FORESTRY AND ECONOMIC DEVELOPMENT IN PAPUA NEW GUINEA

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Abstract

This paper suggests that Papua New Guinea's national income would grow much more rapidly if its largest natural resource, its forests, were developed to their full potential subject to both sustainability and reasonable conservation of biodiversity. Data will be provided showing that plantation forestry could deliver exports worth more than the country's total mineral exports in 2003 from an area of only a seventh of the total under forests. Suggestions for necessary legal and institutional changes for this to occur conclude the paper.

Helen Hughes (2004: 1) proposes economic reforms that "could put Papua New Guinea on an annual growth path of 7 per cent a year that would double its GDP every decade". That is certainly not an unreasonable ambition, since such rates have been and are being achieved by many countries in South-east Asia, including Malaysia, Singapore, and Thailand, not to mention China. Moreover, when Papua New Guinea's total GDP growth rate, as measured in Australian dollars, has been nearly 6 per cent per annum since 1975, 7 per cent ought to be attainable (Curtin 2004). But the ambition seems unlikely to be attained if the country follows Hughes' advice against relying on development either of mineral resources, such as the Gas-to-Queensland project, because such projects "create only economic rents that provide revenues for a swollen government and public services", or renewable resources like timber, because of the "depredations of timber exporting companies" (ibid: 2-3). These are rather sweeping statements -- the government does manage to pay some 30,000 teachers, many of whom do teach rather than absent themselves (which is a problem especially in non-mission schools in many rural areas), and the "depredations" of timber exporters have been much exaggerated, as will be shown below.

Hughes goes on to show how Papua New Guinea's merchandise exports per capita, at US$324 in 2002, are a small fraction of those of Botswana and Malaysia, yet in decrying the Somare government's attempts to revive growth of mineral resource exports, ignores the fact that Botswana's exports are dominated by diamonds with a much higher per capita value than Papua New Guinea's total mineral exports, whilst Malaysia's include a

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significant contribution from logging, which Hughes, like the World Bank, is wholly opposed to in Papua New Guinea. Although log and sawn timber exports are now less than 2 per cent of Malaysia's total exports, they were ten times larger than Papua New Guinea's in 2002. Moreover Malaysia's total exports of logs, sawn timber, wood products, pulp and paper, rubber and products amounted to a staggering US$8.8 billion in 2002, compared with just over US$200 million for Papua New Guinea -- but the World Bank and the NGO community continue to lobby Papua New Guinea against even contemplating development of its largest resource which could well rival Malaysia's timber industry given half a chance.

Helen Hughes (2004: 1) like Satish Chand (2004) emphasizes the apparent zero growth of per capita income in 2003, but adds the claim that "[mineral] resource revenues have also led to waste and corruption, subsidising a small political elite at the expense of investment in roads, health, and education".[2] With many commentators following Chand in anticipating closure (because of reserve depletion) of all Papua New Guinea's current mineral projects except Lihir Gold Ltd by 2012, Hughes looks to land tenure reform and massive expansion of the oil palm plantation sector as both the source of compensatory export revenues and the drivers of her 7 per cent growth rate target, suggesting that oil palm exports could grow at 30 per cent a year and replace oil and mining as the country's biggest exports.[3]

Michael Bourke (2004) has demonstrated the improbability of this being feasible with the following data:

> The [average] FOB value of crude oil and minerals in 2001, 2002 and 2003 was K5155.4 million The [average] FOB price for palm oil for this period was K1095/tonne. Production of palm oil is about 3 tonnes per hectare of planted oil palm. PNG exports of palm oil in 2003 were 326,900 tonnes. Hence PNG would need to produce 4,700,000 tonnes of palm oil to totally replace crude oil and minerals [from over 1.5 million hectares compared with the present 108,000 hectares].

