

**The Economic Contribution of
Rimbunan Hijau's Forestry Operations
in Papua New Guinea**

**Report for
Rimbunan Hijau (PNG) Group**

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Abbreviations and acronyms

ADB	Asian Development Bank
ANU	Australian National University
BPNG	Bank of Papua New Guinea
CIF	cost, insurance and freight
DFAT	Department of Foreign Affairs and Trade (Australia)
DFID	Department for International Development (United Kingdom)
FAO	Food and Agriculture Organization of the United Nations
FOB	free on board
GDP	gross domestic product
GST	Goods and Services Tax
IMF	International Monetary Fund
ITTO	International Tropical Timber Organization
K	Kina
NEFC	National Economic and Fiscal Commission (PNG)
NGO	Non-governmental organisation
NPF	National Provident Fund
NSO	National Statistical Office of PNG
PDL	Project Development Levy
PNG	Papua New Guinea
PNGFA	Papua New Guinea Forest Authority
PNGFIA	Papua New Guinea Forest Industries Association
RH	Rimbunan Hijau
UNECE	United Nations Economic Commission for Europe
US\$	United States dollar
VPF	Vanimo Forest Products
WTO	World Trade Organisation

Executive Summary

The commercial harvesting and processing of PNG's rich forest resources generates significant social and economic benefits for its people. These activities contribute substantially to national income, local employment and exports. Moreover, they significantly augment the infrastructure and social services provided by national, provincial and local governments. A high proportion of these social and economic benefits accrue to by those who live and work in rural areas of PNG.

Since the Asian financial crisis, the forestry sector's contribution to the PNG economy has been estimated at around K187 million a year, measured in 2005 prices.¹ Notwithstanding the ups and downs of the world timber market, the sector has provided paid employment for an average of 6,500 people over this period and each employee has contributed an average of K28,800 a year to national output.

Overall then, the forestry sector is making a sizeable contribution to the PNG economy and that contribution is growing in real terms. In contrast, PNG's national income per head of population is currently around K2,600 per person and is slowly declining in real terms.

Rimbunan Hijau (PNG) Group Ltd.² (referred to as Rimbunan Hijau throughout this report) is one of the country's largest log harvesting and export companies. Its forestry activities generate around half of the output of the forestry sector in PNG. Since 2002 the Company's forestry operations have contributed an average of K77.1 million a year to the PNG economy. This was equivalent to over K18,500 per RH employee per year.

Rimbunan Hijau is a substantial employer and employs a total of 5,300 people in PNG, of whom 4,200 work in its forestry operations. The wages bill for its forestry operations alone is K18.8 million. On either count, the Company is one of the largest private sector employers in the country.

Most of the forestry sector's economic activity and employment is created in rural areas. Rimbunan Hijau is therefore a significant source of cash income and economic development for the rural areas in which it operates.

For three reasons, these estimates of the economic contributions of Rimbunan Hijau and the forestry sector to the PNG economy are likely to be conservative.

First, the IMF has found that the PNG National Accounting, on which these estimates are based, understate the direct contribution of the forestry sector to the PNG economy.

Second, in economies that have significant unemployed or underemployed resources, such as PNG, economic activity in one sector will generate economic activity in others. In the case of commercial forestry, these 'multiplier' effects can be significant and the additional economic benefits to PNG have been estimated at up to K125 million a year.

Third, the forestry sector is a major provider of infrastructure and social services in rural areas of PNG and the net benefits that they generate are not included in the National Accounts. Forestry companies provide roads, bridges, airstrips and other transport infrastructure as part of their operations, which are able to be used by local communities thereby promoting economic development. They also provide health and educational infrastructure under their resource access agreements with PNG landowners.

Most of the economic contribution that Rimbunan Hijau has generated from its forestry activities has been to the benefit of rural areas. Since 1998 the Company has spent a total of K193.5 million on wages and salaries to its forestry employees, most of whom work in rural areas, and on royalties to local landowners.

In addition Rimbunan Hijau has contributed directly to rural development. Since commencing forestry operations in PNG in 1993, it has spent a total of K16.5 million on health, transport and educational

1 In this report, all references to the 'economic contribution' of a sector or an individual business, such as Rimbunan Hijau, are defined in terms of their share of PNG gross domestic product (GDP) for the year or years in question. All economic measures in the report are valued in real terms – to eliminate the effects of price inflation – and expressed in contemporary (2005) prices, except where otherwise indicated.

2 Rimbunan Hijau (PNG) Group Ltd refers to a group of companies operating in PNG that are subsidiaries of Rimbunan Hijau (PNG) Group Ltd, referred to simply as Rimbunan Hijau or RH.

infrastructure. The significance of its expenditure on rural development cannot be underestimated. In particular, it has substantially augmented the public spending on these services in rural areas with low population densities and poor or non-existent public services.

While care is required in comparing private and public expenditures on such services, the evidence is nonetheless overwhelming. In the Gulf Province, for example, the spending by Rimbunan Hijau on roads, bridges, culverts, wharves, airstrips, as well as health and educational services dwarfs that of the National and Provincial Governments – possibly by as much as 80 per cent.

The contributions by Rimbunan Hijau and other private sector operators therefore fill a critical social and economic gap. Without them, the communities in question would be forced to rely on subsistence activities, disconnected from the market economy and the opportunities it provides them to improve their wellbeing.

PNG has made good progress in putting in place the policy and institutional arrangements to realise the social and economic benefits of the sustainable development of its forest resources. But the country still faces enormous development challenges. The cost of providing and maintaining infrastructure and social services in remote and sparsely populated regions of the country remains painfully high.

In such circumstances, there is every reason for PNG to fully exploit the sustainable use of its forestry endowment. This will provide forestry companies, such as Rimbunan Hijau, with the strongest incentives to increase economic activity and formal employment in the remote regions of the country. And in doing so, the forestry companies will also provide such areas with much needed infrastructure and social services.

This report highlights the significant complementarities between what a committed forestry company such as Rimbunan Hijau can provide local communities in terms of economic activity, employment, infrastructure and social services, on the one hand, and what those communities can reasonably expect from National and Provincial Governments, on the other.

Encouraging progress has been made over recent years in putting in place right policy and institutional settings for commercial forestry. It needs to continue.

Chapter 1. Introduction

ITS Global has been commissioned by Rimbunan Hijau (PNG) Group Ltd. to provide an assessment of the economic and social significance of the Company's forestry operations in Papua New Guinea (PNG) from both a national and a regional perspective.

The objectives for this report are:

- to assess the net economic benefit for PNG as a whole from Rimbunan Hijau's forestry operations; and
- to demonstrate the on-ground benefits (in terms of jobs, incomes, the provision of infrastructure and social services) that are generated in representative regions of PNG in which Rimbunan Hijau operates forestry activities.

Rimbunan Hijau wants to work with the PNG Government and its agencies to maximise the social and economic benefits from the sustainable use of PNG's forestry endowment via commercial forestry. Doing so requires all interested parties to have a clear understanding of the socio-economic importance of Rimbunan Hijau's forestry operations at both the national and the regional levels.

This is the second report on the socio-economic importance of the forestry industry undertaken by ITS Global on behalf of Rimbunan Hijau. It includes a case study of Rimbunan Hijau's forestry operations in the Gulf Province. A full explanation of the methodology and its approach to the assessment used in this report can be found in Annex II.

The first report by ITS Global, *The Economic Importance of the Forestry Industry to Papua New Guinea*, was published in 2006. It demonstrated that the contribution of the forestry industry as a whole to the national economy was very significant:

- The forestry industry contributed between 5.1 and 8.6 per cent of PNG's gross domestic product (GDP).
- The forestry industry generated around 5 per cent of PNG's merchandise exports.
- Taxes on log exports accounted for 3 to 6 per cent of all tax revenues collected by the PNG Government between 1990 and 2005.
- The revenue from export taxes on logs represented, on average, around 30 per cent of all development expenditure by the PNG Government in this period.
- PNG's failure to realise its maximum sustainable harvest has cost the PNG Government around \$US20 million a year in revenue foregone.³

The first report also included a case study of the economic infrastructure, and the health and education services that have been provided by Rimbunan Hijau in the Western Province as part of its Wawoi Guavi forestry project. It demonstrated that the expenditure by Rimbunan Hijau on infrastructure and social services in the Western Province was very substantial – both in its own right and when compared with the equivalent expenditures by the Provincial Government.⁴

Key findings from the case study were:

- national wages have grown very substantially, from K1.03 million in 1993 to K7.15 million in 2005;
- export duty (K147.11 million) comprises 55.4 per cent of the total contribution to GDP from the project;
- royalty and wages paid to nationals together comprise K80.1 million between 1993 and 2005 – or around 30 per cent of total project contributions to GDP;
- infrastructure investment has been at least K2.95 million since 1993;
- the contribution to GDP of around K2.6 million in 2005 compared with Unconditional Grants to the Western Province Government in the 2006 national budget of K34.47 million;
- the total contribution to GDP since 1993 was around K265 million;

3 ITS Global (2006). *The Economic Importance of the Forestry Industry to Papua New Guinea*, Melbourne, available at <http://www.forestryanddevelopment.com>

4 ITS Global, *op. cit.*, page 22.

- road investments for community purposes constitute a significant proportion of the K92.9 million in road investments by Rimbunan Hijau between 1992-2004 – compared with an allocation to the Western Province District Road Improvement program of K1.2 million in 2006;
- around two thirds of K2.16 million invested by Rimbunan Hijau for the Wawoi Guavi airstrip accrued to local people; and
- if the health and education services provided by Rimbunan Hijau had not been provided it is highly unlikely that such services would have been provided by the national or provincial governments.⁵

5 ITS Global, *op cit*, pages 38-44.

Chapter 2. Economic significance of forestry to Papua New Guinea

2.1 Brief description of Papua New Guinea's economy

The economy of Papua New Guinea (PNG) is dominated by a large, labour-intensive agricultural sector and a capital-intensive oil and minerals sector. The formal economy is to be found largely in the extractive industries – forestry, mining and petroleum – the production of cash crops by the agricultural sector, and a small, import-substitution manufacturing sector. The informal economy is mostly subsistence agriculture but it makes a substantial contribution to national income, particularly in rural areas – for example, between 1994 and 2002, the informal economy generated just under a half of the value-added in the agricultural sector and nearly 17 per cent of GDP.⁶

Since the Asian financial crisis of 1997, PNG's GDP has increased by just over 7 per cent in real terms in the period to 2005, with virtually all the increase coming in the last two years of the period – see Table 2.1 for the details. The growth in real GDP has not, however, been sufficient to keep up with population growth over the same period and living standards have suffered as a consequence. Between 1998 and 2005, PNG has experienced a decline of more than 13 per cent in real GDP *per capita*, dropping from K2,977 per person in 1998 to K2,582 per person in 2005.⁷ The result for 2005 is equivalent to US\$675 per person *per annum*.

Data on formal employment in PNG are difficult to obtain; there are no regular formal workforce surveys. A 2002 report noted that only 270,000 of the 3 million people who were of working-age were employed in the formal economy, or approximately 10 per cent of the potential labour force. The rest of the working-age population is highly dependent on subsistence activities, particularly subsistence agriculture in rural areas. This is well illustrated by the estimates of the productivity differentials between urban and rural areas, with urban productivity outstripping rural productivity by more than 350 per cent.⁸

Table 2.1: PNG gross domestic product (GDP) and formal employment, 1998 to 2005

Measure	1998	1999	2000	2001	2002	2003	2004	2005
GDP, current prices (Kina millions)	7,804	7,948	7,750	7,741	7,728	7,898	8,112	8,379
GDP, 2005 prices (Kina millions)	14,286	14,550	14,187	14,171	14,147	14,458	14,850	15,339
GDP per capita, 2005 prices (Kina)	2,977	2,941	2,782	2,695	2,610	2,587	2,577	2,582
GDP per capita, current prices (US\$)	790	700	692	586	535	627	610	675
Formal employment (Index, June 1989 = 100) (a)	98	101	102	96	97	103	104	106

Note: (a) excludes employment in the mining sector

Source: IMF *World Economic Outlook 2007* Database accessed at <www.imf.org> and IMF *PNG Country Reports*, 2003, 2004, 2006 and 2007

6 ITS Global estimate based on disaggregated National Accounts data for 1994 to 2002 released by the National Statistical Office of PNG, accessed at <www.nso.gov.pg>

7 International Monetary Fund (2003). *PNG Country Report*, Report No. 03/176, 2003, IMF, Washington, DC, accessed at <http://www.imf.org>

8 Levantis, T. (2000) *PNG: Employment, Wages and Economic Development*, Asia Pacific Press, Canberra. Quoted in Department of Foreign Affairs and Trade (2004). *Papua New Guinea: The Road Ahead*, DFAT, Canberra.

