



Production,
privatisation and
preservation in
Papua New
Guinea forestry

Colin Hunt (editor)

2002

A component of the international collaborative
research project steered by IIED: Instruments for
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Executive summary

This report

The aim of this report is to identify instruments and arrangements to enhance the economic, social and environmental benefits derived from forestry in Papua New Guinea (PNG). The report draws on new research on:

- Potential reforms of the forest revenue system
- The lease, lease-back system in PNG and potential applications in forestry
- Small-scale certified forestry ('eco-forestry')
- New opportunities for contracting-out forestry services to the private sector

Current situation

Papua New Guinea – big forests, big issues

More than two-thirds of the area of Papua New Guinea is covered by primary forest, representing an enormous timber resource and a globally significant storehouse of carbon and biological diversity. The future of this resource has been the focus of heated debate over the last ten years, both within PNG and internationally. Key issues include:

- whether any further industrial forestry should be allowed in PNG, given the high conservation value of the country's remaining forests; and, if allowed,
- how to reduce damage to the environment caused by timber harvesting; and
- how to ensure that the costs and benefits of industrial forestry (and other uses of forests) are distributed equitably and efficiently.

There are an estimated 26.2 million hectares of forest in PNG, of which some 3 to 4 million ha have been logged or converted to other land uses. Of the total remaining, 10.5 million hectares have been acquired by the PNG Forest Authority, including 6.1 million hectares allocated under permit to 42 logging operations. Only about 2.8 per cent of the country is legally protected under National Parks, Provincial Parks and Wildlife Management Areas.

Actors and tenure

A range of different actors (stakeholders) is involved in the forest policy debate in PNG. Key actors include customary landowners, logging companies, timber exporters and processors, politicians and Government agencies, official aid donors (bilateral and multilateral agencies), international environmental NGOs



(and their domestic allies), academics, the media and the general public. Their voices and views are neither consistent nor coherent, even within a single organisation. Alliances are frequently shifting and it is not always clear who has the upper hand at any moment. In such a confused context, unfortunately, there is ample scope for private gain and for short-term interests to prevail.

Strong customary land tenure – upheld by the national constitution – is a distinctive feature of forest management and policy in PNG. Despite the strong legal claims of traditional landowners, however, alternatives to industrial logging are only rarely considered prior to the allocation of forest resources. Moreover, customary tenure in PNG has not guaranteed sustainable land use, due to the difficulties of identifying traditional landowners, poor enforcement of the terms of land leases and of concessions to private operators, and disputes over the distribution of benefits from logging and other non-traditional land uses. Land tenure issues are a major stumbling block in the development of plantation forestry in PNG, as well as constituting a hurdle to the development of new, conservation-oriented forestry activities.

Forest industry – at a crossroads

PNG has several natural advantages as a timber exporter including abundant raw material, good proximity to major Asian markets and (relatively) cheap labour. Log exporting is the most important activity of private logging companies (some 23 overseas-owned and incorporated concessionaires). One Malaysian-owned company accounts for almost half of all log exports from PNG. Annual log exports averaged 2.25 million m³ over 1996-99, generating US\$931 million in foreign exchange earnings and \$297 million in tax receipts over the same period. Processed wood exports and domestic consumption account for a relatively small share of log production.

The PNG forest products industry suffered a severe downturn during the recent Asian financial crisis, and future prospects remain unclear. Declining profitability has resulted in firm closures, job losses and stalled investment. Other factors, which have exacerbated the risks faced by the forest products industry in PNG and have further discouraged private investment, include:

- a Government moratorium on new logging concessions;
- increasingly demanding foreign consumers;
- competition from suppliers in other countries;
- frequent shifts in the regulatory and tax framework;
- an unstable macroeconomic climate;
- sharp criticism from environmental NGOs;
- embattled donor agencies;
- weak Government capacity; and
- ingrained corruption.

Sustainable forestry – an elusive goal

Under current conditions it is difficult to see how industrial harvesting of timber will ever get on to a sustainable footing in Papua New Guinea. This is true even if 'sustainable' is defined in the narrow sense of managing forests such that profitable yields of timber can be harvested in perpetuity. If we add other dimensions of sustainability, such as the conservation of biological diversity and other forest goods and services, or the development of vibrant and equitable rural economies, then the goal of sustainable forest management in PNG seems even more remote.

Managing natural forests for the sustained yield of timber is a sophisticated and expensive undertaking. Unfortunately, the PNG Forest Authority currently lacks the capacity to carry out this responsibility, as seen for example by its inability to generate accurate resource inventories for Forest Management Agreements – if the resource inventory is inaccurate then implementing a 35-year cutting cycle is impossible. Another limitation of the Forest Management Agreement is the real possibility that much of the forest will not recover, or be allowed to recover, after the initial harvest.

Under the present system, the Forest Authority bundles up forest areas into Forest Management Agreements, which are then made available by concession to commercial firms. The existing process does not allow for alternative land use options to be considered, e.g. conservation or small-scale harvesting. Community participation in forestry is essentially limited to the requirement that landowners be incorporated before they transfer control of their forest resources to the State.

Because land areas under Forest Management Agreements are to be harvested on a 35-year cycle, they are generally very large in area and, together with the existing operational concessions, will take the area set aside for industrial logging (and out of the control of customary owners) to about half the available forest area of the country. The locking up of vast forest concessions for long periods of time when the economic future is unknown, and depriving landowners of timely and equitable benefits from the exploitation of their resource, is both economically and socially unjustifiable.

New directions

Rural development and industrial forestry

One of the most pressing challenges for forest policy in PNG is how to promote rapid improvement of rural livelihoods, while maintaining the value of the resource base for future generations and avoiding actions that foreclose options for potential economic activity (e.g. eco-tourism, pharmaceutical prospecting, carbon storage contracts, etc.). The recent moratorium on new logging concessions imposed significant economic costs, in the form of forgone export income, employment and tax receipts. But it also bought time to sort out key issues. Some of these issues revolve around the forest revenue system, and

particularly the internalisation of environmental costs and the equitable distribution of the benefits of forest land use.

A tax system that internalises environmental costs

There are grounds for reforming the forest revenue system in a way that internalises environmental costs, while maintaining private profitability and reducing incentives to cheat. The current system of timber royalties and export taxes has several weaknesses, i.e. it:

- provides no incentive to reduce the adverse environmental impacts of logging;
- inadvertently distorts production decisions at the long term expense of the treasury; and
- creates perverse incentives to under-report the value of production and to neglect forest management regulations.

Estimated environmental damages from logging are conservatively estimated at K50 per m³ (about US\$20/m³). This figure provides the 'base' rate for a proposed new tax system. An additional percentage tax based on profits (per m³) would help ensure that Government (and/or landowners) benefit from rising timber prices, while protecting industry from adverse short-term fluctuations in market conditions. Variations on this system could incorporate measures such as increased revenue sharing with landowners, earmarking of tax revenue for forest conservation and management, tax rebates for environmental compliance. Competitive auction of timber concessions could also be tried, on an experimental basis, as a means to maximise the recovery of resource rents.

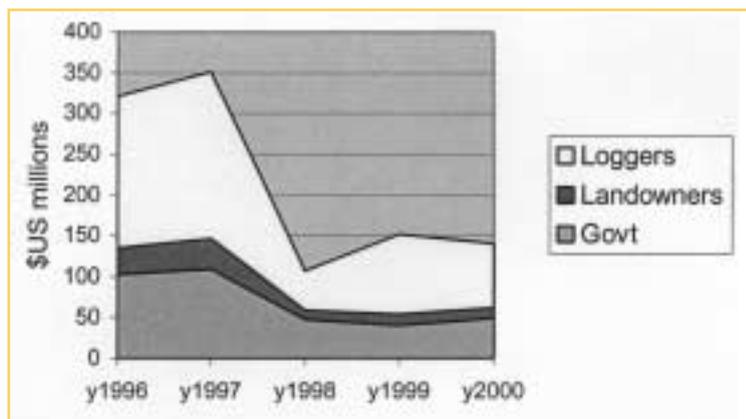
An important issue in the taxation of export industries such as logging in PNG is the denomination of tax, i.e. whether taxes are levied on the local currency value or the world price of the export commodity. Analysis suggests that if the PNG Government is risk-averse and aims to ensure a stable revenue stream, they should favour local currency denomination. This would allow the Government to avoid downward fiscal shocks in the event of rapid exchange rate or world commodity price fluctuations.

A revenue system that gives fair shares and fosters investment

Another weakness of the current forest revenue system is the inequitable distribution of benefits. The resource owners – customary landowners – presently receive at best only about 12 per cent of the market value of logs (see figure below). Moreover the system of payment is complicated and indirect – through central government, or via local funds that are supposed to facilitate development but are open to mismanagement. This report argues that customary landowners should receive a larger share of the economic benefits of timber harvesting than they do at present, and proposes a change to a simpler system where the increased landowner benefit is calculated as a fixed percentage of total log tax.

The distribution of benefits from logging in PNG

(shares of market - 'free on board' - log value, 1996-2000)



In the event of a more fundamental shift in policy – the abandonment of the present system of acquisition and allocation of forest and replacement by direct landowner-logger bargaining – the landowners would receive their negotiated share direct from logging companies. In this event, the same basic regulations would apply to harvesting and marketing as apply now. The logging code of practice would be enforced and a log tax – based on profit rather than price – would still be collected from the private harvesting companies by the Government on the basis of monitored log shipments from ports.



It is noteworthy that no serious forest conservation is in place because of the restraints of customary tenure and the incapacity of Government. Under the alternative proposed, where landowners are free to choose from a range of alternatives, there would be equal opportunities for NGOs, donors and private enterprise to compete for the use of the forests. Allowing conservation to be a commercial option faces the reality that landowners will not adopt conservation simply because their awareness of its value is raised, but only if the rewards justify it. Eco-tourism based on forest conservation could flourish to the benefit of landowners, but law and order problems are a major constraining factor.

Present forestry policies and Forest Authority practice are mainly aimed at generating tax revenue for the Government. Under the present tax system, based on log price, the tax can and often does exceed the resource rent available, stifling production and investment in forest industries. The overall goal should be to create a situation where profits can be retained and a climate that is conducive to private sector investment, leading to employment and income growth. Judicious export tax reductions and/or other incentives could stimulate investment in processing – given that this investment is likely to come from companies already operating in PNG. However these incentives should always be justified in terms of a net increase in value added to the domestic economy equal to or better than that of other investments.

Outsourcing forestry services

The provision by Government of management, regulatory and research services in forestry will continue to prove difficult, in light of the severe fiscal constraints affecting Papua New Guinea. Moreover, the pool of trained human resources, from which Government is expected to draw expertise, is inadequate and unlikely to expand in the near future. This study puts forward options for outsourcing and privatising certain forestry services to achieve greater effectiveness and cost savings. The benefits of outsourcing forestry services to reliable companies include greater freedom from political interference in operations, increased transparency and reduced opportunities for nepotism or corruption.

Opportunities for outsourcing the services of the Forest Authority include transferring forest related research to local universities, and outsourcing resource inventories and acquisition to commercial consultants. While the potential financial savings to the State may not be great – perhaps between K6 and K12 million (US\$1.6m-US\$3.2m) per annum – there could be significant advantages in terms of management effectiveness. In the case of research, the discipline imposed by commercial contracts should improve efficiency, with potential knock-on benefits to technical and professional training programmes in forestry. Similarly, outsourcing certain activities related to forest resource inventories and acquisition would stimulate the development of a group of independent forest management specialists and possibly also greater involvement in forest management activities by traditional resource owners. Greater reliance on outsourcing will however require stricter procedures for licensing and monitoring the performance of private contractors.

Using private contractors to monitor transfer pricing

The important task of monitoring PNG log exports has already been outsourced to SGS, an international firm that specialises in monitoring trade between countries. Most observers in PNG agree that SGS has performed its assigned tasks well, and that the financial benefits to the State are significant. A similar approach could be used to monitor the entire chain of commercial transactions, from forest resource owners to export markets, generating benefits beyond simply ensuring that tax revenues are fully and fairly collected. For instance, an international firm could be contracted to gather and disseminate information on market prices overseas, helping resource owners, harvesters and the State to ascertain whether they were receiving their fair shares.

Comparisons of prices reported by PNG log exporters against prices recorded independently in overseas markets would assist Government in its efforts to control transfer pricing – i.e. under-reporting export values. Total losses from transfer pricing in PNG were estimated at between K26 and K52 million in 1999. The PNG Government argues that tax reforms are impossible so long as some companies continue to avoid tax through transfer pricing. We believe that transfer pricing should not stand in the way of urgent reforms of forestry taxation, not least because log companies themselves lose income from the practice.

Going further – reforming the role of the State

In the longer term, even greater savings may be achieved by reforming the role of the State in forest management. For example, the constitutional imperative 'to conserve' need not be interpreted as a requirement for the State itself to manage forests at a provincial level on a sustained yield basis, but rather as a mandate for the State to ensure that environmental and other standards are upheld. This would of course also imply a much greater role for resource owners in the management of their resources, with the State primarily focusing on environmental enforcement and tax collection.

Sceptics argue that resource owners in PNG cannot assume greater responsibility for forest management, because they lack the commercial sophistication required to deal on equal terms with companies (or indeed with NGOs), and because they will not agree among themselves on matters such as the division of profits from forest harvesting.

While many resource owners will certainly need assistance, their lack of experience of commercial and collective decision-making should not be used as an excuse to prevent them realising their inheritance. Sooner or later, forest owners will themselves demand greater control of their resources. Unless the State prepares for this by appropriate outsourcing and a controlled transfer of management responsibilities, it may run the risk of alienating rural populations, and potential social unrest.

Plantation forestry and the 'lease, lease-back' system

In Papua New Guinea, developers are not currently allowed to deal directly in land. Insecure tenure and frequent land disputes have discouraged the development of large-scale agricultural plantations outside of State lands. Instead, a way must be found whereby a lease can be obtained that gives the developer security of tenure, allowing management of the land, while at the same time guaranteeing the continuation of customary tenure.

Under the lease, lease-back system, customary landowners are first incorporated as a legal entity or Land Group, to which the State issues a lease. The Land Group then sub-leases the land to a private developer, who pays rent and royalties to the landowners directly, in accordance with the agreement. The system does not affect land ownership, which remains in the hands of customary owners. At the same time, lease, lease-back provides greater security and encouragement to land developers, in the form of a State guarantee of the lease. Importantly, the system provides a framework for customary landowners to share in the benefits of land development. The system has been used in oil palm so far successfully, generating significant cash income for landowners as well as strengthening local capacity in cash crop production technology and agri-business management. Full and informed support for the lease, lease-back system among customary landowners is a fundamental precondition for its success.

The lease, lease-back system may have potential in reforestation or timber plantation projects. Many of the same conditions apply as in cash crop projects:

- relatively large areas of contiguous land are required;
- benefits to local populations should be immediate and tangible;
- demands on local populations are modest (other than access to the land); and
- Government has a limited role as legal guarantor of the agreement.

The importance of immediate benefits to landowners may be a constraint in some forestry projects, where several years of growth are required before any harvest takes place. However, with secure land tenure it should be possible for developers to borrow against future income, allowing them to make early payments to landowners.

Sub-leases under the lease, lease-back system could also be used in forest conservation projects proposed by environmental NGOs. With leases running for 99 years, the system could enable NGOs to secure forestland on a long-term basis – just as a palm oil company has secure management of plantations. Lease payments from NGOs to landowner groups could be negotiated under the sublease, as they are in oil palm projects. On expiry the sublease could be renewed, failing which the forest would revert to the management of the customary owners, again as in the case of oil palm. A logging company seeking to undertake the sustainable management of an area of natural forest could likewise use lease, lease-back as a vehicle to secure long-term access. More research is urgently required on these possibilities.

Eco-forestry's advantages over logging

'Eco-forestry' – small-scale forestry that is certified, or conducted in an ecologically sensitive manner – has gained in popularity due to the efforts of several indigenous NGOs: the Village Development Trust, the Pacific Heritage Foundation and the Foundation for People and Community Development, and the investment of the European Union in its project based in West New Britain.

Analysis here shows that without the substantial subsidies provided by the EU, certified forestry groups in PNG would find it very difficult to start up. Significant up-front investment is required to train landowner groups in saw operation and forestry management, and to ensure that a viable forest management plan is in place. Once established the ongoing annual cost of preparing for certification and of certification itself must be met, and this is also subsidised by the EU. However, these added costs are not recouped in higher sale prices for certified timber thus, without the financial support of the EU, a financial incentive for certification is lacking. It is therefore not surprising that some NGOs, which are not nearly so well endowed as the EU, are not presently pressing ahead with certification of the groups they work with.

Subsidised small-scale enterprises can provide employment and quite a healthy profit, comparable with the returns to landowners from logging (depending on

how the proceeds of logging are used). Donors are also interested in the substantial environmental benefits of diverting large areas of forest from logging to eco-forestry. While the environmental benefits are very difficult to estimate accurately, the analysis suggests that the subsidisation of eco-forestry can be economically worthwhile despite these costs, when environmental benefits are accounted for. In addition, the intangible benefits that flow to the supported eco-forestry groups can be substantial. These include experience of the market economy, an introduction to land use planning, and how to organise themselves into a functional business enterprise.

Remaining challenges for small-scale forestry

Presently the eco-forestry groups contribute nothing to Government coffers by way of a resource or log tax. However, if groups become subject to log tax at the present rate their profitability will be substantially reduced and their viability will be threatened.

Another disadvantage of eco-forestry is that it typically involves separate areas of about 1,000 hectares of forest. In theory, external subsidies for 'environmentally-friendly' forestry would more easily be justified for large, contiguous areas of forest that provide habitat for a wide range of species. In practice, the conservation of large areas inhabited by many different clans would involve much higher set up costs, more complicated distributive mechanisms and possibly a higher cost of monitoring in remote areas. These constraints are also likely to hamper the development of markets for environmental services in PNG.

Analysis suggests that global environmental benefits, such as carbon sequestration and biodiversity conservation, dominate the domestic economic benefits of tropical forest conservation in PNG. But these global benefits are a consequence of the functioning of local environments. If donors are to justify continuing subsidies for eco-forestry, or for direct forest conservation they will need better information on the value of environmental services provided under alternative land management systems.

Sponsored small-scale timber harvesting is a welcome development, but there are probably hundreds of unsponsored and unregulated portable mills currently in operation in PNG. While the absence of heavy machinery in these portable operations makes them intrinsically less damaging, they work with impunity in areas off limits to loggers, such as buffer zones, thus undermining efforts to reduce the impact of industrial logging. Portable mills use logging roads to make use of rejected or waste logs, but they can also harvest undersized trees left behind and selectively fell the most desirable species, thus ruling out an economically viable second cut at the end of the planned cycle. Forestry administrators and donors urgently need to develop appropriate policies that will not stifle small-scale regional businesses but will impose greater sustainability on their operations.

Once again, the monitoring and control of small-scale forestry operations is something that could be outsourced to the private sector on grounds of technical and economic efficiency. It should, nevertheless, be borne in mind – given the difficulty of administering small, and in many cases remote enterprises – that further work needs to be done to establish the benefits and costs of such a regulatory system.

Summary of recommendations

Keep a focus on value-added processing. Macroeconomic stability, economic recovery and improved governance are essential for attracting private investment in forestry in Papua New Guinea. In the current fiscal context, significant Government support for the wood-processing sector is hard to justify. However, increasing domestic value added is a legitimate goal and more attention should be given to how this can be economically achieved, without undermining incentives for sustainable resource management.

Try the lease, lease-back system in forestry. Customary land tenure is both a defining characteristic of Papua New Guinea and a significant constraint on land development, including sustainable forestry. The lease, lease-back system may be an effective instrument to overcome barriers inherent in customary land tenure and to encourage private investment in forestry, while ensuring that the benefits of land development are shared equitably.

Revisit the revenue system. The log export tax should be retained and denominated in kina as an effective instrument for extracting resource rents. However, the revenue system should be revisited so that customary landowners receive a fairer (larger) share of the rents from logging. Moreover, the tax structure should be adjusted to account for the costs of production, so that private harvesters are assured of at least normal profits. A reformed tax regime should also incorporate a fixed base rate per cubic metre, reflecting the average environmental damages from logging.

Enable customary owners to control their resources. The cutting cycle proposed under Forest Management Agreements is unlikely to be socially or economically sustainable. An alternative approach would acknowledge that customary owners have ultimate control over their resource, and would allow open competition between those wishing to exploit or conserve forest resources. Under such a system Government would continue to impose taxes and monitor and control both log exports and logging practices.

Outsource routine forestry services. Severe fiscal and human resource constraints within the PNG Government demand innovative responses. Opportunities exist to make more use of private contractors to provide routine forestry services, including export monitoring and field supervision. Contracting out these and other forestry services on the basis of competitive tenders could alleviate pressure on Government budgets and personnel, while improving



efficiency. Potential cost savings from contracting out and related reforms are estimated at between K6 and K12 million [(US\$1.6m-US\$3.2m) per annum.

Support small-scale forestry for environmental and social benefits. Forest certification and promotion of small-scale 'eco-forestry' may be a more cost-effective means of achieving conservation goals than the creation of new protected areas (although these are also required). However, the costs of certification are presently high while the market benefits are limited. Subsidies are required if village-based groups are to embrace certification and small-scale logging for export. These subsidies may be justified in part by environmental benefits, as well as local capacity-building and other social benefits. However, so far, the burden of supporting small-scale forestry in PNG has been borne mainly by foreign NGOs and donor agencies, with only limited support from Government. This support may be difficult to sustain over the long-term.

Install systems for improving small-scale forestry standards. Government must play a more active role in managing small-scale loggers and wood processors, to ensure that they conform to approved management standards. The limited information available on the activities of unregulated small-scale forestry in PNG suggests that a programme of licensing, training and extension is required, similar to that in Vanuatu. Such a programme could be contracted out to certified independent foresters that also monitor industrial logging.

Acknowledgements

The aim of this Papua New Guinea country study is to identify instruments, mechanisms and arrangements that will enhance the economic, social and environmental benefits derived from the forestry sector. The PNG study forms part of a global project that draws together important themes and policy issues in private sector forestry.¹

This study complements and extends previous collaborative research by the PNG National Research Institute (NRI) and the International Institute for Environment and Development (IIED) on the PNG forest sector (Filer with Sekhran, 1998), and by IIED on global trends and challenges in the privatisation of sustainable forestry (Landell-Mills and Ford, 1999). The study also benefited from two workshops held by IIED in London; the first held in January 1999 to identify research issues, the second in November 2000 to report findings from the country studies and to identify key policy themes.

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An international forestry conference held in Port Moresby in August 2000, entitled 'Forest Policy for the New Millennium' was hosted by the National Research Institute and co-sponsored by IIED under the auspices of this study. The conference attracted over 200 international and local participants, including a strong landowner contingent. The papers and discussions arising out of the conference had a significant bearing on this study.

Joshua Bishop of IIED was influential in the organisation of the research and in structuring and commenting on this report. William Hyde provided advice both technical and editorial, and editorial comments were received from Claude Heimo and James Mayers.

1. The other countries studied are Brazil, China, India and the Republic of South Africa. Additional thematic studies carried out by IIED address the impacts of forest certification, lessons from forestry partnerships involving corporations and communities, and the potential benefits and limitations of markets for environmental services as instruments for sustainable forest management and poverty reduction.

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Acronyms

AIDAB	Australian International Development Assistance Bureau (see AusAID)
AusAID	Australian Agency for International Development (formerly AIDAB)
CDM	The Clean Development Mechanism
CTF	Conservation Trust Fund
CPI	Consumer Price Index
EU	European Union
ET	Emissions Trading
FIA	Forest Industries Association
FMA	Forest Management Agreement
FOB	Free on Board
FRI	Forest Research Institute
FSC	Forest Stewardship Council
GEF	Global Environment Facility
IIED	International Institute for Environment and Development
ILG	Incorporated Landowner Group
ILGs	Incorporated Land Groups
IMF	International Monetary Fund
IRECDP	Islands Region Environmental and Community Development Programme
JI	Joint Implementation
LFAs	Local Forest Areas
NFA	National Forest Authority
NFP	National Forest Plan
NFS	National Forest Service
NGOs	Non-government Organisations
NPV	Net Present Value
NTFPs	Non-timber forest products
PDB	Producer Development Benefit
PFMC	Provincial Management Committee
PNG	Papua New Guinea
PNGCTF	Papua New Guinea Conservation Trust Fund
PNGFA	The Papua New Guinea Forest Authority
SGS	Society for General Surveillance
SPO	The State Purchase Option
TAs	Timber Authorities
TRP	Timber Rights Purchase
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WWF	World Wide Fund for Nature/World Wildlife fund



Currency exchange rates US\$/Kina Foreign Currency Units per PNG Kina, 1992-01 (Year End)

1992	1.0127
1993	1.019
1994	0.8485
1995	0.7545
1996	0.7553
1997	0.6971
1998	0.4856
1999	0.3922
2000	0.3623
2001	0.28

Source: Bank of Papua New Guinea

Errata:

Frontispiece Citation should read:

Colin Hunt (ed.) 2002 *Production, privatisation and preservation in Papua New Guinea Forestry*, Instruments for sustainable private sector forestry series. International Institute for Environment and Development, London.

(2) Page 81, should read:

$$NPVEF = \sum_{n=0}^{50} CB_n / (1+r)^n$$

(3) Page 82, should read:

$$NPVLO = \sum_{n=0}^{50} AL_n / (1+i)^n / (1+r)^n$$

(4) Page 86, should read:

$$NPVCC = (t_1 * c_1 * 1000) - \left\{ \sum_{n=0}^{50} (t_1 * c_n * 1000 / 50) / (1+r)^n \right\}$$

(5) Page 88, should read:

$$NPVCE = \sum_{n=0}^{50} \{ (e_1 - (e_1 * n / 50)) * 1000 \} / (1+r)^n$$

(6) Page 89, should read:

$$NPVEB = \sum_{n=0}^{50} (CB_n - SE_n - LO_n + CC_n + CE_n) / (1+r)^n$$

Issues of forest ownership, exploitation, preservation and allocation

This introductory chapter sets the policy scene by highlighting the importance of ownership, the role of the private sector and institutions, and the influence of domestic and international economic forces in the exploitation and management of Papua New Guinean forests.

1.1 The forests of Papua New Guinea

About 70 per cent of the land area of the country is covered by primary forest that represents both an enormous timber resource and a storehouse of some seven per cent of the world's biodiversity. The size and nature of this tropical forest resource makes up a significant proportion of the untouched global total.

There is some uncertainty over the actual area of forest that is suitable for commercial exploitation. The Papua New Guinea Forest Authority (PNGFA, 1996) states that there are potentially 26.2 million hectares available. McAlpine and Quigley (1998:iii) suggest that some 3.3 million hectares had been logged over or converted to other land uses by 1996. Subtracting this from the total leaves some 23 million hectares available. Assuming that there has been approximately one million hectares logged since 1996 this leaves 22 million hectares available. Of this, 10.6 million hectares – or half the total available – have been acquired by the Authority (PNGFA, 1998; Table 2), while 6.1 million hectares – or less than two thirds of that acquired – are allocated under permit to existing operations by some 23 parent companies at 90 sites.

The continuing uncertainty surrounding the amount and availability of the forest resource hinders planning and forest management. This project offered to assist the PNGFA to validate forest inventories from databases but the offer was declined.

Three issues have formed foci of the forest debate over the last ten years. The first debate has been about whether there should be logging at all, given the high biodiversity value of the forest, together with the fact that, where there is logging, landowners seem to benefit little from the proceeds. The second debate has been on the minimisation of the damage to biodiversity and environmental services caused by log harvesting. The third debate has been about the apportionment of the resource rents from logging between the various stakeholders.

The Office (formerly Department) of Environment and Conservation has expressed concern at the lack of planning and the lack of control of forestry



operations in the case of logging activities. Irrespective of the forest type, “...the impact immediately after logging is so great that more than 70 per cent of the trees in the original forest are so severely cut or damaged that they do not survive the following 10 years” (Department of Environment and Conservation, 1995:163, cited by AusAID, 1997:67). “In addition, regeneration is generally unsupervised leading to a proliferation of fast growing, less valuable, pioneer species as a result of the opening up of the canopy” (AusAID, 1997:67). A Logging Code of Practice is now in place, and this is being reinforced by training of forestry operators under an AusAID scheme. However, rangers (through personal communications) report that the implementation of the Code is patchy. A considerable proportion of the area to be logged under Forest Management Agreements is often classified by the Office of Environment and Conservation as ‘fragile’, but the exclusion of these areas from the loggable area can render the project uneconomic (Everts, 2001).

The need to enhance the regeneration of logged areas and of reforestation is also attracting the attention of aid donors.

1.1.1 Conservation

In Papua New Guinea, and indeed throughout Melanesia, the forests are invariably the source of non-timber forest products (NTFPs) and timber for local construction. It is not practical or desirable to exclude customary owners from forests in the name of ‘preservation’. The goal must be ‘conservation’ that recognises local rights to NTFPs, the rights being embodied in forest management plans. Therefore in this study the term ‘conservation’ is preferred to ‘preservation’.

Only some 2.8 per cent of the country is legally protected under National Parks, Provincial Parks and Wildlife Management Areas although the status of these areas that have been handed back to provincial administrations is unknown. Reasons for the minor role of formal conservation affecting acquisition include the dominance of strong customary land tenure and the limited financial and operational ability of the Government to manage such areas. NTFPs used by the indigenous population include fruits and nuts, tannins, rattan, fauna and insects. Some small-scale commercial operations have developed, including butterfly farming, orchid growing (in the case of orchids there is a Government ban on exports) and eco-tourism, but these have yet to attract significant private sector interest. Eco-tourism development is hampered by the country’s law and order problems.

The increasing interest being shown by the international community and pharmaceutical companies in paying for forest conservation offers new incentives for forest protection. The 1991 *Forestry Act* makes provisions for permits to be issued for bio-prospecting and carbon storage. There are already examples of local entrepreneurs forming contracts with foreign research groups and pharmaceutical companies despatching samples of flora.

The recognition of the need to conserve PNG's natural forests and the enormous biodiversity they contain has already attracted significant funding from international donors. For example, the Global Environment Facility (GEF)¹ has become an important source of funding for regional biodiversity conservation through allocations to the South Pacific, including Papua New Guinea. The GEF has also very recently contributed to the establishment of the Papua New Guinea Conservation Trust Fund (PNGCTF) (World Bank, 1998). Such funds are suitable mechanisms for funding long-term conservation projects. With the addition of collateral investment (which is actively being sought) to its perpetual fund, the PNGCTF will generate financial flows available for investment in both land and marine biodiversity conservation, the extent of which will be dependent on the fund's success in attracting financial contributions. The major international NGO involved, The Nature Conservancy, provided technical assistance and administration to the fund in its initial stages. The fund is now overseen by an independent board that will oversee fund management and its investment policies.

It may be argued that the existence of strong customary tenure – which, as emphasised above, is common to almost all forested areas in PNG – is more likely to promote sustainable use of natural resources, compared with weak tenure, where strong external economic agents may easily override local resource rules. However, its existence is by no means a guarantee against deforestation because of the difficulty of establishing ownership over commonly held forests and the consequential problem of transferring financial incentives to the owners without dispute. While logging is a short-term, one-off, operation that involves a relatively small number of landowners at any one time, conservation – in contrast – is long-term and involves all landowners simultaneously over large, and therefore more diverse, areas. The long-term and continuous nature of conservation means that any arrangements, between landowners and agents providing financial support, are subject to risk and uncertainty.

The major constraint to the application of financial incentives to traditional owners to conserve biodiversity is the lack of knowledge of arrangements and agreements between donors and owners that will stand the test of time. Both parties, donors and traditional landowners, need to feel secure in a relationship. Landowners need to know that their customary rights over land or inshore waters are not compromised by the arrangement. Donors need some kind of security that the agreement will be robust enough to deliver long-term conservation.

Elsewhere in the Pacific there are examples of agreements on land use and financial assistance for conservation that have conservation potential. Under the

1. The GEF is a financial mechanism that provides grant and concessional funds to augment projects and activities in developing countries that aim to protect the global environment. The problems addressed by the GEF are climate change, biodiversity loss, pollution of international waters and ozone layer depletion. In 1994, US\$ 2 billion was pledged by June 1997, by 31 countries, to the GEF trust fund in the World Bank. Implementation is through the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP), which are charged with identifying projects, providing associated technical and scientific assistance and capacity-building.

Vanuatu Biodiversity Conservation Trust Fund, for example, there is an arrangement under which landowners of the Erromango Kauri Protected Area lease their land to the Government in exchange for annual lease payments (Tacconi and Bennet, 1994).² A contrasting arrangement exists with respect to a conservation covenant between the owners of the forest and the international benefactors in Samoa. The covenant is binding to both parties but it contains no arrangement allowing the donor to exercise jurisdiction over the future use of the land (Hunt, 1998).³

Filer with Sekhran (1998) are very specific in suggesting that without the development of arrangements that can satisfy both parties, in terms of providing security, the future of conservation in Papua New Guinea is bleak. They suggest that while it may take a long time to test innovations and to hold the debate at three levels – local, national and global – and to transform the relationship between forest and people, Papua New Guinea has time on its side because the forests are still present and the people cannot make rapid changes to portions of the landscape even if they wish to.

However, given the poor social and economic conditions in the country – relative to other Pacific nations as well as to the rest of the world (Office of National Planning, 1999) – there is also an urgent need to harness forest resources for development. At the same time, valuable areas of forest must be conserved for posterity, and protected from ‘death by a thousand cuts’.

1.2 Customary land tenure

Almost all land within Papua New Guinea (about 97 per cent being the oft-quoted figure) is held under customary tenure. Though there may be debate about who owns the land under this tenure, most agree that the clan, sub-clan or lineage is responsible for its defence and that customary law provides an incentive structure for cooperation and coordination amongst kin. Customary tenure usually consists of possession of a bundle of rights, such as the right to occupy, use, develop, inherit, bequeath, defend and exclude others. Inheritance of tenure usually follows patrilineal or matrilineal systems while some customs may specify inheritance, thereby precluding an individual’s choice of an heir. Others allow the selection of an heir after fulfilling certain obligations to the land owning group. Some customs forbid the sale of parcels of land, others allow the sale of land to relatives. Some customs allow the members of a family to plant subsistence crops but deny them the right to grow permanent or cash crops without permission. There is variation in customs throughout the country, but in almost all cases the rights of the individual are subordinate to the recognised land owning group. Customary land tenure prevails throughout the Pacific and Box 1.1 explains its general parameters in the region.

2. The lease payments to the landowners being an annuity equivalent to the value of the timber if it were harvested.

3. However, anecdotal evidence suggests that this conserved forest was burnt down in the *El Niño* drought of 1998-1999.

Box 1.1 Customary land tenure in the Pacific

A community of several clans would claim an area of land as its territory. Within that territory, each clan would be acknowledged as the controller or owner of particular sections. The whole area was not the common property of the community for more intensive uses, despite the fact that, by custom, all residents might be free to gather forest products from anywhere in the uncultivated parts of the territory. Although some limited rights might have approached commonality within this forest or uncultivated land, individual trees or products would be recognised as the property of individuals and control of hunting and gathering would rest with particular people or sub groups.