If anything Bourke was too kind to Hughes -- his demolition would have been complete if he had noticed that her projected growth rate for Papua New Guinea's oil palm exports would within 15 years imply output greater than current world consumption -- and as a result a collapse in the world price. By then the area under oil palm would have to be over 7 million hectares -- another implausibility, as Bourke points out.

Bourke's evaluation is that there is not enough suitable land to permit the massive expansion of oil palm production needed to replace revenue from oil, gold, and copper. However, Kenya's larger agricultural exports from a

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[2] Curtin (2004, 2005) has shown how Papua New Guinea's economic performance has not been as poor as Chand and Hughes have contended, with growth of per capita GDP in current Australian dollar terms having been faster than in Australia since 1975.

[3] Chand and Hughes were both too pessimistic about the dates of depletion of reserves at mines and oilfields in Papua New Guinea. The mines at Porgera and Ok Tedi have both extended their closure dates, and the Kutubu and adjacent oilfields are now expected to continue production until after 2020, without taking into account the proposed gas to Queensland project.

smaller area than is available in Papua New Guinea, including US$1 billion p.a. in horticultural exports, despite a much larger population needing to be fed, suggests that there is scope for significant increases in palm oil and other agricultural production, if not to the extent needed to replace mineral revenues. But it would be necessary to go beyond the present mix of subsistence agriculture and smallholder cash crop production.

Ironically, the primary industry that really could replace Papua New Guinea's mineral exports if they dwindle almost to nil is that which already covers most of the country's landmass -- namely its forests. Exports of forest products, mainly 2 million cubic metres of logs, contributed K415.8 million (5.3 per cent) to total exports of K7.79 billion in 2003, compared with palm oil's K421.3 million, despite the World Bank-imposed export tax system (see below). Forest product exports would have been even smaller if the World Bank had succeeded in its demands that the government should close the Vailala and Wawoi Guavi projects (in Gulf and Western Provinces respectively) as part of its undeclared but obvious intention of terminating all logging in Papua New Guinea (Filer 2000, 2004).

Yet a seriously rich country like Sweden, unimpeded by the World Bank, has been logging at rates of up to 70 million cubic metres a year for the last decade, 35 times more than Papua New Guinea with its much larger forested area (369,000 square kilometres compared with Sweden's 244,000 square kilometres). Moreover Sweden's forestry industry maintains both biodiversity and sustainability. Were Papua New Guinea to attain Sweden's level of output, and there is no reason why it could not, given its equal -- possibly superior -- suitability for softwood pine forestry, then its logging exports could be worth K13 billion, nearly double *total* exports in 2003, which would therefore much more than compensate for the projected decline in mineral exports after 2010.[4]

New Zealand is another country that owes much of its high standard of living to its development of its forestry resources, with annual production of 2.5 million cubic metres of sawn timber and 15.6 million cubic metres of roundwood that was used in the production of 2 million tonnes of wood pulp and paper a year in the 1990s. Thus New Zealand's loggers produced nearly ten times as much as Papua New Guinea's in the 1990s, but from a forested area that is only seven per cent of the country's smaller total land area. In 1993 26,750 persons were engaged in timber related industries -- about three times more than in the whole of Papua New Guinea's mining industry. New Zealand's exports of forest products (excluding newsprint) contributed 10 per cent of its total exports in 2002, and amounted to NZ$3.5 billion (about K6.6 billion, more than Papua New Guinea's *total* exports in 2002).

Interestingly, the share of natural forests in New Zealand's production of roundwood dropped from 6 per cent in 1988 to one per cent by 1993, with

[4] Sweden's total land area is 450,000 square kilometres, similar to Papua New Guinea's, and its population is 9 million (July 2004). Sweden produced 17 million cubic metres of softwood lumber and 35 million cubic metres of softwood logs in 2003. Sweden also produced nearly 1 million cubic metres of temperate hardwood.

plantations more than compensating, since total output increased by 50 per cent in that period. This is a natural progression that has hardly begun in Papua New Guinea, in part at least because of the difficulty in securing government approval and landowner participation in the required transition, as plantations with their long rotations require long-term leases if investors are to come forward and finance them.