Table 2.2: Contribution to PNG GDP, by sector, per cent, 1998 to 2005

Sector	1998	1999	2000	2001	2002	2003	2004	2005
Agriculture, forestry, and fishing	30	24	28	34	38	38	36	37
Mining, quarrying, and petroleum	21	29	27	23	18	18	19	24
Manufacturing and services	49	48	45	42	44	44	45	39
Gross Domestic Product	100	100	100	100	100	100	100	100

Source: IMF *World Economic Outlook 2007* Database and IMF *PNG Country Reports*, 2003, 2004, 2006 and 2007

A considerable proportion of the formal workforce is employed by government. The 1998 business census by the PNG Government indicated that approximately 116,000 people were employed in the private sector. This suggests that less than 45 per cent of formal employment is in the private sector and more than half is in the public sector. Nonetheless, the International Monetary Fund (IMF) has reported a modest increase in formal employment between 1998 and 2006 of about 8 per cent, compared to an estimated increase in the PNG population of nearly 24 per cent over the same time.⁹

On the basis of the estimates of real GDP and formal employment referred to above, labour productivity in the formal economy has probably not changed significantly between 1998 and 2005.

In PNG the sectoral contributions to GDP are dominated by the contribution of agriculture, forestry and fisheries – the details are in Table 2.2. Although highly variable over time, its contribution to GDP substantially outstrips those made by mining, manufacturing, or services. Over the period from 1998 to 2005, agriculture, forestry and fisheries have contributed around one-third of PNG's GDP, on average, but its contribution has varied from 24 to 38 per cent. The contribution of the mining sector has been equally volatile. This reflects the strong export orientation of these two sectors.

PNG's merchandise exports totalled US\$2.8 billion in 2005. As highlighted by Table 2.3, they are dominated by the exports of the mining sector, which produced approximately 75 per cent of all exports by value over the period from 1998 to 2005. The agricultural sector accounted for about 20 per cent of all exports from PNG and forestry for around 5 per cent over this period. PNG's major trading partner is Australia, for both its exports and imports. Other important trading partners are China and Japan.

Since 1998 total exports from PNG have increased by nearly 80 per cent in US dollar terms to 2005. This change is principally due to substantial increases in mineral and petroleum exports (of nearly 100 per cent) and

Table 2.3: PNG exports, major commodities, US\$ million, 1998 to 2005

Product	1998	1999	2000	2001	2002	2003	2004	2005
Minerals and petroleum	1,239	1,439	1,805	1,598	1,228	1,635	1,863	2,467
Logs	75	100	103	73	94	103	110	131
Coffee	231	164	107	56	71	83	88	152
Palm oil	132	133	111	85	100	117	136	126
Cocoa	40	33	31	33	58	72	68	64
Copra oil	34	38	24	8	9	19	25	30
Other exports	98	114	35	25	85	126	263	308
Total exports	1,849	2,020	2,215	1,878	1,646	2,153	2,554	3,278

Source: IMF *World Economic Outlook 2007* Database and IMF *PNG Country Reports*, 2003, 2004, 2006 and 2007

⁹ IMF (2007) *PNG Country Report*, Report No. 07/112, 2007, IMF, Washington, DC, accessed at <http://www.imf.org>

log exports (of nearly 75 per cent). The minor export commodities have also collectively experienced very strong growth over this period, albeit off a small base. This group includes non-traditional exports, such as vanilla. The increase in exports of logs, petroleum and minerals have been able to more than offset the sharp declines in coffee and palm oil exports over the period.

2.2 Forestry in the PNG economy

The forest area in PNG covers a total of 29.6 million hectares, which is 64 per cent of the country's land area.¹⁰ In a global context, such an area is of moderate significance. For example, Brazil has around 412 million hectares of tropical hardwood, representing 20 per cent of the world's total stock.¹¹ On this basis PNG possesses less than two per cent of the world's tropical hardwoods.

Forestry operations in PNG primarily involve the harvesting of roundwood (logs) for export to Asia, mainly to China, Japan and Korea. That said, there is an emerging downstream processing industry in PNG but the harvesting of plantation-based timber has yet to contribute significantly to the output of the sector.

Following the Asian financial crisis, the volume of logs harvested in PNG dropped sharply. Since 1998, however, log volumes have more than doubled to 2.3 million cubic metres by 2005. In real terms the value of the sector's output of logs only rose by 44 per cent over the same period. This was mostly due to a substantial decline in world log prices.

Forestry sector contribution to GDP

For a number of decades, the forestry sector has made a number of significant contributions to the PNG economy. The forestry sector's primary contribution takes the form of the value-added that these activities generate. Value-added is the sum of the gross returns to each of the primary factors – a sector's land, labour and capital – that are used to produce the output of the sector. The sum of the value-added generated by each sector gives GDP.

In disseminating the PNG National Accounts, the National Statistical Office (NSO) of PNG used to publish a more detailed sectoral breakdown of its estimates of GDP and the gross factor incomes that make up GDP.¹² This level of sectoral detail was such that the direct contribution of the forestry sector to GDP was separately identified.¹³ Publication of this more detailed breakdown has been discontinued, however, apparently due to concerns about its accuracy, particularly with respect to the estimation of the direct contribution of the forestry sector.¹⁴

Based on the most detailed National Accounts for the period from 1994 to 2002, ITS Global has estimated the direct contribution of the forestry sector to GDP, in real terms, for the subsequent years to 2005. To do so, it estimated the sector's average value-added as a share of the value of its log output for the period 1994 to 2002. The result was then used to extrapolate sectoral value-added to 2005 based on the value of log output in each of the years after 2002. In the process ITS Global also updated the price basis of the estimates to 2005 prices using the GDP deflator.¹⁵

The ITS Global estimates are presented in Table 2.4. Overall they reveal that, between 1998 and 2005, the forestry sector contributed an average of K187 million a year, in 2005 prices, to the PNG economy. This was equivalent to around 1.3 per cent of real GDP over the same period.¹⁶

10 Food and Agriculture Organisation of the United Nations (FAO) (2005), *Global Forest Resources Assessment 2005: Papua New Guinea Country Report*, Country Report 097, FAO, Rome.

11 See <http://www.nationsencyclopedia.com/Americas/Brazil-FORESTRY.html>.

12 In national accounting the principal factor incomes are Compensation for employees (the gross return to labour) and Gross operating surplus (the gross return to capital).

13 The sectoral breakdown that the National Statistical Office publishes each year generally includes the contribution of the forestry sector with those of the agricultural and fisheries sectors.

14 A recent review by the IMF has observed that the official statistics in PNG are not fully capturing the direct contribution of the forestry sector to the PNG economy (see Department of the Treasury, 'Economic and Fiscal Developments in 2005 and 2006' in *2007 Budget*, Vol. 1, Government of PNG, Port Moresby, November 2006, page 2, accessed at <www.treasury.gov.pg>).

15 All the more recent estimates of GDP and its factor income components in constant prices that have been published by the National Statistical Office have been based on 1998 prices.

16 All Kina valuations referred to in this section are expressed in 2005 prices as measured by the GDP deflator for PNG, as published by the IMF (2007).

Table 2.4: Economic contribution of the forestry sector in PNG, 1998 to 2005

Measure	1998	1999	2000	2001	2002	2003	2004	2005
Volume of logs produced ('000 cubic metres)	1,067	1,312	1,400	1,400	1,800	2,000	2,000	2,300
Value of logs produced (2005 prices, Kina millions)	282	422	412	349	444	426	418	405
Forestry contribution to GDP (2005 prices, Kina millions)	109	305	282	159	141	171	168	163
Forestry contribution as share of GDP (per cent)	0.8	2.1	2.0	1.1	1.0	1.2	1.1	1.1
No. of people employed in Forestry sector	4,175	5,135	5,478	5,478	7,043	7,826	7,826	9,000
Forestry contribution per employee (2005 prices, Kina per person)	26,081	59,332	51,400	29,052	20,003	21,853	21,449	18,079

Source: IMF 2003, 2004, 2006 & 2007; ITTO; NSO; and ITS Global estimates

Over time the forestry sector's contribution to GDP has exhibited a considerable degree of volatility, both in absolute and relative terms. Its value-added suffered a sharp downturn in absolute terms immediately following the Asian financial crisis of 1997, such that its relative contribution dropped to less than one per cent of GDP. After recovering from that trough, however, its relative contribution has continued to fluctuate over a wide range, increasing to over 2 per cent of GDP in 1999. In large part, this volatility was due to the sector's nearly complete reliance on world markets and the sharp volatility of world prices for logs and processed timber products.

Notwithstanding the natural volatility in the sector's contribution to GDP, the PNG Government sees considerable potential for its expansion. The National Budget has observed that:

“With new logging projects currently in the pipeline, activity in the sector can be expected to remain buoyant over the immediate future. ... Downstream processing activities such as sawmills, furniture, flooring and mouldings have the potential to grow and the latest venture in the Central Province is evidence of this”.¹⁷

This is a welcome recognition of the scope for the sector to utilise PNG's forestry endowment for economic development in a sustainable manner. In principle, the more value-added that PNG can generate from a given stock of forestry resources, the more it is likely to maximise the generation of new employment opportunities, the enhancement of the community's standard of living and the successful provision of infrastructure, health and education services in rural areas.¹⁸

Employment in forestry sector

As stated above, there are no regular surveys of formal employment in the forestry sector in PNG, although the Bank of PNG does conduct a regular survey of formal employment in the economy as whole.

The United Nations Food and Agriculture Organisation (FAO) publishes regular assessments of the level of employment in the PNG forestry sector as part of its global assessment of forest resources.¹⁹ Based on data provided by the PNG Forest Authority (PNGFA) and the PNG Forest Industries Association (PNGFIA), the FAO

17 PNG Department of the Treasury (2006). *2007 Budget*, Vol. 1, Government of PNG, Port Moresby, November 2006, page 95.

18 The evidence is detailed in our first national economic benefits report by ITS Global. The Wawoi Guavi forestry project in West New Britain Province is clearly generating considerable value-added.

19 FAO [Food and Agriculture Organisation of the United Nations], *op. cit.*

has estimated the labour input in person-years that was employed in various forestry-related activities in PNG in 2000. They were as follows:

- primary production of forest goods, such as roundwood, woodfuel and non-wood forest products: 7,820 person-years;
- services from forests and woodlands: 550 person-years;
- unspecified forestry activities: 2,280 person-years.

More recently the PNG Forest Authority (PNGFA) has estimated that the forestry sector in PNG directly employs 9,000 people, representing about 4 per cent of national formal employment.²⁰ Virtually all of these jobs were located in rural areas. This estimate covers both the harvesting of logs and any subsequent processing of them into timber products.

ITS Global has used the PNGFA figure to estimate the level of formal employment in the sector from 1998 to 2004. To do so it used the proportionate change in the volume of logs harvested each year to estimate the annual change in employment, based on the assumption that the level of employment was 9,000 in 2005, in line with the PNGFA estimate. This estimate is the most recent that is publicly available and is from a source that the FAO rates as being highly credible.

This method assumes that forestry employment in PNG is directly determined by the volume of the log harvest, which seems reasonable on the face of it. ITS Global has, however, sought to confirm the relationship between these two variables via an analysis of the PNG National Accounts.

The NSO (National Statistical Office of PNG) has released details of the decomposition of the value-added by the forestry sector into gross factor incomes, for the years 1998, 2000 and 2002. Among other things, this breakdown identifies the total cost of the labour employed by the sector in each of these years in real terms. Despite the substantial variations in the volume of output from the sector between these years, the share of sectoral value-added paid out as compensation to employees was virtually unchanged.²¹ This supports the assumption of a linear relationship between log output and sectoral employment.²²

The estimates by ITS Global of the level of employment in the forestry sector from 1998 to 2005 are presented in Table 2.4. They show that formal employment in the sector averaged just over 6,500 persons over the period. In line with the assumption used in the estimation process, employment grew over the period.

