

Final Paper

On

National Analysis of Trade-Related Instruments Influencing Trade in Sandalwood (*Santalum macgregorii* F. Muell) and Eaglewood (*Acquilaria*. and *Gyrinops ledermannii* spp): Applications and Impacts on Poverty Alleviation and Sustainable Forest Management in Papua New Guinea

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By

Yati A. Bun and Israel Bewang¹

Under the Supervision of

Sven Walter²

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¹ Foundation for People and Community Development Inc Papua New Guinea

²

FAO, Forest Products Division, Non-wood Forest Products Programme, Viale delle Terme di Caracalla, 00100 Rome, Italy, www.fao.org.

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Acronyms and Abbreviations

CIFOR	Centre for International Forestry Research
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FOB	Free on Board
FSC	Forest Stewardship Council
GDP	Gross Domestic Product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
ISO	International Standard Organization
NWFP	Non-Wood Forest Products
CSIRO	Commonwealth Scientific Industrial Research Organization
FPCD	Foundation for People and Community Development Inc.
NGO	Non-governmental organization
PNG	Papua New Guinea.
IAC	Inter Agency Committee
PNGFRI	Papua New Guinea Forest Research Institute
NFA	National Forest Authority
CBD	Convention on Biological Diversity
NPP	Norway Partnership Programme
SFM	Sustainable Forest Management
UK	United Kingdom
USA	United States of America
US\$	United States of America Dollar
WWF	World Wide Fund for Nature

1 Introduction

This research work was commissioned to the Foundation for People and Community Development Inc (FPCD) Papua New Guinea (PNG), by the Food and Agricultural Organization of the United Nations (FAO) under the Norway Partnership Programme (NPP) “Forests for Sustainable Livelihoods (FNOP/INT/004/NOR).” The paper dwells on trade-related instruments influencing trade in non-wood forest products (NWFP), which is a sub-component of component 3 “Trade in Non-Wood Forest Products – Options for Poverty Alleviation” of the overall study on forests for sustainable livelihoods. The NPP complements and accelerates the implementation of ongoing activities of FAO’s Programme “Promotion and Development of Non-Wood Forest Products (NWFP)”. The Programme aims at improving the sustainable use of NWFP in order to contribute to the wise management of the world's forests, to conserve their biodiversity, and to improve income-generation and food security.

The NPP component 3 “Trade in NWFP – Options for Poverty Alleviation” aims at analyzing i) the impact of trade in NWFP on local livelihoods and on the sustainable use of NWFP and ii) the applicability of relevant trade-related instruments as adequate policy tools to promote and develop NWFP on a sustainable basis and including the adequate share of benefits among stakeholders concerned. Therefore, the overall objective of component 3 of the study is to analyze the impact of trade in NWFP on poverty alleviation and on the sustainability of the resources. However, discussions in this paper are limited to trade-related instruments with the specific objective to analyze how such instruments influence trade in NWFP and their impacts on poverty alleviation and sustainable forest management (SFM) in Papua New Guinea. Some of these trade-related instruments include:

- National public policies (e.g. national forest programmes, harvesting restrictions/bans);
- International and intergovernmental processes (e.g. multilateral environmental agreements such as CITES, CBD);
- Market-based instruments (e.g. certification, supply-chain management).

Two NWFP were selected from Papua New Guinea as case studies to analyze how trade-related instruments influence their commercialization and contributions to rural livelihoods and poverty alleviation. These two NWFP are Eaglewood and the Sandalwood. The criteria for selecting these products include:

- i) High socio-economic importance,
- ii) High domestic/international trade,
- iii) Threatening of sustainable production by poorly controlled harvesting associated with international trade and
- iv) Existing level of national and international intervention

Eaglewood and Sandalwood are two of the emerging commercialized NWFP in Papua New Guinea with not so well documented production and trade. However, such commercialization and the regulations that govern them have been identified to cause major impacts (positive and negative) on the sustainability of production as well as on the benefits that accrue to stakeholders. One reason suggests that there have been no effective mechanisms put in place to ensure sustainable production and equitable trade due to the lack of adequate data to clearly show the possibility of a win-win situation in the light of equity and sustainability for both the traders, local producing communities and resource conservation. This has rendered dialogue to arrive at fair trade terms difficult. A win-win situation in a production and trade system is believed to be one in which the sustainable supply of raw materials, as well as, better prices commensurate to the efforts and end value of the products are assured. Therefore, this paper analyzes how trade-related instruments have influenced the commercialization and livelihoods contributions of the two-selected NWFP in Papua New Guinea, and also suggests how positive impacts can be enhanced or negative impacts minimized.