A recent New Zealand case study provides yet more evidence of Papua New Guinea's failure to develop its forestry resources to their full potential. A plantation including the Kaingaroa Forest near Mount Maunganui acquired by Fletcher Challenge Forests in 2001 was projected to yield log sales of 4.5 million cubic metres of radiata pine and other species in 2004, and a further 0.8 million cubic metres of manufactured timber products -- all this from 162,173 hectares, or about 5 per cent of Papua New Guinea's forested area. The log sales alone were projected to be worth NZ$427.5 million, about A$388 million or K947 million, compared with Papua New Guinea's total log exports worth K370 million in 2003 (Fletcher Challenge Forests 2002: 94-95).

In another example from New Zealand, Fletcher Challenge Forests was notably successful in both its owned and its leased plantations, and in 2000 earned US$88.8 million from sales of 1.48 million cubic metres of log sales grown on just its owned 110,000 hectares. If Papua New Guinea produced as much *pro rata* from only 5 million hectares of its total forest area of well over 30 million hectares, its log exports would be worth US$4 billion, or K13.5 billion, more than double its actual mineral exports in 2003.[5]

Also pertinent, in terms of both opportunity and difficulty, is Fiji's experience. Its total indigenous forest area is around 760,000 hectares (of which 200,000 hectares is production forest, with standing volumes of 30 cubic metres per hectare or more, 260,000 hectares non-commercial forest, and 300,000 hectares protection forest on steep slopes).

Fiji has established comparatively large plantation forests. Around 45,000 hectares are under pine (managed by Fiji Pine Ltd), whereas about 50,000 hectares has been planted with broadleaf species such as mahogany (managed by Fiji Hardwood Ltd) (GTZ 2002). The Government of Fiji had begun planting pine on degraded grasslands in the 1950s, in an effort to rehabilitate the land and prevent further soil erosion. The areas planted are leased from local landowners. During the 1970's, Fiji Pine carried out plantings on the two main islands, Viti Levu and Vanua Levu. The long-term objective of this programme was to supply a timber-processing plant in Fiji to supply domestic and export markets. Simultaneously, small-scale plantings were being encouraged at village level in remote areas of the two main islands and the smaller more distant islands. These plantings were supported by the extension services of Fiji Pine Ltd., aiming to promote planting of pine

[5] This calculation uses the price obtained by Fletcher Challenge's log exports (mainly radiata pine) of US$60 per cubic metre in 2000, compared with the average price (f.o.b.) of US$73 for Papua New Guinea's exports of tropical hardwoods in 2000 (see Fletcher Challenge Forests 2000 and Bank of Papua New Guinea *Quarterly Economic Bulletin*, December 2003).

on unproductive land and to maximise the returns from these plantations for the landowners.

In the early 1980s, Fiji Pine Ltd set up Forest Development Service Ltd to administer the timber-processing plant at Drasa (western Viti Levu), which would be responsible for processing timber from all large-scale plantations within a 100-mile radius. Small-scale plantings have reached maturity and are ready for harvesting. Unfortunately, they tend to be outside the 100-mile radius of the Drasa plant and, with the small volumes available, harvesting and processing are difficult and expensive. The former Fiji Pine Commission was corporatized in January 1991. Fiji Pine Ltd is now a public company wholly owned by Government and landowners, and headed by a Chief Executive who reports to a Board of Directors. There are two fundamental questions: whether it can be both financially viable and economically efficient. Although it has a modest operating profit, it has not reached the point where is can meet operating costs, development expenditure and debt service obligations from internal revenues. If concessional finance is secured and if the Vanua Leva resource is developed (52,000 hectares of plantation) and exploited, the company will achieve its modest target financial rate of return of 3 per cent (DFID 2004).