Given the capital-intensive nature of forestry operations, the labour productivity in the forestry sector of PNG is relatively high. The economic contribution by each employee in the forestry sector averaged K28,800 per employee, in 2005 prices. The sector's labour productivity has, however, experienced very large swings – rising to a peak of K51,400 per person in 1999 before dropping to K18,079 per person by the end of the period. These swings in labour productivity mostly reflected the high degree of volatility in world log and timber prices, as well as in the volumes of logs that were harvested in PNG each year over the period.

Forestry exports

Roughly 5 per cent of PNG's merchandise exports were generated by the forestry sector from 1998 to 2005. Over this period roundwood exports from PNG nearly doubled in value²³ and by 2005 they were valued at over K130 million, placing them second after coffee among the country's non-mineral export earners. The sector also

20 The Government of Papua New Guinea (2006) *Forest Law and Governance in Papua New Guinea in the Context of Sustainable Forest Management*, Proceedings of the Regional Multi-Stakeholder Workshop on Forest Law Enforcement and Governance, Port Moresby 10-11 October 2006, prepared for the International Tropical Timber Organization, Forty-Second Session, 7-12 May 2007

21 The variation in the labour cost share varied by no more than one-tenth of a percentage point, while the volume of output increased by 30 percent between 1998 and 2000 and by 29 per cent between 2000 and 2002.

22 The stability of the share of employee compensation is also logically consistent with the possibility that it is the wage rate that changes with output, rather than job numbers. Extensive empirical analysis of labour markets suggests, however, that the wage rate is significantly more resistant to change than the level of employment.

23 This is when log exports are valued in Kina at current prices – that is ignoring the effects of the inflation in domestic prices. When measured in US dollars, the increase in export value is significantly less due to the overall depreciation of the Kina against the US dollar that occurred over the period in question.

Table 2.5: Exports of logs from PNG, by volume and value, 1998 to 2005

Measure	1998	1999	2000	2001	2002	2003	2004	2005
Volume of log exports (‘000 cubic metres)	1,067	1,312	1,400	1,400	1,800	2,000	2,000	2,300
Value of log exports, FOB (US\$ million)	75.0	100.2	102.7	73.1	94.1	102.6	110.3	130.5
Value of log exports, FOB (Kina million)	154	256	283	256	366	370	356	405
Average export price, FOB (US\$ per cubic metre)	70.0	76.4	73.4	60.3	51.3	50.9	54.8	57.5

Source: IMF, *PNG Country Reports*, 2003, 2004, 2006 & 2007

exported relatively small but nevertheless significant quantities of processed timber products, mostly veneer, timber and plywood.

As an export industry forestry is subject to significant fluctuations in the world prices for logs and timber. Forestry's contribution to GDP therefore depends on changes in export prices and foreign exchange rates, as well as the volume of logs exported by PNG. Table 2.5 presents data on log export values from 1998 to 2005, both in Kina and US dollars to illustrate these aspects. Both series reflect current, not real, prices.

In Kina terms, log export prices were quite stable for most of the period; but in US dollar terms, there was a substantial decline in export prices. This suggests that the declining share of forestry's contribution to GDP reflects declining world prices in US dollars as well as the relative growth of other sectors of the PNG economy.

The value of exports of processed forest products from PNG is also substantial – the details are set out in Table 2.6. The products in question include plywood, lumber and woodchips. The free on board (FOB) value of all processed forest exports from PNG in 2005 was US\$32.15 million. Like log exports, processed wood exports are subject to significant volatility in world prices.

Table 2.6: Exports of processed forest products from PNG, by volume and value, 2000 to 2005

Product	Unit	2000	2001	2002	2003	2004	2005
Furniture	m ³ ‘000			0.3	0.5	0.3	0.6
	US\$‘000			195	219	140	306
Plywood	m ³ ‘000		0.9	1.7	3.7	4.6	10.9
	US\$‘000		347	678	1,362	1,771	5,049
Lumber	m ³ ‘000	33.6	39.8	42.2	41.4	49.4	28.1
	US\$‘000	12,940	15,357	14,269	13,798	15,853	9,694
Veneer	m ³ ‘000	32.7	59.1	71.4	77.8	79.8	72.5
	US\$‘000	5,692	9,306	12,306	13,901	18,501	14,039
Woodchips	m ³ ‘000	193.6	149.9	150.1	196.3	126.3	120.3
	US\$‘000	9,270	3,838	4,554	5,030	3,764	3,060
All Processed Products	m ³ ‘000			265.7	319.7	260.4	232.4
	US\$‘000			32,002	34,310	40,029	32,148

Source: PNG Forest Industries Association, *Export Statistics*, accessed at http://www.fiapng.com/export_stats_1997-2002.pdf

Contribution to Government revenue by forestry sector

The PNG Government levies a range of taxes, levies and charges on the output of the forestry sector. The most significant of these from a revenue perspective is the tax that is levied on the value of all logs exported from PNG, as part of the PNG Government's regime of commodity export taxes.

The export tax on logs is levied on a progressive scale of ad valorem tax rates and it has represented a substantial share of the export value of the logs. As the export price of logs from PNG is set in a global market, the taxes are borne by the forestry sector, their employees and the owners of the land from which they harvest their logs.

Between 1998 and 2004, the taxes levied on log exports raised an average of K101 million per year for the PNG Government – see Table 2.7 for the details. The effective rate of tax on log exports over this period was more than 30 per cent of the export value of the logs. This revenue stream accounted for around 6 per cent of all tax receipts and about 5 per cent of all public revenue collected by the PNG Government over the period in question.²⁴ Indirect tax receipts from the forestry sector are estimated at around 16 per cent of all indirect tax receipts by the PNG Government.²⁵

Since 2002 the forestry industry has become even more important to the PNG economy in terms of its contribution to public revenue. The 2007 National Budget has noted that:

“...tax revenue from forestry sector represents an increasingly important component of the tax base, with duties of around K150 million expected in 2006. This follows a steady rise in the volume of log exports with approximately 2.5 million cubic metres expected in 2006, which is approaching the peak levels experienced in 1997.”²⁶

In the 2007 Budget, the national government made two important changes to forestry taxation in PNG:

- A ‘premium levy’ of K8 per cubic metre of natural unprocessed logs and flitches was introduced – in addition to the K10 per cubic metre royalty that is paid to landowners; and
- The log export tax was changed to a flat rate of 28.5 per cent thereby “...offsetting both the ‘premium levy’ and the impact of the increase in average rate of tax since the scales were last reviewed.”²⁷

Changing the progressive log export tax to a flat rate was an economically sensible decision. A progressive scale of tax rate scale log export tax constituted a disincentive for the forestry sector to maximise the value of its exports, which contradicts current government export policy.

Some non-governmental organisations (NGOs) have criticised the commercial forestry industry in PNG as engaging in transfer pricing. Transfer pricing is the practice of under-declaring export values to avoid or minimise the amount of export duties that have to be paid to the Government and collecting the tax saving in the importing country where the product is sold for its real value. Although a progressive scale of export taxes constitutes a financial incentive to engage in such transfer pricing, there is no conclusive evidence of transfer pricing in the PNG forestry industry.

2.3 Conclusions

The forest industry in PNG is a significant contributor to the economy. It is, however, subject to the fluctuations of international timber markets for a number of its products. For short-term operators, this means a disinclination to make long-term capital investments in the industry, such as those required for downstream processing.

24 Independent Forest Review Team (2004). *Towards Sustainable Timber Production – A Review of Existing Logging Projects*, Draft Observations and Recommendations Report, Vol. 1, Prepared for the Government of PNG, Port Moresby, March 2004, pages 62 and 64.

25 *Ibid.*, page 62.

26 PNG Department of the Treasury (2006) *op. cit.*, page 95.

27 PNG Department of the Treasury (2006) *op. cit.*, page 53.

Table 2.7: PNG log exports and log export taxes, 1998 to 2004

Year	1998	1999	2000	2001	2002	2003	2004	Average 1999 to 2004
Value of exports (FOB, Kina million)	154	256	283	256	366	370	356	292
Export tax revenue (Kina million)	47	101	136	96	113	111	104	101
Effective tax rate (per cent)	30.5%	39.5%	48.1%	37.5%	30.9%	30.0%	29.2%	34.7%

Source: IMF, *PNG Country Reports*, 2003, 2004, 2006 & 2007 and PNG Forest Industries Association, *Export Statistics*, accessed at http://www.fiapng.com/export_stats_1997-2002.pdf

For long-term operators, price fluctuations require a diversity of forest products such that business operations can be sheltered from market vagaries. In this regard, roundwood, sawnwood, plywood and other forest product operations are complementary. Onerous tax structures and export tariffs on one part of the industry can therefore also have a perverse effect on other parts of the industry.

This situation is, however, changing. Changes to the tariff structure will encourage long-term investments in forestry operations. In this context, it needs to be understood that the forestry industry in PNG operates legally and sustainably. ITS Global has demonstrated that the industry operates in accordance with PNG law.²⁸

FAO and International Tropical Timber Organization (ITTO) data indicate that the forestry industry in PNG is sustainable. Indeed, the failure to use its annual sustainable 'cut', as estimated by FAO and ITTO, costs PNG around \$US20 million in lost government revenue each year. This cost can be regarded as an outcome of the anti-forestry campaigns mounted by Green NGOs. It could be argued that Green NGO activities should at least generate US\$20 million in government revenue each year to compensate PNG for the consequences of their campaigns to downgrade the commercial forestry industry.

The previous lack of long-term investment is reflected in the insubstantial investment in the plantation sector. When assessing the socio-economic potential of the forestry industry in PNG, reference is usually made to the challenges flowing from communal land ownership of forestry resources. The Chairman of the PNG Rural Industries' Council, Mr Brown Bai has, for example, argued that development of the plantation sector will boost overall agricultural development and provide direct economic and infrastructural links to small individual farmers, as well as increase direct foreign investment.²⁹

A first step towards putting in place policies and institutional arrangements to encourage plantation forestry and long-term sustainable forestry operations is to understand the industry's significance in terms of generating jobs, infrastructure and social welfare facilities in rural areas.

This is reflected in the 2007 Budget's references to the importance the Government attaches to maximising the economic contribution from the sustainable use of PNG's forestry endowment. It suggests that PNG is prepared to continue to put in place policies and institutional arrangements to secure that objective. The first task is to recognise the wealth embodied in PNG's forestry endowment – and the contribution that forestry can make in generating jobs and providing infrastructure and health and education services in remote areas of PNG. The second task is to continue this sensible evolution in policy.

28 ITS Global, (2006) *Whatever it takes: Greenpeace's anti-forestry campaign in Papua New Guinea*, Melbourne 2006, available at www.forestryanddevelopment.com

29 Brown, Bai (2003). *Performance of Major Agricultural Export Commodities and their Future Prospects*, accessed at <http://peb.anu.edu.au/pdf/PNG%20Update%20BAI%202003.pdf>

Chapter 3. Rimbunan Hijau in the PNG economy

3.1 RH forestry operations in PNG

Rimbunan Hijau (PNG) Group is a subsidiary of the Malaysian-owned company, Rimbunan Hijau, which was established as a timber contractor in that country in 1975. The parent company is now a significant multinational enterprise with interests in Japan, Hong Kong, Australia, Canada, the US, Singapore, China, Russia, Equatorial Guinea, Brazil and British Guyana, in addition to Papua New Guinea.

Rimbunan Hijau (PNG) Group commenced operations in PNG in 1989. Its business interests there include timber extraction, timber processing, media publications, general trading, shipping, travel and property development. It established the Panakawa Veneer Mill in 1997 and currently has five downstream processing operations in PNG.

At the rural and provincial level, Rimbunan Hijau's business activities are dominated by its PNG forestry and timber processing operations. It has 12 operating subsidiaries in the forestry sector; 10 are licensed to harvest forest concessions, 2 are solely processors. These forestry operations constitute the core of the company's business in PNG and are responsible for the majority of the company's revenue and its employees.

Rimbunan Hijau and its subsidiary companies operate 17 forestry concessions, which have a total area of 1,755,408 hectares. Their annual allowable cut amounts to 2,084,000 cubic metres. The company's log export quota for round logs is 1,673,000 cubic metres per year and its processing quota is 411,000 cubic metres per year.

