. All wood chip exports from Papua New Guinea are imported into Japan. Balsa wood exports from Papua New Guinea have averaged 2,300 cubic meters per annum over the last four years. During that period, Papua New Guinea balsa was exported to a total of fifteen countries around the globe (**Table 18**). Australia, China, England, Germany and Italy are the most important export markets for balsa wood from Papua New Guinea. These five countries have imported 93% of Papua New Guinea's total balsa wood exports over the last four years. In the period from 1999 to 2002, China was the second largest importer of balsa wood from Papua New Guinea, with 21% of total exports. In 2002, China was the largest importer of balsa wood from Papua New Guinea, with 24.5% of total exports. All Papua New Guinea exports of plywood are sold in the Pacific market. Aotearoa (New Zealand), Vanuatu, Solomon Islands and New Caledonia have been the recipient countries over the last four years. No data is available on the identity of the importing countries for veneer produced in Papua New Guinea.

PROJECTED EXPORT TRENDS

Sawn timber production and export levels are expected to remain largely stable. There are some indications that relatively modest increases in export volumes may be achieved in the short-term. There is no indication that China or Hong Kong will significantly increase their share of the sawn wood export market. China and Hong Kong do not currently feature in the market for wood chips or plywood exports from Papua New Guinea and there are no indications that this will change in the short term. China and Hong Kong are very significant markets for balsa wood exports from Papua New Guinea. However, the volumes and values are comparatively minor when compared to raw log exports and the trade in sawn timber.

In the longer term, Papua New Guinea does have significant timber resources that have not yet been commercially exploited and they offer the opportunity for Chinese investment and/or market access.

Table 15: Volume of Processed Timber Exports 1999-2002

Product	1999	2000	2001	2002
Veneer	8,500	20,000	68,000	not available
Plywood	700	500	900	1,700
Wood Chips*	90,000	120,000	97,000	not available
Lumber	19,500	40,000	40,000	42,000
Balsa	3,500	1,000	2,050	2,700
Total	126,700	184,000	209,200	not available

Note: All volumes are in cubic meters.

Source: PNG Forest Authority Database.

**: The source of these figures is the PNG Forest Industries Association. The records of the PNG Forest Authority give a much lower annual export volume for wood chips (20,000, 10,000, 0, and 0 for each year in the period respectively).*

Table 16: Value of Processed Timber Exports 1999-2002

Product	1999	2000	2001	2002
Veneer	1,800,000	3,600,000	10,600,000	not available
Plywood	200,000	140,000	300,000	680,000
Wood Chips*	5,000,000	6,000,000	4,000,000	not available
Lumber	8,100,000	14,000,000	15,400,000	14,400,000
Balsa	1,700,000	560,000	910,000	910,000
Total	16,800,000	24,300,000	31,200,000	not available

Note: All values are in United States dollars.

Source: PNG Forest Authority Database.

**: The source of these figures is the PNG Forest Industries Association. The records of the PNG Forest Authority give a much lower annual export volume for wood chips and therefore a much lower value.*

Table 17: Sawn Timber (Lumber) Export Destinations 1999-2002 (cubic meters)

Destination	1999	2000	2001	2002
Australia	5,251	16,615	12,750	16,653
Belgium	2,709	5,739	2,625	1,537
Canada	0	0	0	51
<i>China</i>	937	12	491	147
<i>Hong Kong</i>	92	317	257	299
Taiwan	1,391	4,274	2,211	684
Denmark	324	94	125	396
East Timor	0	0	53	0
England	2	60	0	0
Europe	54	16	0	0
France	72	83	0	0
French Polynesia	952	1,030	803	903
Germany	81	141	1,554	928
India	0	1,854	208	0
Indonesia	970	2,141	3,182	20
Italy	0	17	31	67
Japan	212	44	416	1,201
Korea	792	1,175	4,761	5,210
Malaysia	1,271	1,260	512	373
Marshall Islands	0	0	0	14
Netherlands	64	210	0	0
New Caledonia	684	1,289	2,166	1,805
New Zealand	2,832	3,412	4,884	10,708
Palau	0	0	0	9
Philippines	434	253	344	108
Portugal	0	0	0	15
Singapore	135	356	2,097	985
Solomon Islands	0	0	28	17
Sri Lanka	11	0	0	0
Spain	0	0	88	131
Turkey	56	0	0	0
United States of America	36	14	52	24
Vanuatu	0	0	34	75
Vietnam	0	0	98	0
Total	19,362	40,406	39,770	42,360

Source: PNG Forest Authority Database.

Table 18: Balsa Wood Export Destinations 1999-2002 (cubic meters)

Destination	1999	2000	2001	2002
Australia	175	275	653	531
China	627	400	275	654
Hong Kong	2	0	54	54
Taiwan	100	50	25	0
England	2,288	112	230	403
Europe	0	0	25	0
Germany	275	150	200	177
Italy	0	0	577	551
Japan	1	0	3	26
Malaysia	0	0	1	9
New Zealand	25	0	0	51
Singapore	3	0	0	29
South Africa	25	0	0	27
Spain	0	0	0	107
Vanuatu	0	0	0	52
Total	3,521	987	2,043	2,671

Source: PNG Forest Authority Database.

DESCRIPTION OF KEY GATEWAYS, CHAINS OF CUSTODY AND ACTORS INVOLVED IN SHIPMENTS TO CHINA AND HONG KONG

SUMMARY

Nanjing is the most significant entry point into China for timber and timber products from Papua New Guinea. In 2002, Nanjing handled 85% of log imports from Papua New Guinea, some 964,000 cubic meters. Gongbei and Haungpu are the most important entry points into China for sawn lumber from Papua New Guinea, although the quantities involved in this trade are relatively insignificant. Shanghai is the most significant entry point into China for veneer imports from Papua New Guinea. Shanghai handled almost 75% of this trade from 2000 to 2002 and handled 100% of the trade in 2002. The only other data currently available on the chain of custody in wood imports into China from Papua New Guinea is the identity of log buyers. Between 2000 and 2002 there were a total of 53 buyers of logs from Papua New Guinea in China and Hong Kong. Over this period the average quantity of logs purchased by each buyer increased from 27,000 cubic meters to 37,000 cubic meters.