The above summary account of Fiji's forestry -- based on reports by aid agencies like DFID (2004) -- leaves out the political dimension in which efforts by an American entrepreneur, Marshall W. Pettit, in association with the Fijian businessman George Speight, to take over and amalgamate Fiji Pine and Fiji Hardwood led directly to the partially abortive coup attempt by Speight in 2000, after he had been blocked by the then prime minister from achieving his aims (Kahn 2000). Politics aside, the main economic problem appears to be the low level of profitability at Fiji Pine, which largely stems from low yields because of poor soils, extended droughts with associated fire hazards, and the small scale of operations, with only around 45,000 hectares of pine and mahogany respectively planted. The potential for much larger areas to be planted in Papua New Guinea, along with better soils and higher rainfall, would suggest that the Fijian model of direct landowner participation in ownership and management could be successfully transplanted.

It has to be said that landowner problems could be as fraught in Papua New Guinea as in Fiji in 2000. But while efforts by landowner companies in the former to involve themselves directly in extractive logging have all been failures, that was largely because such ventures were all based on logging the natural forest and did not contemplate plantation forestry. For example, Mullins (1994: 44-72) has described how the Kumil timber project in Madang province failed despite the setting up of a landowner company (Ulingan Development Corporation, UDC, in which 74 clans had a total of 76 shares) to receive the government's timber permit in 1984. UDC then engaged a succession of logging contractors who all failed to deliver on expected log harvest targets, mainly because of a combination of falling world prices, exacerbated by the strong kina policy (so that kina values of realised export values were less than the US dollar equivalent at the time), with the very low yields (at best only 36 cubic metres per hectare) and extremely mixed range

of species in the Kumil area (Mullins 1994: 52-53). Leedom (1997) provides an account of similar failures of cooperation between landowners and the logging contractor at the Hawain logging project in East Sepik -- but again the low achieved yields (only 13 cubic metres per hectare) meant that the project's cash returns disappointed all the stakeholders. By contrast, New Britain Palm Oil Ltd has successfully expanded its area of operations in partnership with local landowners, demonstrating that where there is potential profitability for all, landowner concerns need not be an obstacle.

The potential for plantation forestry in Papua New Guinea will be evident from the yield data from the *Silvicultural Manual for the Solomon Islands* (Chaplin 1993). Planting logged areas at a rate of 100,000 hectares a year, with a conservative rotation of 20 years, and logging old growth prior to planting to finance working capital, by 2025 it would be possible to harvest 100,000 hectares a year, which at an average yield of 250 cubic metres per hectare -- 7 times larger than at Kumil -- generates timber of 25 million cubic metres a year, worth US$2.5 billion at only $100 per cubic metre (as against the US$200 per cubic metre earned by Malaysia's kwila exports in 2004 -- kwila being a species that is also widespread in Papua New Guinea). That exceeds the value of Papua New Guinea's mineral exports in 2003, and would use only 3 million hectares of the 15-30 million potentially available for plantations.[6]

This demonstration that Papua New Guinea's forest resource has the capacity to yield much more than the total income the country currently derives from mineral exports seems to be so politically incorrect that the income generating potential of plantation forestry could not be mentioned either in the World Bank's loan appraisal (2000) or in the Ausaid/ANU *Rural Development Handbook (*Hanson *et al.* 2001). The latter hardly refers to forestry in any province, and not at all in Madang, where the Gogol woodchip project eventually led to significant landowner participation in timber production for the Jant woodchip mill in Madang town. Yet the gross export value *per hectare* of forestry was as much as US$36,000 in 1997 (PNGFP 1998), and from coffee only US$1,642.[7] But then authors of recent World Bank reports on agriculture and forestry in Papua New Guinea seem wholly unaware of the concept of yield that most Papua New Guinean subsistence farmers appreciate rather well.[8] Even the Papua New Guinea Forest Authority (2004) recognises that its klinkii pine plantation at Bulolo has yields about ten times larger than those of most natural forest logging operations, at around 250 cubic metres per hectare against, for example, the 26 cubic metres that was hoped for by the Rimbunan Hijau logging project at Hawain in East Sepik,

[6] Sohngen *et al*. (1999) cite mean timber yields (annual increment rates in cubic metres per hectare per annum) of 17.4 in Oceania and 11.43 in Asia-Pacific in 1990; these imply rotations of between 15 years and 22 years to achieve harvests of 250 cubic metres per hectare.