In 2006, the total production from Rimbunan Hijau forestry concessions totalled 1,055,000 cubic metres. Just under 90 per cent of this was for export as round logs, sawn timber or veneer. The primary export markets are China, Taiwan and Korea. Round logs constituted approximately 86 per cent of total exports, with an FOB value of K150.6 million (US\$51.1 million).

Rimbunan Hijau's downstream processing operations in PNG collectively employ a total of 1,350 people. Turnover in downstream processing was K96 million in 2006. Capital expenditure for these operations totalled K120 million that year.

In 2006 total downstream production by Rimbunan Hijau stood at 114,961 cubic metres. A total of 31,559 cubic metres of sawn wood products were exported in 2006 with a FOB value of K29.8 million (US\$10.1 million). A total of 57,573 cubic metres of veneer were exported in 2006 with a FOB value of K48.6 million (US\$16.5 million).

Rimbunan Hijau's log exports are substantial. An analysis of recent data from Société Générale de Surveillance (SGS), the audit organisation employed by the PNG Government to monitor revenue collection from log exports, shows that their log export volumes make up approximately 40 per cent of PNG's total log exports. In this regard Rimbunan Hijau is the market leader. Their nearest competitor, Kerawarra, has just a 12 per cent share of the log export market.

The input measures of Rimbunan Hijau forestry operations in PNG indicate that they are significant economic activities. Table 3.1 provides a summary of selected input expenditures by Rimbunan Hijau in respect of its forestry operations between 1998 and 2006.

3.2 Contributions of Rimbunan Hijau to the PNG economy

Contribution to PNG GDP

ITS Global has estimated the contribution that Rimbunan Hijau has made to PNG GDP from its forestry operations. Other things being equal, Rimbunan Hijau's share of the volume of logs harvested in PNG should be a good proxy for its share of the forestry sector's contribution to GDP in PNG. Although the contribution per unit of output is likely to vary across the PNG forestry sector, Rimbunan Hijau's dominance of the sector suggests that the average for the forestry sector will not be greatly different from that for Rimbunan Hijau on its own.

Table 3.2 presents the relevant data for the period, 2002 to 2005, provided by Rimbunan Hijau. They

Table 3.1: Rimbunan Hijau PNG forestry operations, selected inputs, current prices, 1998 to 2006

Measure	1998	1999	2000	2001	2002	2003	2004	2005	2006
No of employees (‘000) (a)	2.65	3.98	3.911	3.10	3.53	4.08	3.73	3.64	4.21
Wages and salaries (Kina million)	4.96	9.61	10.80	8.75	10.82	14.14	14.92	15.82	18.80
Premiums and levies (Kina million)	7.00	11.80	11.14	6.92	9.23	8.33	11.28	10.25	10.52
Royalties (Kina million)	6.11	10.11	9.77	8.09	10.72	9.02	10.71	8.47	11.86
Export duties (Kina million)	18.13	38.71	49.41	30.44	45.24	36.75	41.91	44.86	55.75
Infrastructure (Kina million)	0.32	0.42	0.55	0.40	0.39	4.55	1.43	0.86	1.11
Other NPF/Contributions (Kina million) (b)	0.04	0.15	0.21	0.22	0.23	0.39	0.40	0.32	0.32

(a) the data have been rounded

(b) National Provident Fund (NPF) Contributions represent superannuation contributions for workers.

Source: Rimbunan Hijau

indicate that, on average, Rimbunan Hijau supplied about half of PNG’s total log output over this period. On this basis ITS Global has estimated the real value of the economic contribution by Rimbunan Hijau’s forestry operations to the PNG economy. Its estimates are included in Table 3.2.

During the period from 2002 to 2005, the economic contribution generated by Rimbunan Hijau’s forestry operations averaged K77.1 million a year. Given the nature of the business, its contribution fluctuated notably around that average over the period, ranging from K93.8 million in 2004 to K57.1 million in 2005. These changes in the level of the Company’s economic contribution level was mostly due to movements in the world prices of logs and processed timber products, and the adjustments in output volumes that were a consequence of those price changes.

These changes were also broadly reflected in the changes in Rimbunan Hijau’s economic contribution when

Table 3.2: Economic contribution of Rimbunan Hijau's forestry operations to PNG GDP, 2005 prices, 2002 to 2005

Measure	2002	2003	2004	2005	Average 2002-05
Total production of logs in PNG (‘000 cubic metres)	1,800	2,000	2,000	2,300	2,025
Rimbunan Hijau production of logs in PNG (‘000 cubic metres)	1,061	870	1,118	807	963,991
Rimbunan Hijau share of total log production in PNG (per cent)	58.9%	43.5%	55.9%	35.1%	47.6%
GDP contribution by Rimbunan Hijau forestry (2005 prices, Kina millions)	83.0	74.4	93.8	57.1	77.1
GDP contribution per employee by RH forestry (2005 prices, Kina per person)	23,538	18,255	25,134	15,691	20,591

Source: Rimbunan Hijau and ITS Global estimates

it is expressed on a per employee basis. Over this period, its contribution peaked at K25,134 per employee in 2002 before declining, albeit unevenly, to K15,691 per employee by the end. The average for the period was K20,591 per employee. As would be expected, given the Company's relative size in terms of log output, its average is close to that for the sector, as a whole, albeit slightly above the latter figure.

These estimates are, however, likely to underestimate the contribution of Rimbunan Hijau's forestry activities to the PNG economy. This is because the PNG National Accounts are known to underestimate the direct contribution of the forestry sector to GDP in PNG and the ITS Global estimate is based on a share of that figure.

Contribution to employment

A key component of Rimbunan Hijau's contribution to PNG GDP involves its employment of PNG residents on its forestry operations in PNG.

In 2006 the Company employed a total of 4,205 PNG citizens and locally-engaged staff in its forestry operations in PNG. In that year the Company paid a total of K18.8 million in wages and salaries to its local employees. Since 1998 it has paid more than K108 million in local wages and salaries. As labour costs are part of the compensation of employees, these expenses are included in the estimates definition of value-added by the forestry sector – and are thereby reflected in GDP.

It is likely that Rimbunan Hijau's forestry business in PNG is one of the largest, if not the largest, private sector employer in the country. For example, Ok Tedi Mining Ltd employs approximately 2000 people in its operations – which is less than half the number employed by Rimbunan Hijau.

Rimbunan Hijau employs people in some of the most remote parts of PNG. There is little or no prospect of alternative formal employment in these regions. Employment with the Company is so highly valued among its workforce that employee turnover is low. The main reason employees give for leaving the Company is that they have secured their target level of cash savings. Employees who leave after reaching their targets often return. This is a clear indication of the value placed on these jobs. The managers at the Purari and Teredau logging sites in Gulf Province advised ITS Global that they had no difficulty in attracting workers.

The FAO has estimated that on average, five family members were supported by each person who was employed on a forestry project in Vanimo. This implies that a total of around 21,000 PNG residents may have been directly reliant on the wages that were paid by Rimbunan Hijau to its forestry workers in 2006.³⁰

Other contributions to PNG economy

A key component of Rimbunan Hijau's other contributions to the PNG economy takes the form of the indirect taxes, fees and charges that the Company pays to the PNG Government each year. In 2006 the Company contributed a total of K77.35 million to central government revenues. These financial transfers from the Company represented around 1.5 per cent of all public revenue that was collected by the PNG Government in 2006.

Another key component of the other contributions to the PNG economy consists of royalty payments to PNG landowners. Since 1993 the Company has paid a total of K123 million in royalties to landowners. In 2006 it paid K11.1 million in such royalty payments. No details are available to compare these royalty payments with the royalty payments to landowners from all forestry and/or mining operations.

The final key component of Rimbunan Hijau's other contributions to the PNG economy takes the form of its investment in local infrastructure. Such contributions are included in GDP as fixed investment and do not directly affect the estimation of sectoral value-added. Although investment in infrastructure is required to support the RH forestry operations in PNG, the infrastructure in question generates benefits for the rest of the community, which do not get captured in the estimation of GDP.

The local and regional areas in which this infrastructure is provided are able to use this infrastructure and therefore to benefit from it at no cost to the community. There is ample empirical evidence that such infrastructure is a major factor in economic development and growth.

³⁰ For further details on the FAO analysis, see Section 2.2.1.

Transport provides a particularly good illustration of the potential benefits to PNG. Port Moresby is not linked by road to any of the other major towns and many remote villages can only be reached by light aircraft or on foot. Moreover, only 4 per cent of roads are paved. Since 1993, Rimbunan Hijau has spent 188.5 million on roads at its forestry operations.

Since 1993, the Company has spent a total of K27.1 million on community infrastructure including education and health facilities. Rimbunan Hijau has also undertaken substantial charitable activities.³¹

Contribution to PNG forestry exports

Rimbunan Hijau has a number of significant export markets for its forest products.

The Company's exports of raw logs constitute approximately 40 per cent of all logs exported from PNG. It harvested nearly 1.1 million cubic metres of round logs in 2006. Just over 89 per cent (938,967 cubic metres) of this was used for export production; the remaining was used for sawmill production. A total of 721,367 cubic metres of round logs (or 77 per cent of the total) was exported in 2006, with a FOB value of \$US51.1 million. This return is reflected in the estimation of the economic contributions by both the Company and the forestry sector to PNG GDP.

The Company's export destinations vary from year to year. For example, its exports to Japan have declined since 2002. FAO has found that tropical hardwood log imports to Japan have plummeted, and that imports of secondary forest products have increased.³² Over the same period, the Company's Korean and Taiwanese markets have remained relatively steady, while its Chinese market has grown significantly.

The Company has a number of significant export markets for its processed wood products. Rimbunan Hijau's major sawn timber export market is Taiwan, followed by Singapore and Australia. The Company exported a total of 31,563 cubic metres of sawn wood products in 2006 with a FOB value of US\$10.1 million.

The total quantity exported by the Company has steadily increased, from 12,148 cubic metres in 2003 to 31,563 cubic metres in 2006. Since 2005 its export volumes have increased by almost 50 per cent, due to more aggressive export marketing strategies. The commencement of kiln drying production at Teredau in 2006 and Kamusie in 2005 is one of the key driving forces behind the increase in export volumes due to more added-value products being produced.

Rimbunan Hijau's sawn timber market is significantly different from both its log export market and its veneer market, with a significantly more varied market base. As with log exports, percentages vary considerably from year to year with regards to export destination. For example, Singapore was a significant customer (16.6 per cent) in 2006, but had purchased no products previously. Similarly, Korea's share has varied considerably between 5 and 17 per cent since 2003.

3.3 Multiplier benefits of RH operations

The flow-on effects from Rimbunan Hijau's forestry operations are substantial, particularly in rural areas of PNG.

The Company is a major investor and provider of infrastructure in some of the most remote areas of PNG, particularly road infrastructure. It provides a very considerable amount of health and education services in remote areas. The taxes on its forestry products underpin a significant amount of public spending by the National Government, including financial transfers to provincial governments.

Rimbunan Hijau makes substantial payments to landowners in the form of royalties on the logs that it harvests from their land. The wages that Rimbunan Hijau pays to its employees, particularly those in the more remote areas of PNG, are highly beneficial to the areas in which they are employed – there are many local inhabitants who rely financially on each employee. The labour that Rimbunan Hijau employs in its forestry operations is most unlikely to have been employed in the market economy in its absence.

31 In 2006, Rimbunan Hijau became a platinum sponsor of the Business Coalition Against HIV and AIDs (BAHA) and donated K600,000 to the organization.

32 United Nations Economic Commission for Europe and Food and Agriculture Organisation of the United Nations (2006), *Forest Products Annual Market Review 2005-2006*, United Nations, New York and Geneva, page 124.

All this expenditure has significant flow-on, or multiplier, effects if there are significant unemployed resources, particularly labour, that are capable of being deployed in productive activity. The precise size of these effects is very difficult to estimate due to the general paucity of data on the impacts in question. There is clear evidence of unemployed resources in PNG, particularly in rural and remote areas, but it is not clear how easily they could be deployed in economically productive activity.

In the first national economic benefits report ITS Global pointed to estimates by ACIL Tasman, an Australian economic consulting firm, of the extent of the multiplier effects that could be expected from the PNG Gas Pipeline Project.³³ ACIL Tasman estimated that for every K0.74 spent by the private sector on the project the flow-on (or multiplier) benefits to the rest of PNG economy would be another K1.02.