The activities addressed in this paper include:

- a. Overview of Eaglewood and Sandalwood trade
- b. NWFP trade and its impacts on livelihood of the local populace
- c. Application of the trade related instruments to trade the NWFP in PNG
- d. Ecology and background of the NWFP
- e. Conclusions and recommendations.

2 Methodology

The task was carried out through various means:

- desk job
- library and internet facilities
- site visits
- one to one

Most of the information was obtained internally due to previous work on eaglewood and sandalwood, including foundational research for development of a Strategy for Conserving and Managing Sandalwood (*Santalum macgregorii*) in PNG.

Primary information was collected through interviewing key individuals involved in Managing Eaglewood and Sandalwood in PNG and the secondary information through research at PNG University of Technology Matheson Library, Forest Research Institute (PNGFRI), departmental records and organizational files. The other information was from the e-mail circulations on Eaglewood and sandalwood matters.

The case study reviewed both national and international trade related instruments like CITES, National Policies and included views from different stakeholders involved in Eaglewood and sandalwood trade.

The case study was closely coordinated by FAO with periodic reviews of each draft and useful comments made this paper publishable.

3 Overview of trade in NWFP and contribution to livelihoods in Papua New Guinea

There is a need for effective policies regulations and management strategies on NWFP to allow for potential of the economic, nutritional and cultural well being of the people. Development of workable regulatory frameworks that would reduce illegal and unregulated trade while maximizing the sustainable management potential of the NWFPs for benefit of PNG is an urgent need. Forest economics is not just about trees and their products, it composes of both flora and fauna and the entire collective ecosystem itself especially for tourism industry, and also for research. Industrial forestry has had terrible social and environmental effects in many parts of Papua New Guinea and there is a really need for an alternative industry focussing on non-wood forest products.

Rattan, sandalwood and eaglewood resources are leading examples for a NWFP industry that have are internationally marketed in Papua New Guinea and there is immediate need for management and policy guidelines for sustainable management of these NWFPs so that the people of Papua New Guinea can have increased economic benefits.

Non-wood forest products have economic value for rural people, which means their development and improved trade will help alleviate poverty in those areas. For domestication of species plant species that produce NWFPs scientists and farmers should be involved so that what is developed by the

scientists will be used by the local farmers to farm the trees using the improved silvicultural methods developed. Both eaglewood and sandalwood species are appropriate for domestication so they are currently tasted for improve gemplasm at PNGFRI and they having positive results, it will improve the genetic selection and will lead provision of necessary incentives for market expansion.

The Scientists and resource owners should be allowed to work in collaboration and the NGOs should be viewed has agents for development (Mulung pers. com. 2004). That demonstrates lack of proper co-ordination or lack of interest and enthusiasm from the country's only department that teaches forestry.

There are many non-wood forest products in Papua New Guinea that are traded at local, national regional and/or international levels. For instance, rattan and sago plus other forest products have a lot of cultural significance including for clothing, shelter and food sources. There is lack of proper forest management in PNG and almost all NWFPs are not managed sustainably. For instance, Sago starch remains a stable food for many people and communities in PNG; it has found wide uses in many traditional foods and products and strongly features in the food security issues of the country (Sapode, 2000), it generates a lot of money from local domestic market that is used for school and medical fees and other necessities. Sago is exploited for stem starch and is both a subsistence and commercial product. Other non-wood forest products can be used as decorative during cultural festivals that will help promote the tourism industry.

Regional trade remains an important aspect of NWFP Economy in Papua New Guinea. For example, Eaglewood is one of the very highly priced commodities in the Asia Pacific Region and has, been extensively traded. The current discovery of Natural stands of this commodity in Papua New Guinea has led to extension of that trade into the country and that it has impacted the rural economy for that matter.

Another regional important development is the second International Agarwood Conference, scheduled for November 2006, will invite scientists, government officials, traders and manufacturers, Agarwood growers and other professionals with a direct involvement in Agarwood development, and manufacturers of eaglewood related products to come together. That will be an opportunity for PNG to meaningfully participate and represent itself to negotiate and establish more links within the region and the end use markets in the middle Eastern Countries, China and Japan.