Within the land of one clan, members would not all have equal rights to clear and cultivate any part because specific individuals, nuclear, or extended families would hold residual and relatively exclusive rights to occupy, stemming from the last period of cultivation of the particular piece. The land of a house site might be specifically under the control of a particular nuclear or extended family.

A superficial examination of this type of system, influenced by ideas stemming from nineteenth century sociology, might well conclude that as all members appeared to be able to hunt, gather, or collect water from any area or site within the community's broader territory, and that people cultivated gardens scattered throughout the territory, that the land was common property.

Source: Young, Ward and Hunt (1998)

In Western societies most land is held under some system of 'freehold' where the owner holds rights generally described as near absolute. Such a landowner is free to occupy, use, and allow others to occupy and use the property, and can dispose of his rights and interests in it as he sees fit. Dealings in land mostly take place between unrelated people whose only connection is commercial. Papua New Guinean landowners do not have such freedoms; their rights are circumscribed by clan rules, where the bundles of rights in the land are dispersed amongst different but related people. Transactions in Papua New Guinea generally take place between parties that are related through descent from a common ancestor and are bound by customary laws and rites. Transfers of the ownership of parcels of land or the right to use parcels of land sometimes occur because of obligations incurred under these traditional practices.

Customary law encourages co-operation among kinship groups in the production and distribution of goods and provides relief from occasional destitution. Economic development over the last fifty years has created opportunities and risks not anticipated or accommodated for by customary law. The State has considered legislation in relation to the registration of customary land that would confer on a group or an individual the full rights of absolute ownership. In spite of the production and presentation of several bills, no national legislation has yet been brought into effect. At present, the only legal mechanism open to citizens for the registration of customary land is through pre-independence legislation, which is suitable only for sporadic applications.

An important question for Papua New Guinea is whether future society will be built upon the dissolution or the evolution of customary groups. Some say that the registration of customary land and the conferring on individuals rights and interests of absolute ownership would destroy the customary rules that have worked for past centuries and that sustained kinship groups. It is clear that if customary law is destroyed and traditional means of production and distribution collapse there would be potentially serious social consequences unless another system were in place to provide the necessities of life. Some recommend that the conversion of customary tenure to individual ownership should be limited to urban areas where there is a demand from people without strong kinship ties, and that customary groups, through the evolution of customary laws, should be able to develop for themselves the best response to cope with changes in opportunities or risks. The seemingly sensible approach of allowing for the evolution of customary law and tenure – allowing customary groups to decide for themselves whether to adapt or dissolve – is suggested by Cooter (1988).

1.2.1 Customary tenure, agriculture and plantation forestry

Acquisition of land generally – or access to the unrestricted use of it – is now seen as an avenue into the cash society and has increased the frequency of disputes over rights in it. About 70 per cent of coffee production and around 60 per cent of cocoa production, in addition to logging and mineral and petroleum exploration, takes place on land held under customary tenure. Land has now become a key factor in the pursuit of 'bisnis' and 'moni'. A rapid increase in population, the extended longevity of its citizens, a much keener interest in commercial agriculture and a shortage of arable ground, has resulted in greater reluctance among customary landowners to allow land to be alienated or transferred to the Government. Any outside individual or company that contemplates the initiation of any large-scale commercial agricultural project would find it very difficult to gain access to State land to lease.

We are continually reminded of the fact that agriculture is an essential development path for Papua New Guinea but that a major obstacle to agricultural development is the difficulty of securing land for agriculture. AIDAB (1991:39) stated: "*The land issue, in the context of Papua New Guinea's development, is one of the country's biggest stumbling blocks*". AIDAB (1993) warned that customary tenure would prevent timber plantation establishment. AusAID (1996) reiterated the problem that most land is under customary ownership without a clear guarantee of individual tenure and that this is overlain by a cumbersome land administration system and the absence of a formal market for small pieces of land. Consequently problems are encountered in acquiring secure access to land for farming, mining and other business activities.

AusAID (1996:87, 88) again reinforced the seriousness of the constraint:

"The difficulty of obtaining secure access to land in Papua New Guinea is particularly important in the agricultural sector. The problem is largely attributable to the customary ownership of land, which does not provide

individual title. Little progress has been made [in customary land registration, land dispute resolution, and improvements to the existing cumbersome land administration system] and the World Bank financed land mobilisation project was recently cancelled. The prospect for resolution of these problems is small, given the importance of land to the country's culture...The central role of landownership in Melanesian culture suggests that the challenge is to develop options that are compatible with both commercial development and local traditions."

Specific recent reference has also been made to the question of land availability in profitable industries. *"This finding [the robustness and efficiency of the palm oil industry] suggests that palm oil is an industry with potential for further expansion if suitable land were available"* (Kannapiran, Lummani and Fleming, 1998:12).

There has been a more recent reference to the restraint as it applies to plantations: *"The minimal activity in natural reforestation and the establishment of new forest plantations can be attributed to limited landowner capacity, doubtful returns to landowners and external investors, and the lack of resource security for investors"* (Hunt and Filer, 2000:11).

Duncan and Duncan (1997), in discussing issues of land security and customary ownership, suggested that the nature of ownership does not need to be changed, but surveys and registration are needed for better identification of land.

Notwithstanding these constraints, it is possible for investors to acquire the use of land through joint ventures with traditional landowners. Customary land is in fact being made available successfully for the expansion of the production of palm oil. This involves a lease, lease-back arrangement. *"Under the lease, lease-back arrangements, the Government leases land from the 'customary owners' and then leases it back to a legal entity formed by members of the same clan. This usufruct for such lands can be formally mortgaged by the customary owners"* (World Bank, 1997:33).

The advantage of the arrangement is that it allows the agricultural developer to plant and manage the crop while leaving the ownership of the land firmly in the hands of the customary landowners. In the case of oil palm, lease payments by the developer to landowners commence on the planting of the palms. This immediate cash flow encourages the landowner to make land available.

While the lease, lease-back arrangement seems to have potential for application in the case of other agricultural crops and for timber plantations, the mechanism is not simple. Several steps are required including negotiating with landowners, documenting genealogies and guiding arrangements through official Government channels. These are documented in detail in Chapter 3.

1.3 The private sector

Log exporting is the most important activity of the private logging companies – some 23 mainly overseas-owned and incorporated concessionaires. Of these, the Rimbunan Hijau group is by far the largest, accounting for 40 per cent of the total value of Papua New Guinea's exports in 1998. Rimbunan Hijau is a Sarawak-based company, owning about 70 per cent of the company Jaya Tiasa, listed on the Kuala Lumpur Stock Exchange (Grieg-Gran *et al*, 1998:42). WTK Realty Ltd (18.5 per cent of value) and Turama Forest Industries Pty Ltd (6.9 per cent of value) are the only other companies that export more than five per cent of total value.

Papua New Guinea's forestry industry has made an important contribution to the government's consolidated revenue, via an export tax. Table 1.1 shows the log taxes paid. The industry also generates foreign exchange, enabling the purchase of imports. And, while the privately owned logging companies are based on foreign direct investment, the generation of domestic employment in forestry operations, or indirectly through the purchase of goods and services is important. Lastly, one of the industry's most crucial contributions is in the generation of income for the forest owners at the local level.

Table 1.1 Log export volumes, prices, values, and log tax paid, Papua New Guinea

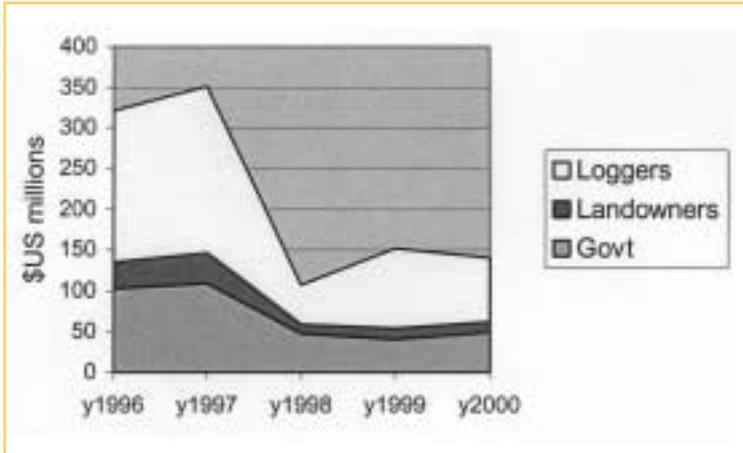
	Log volume m ³ , millions	Average price US\$/m ³	Total value US\$, millions	Log tax US\$, millions
1996	2.4	133	321	102
1997	3.0	117	351	108
1998	1.6	66	107	47
1999	2.0	77	152	40
2000	2.0	72	144	51

Source: SGS PNG Ltd (various)

The recent Asian financial crisis led to a log price slump that bottomed at about US\$ 58/m³ in July 1998, after reaching a high of US\$ 232/m³ in May, 1993. This bust led to a contraction in the industry with a number of operators closing down, and to a consequent production slump in 1998 to about half the level of the previous few years. At the same time the 1998 value of log exports declined to less than a quarter of the 1993 and 1994 levels. Table 1.1 shows the decline in price, volume and value of export logs over the last four years.

The present log export tax system does not allow for costs of production, being based on export (FOB) price. As a result, currency depreciation has shifted resource rent to Government and away from the private harvesters. Figure 1.1 shows the shares to the three stakeholders – private harvesters, landowners and government, of the total value of log exports. The shares of all three stakeholders have declined in absolute terms, but the share of the private harvesters has declined the most.

Figure 1.1 Estimates of shares of total FOB log value



Source: SGS (various)

In obtaining these shares the private harvesters incur costs of harvesting while the Government incurs costs of administering and monitoring the industry and the collection of taxes. Landowners incur few direct costs (their main costs are opportunity costs or what could have been received from the next best alternative to industrial logging), and receive a relatively small proportion (12 per cent) of the share of proceeds.

The fact that cost of production is not allowed for in the tax system has meant that the average tax take has increased to such an extent that in many cases it appears that the private harvesters are unable to cover their long-term costs (costs of operation plus costs of plant replacement). Therefore, the system is economically unsustainable.

The evidence suggests that, as a consequence, private harvesters are engaging in cost cutting and company tax minimisation. An alternative tax system needs to be developed that is sustainable in the face of log price and exchange rate changes. Both the fiscal and risk implications need to be made explicit in such alternatives. Moreover, the system needs to distribute the proceeds in a manner consistent with the requirements of the constitution – that is, that natural resources be developed for the benefit of all, and not just one section of the community. Above all, however, any new system needs to be simple in its application so that all stakeholders are clear about the derivation of their share of revenue.

1.3.1 Processing

Timber, plywood and woodchip exports are small relative to log exports, comprising some five per cent of total value. The Rimbunan Hijau group opened a processing plant in Western Province in 1998 and announced that it would build more such plants in other provinces and in Port Moresby. The

prospects for an increase in processed timber products exports have nevertheless become complex given the recent regional currency realignments and the lifting of the log export ban in Indonesia. The prospects for suppliers of the local market have also become clouded given the phased removal and reduction of import duties on plywood and other wood products.

If one were to believe the Bank of Papua New Guinea, the value of forest products other than logs, i.e. processed wood products, has followed the downward trend in log exports, and has been disappointing in recent years despite the favourable exchange rate. It should be borne in mind, however, that the Bank's statistical base is probably unreliable, omitting many small exporters. The Forest Industries Association of Papua New Guinea (FIA), in contrast, reports the 1999 exports of processed wood exports at about US\$18 million (compared with the estimate of US\$4.0 million for the same year by the Bank of PNG (2000:s31)) and about US\$25 million for 2000 (FIA, 2001:10). The main processed exports by volume and value are woodchip, lumber and veneer. The prices for lumber exports fall mainly in the range US\$200 to US\$400/m³. The main destinations of processed exports, other than woodchips, are Australia, China and Indonesia (FIA, 2001).

The area of plantations has changed little since 1996. There are about 40,000 hectares in four main plantations of Eucalyptus and Acacia species for woodchips, out of a total of 60,000 hectare smallholder plantations. Figures for balsa wood production are unrecorded but estimated at 400 hectares (FIA, 2001: 12). While the exchange rate now favours the development of plantations, an inhibiting factor remains the difficulty for investors of securing land. The bypassing of this constraint is addressed in Chapter 3.

Along with Government and logging companies, landowners complete the triumvirate of major stakeholders in the forestry sector. As has been emphasised, the nature of the landowners' tenure has extremely important consequences for development and for conservation. Decisions on whether to enter into logging contracts or to conserve forests are characteristically made collectively. While the PNGFA has the ultimate power in granting concessions to logging companies, landowners (through the Provincial Forest Management Committees) are in theory influential in the allocation process. Once logging revenue is generated, landowners' share is in two parts, a flat royalty of K10/m³, together with progressive Producer Development Benefit (PDB) that increases with log price. These currently total 12 per cent of FOB value. Forty per cent of the PDB is paid in cash to all groups in a project area to fund local social and business development. Sixty per cent of the PDB is paid into project area development funds for the provision of infrastructure in those areas.⁴ 'In kind' benefits and price 'premiums' to landowners may also be part of negotiated agreements.

4. The government (Independent State of Papua New Guinea, 1999) foreshadowed a change in the distribution of the PDB. It is proposed that all of the PDB will be distributed to a development fund, rather than 60 per cent of it.

Another benefit of a tax system based on the economic surplus or rent from log harvesting is that it can be applied across the board, whether log sales are for export or domestic use. The tax shelter created by the export tax, on the other hand, distorts investment in favour of domestic processing. However, the domestic processing industry is going through a period of adjustment caused by the progressive removal of import duties on processed timber together with a poorly performing economy. And while PNG's competitiveness has improved and growth is occurring in processed exports, a tax applied across the board to include logs that are domestically processed, and not just to exported logs, would tend to dampen that trend.

There are currently about 50 sawmills, 27 furniture factories, a plywood mill, and a woodchip mill in PNG. In addition there are several hundred scattered portable sawmills; these small-scale processors access raw logs relatively cheaply free of tax. It is often suggested that the forestry industry, in Papua New Guinea and other Melanesian countries, should take greater advantage of their forests by switching from the export of raw logs to the export of processed timber and thereby gain the economic benefits of value adding and greater urban and rural employment. However, low technical efficiency reflected in the product and low labour productivity, together with high shipping costs, have in the past made it difficult to compete with South-east Asian exporters. Timber processing is a capital-intensive industry requiring overseas investment. Potential overseas investors may find it hard to consider Papua New Guinea favourably given its volatile political and economic climate and its law and order problems (Yala and Levantis, 1998). The unstable policy environment faced by foreign direct investors is illustrated by the case of the company D-Scan Ltd, described in Box 1.2.

The establishment of timber plantations that would substitute a much higher yield of more uniform logs for the very variable and lower yielding native trees, thus reducing harvesting and milling costs, is another option often put forward for Papua New Guinea. The economics of plantations do not look favourable,

Box 1.2 The case of D-Scan

The company D-Scan is engaged in downstream processing of teak into furniture components and exporting them to Indonesia for assembly. The company employs 15 people, has invested US\$ 5.7 million, including in a new factory, and uses teak grown locally. It planned to invest a total of US\$ 8 million and employ up to 500 people. The company was invited to Papua New Guinea by two instrumentalities, the Investment Promotion Authority and the PNGFA.

The levy of royalty on teak used was increased from US\$ 40 per m³ when the operation began to US\$ 300 per m³ in 2000. The company claimed that other teak operators were being charged a much lower royalty (Manning, 2000).

After the company was about to close its doors and pull out of PNG, and after publicly stating its case in the press, the PNGFA relented, and lowered royalty to the same level as for other similar operators.

however. Plantations take years to produce millable timber and high discount rates in the country inflate the costs of harvestable plantation logs. Private developers, in assembling large contiguous areas for plantations, may face land ownership disputes and fire risk. Meanwhile, the Government has demonstrated its unwillingness to participate in plantation forestry by handing back its plantations to the customary owners. AusAID (1997) suggested that the failure of plantation forestry to develop should be the subject of a major policy review.

A ban on log exports has been supported by conservation groups but opposed by the World Bank (1995). The Bank argues that the cessation of export logging would devalue the forest and hasten its conversion to agriculture. This is a doubtful argument given the low absolute and relative share of log value received by landowners and given that agricultural conversion is actually facilitated by logging. However, proponents of a ban need to satisfy themselves that the inevitable rise of black market logging, free of all taxes and environmental controls and therefore destructive, would be preferable to official logging for export that generates Government revenues and comes under environmental controls, albeit of doubtful consistency.

In any case, it is unlikely that logging bans, other than temporary ones, will be imposed in Papua New Guinea, or in any Melanesian country for that matter, because their treasuries cannot easily replace the log export tax revenues foregone.

A research issue is the analysis of appropriate arrangements that will encourage reforestation. Possible instruments include levies and tax credits. A levy is currently collected from logging companies and deposited in the Reforestation Levy Trust Account. The levy collected in 1994, 1995 and 1996 was K3.5 million, K2.6 million and K5.3 million respectively (Fortech, 1998:6). Some K1 million was used in 1998, and the balance in the Account brought forward in 1999 was K7.2 million (Lasaro, 1998:T68). However, the fund does not seem to have contributed materially to reforestation.

A financial incentive that could be used more to encourage improved forest management by the private sector, is the performance bond (the structure of which can be found in Hunt, 1998). Performance bonds must be lodged by timber permit holders at a bank and are subject to being drawn upon by the PNGFA if the permit holder breaches permit conditions. The bond does not presently extend to post logging reforestation, defined as: "*treatment of the logged forest to favour potential crop trees and reforestation, where necessary, through enrichment planting or silvicultural techniques*" (AusAID, 1998:27). This is not surprising given the difficulty of trying to set down exactly what is expected of the private harvester and enforcing this under law. For example, to enable the performance bond instrument to be enforced the logging must be shown to have crossed boundaries, taken place on stream banks or on steep land. The performance bond is likely to be more effective where operational expectations can be specified and measured; in the case where road development or agricultural development is planned and clear felling is therefore allowed, the performance bond could be a useful instrument in

ensuring compliance with road and agricultural project establishment, because boundaries should be able to be clearly defined.

1.3.2 Logging cycle

Most current industrial logging projects are operating on a 10-12 year cycle. New projects and those up for renewal are required to adopt a 35-year cutting cycle on their concessions, which is judged to be sustainable (although some commentators advocate a much longer cycle). The concessions granted will need to be larger than hitherto to accommodate the longer cutting cycles. However, a question needs to be posed about how realistic it is to expect that companies will be able to return to concessions in 35 years' time. The population of Papua New Guinea will more than double over the next 35 years and there will be pressure in some areas in the intervening period to convert logged areas to other land uses. There is also the question of whether there will be sufficient regeneration to warrant a second cut.

Other measures, besides the adoption of a longer cutting cycle, that have attempted to force the internalisation by industry of environmental and management costs, include requirements for the industry to undertake resource inventories, demarcate boundaries and prepare harvesting and silvicultural plans. The plans must be consistent with a Logging Code of Practice (PNGFA, 1995).

Timber Authorities (TAs) grant rights to harvest timber, but with fewer conditions than Timber Permits. TAs apply to operations extracting less than 5,000 m³ per year and where the harvester commits to processing the wood locally. Alternatively, TAs can be allocated for salvage logging, where trees need to be removed to clear land for another use, as set out in the National Forest Plan (Papua New Guinea Forest Authority, 1996).

The issue of Timber Authorities, unlike permits, is designed to allow clearing for the establishment of agro-forestry ventures or roads, or for small-scale domestic harvesting. However, TAs have been exploited by medium- and small-scale logging companies (Filer with Sekhran, 1998).⁵ The granting of a Timber Authority is now carried out by the National Forest Board and approval is sought from Provincial Forest Management Committees (Independent State of Papua New Guinea, 1988).

5. Experience supports critics' concerns about TAs. For instance in the Aitape area of West Sepik Province a large agro-forestry project was approved that has dubious agricultural merit, and in 1995 two projects in Gulf Province were given legal validity, but were later found to be uneconomical and to be in areas where the landowners, through Incorporated Landowner Groups, were already committed to a Forest Management Agreement (Hunt and Gumoi, 1999).

Companies gained a TA under the pretext of road construction in Western Province, where they logged all the trees covering one kilometre on either side of the road. In 1996 a multi-stakeholder group including members of the National Forest Service submitted a document on "Conversion of Forests to Agriculture and Development of New Public Roads through Forested Areas" to Cabinet to reinforce its commitment to uphold laws already passed. This appears to have slowed down the issue of TAs for agro-forestry and road construction, but has not led to the retraction of permits already issued (Filer with Sekhran, 1998).

1.3.3 The Forest Industries Association

The overwhelming concern of the Forest Industries Association (FIA), which represents the logging companies and timber processors, has been the perceived high level of log export tax (FIA, 1999). Tax relief had been granted in 1999 through lower rates but in 2000 higher rates were reintroduced. While the tax could be described as excessive (an issue dealt with in the Chapter 2 on Industrial Harvesting) the log volumes have held up at 2 million m³ per year. The Taxation Review was unsympathetic to industry calls for tax relief, citing transfer pricing as a reason why logging companies could continue to operate despite the level of tax. However, this reasoning appears to be quite erroneous, given that companies themselves are also disadvantaged by transfer pricing, because their profits are reduced. This is explained and quantified in Chapter 2.⁶

The FIA supports the privatisation of Government plantations where they are commercially viable and emphasises that timber plantation development should not be carried out by the private sector with encouragement from government. The industry calls for policy development in the areas of land use designation, ownership of plantation trees and felling rights, and the taxes that will apply to felled plantations.

The FIA supports the monitoring of export logs, a service outsourced by the Forest Authority to SGS PNG Ltd. However, the industry opposes a levy on industry to pay for the service, suggesting that it should be absorbed by the PNGFA. There is a discussion of the role and future of SGS in the final chapter of this volume, 'Substitution of Government Services by the Private Sector'. With respect to the introduction of the Logging Code of Practice, the FIA claims that there has been a significant improvement in the day-to-day management of forest resources. On the issue of sustainability the Association claims that the volume of logging, at around 2 million m³ per year, is well within the sustainable log harvest of 4.9 m.m³.⁷

The FIA highlights the fact that no new forest concessions under Forest Management Agreements (FMAs) and a 35-year cutting cycle have been developed since 1992 (FMA extensions only have been made to existing concessions), but notes that these concessions need to be large to confer economic viability, and that, particularly in areas where there is significant investment in processing facilities, preference should be given to existing operators in forest allocation decisions.

The broad concern of the FIA is that Government agencies and donors do not have a coherent and coordinated policy on development of the forestry sector, something that is urgently needed given the stagnant nature of the domestic economy.

6. While the concerns of the FIA that the method of applying the VAT to the forestry industry was discriminatory was redressed by the Taxation Review, the log export tax rates were increased marginally to compensate the government for its loss of VAT revenue resulting from this adjustment (Government of Papua New Guinea, 2000).

7. While this conclusion may be notionally valid, this method of assessing sustainability is patently flawed. Comparing national production with national sustainable yield ignores the concentration of logging in some provinces, where log volumes can far exceed sustainable yield.

1.3.4 Small-scale processing

No statistics exist for the volume of timber being processed for operations smaller than 500m³ of log utilisation per year and these small processors remain unlicensed, unregulated and unaccountable for resource usage. They are usually devoid of commercial structure and generate only informal employment evolving from efforts by village groups to become commercially active. It was estimated in 1995 that there were some 1,500 mobile or walkabout sawmills in the country (Foundation for the Peoples of the South Pacific, 1995). While it is not known how many of these were operational, 350 of them were surveyed. The majority were cutting trees selectively or clear felling and were not working to a forest management plan. Because of favourable export prices – as a result of the devaluation of the kina – for Papua New Guinea's hardwoods, an increasing number of local and foreign owned exporters are engaging in unsustainable single species harvesting of a few premium species, especially kwila and rosewood (Dam, 2000). According to Dam (2000) the manner of harvesting also leaves a lot to be desired, harvesting taking place in buffer zones and reserves. This observation was reiterated by rangers under an AusAID project (G Stocker, personal communication, 2001). The dilemma is how to regulate these small-scale operators to limit the long-term damage they are inflicting on the resource base.

Box 1.3 illustrates how Vanuatu is endeavouring to control harvesting by small-scale mills. This experience could provide valuable pointers to how Papua New Guinea might go about developing policy and management strategies for small-scale forestry.

Box 1.3 The case of small-scale sawmilling in Vanuatu

Mobile sawmills provide an affordable and practical way of utilising timber resources and significant benefits in terms of direct income and employment. They also have a potential advantage in that they cause minimal environmental disturbance.

There are now 136 mobile sawmills registered. Of these it is estimated that 92 are actively working. Almost all mobile sawmills are owned by ni-Vanuatu and 90 per cent are individually owned. About 8,000 cubic metres of logs are harvested by mobile sawmills each year from which small quantities are exported overseas, most of the timber being sold on the domestic market or used in community projects. The policy allocates about 30 per cent of the estimated sustainable yield to mobile sawmills equivalent to 19,000m³.

Under the provisions of 1996 forestry regulations, the Department of Forests now has responsibility for regulation. All commercial operators must pay for a timber licence from the Forestry Office and a utilisation agreement with the landowners. There are controls on the importation of mobile sawmills.

Consequently the Forestry Department has established training courses, with assistance from the Australian-funded Vanuatu Sustainable Forest Utilisation Project and is now organising an operators' licensing scheme to improve competency and compliance with standards including safety and health.

A later section explores the benefits of small-scale, certified eco-forestry in Papua New Guinea. These 'eco-forestry' operations, which are very much in the minority, are also unregulated by Government but, in contrast to the majority, are designed to be ecologically sustainable.

A later section will also tackle prospects for the reorganisation of the National Forest Service (NFS) and how it might contribute to the regulation of the small-scale sector.

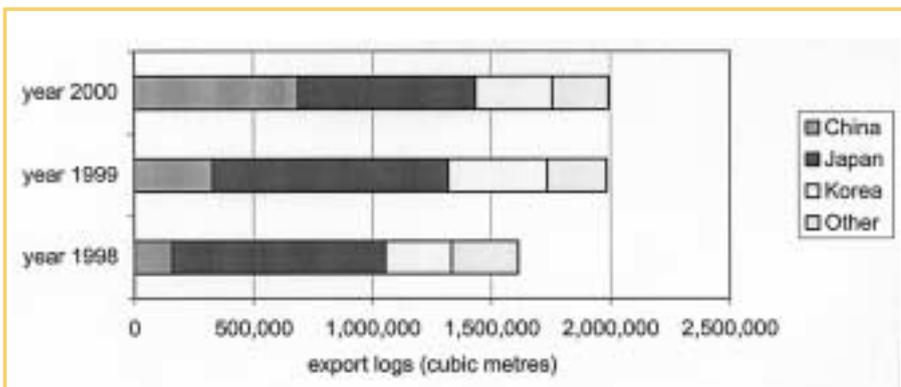
1.4 Globalisation and the forestry sector

The privatisation of the Chinese economy, which has led to rapid economic growth, together with the gradual recovery of the Asian 'tiger' economies affected by the Asian financial crisis, has the potential to greatly increase the demand for logs and to impact on industrial forestry across south-east Asia and the Pacific (Wenming, 2001). In a very short time China has become the second most important destination for Papua New Guinea's raw logs; in the year 2000, almost 700,000m³ was shipped to that country compared with 158,000 m³ in 1998. At the same time the demand for logs from Japan, traditionally the most important market, has declined, reflecting that country's ailing economy. However, the total of log export has not yet recovered to former levels in the early and mid-1990s (see Figure 1.2).

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If the trend in China's demand continues, it could herald the resurgence of logging activity in Papua New Guinea. However, the price in the Chinese market is very competitive and hence the profitability for Papua New Guinean loggers is low. A trend to establish large softwood plantations in the southern hemisphere, for example in New Zealand and Chile, and the substitution of softwoods for hardwoods may well mitigate the rise in demand for hardwoods.

Figure 1.2 Destination of PNG log exports



Source: SGS (various)

The return of the multilateral donors to Papua New Guinea and the concomitant structural adjustment programme is also impacting directly on policy in the forestry sector (Papua New Guinea is one of the countries where there has already been heavy donor intervention (Seymour and Dubash, 2000)). This detailed intervention strategy is aimed at strengthening governance and compliance in the sector and is covered more fully below under Institutional Environment.

In contrast to the probable stimulating effect of globalisation on overall demand for wood products, the dismantling of barriers to world trade, as manifest in the structural adjustment programme negotiated between the Government of Papua New Guinea and World Bank and IMF (stemming from the country's fiscal and monetary crises of 1999), is eroding the ability of the country's domestic timber processing sector to compete with imported timber products on the home market. The tariff rates on timber products and the staged reduction scheduled are shown in Table 1.2.

Description	Tariff rate		
	From 1 Jan 2001 to 31 Dec 2002	From 1 Jan 2003 to 31 Dec 2005	From 1 Jan 2006
Vener sheets and sheets for plywood	50%	45%	40%
Plywood, veneer panels and similar laminated wood	85%	75%	40%
Other wood products	35%	30%	25%

Source: C. O'Driscoll, Internal Revenue Commission of PNG, personal communication, 2001

Notwithstanding the challenges for the small domestic market as a result of the dismantling of protection, it is the ability of Papua New Guinean wood processors to compete internationally that is vital for growth.

Another manifestation of globalisation affecting the sector, apart from trade liberalisation and the reach of multilateral donors, is the establishment of offices of a number of international non-governmental organisations in Port Moresby. Prominent among these are WWF, Conservation International, Greenpeace and The Nature Conservancy. The World Bank in particular has recently been more receptive than hitherto to representations from the Washington offices of these NGOs concerning forest conservation and policy. It is expected therefore that the concerns of the NGOs will be translated into policy through the leverage that the World Bank has over Papua New Guinea's forest policy via the structural adjustment programme.

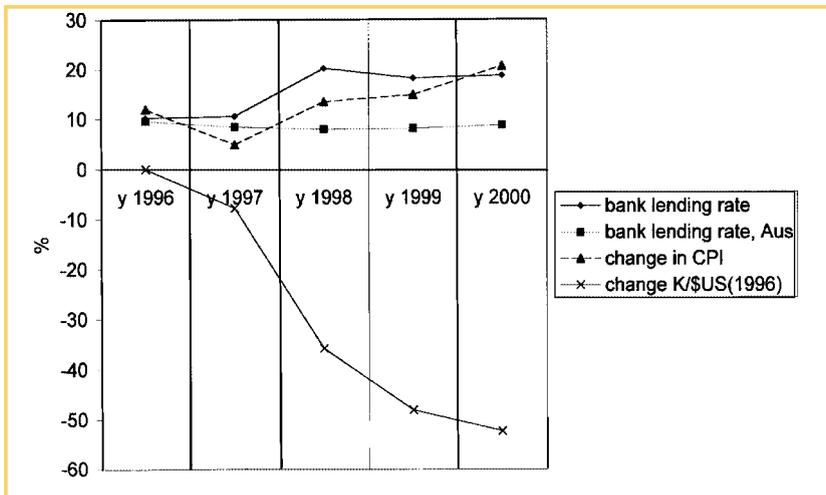
1.5 The macro-economy and governance

When undertaking a sectoral analysis, such as this, it is easy to overlook the economic settings that are important to potential investors but are a function of macro-economic management. In all sectors of Papua New Guinea's economy private investment is virtually non-existent (Manning, 1999) and the causes are largely poor macro-economic management and poor governance. The failings in economic management have generated unfavourable interest rates and high inflation. These impediments are reinforced by exchange rate and tax uncertainty. Moreover, a high turnover of governments, ministers and heads of departments, means that policy settings are in a constant state of flux.

The lending rates in Papua New Guinea have been high, in contrast to rates in other countries in the region where investors might do business. Commercial Bank interest rates rose from an average of ten per cent in 1996 and 1997 to over 20 per cent in 1998, falling back to 18 per cent in June 2000. This trend is illustrated in Figure 1.3, which also shows the bank lending rates for business in Australia over the same period.

Inflation is another deterrent to investment, in that it increases the domestic cost of operations and tends to squeeze profit margins or increase losses. Rising import costs resulting from devaluation of the kina relative to the currencies of major trading partners, the introduction of a ten per cent VAT on 1 July, 1999, higher taxes in a mini-budget of the same year, together with the high interest rates, are the major causes of high inflation. As measured by the consumer price index (CPI), annual inflation was running at over 20 per cent in the middle of 2000, having been at a high rate since the last quarter of 1998, but it is now finally falling. Any business that uses machinery and vehicles has not only been affected by the rapid rise in replacement costs and spare parts, which are inevitably imported, but by the rise in the price of fuel in the year 2000. Figure 1.3 also shows the trend in the CPI.

Figure 1.3 Lending rates and CPI and exchange rates, PNG



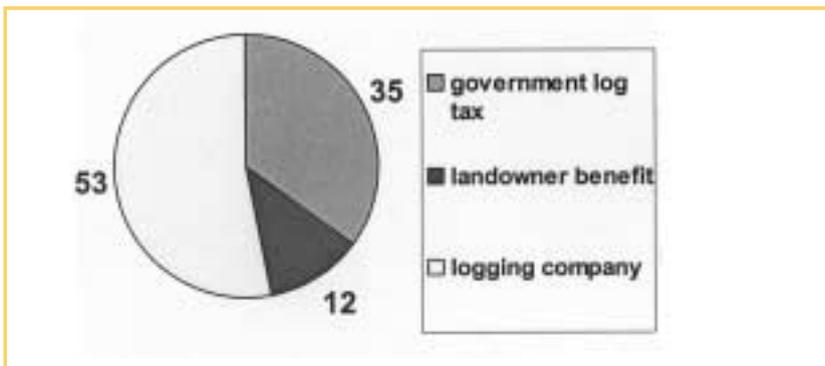
Source: Bank Papua New Guinea (2000)

While there are downsides associated with the devaluation of the kina, a significant potential benefit is the greater competitiveness of the country's exports. However, AusAID (1999:xviii) warned that, *“to maximise the opportunities on offer, policy will need to be more vigilant in maintaining macro-economic stability and in ensuring Papua New Guinea's improved competitive position is not forfeited.”*

Capital is in short supply for the formation of small business. However, landowners who wish to enter the small-scale processing industry face prohibitive interest rates on start up loans, even if they are fortunate enough to have collateral. In the case of the private harvesters engaged in raw log exports through foreign direct investment, there have been additional factors at work reducing prospects for profitability and investment. For example, there has been a substantial shift of the resource rent from the private harvesters to the government. This has come about not just by a reversion in late 1999 to a severe tax regime but by the fact that devaluation caused an increase in the kina price of logs and therefore of the average tax rate, even in the face of falling \$US export prices. The effects of tax on the efficiency and distribution of resource rents in the industry are dealt with in Chapter 3 under reforming the log tax system.

Businesses need tax stability in order to plan their operations. Indeed, tax predictability is probably just as important as the tax rate for business confidence. However, in Papua New Guinea's recent past there have been significant tax shocks to both log exporters and timber processors. The ten per cent VAT increased costs for log exporters by about five per cent at a time when other costs were rising rapidly from mid-1999. Then in August 1999, in the new Morauta Government mini-budget, the export log tax system that had been introduced in 1996 – but abandoned in 1998 as too severe – was reintroduced. Figure 1.1 showed how the tax system has altered the shares of income from log exports over time, while Figure 1.4 below shows the percentage distribution of the FOB value of logs between government, landowners and logging company in year 2000.

