

Forest Exploitation in Papua New Guinea

Simon Saulei

Papua New Guinea has a total land area of 46.2 million hectares and a population of about 4 million people. Of this land, 97 percent is privately owned by the customary owners. Forest covers some 78 percent or 36.125 million hectares of the total land mass, ranging from mangrove forests along the coast to alpine forests at higher altitudes. About 15 million hectares of these forests are considered operable (commercial) forests. However, some uncertainty exists about the exact acreage of the operable forest because the figure of 15 million hectares was estimated from aerial photographs taken by the Australian military during the war (1944–45) and in the early 1960s, making them about fifty and thirty years old respectively. Further, much of these areas has since been cleared for agriculture, infrastructure, mining and oil exploration, and by logging operations. Of the 36.1 million hectares of forested land, 35.563 million hectares are broadleaf forests, 520,000 hectares are coniferous, and 42,000 hectares are plantation forests (World Bank 1990).

Although Papua New Guinea's forests account for only 1.5 percent of the world's tropical rainforests, they are outstandingly rich in diversity by global standards. Few species of plants or animals are considered endangered, but this could be a consequence of incomplete inventory. The conservation and commercial value of this rich gene pool is considerable. The forests offer many natural resources of commercial, subsistence, cultural, and scientific importance. In terms of timber production, the country's forests contain more than two thousand species of trees, of which about four hundred are known to be commercially useful.

Past forestry legislation allows for the harvest of timber and other forest products through the granting of permits, licenses, authorities, and approvals to private dealings. However, current legislation allows only

two types of license: permits and authorities. The maximum annual allowable cut under all concessions at present represents 4.6 million cubic meters, but the actual total annual harvest has been less. In 1991, the harvest up to September was 1.2 million cubic meters.

The export of timber in unprocessed form (logs) is by far the largest activity of the timber industry, representing over 80 percent of all forest-product exports. There are currently some forty log-exporting operations. To correct this apparent imbalance between the high level of log exporting and the low level of processing, the new National Forest Policy includes measures to encourage and require onshore processing. At present, the timber processing industry in the country includes about 50 large sawmills, 1 plywood mill, 1 woodchip mill, and 27 furniture-making factories and joineries. In addition, there are more than 400 small, mobile sawmills scattered across the country.

Since about 97 percent of the land in Papua New Guinea remains under the ownership of the traditional owners through village clans, almost all rainforest areas are owned by them. Access to land and ownership of land together with its resources are important for the people's day-to-day subsistence. Land is also a major determinant of wealth and status. By law, development of forest resources must be carried out with the approval and participation of the local owners.

Experience has shown that landowners' concerns about royalty payments, environmental degradation, and lack of opportunities for meaningful participation in development projects, can lead to disputes that in turn can slow down or even halt a project. Landowner companies are being formed to give local communities greater control over forest development.

In this paper, I give a brief account of forest exploitation in relation to changes in forest policies and acts of parliament, acquisition of forest resources for development, forestry, and economy, future sustainability, and the associated problems.

BACKGROUND TO PRESENT FOREST DEVELOPMENTS

Although the first colonial government in Papua was established in 1884, the first forestry activity was not initiated until 1908, when an Australian forester made a brief appraisal of the timber resource. A timber ordinance came into effect in 1909 in both territories—Papua and New Guinea. The

first commercial sawmill began operations at Ulamona, West New Britain Province, in 1898. In the period before the Second World War, C E Lane-Poole, an Australian forester of worldwide reputation, visited Papua New Guinea as a consultant to the Australian Government. He reported that there was potential of a high order, but no immediate prospect of profitable sawmilling. In 1937 a Forestry Ordinance was enacted to control use, establish a forest industry, and acquire and manage a forest estate. This superseded the 1909 legislation, which had been found inadequate. In New Guinea, nine small sawmills were operating at the beginning of the Second World War and an export trade of *Dracontomelum* logs, mostly to the United States, had begun in 1937. The volume exported had reached 16,500 cubic meters by 1940–41. During the latter part of the war the large demand for round timber and lumber by the Allied Forces caused the establishment of many logging and sawmilling operations, and more than 188,000 cubic meters of sawn timber were produced between 1943 and the end of the war in August 1945.