In 2006, the total expenditure by Rimbunan Hijau on its forestry operations amounted to K110 million. Applying the multiplier estimates by ACIL Tasman for the PNG gas pipeline project to the Company's activities suggests that in addition to the value-added generated by the Company, the PNG economy would also benefit from value-added in other sectors of the PNG economy to the tune of K112 million.

An analysis of a forestry project in Wales suggests that the multiplier effects may be even higher.³⁴ Applying the results of this study suggests that Rimbunan Hijau's forestry operations would have generated additional benefits of between K115 million and K135 million in that year.

3.4 Conclusions

The analysis presented above indicates that Rimbunan Hijau's forestry operations make a major contribution to the PNG economy. It is a major employer in rural areas with few formal employment alternatives, contributes a significant share of government revenue, makes substantial payments to local landowners in the form of royalties, and provides substantial amounts of infrastructure of local communities in PNG.

33 ACIL Tasman (2005). *Economic Impacts of the PNG Gas Project: An assessment of direct and indirect impacts on the economy of Papua New Guinea*, Prepared for the PNG Gas Project, 15 May 2005, in conjunction with Focus Economics, ACIL Tasman, Melbourne.

34 Welsh Economy Research Unit, Welsh Institute for Rural Studies and School of Agriculture and Forest Sciences (1999). *Welsh Forestry Multiplier Study*, Report for Forestry Commission, Timber Growers Association and Welsh Development Agency, Final Report, November 1999 accessed at <http://www.forestry.gov.uk/pdf/Walmult.pdf>

Chapter 4. Regional development and forestry in PNG

The United Nations Food and Agriculture Organisation (FAO) has concluded that the regional impact of forestry projects in developing countries can be very significant. It has noted that:

- timber harvesting is an important development option and revenue source for public and private land;
- the proceeds from timber harvesting and processing are available for distribution among landowners, government and the forestry industry; and
- these proceeds are important sources of funds for infrastructure, social services and other enterprises.³⁵

The FAO has observed that, in addition to the value of the timber products that are produced by commercial forestry, other values such as biological diversity, non-timber products, cultural values, and environmental services should be considered when planning the harvesting of forestry resources.³⁶

The FAO has examined the socio-economic impact of a forestry project in the Vanimo region in PNG. The area in question was largely underdeveloped prior to the project. There were no roads linking Vanimo with the rest of the country, except for a rough road from Vanimo to Ossima and Bewani.

Vanimo Forest Products (VFP) – the timber company holding the Wutung-Warumo TRP – built a road between Vanimo and Wutung in 1972-75 to provide access to the Indonesian border. The completion of this road has had a “profound” effect on the economy of Vanimo. It resulted in:

- the opening of larger shops in the local area;
- an increase in local road construction;
- royalty payments to local land owners;
- tax revenues for the national government; and
- contributions to local sporting facilities.

In 1990 the Company employed 451 PNG nationals from Sandaun Province in its forestry operations. The FAO estimated that a total of 2,255 people were directly and indirectly supported by VFP. This figure excluded local businessmen, landowners, government servants, or their dependents. The FAO also noted that infrastructure such as schools, health centres and roads established by VFP also had a benefit for a large number of villages in the area. In doing so, it stated that

“Of particular importance are the schools and health centres scheduled to be constructed in many rural communities.”³⁷

Road investments by forestry companies also generate significant socio-economic benefits. The World Bank has concluded that in PNG

“...only 27 per cent of the existing road system (national and provincial), is now in good condition and about 15 per cent of the Country’s 2,000 bridges on the national and provincial network require urgent rehabilitation or maintenance.”³⁸

This demonstrates just how important the provision of roads and their maintenance are by forestry companies in PNG. The benefits of such roads might not be understood or accepted by critics of the commercial forestry industry in PNG, but the socio-economic benefits for local communities are clear.

35 Food and Agriculture Organisation of the United Nations (2005) “Social and economic impact of resource development” in Forest harvesting operations in Papua New Guinea: The PNG logging code of practice, Forest harvesting case-study 15, FAO, Rome, accessed at <http://www.fao.org/docrep/004/Y2711E/y2711e10.htm>

36 *Ibid.*, page 1.

37 *Ibid.*, pages 2 and 3 .

38 World Bank (1999). PNG Road Maintenance and Rehabilitation Project, Report PID705, Washington, DC, 1999, accessed at <http://www.wds-worldbank.org>

4.1 Regional impact of the forestry sector

Despite the significance of the forestry industry to the rural and remote areas of PNG, the available data on its economic impact at the local level are patchy at best.

Details of the spending by the National, Provincial and Local Governments in the relevant provinces would provide useful indicators of some of these impacts. These would include expenditure on infrastructure, social services (primarily health and education), royalties to landowners, and wages and salaries at the local and regional levels. But such data does not exist.

Some data are available on aggregate spending on these areas by the National Government. But there is no easy or defensible basis to allocate that to particular regions. The PNG Treasury has informed ITS Global that it is not in a position to advise what proportion of spending notionally allocated to specific regions for infrastructure, health and education services by the National and Provincial Governments has actually been spent.

It is therefore not possible to compare spending on these aggregates by Rimbunan Hijau and the National Government. Some data are available for such spending by the Gulf Provincial and Local Level Government. As explained in Annex II, there are significant questions about its reliability.

What is clear is that forestry companies make major investments in regional PNG on infrastructure and health and education services. In the more remote areas, they seem in many cases to be the only providers of such services.

4.2 Regional impact of Rimbunan Hijau's operations

The major impact that Rimbunan Hijau has on regional areas of PNG is due to the wages and salaries that it pays out to its local employees and the royalties that it pays to local landowners. Since 1998 the Company has spent a total of K193.5 million on these two expenditure items: K108.6 million on wages and salaries for all its forestry employees, most of whom work in rural areas of the country, and K84.9 million for royalties to local landowners.

In addition to these expenditures, Rimbunan Hijau spends significant amounts on rural development in its own right. For this report the Company has provided ITS Global with detailed audited data on its spending on rural development in PNG associated with each of its forestry projects.

ITS Global has visited Rimbunan Hijau's key forestry operations in the Western and Gulf Provinces. These visits have confirmed that Rimbunan Hijau's investments in infrastructure and social services are maintained to a standard appropriate to its operations.³⁹ Whether the same can be said for the infrastructure and social welfare services that is provided in rural areas by the National and Provincial Governments is beyond the scope of this report.

Before presenting the data on Rimbunan Hijau's investments in infrastructure, regional services, employment and royalties paid to landowners, some general points need to be made about the data that were provided to ITS Global by Rimbunan Hijau for this report.

- Disaggregation of the data is difficult. When a forestry site is being developed, materials and other items are grouped together for accounting purposes. Expenditure cannot be retrospectively disaggregated in the detail required for a report such as this.⁴⁰
- The duration of infrastructure investments is difficult to estimate. Much depends on the physical conditions on the ground, and especially rainfall patterns. In the Gulf Province, for example, heavy rainfall not only hinders logging (and hence increases costs and interrupts logging operations), but has a significant impact on roads.⁴¹

39 Green NGOs are fond of asserting that this infrastructure is somehow "sub-standard". Yet all the evidence is that Rimbunan Hijau is not having any difficulties in attracting and retaining workers. If its living and working conditions, not to mention rates of pay, were below PNG standards, it would be unable to attract and retain workers.

40 This means that some figures may overestimate the extent of benefits and in other cases may underestimate them.

41 Green NGOs are fond of presenting photographs of logging roads which have suffered from erosion. The implication is that such erosion never occurs on roads constructed by governments and that such erosion is never fixed by the forestry companies. When forestry roads are eroded and operational requirements dictate, repairs are of course made. As our first economic report revealed, local people use and value forestry roads. The fact that such roads are not maintained after logging does not constitute a criticism of the forestry companies. It is invalid to criticise forestry companies for not doing what they are not required by law to do: maintain logging roads after logging. As far as we are aware, there has been no Green NGO expenditure to assist local people to maintain forestry roads after logging. We are not aware that aid donors have done so.

Rimbunan Hijau has advised that secondary forestry roads tend to last from six to nine months before they become overgrown and/or suffer from erosion. Provincial and village roads can last for between three to ten years.

- Expenditure on secondary roads and their maintenance is included in the total costs for such roads. Rimbunan Hijau estimates that given the high rainfall in the Gulf and Western Provinces, 25 to 30 per cent of total expenditure on secondary roads is maintenance expenditure.
- There are no comprehensive data on the usage of roads provided by Rimbunan Hijau. Such investments are undertaken to facilitate commercial forestry activities. Timber permits spell out the investments that are required. But these roads are used by local communities – including for transporting food and other services to logging projects. These investments generate benefits for Rimbunan Hijau and local communities, but with the exception of air transport, data is not available with which to estimate the share of the benefits between Rimbunan Hijau and local people.

Table 4.1 presents data on education infrastructure, wharf and jetty infrastructure and health infrastructure by Rimbunan Hijau at its forestry projects in PNG by Province. This table has been compiled by ITS Global from the detail on project expenditure presented in Annex I. The data have been recorded by Rimbunan Hijau on an

Table 4.1: Expenditure by Rimbunan Hijau on education, health, wharves and jetties, by forestry project, by Province, Kina '000, 1993 to 2006

Project	Education Infrastructure	Wharf & Jetty Infrastructure	Health Infrastructure
Edevu	192		30
<i>Sub-total Central Province</i>	192		30
Cape Orford	136	9	16
<i>Sub-total East New Britain Province</i>	136	9	16
East Kikori	624	975	234
Turama			16
Vailala Block 1	724	200	936
Vailala Bocks 2 & 3	1,823	2,130	90
<i>Sub-total Gulf Province</i>	3,171	3,305	1,276
Jaha		100	
West Manus	25	300	25
<i>Sub-total Manus Province</i>	25	400	25
Alimbit Andru	960		300
Passismanua	391		48
Sagarai-Gadaisu	316	100	86
Tokai Matong		925	72
<i>Sub-total West New Britain Province</i>	1,667	1,025	506
Wawoi Guavi	1,081	5,095	309
<i>Sub-total Western Province</i>	1,081	5,095	309
Total	6,272	7,604	2,594

Source: Rimbunan Hijau and ITS Global

historical cost basis in the year in which it was spent.⁴² Considerable care is therefore required in seeking to compare the accumulated historical cost spending by Rimbunan Hijau (or the stock of investment) with the budgeted amounts allocated in a particular year by the Gulf Provincial and Local Government (or the flow of investment).

The amount spent by Rimbunan Hijau between 1993 and 2006 on education, health, and wharves and jetties are very substantial: the Company spent K6.272 million on education; K7.604 million on wharves and jetties; and K2.594 million on health infrastructure at the logging sites. The breakdown by Province and by Rimbunan Hijau forestry project is in Table 4.1.

Table 4.2 presents capital spending by Rimbunan Hijau on roads, bridges and culverts and other infrastructure investments at specific projects by Province. Note that this is additional to the transport infrastructure figures presented in Table 4.1, which relates to the Company's spending on wharves and jetties. Further project detail is presented in Appendix 1.

This shows expenditure by Rimbunan Hijau on roads and other infrastructure is very substantial: involving a total expenditure of K233.16 million on roads, culverts and bridges over the period, and K26.7 million on other infrastructure.

We have noted the limitations involved in any attempts to compare such expenditure by Rimbunan Hijau at its forestry operations and similar expenditure by the National and/or Provincial Governments. What is unarguable is that these investments are very significant – and that they underpin the generation of jobs, incomes, exports and government revenue and the provision by Rimbunan Hijau of key services in remote parts of PNG.

42 Rimbunan Hijau has provided data on land clearing, which is identified as a separate item in Appendix 1. Some of that spending would have been for education, transport and health infrastructure, but it has been excluded from Table 6 as there was no way of allocating such spending to education, transport and health infrastructure.