[7] Equivalent figures for 2003 are US$13,950 for timber and US$520 for coffee.

[8] For example, the World Bank's (1997) report on 'accelerating agricultural growth' in Papua New Guinea never discusses yields of alternative crops either relative to each other or to plantation forestry. Likewise, the earlier World Bank report on the forestry sector also fails to compare the opportunity costs of plantation forestry with those of agriculture in a country whose primary resource endowment is forests whilst downplaying the prospects for the former (World Bank 1990: 26) and ignoring them completely in its section on "maximizing returns to the forestry sector" (ibid: 29).

where its actual yield in 1993-94 was only 13 cubic metres per hectare (Leedom 1997: 63). Yet the Forest Authority has made no attempt either to replicate the Bulolo plantation elsewhere on its own account or to encourage a shift to plantation silviculture by the resource owners themselves.

Not one of the many fine full-colour maps of each province's subsistence agriculture and land potential in the *Rural Development Handbook* (Hanson *et al*. 2001) shows either the topography or the extent of forested areas. Both are surely critical for assessing the scope for yet more subsistence agriculture, and especially for determining the trade-offs between forestry activities and agriculture when both compete for the same land. Hopefully, a future second edition would address this by collating the forestry location maps from the *National Forest Plan 1996* with the maps in the *Handbook*. Comparing the respective maps for Sandaun Province (see Curtin 2004, Figures 4 and 5), one may note how the potential for forestry just inland from the coast east of Aitape would not compete with the main agriculture in the province, which is low intensity sago production in the most populous area around Lumi, south of Aitape. The *Handbook* fails to mention either the low welfare level of subsistence based on sago or the potential of plantation forestry to generate employment and high cash income per hectare, despite concluding that the people of Sandaun have "very low incomes, poor access to services [and] have few opportunities to improve their livelihoods" (Hanson *et al.* 2001: 229).

The neglect of forestry in the *Rural Development Handbook*, despite its focus on smallholder agriculture, is as surprising as the absence of any specific measures to raise incomes from forestry either in the World Bank's proposal in 2000 to offer a Forestry and Conservation Loan Agreement to Papua New Guinea of US$17 million or in the (2004) report of its Forestry Review Team to the government's Inter-Agency Forestry Committee.[9] The World claimed that the loan would generate financial and economic rates of return of 21 per cent per annum. That would have been unlikely when its main components consisted of allocating US$6.4 million to improving landowner decision-making through training workshops and seminars, and US$4.68 million for "technical assistance" to the government's Office for Environment and Conservation. A further US$7.26 million of the project loan was to fund the Forest Authority to expand its "inspection and monitoring" (World Bank code for prevention, see Filer 2004) of forest operations (World Bank 2000: 36-40). Given that the proposed loan required payment with interest at the World Bank's usual commercial fixed spread rate, commitment fees (0.85 per cent per annum for the first 4 years), and front-end fee (1 per cent or US$0.1736 million), the Government of Papua New Guinea did well not to accept this loan, with its highly unlikely capacity to generate sufficient tax revenue to enable the government to repay the full loan which with interest could well be US$35 million. Fletcher Challenge Forests provided for taxes of US$15 million in 2000, but the Bank's loan appraisal never mentioned any tax being generated by its project for the good reason that there could be none --

[9] The World Bank formally cancelled the loan in May 2005 following the Papua New Guinea government's refusal to meet all its conditions.

least of all from the advisers it was proposing to fund from the loan's technical assistance component (US$7.37 million).