Perhaps more important was the establishment by the Australian Army of a forest resource survey unit, which inventoried the forests of the northeast coast of the mainland, parts of the Bismarck Archipelago, and the North Solomons. Aerial photo interpretation supplemented field reconnaissance. During these surveys more than 9,500 botanical specimens were collected, forming the basis for the National Herbarium at Lae. Earlier German collections had been housed in Germany, and most were lost during the war. Using these data, J B McAdam, the first director of the newly constituted Forestry Department, stated that there was a possible resource of 90 million cubic meters in accessible forests in Papua New Guinea.

Throughout the 1940s and 1950s a program of resource assessment continued, but the main emphasis was on supporting postwar reconstruction through the operation of the two government sawmills, at Yalu near Lae and at Kerevat near Rabaul. Each mill produced about 4,000 cubic meters of lumber per year, the Yalu mill from 1947 to 1962, and the Kerevat mill from 1946 to 1958. Reforestation projects were begun at Bulolo, Kerevat, and later at Brown River near Port Moresby. In 1957 a forest policy was announced whose seven main elements were acquisition and reservation of a permanent forest estate, establishment of a training center, establishment of a research institute, reforestation with a strong bias toward grassland reclamation in the highlands, timber use research,

continuing botanical collection and identification, and promotion of the timber industry.

By 1960 well over two thousand people were employed in the timber trade, which represented half the total labor force in factory employment in the country. Caution was still expressed about the rate of expansion of exploitation because inventory data were considered inadequate—a caution that with the advantage of hindsight was only too well justified. The forestry program of 1962–1967 paralleled increased exploitation with expansion of reforestation, the establishment of the Forestry School at Bulolo, and an increase in forest stations throughout the country. The major forestry activity from 1957 to 1963 was forest inventory, when some 600,000 hectares were covered by reconnaissance-level surveys, making extensive use of helicopters from 1964 on. By 1975, 4.8 million hectares had been appraised, and all the major areas suitable for exploitation had been identified.

In 1968 a five-year development program, extending from 1968–69 to 1972–73, was announced, with the major objectives of a rapid increase in processing, increased export earnings and employment through local processing, the establishment of a fully integrated forest industry by building industrial complexes within permanent forest estates, the promotion of local equity participation in the industry, and increased training and employment in the timber industry. These programs, plus the strategies recommended by the International Bank for Reconstruction and Development, shaped the course of the industry's development until the policy revision of 1979. The need for foreign skills and finance was appreciated, as was the fact that new processing in most cases would have to be preceded by log exports.

The government had an eight-point improvement program for the entire economy. For the forestry sector, the 1973 Forest Policy and the 1971 "Private Dealings Act" were defined as an expression of these eight objectives, which included increased opportunity for local equity participation in the forest industry; providing direct revenue to resource owners through shares in timber royalties, equity, and employment; developing extension services to promote local participation in forest industry activities, minor forest products, and reforestation; increased opportunities for employment in logging, hauling, carpentry, and other small industries; improving the competitive position of local timber products against imports; improved marketing and prices for exported timber products to generate

more revenue from royalties and taxes; increasing opportunities for female employment in forestry; and the assumption by the Forestry Department of management responsibility for forest resources, to ensure that the national objectives were achieved, that resource owners were fairly treated, and that the industry assumed maximum responsibility for reforestation and use.

Of the major objectives identified, the creation of a permanent forest estate has been the most difficult to implement, not through any lack of effort by the Forestry Department, but because of landownership problems. A gradual increase in the acquisitions of timber rights purchases followed, and to some extent paralleled, the acquisition of land for plantations, peaking in the late 1960s. By this mechanism there was no problem of land purchase, but the rights to the timber were assumed by the government. Initial projects were mainly for log export and, in the case of Madang, chipwood export.