Table 4.2: Expenditure by Rimbunan Hijau on infrastructure, by forestry project, by Province, Kina millions, 1993 to 2006

Project	Roads, culverts & bridges	Other Infrastructure	Total
Edevu	5.01	0.54	5.55
<i>Sub-total Central Province</i>	<i>5.01</i>	<i>0.54</i>	<i>5.55</i>
Cape Orford	12.81	0.58	13.40
Nutuve	0.41		0.41
Tokai Matong	15.95	1.53	17.49
<i>Sub-total East New Britain Province</i>	<i>28.17</i>	<i>2.11</i>	<i>31.30</i>
East Kikori	16.51	2.88	19.40
Turama	3.74	0.12	3.86
Vailala Block 1	12.47	2.78	15.25
Vailala Blocks 2 & 3	14.70	4.72	19.46
<i>Sub-total Gulf Province</i>	<i>47.42</i>	<i>10.50</i>	<i>57.97</i>
Jaha	3.19	0.17	3.60
Kali Bay	1.72	0.08	1.81
West Manus	7.75	0.74	8.29
<i>Sub-total Manus Province</i>	<i>12.66</i>	<i>1.71</i>	<i>13.70</i>
Sagarai-Gadaisu	18.44	1.16	19.61
<i>Sub-total Milne Bay Province</i>	<i>18.44</i>	<i>1.16</i>	<i>19.61</i>
Alimbit Andru	14.16	1.86	16.02
Passismanua Inland	13.39	1.13	14.53
<i>Sub-total West New Britain Province</i>	<i>27.55</i>	<i>2.99</i>	<i>30.55</i>
Wawoi Guavi	92.88	4.72	100.81
<i>Sub-total Western Province</i>	<i>92.88</i>	<i>4.72</i>	<i>100.81</i>
Total	233.16	26.27	259.44

Source: Rimbunan Hijau

Chapter 5. Gulf Province Case Study

5.1 Contribution by Rimbunan Hijau forestry operations to provincial economy

Rimbunan Hijau currently operates four forestry concessions in the Gulf Province. They are:

- East Kikori;
- Turama;
- Vailala Block 1; and
- Vailala Blocks 2 and 3.

In 2006 Rimbunan Hijau produced a total of 251,000 cubic metres of logs from these concessions, either for export as logs or for processing in sawmills in the Province. The Company's log output in the Gulf represented approximately one-quarter of its overall log harvest in PNG that year, which in turn was over 30 per cent above the Company's total log production level for PNG in 2005.

On this basis, ITS Global has sought to estimate the economic contribution that the Company's forestry activities in the Gulf Province make to the national economy. Based on an extrapolation of its estimates for the overall contribution by the Company to the national economy in 2005, ITS Global has estimated that the Gulf Province forestry would probably generate a contribution to the national economy of around K18 million a year. As with the previous estimates, this is in 2005 prices.

On the available information, it is very difficult to determine how much of this contribution to the national economy would benefit the Gulf Province. Some of these economic impacts would certainly be direct. The most obvious examples are the wages that Rimbunan Hijau pays to its local employees, the payments that it makes to local contractors, and the royalties that it pays to local land owners from whose land the logs are harvested. Other impacts, however, are indirect – such as the tax revenue from these activities that is then used by the national government to provide services to local residents, either through its own agencies or the provincial government.

Based on recent National Accounts data on the extent of employee compensation in the forestry sector, it would seem that the wages paid to the Company's forestry employees in the Gulf Province would be likely to be of the order of K700,000 a year. This wages expenditure would flow straight to local families and would sustain higher levels of consumption by them than would be possible otherwise, given the paucity of alternative paid employment opportunities in the Province.

On top of this expenditure, the Company also provides infrastructure and social services in support of its commercial operations in the Gulf that are extensively used by residents of the Province. This is the subject of the following section.

5.2 Public contributions to infrastructure & social services

PNG suffers from a shortage of infrastructure and social services, especially in remote areas. That is not a criticism of either the National or Provincial Governments but a reflection of the development challenges confronting PNG. The shortage results in poor economic and productivity growth.

Industries that provide infrastructure and social services therefore play an important role in supplementing public delivery. In some remote areas, forestry companies such as Rimbunan Hijau are the largest providers of infrastructure and health and education services. In other locations they may be the sole provider.

An assessment of expenditure on infrastructure and health and education services by National, Provincial and Local Governments is limited by the coverage and quality of the data. From published data, it is not possible to determine the spending by the National Government on these items by Province.

The 2007 Budget of the Gulf Provincial Government has total revenue of K52.91 million. Of this, K25.73 million was to be obtained from the National Government and K27.17 million from the Provincial

Government's own revenue sources.⁴³ The Budget allocated spending to: Personal Emoluments, K16.28 million (63 per cent); Goods/Services, K3.9 million (15 per cent); and Public Investment Programme, K5.55 million (22 per cent).⁴⁴

Funding provided by the National Government comprises a range of grants. The PNG Treasury explains that

“In the 2004 Budget, the Administration and Infrastructure Grants were replaced by an unconditional Block Grant and three conditional Function Grants tied to service delivery in the MDTs (Medium Term Fiscal Strategy) core priority areas: basic education, primary health care and transport infrastructure maintenance.”⁴⁵

The Treasury provides the following definitions of grants provided to Provincial Governments:

- “Function Grants are to be used to pay only for operational ‘goods/services’ and maintenance costs incurred in the primary health, basic education, transport infrastructure and village court systems. They cannot be spent on salaries or capital development unless the budget allocation specifies that purpose”.⁴⁶ In other words, Function Grants are not same as recurrent expenditure as they exclude salaries;
- The Education Function Grant is not to be used for the construction of new teachers’ houses and classrooms, however, it may be used for routine maintenance”;⁴⁷
- “The Transport Infrastructure Maintenance Function Grant can only be applied to the maintenance costs of provincial roads, jetties/wharves, airstrips/airfields etc. It should not be used for the construction of new roads or maintenance of buildings or for major reconstruction of unusable existing roads”;⁴⁸
- “Block Grants should be used to cover the costs of a Province’s administrative overheads and the costs of other sectors not covered in Function Grants. Provinces will need to supplement this Grant, drawing on revenues or other benefits, to fund local priorities.”⁴⁹; and
- Derivation Grants are “a conditional economic grant that the National Government is legally bound to transfer to Provinces” which are allocated “based on the value of actual exports derived from each Province in 2006, being the most recent full year data available”. Derivation Grants are to be spent only “to promote exports of their primary and secondary processed products or to rehabilitate the infrastructure necessary to enable producers to take their produce to market”.⁵⁰

Recurrent expenditure by the Gulf and Local Governments

Function Grants the best published measure of recurrent expenditure by the Gulf and Local Governments from National Government Grants. These grants are not supposed to be used for salaries. They will therefore be less than total recurrent expenditure if they are supplemented by Provincial Government funds.

Block Grants are a measure of capital expenditure from National Government funds. But to the extent that Block Grants are supplemented by Provincial Government revenue and such funds are used for capital expenditure, Block Grants will underestimate actual capital expenditure. The Block Grant to the Gulf and Local Level Government was K0.55 million in 2007.⁵¹

43 Gulf Provincial and Local Level Government (2006). *Recurrent Budget Estimates of Revenue and Expenditure of Gulf Provincial and Local Level Government for year Ending 31 December 2007*, A Bill for an Act Entitled Appropriation Act 2007, Act No. 1 of 2007, Acting Government Printer, Port Moresby, 28 December 2006, insert between pages 8 and 9.

44 *Ibid.*, insert between pages 10 and 11.

45 PNG Department of the Treasury (2006) *op. cit.*, page 9.

46 *Ibid.*

47 *Ibid.*, page 11.

48 *Ibid.*, page 11.

49 *Ibid.*, page 9.

50 *Ibid.*, page 14.

51 Gulf Provincial and Local Level Government (2006) *op. cit.*, page 9.

In the 2007 Gulf Provincial Budget, of the K25.72 million from National Government Grants, Personal Emolument and Goods/Services accounted for 78 per cent and the Public Investment Programme for 22 per cent of the funds.⁵²

Two Function Grants are identified in the 2007 Gulf Provincial Budget:

- 0.76 million from the Health Function Grant (K0.47 million in 2005 and K0.35 million in 2006); and
- K1.07 million from the Education Function Grant (K0.48 million in 2005 and K0.58 million in 2006).⁵³

To the extent that Function Grants are the best published measures of recurrent expenditure by the Gulf Province from National Government grants, total recurrent expenditure by the Gulf Province in 2007 on health and education from such grants was K1.83 million – up from K0.95 million in 2005 and K0.93 million in 2006.⁵⁴

As noted above, Function Grants are likely to underestimate recurrent spending by the Gulf and Local Governments. The 2007 Budget also identifies the following items under Administration Support Grants from National Government Grants:

- K0.21 million from the Transport/Infrastructure Grant (K0.12 million in 2005 and K0.58 million in 2006);
- K9.87 million from the Teaching Services Grant (K6.56 million in 2005 and K9.87 million in 2006); and
- K0.79 million in Teacher's Leave Fares (K0.66 million in 2005 and K0.55 million in 2006).⁵⁵

If the funds from the Transport/Infrastructure Grant, Teaching Services Grant and Teacher's Leave Fares also represent recurrent expenditure, and were in fact spent for the designated purposes, total recurrent spending by the Provincial Government on health, education and infrastructure in 2007 would have been:

- education: K11.73 million (Education Function Grant, plus Teaching Services Grant and Teacher's Leave Fares);
- health: K0.79 million; and
- transport and infrastructure: K0.21 million.

Total recurrent expenditure on these three items from National Government sources in the Gulf Province was therefore K12.73 million in 2007.

The 2000 PNG census indicated that 105,050 people lived in the Gulf Province.⁵⁶ PNG's population has been growing at an annual average rate of 2.7 per cent.⁵⁷ If the population of the Gulf Province increased at the annual rate of 2.7 per cent, its current population would be around 126,500 in 2007.

Based on a Provincial population of 126,500 in 2007 and the allocations to the education, health and transport/infrastructure presented above, the expenditures per person from the National Government recurrent grants are as follows:

- education: K92.7 per person;
- health: K6.24 per person; and
- transport and infrastructure: K1.6 per person.

Capital expenditure by the Gulf and Local Governments

In the 2007 Gulf Provincial and Local Budget, there is also capital expenditure on specific education facilities. These expenditures are set out in Table 5.1. Total capital expenditure on education by the Gulf Provincial and

52 *Ibid.*, insert between pages 10 and 11.

53 *Ibid.*, page 9.

54 *Ibid.*

55 *Ibid.*

56 See http://www.pngbd.com/travel/tourism_guide_tpa/index.php?page=http%3A//www.pngbd.com/travel/tourism_guide_tpa/populationbyprovincepng2.html

57 Australian Agency for International Development (2007). *About Papua New Guinea*, AusAID, Canberra accessed at http://www.ausaid.gov.au/country/png/png_intro.cfm

Table 5.1: Gulf Provincial and local level capital expenditure on education, Kina millions, 2005, 2006 and 2007⁶⁰

Allocation	Budget year 2005	Budget year 2006	Budget Year 2007	Total 2005-2007
Purchase of a vehicle for the Provincial Education Office			0.12	
Debt servicing ⁶¹			0.06	0.18
Grants and subsidies for Provincial High Schools ⁶²	0.11	0.11	0.13	0.35
Grants and subsidies for Vocational School Subsidy ⁶³	0.06	0.04	0.03	0.13
Primary Schools Subsidy	0.15	0.27	0.27	0.69
High school maintenance ⁶⁴	0.04	0.25	0.15	0.44
School maintenance in the Kerema District ⁶⁵	0.2	0.5	0.5	1.2
School maintenance in the Kikori District ⁶⁶	0.2	0.4	0.4	1
Construction, renovation and improvement of the Don Bosco Technical School ⁶⁷	0.1	0.1	0.1	0.3
Total	0.86	1.67	1.76	4.29

Source: ITS Global and 2007 Gulf Provincial and Local Level Government Budget

Local Governments in 2007 was K1.76 million. This represented 31.7 per cent of the total public investment program of K5.55 million in 2007.

There were no allocations for capital expenditure on health services in 2005 and 2007 by the Gulf and Local Governments from National Government Grants. The only capital expenditure on health services from National Government Grants was K1 million in 2006 for a feasibility study for the Kerema General Hospital Re-Development.⁵⁸

There were no allocations for capital expenditure from the Gulf and Local Level Government's own revenues.⁵⁹ The only capital expenditure on health services in the Gulf Province between 2005 and 2007 was K1 million to fund feasibility study for the Kerema General Hospital Re-Development. There is room for debate as to whether a feasibility study for a redevelopment should be described as capital expenditure. If the feasibility study is excluded, there was no capital expenditure on health in the Gulf Province for between 2005 and 2007.