MAIN GATEWAYS, VOLUMES AND TRENDS

Raw hardwood logs are the principal wood product imported into China from Papua New Guinea. Eight Chinese ports have been identified as being involved in this trade during the last five years, 1998-2002. They are Gongbei, Shanghai, Guangzhou, Shenzhen, Nanjing, Qingdao, Hangzhou and Haikou (**Table 19**).

By volume, Nanjing is the most significant entry point in China for logs from Papua New Guinea. Over the last five years, Nanjing has been the entry point for 61% of China's log imports from Papua New Guinea (1.7 million cubic meters). After Nanjing, Hangzhou (10%), Shanghai (6%), Shenzhen (6%) and Gongbei (5%) were the other significant entry points into China for logs from Papua New Guinea. The quantity of logs imported into China from Papua New Guinea through Nanjing has been steadily rising since 1998. From 55,940 cubic meters in 1998, the trade reached 964,967 cubic meters in 2002. During the same period there also was a steady increase in the quantity of logs imported into China from Papua New Guinea through Hangzhou (from 14,470 cubic meters in 1998 to 63,157 cubic meters in 2002).

Although the volume of lumber imports into China from Papua New Guinea is very small, eleven Chinese ports have been identified as being involved in this trade during the last five years, 1998-2002. These are Gongbei, Jianmen, Shanghai, Guangzhou, Shenzhen, Nanjing, Qingdao, Hangzhou, Huangpu, Xiamen and Haikou. By volume, Huangpu and Gongbei are the most significant entry point in China for lumber from Papua New Guinea. Huangpu has been the entry point for 33% of China's lumber imports from Papua New Guinea (2,271 cubic meters), and Gongbei has been the entry point for 31%, 2,036 cubic meters (**Table 20**). After Huangpu and Gongbei, Shenzhen (11%), Shanghai (8.5%) and Nanjing (6.5%) have been the other significant entry points into China for lumber from Papua New Guinea. The quantity of logs imported into China from Papua New Guinea through Huangpu has risen significantly in the three years since 2000, from 595 cubic meters to 1,058 cubic meters. In contrast, the volume of imports through Gongbei remained largely consistent in the period between 1998 and 2002. In the last two years there have been almost no imports of lumber into China from Papua New Guinea through Nanjing, Shanghai or Shenzhen. Most veneer imports into China from Papua New Guinea are routed through Shanghai. From 2000 to 2002, Shanghai was the port of entry for 73% of veneer imports from Papua New Guinea, 15 million kilograms. The only other Chinese ports that have been identified as involved in the importation of veneer from Papua New Guinea are Hangzhou, Nanjing and Dalian. These three ports have handled 10% (2.2 million kilograms), 10% (2 million kilograms) and 7% (1.3 million kilograms) of the total veneer imports respectively.

LOG EXPORT BUYERS

According to the database of the PNG Forest Authority, there were fifty-three buyers in China and Hong Kong for hardwood logs exported from Papua New Guinea from 2000 to 2002 (**Table 20**). From 2000 until 2002, the volume of logs purchased increased significantly, from 740,000 cubic meters in 2000 to 1,146,000 cubic meters in 2002. However, the number of buyers only increased marginally, from 27 to 31. What changed was the average volume of logs taken by each buyer, from 27,000 cubic meters to almost 37,000 cubic meters. In 2002 the largest buyer of hardwood logs from Papua New Guinea purchased 178,000 cubic meters, the smallest volume bought by a single buyer was 2,138 cubic meters.

Table 19: Main Chinese Entry Ports for Log Exports from Papua New Guinea 1998 –2002

Year	Gongbei	Shanghai	Guangzhou	Shenzhen	Nanjing	Qingdao	Hangzhou	Haikou	Other
1998	30,479	39,684	0	0	55,940	17,473	14,470	0	26,575
1999	38,006	23,532	42,973	0	248,889	0	27,784	0	73,210
2000	26,282	38,223	0	76,088	451,896	0	93,083	0	69,830
2001	10,499	12,068	0	37,724	741,795	0	81,688	0	26,419
2002	0	25,811	0	34,341	964,967	0	63,157	19,207	20,514
Total	142,090	169,809	70,527	174,990	1,708,109	17,473	280,182	19,207	216,548

Note: All volumes are in cubic meters.

Source: Sun et al. 2004.

Table 20: Main Chinese Entry Ports for Lumber Exports from Papua New Guinea 1998 –2002

Year	Gongbei	Shenzhen	Shanghai	Nanjing	Huangpu	Other
1998	200	25	397	42	0	123
1999	333	502	30	245	0	0
2000	501	208	131	171	595	103
2001	430	0	36	0	618	337
2002	572	0	0	0	1,058	196
Total	2,036	735	594	458	2,271	759

Note: All volumes are in cubic meters.

Source: Sun et al. 2004.

Table 21: Main Chinese Entry Ports for Veneer Exports from Papua New Guinea 1998 –2002

Year	Shanghai	Nanjing	Hangzhou	Dalian
1998	0	0	0	0
1999	0	0	0	0
2000	1,709,120	0	0	0
2001	7,476,529	2,185,498	2,011,269	1,288,980
2002	6,187,675	0	0	0
Total	15,373,324	2,185,498	2,011,269	1,288,980

Note: All volumes are in kilograms.

Source: Sun et al. 2004.