Colin Filer (2000) has documented the repeated efforts of the Papua New Guinea government to engineer replacement of log exports by processed timber products, as urged by the Barnett Inquiry (1989). Lacking that theology, New Zealand's Fletcher Challenge Forests sold 3.5 million cubic metres of logs in 2000, and only 0.6 million cubic metres of manufactured products, directing more than half of its logs to processors in Japan, Korea, and other industrial countries, while less than half was taken up by industry in New Zealand. In general, it is difficult for exporters of raw materials to know in detail the specific requirements of consumers in importing countries for the finished product, which explains why New Zealand's exporters have been content to export raw rather than finished products. This provides a measure of the opportunity costs Papua New Guinea incurs by not developing its forest resources. But because most forest licences issued in Papua New Guinea are not only issued for short periods and have no certainty, being either terminable at will by the Government whenever it has been required to do so by the World Bank or subject to the penal export tax rates also imposed by the World Bank in its 1996 Structural Adjustment Programme (see below) there has been little incentive for licensees either to undertake sustainable logging of natural forest or to replant on a plantation basis (Filer 1998: 367-8).

Now if Papua New Guinea chose to follow the example of countries like Malaysia, Sweden, and New Zealand by exploiting its largest resource to its full potential, what would need to be done to begin that process? The first step would have to be amending the *Forestry Act* 1991 and reverting substantially to the legislation previously in place, notably the *Forestry (Private Dealings) Act*. The Forestry Act was largely a response to what in retrospect seems the half-baked Barnett Report, with its exhaustive exposure of alleged "depredations" through the claimed transfer pricing of foreign logging companies.[10] But instead of seeking to strengthen the capacity of the customary owners of Papua New Guinea's forests to negotiate directly with logging companies to secure an equitable share in logging revenues, the 1991 Act in effect nationalized the country's forests, and reduced the role of the supposed owners to being no more than spectators of the exploitation of their largest single source of wealth (see Lea 2005). The 1991 Act would have made a real contribution to improved management of Papua New Guinea's forestry resources if it had put in place mechanisms to allow for ownership of *designated areas* to be vested in landowner *companies* rather than the "incorporated land groups" (ILGs), because the Act governing the latter makes no effort to define the land to which the ILGs lay claim. In addition the

[10] On closer inspection, much of Barnett's evidence of transfer pricing was false, mainly because he failed (apart from a cursory mention) to allow for freight costs when comparing c.i.f. log import prices in Japan with f.o.b. export prices in Papua New Guinea. Malaysian and Papua New Guinean log export prices tracked each other very closely in the 1980s and showed the same difference from Japan's import prices (see Curtin 2004, Figure 3). Duncan (1994: 20) also found very little evidence to support Barnett's claims of either transfer pricing or under-reporting of volumes exported prior to 1994.

ILG Act has vastly inferior governance and accountability provisions compared with those in the *Companies Act* 1997.

One of the key weaknesses of both the *Forestry Act* 1991 and the *Incorporated Land Groups Act* is the failure to establish a mechanism for defining the ownership of specific land areas, which has meant that any number of ILGs are able to lay claim to identical stretches of forest. For example, when the Ramu Sugar estate was being established, negotiations took place with "landowners" residing in the area. Subsequently a group at the coast claimed that they were the original and "true" owners and sought a court judgment based on custom.

The failure arose partly from undue reliance on "custom" to settle issues of underlying ownership, and partly from a general unwillingness (e.g. Fingleton 2004) to accept that while customary land tenure in Papua New Guinea provides for individual usufruct and ownership of homes and gardens, so such areas are not owned "collectively" or "communally", the forests are classical "commons" in the manner understood in Europe before the nineteenth century, with no rights of exclusion such as apply to individual usufruct gardens and other cultivated areas (see Curtin 2003).