Figure 1.4 Share (percentage) of total FOB log value, 2000



Source: SGS (various)

Timber processors servicing the domestic market have been operating under considerable protection against imports. Indonesia and Malaysia have in the recent past been able to land timber goods in Port Moresby at a fraction of the domestic cost of production. But the high protective tariffs on timber products increase the input costs for other local businesses. As part of the structural adjustment process, overseen by the IMF and the World Bank, these high tariff rates are being reduced. The tariff cuts are expected to impact on processing but it is not clear how the industry will respond given that Papua New Guinea's competitiveness is being enhanced by the depreciation of the kina *vis a vis* the US\$.

Any business that is financed by foreign direct investment would wish to be able to deploy its profits offshore, or wherever it sees the greatest benefits. Foreign exchange restrictions are bound to deter investors, particularly in countries where the economy and the currency are unstable. Nevertheless, such restrictions apply to private log harvesters in Papua New Guinea who are obliged to bring proceeds of log exports onshore.

We now turn briefly to the consideration of governance in relation to investment and doing business. Poor governance has led to the deterioration of education and health services. The productivity of the workforce is low as a consequence. Roads are often in a very poor state due to lack of maintenance, thus the costs of road transport in regional areas may be very high; in fact, a major benefit to landowners as a result of entering into logging agreements is the road infrastructure left behind by the loggers. While these roads may have a limited life, being poorly built and lacking in maintenance, they nevertheless facilitate commerce and the opening up of the area to services.

Violent crime and theft are common enough to warrant high expenditure by businesses on crime protection. This entails capital costs, as well as operating costs in the employment of security guards at all business premises. Law enforcement is often weak; thus the deterrent effect is absent, and redress for loss of assets or income is problematic through the courts.

The Morauta Government appears to be turning the economy around, with the assistance of the World Bank, the IMF and the 'friends of PNG' (which include Australia and Japan). Better fiscal management is expected to bring Government expenditure into line with income and the Government has already paid off much high interest debt and increased its foreign exchange reserves, while inflation and interest rates are falling. The Government is also attempting to root out deeply embedded corruption by bringing to account the perpetrators of schemes that defrauded Government and semi-government institutions of millions of kina. However, the road to recovery will be a long one. The gutting of institutions, particularly by the previous government, not only left large financial holes but depressed public service morale and efficiency. The lack of trained professionals will be a major obstacle to the resuscitation of the economy and the strengthening of governance.

1.6 Institutional environment

1.6.1 Papua New Guinea Forest Authority

Constitutionally, the Government has the responsibility to ensure that the nation as a whole benefits from the development of natural resources. At the same time, as stated in *National Forest Policy*, “the rights of the customary owners of the forest resource shall be recognised and respected in all transactions affecting the resource” (Ministry of Forests, 1991:4). The state’s main objectives are to utilise the forest resources to achieve economic growth, to create employment and to achieve greater PNG participation in industry and increased viable onshore processing. At the same time, the forest will be managed and protected as a renewable natural asset (Ministry of Forests, 1991). The *National Forest Policy* also acknowledges that to achieve these goals detailed forest inventories are required, the principle of sustained yield management adopted and environmental guidelines adhered to. The Government set up statutes (*Forestry Act 1991*) and institutions (the Papua New Guinea Forest Authority (PNGFA)) to oversee these policies and objectives.

The National Forest Service (NFS) is made up of the staff of the Forest Authority while a separate National Forest Board exercises the powers of the Authority. The activities of the Authority have been constrained, like other Government departments, by a reduction in allocations in real terms. However, a serious question remains about the efficiency of the Forest Authority given the lack of audited accounts. If the Authority were granted financial autonomy, the fiscal strictures imposed by the Government could be avoided. However, the corporatisation of the Authority has been resisted by the Finance Department.

Unlike other developing countries in south-east Asia and in Africa, the resource is still held under strong traditional or ‘customary’ tenure, as explained above. The consequence for the Government is that it must devise mechanisms that allow the bundling together of the forest resources – acquisition – in a form that can be made available for the private sector – allocation – under permits and licences. Royalties, the Producer Development Benefit and payments in kind are the incentives for landowners to allow their forest to be acquired by Government and allocated to permitted loggers.

Previously the Forest Authority secured timber harvesting rights from customary landowners under Timber Rights Purchase Agreements; currently it does so under Forest Management Agreements, before the granting of Timber Permits to what are called ‘forestry industry participants’. This is done in accordance with the conditions specified in the *Forestry (Amendment) Act* of 1993, and after consultation with the Provincial Forest Management Committee. The Office of Environment and Conservation is responsible for approving environmental plans pertaining to large-scale logging operations. Another important national stakeholder is the Internal Revenue Commission in its capacity as a tax collector.

An important function overseen by the PNGFA, but contracted out to the international company Society for General Surveillance (SGS), is the monitoring of all log export shipments from Papua New Guinea, to verify volume, grade and species composition. This operation effectively reduces the scope for transfer pricing by exporters. The State Purchase Option (SPO) is another function of the Authority related to tax collection. Under the SPO, the Authority may sell up to 25 per cent of the output of an exporter to verify that exporters are achieving prices consistent with the market. The exercise of the SPO has reportedly enabled the Authority to achieve higher prices for a small proportion of exports and, importantly, to gain an appreciation of the export log market. But it has not been effective in eliminating transfer pricing (Fortech, 1998a).

1.6.2 AusAID, the World Bank and NGOs

Other stakeholders that are very influential in attempting to move the industry to a more sustainable footing are aid donors, principally the World Bank and AusAID (the overseas development arm of the Australian Government). International donors represent stakeholders in the international community concerned with development and, increasingly, with conservation. The international donors are augmented by the presence of several large international NGOs and some domestic ones; the latter representing – or purporting to – non-vocal landowners, the former reflecting the global community's need to conserve Papua New Guinea's biodiversity.

The series of fiscal crises that Papua New Guinea has experienced since 1992 has occasioned substantial intervention in Papua New Guinea's economy by the World Bank through its structural adjustment measures. Filer and Sekhran (1998:348) explain how these crises are windows of opportunity for the World Bank to influence Papua New Guinea's forest policy.

It was the fiscal indiscipline of the Wingti Government from 1992 to 1994 which provided the World Bank with the leverage to prevent the Chan Government from reversing the progress already made in the rationalisation of the forestry sector, and force it to impose the new fiscal regime which transformed the distribution of resource rent derived from the log export industry. And the use of the Bank's bargaining power in the context of structural adjustment reveals the central paradox of the aid relationship – that the continued exercise of such power depends on the continued crisis of governance, which the donors are attempting to solve.

Intended interventions by the World Bank in 1998 included the distribution of revenues under the forest revenue system, guarantees that the Government of Papua New Guinea would continue to fund the PNGFA, and that the National Forest Board would remain independent of government. However, in 1998, the Government of Papua New Guinea and the Bank failed to reach agreement on the preconditions for further loan assistance. As a consequence, the World Bank was temporarily without influence on the forestry sector and it looked likely that, because of the government's inability to fund its budget, some of the

institutional settings designed to regulate and monitor the industry would be removed. However, the deepening of the government's crisis, caused by misguided macro-economic management and exacerbated by a drought and the Asian financial crisis, led to a change in government in mid-1999. The new Morauta Government quickly designed and introduced a mini-budget in late 1999 that impressed donors. The World Bank took a coordinating role in creating a rescue package.

The World Bank has not only leveraged macroeconomic reform and governance measures, but has stipulated detailed changes to forestry policy.⁸ The World Bank loan, approved by its president in May 2000, was for US\$90 million. The first tranche of US\$35 million has been disbursed. A second tranche of US\$35 million *"would be disbursed upon completion of further actions as specified in the loan document"* (World Bank, 2000a:24). The specific 'actions' include a whole raft of measures to strengthen economic management and improve governance. Of particular interest here are those required in the forestry sector. The reforms that were to be implemented by the Papua New Guinea Government under the new structural adjustment package are summarised in the six points below.

1. Complete an independent review of all FMA timber permits and geographic extensions to timber permits.
2. Act to prevent the approval of bogus schemes that are purportedly agricultural development schemes but in reality are logging projects that avoid the regulations governing the harvesting of forests.
3. Review the composition of the Forest Board and its selection criteria for members and make its deliberations transparent.
4. Address the issues of efficiency and equity that arise in the sector through a review of the forest revenue and royalty regimes *"so that the actual revenues collected from logging operations are close to the full economic rent which applies, and also to ensure that landholders receive a fair and consistent share of the overall return for their resources"* (World Bank, 2000a, Annex 1:15).
5. Address the capacity of the relevant Government agencies to carry out monitoring and enforcement of all regulations and codes in forest operations and in the export of forest output, in a manner that relies on inputs from independent experts or firms.
6. Upgrade the process by which landowners are involved in the early decisions on resource based projects in the forestry sector, to ensure that they are adequately represented and properly informed as to the implications of the proposed project in their areas.

8. An account of the World Bank's intervention in forest policy up until 2000 is contained in Filer *et al.* (2000).

The World Bank has had a Forestry and Conservation Project under design since 1997. The principal objective of the project is to help local people and government and non-government organisations to manage and conserve Papua New Guinea's extensive forest reserves more sustainably. The Bank's focus now is on combating poverty and it is looking to do this through the forest sector. The main components of the project, which were said to be in the final negotiating stage (Bond, 2000) but in practice seem to have stalled are:

- landowner forest decision making;
- conservation trust funds;
- sustainable forest management;
- environmental assessment and monitoring; and
- forest conservation.

The other major donor, AusAID, has been active in human resource development and in enhancing reforestation. It also has a potential project which includes the following components:

1. Enhancing management capacity of PNG forest conservation NGOs
2. Forest utilisation
3. Assessment and information on forest resource and biodiversity
4. Community based forest conservation
5. Mechanisms to ensure coordination with other donors (Arentz, 2000).

1.7 The allocation of forest resources

1.7.1 Allocation to forestry alternatives

An important question to be addressed is how the forests of Papua New Guinea should be allocated.

It was described above how the forest resources are presently 'bundled' under a Forest Management Agreement between landowners and the PNGFA prior to their allocation under permit to a private harvester. Because of the economies of scale that are present in industrial harvesting, it is important for the Forest Authority to deliver large contiguous concessions. However, there is no attempt to allocate the forest resource to other uses, such as conservation or small-scale forestry before they are allocated to logging companies. Forest with high biodiversity or ecological value may therefore be allocated to harvesting while the small-scale forestry option or eco-forestry that may better satisfy landowners' aspirations goes unexplored.

Wood (1998:17) comments on the allocation process in relation to the Kamula-Doso concession in Western Province:

"Many of the Kamula and Doso landowners have gone through the ILG process, and FMAs have been signed. These landowners think they have registered their land: they don't understand that the State now has the right to

negotiate on their behalf. The Forestry Act only allows for a Development Option Study to be conducted after the landowners have signed the FMA. This means that the landowners have to sign away control of their forest before they are given access to expert opinion about the value or the options for their use.”

Everts’ (2001) finding in relation to the Kamula Doso concession, that there is little evidence of landowner involvement in the allocation process, supports this contention.

Mayer and Brown (2000:7) comment on the allocation process in relation to the Josephstaal FMA:

“The NFA report “Development Options for the Commercial Forest Resources in the Josephstaal Forest Area”, contains a resource assessment and general information outlining the limitations of the FMA in terms of developing only the timber resource on an economic and commercial basis. Written with the industrial scale development model as its benchmark, the report concluded that [forest resource] development options were limited given remoteness and transport difficulties. Despite the report’s conclusions, the NFA only considered the timber harvesting option and not more suitable alternatives.”

Box 1.4 summarises policy recommendations that were made to the Forest Board with respect to the need for more effective allocation of forests via forest options studies.

The benefits of the forest option small-scale forestry are explored in detail in Chapter 4.

Box 1.4 Forest options for landowners

The recommendation to the Forest Board is that option studies be carried out **before** the allocation of forest resources to Forest Management Agreements.

What is lacking is a mechanism that can assist landowners to make the best decision for themselves and then, if it is to allocate some or all their resource to a use other than industrial harvesting, to communicate this decision to appropriate institutions that can assist them in meeting these aspirations.

However, for landowners to be able to make informed choices, an evaluation of forestry options must precede the formation of an FMA under which industrial logging is predicated. Such an evaluation would not only facilitate the beneficial allocation of the forest resource but it would also avoid the administrative costs of dealing with requests for withdrawal.

This ‘new’ forest option study would take account of the wishes of resource owners to deploy their forests to uses other than industrial logging i.e. to forest conservation and small-scale harvesting and processing. The financial attractiveness of these options could increase somewhat with the imminent entry of the Conservation Trust Fund (CTF) and the extension and intensification of eco-forestry programmes by the EU and NGOs.

It is important to recognise that there is no need to undertake studies of the agricultural options of the land under forest. That is the task of the private agricultural developer. Both large- and small-scale cash cropping can best be pursued after logging. And to facilitate the development of forested areas for agriculture, without the need to wait for log harvesting under an FMA, commercial agriculture can be pursued under a Timber Authority.

It is the allocation of **forest resource** to alternative uses that is not enabled under current legislation or practice.

A suggestion is to introduce regulations that facilitate forest option studies in areas already designated for FMAs but for which permits have not been issued, as well as for areas that have been earmarked as potential FMAs. Independent foresters under tender may best carry out the additional and new, 'Forest Options Study'.

Such pre-allocation studies would entail discussion with landowners of the relative merits of alternative forest uses. At the same time, identification and mapping of areas of high biodiversity value that should not be logged, as well as identification and mapping of areas that must not be logged (because they do not meet physical criteria e.g. slope) would be carried out.

Copies of the 'Forest Options Study' would be made available to NGOs, donors and the CTF, to alert those institutions to landowner interest in small-scale forestry and the presence of identified conservation values.

Industrial harvesting is likely to remain an attractive 'forestry option'. Biodiversity values may be lacking, or donors and NGOs may not offer rewards for conservation comparable to industrial harvesting, or remoteness may preclude small-scale timber harvesting and processing.

Source: Hunt, C. (2000a)

1.7.2 Allocation to conservation

A strongly held view is that no further logging concessions should be allocated. The view of the NGOs proposing this option is that an indefinite moratorium would enable the conservation of the remaining old growth forests. The view that forests are as valuable when conserved as they are when exploited tends to be supported by Hunt (2001), who, in a study associated with deriving the benefits of eco-forestry, estimated that the conservation value of forest is about equal to its export value. While the quantification of environmental benefits is difficult, he nevertheless found that two thirds of the conservation values was 'global', that is benefiting the world as a whole, while only one third was 'local', benefiting landowners or Papua New Guinea. However, the idea that landowners have a natural interest in the conservation of their forest, that they are dependent on rainforest products to meet their subsistence needs and that simply raising their awareness about the value of the forest will effect sustainable development is debunked by Filer and Sekhran (1998).

Official conservation policies are needed and in Papua New Guinea these are constructed around the establishment of a representative system of protected

areas. But, as Filer and Sekhran (1998:317) point out *“The legal and institutional mechanisms established to pursue this goal have proved to be unwieldy and ineffective. The terrestrial biodiversity values are almost entirely confined to customary land and there is no prospect of this land being alienated by the State for the purpose of conservation”*. Another fact inhibiting conservation – the ineffectiveness of the Department of Environment and Conservation and the failure of donor intervention to bolster it – were exposed by Filer and Sekhran (1998:317): *“The political weakness of the department has previously been associated with the very limited capacity to enforce the laws and regulations for which it is responsible, and the association seems set to continue, whether or not the laws and regulations change. The donors who have invested heavily in strengthening the Department of Environment and Conservation have reason to wonder if they are flogging a dead horse”*.⁹

As a condition of the structural adjustment programme of the World Bank there is currently a limited moratorium in place on new concessions and extensions while the Government undertakes a review of allocation procedures for concessions. The NGOs have taken advantage of this pause to push their case for an indefinite moratorium. For an extension of the moratorium on logging to become reality there needs to be a plan backed up by financial resources to deal with opportunity costs. However, as far as is known, no enabling plan has been put forward by the NGOs or donors that recognises that most conservation benefits are derived by the rest of the world, rather than Papua New Guinea, or that recognises the opportunity costs of such an indefinite logging moratorium to landowners and the Government of Papua New Guinea. This lack of cohesion reflects the lack of common goals between NGOs and donors in bringing such a plan forward, or it may reflect the fact that not all NGOs are in favour of a moratorium – some believing that there is a place for industrial logging along with other forest uses.

1.7.3 Allocation to and markets for environmental services

A major global benefit of forest conservation is the prevention of release of carbon from forests (which contributes to global warming) by their conservation. There are mechanisms being developed as a result of the Kyoto Protocol that facilitate the transfer of this global benefit to the owners of the conserved forest, thereby providing an incentive to allocate forest to conservation rather than an alternative use. Box 1.5 explains the mechanisms being put in place globally and in Australia to facilitate this transfer.

The feasibility of the extension of the Clean Development Mechanism (CDM) mechanism to Papua New Guinea is rather doubtful, particularly in the short-term, because of the high costs of meeting the criteria. There are high transaction costs associated with any native forest conservation mechanisms in Papua New Guinea, due mainly to the implications of customary tenure and remoteness. The cost of carbon sequestration in the native forest of Papua New Guinea may

9. The Department of Conservation and Environment has since been downgraded to the Office of Environment and Conservation.

Box 1.5 The Clean Development Mechanism – CDM

The Kyoto Protocol of 1997 to the Framework Convention on Climate Change sets the agenda for reducing carbon emissions, with quantitative reduction targets to be introduced by developed countries, initially from 2008 to 2012. To assist countries in achieving the emissions reduction targets, flexibility mechanisms, including Emissions Trading (ET) and Joint Implementation (JI), are available to share the burden of meeting emission reduction targets between developed countries.

The Clean Development Mechanism (CDM) is designed to engage developing countries by facilitating investment from developed countries in greenhouse-positive sustainable development. The greenhouse benefit is accounted for under certified emission reductions, and shared with the investing country. An additional incentive is that credits generated from CDM projects commencing from 2000 can be included in the first commitment period, 2008-2012.

At this stage carbon sinks are not explicitly detailed in the Protocol as part of CDM. Nevertheless, Australia's position is that it supports the inclusion of sinks for their potential to finance sustainable development outcomes, including reforestation and modified harvesting practices in native forests. Negotiations, which were due to commence in the Netherlands in November 2000, will consider, amongst other things, options for managing CDM including sinks. In Australia, work is underway to develop a market – hosted by the Sydney Futures Exchange – to trade carbon sequestration certificates generated from Kyoto compliant forests.

Some environmental NGOs for example Greenpeace and WWF, oppose including forest in CDM, on the grounds that deforestation may increase elsewhere as a result.

therefore be high relative to other locations in the world that are open to investors in carbon. Carbon credits may be more attainable through plantation establishment, augmenting their financial attractiveness. Filer and Sekhran (1998:378) doubted the applicability of carbon offset schemes: *“PNG’s ability to profit substantially from this particular form of world trade is not only dependent on the managerial capacities of the national government, which are slender enough, but on a wholesale transformation of indigenous property relations, which is beyond the reach of any donor.”* The withdrawal of support for the Kyoto Protocol by the United States will further dampen any interest in the sequestration of PNG carbon.

Papua New Guinea has outstanding biodiversity associated with its forests – for example, birds of paradise, tree kangaroos and rare orchids – that are potentially the basis for a large eco-tourism industry. However, tourism is a very minor contributor to the economy. Law and order problems, remoteness, and high costs, all mitigate against potential tourists choosing Papua New Guinea rather than Australia or some other destination in the region. So that while there is a great deal of interest among landowners in setting up eco-tourism projects, the reality is that very few are likely to become commercially viable. Shortages of capital, high interest rates and high transport and security costs – inhibiting factors to business mentioned above under the macro-economy discussion – also mitigate against the establishment of such ventures.

Industrial harvesting: problems and proposals

This chapter examines one of the major industries of the country – industrial forestry – for its present and future impact on the resource, the landowners and the government. In so doing it exposes problems of unsustainability, complexity, inefficiency and inequity in industrial harvesting, and proposes solutions.

2.1 Allocative issues within industrial harvesting

Under the old *Forestry Act*, the State acquired timber rights from the customary resource owners through negotiations of a Timber Rights Purchase (TRP) agreement. These agreements were supposed to be signed by all the customary owners, or at least the adult males among them, and some effort was made to ensure the level of consensus during the last years of the colonial administration, but as Filer with Sekhran (1999:179) explain, when the rate of forest exploitation began to rise substantially, in the 1980s, the Department of Forests began an unofficial policy of accepting 75 per cent of the relevant signatures as sufficient evidence of landowner consent. The Barnett Inquiry found that even this level of consent had commonly been manipulated or manufactured to suit the demands of the logging companies. This kind of manipulation was even more likely to take place in the declaration of Local Forest Areas (LFAs) under the *Forestry (Private Dealings) Act*, which only required the Minister's assent to a dealing purportedly negotiated between representatives of a landowner company interested in negotiating its own Logging and Marketing Agreement with a logging operator. Some LFAs were established in New Ireland Province during the 1970s, but many more came into existence, most notably in West New Britain Province, when Karl Stack was Forest Minister from 1988 to 1991 (Filer with Sekhran, 1999:180).

By repealing the old *Forestry Act* and the *Forestry (Private Dealings) Act*, the new *Forestry Act* 1991 and *Forestry (Amendment) Act* 1993 established a new set of resource acquisition procedures, which were primarily designed to safeguard the interests of customary landowners against the risk of being misrepresented by a small minority of self-interested individuals. According to Section 46 of the new Act the rights of the customary owners of a forest resource shall be fully recognised and respected in all transactions affecting the resource. According to the *National Forest Policy* (Ministry of Forests, 1991:4) this meant that: “*Priority must be given to the development and promotion of forms of ownership and organisation based on traditional precepts*” and the use of arbitrary procedures to obtain the approval of resource owners was not



acceptable. Importantly, the policy failed to indicate how the assertion of customary rights could be reconciled with greater Government control over the utilisation of forestry resources on customary land.

The new act prescribed a process of resource acquisition (Section 54-60) in which the PNGFA enters into Forest Management Agreements with customary owners, whose title is either vested in land groups incorporated under the *Land Groups Incorporation Act* or registered under a law providing for the registration of title to customary land. Each FMA was to contain a map showing the boundaries of the area which it contained, the benefits which the owners would receive in exchange for the harvest rights, and the period required for “*proper forest management measured to be carried out to completion*” (Filer with Sekhran, 1998:180,181). After the Forest Authority has bundled together the forest resources, they are allocated to successful private tenders under permit for export logging.

While the *Forestry (Amendment) Act* 1993 provides for new forms of consultation between Government officials and customary resource owners – for example the FMA form states that the incorporated land groups (ILGs), or their representatives, must be involved in negotiations – the *Forestry Act* calls only for consultation by the Provincial Management Committee (PFMC) with the owners of the forest resource. Only two representatives of the landowners can attend the PFMC meetings and they have no power to vote on any of its decisions. However, as Wood (1998) asserts, two individuals cannot possibly represent the several language groups that may well make up an FMA. The Government then subsequently appropriates a proportion of the resource rents by means of royalties and export taxes on logs, the royalty component being returned to landowners.

The question should be raised here whether this method of allocation secures the maximum net benefit for the nation. An alternative is for the Government to auction the forest concessions. In theory, under competitive bidding the most efficient private harvesters will outbid their rivals, and resource rent to the Government would be maximised. The propensity for bribery to become part of the allocation mechanism would also seem to be reduced under such a system where price is the determining factor rather than a range of other criteria.

Karsenty (2000), and Duncan (1994), support an auction system, criticising the export tax on the grounds that transfer pricing will reduce the price of logs and therefore the tax collected, and also on the grounds that this tax structure results in the forest resource being undervalued and also requires effective field monitoring. Karsenty (2000) also suggests that taxes do not fulfil the functions of generating revenue for the Government or encouraging local processing. An additional problem, he states, is arriving at costs in the industry and being able to calculate taxes in a range that secures an adequate proportion of the resource rent for government, while at the same time allowing private harvesters to make a normal profit. However, Karsenty (2000) does allow that the effectiveness of the auction hinges on the mode of government in the country. Competitive

bidding for forest concessions has also been recommended for Cameroon and Gabon as an alternative to the present allocative mechanisms that make the forest resource available at subsidised prices (C. Heimo, personal communication, 2001).

Papua New Guinea has its own set of restraints on competitive bidding as an allocation method, however. In the case of Papua New Guinea, where there may be a relatively small number of locally based bidders, there is a distinct possibility of collusion, which would drive down the price. While bidding itself may be competitive, the selection of the bidding companies could potentially be open to political opportunism, nepotism and corruption. There would also be a problem of how to prevent the development of a monopoly in private harvesting. It should also be noted that the auction would not obviate the need for the Forest Authority to aggregate the forest resource into concessions or to regulate the extent and manner of harvesting. Moreover, the Forest Authority would need to undertake a detailed evaluation of the resource in a concession prior to auction in order to determine whether the concession contained enough timber to be commercially viable and to set a reserve price. However, the Authority has shown itself to be woefully inefficient in its resource assessments of FMAs (Everts, 2001).

There is strong evidence that the export tax system in Papua New Guinea is suffering from the very problem of transfer pricing, through under-pricing by buyers and intermediaries, that Karsenty (2000) points to (see the section below on the revenue system). Papua New Guinea also has the problem of lack of recognition of costs of production and environmental costs in the tax structure. But in general terms the system in place in Papua New Guinea is effective in raising substantial revenues for government, and to a lesser extent for landowners, on a continuous, but somewhat variable, basis. The uncertainty of the net benefits of the auction, over and above the present export tax-based system, seems to rule it out for serious consideration as a mechanism to replace the present system in Papua New Guinea.

There is much at stake in the allocation of concessions, and whatever mechanism is used needs to be very rigorous. With assistance from the World Bank, the Government recently investigated the administration of the allocative mechanism for Forest Management Agreement Areas as a condition of the second tranche of a structural adjustment loan. The difficulties that can be encountered are illustrated by the case of the Kamula Doso concession, of some 800,000 hectares. The investigation (Everts, 2001) found that observance of due process in allocation was doubtful in that the Forest Board granted the project as an extension to an existing concession, thus avoiding public tender. Recent (January 2001) changes to the *Forestry Act* 1991 now prevent such decisions.

2.2 Sustainability issues

Forest Management Agreements that allow the PNGFA to acquire timber rights from the customary owners are based on 'sustainable yield principles' and specify a cutting cycle of 35 or 40 years ('sustained yield' and 'sustainable management' are explained in Box 2.1). That is, coupes containing primary forest of around 1/35th or 1/40th of the concession will be logged annually for a period of 35 or 40 years and, at the end of that cycle, the logging will recommence on the same coupes, on which the forest will have regenerated. In this way a perpetual even flow of industrial wood will be generated from the concession. Box 2.1 explains sustained yield management.

Box 2.1 Sustained yield and sustainable management

A clear distinction should be made between the meanings of the terms 'sustained yield management' and 'sustainable forest management'. 'Sustained yield management' is used in the technical forestry context of planning and operating, so as to ensure the constant flow in perpetuity of forest products from a particular forest area. The products are usually logs of nominated species, dimension and volume. 'Sustainable forest management' is used in a broader context. Supply of forest products in perpetuity is still implied, but without strict specification as to their characteristics or availability at a particular time. Instead, the emphasis is to ensure that the productive potential of the forest in terms of its biota and other values, is not degraded.

Although silvicultural techniques for increasing the productivity of tropical forests have been known for almost 100 years, it is now generally accepted that the most efficient way to improve the growth rates of the most desirable of the remaining trees is through careful planning and control of the harvesting process. Other post-harvest interventions, such as noncommercial thinning and enrichment planting, may produce even better results but can rarely be justified on economic grounds.

Source: G. Stoker, private communication (2001)

The Forest Management Agreements are based on several assumptions. First, is that the Forest Authority has undertaken a resource inventory sufficiently accurately to ensure that the resource is large enough to enable economic exploitation over a cutting cycle of 35 to 40 years. Second, that the private harvester will be limited by regulation and monitoring to coupes of 1/35th or 1/40th of the concession per year, either in terms of area or, more likely, volume. Third, that some landowners will be willing to wait for 35 to 40 years before they receive direct benefit from harvesting. Fourth, that the forest will have regenerated and be available for an economical second cut. These assumptions are challenged in turn.

Inaccurate resource assessment was a problem encountered by the Nature Conservancy in its bid for the Josephsthal FMA in 1996. In the case of Josephsthal FMA, the Forest Authority's timber assessment, of 39,000m³, was considerably overestimated. The Forest Authority's estimate ignored factors that constrain the volume of timber available such as soil types, allowance for road construction, and forest species and distribution (Mayer and Brown, 2000).

This assertion is corroborated by Everts (2001) who found the harvestable volume hugely over-stated in the FMA document, creating landowner expectations which would never be met, and the potential sustainable annual cut too small to support a financially efficient logging investment, or a conventional stand-alone log export project. Everts (2001) also found a significant proportion (ten per cent) of the Josephstael forest was classified by the Office of Environment and Conservation as 'fragile', but the right of the PNGFA to implement conservation set asides had not been brought forward into the draft Project Agreement. Moreover, also in respect of resource and planning issues, Everts (2001) reported that in the case of the 800,000 hectare Kamula Doso concession, sensible operational procedures had not been complied with in that the resource data was based on an extremely low field inventory sample. Moreover, in the case of the Hekiko concession (Gulf Province) it was reported that:

“Sensible operational procedures have not been complied with in that there has not been any field volumetric inventory. A very significant proportion (38 per cent) of the forest is classified by the Office of Environment and Conservation as ‘fragile’. The estimated sustainable annual cut is not sufficient to support a conventional stand-alone log export project (or a financially efficient logging operation if ‘fragile’ forests are excluded from logging). The right of the PNGFA to implement conservation set asides as provided for in the Forest Management Agreement (and the consequences thereof) has not been brought forward into the Project Agreement” (Everts, 2000).

Everts (2000) found that these inventory problems with FMAs were not isolated. The FMAs are in fact characterised by inadequate sampling of the resource on which to base resource inventories. If the resource inventory is inaccurate then the attainment of the 35-year cutting cycle is in jeopardy, and sustainability and efficiency principles are prejudiced from the outset.

Despite the fact that the FMA and Timber Permit confer property rights on the private harvester, other factors force the private harvester to discount the future heavily. These are the possibility of the change of rules governing private harvesters, high inflation and interest rates, and the uncertainty about future prices for tropical logs. Therefore, private harvesters will be intent on logging to the limit of their capacity and this may be well in excess of the stipulated annual volume and area unless monitoring and penalties are strictly applied, but this seems unlikely given recent experience.

Although the NFS has established a *Logging Code of Practice* (PNGFA, 1995), the code may be of little consequence to logging companies bent on cost cutting. Personal communications (G. Stocker, 2001) with rangers employed by AusAID (under its Human Resource Development Program) to assist the NFS with the control of forestry activities in the field, suggest that the implementation of the Logging Code of Practice has been very patchy; in some areas the standards and requirements have been adhered to but in others ignored. Although the code's implementation is primarily dependent upon the enthusiasm of the NFS area

managers, other factors such as the attitude of the loggers and the terrain are also important. The enforcement of some of the provisions is reportedly often ineffectual. For instance, buffer strips may be enforceable during the industrial harvest, but these areas are very vulnerable to portable sawmill operations as soon as the industrial phase has finished (Section 5 deals with the outsourcing of NFS functions, such as the enforcement of the Logging Code of Practice, to achieve greater effectiveness).¹⁰

It is argued that landowners are unlikely to wait for up to 40 years for their forest to be harvested while neighbours are enjoying financial benefits. The system is likely to succumb to political and social unrest. One way of avoiding this uneven time distribution of financial benefits is to spread all the annual royalty proceeds from the current coupe over all the ILGs in the FMA area. But this policy may result in only a small trickle of funds to each of the land groups, insufficient for meaningful investments and suitable only for consumption. Moreover, the potential for the misappropriation of proceeds would be high given the number of transactions involved.

Another flaw in the logic of the 35 to 40-year rotation is the assumption that primary forest will still be standing in those coupes earmarked for harvesting towards the latter end of the 35-40 year cycle. It is unlikely that landowners will pass over an opportunity to make cash from some other land use, rather than sustainable yield forestry, if the opportunity arises.

The third assumption, that there will be regenerated forest available for a second cut, also seems to be seriously flawed. A second cut will be compromised by the collateral damage to trees left untargeted and by the cutting of trees left standing by portable sawmill operators who use the logging roads to gain access to previously impenetrable forest. After harvesting, it is much easier to burn the forest for conversion to subsistence or cash agriculture.

The population of Papua New Guinea is doubling every 30 years and is almost all regionally based and in subsistence. Therefore the land required for gardening will need to increase, depending on the level of intensification achieved (cash cropping – one of the few ways that people can lift themselves out of poverty, and heavily promoted by Government – will undoubtedly require more land – admittedly only in areas where transport is not prohibitive and soils allow). Filer and Sekhran (1998:377), however, suggest that there is little evidence to back up the widespread assumption that rapid rates of population growth are already causing encroachment into the forest, though they might eventually do so in some areas; they also suggest that the conversion of tracts of forest to large-scale agricultural estates is little more than a 'pipe dream'. While the conversion to oil palm is certainly proceeding at a rapid rate, it is confined to certain locations – as described in Section 3.

10. In 1999, on a visit to a logging site in the Bainings in East New Britain, the author witnessed felled logs being towed by bulldozers up tracks, the steepness of which was estimated by an accompanying experienced forester to be 45 per cent. Bulldozers sliding down the same tracks to retrieve logs were using their blades to stop them skidding headlong into the river below. Heavy rain was causing sheet and gully erosion in the tracks.

Similar concerns are expressed by Barr (forthcoming) in respect of the sustainability of the 35-year cutting cycle in Indonesia. He found that concession holders questioned whether the second cut would be profitable, given doubts about the size and value of the regenerated forest. The trees grew too slowly to reach 50 cm in diameter in 35 years' time and regenerated stands were dominated by species of lesser value. Heavy collateral damage (35-50 per cent) was one of the contributory factors limiting the value of the second cut in Indonesia (an AusAID (1997) report claiming even higher levels of collateral damage in Papua New Guinea has already been cited in Section 1). Given that Indonesian logging companies do not realistically expect to have access to the same forest, or doubt that trees will still be in place in 35 years, they have little incentive to leave any trees with commercial value. Barr (forthcoming) notes that logged over areas are highly susceptible to encroachment and to reclassification to other land uses. There is therefore an incentive for the Indonesian private harvester to re-log the regenerating stand prematurely. Moreover, logged-over areas in Indonesia have been susceptible to forest fires, which diminish the availability of second rotation timber. While fires in Papua New Guinea were not as devastating as those in Indonesia, they were quite widespread at the height of *El Niño*. While there is no actual evidence that these fires were worse in the logged-over areas, the fact that fire can ravage even primary forest as a result of the extreme *El Niño* weather patterns, suggests that caution should be applied in planning the commitment of forests for long periods ahead.