Table 22: Chinese Buyers of Log Exports from Papua New Guinea 2000–2002

Buyer	2000		2001		2002	
	Volume	Price	Volume	Price	Volume	Price
Able Wood Enterprises	0	0	0	0	7,109	57
Ausmin Timber	17,815	73	42,007	54	72,628	54
Cheenway International	0	0	0	0	6,140	80
Dadonghai International	0	0	5,356	38	0	0
Dalian Tai Song Plywood	14,815	80	0	0	0	0
Ensure Enterprise	0	0	0	0	7,308	61
Fairview Services	21,902	53	5,761	31	0	0
Far East Treasure	71,190	59	71,641	54	2,138	40
Forestone	5,561	57	6,759	40	0	0
Great Kuan Industrial	0	0	0	0	8,881	54
Greption	5,312	120	0	0	0	0
Guymon Enterprises	32,406	60	59,001	47	131,503	53
Happy International	0	0	0	0	15,479	55
Ichiban Timber Products	71,733	68	59,545	55	74,512	53
Jan Dian	0	0	0	0	3,250	50
Jiang Su Economic	0	0	5,791	68	15,384	53
Jiangsu Sumec International	0	0	13,563	68	0	0
Kam Hing Trading	0	0	40,923	60	69,594	62
Kasco and Company	0	0	2,803	49	0	0
Lei Shing Hong	95,077	73	112,479	59	173,051	57
Lei Shing Hong Trading	0	0	0	0	47,982	53
Loya Gem	0	0	0	0	55,415	51
Midoriya Mokuzai	93,441	74	139,482	60	178,804	57
Nanlong Plywood Industry	12,674	56	0	0	0	0
Nippon Paper Industries	2,885	85	0	0	0	0
Nissho Iwai Corporation	69,215	82	61,310	58	57,216	61
Nissho Iwai Hong Kong	1,493	82	0	0	0	0
Pottery Agents	0	0	0	0	30,757	46
Qianglin Timbers	6,083	70	63,400	57	42,212	51
Quantum Logistics	0	0	0	0	6,351	37
San Bee Timber	2,071	90	0	0	0	0
Sino Forest Corporation	5,390	57	21,698	44	3,656	38
South Pacific	10,354	20	0	0	12,552	87
Sumec International	2,490	65	6,536	60	18,294	56
Synetics Enterprises	0		1,694	40	0	0
Taicang Foreign Trade	0	0	6,814	57	0	0
Tseng Li Enterprise	0	0	0	0	7,513	53
Victorius Wood Enterprise	0	0	6,410	45	11,373	37
Wayco Enterprise	25,236	57	1,964	67	0	0
Wayne Wood	110,659	73	35,348	59	25,316	57
Yee Young	0	0	14,216	49	31,387	54
Yuchon	0	0	525	105	0	0
Yuehon	0	0	705	105	6,915	58

Buyer	2000		2001		2002	
	Volume	Price	Volume	Price	Volume	Price
<i>Hong Kong</i>						
Able Wood Enterprise	0	0	0	0	6,726	62
Ichiban Timber Products	13,231	75	14,011	68	0	0
Itochu (Hong Kong)	1,512	102	0	0	0	0
Kam Hing Trading	0	0	6,499	55	0	0
Midonya Mokuzai	18,343	78	0	0	0	0
Nissho Iwai (Hong Kong)	1,628	94	0	0	0	0
Qianglin Timbers	0	0	26,321	58	0	0
South Pacific	5,341	120	0	0	0	0
Tseng Li Enterprise	0	0	0	0	6,219	60
Wayne Wood (HK)	13,128	82	0	0	0	0
Total	740,962	-----	832,565	-----	1,146,646	-----

Note: All volumes are in cubic meters, all values are US dollars.

Source: PNG Forest Authority.

DESCRIPTION OF PLANTATION DEVELOPMENT AND LINKS TO CHINA AND HONG KONG

SUMMARY

Papua New Guinea's plantation sector is relatively small when compared with other nations in South East Asia. There are at least 61,000 hectares of established tree plantations spread across seventeen different sites in ten provinces. Over 60% of plantations are in private hands, and the rest is state-owned. Hardwood species predominate with some *Pinus* and *Aleuraria* species and a small area of rubberwood. Plantation log exports totaled just less than 140,000 cubic meters in 2002. Existing government policies have not been successful in promoting plantation development, but a new reforestation policy has been drafted and should be approved and implemented shortly.

GOVERNMENT POLICIES

Papua New Guinea's National Forest Policy³⁰ has a number of provisions related to the development and management of tree plantations:

4a Reforestation. Programs for plantation development will be guided by economic criteria and feasibility studies to assess the commercial potential of processing plantation material for a variety of end uses.

9a Forest Resource Replacement. Private investment in forest plantation programs and processing plantation material will be actively promoted and negotiated as part of major timber agreements or as commercial enterprises in their own right. In either case, plantation decisions as to the scale of individual programs and type of material to be produced will be guided by options for profitable processing within the country.

9b Forest Resource Replacement. Plantation establishment by landowner groups shall be actively promoted and supported.

Forest plantations way for the future

The National Government believes forest plantations have a huge potential in PNG and will promote it. And the National Forest Authority's reforestation policy to be completed by the end of the year, will spell out the role of landowners, investors and the government in forest plantation development in PNG.

Forest Minister Patrick Pruaitch stressed the importance of plantations as opposed to natural forests, when receiving a dividend cheque for K300,000 from acting managing director NFA Terry Warra on Friday.

"Basically, the government is looking at promoting forest plantations in the country to compliment the natural resource," he said.

"The idea is quite simple, in that it is a lot leaner, it is a lot easier to run and manage plantations. Forest plantations are going to be our main threshold for forest management in the country."

The National, August 25th 2003.

³⁰ Ministry of Forests 1991.

The PNG Forest Authority has recently completed an exhaustive process to develop a new Reforestation Policy³¹ that includes positive statements on the need to encourage further plantation development. It is not clear at this stage whether this commitment will be supported by economic incentives or other government support and assistance. Papua New Guinea generally has a poor record on the implementation of policy commitments.

PLANTATION DEVELOPMENTS

Tree plantation development began in Papua New Guinea in the 1960s and there are now at least 61,000 hectares of tree plantations.³² These plantations are spread over 17 sites in 10 Provinces (**Table 23**) and can be found in all three regions of Papua New Guinea (the coastal mainland, Highlands and Islands). The average plantation size is about 3,500 hectares. The greatest expansion in the area under plantations in Papua New Guinea occurred from 1975 until 1996 when over 48,500 hectares were planted (this represents 80% of the current plantation estate). In the period since 1996, new plantings have been minimal (2,300 hectares) and have barely exceeded plantation clearances (**Table 24**).

Plantation development was almost exclusively a state initiative in the early years. At the end of 1969, the state owned 99% of all plantation developments and this share fell by only one percent to 98% by the end of 1974 (**Table 26**). Since then the private sector has dominated plantation developments in Papua New Guinea, although the size of the state sector did double in the period from 1975 to 1996. Private enterprises now own over 60% of all plantation developments in Papua New Guinea; 38,650 hectares against state ownership of 22,700 hectares.

The new draft reforestation policy from the PNG Forest Authority identifies a number of reasons to explain why new areas of tree plantations have not continued to be developed since 1996:

- Availability of land
- Funding
- Incentives for undergoing replanting

These explanations are not necessarily supported by the facts and seem to be overly simplistic.

³¹ Forest Authority 2003.