Ironically, significant transfer pricing of the kind claimed by Barnett (1989) and used to justify the regulatory regime imposed by the 1991 Forestry Act only emerged after the World Bank required Papua New Guinea to impose a progressive export tax in 1997, resulting in sharp reductions in both volumes and declared prices as compared with Malaysia's at the same time. The effective marginal rate of the log export tax is easily as much as 110 per cent of normal profits, for a normal gross profit margin on sales value of K100 per cubic metre could be 30 per cent, but until 2004 the log tax rose to 30 per cent of marginal sales value when prices rise are between K110 and K130 per cubic metre, 50 per cent between K130 and K150, and finally 70 per cent on the excess of prices above K200.[11] That explains why *declared* log prices have fallen since the Bank's tax came in from as much as $170 per cubic metre in 1996 to as low as US$70, with a consequent loss of foreign exchange earnings as well as tax proceeds far below what they would be in a more honest system, based on corporate tax at PNG's current rate of 25 per cent for non-mining profits.[12]

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[11] Fletcher Challenge Forests' revenues were only 6 per cent and 13 per cent larger than operating costs in 1999 and 2000 respectively. Had it been subjected to even the World Bank's lowest 15 per cent tax rate on its exports it could have been put out of business (Fletcher Challenge Forests 2000: 27).

[12] It has been claimed (by Jim Douglas amongst others) that the World Bank's initial forest revenue system might not have had the severe impact on declared export volumes and prices after 1997 had it been imposed as originally intended on US dollar export prices rather than the Kina equivalent price applied by the Papua New Guinea Forest Authority and Customs, especially when the Kina was depreciating rapidly. However, it is likely that higher rates would have been charged if the US dollar price had been the applicable base following the fall in international prices in 1998 -- using the declared log prices below US$100 since 1998 as the tax base, the Bank's progressive tax rates would have generated zero revenue. That is why, when the tax base was changed to US dollars in the 2004 Budget, the nominal rates were drastically changed to match the lower US dollar prices (see Curtin 2004, Tables 3 and 4).

The export tax system imposed by the World Bank is a levy that is more than proportionate with rising prices of log exports above a very low level. Now most economists agree that:

1. General Sales Taxes (GST) and the equivalent Value Added Tax (VAT) should be levied at a standard (i.e. without exceptions or variations) rate, as with the 10 per cent GST in Australia and the restyled VAT in Papua New Guinea.
2. This means that specific taxes on particular export commodities should be avoided - and in practice GST/VAT systems not only exempt all exports, since most countries seek to encourage exports, but also provide for refunds of VAT incurred on inputs used to produce exports.

The World Bank (1999a: 67) recognized that discriminatory taxation of logging exports was inconsistent with the standard economy theory of taxation, but excused its progressive export tax on the grounds that the country's Internal Revenue Commission (IRC) was not capable of collecting corporate taxes from the log exporters. A simpler solution to that problem would have been to use the US$1 million p.a. the Bank spent on its consultants in Papua New Guinea's Forest Authority to provide the same number of tax auditors to the IRC. Even just one would be enough to see to it that companies like Rimbunan Hijau paid their due taxes on their profits derived from log exports. The World Bank's further justification of its log export tax (1999a: 66-67) claiming that the fall in log exports in 1998 and 1999 was not due to its tax but to the regional economic crisis of 1997-98 contrasts with Malaysia's strong forest product exports in those years.