Mindful of the difficulties of conferring sustainability on the harvesting system that stem from the inequity of the distribution process under a long cutting cycle, and of the fact that landowners may convert their land with impunity after it has been harvested (or even before), it is proposed that the State cedes much greater control to landowners, not only because sustainable yield harvesting will not work but to allow landowners to take charge of their resource and thereby to control their destiny. Filer and Sekhran (1998:374) heralded a change in this direction: *"the resource owners will continue to ascend the learning curve which leads to a greater measure of control over the allocation and exploitation of their resources, and a greater interest in their sustainability, but it is not so clear that this form of empowerment would be consistent with the maintenance of a large-scale log export industry in its present form"*.

If Papua New Guinea's forests are to be properly managed, their short, medium and long-term values must be apparent and accessible to the landowners. Indeed resource owners must be able to maximise the value of their heritage. Unless the returns from their forests provide them with the money to enable them to purchase the essential trappings of a western lifestyle, most may eventually convert their forests to an alternative land use that they perceive will provide higher returns. The proposal is summarised in Box 2.2, and its implications are developed by Stocker in Section 5.

Box 2.2 Proposal for landowners to allocate their forest

Landowners to allocate their forest to:

- Logging, and or
- Conservation, and or
- Agricultural development

Allocation by landowners to logging

- Resource owners to manage their forests subject to a forest management plan, certified to conform to the state's environmental regulations.
- Resource owners to deal directly with loggers and log buyers on a simple contract basis, the Incorporated Land Group being the most appropriate and accessible vehicle through which landowners would do business. Since the State would have an interest in the financial transaction associated with the contract, it would be registered with the State.
- Landowners to be protected from unfair dealing by new legislation and strengthened existing legislation.
- An independent arbiter to determine either the FOB or mill door (domestic processing) value of the logs. The contract between the resource owner and the logger would specify the proportion of this value to be paid to the resource owner.
- The value of the logs, as verified by the independent arbiter, to be the basis of a log tax levied on the harvester.

2.3 Instruments for efficiency and distribution – the forest revenue system

By far the larger proportion of log harvesting taking place in Papua New Guinea is not in the new FMA areas (only a couple of extensions to existing concessions have actually been brought into existence under these Agreements). Most of the harvest, currently at the historically low level of 2 million m³ of logs for export, is in fact derived from earlier timber agreements between the State and the private harvesters not subject to the sustained yield objective. There are presently about 90 active projects listed covering a total area of 7.2 million hectares and with total allocated timber resource of 108.8 million m³ (PNGFA, 1999). The length of the permit varies but averages around ten years. Many permits are due to expire in the next few years but at the present rate of production the resource may last for another 25 years.

The section below explores the issues in the design of forest revenue systems – the means by which the financial value of the export logs from these projects is shared between the parties (landowners, loggers and government). In the light of the theory, and what are seen as deficiencies of the present system, it proposes modifications that improve its efficiency and its economic, environmental and social sustainability.

2.3.1 Issues in the design of forest revenue systems

Issues of efficiency and distribution have been acknowledged as crucial considerations in the design of forest royalty and tax systems. These were made explicit in the seminal article of Hyde and Sedjo (1992), and in the debate on rent capture initiated by Vincent (1990). Efficiency in terms of the achievement of a social optimum in the level of harvesting is attained by imposing a per unit tax on harvest equivalent to the social costs of harvest. The social costs include environmental costs and may be local or global. The distributional issue, on the other hand, concerns the allocation of rents between the private harvesters and government; rent is the return to harvesting over and above cost of harvesting and the social tax.

A brief explanation of the theory of forestry taxation paves the way for the discussion of the issue of the choice of currency for the denomination of the tax schedule. The theory discusses the application of taxes imposed per volume of production and on gross or net value of production, the latter sometimes being referred to as 'stumpage' in forestry literature. In this report, the argument concerns solely the tax on the export value of logs, there being no tax on timber harvested for domestic consumption. However, it does envisage an extension of the tax, albeit at reduced rates, to domestic logs.

Hyde and Sedjo (1992) illustrated that, in the short run, private harvesters of natural forests seek to harvest to the level where their marginal operating cost equals net price. The application of a fixed rate tax on price per unit of timber volume reduces production. This tax can be set to achieve the long-run efficient harvesting level by equating tax to the marginal social cost of harvesting. Marginal social costs of harvesting of natural tropical forests include environmental damage, both local and global, and a reduced harvest of NTFPs by the inhabitants.

However, as the fixed tax increases so does the incentive for its avoidance. The costs of monitoring by the Forestry Authority are consequently greater. The change in the amount of tax collected with change in size of tax imposed will depend on the elasticity of supply, or the slope of the marginal cost curve.

In contrast to a fixed tax per unit of production, a tax based on profit or resource rent (where cost of production includes a normal profit) is neutral with respect to harvesting decisions. It is suggested that the two goals of achieving a social optimum through the imposition of a fixed tax per unit and the capture of a share of resource rents through a profit tax can be combined in a single tax system.

A convenient method of appropriating resource rents in log harvesting is for Government to impose a tax on the raw log exports of the private harvesters – commonly referred to as a 'log export tax'. This method is adopted by Papua New Guinea and by the Solomon Islands and Vanuatu. Log sale contracts and trade are in US dollars and the taxing country has the choice of imposing the tax on the US dollar FOB value of the logs, or on the local currency value.

2.3.2 A case study of Papua New Guinea's log tax system

Papua New Guinea is the fourth largest exporter of tropical timber from the Asia-Pacific region, after Indonesia, Malaysia and India. Log exports generate about ten per cent of annual export income and five to ten per cent of annual tax revenues of Papua New Guinea.

The tax system that presently applies to harvested logs does not allow for the cost of production. It is progressive (the rate of tax rising with log price) and the tax schedule is denominated in local currency. The form of the log export tax is shown in Figure 2.1.

Figure 2.1 Log tax is progressive from a low rate at low prices



The rate of change of the log tax is greater than the rate of change in the log price in Figure 2.1.¹¹ That is:

$$\frac{dT_{LC}}{dP_{LC}} > 0 \quad (1)$$

Where:

T_{LC} = log tax in local currency,

P_{LC} = price in local currency.

The log export tax is collected by Customs before the shipment leaves port and an estimate of what this tax should be (given log volume monitored by the independent company SGS PNG Ltd and log export price approved by the Forest Authority), is passed by SGS to Customs, the Internal Revenue Commission and the Forest Authority.

11. If the tax rate were constant, that is if the rate of change in tax equalled the rate of change of log price, then the relationship between tax per unit and price per unit would be represented by a straight line in Figure 2.1.

The so-called 'royalty' is paid later to landowners on the basis of SGS's volume records passed to the Forest Authority. The Producer Development Benefit is distributed later by the Forest Authority for the benefit of landowners, on the basis of verified volume and price.

Between September 1997 and September 1999, a unit of local currency depreciated from US\$0.70 to US\$0.35 (see Table 2.1, row 1).

Table 2.1 Relationship between exchange rate, tax and revenue shares from industrial logging in Papua New Guinea¹²

	Sep 1		
1 X rate (K1.00/US\$1.00)	0.70	0.43	0.35
2 Vol, m ³	262636	98120	103464
3 FOB value log exports, US\$	30616118	5865458	8353730
4 FOB value, kina	43810118	13593576	24185945
5 Log export tax, kina	13714833	3656185	9818664
6 Price/m ³ , kina	167	139	234
7 Price/m ³ , US\$	117	60	81
8 Landowner, kina	6040628	1766160	2643505
9 Tax/m ³ , kina	52	37	95
10 Company share, kina	24054657	8171231	1723776
11 Government share %	31	27	41
12 Landowner share %	14	13	11
13 Company share %	55	60	48
14 Company share, kina/m ³	92	83	113
15 % Change in price, k/m ³ (1997 to 1999) %			40
16 % Change in tax, k/m ³ (1997 to 1999) %			82

Source of data: SGS (various)

Over the same period, mainly as a result of the Asian financial crisis, the log price per unit fell from US\$117/m³ to US\$81/m³ (Table 2.1, row 7). However, as a consequence of the exchange rate change, local currency prices for logs rose from K167/m³ to K234/m³ (Table 2.1 row 6) and the tax rate almost doubled over the period from K52/m³ to K95/m³ (Table 2.1, row 9). The effect of the progressive tax can be seen in rows 15 and 16 of Table 2.1 where the kina price increase over the period was 40 per cent but the increase in kina tax revenue was 82 per cent. Consequently the government's share of log revenue was 41 per cent of price at the end of the period, compared to 31 per cent at the beginning (Table 2.1, row 11). Meanwhile, the landowner share of revenue declined from 14 per cent to 11 per cent (Table 2.1, row 12).

The Government was thus shielded from a severe fall in revenues by the fact that royalty was based on rising local currency prices. In the process, however, the shares of the other stakeholders tended to be crowded out.

12. In the three year period 1997 to 1999, there was a change in the tax system (tax relief was provided in October 1998 but withdrawn in August 1999) which invalidates a comparison of annual results, therefore the month of September is chosen for analysis because the tax regime remained constant for these months.

Private profits were severely eroded over the period covered by the Table 2.1. A conservative estimate of cost of production in 1999 is US\$ 105/m³.¹³ These costs would have risen sharply since 1997 given that the cost of US\$ imports would have doubled due to the depreciation of the kina (see Table 2.1, row 1) and inflation would have increased domestic costs by over a third (Bank of Papua New Guinea 2000: s490, Table 10.4). Given that the company share of log value after tax was K113 (Table 2.1, row 14), the margin appears to have been very slim for private harvesters if the average cost was K105. In 1997 and 1998, logging costs would have been less but, again, row 14 suggests that profit margins would have been non-existent or very small. Production was curtailed in the years 1998 and 1999 when profit margins were most affected.¹⁴

It would seem that the opportunity cost to Papua New Guinea of the severe tax regime may have been high both in terms of revenue foregone and in terms of the type of harvesting company that has left the industry or will do so as the economic squeeze continues. On the latter issue Filer and Sekhran (1998:373) came to the conclusion that *“...the companies that make the serious effort to provide the market benefits specified in their harvesting contracts, or limit the damage which they caused to the natural environment, will be the first to feel the pinch”*. Consequently, *“It is hard to credit the [World] Bank’s claim that a sliding tax on kina denominated export values ensures that the order in which they exit is inversely correlated to their long-term contribution to sustainable forest management”* (Filer with Sekhran, 1998:316,317).

It was illustrated above how the price-based log tax that ignores the cost of production leads to a situation where tax plus cost of production exceeds the FOB price. While the log tax system holds up Government revenue in the short run, it is inefficient if it deters investment by the private harvesters in the long run. Those private harvesters who have not ceased production will have cut costs and delayed capital expenditure to survive.¹⁵ Filer and Sekhran (1998:316) lamented the introduction of a *“blunt and heavy”* instrument that *“... with falling market prices and an equally dramatic decline in the value of the national currency has been successful in driving many operators out of the forest at least for the time being and thus reducing the aggregate level of exports”*. The conventional wisdom in Government and donor circles, nevertheless, is that the industry must still be profitable – otherwise production

13. Filer (1997:233,234) quoted logging cost estimates of the PNG Forest Management and Planning Project – a low cost of K22.40/m³ and a high cost of K66.00/m³; he also quoted a cost range estimate of economists associated with the World Bank of K60-70/m³ and that of industry of K90-K110/m³. The subsequent Fortech (1997) study suggested an actual mean cost of US\$60.93/m³ with a range of plus or minus US14.11. On the assumption that efficiency could be improved, a mean ‘target’ cost was assessed by Fortech at US\$46.80, with a range of plus or minus US8.00. However, this Fortech target cost is still high relative to the other cost estimates quoted. The adopted cost of K105 is equivalent to US\$36.75 at the exchange rate of US\$0.35=K1.00.

14. Low prices were cited by PNGFA (1999a) as the cause of the slow down or shut down of about ten logging projects in 1997 and 1998, rather than a lack of demand.

15. The very low number of tractors sold to private harvesters in the last few years lends support to this argument.

would have slowed to a trickle (for example, see the Taxation Review (2000)). There are heavy sunk costs in the private log harvesting business and companies are often better off, at times of low profitability, cutting operating costs and retaining their labour force – rather than closing down and selling out – in the hope that prices, exchange rates or taxes will move in their favour.

There seems to be a tendency to overstate profits made by foreign-owned resource companies amid philosophy that all profits must be taxed away (World Bank, 2000a). Citing Scotland (1999), Barr (forthcoming) describes a similar set of circumstances in Indonesia (to those in Papua New Guinea), with only a small proportion of rents being collected by the concession holders since the Asian financial crisis: “... *timber companies with smaller, less productive, and/or remote concessions have been operating much closer to the margins of profitability. It is likely that many have resorted to illegal – and presumably unsustainable – practices in order to maintain their profit levels*”. In addition to the production effect of such a system, that ignores the cost of production and applies high taxes, there is also an incentive to avoid company tax. Transfer pricing is a phenomenon that has clouded the issue of tax reform in that the Government has taken the view that a high rate of log tax is warranted because there is tax leakage through transfer pricing. The phenomenon of transfer pricing in Papua New Guinea and its costs are therefore explored in the next section.

Transfer pricing

Fortech (1998a:8) compared the FOB prices in Papua New Guinea with CIF prices in Japan using the Japan Customs Database and revealed a US\$ 54 per cubic metre difference. After allowing for shipping and insurance of US\$ 40, Fortech concluded that transfer pricing was taking place to an extent of some US\$ 14 per cubic metre, or some ten per cent of price. There is evidence that transfer pricing has again emerged as a significant problem in Papua New Guinea as log taxes have risen. The transfer pricing that appears to be occurring now is taking place despite the fact that the PNGFA authorises the invoiced prices that seem to be affected by transfer pricing.

As illustrated in Table 2.2, the FOB prices received in Papua New Guinea for logs appear to be substantially lower than the FOB prices quoted in the *Japan Lumber Journal* and by the International Tropical Timber Organisation (ITTO). For species taun and *Calophyllum* local prices are discounted in the range -17 per cent to -42 per cent, while for the less valuable species the price discrepancy range is -30 per cent to -50 per cent.

Table 2.2 Discrepancies between quoted FOB prices and actual PNG FOB prices

	Species	US\$ Price ITTO ^a 31 July 1999	US\$ Price JLJ ^b 3rd week Sep 1999 ¹⁶	US\$ Price PNG ^c July/Aug 1999	Discrepancy
1.	Cal.	115-120	131-135	95	-21% to -42%
2.	Taun	115-120	131-135	98	-17% to -38%
3.	Gp2	95-100		73	-30% to -36%
4.	Gp3	90-100		66	-36% to -52%
5.	Gp4	85-90		60	-42% to -50%

Source: ^a International Tropical Timber Organisation (2000:9); ^b *Japan Lumber Journal* (2000:5); ^c SGS (2000b).

The prices can be compared for another time period. The wholesale price for the species taun and *Calophyllum* quoted for February 2000 by ITTO (2000:9) is US\$ 134, after allowing for freight of US\$ 35.¹⁷ However, US\$ 134 is 65 per cent above the FOB price of US\$ 82/m³ for log exports to Japan quoted by SGS for December 1999 (SGS, 2000b).

A third comparison is made between the prices paid in the Solomon Islands for low grade logs and *Calophyllum*. Table 2.3 shows PNG prices to be 38 per cent less for low-grade logs and 28 per cent less for *Calophyllum*.

Table 2.3 Discrepancies between actual Solomon Islands FOB prices and actual Papua New Guinea FOB prices

Type	US\$ Price Sol Islands ^a 30 July 1999	PNG price ^b July/Aug 1999	Discrepancy
Low grade saw logs	82	59	-38%
Cal.	121	95	-28%

Source: ^a Sun Kung Enterprises Co Ltd (1999); ^b SGS (2000b).

Some of the price discrepancy may be due to Japanese prices being quoted for plywood quality logs, which are about ten per cent dearer than average prices (R. Tate, personal communication, 2000). If a ten per cent adjustment is made to the *Japanese Lumber Journal* FOB price of US\$ 133 (Table 2.3, row 1), together with an upward adjustment for freight and insurance from US\$ 35/m³ to US\$ 40/m³ – the latter cost being adopted by Fortech (1998:8) – then the FOB price for Japan is reduced to US\$ 115, this price is still US\$ 20/m³ greater than the actual PNG price (Table 2.3, row 1). If the same adjustments

16. The editor of the *Japan Lumber Journal* confirmed in correspondence with the author that the prices quoted are before freight, i.e. FOB prices. The cost of freight, PNG – Japan, quoted by the *Japan Lumber Journal* (2000) is US\$ 34.8 per cubic metre. To allow for elapsed time between shipping from Papua New Guinea and arrival in Japan's wholesale markets, the *Japan Lumber Journal* price quoted is for September while the PNG price quoted is for July/August.

17. Converting at rates of 1 koku=0.278 m³ and 1US\$=Y110.765, the price quoted in the *Tropical Timber Market Report* for 16-29 February 2000 (ITTO, 2000:9) is equivalent to US\$169/m³.

are made to the average ITTO price of US\$97.50 for the cheaper Gp2 species (Table 2.3, row 3), then the price falls to US\$ 83, or US\$ 10 above the actual PNG price.

The total tax avoidance resulting from this assessed transfer pricing is as follows:

$$T = V(p_e * t_e - p_a * t_a) \quad (2)$$

Where

T = tax avoided, kina

V = volume of log exports affected, m³

p_e = price estimated free of transfer pricing/m³, kina

p_a = price actual on which tax was paid/m³, kina

t_e = tax applicable to estimated price from the tax schedule/m³, kina (from Table 2.4).

t_a = tax applicable to actual price from the tax schedule/m³, kina (from Table 2.4).

Table 2.4 summarises the present tax system (its progressive nature can be seen in the 'rate of export' and the 'landowner benefit' columns).

When FOB kina price (p) per m ³ does not exceed	Rate of export tax K/m ³	Landowner royalty K/m ³	Landowner benefit K/m ³
90	$p \times 0.15$	10	0
110	$p \times 0.30-13.5$	10	2
130	$p \times 0.50-35.5$	10	5
150	$p \times 0.55-42.0$	10	8
200		10	13
>200		10	K13.00+7.5% of FOB >K200

Japan was the destination for 988,711m³ of Papua New Guinea's log exports in 1999, at an average FOB price of US\$ 80, or K205 at the 1999 exchange rate of US\$ 0.39=K1.00 in 1999 (SGS, 2000a). It was suggested above that the understatement of price per m³ lies between US\$ 10 and US\$ 20, or in local currency between K26 and K51/m³. Adding these margins to the average price declared of K205 gives prices of K231 and K256 per unit. From the tax schedule in Table 2.4, the tax on K205 is K74, while the tax on K231 is K 92, and on K256 is K110. Substituting these values in (2) gives a range of total tax avoided for the year 1999 of between K17.8 million and K35.6 million or between US\$ 7 million and US\$ 14 million.

We now estimate the landowner share of revenue foregone due to transfer pricing.

The landowner royalty plus benefit, where the price is greater than K200/m³ is as follows (see Table 2.4):

$$L = 10 + 13 + 0.075(p-200) \quad (3)$$

Where L = royalty plus benefit/m³,

10 = royalty/m³, kina

p = price/m³, kina

$13 + 0.075(p-200)$ = benefit for log prices above K200/m³, kina.

The total of landowner benefits foregone is assessed as follows:

$$B = V(Lp_e - Lp_a) \quad (4)$$

where: B = total landowner benefit, kina,

V = volume of log exports affected, m³,

Lp_e = landowner benefit at price estimated free of transfer pricing/m³, kina,

Lp_a = landowner benefit at price actual on which tax was paid/m³, kina.

Substituting the actual and estimated prices of K205, K231 and K256 respectively in (4) generates landowner benefits foregone, in 1999, of K1.9 million to K3.8 million.

It was contended by Fortech (1998a) that the beneficiaries of transfer pricing are not domestic loggers, but log buyers and other intermediaries, who gain the benefit of the difference between the discounted price they paid for logs in Papua New Guinea and the wholesale prices they realise for the logs in Japan. To show how the losses due to price discounting are distributed between Government and logging company, we take our estimates above of transfer pricing, and calculate the tax and the profits foregone in Table 2.5.

1.	A. Actual log price PNG, K/m ³ 205	B. Estimated market price, K/m ³ 231	C. Estimated market price, K/m ³ 256
2. Log tax, K/m ³	74	92	110
3. Log tax foregone, K/m ³		B2-A2 18	C2-A2 36
4. Producer royalty plus benefit, K/m ³	23	25	27
5. Producer benefit foregone, K/m ³		B4-A4 2	C4-A4 4
6. Price margin K/m ³		(B1-A1) 26	(C1-A1) 51
7. Logger profit foregone, K/m ³		(B6-B3-B5) 6	(C6-C3-C5) 11

Row 1 of Table 2.5 shows the actual average price in 1999, and the prices that were estimated without transfer pricing. Row 2 shows the log tax payable on these prices, and row 3 shows the Government log tax foregone. Row 4 shows the producer royalty plus benefit pertaining at the three prices. Row 5 shows the producer benefit foregone. In row 7, of Table 2.5, the tax and producer benefit are subtracted from the price margin, of row 6, to give the net profit to the producer that would have been obtained without transfer pricing. Given that the volume of logs exported to Japan in 1999 was 988,711m³, the estimated total profit losses for 1999 are in the range K5.9 million at the lower price estimate and K10.8 million at the higher price. The company profits foregone are less than the log taxes foregone because the tax structure is such that it captures 77 per cent and 78 per cent of the FOB price for prices above K200/m³ (see the last row of Table 2.4).

The loss of Government revenue of between K18 and K36 million in 1999 is all the more serious when the government's serious fiscal difficulties are taken into account. The foregone landowner benefit is also of concern given the limited revenue generating opportunities that exist in many regional areas. The seriousness of the apparent transfer pricing was conveyed in correspondence by the author to both the World Bank's Regional Policy Adviser in Washington and to the Managing Director of the Forest Authority, on March 10, 2000, but no responses were forthcoming from these institutions.

In contrast, the Taxation Review (2000) did not ignore the evidence of transfer pricing that was submitted to it. However, it failed to carry out any investigations or advance any measures for its mitigation. Moreover, the Review confounded the issue by reference to transfer pricing in the context of corporate income tax where it involves the practice of artificially boosting operating costs, stating that transfer pricing was a reason why logging companies failed to show a profit and why half the companies had never paid any corporate income tax. The two forms of transfer pricing, one concerning the pricing of the export product, and the other concerning the pricing of production inputs, need to be clearly differentiated if they are to be addressed. The Review lamented the inability of the Internal Revenue Commission to pursue transfer pricing (presumably of the operating cost kind) because of its limited resources, and recommended that the Papua New Guinea Forest Authority examine transfer pricing (presumably of the export pricing kind) and make recommendations concerning its minimisation. However, the argument of the Review that transfer pricing (of the export pricing kind) enables logging companies to continue to operate while prices are low, by escaping tax, is erroneous because the companies also lose income, as demonstrated in Table 2.4. The logging companies only benefit in the event of the log buyers and intermediaries who benefit from transfer pricing passing back some of their gains to the logging companies. But the question remains whether such a passed-back margin could be greater than the profit foregone; if not, there is no incentive for the logging company to be involved in transfer pricing.

Invoiced prices for exported logs are usually approved by the Forest Authority. According to Fortech (1998c) the State Purchase Option, whereby the PNGFA has the authority to sell up to 25 per cent of current output did not eliminate transfer pricing. This transfer pricing may well be a manifestation of the oligopolistic structure of the Japanese market (Filer and Sekhran, 1998). An independent company should be engaged in verifying log export prices and investigate transfer pricing – an extension of the log monitoring function presently carried out by SGS PNG Ltd. The FOB prices received in Papua New Guinea for logs appear to be substantially lower than FOB prices quoted in Japan.

Summary of findings on log tax system

The undesirable features of Papua New Guinea's tax system revealed in the case study above are summarised as follows:

1. There is no recognition of the social costs of forest harvesting;
2. The tax system affects production decisions and increases in tax rates have probably decreased Government revenues, by lowering production;
3. The inadvertent escalation of taxes to high levels, so that little resource rent remains for the private harvester, provides an incentive for the private harvesters to cut costs including costs associated with sustainable forest management. On the positive side, basing the log tax schedule in the local currency protected the revenue base of the Government in the face of a price fall in the value of logs and other commodities;
4. There is failure to investigate apparent transfer pricing.

The question of company tax payments by private harvesters should be considered in relation to the collection of export taxes. There appears to be a grave weakness in the ability to collect company tax or to prosecute tax evaders. Given the weakness of the company tax collection regime, the Government must continue to rely on the export tax system to deliver a share of the value of harvested timber resources. However, it should not continue to avoid log tax reform with the excuse that transfer pricing in the market is a form of tax evasion perpetrated by the logging companies.

2.4 A proposed tax system for Papua New Guinea

As stated in Section 1, an alternative tax system needs to be developed that is sustainable in the face of log price and exchange rate changes. Both the fiscal and risk implications need to be made explicit in such alternatives. Moreover, the system needs to distribute the proceeds in a manner consistent with the requirements of the constitution – that is, that natural resources be developed for the benefit of all, and not just one section of the community.

It has been emphasised that the landowners own the forest resource. It can therefore be argued that the income generated by landowners from the sale of logs, timber or timber products should be subject to income tax, as is income from cash cropping or any other commercial enterprise. However, the resources of the Internal Revenue Commission are currently inadequate, and abandonment of the present forest revenue system in favour of income taxes, would probably result in a loss of revenue to the Government – a loss that would exacerbate the government’s acute fiscal difficulties outlined in the first section. Moreover, the retention of a log tax means the retention of the ability to internalise the local social cost of logging. It is recommended that this be done through the imposition of a fixed rate component of the log tax that reflects social costs, collected from loggers at the same time as the profit tax component of the log tax.

The deficiencies of the present forest revenue system were highlighted in the foregoing – this section now demonstrates how a more efficient system, based round the log export tax, can be devised that takes account of costs by:

- i) applying a fixed rate tax per unit of production that reflects the social costs of log harvesting per unit, and
- ii) applying a tax as a percentage of resource rent or profit per unit of production.

2.4.1 Reflecting social costs

The local social cost per cubic metre of logging is estimated by Hunt (2001) to have a present value of K58 per cubic metre harvested. This is made up of extractive values lost, for example firewood and traditional food supplies, together with damage to watersheds. The global social cost, in the form of damage from carbon emissions, is estimated (Hunt, 2001) to have a present value of K142 per cubic metre of timber extracted, making a present value of total social cost of K200 per cubic metre.

The total present value of social cost is about equal to the present average FOB price of timber harvested for export. Such a tax would preclude harvesting, except for species of sufficiently high value that would yield a profit after tax plus royalty and cost of harvesting.

In practice, the Government of Papua New Guinea and the landowners cannot be expected to bear the opportunity cost of the application of a tax reflecting global environmental costs without being compensated by the rest of the world. It is in the interests of Papua New Guinea, nevertheless, to impose a tax that reflects local environmental costs. This local environmental cost is derived from international research in tropical forests and it is not claimed that it accurately reflect costs in Papua New Guinea. Nevertheless, evidence exists that substantial costs of the kind cited are incurred with industrial logging. It is therefore suggested that a conservative level of fixed rate tax of K50 per cubic metre be applied.

Such a fixed rate tax is easy to administer but it should be noted that it does not reflect the fact that local social costs will vary from coupe to coupe. This will result in some distortion of harvesting patterns. The more costly areas to harvest – in terms of steepness, for example – would tend to be avoided because the fixed rate tax would make harvesting them even less profitable. However, in other areas where there are significant environmental values at risk, such as biodiversity, the fixed rate tax may allow more harvesting than warranted if full social cost in that instance were reflected in the fixed rate tax.

2.4.2 Resource rent tax

The government's interest is to maximise its share of the rent without dampening investment and, in the case of Papua New Guinea, to distribute a share of rent to the customary resource owners. The attractiveness of the resource rent tax is that it does not affect the level of harvesting, in the same way as a tax on production, because a normal profit is built into the cost structure. However, if the tax appropriates a very large percentage share of resource rent, the marginal benefit of seeking higher market prices – higher market price less tax – may not exceed the extra marginal cost of seeking the higher price. This diminished market incentive and lower market prices would be reflected in the lower resource rents for government. This needs to be recognised in determining the upper rate of the resource rent tax.

The suggested forest revenue system is shown in Table 2.6.

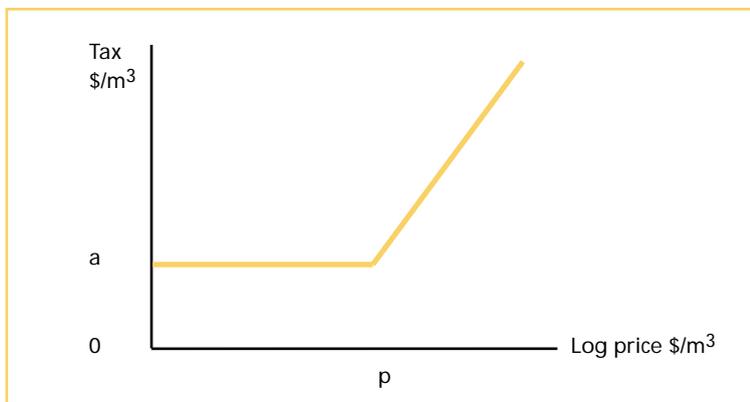
Table 2.6 A proposed forest revenue system	
Fixed tax per m ³	Resource rent tax per m ³
<i>a</i>	$b(p-(c+a))$
Tax	$= a + b(p-(c+a))$
Where	<i>a</i> = amount of fixed rate tax, kina <i>b</i> = rate of resource rent tax, kina <i>p</i> = log price, kina <i>c</i> = cost of production.

The fixed tax *a* adds to the cost of harvesting and shifts the volume of harvesting towards the social optimum, as discussed above. Resource rent is appropriated for Government at rate *b* applied to the margin of price *p* less cost of production *c* plus fixed rate royalty *a*.

In Table 2.6, cost of production *c* includes normal profit, or a profit that an investor could reasonably expect to obtain by investing in Papua New Guinea.

Figure 2.2 shows this tax structure graphically. The horizontal tax line represents the constant fixed rate tax (*a*). The upward sloping line represents the profit tax at a constant percentage of price, cutting in at a price above cost of production.

Figure 2.2 Tax is in two parts: a fixed rate per unit plus a constant percentage of price above a threshold price



The price p should accurately represent the price for logs, which vary between species. SGS PNG Ltd, the company charged with the monitoring, recording and pricing of log exports generates such prices for tax purposes.

For the proposed system to reflect resource rents accurately, the cost of production component, c , needs to reflect actual costs, which vary with terrain and location. By adopting a uniform cost of production, the proposed system penalises individual companies with high costs, i.e. above K176/m³, by accentuating their profits and therefore their log tax, and favours individual companies with low costs, i.e. below K176, by diminishing their estimates of profit and therefore their tax. To overcome this problem Fortech (1998b) gathered costs in US\$ for five geographic zones in Papua New Guinea and examined a profit tax system that takes account of these zoned costs (Fortech, 1998b:Table 5.3, p.39). The costs of logging are stated in US\$, therefore the schedule is in US\$ and the costs by zone are Fortech's 'target' costs plus a 20 per cent normal profit margin. The balance of resource rent, that is log price, less costs, profit margin and royalty, is taxed at 90 per cent.

Table 2.7 generates tax outcomes for regions under Fortech's system for a total production of just over 2 million m³.

Predictably, the system achieves the desired result by generating most tax from the regions where resource rents are highest. However, the system generates only about US\$ 11m in tax. To be politically acceptable the cost structure would need to be adjusted downwards on a *pro rata* basis to achieve a greater amount of tax revenue, given that the tax foregone would be considerable – annual tax collection in Papua New Guinea at the time of writing is at a rate of K135 million per annum, or US\$ 47 million at the exchange rate (US\$/K) of 0.35.

Log company cost data would need to be collected to estimate costs by region as in Table 2.7. This data would need to be monitored and checked for freedom

from transfer pricing and other factors that artificially bolster costs. This is an expensive exercise, and Fortech (1998a, Table 5.1, p.37) suggests a cost of administration of a profit tax based on regional cost structures, to be borne by the Government of Papua New Guinea, of US\$ 670,000 in year 4, falling from US\$ 808,000 in year 1 of the scheme. Such a level expenditure may be unwarranted in the light of the additional efficiency gains and given the scarcity of Government funds. Moreover, it is doubtful if company-by-company income and expense data on a timely basis and free of transfer pricing could be obtained from logging companies.¹⁸

Nevertheless, more research on the potentially efficient regional resource rent system is warranted.

Efficiency also demands that cost structures in the revenue system reflect the currency of company costs. For example, if costs are incurred predominantly in US\$ then the statutory cost deduction (c) should also be in US\$. However, reflecting the currency of costs is out of the question given that this proportion

Table 2.7 Estimated government tax revenues under proposed profit tax system

A Region	B Estimated logging cost US\$/m ^{3(a)}	C Profit 20% of costs US\$/m ³	D Landowner share US\$/m ^{3(b)}	E Expected FOB price US\$/m ³	F Expected profit tax US\$/m ^{3(c)}	G Vol. m ^{3(d)}	H Tax US\$
Manus	38.7	7.7	7.5	96	37.9	74,707	2,827,959
Western/ Gulf	54.9	11.0	7.5	71	0	977,048	0
New Britain	51.35	10.3	7.5	76	6.2	685,825	4,246,628
Morobe	54.04	10.8	7.5	76	3.3	2 10,888	693,1478
Vanimo	47.22	9.4	7.5	89	22.4	51,219	3,380,108
Total						2,099.687	11,14

Source: (a) Fortech (1998b, Table 5.3, page 39); (b) An approximation, given that the landowner share schedule is in kina (see Table 2.3); (c) 0.9(E-B-C-D); (d) Source of weights in estimating log volumes by region is SGS (1999).

18. In the mining industry in PNG, which is characterised by a few geographically confined operations, it is possible to 'ring fence' the companies for tax purposes, enabling prevention of transfer pricing and the calculation of profit tax (Hunt, 1998).

19. The Fortech (1998a) study asserted that logging company costs were predominantly in US\$. Unfortunately, however, no evidence was presented to show this. Nor has further information come to light to back up the assertion.

is likely to vary from company to company and from time to time, as companies substitute imports for locally purchased inputs, or *vice versa*, depending on relative exchange rates and costs.¹⁹

Returning to the recommended system, a conservative estimate of logging costs was made above of K105. The addition of 20 per cent normal profit brings the total of *c*, to K126. The fixed tax *a*, reflecting social cost, is K50/m³. Therefore the resource rent tax does not generate tax until price *p* exceeds *c+a*, or K176.

Given the high inflation rate in Papua New Guinea, the cost *c* would need to be indexed for inflation. (The Consumer Price Index would appear to be an appropriate index in the absence of an index that reflects harvesting costs.) It is suggested that the resource rent tax should appropriate some 80 per cent of the rents, leaving a margin of 20 per cent for the industry.

The alternative and much simpler tax system can therefore be summarised as in (5):

$$T = a + b(p - (c+a)) \quad (5)$$

where: $a = \text{K}50/\text{m}^3$
 $b = 0.8$
 $p = \text{FOB price}$
 $c = \text{K}126/\text{m}^3$.