³² The latest statistics from the PNG Forest Authority show that there are now 70,000 hectares of tree plantations, but no site-specific details or other justification are provided to support this figure.

PLANTATION SPECIES AND PROJECTED VOLUMES

There are four main groups of timber species that have been utilized in Papua New Guinea's tree plantations. The largest group is the mixed hardwoods, which account for 37,000 hectares or 60% of the total plantation area. *Pinus* and *Aleurcaria* species account for a further 16,000 hectares, 26% of the total. The remaining 24% of the plantation area is divided between teak (*Tectonia grandis*) and rubberwood (**Table 27**). Estimates have been made of the total volume of timber resources that could be available from Papua New Guinea's tree plantations at maturity (**Table 28**). The potential total estimated resource is just over 15 million cubic meters.

PLANTATION LOG EXPORTS

In 2002, log exports of tree plantation material from Papua New Guinea totaled just less than 140,000 cubic meters (**Table 29**). This is a relatively low figure given the total area under plantation and is a reflection of the fact that 65% of plantation output is consumed in the domestic wood chip market.³³ In 2002, log exports of tree plantation material from Papua New Guinea had a total declared value of just under US\$5 million. 80% of the log exports of tree plantation material from Papua New Guinea are of undifferentiated 'second grade' species. Only two first grade species are exported; *Erima* (6%) and *Terminalia* (14%) (**Table 30**). Log exports of tree plantation material from Papua New Guinea are regularly made by Nissho Iwai Corporation (Japan), Open Bay Timbers (Japan), Madang Timbers (Malaysia) and Ula Mona Sawmill (locally owned).

PLANTATION LOG EXPORT DESTINATIONS

Japan dominates the current market for export plantation logs from Papua New Guinea. In 2002, Japan imported 75% of all plantation log exports from Papua New Guinea. China currently ranks third, with 7.5% of plantation log exports, while Korea takes 9%, Philippines 4.5% and Vietnam 4% (**Table 31**).

PLANTATION LOG EXPORT PRICES

An analysis of current prices paid by different countries for plantation log exports from Papua New Guinea indicates that China ranks fourth out of five countries in the prices that it currently pays for a basket of different grade plantation logs. While China currently pays an average of US\$35.99, Vietnam is paying 40.03, Japan 38.45 and the Philippines 37.36. The only country that pays a lower price than China is Korea (US\$32.35) (**Table 32**).

It is difficult to see these price variations as simply a factor of volume, as Japan imports ten times as many plantation logs from Papua New Guinea as does China while the Philippines and Vietnam both take significantly less than China, yet all three countries are paying a higher price on average.

³³ Filer 2002.

Table 23: Plantation Development Areas

Site	Province	Size
Brown River	Central	1,300
Bulolo / Wau	Morobe	11,700
Gogol	Madang	8,800
Madang	Madang	800
Fayatina	Eastern Highlands	1,000
Ialibu	Southern Highlands	150
Kainatu	Eastern Highlands	950
Kaut	New Ireland	50
Keravat	East New Britain	1,800
Kuriva	Central	800
Lapegu	Eastern Highlands	2,700
Open Bay	East New Britain	11,500
Stettin Bay	West New Britain	10,300
Ulabu / Sagarai	Milne Bay	1,400
Wahgi	Western Highlands	2,200
Galley Reach	Central	5,000
Ulamona	West New Britain	900
Total		61,350

Note: All figures are as of December 2001. All figures are hectares. Figures do not include an estimated 400 hectares of balsa planting mainly in East New Britain.

Source: PNG Forest Industries Association.

Table 24: Plantation Development History - Summary

Period	1960-1969	1970-1974	1975-1996	1997-2001
New Planting	8,760	3,960	48,580	2,300
Clearing	0	0	300	1,950
Cumulative	8,760	12,720	61,000	61,350

Note: All figures are hectares.

Source: PNG Forest Industries Association.

Table 25: Plantation Development History – Cumulative Plantings

Site	1969	1974	1996	2001
Brown River	910	1,500	1,200	1,300
Bulolo / Wau	6,100	7,800	11,700	11,700
Gogol	0	120	9,350	8,800
Madang	0	0	900	800
Fayatina	0	0	900	1,000
Ialibu	0	0	400	150
Kainatu	0	0	1,000	950
Kaut	0	0	250	50
Keravat	1,300	1,800	1,950	1,800
Kuriva	0	0	650	800
Lapegu	0	900	3,250	2,700
Open Bay	0	0	10,800	11,500
Stettin Bay	50	200	9,350	10,300
Ulabu / Sagarai	0	0	1,500	1,400
Wahgi	400	400	2,000	2,200
Galley Reach	0	0	5,000	5,000
Ulamona	0	0	900	900
Total	8,760	12,720	61,100	61,350

Note: All figures are hectares.

Source: PNG Forest Industries Association.

Table 26: Plantation Ownership by Sector

Sector	1969	1974	1996	2001
State	8,700ha	12,500ha	23,800ha	22,700ha
	99.0%	98.0%	39.0%	37.0%
Private	40ha	250ha	37,200ha	38,650ha
	0.5%	2.0%	61.0%	63.0%

Source: PNG Forest Authority Database.

Table 27: Plantation Resources by Species in 2001

Species	Area
Teak	3,000
Pinus/Aurcaria	16,300
Rubberwood	4,900
Hardwoods	37,100
Total	61,300

Note: All figures are hectares.

Source: PNG Forest Industries Association.

Table 28: Estimated Gross Volumes of Existing Plantation Stock Expected at Maturity

Species	Volume
Teak	750,000
Pinus/Aaurcari	3,800,000
Rubberwood	1,100,000
Hardwoods	9,600,000
Total	15,250,000

Note: All figures are cubic meters.

Source: PNG Forest Industries Association.

Table 29: Plantation Log Exports by Grade and Revenue 2002

	Tiny Small	Super Small	Small	Regular	Low Grade	Baby Small	Total
Quantity	14,692	46,651	18,018	2,315	4,183	53,883	139,742
Revenue	351,000	1,788,000	778,000	116,000	60,000	1,737,000	4,830,000

Note: All quantity figures are cubic meters. All revenue figures are US dollars.

Source: PNG Forest Authority Timber Digest.