Regrettably, over a period it became apparent that the export of processed lumber rarely showed a profit, for many complex reasons. The main ones include a hard-kina currency policy determined by the far more important nonmanufacturing industries, specifically copper; sizable untied aid from Australia; a regional surplus of processing in the countries of the South East Asian Lumber Producers Association; very high wages in Papua New Guinea relative to its competitors; and small domestic markets that limited the use of lesser known species and of sizes unsuitable for export. Expectations and predictions of forest industry growth made in the early 1970s were not fulfilled, and a series of sawmills closed. The oil crisis of 1973–74 gravely affected the Japanese economy's requirement for processed products, and Papua New Guinea was already firmly tied to that market for forest products. This problem, compounded by the others mentioned, forced the Department of Forests to review its strategy.

In 1979 a revised policy, announced by the minister for forests, was addressed to two fundamental areas of the National Development Strategy: that natural resources will be used to generate revenue, and that opportunities for wage earning and self-employment in the rural sector must be expanded. The essential ingredients of the policy were a relaxation of the former stringent limits on log exports, in recognition of the need for the establishment of a profitable industry as a means to increase income for the country; the increased efficiency of existing processing

(and any firmly committed to be built); the continuing encouragement of investment from foreign companies with a proven ability to process and market forest products; and the establishment of Forestry Development Corporations.

As a consequence of this policy change aimed at increasing foreign exchange earnings through increases in the export of round logs, large tracts of natural forest lands were destroyed. The log-export trade was characterized by the dominance of a few foreign companies with strong commercial links abroad and often working as subsidiaries to their overseas principals. Coupled with the increases in export logs, the returns to the resource owners, and also to the state, were minimal. Much of the revenue due was lost through transfer pricing, undervaluing of timber through misidentification of tree species, gross mismanagement of logging operations due to lack of monitoring, and an almost complete absence of locally owned international log-trading institutions.

In 1989, then Prime Minister Pias Wingti, through the National Executive Council, established a commission to inquire into aspects of the forest industry and to investigate its activities throughout the country. The results of this investigation showed that the industry was “totally out of control” (Barnett 1989). In 1990 the World Bank came to the aid of the government and began to draw up strategies to remedy the situation. Concomitantly, the government, following the results of the Barnett Commission, began to draw up a new forest policy and by 1991 a new Forestry Act had been passed by parliament. Further amendments were enacted in 1993. The new Act basically aimed at changing the trend toward exploitative industry to one of adherence to the principles of sustainable yield management. This aim was further spelled out in the policy, which can be summarized as: the introduction of sustained yield management principles into all aspects of forestry projects; the expansion of research capacity through upgrading facilities and the management of research programs (by determining exact resource availability, types of species, growth increments and yield, and reforestation and agroforestry requirements with different types of effective forest management systems); the strengthening of planning, extension monitoring, and enforcement capacity; provision for adequate data for use in planning, monitoring, and enforcement capabilities before projects are approved; ensuring adherence to procedures of consultation with provinces, resource owners, and other appropriate bodies in forestry planning; ensuring adequate infor-

mation to, and feedback from, resource owners on proposed projects and their potential implications; the establishment of appraisal procedures for investors and other developers involved or to be involved in the industry; the establishment of review procedures for the industry, government institutions, and the decision-making processes in forestry; the establishment of a state marketing agency to ensure competitive international markets; the establishment of a National Forestry Service operating under a board with representation from national and provincial government departments, the industry, and nongovernment organizations; the encouragement of local downstream processing of forest products; and the development of an effective training program for forestry personnel, in both the government and private sectors.

For this policy to become effective, a substantial program of support is required. It involves, among other things, a major restructuring of the forestry administration. Support for this was provided by the World Bank initiative that established the National Forest and Conservation Action Plan, many of whose programs are already under way.

RESOURCE ACQUISITIONS

Since the land and its forest resources are owned by the customary owners, the only way to develop the forest resources is to obtain approval from the owners. To acquire such approvals in a legal manner, the government passed various Acts. Prior to 1991, the state was able to acquire rights for the development of forest resources through timber rights purchases, the Native Timber Authority, and the provisions of the Private Dealings Act.