Some other NWFPs traded internationally are Rattan, Butterflies, Sandalwood and Orchids. Sago another NWFP that has regional recognition in terms of research for commercial purposes. There are other great potential there in exporting the nuts like those of Canarium and Bettlenut.

The economic importance of NWFP in the livelihoods of forest-dwellers in Papua New Guinea should not be underestimated. It is estimated that 70% of the Land and resources is customary owned and that in the prehistoric period the people entirely depended on NWFP for food, shelter, transport, clothes, medicine. At current rural population uses NWFPs as way forward in development and alleviation of poverty.

The NWFPs are part of the lives of the people of Papua New Guinea and the forests are rich in non-wood forest products they are products that can be provided by forest without them being cut down that is diversifies the use of forests especially for economic reasons. NWFP have been used by the indigenous communities since ancient times, making a major contribution to their domestic economies. However, eaglewood and sandalwood had no recorded traditional use apart from their current economic uses. In 1992 DEC imposed a total ban on the wild orchids (Kabar, 1992) and domestication of wild flowers is being encouraged by the National Botanical Gardens in Port Moresby and Lae Botanical Gardens, the wild orchids and flowers are very important for income generation to the village communities, they are often sold in the local markets and are grown to attract other non wood forest products like the insects, butterflies and attraction of tourists.

Timber products are almost always seen as the only contribution of forestry to national economies, but non-wood products are also very important and often most significant to local economies well being of the local people (Booth & Wickens 1988).

Socially, NWFP play crucial roles in reducing social tensions within rural households by providing cash income for the purchase of basic needs such shelter, food, clothes, school fees and transportation. Nuts like Karuka from a Pandanus species; Canarium, Okari nuts can be of great social significance. Most of the NWFP are traded within the informal sector where there is no proper documentation or recorded figures to indicate the actual trading.

In addition to the current contributions of some NWFP to rural household revenues, the two most important NWFPs in PNG are Sandalwood and Eaglewood and they produce substantial amounts of money and have the economic potential and provide examples and values. If they are properly managed then they would help improve the living standards of the people as discussed below.

4 Overview of the trade in selected NWFP

Two NWFP were selected from Papua New Guinea as case studies to analyze how trade-related instruments influence the trade of NWFP as well as assess their contributions to rural livelihoods and poverty alleviation. These NWFP are Eaglewood and Sandalwood. The criteria for selecting these products include:

- High local, national/international trade values,
- Threatening of sustainable production by poorly/uncontrolled production.
- Existing institutional interventions at national and international levels
- The potentials to develop the products and its market in producing country,
- The potentials of sustainability in the light of proper utilisation of trade-related instruments governing their trade.
- The potentials for poverty alleviation at the local level following better trade arrangements and
- Available published and grey literature

Eaglewood and the Sandalwood have been identified as priority species of international value for conservation and development because amongst other things, there is very little knowledge about this subject.

4.1.1 Case Study 1: Eaglewood Trade in Papua New Guinea

4.1.1.1 Ecology of Eaglewood

Gaharu, Eaglewood, Aloeswood or Agarwood was known and traded throughout the Asian and the middle-east countries for over thousands of years. It is found in the tropical countries, from the south pacific island countries to India. There are at least 15 species from the genus Gyrinops.

Papua New Guinea Eaglewood is associated with the mid canopy tree species in the rainforest. The associated species include, Agathis, Astronia, Barringtonia, Buchannania, Camnosperma, Canarium, Cryptocarya, Dyospyros, Dysoxylum, Endiandra, Ficus, Garcinia, Instia bijuga, Pometia, Pouteria, Prunus, Terminalia, Syzygium, Xylopi and various palms such as Licuala and rattan (Singadan et al, 2001. Zich and Compton 2001). It occurs on steep slopes to flat areas with a seasonally high water table or possible inundated for short periods acids (Ph 4.8-5.6) with a thin humus layer and often a dense humus root mat. In the seasonal swamp soils. The most common soil type is sandy clay over clay. (Brian Gunn-MARCH 2004).

It is believed this could be the last remaining natural stands of Eaglewood trees to be found in the world. In Papua New Guinea, Eaglewood has been discovered in different geographic locations within five different Provinces, namely Hunstein Range and Karawari river in the East Sepik Province, Biaru in the Morobe Province, Sandaun Province, Lower Ramu in the Madang Province, Cape Rodney in the Central Province, Vailala in the Gulf Province, Middle Fly of the Western Province and Maramui from Enga Province.