Present and alternative systems compared

The rate of tax is constant at low prices under the proposed system as shown in Figure 2.3. This reflects the fact that there is always a fixed K50/m³ tax, no matter what the price. The tax on resource rents at the rate of 80 per cent does not apply until the price reaches K176. Figure 2.3 also illustrates that at log

Figure 2.3 Tax per cubic metre of log

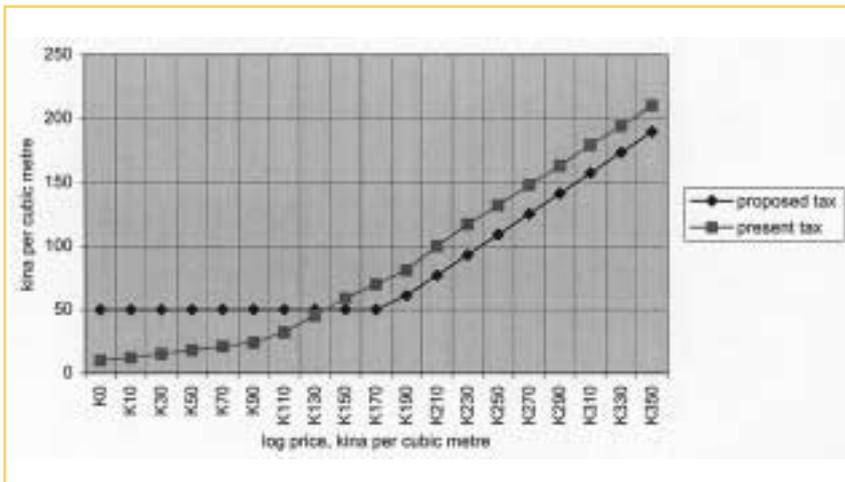
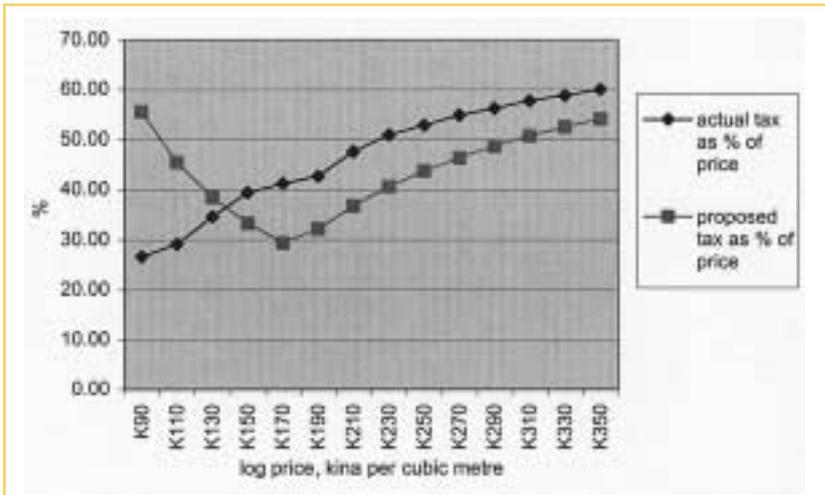


Figure 2.4 Tax as percentage of FOB price of log



prices below K150 the tax collected per unit under the proposed system is increased compared with the existing system, and at log prices above K150 there is some tax relief. As Figure 2.4 shows, at prices of K200-K210 per cubic metre the tax collected amounts to some 45 per cent of price but under the proposed system it decreases to 35 per cent.

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Figure 2.4 also shows that the average tax rate of the proposed schedule increases with price. At a price of K180 the tax is 30 per cent of price while at the higher price of K310 it is 50 per cent of price. This increase in the tax rate is caused by the fact that the profit margin above the cost of K176/m³ increases with price, and so does the tax, which is 80 per cent of that profit margin.

Earlier, it was suggested that the present system has the disadvantage that it does not recognise the cost of production or social costs. Moreover, it is likely that the present system is encouraging cost cutting, leading to environmental damage. The proposed system provides some tax relief which can be expected to lead to some increase in the level of production – and, according to the elasticity analysis cited above – an increase in revenues, while at the same time reducing the incentive for tax avoidance and cost cutting methods of logging.

These examples are more of an exploration of the application of changes that can be brought about by an improved forest revenue system that recognises the roles of a fixed rate tax and a profit tax in delivering an efficient outcome, rather than an attempt to recommend a level of tax. A reduction in the log tax would lead to an increase in investment by the industry. A competitive exchange rate already exists, and macro-economic reform should eventually deliver a more favourable overall economic climate in which forestry investment can take place.

Landowner benefits

The distribution of royalties to landowners is a matter of equity. There are two main issues. Apart from the share of revenues that should be directed to landowners, the other issue is whether landowners should be protected from low prices. At present landowners receive a royalty and, indirectly, the Producer Development Benefit (PDB). The latter is not easily understood and its operation is being examined by the Forest Board and the Forest Authority.

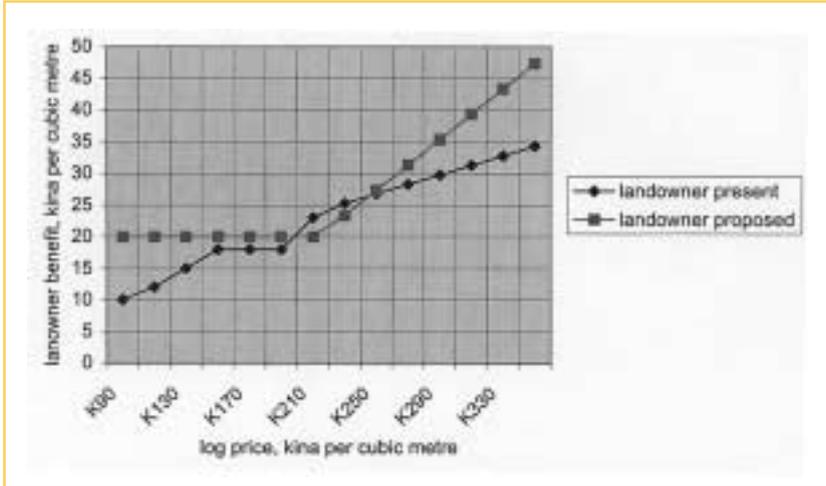
It is argued that, on the grounds of equity and given that they are the recognised customary owners of the resource, landowners should receive a much higher share of log revenues than they currently enjoy. This would mean a reduction in the government's share, as it is unlikely that the loggers' share would be reduced. In the proposal that follows it is assumed that such a radical shift in the share of proceeds between the stakeholders will not be achieved until some time in the future, given the government's acute shortage of revenue. The proposal is for the landowners to receive a share based on a percentage of Government proceeds. This proposal is flexible in that any agreed percentage can be deployed for the benefit of landowners.

Irrespective of the percentage of log value landowners receive, it is equitable for the share to rise or fall at the same rate as that of the government, and a system where landowner benefit is equal to 25 per cent of total tax revenue is suggested in the short run. The proposal being considered has the advantage that it is much simpler to apply and more easily understood than the present one: compare the present system in Table 2.4 with the proposed system in Table 2.6.

In the event of a change in the method of forest allocation, from the system where the Forest Authority transfers the resource on behalf of landowners to the private harvesters, to one where the landowners negotiate an agreement directly with private harvesters, then landowners would receive benefits directly via that agreement, rather than through a benefit based on a percentage of total tax.

Figure 2.5 assumes for the purposes of illustration that the landowners receive a share equal to 25 per cent of Government tax. At prices above K200/m³, landowner benefits are generally greater under the proposed system than under the existing system. In other words, as prices increase the landowners will reap a greater share of that increase under the proposed system and, furthermore, this share is in proportion to the Government's share. Moreover, there is a built-in insurance for landowners in that proceeds cannot fall below K20/m³ (hence the straight line in landowner proposed benefit between log price K90 and K230). The other important issue is whether committees or the Government should direct the investment of part or all of the landowners' share of logging proceeds. There is no evidence that committees or local trust fund managers will invest the money any more wisely than the individuals. Moreover, corruption is encouraged by channelling the proceeds through more hands. Holzknacht (2001) reminds us that in the early 1990s provision was made for royalties due to resource owners to go into trust funds so that it could be accounted for, but this did not find favour anywhere and it was eventually abandoned.

Figure 2.5 Landowner benefit



It is recommended that landowners should be paid directly, and in full, their share of the proceeds. This would be accomplished under the recommendation that the State should formally withdraw from the forest acquisition process, restoring sovereignty over forest resources to the customary owners.

2.4.3 A special tax for environmental conservation

Earmarking

At present, the conservation of forests is hampered by lack of resources to provide incentives for landowners to enter into conservation agreements. It is also held back by the absence of institutional arrangements within which stewardship of the forest by landowners can be effected. While competition for funds within the economy of Papua New Guinea is one reason why environmental protection and conservation tend to receive only lip service by the national government, there is, on the other hand, a good deal of interest among donors.

There is a case for the generation of conservation funds from within Papua New Guinea's forestry industry itself, which would enable the reduction of local environmental costs and the generation of conservation options for landowners. It is envisaged that the proceeds of an environmental levy on the industry would be channelled into the Conservation Trust Fund (CTF) and used for forest conservation. If CTF does not come to fruition then another vehicle would need to be set-up to apply the funds from the levy to forest conservation.

As well as enabling the payment of incentives to landowners for forest stewardship, an important function of the levy could be to meet the costs of clarifying customary tenure and, in consultation with landowners, drawing up lease, lease-back arrangements and forming ILGs (see Section 3). Forest management plans would incorporate these arrangements. Some detailed

mechanisms by which the proceeds of the levy will be applied to forestry conservation are no doubt already being developed by the CTF.

It is envisaged that, initially, an earmarked environmental levy in the order of K2 per cubic metre could be imposed. This would raise some K4 million at the present rate of harvesting. The rate of levy could be raised in the future if the levy proved successful in effecting conservation.

It should be noted that such a fixed levy has the same disadvantage as the fixed rate tax. That is, it would not reflect the environmental costs of logging in any particular coupe. However, its administrative simplicity recommends it.

Tax remission as environmental incentive

A problem with environmental compliance in Papua New Guinea's industrial logging sector is that it is dependent on the limited monitoring resources of the National Forest Service. Moreover, the sanctions for breaching environmental regulations are weak. An alternative is to provide an incentive to logging companies to comply with the *Logging Code of Practice* and other environmental regulations. In this incentive proposal, forest taxation becomes the vector of possible changes in the economic structure and patterns of forest management (Karsenty, 2000).

The proposal takes the form of a remission of the fixed rate tax; recapping, the fixed tax recommended (to reflect the social costs of log harvesting) is K50 per cubic metre harvested. A reduction of this tax would be an added incentive for companies to reduce their environmental impact. At present prices, under the proposed tax system, the profit margin to logging companies, after fixed rate tax and cost of production, is about K40 per cubic metre. A K10 reduction in the fixed rate tax represents an increase of 25 per cent in profit per cubic metre. Such a level of profit increase is a significant incentive for companies to achieve higher management levels. At present, on the other hand, the extra cost of better practices and management is a disincentive to logging companies. Compliance with the logging code of practice could be the basic criterion for its application.

The tax remission for good management could be graded, a high level of management practice by the logger earning a higher remission of royalty, and a moderate level of environmental management a lower remission. A monitoring and points score method would need to be devised along with a method of administering tax remissions. It is suggested that this monitoring function should most efficiently be outsourced, along with other functions of the National Forest Service, as suggested in Section 5.

Tax on domestic log harvesting

We now consider the issue of tax on domestic logs. On the grounds of creating a level playing field for investment in the forest industries, it is proposed that the log tax should apply to domestic users of raw logs as well as to exporters. To

reduce administrative costs of collecting revenues, the system would apply only to domestic processors of a certain size (in terms of their domestic log consumption). This may exempt some small walkabout sawmill or eco-forestry operations, for example. The impact of a log tax on eco-forestry is detailed in Section 4.

Records would need to be kept by domestic processors of the sources of logs to facilitate payment of tax. No estimate has been made of the extra Government revenues generated by such domestic taxes. If the Government wishes to support domestic processing as part of a comprehensive policy for the forestry industry it could make assistance available through the annual budget. The assistance is then transparent and time bound and must compete with other Government priorities.

Tax based on US dollars or kina?

The issue of how best to denominate an export tax has not been addressed in the forestry literature, and yet it is an important one in terms of efficiency and distribution of resource rents between the private harvesters and government. Where log exports contribute a major share of Government revenues, as in Papua New Guinea, the denomination of the currency in the forest revenue schedule becomes an issue that impinges on macro-economic management. When commodity prices and volumes slump, as they did in the Asian financial crisis, export revenues fall and the Government can have difficulty in meeting its fiscal targets; indeed, important budget areas such as health and education may suffer funding cuts. At the same time, it is likely that a reduction in export volume and other factors associated with the slump, such as inflation, will weaken the value of the local currency relative to the US dollar. The denomination issue is covered in more detail in Hunt (2000b), and below is a summary of the main conclusions.

If the forest tax system is characterised by a rising average tax rate²⁰, (see Figure 2.1) and the statutory tax schedule is denominated in local currency, the effect of a depreciation is to increase the local price of logs *vis a vis* the US dollar price (see Table 2.1). The increase in Government revenue through a redistribution of resource rents between the Government and the private harvesters tends to offset the effect of any slump in price. The phenomenon is clearly illustrated in the case of Papua New Guinea. Conversely, if the revenue system is denominated in US dollars, the downward effect on Government revenue of a price fall is exacerbated by a concurrent depreciation.

This analysis suggests that, to reduce the risk of budget shortfalls – a potential hazard especially where log taxes contribute substantially to Government revenue – the log export tax should be denominated in local currency. It needs to be recognised that while Government revenues can be stabilised by this policy choice, the distributional effect may induce logging company responses

20. The present and proposed tax systems share the characteristic of a rising average tax rate with price.

such as production cuts, company tax avoidance and other cost saving activities inimical to forest management. Such responses can be minimised, however, by adopting a structure that allows for cost of production and normal profit and taxes resource rent or profit, rather than price. Such a structure, particularly if the cost component is regularly updated, reduces the risks to private harvesters associated with currency depreciations. To allow the industry to reduce its risks resulting from the uncertainty associated with price and exchange rate fluctuations, it should be given the freedom to organise its own hedges, and the Government should consider removing any impediments to it doing so.

2.4.4 Summary and main features of tax proposals

Filer and Sekhran (1998:316) pointed to the difficulties in designing a forest revenue system that:

- takes account of the quality of timber and the variations in logging costs from place to place;
- delivers a normal profit to efficient operators;
- produces an equitable distribution between the stakeholders that promotes sustainability; and
- encourages downstream processing without subsidising inefficient local manufacturers.

While it is not claimed that the foregoing section has delivered solutions to all these challenges, it has nevertheless shown how environmental concerns can be built into a tax system that at the same time ensures normal profit and prevents the industry from being taxed out of existence, and how the landowners' share can be increased under a simple formula. The main features of the proposed systems are summarised in Box 2.3.

Box 2.3 Summary of the advantages of the proposed tax system

1. It is easily understood, for example the landowner share can be a percentage of Government or total tax, rather than being based on a complicated separate formula.
2. Applying a fixed tax component per m³ harvested equal to social costs ensures that the level of logging reflects those costs.
3. Allowing for a cost of production in calculating the profit tax avoids the possibility of imposing negative profits on the logger.

The World Bank and the Papua New Guinea Forest Authority have so far failed to address the issue of tax relief. This may be out of fear of a vociferous reaction from the international conservation NGOs that are influential in Washington. The Taxation Review Committee (2000), having found the issues in forestry taxes beyond its analytical capacity, has handed the problem back to the Bank. Yet another set of consultants' reports, similar to those already generated by Fortech (1997, 1998a, 1998b, 1998c), but seemingly ignored by the World Bank, is now being prepared.

This completes the discussion of the revenue system. The next section addresses one of the major impediments to the development of the forestry industry in the country: the acquisition of customary land for timber plantations.

Lease, lease-back – an instrument for forestry?

This section discusses the role of lease, lease-back in securing land for agricultural development and the potential for the instrument's adoption in plantation forestry.

3.1 A company-landowner partnership

The three per cent of land in Papua New Guinea that is not under customary tenure, alienated under the *Land Registration Act*, was acquired from customary landowners by the State and by former colonial administrations. The State is the only non-citizen body eligible under law to enter into dealings over customary land but, for various reasons, present-day customary landowners are unwilling to transfer their land to the state. Therefore there is a shortage of agriculture and urban land available for development by non-citizens or through joint ventures.

Despite numerous attempts to enact legislation that would provide for the registration of customary land and allow development, the only legal machinery available is the *Land Tenure Conversion Act 1963*. However, processes under this Act are unworkably cumbersome and slow. The lease, lease-back provisions of the *Land Act 1996*, together with the *Land Groups Incorporation Act*, are the only practical, legal mechanisms for large-scale commercial agricultural development.

Given that the only land that non-citizens can deal with is land registered under the *Land Registration Act*, the State must bring customary land under this Act by acquiring some form of tenure over the customary land that will allow it to issue a registered negotiable title legally. Having formalised title to their land through a lease to the state, and having had it leased back to them, hence 'lease, lease-back', the landowners are then able to negotiate with non-citizens with respect to the use of the land.

The lease, lease-back amendments were made to the *Land Act* to assist customary landowners to obtain registered titles that facilitated loans for cash cropping. This is still the main reason behind the lodging of most applications today. These applications are made mostly on behalf of individuals or families, involve small areas and do not require the use of the *Land Groups Incorporation Act*. However, in large-scale projects, over areas of communal land containing a relatively large number of traditional land-owning groups,



it becomes necessary to reduce the administrative burden by complementing the lease, lease-back provisions of the *Land Act* with the *Land Groups Incorporation Act*.

This latter Act enables the landowners within a group, sub-clan or clan, to form a single legally constituted body - the Incorporated Landowner Group (ILG). In taking a lease over the land, the State formally recognises and identifies the traditional owners of a specific parcel of land, formed into an ILG as lessors. In leasing the land back to the ILG the State foregoes the use rights to the land and transfers them back to the landowners. The ILG is then free to sub-lease directly to a developer. The arrangement allows the developer to invest in a joint venture over relatively large areas.

Lease, lease-back has been recognised by Jones and McGavin (2000) as the most successful and widespread of the schemes in the agricultural industry that transfer land use rights to foreign developers.^{21,22} Haynes (1994) examined the lease, lease-back procedure and recommended changes. Pacific Agribusiness (1987) declared lease, lease-back a useful instrument for securing bank loans. It recommended that the instrument should be maintained and strengthened until such time as a national customary land registration law was in place. The rewriting of the *Land Act 1996* put these recommendations into effect. Box 3.1 summarises the instrument.

Box 3.1 Lease, lease-back in a nutshell

Under Papua New Guinea Law, dealings in customary land can only be entered into between citizens in accordance with custom or between citizens and the State, i.e., non-citizens cannot legally engage in any dealing with customary land. There is no law covering the identification and registration of customary land, even though several unsuccessful attempts have been made by previous national administrations to enact one. A non-citizen wishing to gain access to land in Papua New Guinea can only apply for land that has been registered under the *Land Registration Act*; that is, land that has already been alienated and recorded in the registers kept by the Department of Lands. Only about three per cent of land within the country has been registered under this act; the remainder is still under customary tenure, the ownership of which, for the most part, is undefined and unrecorded.

To enable and to promote customary land owners' entry into commercial agriculture - without putting continued ownership of their land in jeopardy - lease, lease-back amendments were introduced to the *Land Act*.

The State leases a defined area of land from the customary landowners for an agreed period and then issues back to the landowners a lease, registered under the *Land Registration Act*, for the same period of time less one day.

21. Jones and McGavin (2000:133), in explaining lease, lease-back are mistaken in saying that the landowner groups register the title to their land "*which is then leased to the national government and from the national government to the developer*". In fact, the State leases the land back to the group, which then sub-leases directly to the developer.

22. There is nothing to preclude domestic developers from employing lease, lease-back. However, in practice, foreign direct investment is the usual vehicle for development.

The customary landowners, or those nominated by them, now possess a negotiable title over the land and can negotiate with a third party (i.e. bank, company or individual) to arrange finance for development, or to sub-lease on whatever terms and conditions are agreed upon. Any such dealing must be registered on the title in accordance with the provisions of the *Land Registration Act* and has the same force as all leases under the Act.

At the expiry of the term of the lease by the State, the land reverts back to the customary landowners.

3.1.1 Partnership benefits

An analysis of the lease, lease-back instrument in the establishment of oil palm plantations suggests that the main reasons companies wish to enter into such partnerships with communities is the security of use rights that it brings over the plantation. The tree crop is planted and managed by the company. The company is unhindered in optimising inputs and cultural and harvesting practices to maximise yields. An alternative arrangement is for landowners themselves to plant oil palm under outgrower schemes organised by the palm oil companies. In this case the management is undertaken by the landowners, but because of financial and other restraints yields are only about half those achieved under lease, lease-back (Hunt and Gumoi, 1999). Were lease, lease-back to be employed in timber plantations, the same advantages of security of use rights, and freedom of management and harvesting that flows from it, would be accorded the timber company.

The advantages to landowners of lease, lease-back in the case of oil palm are mainly the attractive level of cash flow and the low labour opportunity cost. The landowner receives lease payments on his land even before the oil palm begins to yield. And, because landowners receive a royalty in proportion to production, it is in their interests to afford the company complete freedom of plantation management. The financial and lease arrangements are directly between company and landowner and are clear-cut.

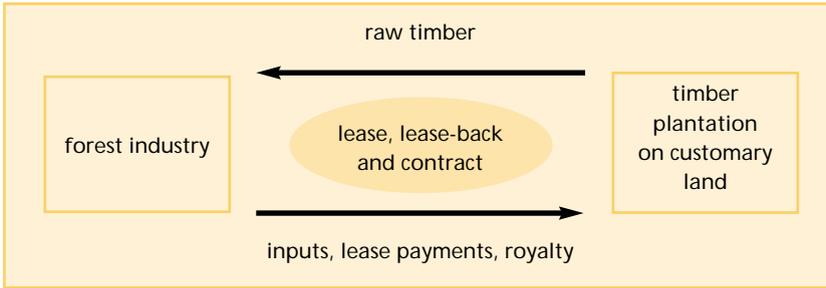
In the case of plantation forestry under lease, lease-back, the benefits to the landowner are bound to be at a lower level than in the case of oil palm. The returns from tree production are delayed for several years depending on whether the production is for wood chips or timber. The lease, lease-back option is likely to be attractive to landowners where superior agricultural alternatives are not available or where land is in surplus supply.

The investor has the security of knowing it subleases a specifically identified parcel of land from the legally recognised traditional landowners. Moreover, the developer's business transactions are facilitated by dealing with a single legal entity, the ILG, under a formally approved agreement and sub-lease. However, in the case of timber plantations, lease payments made by the timber company from the commencement of the lease – necessary to secure the interest and the cooperation of landowners – would need to be funded by borrowing against

future returns. However, the level of return, being sometime in the future and therefore subject to the vagaries of markets and interest rates, is uncertain.

The financial, resource and input flows in the suggested lease, lease-back partnership arrangement for timber plantations in Papua New Guinea, is summarised in Figure 3.1.

Figure 3.1 Lease, lease-back and timber production in PNG



3.2 The lease, lease-back process

Under the lease, lease-back instrument, the State leases the land from the ILG, then leases the land back to the group under a Special Agricultural and Business Lease. The group then sub-leases the land to a developer who pays rent, and in the case of oil palm a royalty, to the landowners in accordance with an agreement.

As in all matters under the *Land Act*, an application for lease, lease-back must be submitted to the Department of Lands in Port Moresby. Any such application originates in the province wherein the landowners reside, and where a record of it is made, before being forwarded to the Department of Lands headquarters for processing and approval (the Department of Lands' check list for a lease, lease-back is in Appendix 1). The steps involved in the lease, lease-back procedure under the *Land Act* are as follows.

1. identification of the land and traditional landowners,
2. approval by the landowners of the proposed project accompanied by a clear understanding of the terms of the agreement with the developer,
3. registration of the landowners as an Incorporated Land Group (Appendix 4 shows a copy of a Certificate of Recognition of an ILG),
4. survey of the boundary of subject land, subdivision into blocks if necessary, and lodgement of the plan of survey,
5. approval of the Local Land Court to the Agreement reached amongst the landowners,

6. application for lease, lease-back lodged in the Province then forwarded to Department of Lands, Port Moresby,
7. application and survey plan examined and if accepted given a registration number and entered into the Department's records and data base,
8. a Land Investigation Instruction number is issued and then forwarded to the Provincial Lands Office for preparation of a Land Investigation Report and forwarding to Department of Lands,
9. a copy of this report is forwarded to the Department of Provincial and Local Government Affairs for examination and approval by the Secretary, in his capacity as Custodian of Trust Land, responsible under the *Land Act* for the protection of the interests of customary landowners (Appendix 5 is a copy of a Certificate of Alienability issued by the Secretary, Department of Provincial and Local Government Affairs),
10. on approval by the Custodian, the matter is referred back to the Department of Lands, where the Acquisitions Officer prepares a Customary Land Dealing (a lease by the State from the landowners) which is forwarded to the Province for execution and the signatures of the landowners,
11. the executed Customary Land Dealing is then returned to the Department of Lands headquarters where it is registered,
12. notices of Grant of the Special Agricultural and Business Lease to the group under the *Land Act* are then prepared and submitted for signature by the Secretary and the Minister for Lands, and issue of notices for publication under Sections 11, 72a and 102 of the *Land Act* granting the lease,
13. signed notices are then delivered to the Government Printer for publication in the Government Gazette,
14. copies of the relevant page of the Government Gazette carrying the Notices of Grant are then delivered to the Leases Officer, Department of Lands, who prepares the Special Agricultural and Business Lease and forwards it to the delegate of the Minister for signature,
15. entry on the lease document of the terms of the agreement and sub-lease reached between the developer and the landowner group is forwarded to the Registrar of Titles for registration,
16. the Register of Titles who allocates a volume and folio number from the Register of State Leases and prepares a Duplicate Lease (Owner's Copy) and forwards it to the lessee (an Owner's Copy of a Special Agricultural and Business lease is attached at Appendix 6).

The customary landowner(s) or ILG, as the lessee of a State Lease, is now in possession of a negotiable title, and in a position to seek finance for development or a sub-lease to a developer (Appendix 7 is a copy of a Sub-Lease Agreement between an ILG and developer)²³. Box 3.2 summarises the steps in lease, lease-back.

Box 3.2 Summary of steps in lease, lease-back

- Identification of the project land, survey of boundaries and preparation of survey plan
- Preparation of Land Investigation Report by Department of Lands
- Incorporation of landowners under the *Land Groups Incorporation Act*
- Execution of Customary Land Dealing (lease from Landowners to the State)
- Issue of Special Agricultural Lease to ILG in accordance with the directions of Customary Land Dealing
- Sub-lease of Special Agricultural Lease from ILG to developer
- Registration of Sub-lease and Agreement by the Registrar of Titles

Result:

1. Lease from customary landowners to the State entered in the Department of Lands Register of Customary Land Dealings.
2. Incorporation of landowners as an ILG.
3. Special Agricultural and Business Lease, issued to the ILG, entered in the Register of State Leases.
4. Sub-lease of the Special Agricultural and Business Lease to the developer, with a signed agreement, is registered by the Registrar of Titles.

Note:

- No rent is paid by the State to the landowners on the Customary Land Dealings.
- No rent is paid by the ILG to the State, on the Special Agricultural and Business Lease.
- There is no dealing between the State and the developer, apart from payment of the normal fees for registration of the sub-lease and agreement.

3.2.1 Evolution of customary tenure and its implications for lease, lease-back

Customary land law is subject to an evolutionary process. It is an 'organic' law which develops and changes according to the wants and needs of those who are subject to it. A system that attempted to complement customary tenure but was rigid would be at risk from disputes. It is therefore important that the lease, lease-back instrument as it is applied to rural development should allow for changes to take place.

23. The processing of applications, preparation of documents and issuing of notices by the Secretary and Minister can become protracted if left to proceed at the Department's pace. There can be a backlog in the processing of applications in the relevant province. It is also necessary for the parties involved or their agents to make regular representations to the Department of Lands in Waigani to ensure that processing continues without undue delay.

Customary land law is part of everyday life and usually reflects land usage. Once law ceases to relate to the realities of usage and common practice, it ceases to have any relevance and is superseded by new law with more legitimacy. Most tribes, clans or customary groupings follow either a matrilineal or patrilineal system of inheritance; very few follow both. However, it is not uncommon to find exceptions to these rules. Papua New Guineans today are no longer content to be subsistence gardeners but strive to enter the cash economy through commercial agriculture. However, the gateway to the cash economy tends to be blocked by customary tenure. Land was used for subsistence by individual families under the authority of the group's hereditary land controller. To allow the commercial use of communal land or by all of the members of the group requires a considerable move away from custom.

The people of Papua New Guinea are now much more mobile than their ancestors. In the past, where a population lived under a system of patrilineal inheritance, it was accepted that married women would leave their villages to live on their husband's land, the children inheriting rights to their father's land. There are plenty of examples today, especially in patrilineal system villages located close to provincial headquarters or Government centres, where men from outside are living in the village of their wives. In many of these cases the children have been adopted into their mother's clan and have rights in their maternal grandfather's land. The children have become citizens of their mother's village with the usual rights and responsibilities.

Clan holdings of land are divided amongst lineages (similar to a corporate body), and when lineages die out the clan absorbs these lands. Individuals are born into a lineage and leave it on death. But the lineage can admit people, who share in the land during their time of membership, and exclude people.

The power to initiate changes in its own traditional rules of inheritance is recognised within the lease, lease-back procedure under the *Land Act*, and the *Land Groups Incorporation Act*. The latter recognises and uses traditional systems in a way that is familiar, understandable and acceptable to village people. The customary laws by which the group may have lived for centuries are examined in preparation of the constitution of the proposed land group. The people make modifications and develop new structures and organisations that are intelligible to them. Under the format of the standard constitution commonly adopted in the registration of customary groups, there is provision to amend the constitution and the rules relating to membership. The members of an ILG can, under its constitution, examine and, with consensus, change any of the customary rules governing the conduct of its affairs. At the very inception of any ILG, the traditional customs by which it abides become the subject of discussions amongst its members.

An application under the *Land Groups Incorporation Act* must be accompanied by the proposed constitution. A major decision in the construction of a land group's constitution is the qualification for membership. To reach agreement on

this requires the setting down of the customs under which membership is determined and the manner in which members are recognised. As with any other corporate body, the constitution must set down its powers, the manner in which the group will act, and how changes are to be made to its constitution. Customary rules incorporate flexibility in future tenure arrangements, and it is possible for them to be changed to suit current circumstances.

The use of the land has changed from subsistence hunting and gathering to commercial agriculture. The control of the use of the land has moved from the former customary land controller to the majority of the members of the incorporated land group, in accordance with the provisions of its constitution. The period over which these changes apply is as specified in the lease of the land to the State, but this period can be extended according to the wishes of the customary landowners at the time of expiry of the lease. The circumstances existing at the expiry of the Special Agricultural and Business Lease will determine whether the land reverts to customary tenure or remains under the *Land Registration Act* by renewal or extension of the lease. The flexibility of the lease, lease-back provisions of the *Land Act* allows the traditional landowners, or their successors at the expiry of the Special Agricultural and Business Lease, to re-examine the situation in accordance with the conditions of the day.

The options that will be open to the lessees at that time will include:

1. To continue registration of the land under the *Land Registration Act* by renewal of the Customary Land Dealing and the Special Agricultural and Business Lease and either:
 - renew the sub-lease to the same developer, or
 - negotiate a new sublease with an alternative developer, or
 - discontinue subleases and manage the land themselves, or:
2. To discontinue the Customary Land Dealing with the State and allow the land to revert to custom under the control of the land controller, if that system still exists.

“What will become of Papua New Guinea will not depend on its constitution, foreign aid, mineral fields, the role of the army, the honesty of its policemen or public servants, on the success (or otherwise) of its secessionist movements – in the end it will depend on whether or not they have the strength to live with (and not off) their land and to share it amongst themselves as they have in the past. If they can do this, the land and the people will survive. Otherwise the only question is who will be ruined first” (Sack, 1974:7).

3.2.2 Terms of oil palm lease, lease-back

The lease, lease-back provisions of the *Land Act*, used in conjunction with the *Land Groups Incorporation Act*, enable the traditional landowners to contribute equity in large-scale commercial agriculture projects with a

developer. If any such partnership or joint venture is to be successful, the terms of the agreement must be beneficial to the two parties. In the lease, lease-back agreements of the mini oil palm estates of New Britain Palm Oil Limited, the company gains free, unfettered access to the subject land for the term of the lease to construct roads, drains, and culverts and to plant oil palm in accordance with its code of practice to manage the crop and to harvest the fruit.

All costs involved in the incorporation of the land groups and registration and issue of the Special Agricultural and Business Lease are borne by the company. The rent offered by the company is K50.00 per hectare per year paid quarterly in advance, plus a royalty of ten per cent of the farm gate price of fruit harvested from the lease area, plus a share offer of 50 ordinary fully-paid shares per planted hectare. At the expiry of the term of the sub-lease, the land and improvements revert to customary tenure. Under the terms of the sub-lease agreement, the developer needs free and uninterrupted access to the land, in order to effect the development and management of the plantation and to harvest the fruit. The access to customary land under sub-leases allows the company to achieve economies of scale through the expansion of company plantings and increased productions and greater processing throughput.

There are other matters that should be considered that are not so easily written into agreements. To facilitate development there should be some landowner involvement in the development of the land, there should preferably be transfer of agricultural expertise and technology and the project should enable the creation of other business opportunities for landowners; for example, landowners being actively involved as workers or sub-contractors in company operations.

3.2.3 Lessons learnt

The ingredients for a successful application of the lease, lease-back instrument are detailed in the following case study.

The final registration of trans-Kulu River project land under the *Land Registration Act*, incorporation of the four landowner groups, and subsequent sub-leasing of the four portions to New Britain Palm Oil Limited, succeeded because of a number of different factors, as follows:

- (a) The subject land was river flats covered with secondary rain forest which was subject to annual inundation and used at infrequent intervals mainly for hunting and gathering.
- (b) The subject land was perfectly located on the other side of the Kulu River directly opposite the Company's Numundo Plantation Group, which facilitated development and management.
- (c) The customary landowner groups were generally in favour of the oil palm expansion project and had adequate additional land for subsistence gardening.

- (d) The West New Britain Provincial Government was a shareholder in New Britain Palm Oil Limited and unequivocally in favour of the proposed joint venture using customary land.
- (e) The terms of the lease agreement were extremely attractive to the landowning groups. They were not required to contribute financially or to provide labour for the development. They would receive rent, royalties and shares in the company in exchange for the contribution of rarely used land.
- (f) The company's use of the subject land would result in the upgrading to all-weather status of the access road to Garu village, guaranteeing the villagers permanent access to Kimbe town.
- (g) The provincial government set-up the Oil Palm Working Committee and appointed Mr. Lucas Waka as its chairman with two well-known senior provincial Government officers as his assistants. The skills of the chairman and his assistants in dispute resolution were crucial in surveying and subdivision of the subject land and the subsequent sub-leasing of the four blocks to the company.
- (h) The company cooperated with, and was proactive in its support of, the Oil Palm Working Committee.