Some authors, including both Duncan (1994) and the World Bank (2000), justify penal log export tax rates as the means whereby the Papua New Government can capture "resource rents" whenever prices rise above prescribed levels. Ironically, the same authors and many others decry rent-seeking behaviour by Papua New Guineans, especially putative landowners in the mineral project areas. Garnaut and Clunies Ross (1983) proposed progressive mineral taxation (known as the "additional profits tax" with rates rising to 75 per cent for petroleum projects) for the same reasons and secured its adoption in Papua New Guinea, albeit in a modified form which means that it has seldom been operative. Mainstream economics deplores *all* rent-seeking and sees the perfectly competitive model as the means whereby it can and should be eliminated, since optimal levels of production will not be attained while rents persist. Mainstream economics proposes, instead of rent-seeking taxation, use of lumpsum transfers from rich to poor to secure desired income redistribution, since such transfers do not affect production levels. Most countries' corporate tax system is consistent with this approach, with a flat rates of say 30-35 per cent on companies' profits whichever sector they might be operating in, with progressively higher marginal rates applying only to individual incomes. The underlying naiveties in the Garnaut and Clunies Ross case for additional profits taxation are, first, that it is inimical to profit maximization (attainable only with flat rate corporate taxes) because of its progressive character, and second, their failure to appreciate that since public

companies sooner or later distribute profits to their shareholders, it is taxation of the latter that may be used to achieve social objectives.

Conclusion

This paper has shown the enormous potential of Papua New Guinea's forest industry for generation of vastly higher incomes for a high proportion of the country's population. Within space confines it has not been possible to include a full discussion of how land tenure issues might complicate the development of plantation forestry in Papua New Guinea, but these are taken up in Curtin (2003) and Lea (2005). Fingleton (2004) argues that Papua New Guinea cannot be viable without customary land groups, while Hughes argues that it cannot be viable while full property rights are denied to agricultural producers (see Gosarevski et al. 2004). Both are probably wrong: the expansion of oil palm planting in areas not owned but directly managed by New Britain Palm Oil Ltd shows that individual land titling is not a necessary condition for commercial large scale production, whilst clearly the existence of thousands of incorporated land groups has done little for production in most of the country. New Britain Palm Oil's leasing arrangements could well serve as a model for plantation forestry.

The production and other data cited above from New Zealand and Solomon Islands showed how it is feasible for Papua New Guinea to generate exports from plantation forestry to a value double its present total exports. Doubling exports would of itself generate at least a proportionate increase in national income and GDP and thereby a doubling of average incomes from the present (2003) US$673-760 (depending on actual population) or A$1035-1169 to about US$1400 or A$2200 (discounting growth from any other source). That could be achieved within 10-15 years if plantations were developed on the rotation basis that the World Bank's first forestry report (1990: 24) considered feasible. Ironically, given the World Bank's later hostility, that would also allow Papua New Guinea to achieve most of the "Millennium Development Goals", such as reductions in the 1990 levels of infant mortality by two-thirds and attainment of universal primary education.

To achieve such an outstanding result would require the following actions:

1. Amendment of the *Forestry Act* 1991 to provide for registration and demarcation of forested areas in favour of those with customary claims thereto without prejudice to retention of current customary ownership of individual homes and gardens.
2. Repeal of the restrictions in the *Forestry Act* 1991 on customary landowners' ability to negotiate timber sales agreements, and their replacement by new legislation to provide for (i) enabling provisions for landowners to enter into long term leasing arrangements including to their own wholly or partly owned plantation companies, (ii) public auctioning of timber rights exclusively to public companies registered in Papua New Guinea and listed on the Port Moresby Stock Exchange, with special voting rights for landowners as "Class A" shareholders being a

possibility, and (iii) public auctioning of logs offered for sale to exporters by the public companies in (ii).[13]

3. Amendment of the *Land Groups Incorporation Act* to provide as a minimum for re-registration of those Incorporated Land Groups Act with a prescribed minimum level of fully paid-up capital as public companies under the *Companies Act* 1997 together with other changes to secure greater accountability of managements to their stakeholders, the landowners themselves (see Lea 2005).
4. Cancellation of all log export taxes, and increased staffing of the Internal Revenue Commission to undertake annual tax audits of all firms engaged in the forest industry in order to secure compliance with the *Taxation Act*.

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