Table 30: Plantation Log Exports by Species 2002

Species	Tiny Small	Super Small	Small	Regular	Low Grade	Baby Small
Erima	159	2,506	956	416	0	3,014
Terminalia	2,857	2,299	210	12	57	7,758
Group 2	11,676	41,846	16,852	1,887	4,125	43,111
Total	14,692	46,651	18,018	2,315	4,183	53,883

Note: All quantity figures are cubic meters.

Source: PNG Forest Authority Timber Digest.

Table 31: Plantation Log Exports by Destination 2002

Destination	Tiny Small	Super Small	Small	Regular	Low Grade	Baby Small	Total
China	820	3,416	1,056	282	0	4,962	10,536
Hong Kong	0	0	0	0	0	0	0
Japan	12,412	35,984	13,657	1,515	259	40,942	104,769
Korea	290	3,602	2,119	310	3,924	2,599	12,844
Philippines	718	1,895	352	152	0	2,958	6,075
Vietnam	453	1,754	834	57	0	2,421	5,519

Note: All figures are cubic meters.

Source: PNG Forest Authority Timber Digest.

Table 32: Plantation Log Prices by Destination 2002

Destination	Tiny Small	Super Small	Small	Regular	Baby Small	Average
China	27.99	38.93	40.56	40.28	32.19	35.99
Japan	23.65	38.46	44.29	53.56	32.29	38.45
Korea	19.52	32.28	35.89	46.33	27.75	32.35
Philippines	23.98	41.74	43.79	44.00	33.31	37.36
Vietnam	24.85	43.19	46.96	49.95	35.19	40.03

Note: All figures are US dollars per cubic meter

Source: PNG Forest Authority Timber Digest.

EXISTING IMPACTS OF EXPORT TRADE ON NATURAL FORESTS IN PRODUCER COUNTRIES AND IMPLICATIONS OF PROJECTED TRENDS

Despite the clear magnitude of the industrial forestry industry, the ecological impact of logging on the forest ecosystems of PNG is still very poorly described or quantified. There have been few long-term or thorough environmental assessments of the impacts of logging on forests in PNG since independence, and in the last decade there have been practically none. Although the Forestry Act gives the National Forestry Authority the clear direction and mandate to monitor the performance of the industry, useful pre-logging surveys are uncommon and follow-up documentation is rare.

In Papua New Guinea, the effects of selective logging on the rainforest communities are varied and depend on the forest type and the degree of impact. Most forests in New Guinea contain low volumes of extractable timber. When combined with the small diameter of many trees, the diverse species composition and heterogeneous distributions, several commentators have suggested that current exploitation practices in themselves do not pose a major threat to the preservation of the biodiversity of the forest communities. The notable exception to the claim occurs where chip logging is practiced, resulting in clear felling, or when cleared land is used for the development of agro-forestry activities.³⁴ In both scenarios, the biological outcome is catastrophic. However, it is now suspected that these optimistic prognoses were incorrect. There is little 'selective' about most logging operations in PNG.

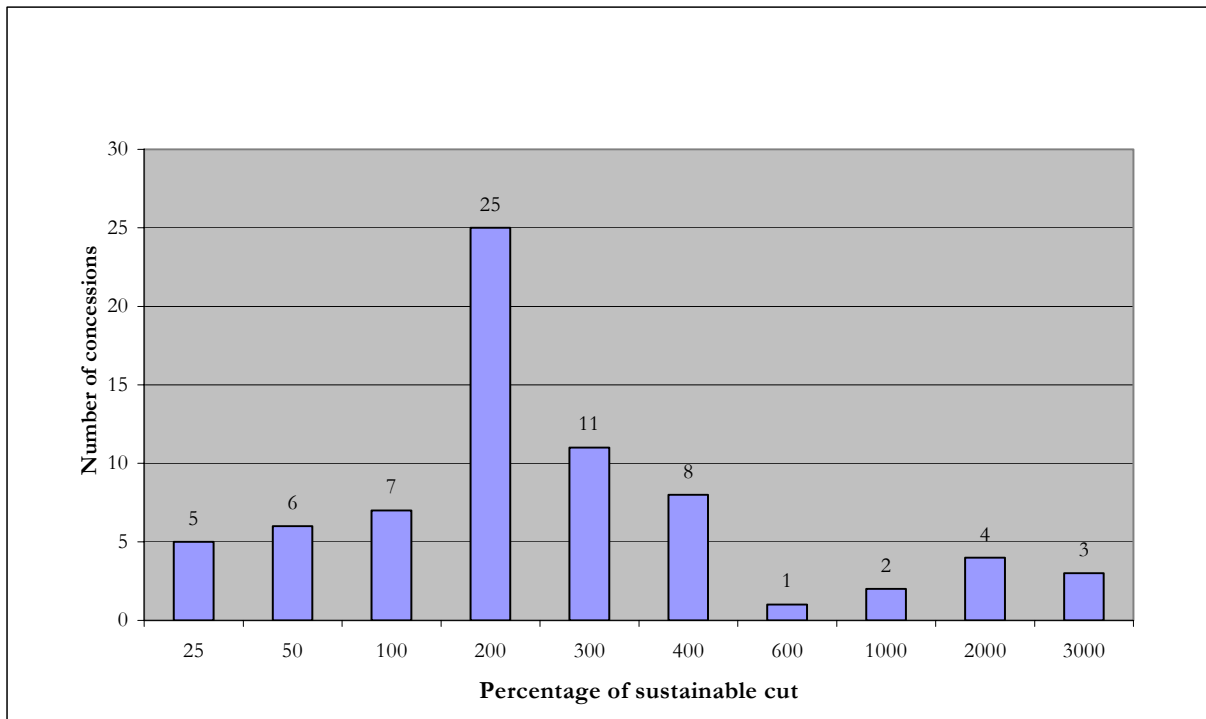
The 35-year cutting cycle in operation in Papua New Guinea is neither based on ecological parameters nor respected. In 1989, the World Bank used a 50-year cutting cycle to estimate the allowable cut that might lead to sustained yield management in PNG. By 1991, a cutting cycle of 40 years was assumed (Ministry of Forests 1991), while many commentators believed that all of these estimations grossly underestimated the period required for proper regeneration.³⁵

The proportion of concessions that are actually operating on a theoretically sustainable basis using the 40 year rotation time as the measure of sustainability is shown in **Figure 3** below. This assessment is based on PNGFA data showing the performance of all concessions operating since 1993. It compares the annual log export volume with the total quantity of timber estimated by the PNGFA in the concession. It shows that only 18 of the 72 concessions have been cutting at a rate that could allow a 40-year rotation. The overwhelming majority of these concessions have been cutting timber at more than double the nationally sustainable rate.