In 2007 the capital expenditure on airstrips by the Provincial Government was K0.61 million.⁶⁸

Table 5.2 presents data on capital expenditure on road maintenance and improvements in the Gulf Province between 2004 and 2007. Total allocations for capital expenditure, road maintenance and improvements by the Gulf Provincial and Local Governments were K2.5 million in 2005, K2.63 in 2006 and K2.22 in 2007. Total spending between 2005 and 2007 was K7.35 million. But of this figure, K2.73 million was for the Kerema Town

58 Gulf Provincial and Local Level Government (2006) *op. cit.*, pages 30-34, page 102 and page 146

59 *Ibid.*, pages 144, 146.

60 The Gulf Budget presents data on capital expenditure from National Government Grants and Gulf Provincial Government revenue. The figures in Table 5.1 present total expenditures from both sources

61 Gulf Provincial and Local Level Government (2006) *op. cit.*, page 35

62 *Ibid.*, page 42.

63 *Ibid.*, page 43.

64 *Ibid.*, page 83.

65 *Ibid.*, page 183.

66 *Ibid.*, page 184.

67 *Ibid.*, page 185.

68 *Ibid.*, pages 51, 52, 92 and 149.

Table 5.2: Capital expenditure allocations for road maintenance and improvements, Gulf Province, Kina millions, 2005 to 2007

Allocation	Budget year 2005	Budget year 2006	BudgetYear 2007	Total
Petoe-Vailala-Hepere road	0.4	0.5	0.4	1.3
Kerema Town Improvement project	0.1	0.1	0.2	0.4
Kerema-Malalaua road	1.1	1.13	0.5	2.73
Mepora-Titikaini road	0.1	0.1	0.1	0.3
Epo-Murua-Matape road	0.3	0.3	0.32	0.92
Iokea-Apanaimpa-Rove road	0.4	0.4	0.3	1.1
Epo-Ihu road	0.1	0.1	0.4	0.6
Total	2.5	2.63	2.22	7.35

Source: ITS Global and 2007 Gulf Provincial and Local Level Government Budget

Improvement Project. Spending in rural areas over the three year period was therefore K4.62 million. As noted above, PNG Treasury cannot advise how much of this allocated spending was actually undertaken.

Using an estimated population for Gulf Province in 2007 of 126,500, and applying that figure to capital expenditure figures for education, health and road maintenance presented above in 2007 gives the following figures on estimated capital expenditure per person in the Gulf Province:

- education: K13.91 per person;
- health: K0 per person; and
- road maintenance and improvement: K17.55 per person

5.3 RH contributions to infrastructure & social services

Rimbunan Hijau has provided ITS Global with comprehensive data on its expenditure on infrastructure and social services at its forestry sites in the Gulf Province. The detail is at Annex 1.

Total spending to February 2007 by Rimbunan Hijau at its forestry projects in the Gulf Province has been K64.39 million. As Rimbunan Hijau has been present in Gulf Province for 14 years, this translates to an average expenditure of K4.565 million per year. For ease of reference, Table 5.3 presents the accumulated expenditure at all four Gulf forestry projects. Three of the four projects account for broadly similar levels of expenditure: East Kikori, Vailala Block 1 and Vailala Blocks 2 and 3.

The accumulated expenditure to February 2007 was K2.87 million on education and K1.276 million on

Table 5.3: Expenditure by Rimbunan Hijau on infrastructure & social services, by project, Gulf Province, Kina millions

Project	Roads, Culverts & Bridges	Education infrastructure	Health infrastructure	Transport	Other Infrastructure	Total
East Kikori	16.51	0.62	0.23	0.98	2.88	21.22
Turama	3.74	0.02	0.12	3.88		
Vailala Block 1	12.47	0.72	0.94	0.96	2.78	17.87
Vailala Blocks 2 & 3	14.70	1.82	0.09	0.09	4.72	21.42
Total	47.42	3.16	1.28	2.03	10.5	64.39

Source: Rimbunan Hijau

health infrastructure. As would be expected, investment in roads, culverts and bridges was the most significant item of accumulated expenditure, at K47.42 million. Other transport investments totalled K2.028 million and other infrastructure K10.5 million.

Rimbunan Hijau also provides direct development grants to communities living along rivers on an annual basis.⁶⁹

Vailala Development Trusts

In June 2003, Rimbunan Hijau set up the Vailala Development Trust to promote and foster integrated agriculture, infrastructure and community development in the Vailala Block 2 and 3 Timber Permit Area. Details of its accumulated expenditures to February 2007 are in Table 5.4.

In January 2005, Rimbunan Hijau facilitated a second Development Trust at the Vailala Block 1 Timber

Table 5.4: Vailala Development Trust, inventory of expenditure to date

Description	Quantity
Sewing Machine	10
Bales of Material	10
Sets of coloured yarn (String)	10
Taper Bush Tanks 1,000 Gallon	62
Water Tap Brass 20mm	121
PVC Reducer 50mm x 20mm	61
Treated Mosquito Nets (Single)	1,000
Rice Mill	2
200 Litre Drum fuel	2
Roofing Iron	80
Rolls of pig wire	20
Packets of fencing nails/clamps	10
Outboard Motor, 15 HP	1
Sea Ambulance Type Fibre Glass Boat	1
Facilitated transport of medical supplies on regular basis	1
Outboard Motor, 15 HP	1
Sea Ambulance Type Fibre Glass Boat	1
Facilitated transport of medical supplies on regular basis	1
K700,00.00 contribution to landowner companies for community development projects	1
K15,000.00 direct cash contribution to local level government for community development projects	1
K 82,325.00 for School Fees	1

Source: Rimbunan Hijau

⁶⁹ Annual development grants are: K26,000 to communities of the Urama Island and Ivi River basin; K24,000 to communities along the Vailala River; and 12,000 to communities along the Purari River.

Table 5.5: Vailala Block 1 Development Trust, inventory of expenditure to date

Description	Quantity
Fibre Glass Dinghy 23 Feet	1
Outboard Motor, two stroke, 40 HP/15HP	2
Rice Mill	1
200 Litre Drum Fuel	1
Polythene Water tank 1,000 Gallons	41
Sheets Roofing Iron	20
Mathematics Books	30
Chemistry Books 2nd Ed	60
GCSE Chemistry Books	60
Physics Books 3rd Ed	60
Mathematics Books 3rd Ed	60
Chemistry Books made clear	60
Polythene Water tank 3,000 Gallons	1
4WD Tractor	1
Registration/CTP	1
Non Tipping Trailer 3 Ton	1
Registration/CTP	1
School Desks (double Bench)	40
Treated Mosquito Nets (Single)	1,000
K320,000.00 for road project between Kerema and Ihu	1
K50,000.00 for feasibility study for commercial agriculture development	1

Source: Rimbunan Hijau

Permit Area, which has already disbursed K320,000 for the first phase of the Kerema to Ihu road construction project. Details of its accumulated expenditures to February 2007 are in Table 5.5.

In addition to the benefits accruing to local communities from items provided to them from the Vailala Development Trusts, the 2007 Gulf and Local Governments Budget records that the Vailala Timber Block 1 Trust provided the Government with K1 million in 2005 and 2006.⁷⁰ This represented 7.38 per cent of the K13.56 million in income generated by the Gulf Budget in 2005 – and 5 per cent of the K19.9 million in 2006.

Purari and Teredau

ITS Global undertook site visits to Rimbunan Hijau's Purari and Teredau forestry operations in Gulf Province. These visits obtained information with which to augment the data presented above.

At Purari, Rimbunan Hijau has constructed a school. It caters for 30-40 students. There is no other school nearby. It services a regional population of around 400. Rimbunan Hijau also constructed an aid post, which provides free medical treatment to workers and children at the school.

⁷⁰ Gulf Provincial and Local Level Government (2006) *op. cit.*, page 10.

Rimbunan Hijau employs around 200 people at Purari. There are no other sources of monetary income to be had in the region.

Workers use the forestry roads regularly to return to their villages. A canteen has been built by Rimbunan Hijau. Workers fish in the rivers, and secure a good proportion of their food needs from this source, as well as from market gardens that have been established on the site and from food brought to the site by local communities using the roads constructed by Rimbunan Hijau.

The Teredau Integrated Processing Facility, which commenced in 2005, employs 149 local people. Staff turnover is low. Management believes employment satisfaction is high. This confirms conclusions drawn from previous site visits to Rimbunan Hijau's forestry operations in the Western Province, i.e. workers value the job opportunities at forestry projects in remote areas of PNG where job opportunities are few and far between. ITS Global was advised by management at Teredau that those who leave do so for family reasons (often as target levels of savings have been achieved) rather than dissatisfaction with their jobs.

Rimbunan Hijau does not provide health services at its Teredau project as such services are provided by the Government. Those who require more complex health services must travel to Kikori. In normal circumstances they would use the aircraft service provided by Tropic Air (a subsidiary of Rimbunan Hijau) to do so.

Rimbunan Hijau has built a school at the site and pays for the maintenance. The Government pays for the teacher. Around 50 students attend the school. The nearest government school is at Kikori.

Tropic Air

Tropic Air operates in both Gulf and Western Provinces. As stated above, this benefits both forestry operations and local communities. In the first economic report, ITS Global demonstrated that approximately one third of passengers carried by Tropic Air to Rimbunan Hijau forestry operations in the Western Province are company employees. Therefore around two thirds of the benefits from this service flowed to local communities.⁷¹

Rimbunan Hijau has provided ITS Global with data on usage of Tropic Air services to its Gulf Province forestry operations. This data is presented in Table 5.6.

At Purari nearly 40 per cent of the benefits from the use of Tropic Air service in June 2007 flowed to landowners and others. At Teredau nearly half of the benefits accrued to landowners and others. At Vailala a higher proportion of the benefits accrued to workers.

In other words, a substantial share (around a half to three quarters) of the benefits from air services to Rimbunan Hijau's forestry operations in the Gulf Province accrue to landowners and others. Green NGO assertions that forestry infrastructure generate benefits only to the forestry companies are demonstrably wrong in this case.

These benefits should not be discounted. Certainly local people do not discount them. The alternative to air transport to such remote areas of PNG is river transport. This is very slow. For people who are injured or sick, air transport is, literally, a life saver. Such transport also enables them to get access to goods and services that would not otherwise be available at the prices and with the regularity that air transport delivers.

Table 5.6: Use of Tropic Air services by Rimbunan Hijau forestry operations, Gulf Province, per cent, June 2007

Airstrip	Workers	Landowners	Others
Purari	62.3%	18.4%	18.3%
Teredau	52.7%	4.7%	42.6%
Vailala	87.5%	0%	12.5%

Source: Rimbunan Hijau

71 ITS Global (2006). *The Economic Importance of the Forestry Industry to Papua New Guinea*, op. cit., pages. 42-43

5.4 Conclusions

There is a strong argument that the regional benefits from Rimbunan Hijau's forestry operations are more significant, in relative terms, than the national economic benefits. But assessing these regional benefits is severely constrained by the paucity of the data.

In those regions where Rimbunan Hijau has established its forestry operations, there are few, if any, alternative job opportunities for the local population. This is especially so in the Gulf and Western provinces. Those areas are characterised by low population densities.

Without commercial forestry, the people in those regions have very little prospect of earning cash incomes from other commercial activities, nor would they have access to the roads, air transport, health and educational services that are provided by the forestry companies.

Comparisons between the spending on infrastructure, health and education services by governments and by Rimbunan Hijau's forestry operations in the Gulf Province are limited by data coverage and data quality issues. Care is therefore required in doing so.

Some key conclusions are warranted, however, by the information presented in this Chapter:

- The public funds allocated to health, education and roads in 2007 is comparatively low. Given the size of the Gulf Province, and its very high rainfall, it will be a challenge to maintain the quality of existing roads with road maintenance spending of K2.22 million in 2007. There would appear very little if any scope for new roads within this amount of money;
- This, in turn, emphasises the complementary nature of spending on roads by forestry companies such as Rimbunan Hijau. Such spending augments the very limited ability of Provincial and Local Governments to provide road services within a Province with a small and highly dispersed population;
- Given the levels of recurrent and capital spending identified in 2005, 2006 and 2007 on infrastructure and social services by the Gulf and Local Governments, and particularly the low levels of expenditure per person, the expenditure by Rimbunan Hijau is clearly very important to the local population; and
- As investments by Rimbunan Hijau at its forestry operations in the Gulf Province have been audited as having taken place, and have been maintained, its accumulated investment in health, education and road infrastructure is likely to represent a significant proportion of the total stock of such assets in the Province.