Timber rights purchases, the main instrument for large-scale forest use, enable the state to acquire the rights over the timber resources of a given concession and then to issue a permit to a selected operator to develop it. Conditions of forest management, environmental protection, and royalty payments are all elements of a permit. The royalty collected is variously divided between the landowners and the provincial and national governments.

The Native Timber Authority permits a person to directly purchase small quantities of timber from a customary landowner. It is a useful tool for clearing fragmented resources on land needed for agriculture.

Under the Private Dealings Act private landowners are permitted to directly dispose of their timber resources to any person, subject to the

Table 1. Resource allocations from the prewar era to the end of 1990

Region and Province	Prewar	Period					Total hectares	Percent
		1951-1960	1961-1970	1971-1980	1981-1990	1981-1990		
Highlands	—	2,373	164,053	611	2,013	169,050	3.61	
Chimbu	—	—	—	—	—	—	—	
Eastern Highlands	—	374	1,474	—	460	2,308	0.04	
Enga	—	997	41,890	—	596	43,483	0.93	
Southern Highlands	—	—	38,000	611	630	39,241	0.84	
Western Highlands	—	1,002	82,689	—	327	84,018	1.80	
Momase	—	25,313	356,567	168,500	447,456	997,836	21.32	
East Sepik	—	25,313	4,157	—	—	28,470	0.61	
Madang	—	—	52,265	45,700	288,588	*39,978	*0.85	
Morobe	—	—	—	122,800	69,842	386,553	8.26	
West Sepik	—	—	300,145	—	448	192,642	4.12	
						300,593	6.42	
						*48,600	*1.04	
New Guinea Islands	17,199	94,100	609,577	427,743	760,449	1,909,068	40.79	
East New Britain	16,369	21,010	162,960	—	217,497	417,836	8.93	
Manus	—	—	—	1,500	13,600	15,100	0.32	
						*19,067	*0.41	
New Ireland	830	80	17,600	81,816	83,690	3,184,016	3.93	
						*131,195	*5.20	
						*112,000		
						*243,195		

North Solomons	—	4,460	49,940	22,650	49,916	126,966	2.71
West New Britain	—	68,550	379,077	190,582	68,181	706,390	15.09
					*196,498	*196,498	*4.20
Southern	—	8,800	275,467	83,288	1,236,907	1,604,462	34.28
Central	—	—	78,070	34,311	170,893	283,274	6.05
					*45,000	*45,000	*0.96
Gulf	—	6,937	40,065	—	453,353	500,355	10.69
Milne Bay	—	1,863	92,221	—	77,013	171,097	3.66
Oro	—	—	48,506	48,977	28,640	126,123	2.70
					*39,930	*39,930	*0.85
Western	—	—	16,605	—	422,078	438,683	9.37
Total	17,199	130,586	1,405,664	680,142	2,446,825	4,680,416	100.00
				*131,195	*501,073	*632,268	
Percent	0.37	2.79	30.03	11.73	41.57	86.49	
				*2.80	*10.71	*13.51	

* Additional allocations under Private Dealings Act license.

Source: Summarized from PNG Department of Forests 1990.

approval of the minister, who must be satisfied that the owners' interests are protected, the agreement does not run contrary to the national interest, and there is a reasonable prospect of economic success.

In 1991, however, the new Forestry Act was passed, superseding the Private Dealings Act and timber rights purchases (which were replaced by the somewhat similar Forest Management Agreement). The Native Timber Authority remained the same, except that it was renamed the Timber Authority.

Under the earlier legislative arrangements, over 4.6 million hectares, or 31 percent of the operable forests, had been approved and allocated for development up to the end of 1990. Further, well over 40 percent of resources allocated were from the New Guinea Islands region, followed by Southern, Momase, and Highlands regions (table 1). The provinces from which much of these resource allocations came were West New Britain (902,888 hectares or 19.29 percent), Gulf (500,355 hectares or 10.65 percent), Western (438,683 hectares or 9.37 percent), and New Ireland (427,211 hectares or 9.13 percent). Most of the pre-war forest activities were based in East New Britain and New Ireland Provinces.