³⁴ Johns 1992.

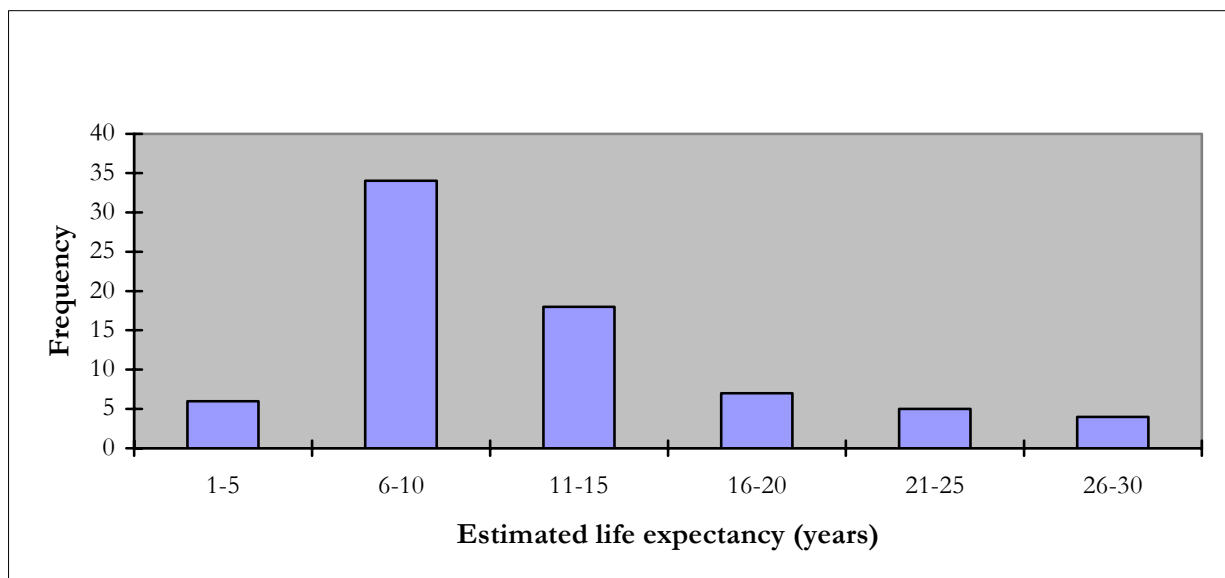
³⁵ Johns 1992; Sauli 1990.

Figure 3: Cutting Rates Expressed as Percentage of 40 Year Rotation



Examining this topic more directly through actual and projected concession lives, the situation is more worrying. For those concessions in operation between 1993 and 2000, the average concession life was 11 years. Indeed for those concessions projected to be exhausted by 2010, the average life span is likely to have been just 12.2 years. This can be seen in **Figure 4**.

Figure 4: Estimated Life Expectancy of Concessions Projected to be Exhausted by 2010 and Operating between 1993 and 2000



Given these figures, it is easy to see how entire provinces could have been logged already, and it is reasonable to suspect that new concessions will be completely logged with a decade of their allocation. While it is not possible to determine the true sustainable yield of timber from New Guinea's forests, it is possible to conclude on the basis of the available data, that forests are being cut at a rate far in excess of what could possibly be justified on any principle of sustainable management.

More critically, now that the bulk of the country's accessible forests have been logged for the first time, some areas are now being harvested for the second time as little as 10 years after the first logging event. This 'salvage' logging is far more destructive in terms of long-term ecosystem damage, predisposition to burning, and potential for total conversion. If existing trends are projected into the future, a large proportion of logged areas will be converted to grassland or non-forest vegetation types and will never again provide a renewable timber resource of economic significance. This question is central to the discussion as to whether logging is going to have a massive or just a huge impact on the natural ecosystems of this country.

The cumulative impact of logging in West New Britain can be inferred from **Figure 5**, which shows the expansion of the logging industry from 1972-2002. West New Britain continues to account for at least 50% of PNG's timber exports and exemplifies the extent to which the logging industry is by far the most dominant form of land use.

IMPLICATIONS FOR GOVERNANCE

There is overwhelming evidence that the foreign-owned logging industry in PNG is a major contributor to corruption at the highest Government levels and throughout the bureaucracy. The issue of forest management in PNG is not just about poor management practices and ineffective controls; corruption also has a major role in fueling the destruction of natural resources outside of the forest sector.

It is widely accepted that the logging industry is the major source of funds for political parties and individual politicians.³⁶ Such support does not come without a price. At a national level, logging companies can 'buy' the right to log in particular concessions areas. Permits or licenses are issued to them totally outside the established legal process for resource acquisition and allocation. The PNG press has documented the repeated attempts by one recent Forest Minister to direct the National Forest Board to grant specific new concessions to his own preferred logging companies.