As awareness and proper training on sustainable Eaglewood management and sound harvesting techniques is being conducted by World Wide Fund (WWF) and other organizations like TRAFFIC in some of the above mention provinces in Papua New Guinea. Due to the Eaglewood market rush the people in the remotes parts of Papua New Guinea are selling their Eaglewood at its face value without better preparation and the know how on the grading systems involved with the trade. Grading is a complicated process by which many features are taken into account.. Not only the color of the wood is considered but also the size of the pieces, its smell, its weight and how easily the wood burns. Here is the standard grading system for Eaglewood in Papua New Guinea. The table below shows the five different grades and their monetary values in Papua New Guinea Kina, the US Dollars at the exchange rate of.32 cent for a PNG Kina.(WWF-2005).

Table 1.1: showing the top grade with their monetary value.

GRADE	PNG KINA(K)	US DOLLAR(\$)
Super A	2000.00	640.00
A	1500.00	480.00
B	1000.00	320.00
C	500.00	160.00
D	50.00	16.00

Twenty five years old Eaglewood trees can produce high-grade Gaharu, a valuable, dark brown, or black-colored heartwood with a very strong smell which carries a hearty scent similar to incense found in special trees where they have been deform because the body of the tree produces resin (like oils) in response to an injury or infection. In some parts of PNG were Eaglewood tree is found the people tend to force the wood to be harvested by injuring the trees with sharp metals and therefore causing deformities but when the injuries are not properly done or due to the immaturity of the trees the whole tree dries up and dies causing loss of income by the owner.

The Eaglewood resources are harvested and prepared often in the local communities and are brought to the local centers where they are graded and marketed.

The eaglewood harvesters are often local indigenous landowners who are aided by the traders.

The people benefits from eaglewood trade are the PNG Forest Authority through taxes, local resource owners through harvesting and trading the eaglewood resources, eaglewood traders through buying and exporting to overseas markets.

The number of people involved is not known at current but provided there is resource availability in their land all the community is involved in the trade sometimes there is trespasses. Supply Chain of Eaglewood is from the Forest to the villages; from they're to traders with Export licenses and from those with export licenses to the export markets.

4.1.1.2 History of Eaglewood Trade in Papua New Guinea

The discovery of Eaglewood was formally registered by the Papua New Guinea Forest Authority (PNGFA) in the early 2000 when PNGFA starts to investigate concerns raised over reports that people were crossing the border from West Papua and Indonesia into Papua New Guinea in search of

eaglewood and cheating villagers off their precious resource, often buying them at a very low prices and selling them for much higher prices when they return. The real market value of eagle wood was not formally determined by the authorities, but the actual trading of eaglewood was taking place at a black market price at which the buyers were reaping off the resource owners.

4.1.1.3 Eaglewood trade

In Papua New Guinea Gaharu is newly discovered and the interest in harvest and trade is still rising and has been taking place for over a decade, currently different parts of Papua New Guinea are going through a harvest boom, mainly in the East Sepik and the Sandaun Provinces. Pukapuki village in the East Sepik Province is a place where Gaharu harvesting is really accelerating. WWF and TRAFFIC staffs are busy conducting research, promoting training mostly educating the resource owners to sustain ably manage this valuable resource. Compared to the Kuni tribe of Lake Murray in the Western Province the bark of the Eaglewood tree

Table 1.2: Showing the Trade and Export Statistics of Eaglewood from 1999 to June 2002.

Year	Weight (kg)	FOB Value (USD)	Average price paid in kilo
1999	1,011.00kg	\$136,880.00	\$135.39/kg
2000	2670.00kg	\$541,442.00	\$202.78/kg
2001	10,508.25 kg	\$1,644,685.00	\$156.51/kg
2002 (Jan-Jun)	4,099.00kg	\$273,270.00	\$66.66/kg
Combined totals:	18,288.25 kg	\$2,596,277.00	\$561.34/kg

Source: IAC proceedings, 2002

4.1.1.4 Livelihoods contribution of Eaglewood sales to the local people

In comparison to any income generating activities taking place at the village level, the turn over of Eaglewood trade is patching a huge income on face value and is also attracting most of the Eaglewood resource owners to discover and venture into this arena of tending and harvesting. This highly priced commodity is in fact changing and raising the standard of living in most of the isolated villages in the geographically remote areas by increasing the cash flow within the rural areas. Gradual changes of living standards like improvement of Health, Nutrition and better materialistic substitutes would be felt at the village level.