Among the trends observed during the period from 1951 to 1990 was the sudden increase in resource allocations. For instance, seven years after the war almost twice the available resource was allocated for development, and by end of 1990 (a fifty-year period) it had reached over 4.6 million hectares. Much of the increase could be accounted for in terms of the requirements for postwar reconstruction and the 1979 dramatic change in forest policy.

Further, the increases in the periods 1971-1980 and 1981-1990 resulted from the implementation of the 1971 Private Dealings Act, particularly in the New Guinea Islands region, where 243,195 hectares of forest resource in New Ireland and 196,498 hectares from West New Britain were allocated under the Act during those periods. Resources allocated through the Private Dealings Act amounted to 13.51 percent (632,268 hectares) of all allocated forest resource areas.

Figures for the volume of timber extracted were not available, but assuming that the average density is 25 cubic meters per hectare, from the prewar period to the end of 1990 a total of 114,230,500 cubic meters of logs could have been extracted.

FORESTRY AND ECONOMY

Papua New Guinea has an open economy with a large international trade sector. Important primary commodities include coffee, cocoa, copra, timber, and fish, while mineral exports of copper, gold, oil, and gas are significant revenue earners. The open nature of the economy has meant that Papua New Guinea is vulnerable to international price fluctuations and inflationary impulses. In defense, the major macroeconomic strategy has been the “hard kina” strategy, which has been in place since independence. In 1990, however, the closure of the Bougainville mine forced the country to devalue its currency by 10 percent. As a result of several problems, including some structural and cultural ones, its mountainous landscape, and its many islands, Papua New Guinea is saddled with a high-cost economy.

The role of forests in generating revenue for the nation is indicated in table 2. Generally, the forestry sector earns from K15 million to more than K100 million of foreign exchange, or between 5 and 10 percent of the total value of all exports. It is the third most important sector of the national economy, in part because it generates revenue, employment, and infrastructure development, especially in remote areas of the country. The revenue from log exports represents over 80 percent of total earnings, followed by woodchips (9 percent), and sawn timber (6 percent). However, the export of sawn timber has declined as a consequence of the 1979 policy (although it was not the intention), with greater emphasis on the export of round logs, high labor and maintenance costs, low recovery, and the low quality of logs processed.

FUTURE SUSTAINABILITY

The concept of sustainability is not new to Papua New Guinea. Traditionally, many people lived in self-contained communities that were sustained over a long period of time. Some traditional systems, however, have not proven sustainable. Current economic and population pressures increase the risk that some systems may collapse. The present-day dual economy, which involves both market and subsistence activities, places differing pressures on resources. Our people's expectations have increased, and their needs have changed. Because many now seek a transition from sub-

Table 2. Export of forest products by value

Year	Logs	Sawn Timber	Woodchips	Plywood	Chopsticks
	thousands of kina				
1973-74	11,804.3	4,731.1	174.7	3,235.4	—
1974-75	7,307.1	2,719.8	1,512.8	2,645.5	—
1975-76	6,579.1	5,162.9	3,436.9	3,487.3	205.3
1977	10,596.9	5,669.6	4,688.9	2,028.9	551.8
1978	11,933.3	3,725.4	5,447.6	2,371.8	642.1
1979	20,755.1	7,934.9	4,432.2	2,466.6	685.2
1980	31,192.9	6,182.3	7,092.2	2,982.4	1,135.4
1981	31,263.3	3,609.4	5,460.6	3,068.9	1,270.2
1982	49,576.2	3,513.8	5,674.9	2,887.8	862.2
1983	44,053.7	3,161.2	5,922.5	2,464.2	17.0
1984	70,272.8	3,322.1	6,137.8	2,317.2	3.7
1985	30,315.4	1,878.0	2,705.8	332.5	—
1986	70,235.3	1,571.7	5,203.8	123.1	—
1987	105,462.0	863.7	5,990.3	15.8	—
1988	92,551.5	692.5	6,779.4	3.9	—
1989	84,277.7	944.4	5,843.1	—	—
1990	74,627.5	1,290.1	7,092.0	—	—
Total	752,804.1	56,972.9	83,595.5	30,431.3	5,372.9
Percent	81.02	6.13	9.00	3.28	0.58