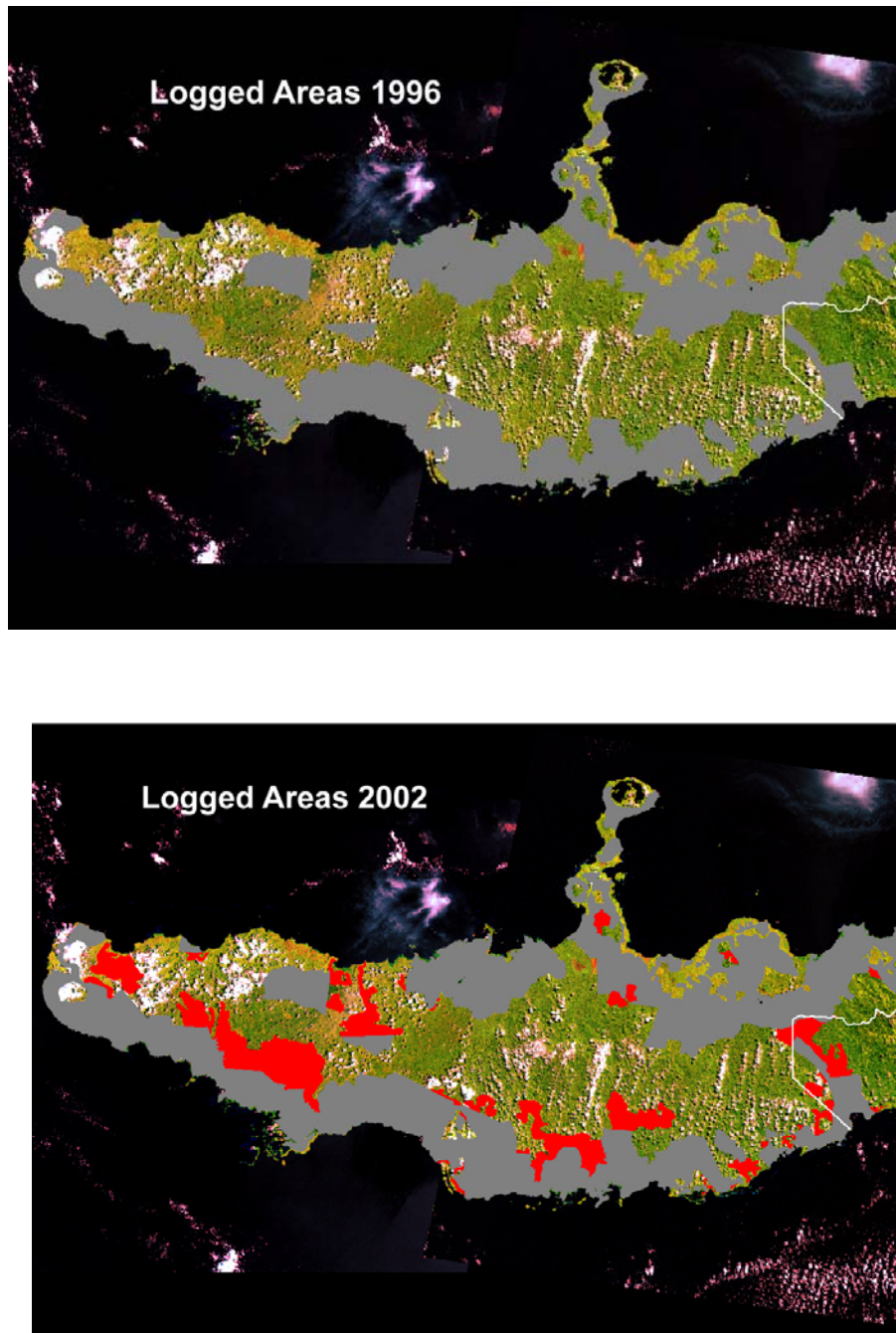
Recently released employment data shows that 90% of the insured workforce of Rimbunan Hijau, the largest logging company in PNG, are Malaysian, Indonesian, Chinese or Filipino. This staff is employed across 17 different subsidiary companies. The vast majority of these people works in positions reserved by law for native Papua New Guineans, such as cooks, tractor drivers and sawmill operators. This data is indicative of either a massive immigration scam involving politicians and senior bureaucrats or an illegal people-smuggling operation.

One of the greatest tragedies of the behavior, demands and influences of the forest industry has been the effective demise and catatonia of the Department of Environment and Conservation (DEC). From the perspective of wider environmental management and control across other sectors, the corruption of this

³⁶ Chin 2000.

department has had wide ramifications. Instead of fulfilling its institutional mandate, the DEC has become merely a liberally applied rubber stamp for all forms of natural resource exploitation.

Figure 5: The Extent of Logging in West New Britain – 1996 and 2002



PRELIMINARY ASSESSMENT OF POLICY IMPLICATIONS OF THE EXPORT TRENDS

In 1998, the Chinese Government, in a dramatic about-turn, banned logging along major rivers in its central and northeastern regions as part of a large-scale reforestation plan to cope with the worsening floods. This was expected to spark a shortfall of 45 million cubic meters of timber by 2000.³⁷ As has been shown in this report, this is being partly met by an increase in the importation of timber from Papua New Guinea.

There is no sign of Papua New Guinea emerging from the economic mire in the near future. The current account deficit is spiraling, over 60% of revenue is spent on debt repayments and cash crises dominate the weekly attention of the public service. The outcome of these troubles means that the country is likely to be extremely anxious to maintain the level of its exports of raw logs and processed timber to China for the foreseeable future.

It is likely, however, that the volume and value of exports to the Chinese market will not increase much higher than the 2002/2003 levels. While log exports to China have risen significantly, the industry is capped by the available resource, and this expansion in Chinese market share has been at the expense of other export destinations. This limitation is due the current exhaustion of many of the concessions that came into operation in the early 1990s and the current World Bank scrutiny of the sector, both set against a backdrop of a dwindling national resource. The one area that does have the potential for expansion is the veneer component of the export industry. All veneer is produced by the Panakawa mill in the Wawoi Guavi Concession of Western Province. As this concession is rapidly approaching the end of its resource as well, the continuation of the Panakawa operations is dependant on the allocation of the neighboring Kamula Doso concession to Rimbunan Hijau, and this concession is still the subject of major controversies as a consequence of corrupt dealings.

The overall implication of PNG's export of raw logs is that it is occurring at the expense of the potential of the industry to continue in a sustainable manner into the future. The forests are being literally mined. As concessions are coming to the end of their resource it is increasingly apparent that they will not support a forestry operation for many decades, if ever. As this fact becomes accepted, it is possible that Australia and the World Bank, both currently keeping PNG economically afloat, will demand greater attention to improving practices within the industry. Alternatively, it is also possible that as log exports will be one of the few areas in which PNG can earn export dollars, short-term expediency will win out over the longer term interests of the country. It is hard not to see whichever outcome occurs as the process is intertwined with the fate of the World Bank Forestry and Conservation project.

³⁷ Reuters 1998. "China expected it would need about 110 million cubic meters of timber in 2000 but domestic supply would be no more than 65 million cubic meters."

PRELIMINARY ASSESSMENT OF LIVELIHOOD IMPLICATIONS OF CHINA'S DEMAND FOR LOW INCOME COMMUNITIES

Over eighty percent of the population of Papua New Guinea lives in rural areas and depends on subsistence farming. While money was not an issue in the recent past, there is a growing trend towards finding ways to generate income to pay for basic services such as school fees and medicine as well as store items such as soap, sugar and other goods. The need to earn cash has caused many rural dwellers to move to the urban areas, but the majority of the population continues to live in a rural setting.