4.1.1.5 Livelihoods contributions of Eaglewood to Papua New Guinean people.

When taking into account the market price of Eaglewood (Table1.1), Eaglewood as a NWFP would encourage a huge turn over in terms of monetary values. When there is enough cash flow at the village level it generally elevates and stabilizes the economy therefore contributing to the overall economy of the country.

4.1.2 Case Study 2. Sandalwood

4.1.2.1 Ecology

Sandalwood species that is endemic to PNG is *Santalum macgregorii* and occurs naturally in the southern region of PNG from Central Province to Western Province.

Sandalwood has been sporadically harvested in PNG and has a trade history of over 100 years; once it was common in Port Moresby area but heavy harvesting including removal of roots for sale had resulted in severe depletion and even elimination of many natural stands. The distribution is from the sea level to 750 m above sea level and between 8-10°S.

Santalum macgregorii is root sucker meaning it has the potential to be able to produce new seedlings from the roots which is good for maximizing stand density for same genetic stock thus giving opportunity for different aged stand of sandalwood through rood coppice.

With the exception of the Western Province stand which has not been described and for which the authors are unaware of the extent and structure of the stand, the other natural areas of sandalwood have been severely depleted over the last 10 years particularly in the more accessible areas, such as near Port Moresby. However, there are remote areas in Central and Gulf provinces where reasonable stands still exist. With increasing access, especially the extension to the Hiritano Highway North of Iokea, many of these stands are now being targeted for exploitation and increasing damage through repeated fire.

Although *S. macgregorii* produces highly valuable aromatic heartwood, it is relatively little known in comparison with other Pacific sandalwood species and *S. album* from India, Indonesia and East Timor. Very little has been published on *S. macgregorii*, with the only major sources of published and unpublished information being Paul (1990), Bosimbi (1997), Radomiljac (1997), Thomson and Bosimbi (2000). Results from a small sample of *S. macgregorii* heart wood using steam distillation gave an oil yield of over 3% and oil constituencies similar to *S. album* and *S. spicatum* (Brophy pers comm. 2002). By comparison, Erligmann (2001) reported that average oil yield for *S. album* is 4-5% going to as high as 8-12%. Given the lack of information on *S. macgregorii* it is necessary to refer to references on other related sandalwood species viz. *S. album*, *S. austrocaledonicum* and *S. yasi* for comparison.

4.1.2.2 History of trade

Current Global Situation.

Sandalwood has considerable cultural importance in many countries in the Asia - Pacific region (Mckinnell 1993, Bun et.al, 2002). In India, the sandal tree (*Santalum album*) is deeply ingrained in the philosophical, cultural and religious ethos of Indian culture (Rai and Sarma 1990). The supply of sandalwood, which is mainly from India, Indonesia and Western Australia, is reported to be declining and is not able to adequately meet world demand. This provides market opportunities for growers. The main reported reasons for the decline are:

- unsustainable harvesting
- theft and smuggling of the resource in some less developed countries
- land clearance for cultivation
- frequent burning and
- uncontrolled livestock browsing
- slow growth resulting in supply not being able to keep up with supply

As reported in Corrigan *et al* (1999), declining production in India and Indonesia may be compensated by proposed large-scale plantings under irrigation, in northwestern Australia. Nevertheless there is a long-term international market for sandalwood, which offers PNG an opportunity to become more involved with the industry through sustainable management of remaining resources, encouragement of natural regeneration and establishment of cultivated plantings. Sandalwood has the potential to contribute to the rural economy were there are very limited economic options available.

Cultivation of sandalwood is however, not an easy undertaking for communities. Infrastructures need to be developed to include nurseries; seedling and host plants establishment and skills developed in maintenance and protection against injury in particular fire. Social issues need to be addressed with regard to protecting the rights of the land and sandalwood owner and at the same time understanding that there needs to be a long term commitment of between 20 and 30 years before a financial return is realised. Such commitment must be balanced against time required to provide food and meet more immediate daily needs. For sandalwood to be a sustainable resource in PNG it will be necessary to develop systems in which villagers are able to manage natural stands or establish plantings which do not adversely impact on their daily activities together with government and non government support.

Regional view.