In contrast to the above successful venture, the Ubae village project did not proceed to the incorporation of the landowner group or with application for lease, lease-back. The company had mistakenly assumed that the proposal had the full support of the villagers. The company was disadvantaged in its investigations, however, because the Oil Palm Working Committee had not yet been established by the provincial government.

3.3 The extent of lease, lease-back in the palm oil industry

New Britain Palm Oil, Higaturu Oil Palm and Milne Bay Estates are the three palm oil companies that have adopted the lease, lease-back instrument in expanding their oil palm operations. New Britain Palm Oil Limited plantations are located within the West New Britain Province in the Islands Region north of the mainland of Papua New Guinea. The company's plantations, oil mills, shipping, storage facilities and administrative headquarters are located in and around the Town of Kimbe, capital of the West New Britain Province, situated on the central north coast of the island of New Britain. The location of New Britain Palm Oil Limited's plantations in West New Britain are shown in Appendices 2 and 3.

Higaturu Oil Palm Limited's plantations are located in the Oro Province on the north east coast of the main island of Papua New Guinea. The company's mills, storage, shipping facilities and administration headquarters are situated around the town of Popondetta, capital of the Oro Province.

Milne Bay Estates' plantations are in Milne Bay on the easternmost tip of the main island of Papua New Guinea. The company's mills, storage, shipping facilities and administration headquarters are located around the town of Alotau, capital of the Milne Bay Province.

Higaturu Oil Palm in the Oro Province has bought six separate blocks of customary land under the *Land Registration Act* and incorporated the respective landowner groups under the *Land Groups Incorporation Act*. Another 2,800 hectares of customary land has been earmarked for lease, lease-back and is subject to negotiation between landowners and company.

Milne Bay Estates in Milne Bay Province, like New Britain Palm Oil Limited, has established its own lands section, anticipating the expansion of the planting of oil palm on customary land in partnership with the traditional landowners. It has 3,350 hectares in 13 separate portions sub-leased from ILGs. Thirty seven other portions of customary land totalling 1,620 hectares have already been surveyed and the registration and incorporation processes are in progress. Another 1,500 hectares of customary land has been identified and negotiations between the landowners and the company are underway. In both Oro and Milne Bay the size of the blocks offered to the companies for development are much smaller than in West New Britain, which has a less dense population.

Listed in Table 3.1 are the areas of State Leases of each company, the areas of registered customary land now under sub-lease, and the areas of lease, lease-back planned and under negotiation.

Lease, lease-back already constitutes 20 per cent of oil palm area of the three major companies and this proportion will increase under company plans due to the scarcity of state-owned land for lease.

Company	State lease, ha	Existing lease, lease-back, at 1 January 2001, ha	Planned lease, lease-back, at 1 January 2001, ha
New Britain Oil Palm	30,027	6,100	10,000
Higaturu Oil Palm	7,300	750	3,500
Milne Bay Estates	6,635	3,551	3,120
Total	43,962	10,401	16,620

3.4 Application of the lease, lease-back instrument to forestry

Reforestation is confined mainly to State land. The economics of reforestation on customary land would need to be assessed relative to other potential forms of land use before any recommendations could be made. The attitudes of the customary owners of logged areas would first need to be determined to establish whether they needed the logged land for subsistence gardening purposes, or if they were interested in developing the land themselves or were prepared to become involved in commercial joint ventures. Pacific Agribusiness (1987) stated that a survey of the forest industry was needed to determine company attitudes towards reforestation and joint ventures with traditional landowners.

A sub-lease of a registered Special Agricultural and Business Lease might provide an investor with sufficient security of tenure and access to make plantation forestry feasible. The sub-lease would involve the operator in the payment of rent. The amount of rent payable relative to the expected returns from, and costs of, growing and harvesting the timber, together with other considerations contained in the agreement, would determine the viability of the proposal. The landowners' main criterion would be the opportunity cost of putting land to plantation timber rather than to other uses.

Under Forest Management Agreements, Incorporated Land Groups (ILGs) may nominate and make available land to be developed as tree plantations. But outside such agreements, there does not seem to be any impediment to ILGs obtaining a lease over their logged land and sub-leasing it to a timber plantation developer.

The Open Bay Plantations of East New Britain and the Stettin Bay plantations of West New Britain, both of *Eucalyptus deglupta*, are each of 10,000 hectares. The Stettin Bay Lumber Company plantation is on State owned land along the main Bialla to Kimbe road between Mosa and Malalimi. The same company made a request to the West New Britain Provincial Government in 1998 to assist it in gaining access to 10,000 hectares of customary land on the south coast for reforestation purposes. The company's request was never granted and anecdotal evidence suggests that landowners were not interested in making their land available to a project that did not have a reasonably quick return. Where these alternatives are feasible, landowners are more likely to be in favour of the cultivation of coffee, cocoa, oil palm, sugar cane or other faster growing crops.

While the lease, lease-back instrument would appear to provide security to the company in terms of access to the timber resource, a risk that remains is one of fire, given the long-term nature of the crop and its combustibility. Moreover, securing the plantation against other damage may also be difficult in the Papua New Guinea context. There is also uncertainty with respect to the future price of timber that of necessity must be reflected in lease and royalty payments to landowners.

In Papua New Guinea society males are dominant and carry more weight than females in discussions over the use and occupation of communal land. The elders

normally have the most influence in matters concerning their land dealings. It is not surprising to find that this group is usually in favour of activities that generate quick returns and are not so supportive of activities that do not generate fast money. The following sentiment is common with respect to development proposals for customary land. “*I want money now, it’s no good to me after I’m dead.*”

In the case of the Jant Limited wood chipping operation in Madang, land is leased by the State from the traditional landowners, and Jant sub-leases the land from the State for an annual rental of K1 per hectare per annum. The cultivation of a quick growing species has shortened the time for return on landowner investment of land. The landowner is also paid a token rent of K1 per hectare per annum. The Jant system differs from the lease, lease-back system in that the State leases the land from the customary landowner and then issues a State lease directly to the developer. The developer pays rent to the state, which in turn pays rent to the appointed landowners’ agent. The company also pays the landowners a royalty of 2.5 per cent of the standing value of each tree harvested. The Jant system has been in place since the early 1970s and the company now holds a large number of such leases aimed at an operational target of around 10,000 hectares.

The development is covered by a permit issued under the Nara/Gogol Timber Rights Purchase Agreement. The numerous leases were negotiated by the State for terms of 30 years. The term of the leases was determined by the harvesting cycle of *Eucalyptus deglupta*, which is 15 years. Acacia species, mainly *Acacia mangium*, are now grown in a shorter rotation cycle of eight years, lessening the time for a return on investment. The timber is supplied to the Jant chipmill at Madang.

The land leases are due to expire in the next five years. Whether they will be renewed depends on the landowners’ choice of land use, for example, cattle may be an option. It is expected that the same system will be followed but it could be worthwhile for the company to consider a more direct dealing with the resource owner such as a lease, lease-back.

Box 3.3 The Jant Ltd lease

- Identification of the project land, survey of boundaries and preparation of survey plan
- Preparation of Land Investigation Report and Customary Land Dealing Examination by Department of Lands
- Execution of Customary Land Dealing (lease from Landowners to the State)
- Issue of State Lease to Jant Ltd

Net Result:

1. Lease from customary landowners to the State entered in the Department of Lands Register of Customary Land Dealings.
2. Issue of State Lease to Jant Ltd.

Note:

1. Jant Ltd pays the agreed rental to the State on the State Lease.
2. The State pays rental to the landowners’ agent.
3. Jant Ltd pays a stumpage royalty to the landowners’ agent on the harvested trees.

Gogol Reforestation Company Limited, a subsidiary of Jant, attends to reforestation of the operator's sub-leases. The State owns 49 per cent of the company and appoints two directors to the board. It has been the company's policy to involve the traditional landowners in its operation. Reforestation is sub-contracted to landowner companies. K40 per hectare is paid for hand maintenance for the period from planting up to year five, and K20 per hectare for minor maintenance from year six to harvest. Reforestation costs the company K1,000 per hectare plus maintenance and other surveillance costs such as fire watch.

Additionally, Jant Ltd. sponsors a landowner out-grower programme, similar to the out-grower systems in the sugar and oil palm industries. Under the aegis of the company, village committees identify and recommend suitable applicants to grow trees on their customary land. To be successful the applicant must meet certain company criteria, such as diligence and ability to work without supervision. Once selected, the outgrower is provided with seedlings and a small loan to cover the cost of tools and other inputs, the basic objective being to develop a fully planted area of eight hectares.

The out-grower plan is to plant and maintain one hectare per annum. In the ninth year, the first planted hectare of trees is felled and the outstanding loan is repaid to the company from grower revenue. The first hectare is then replanted and the process continues annually. The successful outgrower, or his successors, enjoy a continual annual income for as long as the cycle is followed.

However, there appear to be disadvantages in the Jant system compared with lease, lease-back:

- (a) there are two separate rent transactions: Jant to the State, then the State to the landowners' agent (this posed a problem in the early 1990s when the State failed to pay the rent to the landowners and Jant was forced to pay the rent twice – to both State, which defaulted, and to landowners).
- (b) Jant Ltd has to deal with two administrative units; the State as lessor for payment of annual rent, and landowners for payment of royalty.
- (c) the State must deal with large numbers of individual land owning families and in some cases it must negotiate separate leases with separate members of the same family.

3.5 Project negotiation

The type of project, its economic viability and its suitability for this system is a matter for consideration by the prospective developer. Once satisfied that the land is suitable in size, soil type, topography and climatic conditions for the proposed use, the next major step is to open negotiations with the traditional landowners and Government authorities. These initial discussions are critical and will have a great bearing on the acceptance of the proposal. It is necessary for the proponent to employ an experienced and skilful negotiator and many meetings are needed to explain the details of the proposal. It is essential that

landowners clearly understand both the terms and conditions of the project and the lease, lease-back concept.

3.5.1 Project agreement

The agreement proposed to cover the project must be comprehensive, clear, fair and be explicit that, upon expiry of the State Lease, the land and everything on it reverts to the customary owners. Thus the developer on the expiry of the lease must be prepared to pass the remaining improvements on the land over to the land group unless their recovery is set out in the terms of the agreement.

3.5.2 Costs and risks to developer

Neither the landowners nor the Government will have the finance needed to cover the costs involved in registration of the project land, incorporation of the landowners, or preparation of other studies needed by the state. The developer must be proactive and either cover the costs of the provincial and national Government officers in processing these matters or obtain permission from the Government to have the processing done by private non-government agents.

There is a certain risk in bearing the cost of registration of the project land, incorporation of the land groups and the studies required. The land group, once in possession of the State Lease and the necessary approvals, could decide to seek an increase in the rental and royalties, to alter the terms of the agreement, to deal with an alternative developer, or to opt to develop the land itself.

The developer has no legal right to set foot on the project land until the sub-lease is signed and endorsed on the State Lease by the Registrar of Titles.

3.5.3 Procedural obstacles

The lease, lease-back instrument is still complex and time consuming and made even more so by the lack of delegation from the Minister of Lands to the provincial governments. Whatever the procedural difficulties, the instrument of lease, lease-back appears to be the only vehicle that will deliver the partnerships that will enable conservation and development to evolve on a firm footing.

3.6 The lease, lease-back instrument and sustained yield forest management

This chapter has so far focused on the potential for lease, lease-back to facilitate plantation forestry in community-company partnerships, drawing on the experience of the oil palm industry. However, there may also be potential for the instrument to facilitate community-company partnerships in sustained yield natural forestry management. In the next section it is suggested that the Forest Authority withdraw from its role in mobilising the forest resources, allowing landowners to negotiate agreements directly with logging companies. If the logging company were to enter a lease, lease-back arrangement with the

landowners it would give the company the security to carry out plantation establishment after logging.

There has been criticism of the way that ILGs are mobilised under the present system, particularly that the forestry alternatives of small-scale harvesting or forestry conservation are not considered before the ILGs are bundled into a Forest Management Agreement prior to allocation to a permit holder. This report suggests the alternatives for forest use and conservation should be on an equal footing and that the lease, lease-back instrument could be an appropriate instrument through which an investor could enter a partnership that delivers the preferred alternative.

3.7 Conclusions

A reforestation levy account, imposed under the *Forestry Act*, has in it several million kina, but no spending came from it in 1998 and 1999 and none was planned in year 2000. It is clear from the foregoing that the existence of such a fund is unlikely to facilitate reforestation unless vital ingredients are present, such as clear land tenure, and clear timber use rights, together with demonstrable financial benefits to the parties involved.

The acceptability to landowners of partnerships or joint ventures on customary land for commercial agriculture, or any other business purpose, depend crucially upon the size of the benefits expected and the time lapse before the benefits accrue. Most citizens are familiar with the common cash crops of copra, cocoa, and coffee that provide a reasonably quick return on investment. Large-scale joint ventures on customary land involving these or other crops with similarly quick returns would be attractive to landowning groups. However, the returns to plantation forests may be too slow or too small to generate interest where these crops are possible. Transport is costly in Papua New Guinea and plantations are more likely to be economically successful in locations where timber can be readily exported or where it is in short supply.

The Jant Limited wood chipping operation in Madang demonstrates that returns can be sufficiently attractive to landowners to commit their land. The lease, lease-back arrangement would appear to be superior to the Jant mechanisms in that it would give the developer greater security and better facilitate business transactions with a large number of landowners.

The benefits of clear tenure and clear financial gains to both parties mean that the lease, lease-back instrument also has potential for facilitating partnerships in sustained yield forestry and forestry conservation.

As has been amply demonstrated, the procedural difficulties in lease, lease-back are not to be taken lightly. To successfully negotiate and conclude a lease, a developer (or conserver) would probably need the services of experienced consultants at added cost. However, such added costs may be outweighed by the benefits of long-term resource security and the ease of business conferred by lease, lease-back.

Economic benefits of forest certification

The purpose of this section is to explore the effectiveness and potential of certification in enhancing economic benefits and sustainability in forestry in Papua New Guinea. The certification scheme being adopted and promoted in Papua New Guinea, and which imposes strict rules concerning customary tenure, environmental impacts and management and monitoring, is that of the Forest Stewardship Council (FSC) (Forest Stewardship Council 1999). But only a handful of eco-forestry operations are currently certified. The reasons for this are mainly economic. The benefits of certification are limited, and its costs place an additional financial burden on the agencies already subsidising the groups. In this section the term 'eco-forestry' includes those community groups using portable sawmills that are formed and operate under the aegis of NGOs that train the community groups in ecologically sustainable timber harvesting methods, or that are certified or are working towards certification under the guidance of the European Union project. An example of how eco-forestry is conducted is provided by the Village Development Trust. This NGO applies the principles and practices of its detailed *Training and Reference Manual* (Village Development Trust, undated) to its community groups. However, the costs and benefits of eco-forestry quantified and analysed in this section relate specifically to the costs and benefits of FSC certified operations.

The first section briefly examines the cost of certification and of the process of bringing community groups to a level where certification can be conferred. The second section attempts to quantify the financial and economic benefits of small-scale certified forestry and its prospects, and also compares it with direct subsidisation as a natural forest conservation instrument.

Before discussing financial and economic analyses, it is useful to briefly review the impact of land and forest tenure on small business in Papua New Guinea and also how tenure makes community or group forestry necessary. Box 4.1 serves to do this.

According to NGOs, there are about 100 groups in the country that aspire to become eco-forestry operations. These groups are all subsidised by NGOs or by an EU project – the Islands Region Environmental and Community Development Programme (IRECDP) – in setting up and maintaining their ecologically sustainable forestry operations. However, not all the NGOs, at this stage, are attempting to certify their groups because of the stringent demands of



Box 4.1 The organisation of eco-forestry groups

It is instructive to begin an analysis of the organisation of eco-forestry groups by acknowledging the fundamental influence of customary land tenure on organisation and business in Papua New Guinea, and indeed throughout the Pacific. The organisation of eco-forestry groups must recognise that the whole clan has rights to the forest resource.

The successful organisation of operations, management and distribution of proceeds becomes more difficult the greater the number of clans involved in a group. Several clans may need to join in order to make up a resource base sufficiently large to support eco-forestry. It would appear that the simplification of organisation by forming the group from a single clan, if possible, is to be recommended.

A formal organisation, recognised by law, is preferable to informal group formation, however democratic. The training and assistance afforded by sponsors in setting up the operational and business groups, is probably an essential component of successful organisation.

Source: Hunt (2000e)

the process and the consequent higher costs, coupled with uncertain rewards. The EU eco-forestry operation in Papua New Guinea is much better funded than the NGOs and is able to both bring groups to the stage of FSC certification and subsidise their certification costs. Its operations are outlined below in Box 4.2.

Box 4.2 The EU's project

The IRECDP programme, an initiative of the Papua New Guinea Government and funded by the European Union, has as its main objective the promotion of income earning possibilities compatible with sustainable use of the country's forests. The primary focus of the programme has been to assist the formation and management of small-scale, community or village-based, timber production organisations – so-called 'eco-forestry'. It sponsors about 40 projects in six provinces that have under their jurisdiction 140,000 hectares of primary tropical forest.

The project itself received Forest Stewardship Council certification – a 'group certificate' – in October 1998 under the Qualifor Programme. The project has conferred certification on three village-based groups. Five more groups are expected to be certified before the end of 2000.

All forty groups market their timber through two project timber yards in two central locations. The project may subsidise transport to the yard from which domestic and international sales are organised on behalf of the producing groups.

A second five-year phase of the project is about to begin, under which central marketing will be developed. The role of the project in group certification, however, will gradually be subsumed by an independent national organisation.

Source: Dam (2000)

The village-based eco-forestry groups themselves do not possess the expertise or the resources to adopt eco-forestry or to achieve certification autonomously. The agencies (NGOs and the EU) do not promote their services but act upon expressions of interest from the clan-based landowner groups to engage in eco-forestry. The landowners have jurisdiction over their land and forest resources and are free to commit them to eco-forestry, unless they have already entered into a Forest Management Agreement under the auspices of the Papua New Guinea Forest Authority committing their resources to logging.

The agencies employ trained foresters and community workers who engage in intensive dialogue and training programmes with village groups, not only in saw operation and maintenance but also, for example, in the principles of forestry management and book-keeping. The costs that sponsors incur in organising, managing, training and equipping the community groups are substantial.

The salaries, wages and transport costs of the foresters are substantial. After the group has expressed interest to an agency, an agency forester begins negotiations at the village level which, if successful, lead to a formal forest survey and land use plan, training, saw mill trials and planning for harvesting and marketing. The large number of visits necessary by foresters means that salaries and transport are major components of the costs of setting up groups. The steps and their costs are detailed in Salafsky (1997; Figure 1:14; Table 1:15). The other major component is the cost of equipment. A saw and a winch are loaned to the group for a year in the setting up stage. The equipment cost in this study is based on straight line depreciation over ten years on a new cost of plant of US\$ 20,400, plus interest of US\$ 1,530²⁴. To this must be added the cost to the supporting agency of fuel, oil and repairs and parts, assessed at US\$ 1,740 for a full year; making a total of US\$ 5,310 for equipment. Table 4.1 details the cost of the 12 steps incurred by the EU in bringing a group to an operational level ready for certification application.

Salaries and wages	Transport	Equipment	Other
5,000	2,400	5,310	800

Source: Chatterton *et al.*, (2000, Table 13:54).

Group certification is available to reduce the costs per eco-forestry operation (see Table 4.2). In this case an agency bears the group certification costs that can be spread among the operations under its aegis. In a group of ten certified operations, each operation would incur a certification cost of US\$ 756.

24. US\$1.00 =K2.5

Table 4.2 Cost to a single eco-forestry operation of group certificates, US\$

Number of groups certified	5	10	30
Annual certification cost per group	1080	756	319

Source: Chatterton *et al.* (2000, Table 13:54).

One reason why there are not more certified groups operating – despite the fact that certification costs are only some four per cent of the group’s total operating costs – is the difficulty in securing a satisfactory premium for certified timber in the market. Certification seems to improve market access, rather than price. Unless groups can achieve a premium of at least US\$ 5/m³ of sawn timber produced (US\$ 756/150m³) the cost is greater than the benefit. But only about half the production of groups (75m³) is of exportable hardwood species that could receive a premium for certification, so that the premium on all exports must be at least US\$ 10/m³ to warrant the cost. This is only the direct cost of certification.

In addition, there are substantial indirect costs also borne each year by the subsidising agency in preparing the groups for certification – the so-called ‘Step 12’. The cost of this is constant per group and has been estimated in Chatterton *et al.* (2000, Table 14:55) to total US\$ 2,800 in years 2 and 3 and US\$ 1,400 in every year thereafter. These indirect costs are US\$ 37/m³ in years 2 and 3, and US\$ 19/m³ thereafter for exportable timber. The total cost of certification, direct and indirect, for exportable timber in years 2 and 3 is thus US\$ 47/m³ (US\$ 10 + US\$ 37). However, given that market premiums for certified timber are generally absent there is little incentive for the NGOs, which are not as well funded as the EU, to outlay these certification expenditures. Thornber (1999) investigated why a community group, under the aegis of the Pacific Heritage Foundation in East New Britain, abandoned certification. Her main conclusion was the lack of tangible benefits of certification in the face of substantial costs.

The need for a substantial market premium to drive certification highlights the importance of enhanced consumer awareness and market promotion in Australia, a major potential market for Papua New Guinean certified timber. Box 4.3 explains in more detail some of the characteristics of the marketing of Papua New Guinean certified timber.

The subsidies, all in the form of costs of set-up and operations met by the agency rather than by the eco-forestry group, are summarised as follows:

- The cost of marketing sawn timber (where the agency meets the cost of transport and selling the timber) of US\$ 40/m³,
- The cost of the 12 steps prior to certification of US\$ 13,510,
- The cost of step 12 to maintain certification: US\$ 2,800 in the first two years and US\$ 1,400 in subsequent years,
- The cost of certification of US\$ 756 every year. (In this case it is assumed that the operation comes under a group certification scheme with ten members).

The present value of the subsidy, at a discount rate of eight per cent, is US\$ 29,000.

Box 4.3 Marketing eco-timber in Papua New Guinea

Small sawmills have a comparative advantage in meeting local needs for building timbers because freight rates for timber are high. Export markets for PNG products are becoming attractive because of the devaluation of the kina. However, high freight rates work against groups attempting to sell in markets some distance away. The market information required to enter such markets directly is usually inaccessible to eco-forestry groups. Subsidised market intermediaries are required to service small groups in remote locations where merchants are absent. There is currently no centralised body collecting data on the production and marketing of timber from community groups. The sponsors presently act as marketing intermediaries, performing the function of bringing together timber demand and supply and negotiating a price. Compared to set-up and certification of eco-forestry there is no justification for the continuation of heavy subsidisation where markets are available. While marketing requires a high level of business and entrepreneurial skill, particularly as it relates to the export market, subsidies currently mask the marketing efficiency of operations. It is in remote locations where further investment in marketing facilities for eco-forestry products would seem to have the greatest social, if not the greatest economic, benefits. Clearly, research is needed on the marketing models – central or regional – that show promise of being commercially viable, while still providing the support that some eco-forestry producers will continue to depend upon. In doing this, it is important to differentiate between the two very different functions of marketing and forestry certification support.

Source: Hunt (2000c)

4.1 The profitability of certified eco-forestry

The importance of adequate incentives for conservation at the grassroots level has been stressed (Western, 1999; Pearce, 1999). This is nowhere more important than in the Pacific region in general and in Papua New Guinea in particular, where customary land tenure is strong and where the customary landowners make the decisions concerning land use.

The following sections concerning the benefits of eco-forestry are based on the detailed financial and economic modelling reported in Hunt (forthcoming). Three issues are addressed. First, the financial viability of community eco-forestry groups; second, the opportunity cost to Government of eco-forestry, and third; the economic returns of eco-forestry and direct conservation, taking account of non-market benefits and costs.

The data for the model – capital and operating costs together with sawn timber yields and returns – was derived mainly from the financial records of eco-forestry operations kept by the EU. According to EU data, the average production of 150 m³ of timber is typical and well within the capacity of groups using a Lewis Saw or a Lucas Mill, the types of portable sawmills commonly used. Based on detailed marketing records, the sawn timber

produced is priced at an average of US\$ 132 per m³, reflecting the fact that only half the sawn timber produced is from tree species with intrinsic export quality – receiving a small US\$ certification premium – the rest being sold on local markets. Given the uncertainty surrounding future supply and demand for timber (large volumes of softwoods are coming on to the market in Australia, Chile and New Zealand) the timber price both for sawn timber and for logs is kept constant over the 50-year period of the model.

While logging proceeds themselves are relatively certain, the ability of the community to translate these benefits into a continuous income stream (especially where it is not possible to invest in high-paying agricultural crops) is very uncertain. Given limited investment opportunities it is more likely that only a proportion of the logging proceeds would be invested and at a lower rate, making eco-forestry relatively more attractive.

To address the issue of the size of the financial benefits a basic cash flow model of a group is constructed. See (1).

$$CB_n = (tp_n * tq_n) - (cv_n + cf_n + cc_n) \quad (1)$$

Where: CB_n = net cash benefit of eco-forestry operation in year n, US\$

tp_n = timber price per m³ in year n, US\$

tq_n = timber quantity sold, m³ in year n, US\$

cv_n = variable costs in year n, US\$

cf_n = fixed costs in year n, US\$

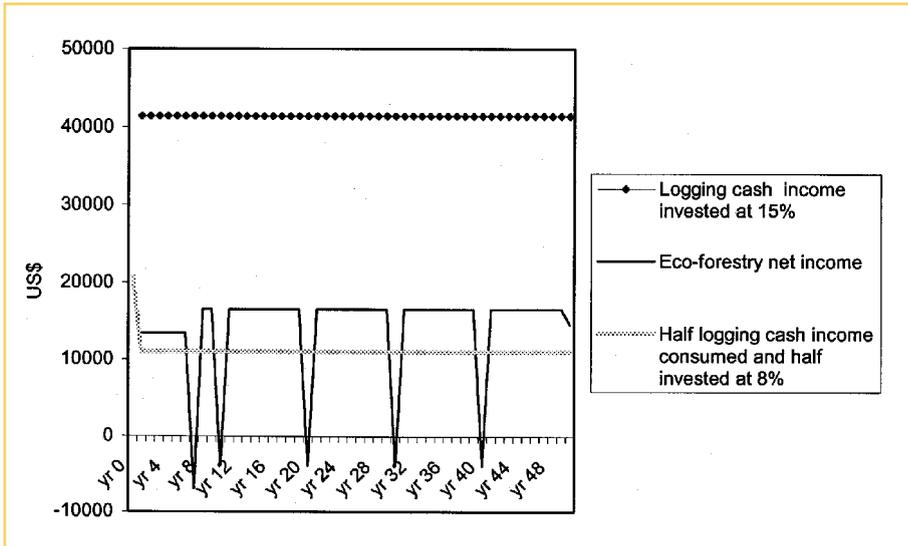
cc_n = capital costs in year n, US\$

n = number of years 0-50.

Results of cash flow analysis show that an eco-forestry group that is subsidised in setting up and certification, and which takes out a loan (at 15 per cent interest) to purchase US\$ 20,400 worth of capital equipment, is able to pay back the loan from savings in year 4 of operation. After year 4, the model generates an annual cash surplus of over US\$ 14,000 for saving or consumption and is able to replace equipment from savings in year 7 (by contrast, an unsubsidised group has difficulty paying off its loan, see the Appendix spreadsheets for subsidised and unsubsidised eco-forestry). While US\$ 14,000 may seem a small sum to be earned by the group, it would nevertheless provide a significant incentive to subsistence communities where development options are minimal and where cash as a consequence is at a premium to meet community obligations or to pay school fees – the case in many regions of Papua New Guinea.

The cash flow consequences of the choices faced by communities of whether to adopt logging or eco-forestry is highlighted in Figure 4.1.

Figure 4.1 Cash flows over 50 years generated by logging and by eco-forestry



The level of average cash flow generated by the investment of all the proceeds of logging, US\$ 276,000, at 15 per cent, is superior to the net cash flow generated by eco-forestry. The consumption of half of the logging proceeds at eight per cent interest gives an annual return profile similar to that of eco-forestry (the dips in the cash flow of eco-forestry in the figure are caused by investment in new plant every ten years).

Industrial logging by private logging companies is one of the major resource industries in Papua New Guinea, generating annually some two million m³ of raw logs for export, from about 100,000 hectares of forest. The total FOB value of export logs in 1999 was US\$ 152 million (SGS, 2000:1). While in recent years Government regulations have been promulgated to internalise environmental damage resulting from logging, in practice much of the forest is destroyed in the process of extraction (AusAID, 1997; Erskine, 1998). It is therefore of interest to attempt to make financial and economic comparisons of certified eco-forestry and logging. The comparisons are facilitated by comparing the net present benefits, first, to the landowners and, second, on a global basis.

In the analysis, the comparison of the benefits of logging versus eco-forestry is facilitated by comparing the annuity on logging income invested with the annual eco-forestry income as in (2) and (3).

$$NPVEF = \sum_{n=0}^{50} CB_n / (1+r)^n \quad (2)$$

Where: $NPVEF$ = net present value of eco-forestry operation, US\$
 CB_n = net cash benefit in year n, US\$
 r = discount rate.

50

$$NPVLO = \sum_{n=0}^{\infty} \frac{AL_n}{(1+r)^n} \quad (3)$$

Where: NPVLO = net present value of logging, US\$

AL_n = annuity, from investment of logging proceeds in year 1, US\$.

i = investment rate

r = discount rate.

In the case of industrial logging, forest concessions are harvested on a 35-year cutting cycle under Government timber permits. Logging concessions are by necessity several hundred thousand hectares in size. Forest Management Agreements enable the bundling of customary timber rights together by the Papua New Guinea Forest Authority (PNGFA) and their transfer to logging companies under permit. To measure the benefits of industrial logging as opposed to eco-forestry it is assumed that the 1,000 hectares forms part of a concession logged in year 1. Year 1999 average log prices (US\$ 76.00) and royalty payments (US\$ 9.20) (SGS, 2000: 1) are inserted in the model and the average yield assumed is 30 m³ of logs per hectare. The adoption of a discount rate (r) of 15 per cent reflects the private time preference in Papua New Guinea that is influenced by the unstable political and economic climate, as described in the Introduction. A discount rate of eight per cent, that may reflect the private time preference in a future more stable economic climate, is also adopted to make the financial comparison. In the model, two levels of investment of logging proceeds are also tested – all the proceeds (US\$ 276,000) and half the proceeds (US\$ 138,000), and at two different investment rates – eight per cent and 15 per cent. Market interest rates are high, reflecting the high rates on treasury bills which are a consequence of the government's monetary policy (a discussion of interest rates can be found in the Introduction). However, opportunities for investment by landowners at the higher rate may be limited because of their remoteness and poorly developed financial and share markets in the country.

The results of financial analysis of community forestry, and the comparison with logging, are shown in Table 4.3. Subsidised eco-forestry generates positive NPVs at both discount rates. The profitability of unsubsidised community forestry is also assessed. Here there is no subsidy for certification and the cost of marketing and of set-up and certification, as detailed above, are added to the variable and fixed costs in (1). Table 4.3 shows that the benefits per hectare are still positive but substantially less than in the case of a subsidised operation.

The results suggest that subsidised eco-forestry generates per hectare benefits inferior to logging where all the proceeds of logging are invested, but comparable with logging where only half the logging proceeds are invested.

Table 4.3 Financial benefits to community of 1,000 hectares of forest

Alternative	NPV US\$/ha (discount rate 0.08)	NPV US\$/ha (discount rate 0.15)
1. Unsubsidised eco-forestry	33	7
2. Subsidised eco-forestry	146	72
3. Subsidised eco-forestry paying log tax	65	33
4. Logging:		
4.1 Half proceeds invested @ 8%	135	74
4.2 All proceeds invested @ 15%	270	147
5. Oil palm	941	464

As can be expected from the earlier examination of the cash flow profiles, the investment of all logging proceeds at 15 per cent is far superior, in terms of NPV, than that of subsidised eco-forestry. However, the NPV of the more realistic scenario where only half the proceeds of logging are invested at the lower level of eight per cent is comparable with that of eco-forestry. However, when the eco-forestry group pays a log tax equivalent to log export tax, NPV is more than halved and the eco-forestry does not compare favourably with logging.

The oil palm returns are derived from a model of 1,000 hectares under oil palm in a lease, lease-back arrangement (Hunt and Gumoi, 1999). Landowner income from oil palm is comprised of a royalty commencing in the fourth year after planting, and rising to a maximum of US\$ 100 per hectare in year 10, a land rent from year 1 of US\$ 20 per hectare, plus shares in the oil palm company in year 1 worth US\$ 60 per hectare. The model assumes a fallow period for the last ten years of the 50-year period because it is uncertain whether oil palm would be planted for a third cycle after the first two cycles of 20 years each. Where oil palm follows logging, the NPV is that of logging income invested, plus the NPV of oil palm.

4.2 Financial implications of eco-forestry for the State

A characteristic of weak states is the ineffectiveness of income tax collection, and Papua New Guinea is no exception (R. Rudy, Internal Revenue Commission, personal communication, 1999). It is likely that community groups pay very little income or company tax on their eco-forestry operations; nor do they pay any log tax – this being raised only on raw log exports by industrial loggers. Export log tax is high, at a third of the FOB value of logs exported and has contributed up to ten per cent of total export revenues of the country over the last decade (Hunt, 1998: Figure 4.2: 98). At the average 1999 log tax of US\$ 20.3 per m³ (SGS, 2000:1) and a per hectare yield of 30m³, the consolidated revenue foregone by Government resulting from 1,000 hectares being committed

to eco-forestry is US\$ 0.61 million. The total area committed to eco-forestry groups in Papua New Guinea is approximately 100,000 hectares, suggesting that the opportunity cost is in the region of US\$ 610 million. It is uncertain, however, just when these areas would be committed to logging – if they were not conserved under eco-forestry.

This opportunity cost is one explanation why eco-forestry is ignored in Government forestry policy. Instead, policy focuses on the formation of Forest Management Agreements that commit the forest resources of landowners and enable the Government to issue long-term timber permits that result in the generation of export tax revenue.

Having examined the financial consequences of eco-forestry for landowner groups and for the government, we analyse the total benefits of community forestry. These overall benefits are of prime concern to the donor countries that subsidise eco-forestry because subsidies reflect the willingness to pay of their citizens for conservation (Kramer *et al.*, 1995). In contrast to the financial benefits captured by communities through subsidisation, the benefits to NGOs and donors are largely non-market, and they may be global, such as through climate regulation and biodiversity conservation, or local, through the delivery of education and training.

Besides the relative financial benefits of eco-forestry and logging, there are other contrasting non-cash benefits and costs. Table 4.4 compares and contrasts the two systems from a local and a national point of view.

4.3 Economic benefits of certified eco-forestry

Economic modelling attempts to bring together all local and global benefits and, in so doing, attempts to highlight some of the significant environmental benefits that are generated where eco-forestry replaces export logging. A large proportion of environmental and other benefits are non-market, their shadow prices being derived as described below.

Economic costs include the opportunity costs of eco-forestry or the benefits foregone of engaging in eco-forestry instead of some other activity. The environmental benefits of eco-forestry accrue, typically, from the long-term conservation of 1,000 hectares of forest under an ecologically sustainable 50-year cutting cycle.