Source: Adapted and modified from World Bank 1990.

sistence to the market economy, Papua New Guinea must achieve economic growth and social development without degrading the potential of its renewable natural resources.

The challenge is to create opportunities for development consistent with the broad goal of sustainable development that will optimize all benefits from forest use, tangible and nontangible, while conserving the integrity of the forest ecosystem. Therefore, it is imperative that sustainable development of forest resources in Papua New Guinea recognize the critical role of land and forest resources to the country's way of life and, in particular, the importance of simultaneously considering social, environmental, and market demands. The diversity of cultural practices and traditional conservation practices, largely still in place, must be

integrated with the government's objective of achieving "integral human development."

These objectives should maintain biodiversity, the ecological integrity of all natural ecosystems, and the general quality of the environment. To achieve the nation's full economic and social potential, resources must be used efficiently, without detracting from community values, and with equitable allocation of rights of access and opportunities to develop resources. This should include equitable distribution of the benefits of development to the communities. Further, the strategy of sustainable development should avoid changes that might be irreversible and should acknowledge uncertainties about the impact of economic activity on the environment.

PROBLEMS

Papua New Guinea's approach to sustainable development of its natural renewable resources, in particular the forest resources, is at present being addressed through the National Forest and Conservation Action Plan. The notion of sustainable development requires attention to a number of critical problems.

Given that 97 percent of the land and resources are under customary ownership, government allocation of land, together with its resources, for longer-term developments for purposes other than those of the owners is very difficult. Land is owned through clans and claims to it are enforced by cooperative actions of the descent system buttressed by traditional beliefs that the spirits of the forebears are the ultimate guardians. That land or resources are held under such interlocking systems of rights and obligations makes the likelihood of transfers of such assets to individuals or groups outside the immediate clan group very remote. Not only does this make land purchases or leases impossible, but it also makes it difficult to obtain general agreement for long-term land-use developments that do not show immediate and obvious benefits to the owners.

Other outstanding problems require consideration. Increasing population growth (2.2 to 2.4 percent per year) will place increasing pressure on the forest resources. For gross domestic product per capita to remain the same from year to year the volume of economic activity has to increase commensurately. A sizeable percentage of the population is concerned mainly with day-to-day survival and with overcoming poverty rather than

preserving resources for future generations. Among resource owners, the lack of awareness, knowledge, and understanding of the real costs of unsustainable development is coupled with unrealistic expectations of returns and compounded by a lack of political will to commit and implement policies conducive to sustainable development, especially regarding forest resources. Legislative arrangements, national forest policies, and environmental management plans are not consistent with each other. Understanding of forest resources and ecosystem dynamics is hampered by the lack of research, trained personnel, and funds to carry out the essential tasks of project design, data generation, evaluation, and monitoring.

This lack of information has far-reaching implications for drawing up provincial and national forestry plans. Decisions about allowable volume of cut at a sustainable level must be based on accurate data and information. Current calculations are based on a forty-year cutting cycle, which is too low to serve as the basis for all other assumptions for drawing up forestry plans. We have yet to determine the extent of the forest resource (15 million hectares?), its growth rates and formation performances (both in the natural state and when disturbed by logging and similar activities), and its environmental requirements. Further, advice is often inappropriate when it comes from experts who do not appreciate the social and political realities of Papua New Guinea, especially in relation to resource use and ownership, or the vulnerability of the country's economy to fluctuations in the international markets. In relation to this vulnerability, Papua New Guinea must also keep its terms of trade within accepted limits and service its debts.

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