Rimbunan Hijau's forestry operations in the Gulf Province generate very significant regional economic and social benefits. These comprise two elements:

- First, the jobs and income generated at its forestry projects in the Province. The low labour turnover is the best possible indication of just how valued these jobs are in areas of PNG where the prospects of earning monetary incomes are very limited; and
- Second, the infrastructure and health and education services provided at these projects.

Both of these benefits are very substantial in their own right. But the infrastructure, health and education benefits provided by Rimbunan Hijau in the Gulf Province may be even more significant than the jobs and incomes generated for those who are able to secure jobs at these projects.

Annex I: Breakdown of Rimbunan Hijau's infrastructure spending in PNG

Project	Item	Amount (Kina millions)
Alimbit Andru LFA	Aid post	0.03
	Landowner buildings	0.58
	School buildings	0.96
	Landclearing	0.04
	Total social	1.61
	Main roads	9.444
	Provincial/Village roads	1.537
	Secondary roads	1.218
	Total roads	12.199
	Cape Orford TRP	Aid post
Airstrip shed		0.009
Landowner offices		0.125
School buildings		0.136
Landclearing		0.04
Total social		0.326
Bridge, permanent		5.175
Culvert, permanent		1.166
Road, main		5.819
Road, secondary		0.543
Total roads	12.703	
East Kikori TRP	Aid post	0.234
	Airstrip	0.975
	Landowner buildings	0.619
	School buildings	0.624
	Water tanks	0.139
	Land clearing	0.015
	Total social	2.606
	Road, main	10.313
	Road, provincial	3.284
	Road, secondary	2.915
Total roads	16.512	

Project	Item	Amount (Kina millions)
Edevu TRP	Aid post	0.03
	Landowner buildings	0.222
	School buildings	0.192
	Total social	0.444
	Bridges, permanent	1.035
	Culvert, permanent	0.11
	Roads, main	2.538
	Roads, provincial	0.511
	Roads, secondary	0.673
	Total roads	4.867
Jaha LFA	Forestry office	0.025
	Jetty	0.1
	Water tanks	0.2
	Land clearing	0.025
	Total social	0.35
	Culvert, permanent	0.22
	Road, provincial	2.592
	Road, secondary	0.378
	Total roads	3.89
Kali Bay LFA	Landowner house	0.05
	Water pipeline	0.005
	Land clearing	0.035
	Total social	0.085
	Culvert, permanent	0.044
	Road, provincial	1.598
	Road, secondary	0.081
	Total roads	1.723
Nutuve TRP	Roads, main	0.396
	Roads, secondary	0.015
	Total roads	0.411
Passismanua Inland LFA	Aid post	0.048
	Church	0.35
	Landowner offices	0.125
	School buildings	0.391
	Water supply	0.02
	Land clearing	0.035
	Total social	0.969

Project	Item	Amount (Kina millions)
Passismanua Inland LFA	Bridge, permanent	1.035
	Roads, main	5.577
	Roads, provincial	1.901
	Roads, secondary	2.575
	Total roads	11.088
Sagarai-Gadaisu TRP	Aid post	0.086
	Church	0.398
	Community hall and housing	0.105
	Land-clearing	0.05
	Jetty	0.1
	Police station	0.03
	Market building	0.036
	School buildings	0.316
	Nursery	0.033
	Water supply	0.015
	Total social	1.169
	Culvert, permanent	0.66
	Roads, main	10.132
	Roads, provincial	4.657
	Roads, secondary	2.977
Total roads	18.426	
Tokai Matong TRP	Aid post	0.072
	Airstrip	0.925
	Community buildings	0.07
	Government buildings	0.051
	Jetty	0.1
	Landowner buildings	0.09
	Land clearing	0.035
	Water supply	0.036
	Total social	1.379
	Bridge, permanent	5.175
	Culvert, permanent	0.77
	Roads, main	4.479
	Roads, provincial	4.163
	Roads, secondary	1.188
	Total roads	15.775

Project	Item	Amount (Kina millions)
Turama TRP	Aid clinic	0.016
	Forestry offices	0.06
	Police station	0.04
	Total social	0.116
	Roads, main	2.463
	Roads, provincial	0.385
	Roads, secondary	0.73
	Total roads	3.578
	Vailala Block 1 TRP	Aid clinic
Church		1.15
Forestry office		0.025
Land clearing		0.01
Jetty		0.2
Landowner buildings		0.066
Market building		0.036
Police station		0.03
School building		0.724
Water supply		0.305
Total social		3.483
Roads, main		5.356
Roads, provincial		6.474
Roads, secondary		0.643
Total roads		12.473
Vailala Blocks 2&3 TRP	Aid clinic	0.09
	Airstrip	1.838
	Forestry offices	0.197
	Landowner houses	0.325
	Jetty	0.3
	Police station	0.16
	Portable sawmills	0.105
	School buildings	1.832
	Water supply	0.04
	Total social	4.887
	Roads, main	11.485
	Roads, provincial	2.183
	Roads, secondary	1.034
	Total roads	14.702

Project	Item	Amount (Kina millions)	
Wawoi Guavi TRP	Aid clinic, hospital and medical centre	0.309	
	Airstrip	2.16	
	Bridge	1.035	
	Church buildings	0.31	
	Community hall	0.035	
	Culvert	0.017	
	Government offices	0.295	
	Jetty and wharf	1.9	
	Landowner buildings	0.325	
	Market building	0.06	
	Police station	0.239	
	School buildings	1.081	
	Water supply	0.025	
	Total social	7.791	
	Roads, main	61.558	
	Roads, secondary	23.105	
	Roads, provincial	8.213	
	Total roads	92.876	
	West Manus TRP	Aid clinic	0.025
		Land clearing	0.066
Landowner buildings		0.16	
Jetty		0.3	
School		0.312	
Total social		0.863	
Bridges, permanent		2.07	
Culvert, permanent		0.448	
Roads, main		2.332	
Roads, provincial		0.172	
Total roads		5.022	

Annex II: Methodology and approach to assessment

Data sources

The assessment methodology draws on two sources. For the macroeconomic aggregates, we have used published National Accounts data. For microeconomic issues we have compared expenditure (on infrastructure and social welfare facilities) by Rimbunan Hijau at its forestry operations and similar expenditure by the National and Provincial Governments.

Care is needed when interpreting the stock of spending on infrastructure, health and education services with the flow of similar spending by the National and Gulf and Local Level Governments. They are not measuring the same things.

Data limitations

One of the challenges in assessing the economic benefits from Rimbunan Hijau's forestry operations is the extent and quality of available data. We have used three sources of data: National Government data; Gulf and Local Level Government data; and data and other information provided to us by Rimbunan Hijau. We have also drawn on reports by academics and international organisations.

Identifying the benefits

Our objective is to identify the socio-economic contribution to the PNG economy by Rimbunan Hijau's forestry operations. It is straightforward to identify the key economic aggregates: wages and taxes paid, jobs and the like. But as our first economic report indicated, Rimbunan Hijau is also a major provider of infrastructure, education and health services. These services are a major part of its overall socio-economic contribution to PNG.

There are two standard methods to analyse an industry's socio-economic contribution.

- First, examine available macroeconomic data and identify the aggregate economic contribution.
- Second, augment the conclusions from macroeconomic data by providing an assessment of the wider socio-economic benefits flowing from spending on infrastructure, education and health services. Ideally, there would be a comparison of spending by the National and provincial level Governments on infrastructure, health and education services with similar expenditure by Rimbunan Hijau.⁷²

Data is available for the macroeconomic analysis. But comparable data is not available on spending on infrastructure, health and education expenditure by the National Government and Gulf and Local Level Governments and Rimbunan Hijau. Even if such data was available, two additional pieces of information would be required:

- Whether budgeted spending was undertaken; and
- The effectiveness of that investment, i.e. comparison of the outcomes from expenditure by Rimbunan Hijau and similar expenditures by the National and Gulf and Local Level Governments.

Auditing of expenditure

There are however no guarantees that notional spending by a provincial government for infrastructure, health and education, as set out in their budgets, is spent for the designated purposes. It can be argued that there should be greater confidence that National Government allocations are spent on the designated purposes.

⁷² As noted below, the objective in undertaking this analysis is to identify the extent to which spending on infrastructure, health and education services by Rimbunan Hijau is complimentary to similar spending by the National and Gulf and Local Province Governments.

The PNG Treasury was contacted to determine whether notional expenditure by the National Government and Gulf and Local Level Governments on infrastructure, health and education services had taken place. Treasury advised that it could not confirm whether such notional spending had been undertaken.

There are reasons to believe that even less reliance should be placed on Gulf and Local Level Government data. The following extracts from the 2007 Recurrent Budget Estimates of Revenue and Expenditure of the Gulf Provincial and Local Level Government are relevant:

“... the Provincial Executive Council or the Chairman of Finance may direct in writing to the Chief Accountable Officer the re-allocation of unexpected appropriation from the Vote or any Vote in Schedule Two provided that the total re-allocation shall not in the case of the Chairman for Finance exceed K20,000.00;

The Chairman may transfer from any programme such activity as is considered necessary to another programme in Schedule Two of the Act; and

Notwithstanding anything under sub-section (9) the Chairman may have the power to direct the expenditure in such manner as is appropriated in so far as to achieve the intended purposes of the funds allocated under sub-section (9).”⁷³

There is clearly scope for notional allocations in the Gulf and Local Level Provincial Government Budget to be changed. ITS Global is not aware of any published, independent, assessments of the extent to which notional spending as specified in its budget differs from actual spending.

Expenditure on infrastructure, health and education services by Rimbunan Hijau has been audited. There is therefore confidence that this spending has been undertaken. There is an additional level of certainty as spending required undertaken via the Project Development Levy has also been independently audited.

Investment maintenance

Even if there was confidence that all allocations in National and Provincial Government budgets for infrastructure, health and education services are spent for the purposes for which they were allocated, that does not imply that such funds are spent effectively or that assets are maintained over their economic life.

In most developed countries it is difficult to obtain an assessment of the effectiveness and efficiency of the stock of Government versus private sector investments in infrastructure, health and education services.

In PNG this issue has particular relevance. Expenditure by forestry companies such as Rimbunan Hijau on infrastructure and health and education facilities at its forestry sites has been shown in our first economic report to be very significant – both in absolute terms and compared with what is known about similar expenditure by the National and Western Province Governments.

A key issue in terms of the long term effectiveness of investment is maintenance.

Both the Australian Department of Foreign Affairs and Trade (DFAT) and the World Bank have noted that social services have fallen to critically low levels in parts of PNG.⁷⁴ Access and participation in education is also low.⁷⁵ Concern has also been expressed at the lack of implementation of policies, despite funding.^{76 77} An inadequate maintenance of transport infrastructure has also been observed.⁷⁸

The more remote the region, the more pronounced these deficiencies are likely to be.

⁷³ 2007 Recurrent Budget Estimates of Revenue and Expenditure of Gulf Provincial and Local Level Government (hereafter Gulf Provincial Budget 2007), pages 6 and 7.

⁷⁴ DFAT, *Papua New Guinea: The Way Ahead*, page 6.

⁷⁵ DFAT, *op. cit.*, page 7.

⁷⁶ DFAT, *op. cit.*, page 10.

⁷⁷ World Bank, *Interim Strategy Note for Papua New Guinea*, Report No: 41790-PG, Washington, DC, 18 March 2005, page 9.

⁷⁸ World Bank, *op. cit.*, page 11.

Case studies

ITS Global agreed with Rimbunan Hijau that having undertaken a case study of the socio-economic contribution of its operations in Western Province, a case study of its forestry operations in the Gulf Province would be appropriate for this report. The company has four forestry operations in the region; a processing facility; and a model development initiative – the Vailala Development Trust.

A template with which to assess the regional socio-economic effect of forestry operations was developed in our first economic benefits report. It was decided to repeat that template for Rimbunan Hijau's forestry operation in the Gulf Province. That template consists of the following:

- Consultations with Rimbunan Hijau officers in Port Moresby to obtain data and other information relevant to the case study;
- Site visits to Purari and Teredau in the Gulf Province;
- Examination of PNG National and Gulf Province data; and
- Examination of reports by academics and international organisations.

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