The set-up and certification expenses associated with eco-forestry are the costs of internalising a large proportion of the external environmental costs evident with industrial logging. While, in theory, industrial logging – under the timber permits associated with Forest Management Agreements – internalises environmental costs through the adoption of a logging code of practice and sustainable yield harvesting, in practice there is poor

Eco-forestry	Logging
Benefits are long-term but may be sporadic	A portion of income is in a lump sum
Production of timber is sustainable	Capital generated for business
Forest is intact for future generations	Damage to local environment may be considerable, depending on the adherence to code of practice
Landowners receive training from sponsors	Damage to global environment through loss of carbon and possibly biodiversity
Minimal tax contribution	Clearing facilitates commercial agriculture
Community employment generated	Training benefits to landowners if employed on roading and infrastructure development
Community acquires business experience	Substantial tax generated
Group requires start up equity of K30,000	Foreign exchange generated
Not possible without subsidisation through sponsor	Jobs generated by logging, roading and infrastructure development and monitoring

enforcement of regulations. Moreover, there will always be some costs that cannot be internalised due to the unavoidably destructive nature of logging with heavy equipment.

The net ecological and environmental benefits of eco-forestry, where it substitutes for industrial logging, will vary from site to site. They will include the retention of the non-market values attached to flora and fauna, and the non-market values of subsistence through hunting and gathering. They could also include the non-market, off-site values associated with watershed protection, such as stream flow maintenance and prevention of river and inshore siltation. In addition, the option values, i.e. the values that could accrue over time to scarce forest resources – through, for example, the increased value of gene pools, tourism, educational services or pharmaceutical uses – are enhanced by eco-forestry as opposed to industrial logging. The positive contribution of tropical rainforest conservation to climate regulation is also a significant benefit and this will be dealt with in detail first.

The first step taken is to model the damage costs of carbon released to the atmosphere as a result of logging but largely avoided under eco-forestry. The lowland tropical forests of Papua New Guinea are subject to disturbances such as cyclones or volcanic eruptions (Lamb, 1990). This suggests that, typically, forests lie between 'closed primary' and 'closed secondary' forests and contain on average 238 tonnes of carbon per hectare (Pearce and Moran, 1994:41). Pearce and Moran (1994:41) suggest losses in the order of 100 to 120 tonnes of carbon per hectare due to deforestation (an unknown proportion of the carbon in logs exported may be sequestered, for example, in buildings). The major carbon loss in Papua New Guinea commences at the time of logging as a result of the death of many non-harvested trees and the radical disturbance of the forest floor (Erskine, 1998; Lamb 1990:). There is no published data available for Papua New Guinea on the proportion of carbon lost due to logging. However, the modelled levels of carbon release caused by logging are considered to be realistic by a forestry expert who is also a former Director of the Papua New Guinea Forest Research Institute (G. Stocker, personal communication, 2000). These are (i) half the original carbon content of the natural forest i.e. 119 tonnes per hectare in the year of logging, and (ii) a quarter of the original carbon content i.e. 59.5 tonnes per hectare.

The sequestration of carbon by the forest after logging will depend on the rate of forest regeneration. The regeneration time of 50 years is considered to be a reasonable assumption (G. Stocker, personal communication, 2000), although regeneration may take up to 200 years (Lamb, 1990). The regeneration rate, in terms of the carbon fixed, is constant at one fiftieth of the original loss. In setting the marginal damage cost of carbon released to the atmosphere, the model adopts Fankhauser's (1995: Table 4.2: 64) central estimates of the once and for all costs per tonne. These are: US\$ 20.3 in year 1991 to 2000 (yr 1 and yr 2 in the model), rising to US\$ 22.8 in 2010 (yr 3 to yr 12 in the model) and US\$ 25.3 to year 2050 (yr 13 to yr 50 in the model).

The net present value of the damage cost of carbon release from logging 1,000 hectares and avoided by eco-forestry is represented in (4).

$$NPVCC = (t_1 * c_1 * 1000) - \sum_{n=1}^{50} \{ \hat{A} (t_1 * c_n * 1000 / 50) / (1+r)^n \} \quad (4)$$

Where: *NPVCC* = net present value of damage cost of carbon resulting from logging, US\$

*t*₁ = tonnes of carbon released from 1 hectare in year 1

*c*₁ = damage cost of one tonne of carbon released in year 1, US\$

*c*_{*n*} = damage cost of 1 tonne of carbon released in year *n*, US\$

n = number of years after logging

1,000 = area logged, hectares

50 = number of years to forest regeneration

r = discount rate.

We now consider the estimation of other ecological and environmental costs avoided by eco-forestry and incurred by industrial logging. Because of the lack of specific values generated by ecosystem services as they apply to Papua New Guinea, we rely on a review by Pearce *et al* (1999), who classify non-timber economic values as 'extractive', 'non-extractive' and 'preservation'. In Papua New Guinea the natural forests are sources of animal proteins, fruits, nuts, building materials and firewood. In the absence of detailed estimates for Papua New Guinea, however, the average estimate suggested by Pearce *et al* (1999:41) of US\$ 50 per hectare per year is adopted. The non-extractive values are mainly in watershed protection and carbon, the latter having been estimated above. Pearce *et al* (1999: 42) suggest the value of watershed functions cluster round US\$ 30 per hectare per year. While the population density in Papua New Guinea's forests is low relative to that in other tropical countries, there is nevertheless a dependency on hunting and gathering from both forests and waterways; in these circumstances the watershed values may not be overstated. Lastly, non-use values for the large and remote tropical lowland forests of Papua New Guinea are based on the low end of results from willingness to pay surveys and are set at US\$ 4 per hectare per year (Pearce *et al*, 1999: 44). The total of these values is US\$ 84 per hectare per year.

In contrast to industrial logging, as practised in Papua New Guinea, eco-forestry extracts only a small proportion of gross timber volume and with only minor disturbance. The scale of the difference is illustrated by the comparison between logging that removes 30,000m³ of logs from 1,000 hectares and incurs significant collateral damage, and eco-forestry that carefully removes only 375m³ of logs per year from the same area. Other factors tend to minimise the ecological impact of eco-forestry, particularly the fact that trees are not selected by species for cutting but by the criterion that they are in excess of 50cm in diameter at breast height – thus ensuring that the species composition of the forest is little affected. Trees are felled into open space to minimise collateral damage. Moreover, trees of ecological or economic significance, for example trees favoured by flying foxes, are marked as 'custom' trees and are retained. The disturbance to the forest and forest floor is also minimised by the practice of moving the mobile saw to the selected tree and then carrying the sawn timber out, rather than towing the whole log through the forest. The resulting sawdust is dispersed to minimise its impact on the forest floor.

As in the case of carbon loss, forest regeneration will compensate for ecosystem loss over time. However, unlike carbon loss, that incurs a once and for all cost, the environmental losses are continual, but gradually diminish as the forest regenerates. The regeneration is accompanied by changes in species composition (Saulei *et al*, 1999) and some ecosystem services are therefore likely to be permanently impaired. Such losses are ignored in the model, however, and full regeneration of ecosystems takes place in 50 years (see (5)).

$$NPVCE = \sum_{n=1}^{\infty} \frac{\{e_1 - (e_1 * n/50)\} * 1000}{(1+r)^n} \quad (5)$$

Where $NPVCE$ = NPV of loss of environmental services resulting from logging, US\$.

e_1 = environmental cost of logging in year 1

n = number of years after logging

1,000 = area of forest, ha

50 = regeneration time, years

r = discount rate.

In continuing to model the overall economic benefits of eco-forestry, it is also necessary to take account of the significant opportunity cost of export logging. The direct opportunity cost to the Papua New Guinea economy of 1,000 hectares of forest conserved, rather than logged, is the FOB value of logs: US\$ 76.00 per m³ average in 1999 (SGS, 2000:1).

In the financial analysis of community forestry above, labour was not included as a cost because the community both pays and receives wages. In the economic analysis, on the other hand, the opportunity cost of labour is included at a level equal to the wage cost of eco-forestry. A high labour input is in practice demanded by subsistence farming and social obligations. Typically, the labour force of an eco-forestry operation rotates reducing the opportunity cost at the margin. Thornber (1999) found that villagers were reluctant to work on the portable sawmills because returns in other enterprises were greater.

Another significant adjustment made to the financial model of eco-forestry, in order to derive economic benefits, is the inclusion of the cost of the subsidy to communities. Subsidies are mainly for set-up, certification and marketing, as described above.

The log export tax does not apply to domestic processors, and the economic model does not allow for an implicit subsidy of US\$ 20/m³ of log consumed to the group consuming 375 m³ of logs. However, the tax is included in the opportunity cost of logging, tax simply being a redistributive mechanism applied to the FOB price, already fully accounted for in total log income.

- To recap, the model of eco-forestry is adjusted to include:
- eco-forestry subsidies as costs,
- the opportunity cost of labour,
- the benefits of prevention of environmental damage by eco-forestry,
- the opportunity costs of logging.

The benefits resulting from the reduction in damage costs are overwhelmingly public: the social time preference dictates that a discount rate of three per cent should be tested along with a discount rate of eight per cent; the latter rate

being commonly adopted in deriving the NPV of environmental benefits (Pearce *et al*, 1999).

The economic model of eco-forestry operating on 1,000 hectares of forest is represented in (6).

$$NPVEB = \sum_{n=0}^{50} (CB_n - SE_n - LO_n + CC_n + CE_n) / (1+r)^n \quad (6)$$

Where: *NPVEB*= Net present value of the economic benefits of 1,000 hectares of eco-forestry, US\$

CB_n= net cash benefit of eco-forestry operation in year n, US\$

SE_n= subsidy to eco-forestry operation in year n, US\$

LO_n= logging income foregone in year n, US\$

CC_n = damage cost of carbon avoided in year n, US\$

CE_n = environmental cost avoided in year n, US\$

r = discount rate.

In the economic analysis, the flows of costs and benefits of eco-forestry itself become relatively insignificant. By far the largest benefit is that of environmental services, and by far the largest cost is the direct opportunity cost to the nation of export logging. Table 4.5, row 1, summarises the economic results, on a per hectares of forest basis, at two discount rates and two levels of avoidance of carbon release. The Appendix spreadsheets detail the 50-year flows of economic benefits and costs of subsidised eco-forestry.

The economic benefits of subsidised eco-forestry are positive when the discount rate is eight per cent but negative at the three per cent rate. The lower discount rate allows the future stream of negative values of carbon uptake by the regenerating forest to be more strongly represented in present value, thus producing a negative result. Table 4.5 shows that when the amount of carbon release prevented by eco-forestry is reduced in the model to 25 per cent of the original level, the benefits of eco-forestry are negative at both discount rates. This result highlights the importance of obtaining reliable measurements of carbon levels in forests and the level of release occasioned by forestry operations. This data will not only facilitate economic modelling but will provide an essential input for carbon offset calculations.

As discussed earlier, the level of the value of environmental benefits adopted in modelling eco-forestry – and which along with carbon values dominate – are sourced from international research and in deriving the results discussed above these values have been held constant. However, if the value of the stream of environmental benefits is halved from US\$ 85.00 per hectare to US\$ 42.50 per hectare, then value of eco-forestry is negative under all assumptions. This result once again draws attention to the need for in-country research on the non-timber values of natural forests.

Having developed an economic model and undertaken an analysis of conservation benefits, we now address the important issue of how best to subsidise forest conservation.

Table 4.5 Economic returns to eco-forestry and direct conservation of 1,000 hectares of forest

Alternative	NPV US\$/ha (discount rate 0.03)	NPV US\$/ha (discount rate 0.08)
1. Subsidised eco-forestry replaces logging:		
1.1 Loss of 50% of carbon prevented by eco-forestry	-164	270
1.2 Loss of 25% of carbon prevented by eco-forestry	-624	-459
1.3 as 1.1 but environmental benefits halved	842	-96
2. Subsidised direct forest conservation replaces eco-forestry:		
2.1 Loss of 50% of carbon prevented by conservation	-195	235
2.2 Loss of 25% of carbon prevented by conservation	-615	-486

4.4 Conservation benefits: certified eco-forestry compared with directly subsidised forest conservation

The question is whether sponsors would achieve higher returns by subsidising forest conservation directly, or indirectly through certified eco-forestry.

The costs of subsidising eco-forestry are not insignificant, as has been shown. Nor are the costs of direct conservation. If the lease, lease-back model is adopted in combination with ILGs, then the process is as described in the previous section. In fact, the costs of setting up and monitoring the directly subsidised groups would probably be similar to the costs associated with setting up and monitoring certified eco-forestry groups – this entails discussions between the sponsor and clan representatives on arrangements for setting up the conservation area, followed by annual physical inspections – and in the model this is the assumption. The direct subsidy paid to a forestry conservation group is set equal to the income generated by subsidised eco-forestry.

The results are summarised in row 2 of Table 4.5, and show that direct subsidisation generates an economic return on investment slightly inferior to eco-forestry but still positive at eight per cent discount if it is assumed that

carbon loss at the higher level is prevented. However, this alternative requires a subsidy four times greater than the subsidy necessary for eco-forestry.

The flows of benefits and costs over 50 years in the direct subsidy model are shown in Appendix 11.

4.5 Certification of large scale private harvesters: the great debate

It was mentioned above that if the environmental damage of industrial logging can be reduced substantially then the net benefits of eco-forestry become doubtful. But what are the prospects for certification being adopted by logging companies in the East Asia Pacific region? Certification is most common among industrial operations that exploit northern hemisphere temperate forests. The larger the company the easier certification is to attain. However, it is ironical that the certification of operations in natural tropical forest, where it is most needed, is proceeding at a snail's pace: "*forests in the North, often industrial plantations, are certified and drive timber from the South away from the most ecologically sensitive market, redirecting it towards Asian markets*" (Karsenty, 2000:iii).

The lack of certified operations in the tropical zone and the fact that substantial modification is usually required to achieve certification (IIED, 2000) is a function of the biologically complex environment – there are fewer tree species in Europe than there are in 0.5 hectares of lowland forest in Papua New Guinea. Furthermore, in Europe, forests are already managed and roads and infrastructure already present. The costs of compliance with certification for the tropical operators are relatively high while sufficient benefits, in terms of market premium to cover extra costs, could only be captured if a favourable price could be struck for the certified production with a retail chain (IIED, 2000).

Nevertheless, there are three private harvesting companies in Papua New Guinea that are in the early stages of application to become FSC certified, and there is already one FSC certified forest project in Malaysia covering 55,000 hectares in Sabah. The Malaysian company Innoprise Corp claims to have improved efficiency and sales of its garden furniture to Germany since the project started in 1994 with German aid. This has prompted other concession holders to seek direct FSC certification but the Malaysian Government wants to set-up its own scheme endorsed by FSC. However, the Government is apparently encountering problems meeting FSC criteria because Malaysian officials "*see no problems with their current practices*" (Gilley, 2000:2). It was this bid by Malaysia to develop a certification scheme that sparked a lively response from Barry (2000) in *Worldwide Forest/Biodiversity Campaign News*.

It is critical that the FSC does not lower standards to accommodate logging operations known for their abuse of forests. One standard must apply to all.

It is far from clear that the Malaysian logging industry has a real interest in responsible, sustainable business practices. By engaging with known bad actors in the industry, the FSC must be certain that it is not being manipulated. This said, if the Malaysian loggers and other known industrial over-exploiters of ancient forests are willing to change their business model all along the chain of custody, and take seriously the ecological sustainability of the ancient forests they manage, then this is a welcome development. However, the author is unconvinced that the timber industry has anything but continuation of their windfall profits in mind, and suspects that they are engaging in delaying tactics.

In relation to this debate, local NGOs hold the view that private harvesting companies should not be allowed to certify individual operations but should be required to certify their global operations. However, a more rational view is that, if the companies can be held to the strict FSC criteria, then the more certified forestry operations – big and small – the better.

The discussion so far has been about certification by small-scale operations in the eco-forestry groups, and about the potential for certification by large operators. However, there is room for discussion of the complementarity between small and large-scale operators. At present, it is common for mobile sawmills to follow up on industrial logging, making use of rejected logs already felled. However, there appears to be little to be gained in certifying such operations given that they are operating in forest whose ecological integrity has largely been compromised by the earlier logging. Currently, the small-scale certified groups operate in primary forest. The *raison d'être* of the support for certification, of both small and large-scale operations in tropical forests, would appear to be to ensure that the flows of environmental benefits of the forest are reduced as little as possible while at the same time generating cash income. The operation of mobile sawmills in logged forest does not generate these benefit flows, therefore there should be no incentive for donors to subsidise such operations.

4.6 Discussion

The subsidisation of eco-forestry by supporting agencies allows communities to generate cash benefits sufficient to make eco-forestry attractive. Logging of the same area generates greater benefits than eco-forestry for the community, but only if all the proceeds of logging are invested. In contrast, when eco-forestry is unsubsidised, with groups meeting their own set-up costs, the returns per hectare are still positive but very modest. In the situation where oil palm is an option, following logging, the returns per hectare of forest converted are likely to be much greater than for subsidised eco-forestry.

Having established that the returns to a community can be attractive – where there are not alternatives of high value agricultural crops, i.e. the case in much of the country where soils are poor or marketing infrastructure is absent – the next consideration is the kind and the quantity of the overall benefits, both

market and non-market, of eco-forestry. The nature and size of these benefits is an important question for the supporting donors and agencies given that groups are dependent on subsidisation.

The overall economic benefits of eco-forestry are positive at a discount rate of eight per cent. However, at a three per cent discount rate, or when environmental benefits are halved, benefits are negative. It is to be noted that where community forestry does not replace logging, instead following or preceding logging, most of the economic benefits disappear; in which case the benefits are mainly side benefits that emanate from raising the skills of groups. Donors should not offer subsidies in such situations where environmental benefits are no longer captured.

The question whether it would be more beneficial to subsidise conservation directly by replacing logging with cash incentives was addressed by setting the conservation incentive equal to eco-forestry income. The results show that the overall benefits of direct conservation are comparable but eco-forestry is much cheaper to the donor. However if a log tax were to be imposed on eco-forestry, equal to the export log tax, the relative advantage of eco-forestry disappears (no tax would be levied on direct conservation because there is no log production).

A direct subsidy for forestry conservation would need to be distributed to the customary owners in proportion to their resource ownership. It is possible that ownership disputes could undermine the conservation arrangements and put the conservation project at risk. In contrast, an eco-forestry subsidy is in kind, and the distribution of the self-generated income is organised by the group itself through some kind of business entity and does not rely on a sponsor to distribute the proceeds. There are other considerations that affect the choice of forest conservation method. Additional non-market benefits of eco-forestry are employment and training in business management and community organisation. Such skills are transferable to other enterprises.

A disadvantage of eco-forestry is that it applies to separate areas of about 1,000 hectares of forest. In theory, direct subsidisation can more easily be applied to large, contiguous areas of forest necessary for the conservation of larger species. But the conservation of relatively large areas, inhabited by relatively large numbers of clans, may necessitate proportionately higher set-up costs, more complicated distributive mechanisms and possibly a higher cost of monitoring in remote areas. Direct conservation subsidies may be more applicable in these areas where infrastructure for timber marketing is poor. On the other hand, in remote areas the cost of administering directly subsidised conservation is likely to be high.

There are very few, if any, models of direct subsidisation that are operational. This fact reflects the inherent difficulty of securing long-term conservation where customary tenure is strong, as it is throughout Papua New Guinea. Moreover, there is opposition to direct subsidisation of forest conservation because of the

implication that landowners are being paid to do nothing (Filer with Sekhran, 1998). However, Section 3 shows how the problem of land availability for conservation can be overcome through the lease, lease-back instrument.

This analysis earlier addressed the substantial financial opportunity cost of eco-forestry to the Papua New Guinea Government in terms of logging taxes foregone. The creation of a level tax field is recommended in the section on industrial logging. The imposition of the log tax on all logs harvested would reduce investment distortions in forestry. A log tax at the present rate would increase the annual operating costs of eco-forestry groups substantially, by US\$ 7,500 a year, to the extent that the financial surplus is very much reduced. It will be interesting to observe the stance taken on the tax issue by the EU, the major subsidiser of eco-forestry, in the eco-forestry policy that it is developing for Papua New Guinea as part of the next stage of its programme.

The method adopted has enabled a comparison 'at the margin' of the benefits derived when supporting agencies subsidise direct and indirect tropical forest conservation. Also of interest to supporting agencies are the returns to their overall investment in infrastructure and personnel, and not just to their investment in subsidies; such estimates can only be obtained by full costing of the donor and NGO organisations that back up the delivery of the eco-forestry services. The overhead cost will vary according to the donors concerned and the number of eco-forestry groups that the overheads are spread over. The overhead cost would need to be only US\$ 25,000 per year to completely extinguish the economic benefits from 1,000 hectares conserved at the eight per cent discount rate. However, donors may argue that they will maintain a constant presence, incurring a constant overhead cost, and that the question therefore is what aid programme will return the best economic return 'at the margin'. This analysis may go some way towards throwing light on the return to donor support for eco-forestry, and thus help in making investment decisions.

Community eco-forestry is feasible where land is under customary tenure or communally owned and where there are still substantial natural forest resources left, such as in Melanesia. In countries where forests are privately or State owned, the financial and social arrangements for small-scale forestry conducted on an ecologically sustainable basis may be very different.

The model has shown that global benefits dominate in economic modelling of tropical forest conservation. But these global benefits are a consequence of the functioning of local environments. If donors are to fully justify subsidies for eco-forestry, or for direct forest conservation – in Melanesia or in other developing regions – they will benefit from the availability of data on local carbon balances and the values of local environmental services.

Not to be underestimated is the training benefit of eco-forestry, which of course is intangible and has not been incorporated in the economic analysis.

Substitution of government services to forestry by the private sector

In this chapter we consider the benefits that might arise from the substitution of Government provided services to the forestry industry of Papua New Guinea with outsourced private sector services, with the objective of improving operational and financial efficiency.

5.1 Introduction

The starting point for reform in the public service is the identification of the few core functions that are key and lie in the critical path of economic and public sector management. The next phase is to investigate whether these core functions are being carried out properly. If they are not, then the structural root causes, of poor governance or macro-economy, are targeted for correction. The non-core functions – production and service delivery – are subsequently transferred to the private or NGO sectors. The goal is on shifting away from a bureaucracy where the emphasis is on control and exercise of power to one where the emphasis is on the delivery of services needed for development, and where rewards and sanctions reflect performance (World Bank, 2000c).

Privatisation and outsourcing are very high on the agenda of the Morauta Government in order to relieve financial burdens on Government and improve the delivery of services. A privatisation commission has been established and the Government's intention is to sell many Government or quasi-Government organisations, including the Papua New Guinea Banking Corporation, Air Niugini, Telikom, Elcom and the Harbours Board.

An example of outsourcing that is expected to improve the delivery of services is that taking place in the National Provident Fund of Papua New Guinea. The fund manages the pensions of private sector employees, and while it has been subject to heavy Government influence through its trustees, it has been afflicted with poor record keeping, corruption and maladministration. As a consequence the fund suffered a massive write-down of its assets in year 2000. It is now in the process of reform, including the outsourcing of some of its key functions. Record keeping, financial accounting, reporting and auditing will now be in the hands of firms that will adopt international standards (*Post Courier*, 2001:5). The core policy-formulation functions will be retained by the management of the fund.

In another case, the recent taxation review (Government of Papua New Guinea, 2000) recommended outsourcing some of the functions of the Internal Revenue



Commission as a strategy for improved compliance; large audits or investigations were recommended for outsourcing, particularly in the resource sector.

In general, there has been little recent impetus in Papua New Guinea for the Government to corporatise or outsource significant functions in forestry management. An attempt was made to radically reform the forest service by corporatisation through the formation of the Papua New Guinea Forest Authority (PNGFA), which includes the National Forest Service (NFS) and the Forest Board. This move followed revelations by the Barnett Inquiry (1989) of corruption in the forestry sector and consequent pressures for change from the World Bank (Filer, *et al* 2000) and local activists. To promote accountability and reduce opportunities for corruption, the Board is interposed between the Minister and senior staff of the Forest Service. However, the Department of Finance refused to provide the new Authority with financial independence, the Department of Personnel Management resisted essential reforms to service conditions for its personnel and the Board's composition has gradually changed to become more responsive to political influence. The further adoption of outsourcing strategies is likely to be resisted by public servants who fear dismissal or loss of current entitlements. The conservation lobby also tends to be conservative in its outlook, perceiving that, with Government ownership and control, resource managers are more likely to be responsive to its influence.

In the context of sustainable forest management at a global level, a review of trends and challenges in efforts to privatise some or all forest related activities was undertaken by Landell-Mills and Ford (1999). They found that there has been a significant increase in private sector participation in the forestry sector over the last ten years as governments attempted to adopt more liberal market policies and reduce budget deficits. Although progress among countries has been very uneven, the responses to their questionnaire nevertheless indicate the development of new forest management systems that often seem to better reflect the realities, if not the official status, of forest ownership.

5.1.1 Forest ownership and forest management in Papua New Guinea

The government's role in forest management is an issue that needs to be addressed before the core policy functions and outsourcing of forestry services can be discussed.

It is argued that policy with respect to forest management and exploitation must recognise that the forests are firmly in the hands of the traditional landowners. However, the administrative arrangements for forest acquisition in Papua New Guinea might be more generously interpreted as constructive paternalism; or more cynically, as a system designed to maximise returns to the Government, loggers and local 'leaders' but one that also precludes resource owners from making choices and allocating their resources between preferred alternatives. As Wood (1998:17) says,

“The [1991 Forestry] Act reproduces a colonising paternalism evident in the Timber Rights Purchase instrument used prior to 1991, whereby the State would acquire property rights in the landowners’ timber and then negotiate on their behalf with the developers ... The Forestry Act should be amended to require the State to explicitly recognise the right of customary landowners to participate in negotiations and even to give them a primary role. Without explicit recognition of their rights, they are destined to be marginalised and denied effective control over their own future”.

At present there is only one real strategy open to landowners to generate cash from their timber resources: logging. However, landowners receive only about 12 per cent of the income generated and most are probably unaware of the full market value of the forest. Despite the fact that landowners receive only a small proportion of the log value there is the opportunity to subsequently grow crops or find other land uses. Moreover, logging roads are a very desirable by-product even if they are of doubtful quality. The standing forest on the other hand may generate little tangible benefit and there is no incentive to conserve it.

The current allocation policy for all new concessions attempts to implement a sustained yield (for a definition of sustained yield forestry see Box 2.1) policy through permits that stipulate a 35 to 40-year cutting cycle, on the assumption that the forest will regenerate and that the yield will be sustained for further cuts. As discussed in Section 1, the regeneration and availability of the forest for a second cut is problematic. Moreover, it is administratively costly and difficult for a developing nation such as Papua New Guinea, with weak institutions, to maintain a strict forest management regime for long periods. Even developed countries find the maintenance of sustained yield forestry beyond them. Moreover, it is argued that the country cannot afford the opportunity cost of a sustained yield harvesting policy. Under a 35-year cutting cycle, forest resources that could have been contributing to national development will lie idle for an average of 17.5 years.

At the same time the system requires resource owners not to exploit and benefit from their forest resources for up to 35 years. Enforcement of sustained yield management will inevitably create considerable tension between those whose forests will be logged now and those who have to wait many years before their turn comes to materially benefit from the exploitation of their resource. For many, death will come first. They will be forced to sacrifice opportunities for personal and social development to satisfy a forestry concept. The sustained yield forestry management concept can be seen to be of doubtful relevance in the age of globalisation (see Box 5.1).

Box 5.1 Globalisation and sustained yield forest management

The concept and practice of sustained yield forest management dates from Europe in the Middle Ages. At this time forests were the primary source of three critical raw materials – fuel, building materials and bedding for animals during winter. Perhaps almost as significant was the role of forests as habitats for game hunted by the ruling classes. With increasing population and the demand for fuel in the form of charcoal to feed emerging iron and steel industries, forest degradation became a serious problem. This was especially so in mountainous areas where erosion and flooding due to deforestation were most evident. Forest laws controlling the harvesting of forest products were promulgated and often vigorously enforced by those appointed to the new profession of forester. By applying the concept of sustained yield forest management systems, foresters were able to ensure that the forest products needed by the community were provided with reasonable reliability in perpetuity. It is also to be noted that although populations were increasing, by the standards of today they were almost stable. Communication between communities was very limited as was the ability to transport forest products over any distance (notable exceptions being sea and river transport). The pace of change, especially in rural communities, was generally very slow. Demands for forest products might have been safely assumed to remain relatively predictable, even over several generations.

Contrast the above picture with the realities of the present global economy. Advances in transport mean that quality wood-based building materials, manufactured by efficient integrated forest industries can be shipped to most of the world's markets at prices local producers have difficulty in meeting. Competing materials and the rapid changes in modern societies make predicting the demand for semi-manufactured forest products for ten years ahead an almost impossible task, let alone a for a whole 35-year cutting cycle. Persuasive economic arguments can be used to support the notion that developing countries cannot afford to lock up the capital contained in their primary forests because it is needed to establish their basic infrastructure. Many of the recently developed, advanced economies have used it for this purpose. Is there, then, still any place for sustained yield forest management philosophies?

The implementation of sustained yield management might appear to be more likely to maintain a higher level of biodiversity than other possible strategies but the integrity of the forest is likely to deteriorate because of its continual exploitation despite being under so-called sustained yield management.

An important question is therefore: are there other ways by which the nation's unique biota can be preserved?

While the social consequences of some landowners receiving immediate returns from exploited forest, while others wait for up to 35 years, may be mitigated by arranging some form of interim payment to the former, owners whose forests were selected for immediate exploitation would probably rebel at receiving considerably less for their resource because of this diversion of funds. Such a system of interim payments, requiring a high level of financial administration, would also be wide open to corruption.

As well as the undesirable economic and social consequences of a 35-year cutting cycle, the system also has doubtful claims to physical sustainability. Achieving a sustained yield depends on the forest in the concession remaining intact to allow for the completion of the cutting cycle, and on regeneration to allow a second and subsequent cycles. However, in the section on industrial harvesting (Section 2) under Sustainability Issues, it was argued that there is only a low probability that these conditions will be met.

Given that it is unlikely that the forests of Papua New Guinea under central Government management will sustain economic and ecological benefits, there is a need for the nation and the world to preserve directly, in perpetuity, significant tracts of operable forest as conservation areas. Some attempts are being made to address this challenge, for example through the proposed Conservation Trust Fund. However, payments to landowners sufficient to provide a long-term conservation incentive will be required, and the Trust Fund does not yet have the resources, or the prospects thereof, to secure the large areas necessary. An example of income transfer to traditional landowners in exchange for environmental services is given Box 5.2.

The equitable distribution of such incentive payments for conservation must also be ensured. It is recommended that the lease, lease-back system, as successfully applied in Papua New Guinea agriculture, and as described in detail in this volume, is an innovative vehicle through which forested areas could be conserved. The key to the success of lease, lease-back is the formalisation of a registered lease by landowners and their ability to then sub-lease to an investing party, whether it be an oil palm company or conservation NGO. This may require little actual ongoing input from the landowners, who reap the benefits of the lease payments while remaining secure in their ownership.

A further issue is what can be expected from logging companies in forest management. The consistent use of the term 'forest developer' in the *National Forest Plan* (PNGFA, 1996) implies that there is more to the process, but this is

Box 5.2 Costa Rica's payments for non-wood forest values

Costa Rica has developed some interesting initiatives in forest management which will be watched closely and which could well serve as models for change in many other countries. Activities related to capturing values associated with its forests' environmental services include the development of mechanisms for promoting private investment in infrastructure for forest tourism, charging for tourist and research access to forests, selling rights for the exploration of its forests' genetic resources and carbon sequestration values, and conservation services. Examples are the payment of compensation for conservation to land owners of US\$ 270 per hectare if they maintain their forest for 25 years, and an additional average payment for environmental services of US\$ 50 per hectare. The latter is based upon the carbon storage, erosion prevention and watershed protection services that the forest provides and are paid for through a 15 per cent tax on fossil fuels.

Source: Landell-Mills and Ford (1999)

misleading. Private harvesters may be able to provide limited services and develop some infrastructure while they are on site but they are essentially nomadic operators, with most of their human and physical capital readily transportable from one locality to another by barge. They do not in general appear to be suitable organisations to be the recipients of activities outsourced by the state. Although many private harvesters do succeed in meeting their obligations, the concern is that the line between maintaining good community relationships and slipping over into bribery and corruption is sometimes difficult to discern.

5.2 Potential for outsourcing in the national forest service

This section examines ways in which some forest management functions currently undertaken by the National Forest Service (NFS), a national Government instrumentality, might be transferred to other organisations, including certain of those in the private sector. The focus is on functions relating to forest management on an industrial scale, rather than at subsistence or small business levels.

Most favoured options generally remove the financial burden from the public purse and shift it to an organisation with greater efficiency. Efficiency is enhanced by removing or modifying parts of the business chain that do not contribute significantly to the end result. Other options may merely shift the burden from one Government organisation to another. However, even here efficiencies can be achieved if this action removes redundancies and opportunities for mismanagement.

In the context of this study, increasing efficiency (particularly financial savings) has been the main consideration. However, issues such as more transparent governance and the greater involvement of resource owners in forest harvesting activities have also been considered.

In examining the *Forestry Act* of 1991, it is apparent that responsibilities for several functions originally envisaged as being undertaken by the NFS, have already been partially or completely passed to other organisations.

It would be useful to go much further into the constitutional and legal basis for Government involvement in what some would see as business transactions among resource owners and their customers. The section on potential for outsourcing NFS functions usefully considers the implications of other possible interpretations of the constitutional imperative and ownership issues. A simple examination of the current functions of the PNGFA serves as a helpful guide to potential outsourcing. While examining the functions undertaken by the NFS, the following questions have been asked:

- Is the NFS necessary for the State to meet its constitutional obligations in terms of both the natural environment and revenue?

- Is there a more efficient way of meeting constitutional obligations?
- Is outsourcing likely to improve efficiency?
- Are there institutions or individuals available to perform outsourced functions?

Outsourcing options which would require significant policy and legislative changes have, at best, only been briefly considered here and the study has generally been kept within the broad policy and legislative framework currently adopted by the Government of Papua New Guinea.

While the provisions of the constitution are relatively general, the National Forest Plan (NFP) (PNGFA, 1996) is quite detailed and could be seen as restrictive. However, the plan's detail has not, in practice, proved much of a restraint on past administrators when, for instance, part of the responsibility for monitoring log exports was outsourced to SGS and responsibility for professional and technical education transferred to the Papua New Guinea University of Technology.

Considered here are the various tiers of forest management planning at national and provincial levels and the most significant components of this process.

5.2.1 The resource and operational plans

The PNGFA has the responsibility for ensuring that the forest resource is developed in accordance with the *National Forest Plan*. At the next level Provincial Forest Plans outline the expected role of the forestry sector in each province by providing a schedule for the management and utilisation of forest areas within the province. The provincial schedules are amalgamated to form the National Forest Development Programme with which forestry operations are expected to accord. Provincial Forest Plans are prepared by Provincial Forest Management Committees, with the assistance of the NFS and other Government departments.