The illiteracy rate is relatively high in Papua New Guinea – between 50-70% – and the bulk of the illiterate population lives in a rural setting. Illiteracy rate plays an important role in the failed development of the people and the country. Papua New Guinea is abundant with natural resources such as minerals and petroleum, fisheries and of course forests. For any major resources development to take place, consent has to be sought from the local communities. In many instances these illiterate people have been subject to abuse and cheating by the few elites of society. Landowners are not making informed decisions in areas of resource development. This is especially the case in forestry. No one feels responsible to adequately take time to sit and educate the landowners about alternative options, their rights and associated matters – there is no empowering of the local people to enable them to make informed decisions.

Given this situation, landowners and low-income communities are usually left to the mercies of a few corrupt people, usually local elites from the given area who usually does not have the interests of the whole community at heart but have their own needs as priority. These elites then find some foreign loggers to bring into their area to log.

Following are some of the major implications of China's demand for low-income communities:

ILLEGAL LOGGING

In their quest to get access to forest areas and the timber resources, many logging companies and their cohorts venture into questionable arrangements. PNG has all the necessary laws and policies in place to ensure things are done properly, but there appears to be no political will to ensure things are done right. In a few cases examples of such practices are now finding their way in to the courts.

Communities' lives are transformed and many people are displaced. Landowner's traditional way of living is disrupted so much that life is no longer the same. Permit obligations are not being executed by the developer of the forest resources. There is no one to police and or ensure that logging companies comply with the permit conditions. Many of the logging activities are also taking place in many remote and inaccessible areas of the country where monitoring and enforcement are difficult.

Just as serious is the fact that the benefits and financial returns that resource owners are supposed to be getting from harvesting of their resources are not happening. Even if some infrastructure development takes place, it usually lasts only as long as the logging period. Numerous examples of unfinished buildings, roads and bridges have been left all over the country where logging has taken place.

At a national level, the state is losing millions in terms of unpaid taxes and other fees due to the illegal logging and the foul and corrupt activities and practices that take place without any government supervision.

NO GOVERNMENT SUPPORT TO COMMUNITIES

Communities that are affected by logging operations or want to seek help do not appear to get support or receive any assistance from the Forest Authority. The forest extension services of the National Forest Service have been abolished with no proper explanations. Landowners are left to fend for themselves on forest development issues.

Landowners need to understand what is going on and need to be able to make informed decisions as to what are the right options for themselves. After all they own the land and the forest resources. On many occasions landowners are spectators of forest development activities that take place on their own land. No one seems to feel responsible to help educate the landowners. The unfortunate thing is that landowners are left to face the consequences of decisions made by others.

GOVERNMENT POLICIES

Current government policies appear to support only large-scale logging operations whose products are mainly round log exports. Trying to change the bureaucracy is not very easy. The government has always paid mere lip service to any attempt to address this issue in a tangible way. Many landowners wanting to be given the opportunity to develop their own forest resources themselves do not seem to get any help from the department that has the mandate to help them. Landowners are being forced to look elsewhere for help, mainly because the government bureaucracy has not opened up to see that the world is changing and that there are other ways of developing the forest.

NEED FOR CASH

In many remote areas where there have been little or no government services, landowners are willing to give up their forest resources in exchange for cash or other forms of compensation. The bottom line in such situations is that deals are not done equitably, and unfortunately creaming of forests takes place at the expense of the livelihood of the people and without any care for the environment. This is the unfortunate situation all around PNG where the government has failed to deliver to its people and has sold out to unscrupulous foreign developers. This is not only prevalent in the forestry sector but occurs all across the range of natural resources.

REFERENCES

- Arentz, F., B. Brunton, A. Carothers, L. Cortesi, H. Holzknecht, and C. LaFranchi. 1998. Sustaining Papua New Guinea's natural heritage: An analysis of the Papua New Guinea national forest plan. Boroko and Gerehu, Papua New Guinea: World Wide Fund for Nature and Greenpeace Pacific.
- Chin, J. 2000. Forest Policy in Papua New Guinea. Paper presented at the Forest Policy for the New Millennium conference, August 1-3, Boroko, Papua New Guinea.
- Sun, X., N. Cheng, A. White, R. A. West, and E. Katsigris. *China's Forest Import Trends 1997-2002: Analysis of Customs Data with Emphasis on Asia-Specific Supplying Countries*. Forest Trends, Centre for International Forestry and Chinese Academy of Forestry, 2004.
- Department of Environment and Conservation. 1993. Papua New Guinea conservation needs assessment. Boroko: Government of Papua New Guinea.
- Department of National Planning and Rural Development. 2003. Papua New Guinea review of current logging projects. Port Moresby: Government of Papua New Guinea.
- Filer, Colin. 2002. *Production, privatization and preservation in Papua New Guinea forestry*. London: International Institute for Environment and Development (IIED).
- Forest Authority. 1979. *Private Dealings Act*. Port Moresby: Government of Papua New Guinea.
- Forest Authority. 1991. *Forestry Act*. Port Moresby: Government of Papua New Guinea.
- Forest Authority. 2000. Maps produced by the National Forest Authority. Port Moresby: Government of Papua New Guinea.
- Forest Authority. 2003. Draft Reforestation Policy. Port Moresby: Government of Papua New Guinea.
- Hammermaster, E. T., and J. C. Saunders. 1995. Forest resources and vegetation mapping of Papua New Guinea. Publication Four. Canberra, Australia: Agency for International Development, PNG Resource Information System.
- Johns, R. J. 1992. Vertebrate responses to selective logging: Implications for the design of logging systems. *Phil. Trans. R. Soc. Lond.* 335: 437-442.
- McRae, P. 2001. Paper presented to the forest industries association investment seminar, March 2001, Port Moresby, Papua New Guinea.
- McAlpine, J. R., and D. F. Freyne. 2001. Land use change and intensification in Papua New Guinea 1975-1996. *Asia Pacific Viewpoint* 42: 2.
- Ministry of Forests. 1991. *National Forest Policy*. Port Moresby: Government of Papua New Guinea.
- PNG Forest Authority Database.
- PNG Forest Authority Timber Digest.

PNG Forest Industries Association.

Reuters. 1998. China logging ban to cause shortage by 2000. *Reuters*: October 1.

Sauli, S. M. 1990. Forest research and development in Papua New Guinea. *Ambio* 19(8): 379-382.

Wunder, S. 2003. *Oil wealth and the fate of the forests*. New York: Routledge.