The NFS is required to prepare a feasibility study prior to advertising a tender for a logging project or 'forest development project'. The scope of the study is determined by the relevant Provincial Forest Management Committee; requirements of a study are detailed resource inventory and investigations into:

- development and forest management options,
- environmental and social impacts,
- project feasibility including the feasibility of domestic processing of all or part of the timber in the area,
- level of investment required, and
- marketing prospects and expected timber prices.

The NFP provides that the actual preparation of these investigations may be either undertaken by the NFS or be contracted out.

The essential field activities carried out prior to the preparation of these plans and studies are forest inventories at various scales, and activities relating to resource acquisition, allocation and development. Each is discussed further.

(i) Inventory: inventories are basic inputs to forest management plans. Although modern techniques such as geographic information systems and satellite imagery can reduce the fieldwork required to a minimum, forest sampling on the ground remains essential.

(ii) Resource acquisition: a feature of current policy is that the PNGFA is empowered by the State to acquire forest resources from the resource owners by means of a Forest Management Agreement (FMA). In theory this overcomes a major problem in forest management in Papua New Guinea for it is seen as removing difficulties associated with industrial loggers having to deal with many small groups of people where each group owns relatively small blocks of forest. FMAs can be seen as a mechanism for the State to assemble, allocate and control the management of bundles of forest resources large enough for long-term industrial harvesting.

Currently, resource acquisition takes a great deal of time and effort as resource owners must be located, their rights to the resource verified and the terms of the acquisition negotiated. Whether resource acquisition by the State ultimately makes it easier for harvesters to deal with the resource owners is debatable.

(iii) Allocation: the allocation process of permits to private harvesters commences with the preparation of a feasibility study carried out by the NFS. This in hand, responsibility for preparing proposals for resource allocation is shared by the relevant Provincial Forest Management Committee and the NFS. The actual allocation of a permit to a concession under an FMA is made by the Minister on the Forest Board's recommendation.

The outsourcing of planning, inventory and acquisition

Strategic plans: with the completion of the NFP, opportunities for the NFS to outsource functions relating to planning activities would seem to be mainly in the area of acquiring data for the regular updating of the plan. The data and the procedures required for its collection are relatively straightforward and, with the caveats noted below, this work could be carried out by appropriately qualified consultants.

Inventory: Accurate inventories are a key element in planning at all levels. Although the techniques are well established, field workers need to be well trained, particularly in species identification. Past experience has shown that outsourcing inventories to groups with an interest in harvesting can create some forest management problems for if yield figures are inflated, the approved

harvesting rates will be set too high and the area containing the allocated resource will be cut over much more rapidly than was originally planned. A similar problem may occur if the inventory does not accurately account for variations in log quality or identify desirable species correctly. Over-reliance on remote sensing techniques in preparing inventories can likewise lead to unrealistic harvesting rates and consequent management problems. If the NFS is to outsource its forest inventory capability, it needs to ensure that it has access to reputable and competent inventory specialists who are clearly independent of the companies involved in harvesting.

Acquisition: Although time consuming, the tasks associated with resource acquisition do not appear to have a primary association with the principal objectives of the NFS and once appropriate guidelines and specifications are prepared, the work could be undertaken by appropriate consultants. In the longer term it may be appropriate for the cost of this exercise to be borne by the resource owners. However, for the time being it may have to continue to be borne by the state.

There is no attempt to allocate the forest resource to uses other than logging, such as conservation or small-scale forestry, before they are allocated to industrial forestry (see Box 1.4). Forest with high biodiversity or ecological value may therefore be allocated to harvesting. Likewise, the small-scale forestry option or eco-forestry that may better satisfy landowners' aspirations goes unexplored. These forest option studies could potentially be outsourced to licensed foresters.

Allocation: NFS responsibilities in relation to allocation are mainly through its support of the relevant Provincial Forest Management Committees. These committees could, if necessary, source additional expertise from consultants. However, the NFS would need some oversight in order to properly brief the Forest Board.

Operational plans: (project statements, environmental plans, five-year working plans, annual working plans and follow-up land use plans) are the responsibility of the 'developer'. Environmental plans are approved by the Office of Environment and Conservation; the remainder by the NFS. These plans are the foundation for successful forest management and are specifically the State's responsibility in order to conserve the environment and replenish it for the benefit of future generations.

While the responsibilities for operational planning are already delegated to the 'developer', for the State to meet its constitutional responsibilities, it must retain control of the approval process and ensure that appropriate standards are set and followed. It may be desirable to outsource the development of Working Plans and Environmental Plans to be used as benchmarks in ensuring standards are adhered to.

5.2.2 Management

The role of the National Forest Service (NFS) in the harvesting process is essentially one of checking to ensure that approved plans, particularly the Five-Year and Annual Forest Working Plans, are followed. The actual operations are carried out by the 'developer'.

Control of the harvesting process is vital if the NFS is to meet the policy objective of sustained yield and environmentally sound management. For instance, poor planning and careless execution of the logging operation can easily increase the cutting cycle from, say, 40 to 80 years and thus halve estimates of sustained yield. Within the next few years, the stand and growth data being collected by FRI will give quantitative indications of how far yield and cutting cycle length objectives have been distorted by poor practice (see the Research section below).

The outsourcing of management

Given the broad geographic distribution of logging activities and the manpower requirements and cost of ensuring compliance, outsourcing the function of monitoring compliance with the Logging Code of Practice to suitable qualified forestry practitioners and perhaps the eventual passing of this function to the resource owners would seem appropriate.

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Responsibilities for silvicultural and related management activities are already passed to the 'developer'. There are signs that some responsibility for management may in the future be placed on the landowners. This development, if confirmed, seems most appropriate and is revisited in the Discussion below.

Plantations: The NFS plays a significant role in the establishment and management of forest plantations. Given the size of the nation's indigenous forest resource, the uncertainties associated with land ownership and the high risk from fire and disease, the continued financing by the State of the establishment and management of industrial plantations is perhaps a little surprising. The State's constitutional need to undertake or even promote industrial plantation establishment is arguable at best. The concept of 'compensatory plantations' (i.e. plantations to bring future total timber yield up to a level where operations within the area controlled by a 'developer' would be sustainable) appears to be flawed. Leaving aside the fact that many of these plantations have been established without the silvicultural information that would give some confidence of success, it could be argued that the purpose of these plantations was to justify undesirable harvesting practices in indigenous forests. These practices inevitably include logging at rates well above the most optimistic level compatible with sustained yield management and a failure to control harvesting operation at standards that would enable acceptable sustained yield management.

Rather than outsource its functions in relation to industrial plantations, the best alternative would appear to be to privatise the state's plantation holdings.

Indeed, this has already been suggested as a possibility in the draft *National Forest Development Guidelines* (1999b). While the commercial linking of plantation ownership to an in-country timber processor would generally seem to be advantageous, linkages to forestry companies primarily involved in log export may not. The problem is that the costs of plantation management and losses associated with this activity can be difficult to monitor accurately and may be inflated by unscrupulous companies to reduce their tax liability. This is particularly applicable to those companies that have very little investment in fixed assets and hold contracts with a life span shorter than the life of a forest plantation.

It is noted here that the controls in the draft *National Forest Development Guidelines* (PNGFA, 1999b) on the development of industrial plantations appear unnecessarily bureaucratic and restrictive. From a Government policy and management perspective it may be more appropriate to equate forest plantations with coconut plantations rather than with natural forests.

5.2.3 Research

Research into forest biology, silviculture, plantation establishment and forest products is currently undertaken by the Papua New Guinea Forest Research Institute (FRI) in Lae. The activities of this Institute are financed almost totally from the funds allocated to the PNGFA. Briefly, the justifications for research undertaken by FRI might be presumed as follows:

Forest biology: the primary function of the Forest Biology group is to maintain reference collections of plant and insect species and monitor the health status of the nation's forests. The reference collections are seen as being of national significance – primary reference points for measures of biodiversity, as well as supporting research in natural forest management and plantation establishment. This group also manages the National Botanic Garden at Lae.

Sustainable forest management: the research here focuses on obtaining the data on the growth in residual stands following harvesting – essential information for assessing expected future yield and cutting cycle length. While this information is essential for accurate planning at both national, regional and provincial levels, there are already rough data available from Papua New Guinea and elsewhere to support planners in the interim. However, even this rough data will be misleading without adequate protection of advanced growth during logging operations.

Plantation establishment: primarily seeks to understand the relationships between site factors and species growth rates, thus improving the efficiency of wood growing for industrial and domestic purposes.

Wood science: examines the basic properties of Papua New Guinea's timbers and their conversion characteristics. This information is seen as important for marketing and the further development of local downstream processing.

It is observed here that research in social sciences that may have an influence on the NFS's forest management role is not actively supported.

The outsourcing of research

In theory at least, there would seem to be good opportunities for outsourcing the research functions of the FRI to one or both of the universities and, perhaps, appropriate consultants. The Government may not necessarily save much money but the following efficiencies might be observed:

Forest biology: given the constitutional imperatives relating to resource management, the Government has a clear responsibility to ensure the development and maintenance of a scientific group that catalogues and examines interactions among significant parts of the national biota. The knowledge held by experts in such a group is relevant to managers in conservation (e.g. for studies of biodiversity), forestry (e.g. identification of tree species and forest pests and diseases) and agriculture (e.g. selection of new crops, identification of weeds and pests and diseases).

While this group may have fitted comfortably within the Department of Forests during the colonial period, this might not be the most efficient place for it to meet potential demands in the 21st century. It is rather bureaucratically and geographically isolated from many of its potential customers. A separate department or institute might be established to manage research and documentation of the nation's cultural and natural heritage. This could include the functions currently undertaken by the Forest Biology group of the FRI. However, a more effective option might be for the Government to charge the universities with this role and provide them with the funds currently allocated to existing organisations so that they could employ some full time staff as well as use existing staff and students to improve and increase the understanding of these important aspects of the nation's heritage.

However, there are some real dangers in this shift of responsibilities as the universities are not currently in a good position to take on increased responsibilities. University staff have high teaching loads and adding additional resources to one or two departments would quickly create internal divisions.

The goals of the Sustainable Forest Management group are relatively clear and its tasks appropriate for outsourcing. It is observed, however, that the tasks require some input from a group with expertise in the identification of tree species, computing and geographic information systems. With additional resources, the work could be undertaken by the Forestry Department in the University of Technology, supplemented perhaps by suitably qualified consultants. It is important to note that because of the unique species composition of Papua New Guinea forests, there are few opportunities to import information that would be useful in building growth and yield models adequate for long-term forest management. It is also observed that the National Forest Plan (PNGFA, 1996) suggests that forest developers may be required to

undertake these studies as part of the agreed five-year working plan. However, experience has shown that forest developers do not have the expertise to establish these plots with the accuracy needed to produce data of sufficient quality to contribute usefully to provincial and national yield models.

Historically there has already been significant donor-funded (International Tropical Timber Organization) outsourcing to establish growth and yield data banks. Unfortunately, these studies must be continued for a much longer period than the normal aid cycle and FRI will have difficulty maintaining and monitoring the many yield plots established under this programme.

Given the extent of the nation's natural timber resource, the justification for spending scarce funds on research into the development of industrial plantations might be critically questioned. Even where plantations can be economically justified, ownership by landowners would seem appropriate (the section on lease, lease-back details how customary tenure can be retained while investors can take up sub-leases for plantation development). In any case, research demands are not high, as the silvicultural requirements of most potentially valuable species are fairly well understood. Furthermore, they are in general not specific to the Papua New Guinea environment, and a great deal of the technology can be transferred from other countries with similar climates. Additional research needed by owners could be undertaken by the Forestry Department of the University of Technology as staff/student exercises. Appropriate consultants may also have a role to play.

A great deal of information is already available on wood science. While a significant increase in downstream processing may increase the demand for new information, this could be commissioned by the industry from the Department of Forestry at the University of Technology or suitably qualified overseas laboratories (perhaps as aid projects).

Realistically, the suggested outsourcing of current research needs will not be easily implemented. Significant alternative providers (the universities) are not well placed either administratively or financially to take over the task. This problem is commented upon further in the Discussion. It is also quite possible that a significant donor of aid in the field of forest research, the Japanese Government, would wish to see the Papua New Guinea Government maintain FRI as it currently stands.

5.2.4 Revenue collection

The NFS, through the Minister, has responsibility for issuing licences under the *Export (Control and Evaluation) Act* and for approving the selling price of logs to be exported. A significant reason for developing this procedure is that, in theory, it provides some protection against transfer pricing with consequent loss of tax revenue to the State. However, the success of this strategy is dependent on the State having very good market intelligence. This is not easily acquired in a market as closed as the Asian log market.

The Marketing Group is responsible for providing information to the State (through the Forest Board) on the current and probable future performance of the forest revenue system. The current system needs to be periodically adjusted to reflect changes in trading patterns and currency valuations. The section on the forest revenue system in this volume showed that taxation revenue would probably be increased if taxes were reduced, and that a depreciating kina altered the shares of resource rent being received by the logging companies and the government. The problem of transfer pricing (discussed in Section 2) also needs addressing.

Other functions include the promotion of Papua New Guinea forest products and the development of grading rules.

The outsourcing of revenue collection and monitoring

While activities relating to finding markets for forest products might be best left to forest-based industries, the State would appear to have a role in ensuring that the benefits of resource use are maximised and that activities such as transfer pricing are kept under control. In achieving these ends, better use might be made of the market intelligence gathering capability of international organisations such as SGS.

Monitoring: the task of ensuring that export logs are correctly described and properly documented has been outsourced to the international trade monitoring company SGS for the past five years. In general, both the NFS and the forest industry have been satisfied with its performance. The advantages of maintaining an 'honest broker' with an international reputation to maintain, amongst buyers, sellers and the State, has some important advantages which are commented upon in the Discussion below.

Enforcement: Enforcement of the *Forestry Act* and regulations is currently a function of the NFS, with the assistance in the area of non-compliance from SGS. While there does not seem to be scope for any immediate outsourcing, in the longer term some of the work of gathering evidence of breaches might be delegated to resource owners.

5.2.5 Education

Extension

Given the constitutional imperatives and the nature of resource ownership, the NFS should have a significant role in ensuring that the large land owning population has a good appreciation of mutual responsibilities for forest management and the tools needed for forest development and improvement. The need for this information appears to be as urgently required in localities where there is a shortage of the forest products essential for subsistence living, especially poles and firewood, as it is in well forested regions. In the absence of a strong extension programme within the NFS, this responsibility has to a large degree been taken over by aid agencies and NGOs. Given the expense of these

programmes and assuming the willingness of other agencies to continue extension activities, it would be appropriate for the NFS to develop a co-ordinating and supportive role.

Professional and technical training

These functions have already been outsourced primarily to the Papua New Guinea University of Technology. There appears little scope for further change.

Staff development

Most training courses are already outsourced when needed by the personnel section of the NFS.

5.2.6 Services

Legal

Some outsourcing of legal services to local practitioners is already undertaken. Further outsourcing should be considered, especially if the workload of the present section is reduced by the devolution of acquisition, allocation, monitoring and enforcement services. However, a core of legal experts should remain within the NFS to undertake tasks such as the drafting of contracts and providing advice to the NFS and the Forest Board on the implementation and further development of the *Forestry Act* and regulations.

Personnel

In the context of personnel management in Papua New Guinea, the use of an independent recruitment firm to shortlist suitably qualified staff for key positions may have some advantages, particularly in refuting accusations of nepotism. Some additional cost would however be involved.

Finance

There do not appear to be advantages in outsourcing finance related functions except to develop some independent auditing activities.

Board and committees

Committees specified in *National Forest Policy* (PNGFA, 1996) include the following:

- Advisory committees for research, training and education, marketing and industrial development, resource assessment, and policy, planning and legal matters.
- Provincial Forest Management Committees.

Given the complexity of the administrative arrangement relating to forest management, it is tempting to have a range of committees to ensure that all

interested parties have an opportunity to provide input and develop an appreciation of the values of other interest groups. However, this management tool can also dilute accountability and transparency, and can be expensive. Further examination of the cost-effectiveness of the established management and advisory committee system is beyond the scope of this study. It does, however, seem worthy of review.

5.3 Financial implications of suggested changes

As noted in the introduction, while outsourcing and other modifications to procedures may lead to efficiencies and, especially, savings, there are also associated costs. A first approximation has been made of the magnitude of the financial costs and savings in Table 5.1. The basis for Table 5.1 is the allocations by the Finance Department for the PNGFA to support activities during 2000. Personal knowledge of the activities undertaken within the broad allocation categories and internal financial arrangements within the NFS were used to estimate savings and extra expenditure due to additional outsourcing in each category.

Strategy 'A': the result of outsourcing some functions currently undertaken by NFS staff (primarily some or all of those associated with research, planning and resource acquisition – see the Discussion below) but without introducing major changes to policy or reinterpreting constitutional obligations of the State or resource owners.

Strategy 'B': the possible consequence of policy and structural change that would considerably reduce the role of the State and place much more responsibility for forest management on the resource owners (see the Discussion below).

Table 5.1 also includes an indication of possible extra costs and cost savings if reforms were to extend to resource owners accepting most of the responsibility for, and costs of, management. The government's role is then restricted to ensuring that tax revenues are collected and the environmental standards pertaining to forest operations are upheld (Strategy 'B') where the net savings of K6.9 million are considerably greater than those applicable to Strategy 'A'. Further comment on how Strategy 'B' might be implemented is provided in the Discussion below.

It should be emphasised that the savings quoted above are estimates. Access to detailed financial records held by the Papua New Guinea Forest Authority are required before planning can proceed further and reliable estimates of savings can be calculated.

5.4 Discussion

The most immediate opportunities for outsourcing would appear to be transferring the capacity to undertake forest related research to the universities and by outsourcing much of the work associated with resource inventories and acquisition to consultants. Although the financial savings to be made by the State

Table 5.1 Estimates of savings and costs of outsourcing or modifying NFS functions (kina)

Function	Budget allocation Yr 2000	Strategy 'A'			Strategy 'B'			Notes
		Savings	Costs	Net	Savings	Costs	Net	
Minister's Office	216,000	0	0		0	0		
MD and the Board	1,450,000	0	0		1,000,000	0	1	
Finance	771,000	0	0		200,000	0	2	
Corporate Services	732,000	0	0		800,000	500,000	3	
General Manager's Office	504,000	0	0		0	0		
Forest Planning	1,094,000	800,000	500,000		800,000	0	4	
Resource Development	3,658,000	3,000,000	1,500,000		3,658,000	0	5	
Operations HQ and Area Offices	3,100,000	0	0		1,000,000	0	6	
Forest Research Institute	4,485,000	4,485,000	3,000,000		4,485,000	3,000,000	7	
Reforestation & Extension	2,200,000	0	0		1,000,000	2,000,000	8	
SGS Monitoring	3,900,000	0	0		0	500,000	9	
Total	23,110,000	8,285,000	5,000,000	3,285,000	12,943,000	6,000,000	6,943,000	

Notes

1. Strategy 'B' assumes the Board would no longer be necessary but that the Managing Director or equivalent would remain.
2. Based on a significant reduction of NFS goods and wages following the implementation of Strategy 'B'.
3. Reflecting reduced staff level for Strategy 'B', but with some additional expense for outsourcing staff recruitment and related office management activities.
4. Some outsourcing in Strategy 'A' but with a significant transfer of responsibility to resource owners in Strategy 'B'.
5. Significant outsourcing in strategy 'A' with responsibility transferred to resource owners and developers in Strategy 'B'.
6. Savings due to fewer staff required for this function with adoption of Strategy 'B'.
7. Functions transferred to universities or similar institutions with some outsourcing to consultants. State still has a constitutional responsibility to support many of these functions.
8. Strategy 'B' would privatise forest plantations. However, the state, under its constitutional obligations, may have to fund additional forest management extension activities.
9. The higher cost level for Strategy 'B' reflects a slightly expanded role for an independent arbiter between buyer and seller, buyer and government, and seller and government.

from outsourcing these functions may not be great, there would seem to be some significant advantages in terms of management effectiveness. In the case of research, the stronger focus inherent in contractual arrangements should improve the efficiency of delivery as well as improve the standard of technical and professional education in forestry. However, there are problems with this research strategy and these are referred to later.

Outsourcing many of the activities relating to resource inventories and acquisition will encourage the development of a group of independent forest management specialists and a perhaps greater involvement in forest management activities by the resource owners. Notes on how these specialists might be controlled and how they could operate are provided below.

In the longer term opportunities exist to make substantially greater savings than those estimated. However, these would depend on the willingness of the State to make significant changes to forest policy and associated legislation. In particular, the constitutional imperative 'to conserve' would not be interpreted as a requirement to manage forests at a provincial level on a sustained yield basis but rather to ensure that best practice in terms of environmental controls were enforced. There would also be a need to acknowledge that the resource owners had the responsibility for the management of their resource and that the function of the State was primarily to ensure that environmental standards were upheld and taxes associated with harvesting paid. Other authors have strongly advocated a withdrawal of the State and a transfer of the primary role of negotiation with respect to forest use to the customary landowners, for example, Wood (1998:17): "*Without explicit recognition of their rights [landowners] are destined to be marginalized and denied effective control over their own future*"; and Taylor (1997:267): "*Only through negotiation, with all its perils to novice participants in the timber industry, can landowners hope to achieve the capacity to protect their interest in the long-term*". In relation to Kamula Doso, the concession that Wood (1998) was specifically referring to, Everts (2001) found little evidence of landowner involvement in the allocation process.

Taylor (1997:267) made more specific recommendations:

"...the State should abandon nationwide land use zoning through forest classification, statements of provincial allowable cut, and inflexible statutory controls over investment of the landowners' share of logging revenues. These reforms are all based on the flawed assumptions that the State is the best judge of the public good and can readily enforce its will. Environmental protection, sustained yield, and revenue distribution objectives should instead be balanced against conflicting interest through project specific negotiation. If the State is less absorbed in nationwide planning and policing work, it should be more able to resource the conduct of development options studies and the scrutiny of environmental plans, such as they serve as useful components of the negotiation process. For existing agreements the parties can rely on periodic review clauses and the transitional review power in the Forestry Act (Section 137) to negotiate

project reforms. The code of logging practice will serve as a standard for incorporation in new or revised agreements.

The role of the State should change from that of a regulator to that of a stakeholder. The State should offer extension services to ensure that landowners are sufficiently organised and informed to participate effectively in project negotiation and enforcement, again deploying resources formerly allocated to the regulatory function. Yet, given the state's conflicting interests, landowners could not count on such assistance, or accept it without question”.

There will without doubt be critics who will claim that transferring responsibility for forest management to resource owners will not work. Two of the frequently heard reasons are:

- they do not have the sophistication to deal on equal terms with logging companies; and
- they will not agree among themselves on basic matters of forest management such as appropriate division of the returns from harvesting. Even if agreement is reached it may not be honoured with the passage of time or the entry of new players.

The first, if valid, would appear to be a significant problem but one that could be addressed by education and in particular by knowing where to get advice. Much of this education is in any event needed as essential life skills for resource owners in a developing country. For instance, in addition to basic forestry skills, forest owners need to understand the fundamentals of investment, manufacturing, trade and commerce. The minimal educational requirement would be that resource owners know where to go for advice, be able to assess the soundness of information supplied to them and relate it to their own perceptions of their needs and aspirations. See Box 5.3 for a discussion on landowner education.

Box 5.3 Preparing resource owners for a greater management role

Landowners in relatively low and scattered population areas of primary forest, where pressures from shifting cultivation have been minimal for the most part, have not received as many Government services, such as education and health, as those in more densely populated areas.

However, the problem of capacity building is not confined to preparing landowners for increased management responsibilities. Even under the *Forestry Act* of 1991, resource owners have responsibilities to approve the commencement and the terms of logging. A significant increase in capacity building is needed to make the present Act work in the landowners' interests. With this in place, the transition to further management responsibility may not be so daunting.

Given the size and complexity of commercial arrangements associated with logging on an industrial scale, resource owners will need assistance with aspects

of environmental and commercial law to manage their increased responsibilities. To engage in commerce and make wise decisions concerning their resources they need to understand the basic fundamentals of investment, financial management and marketing. Landowners will also need to understand the rudiments of forest management such as the design of logging operations (especially roading) and the silvicultural techniques needed to confer long-term sustainability on the forest environment.

A past attempt at providing support for resource owners in commercial dealings with logging companies was the *Fairness of Transactions Act*. This was approved by Parliament but never gazetted (Filer *et al*, 2000). This Act needs to be revisited to confirm its relevance to a new forest management strategy where forest owners would negotiate directly with loggers.

Although the primary responsibilities for education must lie with national and provincial governments, aid programmes could assist the development of curricula and running of pilot projects. To some degree aid and NGO projects are already involved in forestry and 'life skill' education. However, some are not as effective as they might be because of a philosophical anti-business bias or the lack of resources. Other groups having a role to play in making resource owners more aware of their forest management options, rights and responsibilities are community leaders and the churches. Their programmes might look more to the broader picture rather than the technical details of forest management.

Addressing the second qualification above is a complex matter. Outsiders must recognise that different societies may have different value systems and what appears logical to some may not be to others. It would seem important for the sake of resource management in general that these problems be sorted out at the grass roots level. If agreement is achieved by the imposition of a solution from above, it is likely to be short-term.

It is argued that as forest owners become increasingly well informed, they will themselves demand greater control of their forest heritage. Unless the State prepares for this development by appropriate outsourcing and a controlled transfer of management responsibilities, it may run the risk of the alienation of rural dwellers, if not widespread social unrest. The latter might well be the most significant cost of a failure to appreciate, in time, the need for forest policy reform.

The current outsourcing of responsibility for monitoring log exports, to the firm SGS, merits special mention (see Box 5.4). SGS is an international firm specialising in the monitoring of trade among countries, and its continued success worldwide is dependent upon it being able to maintain a clean image. In Papua New Guinea it is generally agreed by those associated with the NFS and forest industries that it performs the task of monitoring well.

Box 5.4 SGS, the international company

SGS is an international company with offices in over 140 countries. It claims to be the world's largest testing, inspection and verification organisation. It was established in 1878 to certify the quality of grain shipments. Its reputation is built on a commitment to quality and a guarantee of impartiality. SGS does not engage in any manufacturing, trading or financial activity which might compromise its independence.

Current activities include:-

- i) monitoring of international trade in agricultural and mineral products, petroleum and petrochemicals, industrial equipment and consumer goods;
- ii) contract compliance, including the speed and efficiency of transactions, the safety and reliability of plant and equipment and delivery and production schedules;
- iii) development of tailor-made programmes for governments and international institutions, especially for import and export verification, and customs and investment monitoring.

5.4.1 SGS in Papua New Guinea's forestry sector

The role of SGS PNG Ltd in the forestry sector is to monitor log exports, ensuring that the companies involved follow relevant regulations and that all logs for export are correct in volume, grade and species. All logs are tagged so that they are readily checked during loading. SGS takes the invoiced log price provided by the exporter and approved by the PNGFA and calculates what should be paid in export tax for the benefits of Customs, the Internal Revenue Commission and the PNGFA. SGS is also able to provide the valuable service of notifying the central bank of the gross value of log shipments.

Although it operates under contract to the Papua New Guinea Government, the finance to pay for SGS's services has often been provided by foreign donors, especially the European Union.

Personal communications with Government officials and representatives of the timber industry suggest that both are generally pleased with the way in which SGS performs its tasks. However, a few critics claim that it is too expensive and others that it is sometimes too ready to exaggerate, for the sake, perhaps, of promoting its own image, the impact of reporting what appear to be minor infringements. Underlying some of the criticism is possibly a perceived affront to national pride – behind the scenes many ask why Papua New Guinea needs to employ an expensive multinational to collect its taxes. Some claim that it is too expensive or that the NFS can now take over this function. However, a rational look at its costs and benefits suggests that the outsourcing is well justified (see Box 5.5). Critics should know that verification and the application of standards in an area where there are significant financial flows is imperative to avert corruption.

Box 5.5 SGS PNG Ltd in Papua New Guinea

SGS PNG Ltd employs a handful of expatriates and about 60 nationals. In the year 2000, the cost of SGS was almost K4 million. In the same year, SGS found discrepancies between logs said to be exported, and logs actually exported, to the value of K6.5 million. SGS estimated that the tax that would have been avoided if the discrepancy had gone unnoticed was K2.2 million in log export tax and K2.5million in company tax. (This estimate of company tax makes the challengeable assumption that the companies involved actually pay company tax.) In the past the discrepancies identified by SGS were higher. For example, in 1997, the value of logs exported was understated by \$15 million. This suggests, as one would expect, that the deterrent effect has increased over time (Personal Communication Bruce Telfer, Managing Director, SGS PNG Ltd.).

The total benefit of surveillance by SGS can only be estimated if we know what the extent of under-reporting would be if SGS were not operating, and on that we can only speculate – but it would probably amount to a large percentage of the value of logs exported. Nevertheless, what we do know is that SGS presently covers over half its present cost just through log export taxes paid.

While the Government incurred the capital cost of setting up SGS, it never contributed more than a small percentage of the running cost of SGS in its first seven years of operation; it has been left to donors – the World Bank and the European Union, and principally the latter – to meet its annual expenses off budget.

A crisis point, where no funding has been budgeted or forthcoming, has been experienced twice in SGS's short history, and on the second occasion the EU rescued the organisation after the General Manager had to sack himself and all the staff. It appears that the Government has finally recognised the value of SGS by budgeting for, and actually meeting, operating costs for 2001.

The monitoring carried out by SGS is obviously a key function in forestry management. When it was first contracted – for 18 months in 1994 – it was expected that its function would be absorbed by the PNGFA, the Government designated regulatory body. It is not clear why PNGFA has refused to absorb and fund SGS; in 1999 the Authority had 60 positions in their manpower pool unfilled and budget funds to support these positions. But this rejection may be a blessing in disguise because the reason that the SGS is successful in its monitoring role is that it is a worldwide company with a reputation to protect, and it operates accordingly.

Such an internationally based organisation as SGS, able to act as an independent arbiter between all parties (including the State), could become involved in the chain of commercial transactions from resource owner to exporter and thus bring benefits beyond those of ensuring that revenues are fully collected. For instance, the ability to gather information on the true current market prices of logs would allow resource owners, harvesters and the State to ascertain whether they were each receiving their agreed share; the transparency of its procedures would minimise disputes and create an atmosphere of cooperation rather than suspicion. Presently the export prices invoiced by log export companies are taken as *bona fide* market prices by the

PNGFA as a basis for log export tax calculation. However, it would seem appropriate, given the transfer pricing that has apparently emerged in the export of timber to Japan (see Section 2), to give SGS increased powers to verify invoiced prices. Where SGS believes that the invoiced price is below market price it could request the company to show why the invoiced price should not be increased for tax purposes. SGS already carries out a similar function of verifying the value of imports for import duty purposes in many countries. While the cost of SGS's services may rise if it were required to carry out the necessary market price checks in export destinations, it could well offset all or part of this cost by generating more log tax through a reduction in transfer pricing.

Some time in the future all parties involved in forest logging may be evenly enough matched to do without an 'honest broker' but for the time being the support provided by monitoring and advisory services would appear essential to the smooth and efficient operation of large and perhaps medium scale forest industries in Papua New Guinea.

The institutional changes that would facilitate outsourcing are now discussed.

Although the current *Forestry Act* provides for the registration of consultants, a desirable modification might be to specifically license those who have the professional expertise and experience to undertake tasks at an operational level. These tasks include the preparation of working plans, certification of the accuracy of inventories and harvesting yields, and confirmation of compliance with specified standards for forest management. Licensees might be contracted by either the NFS, the developers, or, hopefully, the resource owners. Such a group of 'licensed foresters' would be subject to periodic audit by the NFS. Serious transgressions could be controlled by legal action and/or the temporary or permanent suspension of the licence. Current models for issuing licences and enforcing compliance might include those for the legal and medical professions.

In a broader strategic planning and research context, the nation's universities appear to be very much underutilised in terms of their potential to provide services to Government departments and agencies. While they have been singled out here as having the potential to provide some outsourcing functions for the NFS, their possible broader role in national development should also be considered. They have some inherent characteristics which, when drawn out by leadership, enable them to do certain tasks much more efficiently than either Government agencies or private companies. The nation's technical elite is in the universities: their students potentially provide a well motivated, educated and relatively inexpensive labour force for research. Both students and staff can benefit significantly from work on projects that have real significance for national development. Although the universities are already set-up to undertake consulting activities, greatly expanded responsibilities for research and extension by the universities may require an overhaul of their administrations.

5.5 Conclusion

It was suggested in this section that constitutional interpretations, particularly concerning the rights of landowners and the role of the state, have an important bearing on the structure of the industry and on the nature of the services provided. This section has served to open the debate about the effective method of forest service delivery, taking account of socio-political contexts in Papua New Guinea. A review of the services and actions necessary to ensure sustainable forest management, and the detailed specification of the deployment of human and financial resources required, remains a future challenge.

Conclusions and recommendations

Macroeconomic stability, economic recovery and improved governance are essential for attracting private investment in forestry in Papua New Guinea. In the current fiscal context, significant government support for the wood processing sector is hard to justify. However, increasing domestic value added is a legitimate goal and more attention should be given to how a viable and economically competitive wood processing industry can be created in PNG, without putting undue pressure on government resources or undermining incentives for sustainable forest management.

Customary land tenure is both a defining characteristic of Papua New Guinea and a significant constraint on land development, including sustainable forestry. The lease, lease-back system may be an effective instrument to overcome barriers inherent in customary land tenure and encourage private investment in forestry, while ensuring that the benefits of land development are shared equitably.

The log export tax should be retained and denominated in kina as an effective instrument for extracting resource rents. However, the revenue system should be revisited so that customary landowners receive a fairer (larger) share of the rents from logging. Moreover, the tax structure should be adjusted to account for the costs of production, so that private harvesters are assured of at least normal profits. A reformed tax regime should also incorporate a fixed base rate per cubic metre, reflecting average environmental damages from logging.

The cutting cycle proposed under Forest Management Agreements is unlikely to be socially or economically sustainable. An alternative approach would acknowledge that customary owners have ultimate control over their resource, and would allow open competition between those wishing to exploit or conserve forest resources. Under such a system Government would continue to impose taxes and monitor and control both log exports and logging practices.

Severe fiscal and human resource constraints within the PNG Government demand innovative responses. Opportunities exist to make more use of private contractors to provide routine forestry services, including export monitoring and field supervision. Contracting out these and other forestry services on the basis of competitive tenders could alleviate pressure on government budgets and personnel, while improving efficiency. Potential cost savings from contracting out, and related reforms, are estimated at between K6 and 12 million per annum.



Forest certification and promotion of small-scale 'eco-forestry' may be a more cost-effective means of achieving conservation goals than the creation of new protected areas (although these are also required). However, the costs of certification are presently high while the market benefits are limited. Subsidies are required if village-based groups are to embrace certification and small-scale logging for export. These subsidies may be justified in part by environmental benefits, as well as local capacity-building and other social benefits. However, so far, the burden of supporting small-scale forestry in PNG has been borne mainly by foreign NGOs and donor agencies, with only limited support from Government. This external support may be difficult to sustain over the long-term.

Government must play a more active role in managing small-scale loggers and wood processors, to ensure that they conform to approved management standards. The limited information available on the activities of unregulated small-scale forestry in PNG suggests that a programme of licensing, training and extension is required, similar to that in Vanuatu. Such a programme could be contracted out to certified independent foresters that also monitor industrial logging.

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