In **Australia** there are 6 natural occurring Sandalwood species and they include, *S. accuminatum*, *S. album*, *S. lanceolatum*, *S. murrayanum*, *S. obtusifolium* and *S. spicatum*.

Areas of natural occurrence, Current knowledge of silvicultural requirements and conservation status of each species. Commercial value of species, potential commercial use. Harvested for aromatic wood, natural stands.. Australia annually exports over 2000 tonnes per annum of various grades are exported to countries in Asia the species exported were *S. lanceolatum* and *S. spicatum*. *S. lanceolatum* has large edible fruits good for development of horticultural production, while *S. album* has very high oil content. Reliable propagation and nursery techniques are being developed with research concentrated on tree improvement and plantation silvicultural requirements for quality wood production.

Native stands of Sandalwood have been depleted in accessible areas, leaving only occasional remnant tree (Paul 1990, Agiva 2001).

Sandalwood was one of the species selected for conservation activities under the PNG Domestication and conservation project, because it was seriously depleted to a point of being completely removed from a number of locations (Boland and Aopo 2000, Agiva 2001).

That was one of the projects aimed at incorporating. Establishment of conservation stand of sandalwood was one of the motives but the project personals involved in PNG FRI have been destroying the seedlings and parent trees for selfish gain

That happened twice resulting in officers involved being terminated and it is delaying establishment of an ex-situ conservation stand. Forest Authority is not working on establishment of in-situ conservation stand of Sandalwood because the project is externally funded and the governments forestry department does not support the project because of lack of funding allocation.

Vegetative propagation activities under the PNG domestication and conservation project began in October 2000 and *Santalum macgregorii*, *Gyrinops lendmanii* were tested amongst others. The focus was on different cutting portions, media, rooting hormone concentrations and misting regimes suitable for production of roots from the stem cuttings. The results so far indicated that vegetative propagation by cuttings of both those species can be achieved and the research still continues.

There are 16 species of Sandalwood in the world that have been on demand for centuries and are particularly price in the Asian markets for their aromatic smell. The oil extracted from is used in aromatherapy; large billets are much sought after for furniture and carvings. In the international scene the main sandalwood industry is based India, based on *Santalum album*, but the others pursuing sandalwood markets are Indonesia, Australia, Pacific, Fiji, Vanuatu, New Caledonia, Tonga and PNG.

4.1.2.3 The Sandalwood trade in Papua New Guinea

Sandalwood has been sporadically harvested in PNG and has a trade history of over 100 years; once it was common in Port Moresby area but heavy harvesting including removal of roots for sale had resulted in severe depletion and even elimination of many natural stands. The distribution is from the sea level to 750 m above sea level and between 8-10°S.

ACIAR commissioned CSRIRO and FPCD and they successfully completed a conservation and management strategy for Sandalwood in PNG in 2001, under Papua New Guinea Indigenous Forest Species project, after gathering background technical and trade information on the species.

The development of this management and conservation strategy is based on information gathered from the Rapid Rural Appraisals (RRA) carried out in three villages associated with the current distribution and use of sandalwood together with input from the PNG National Forest Service. Information from the development of species conservation strategies prepared for two Pacific sandalwood species, viz. *S. austrocaledonicum* in Vanuatu (Corrigan *et al.* 1999) and *S. yasi* in Fiji and Tonga (Tuisese *et al.* 2000 and Thomson 2000) under the South Pacific Regional Initiative on Forest Genetic Resources) Project (PRIG have been extensively referred to.

Table 2: Showing the Sandalwood trade in PNG.

SANDALWOOD TRADE IN PNG

DATE/YAR	PNGFA ID NO:	COMPANY	WEIGHT (TONS)	FOB VALUE (US\$)
1997	9711063	Yema gaiapa Developers P/L	22	46,958.00
1997 Total =			22.00 tons	46,958.00
1998	9801088	Hercules Timbers P/L	14	21,000.00
	9810049	Hercules Timbers P/L	5	21,500.00
	9811046	Hercules Timbers P/L	1	4,500.00
1998 Total =			20.00 tons	47,000.00
1999	9901087	Hercules timbers P/L	4	19,306.00
	9902001	Hercules timbers P/L	4	13,779.00
	9906127	Watlando Investment Ltd	11	14,845.00
1999 Total =			19 tons	47,530.00
2000	2028	Karintz Timbers Ltd	13	12,700.00
	5129	Karintz Timbers Ltd	23	18,000.00
	8113	Jamba's Resources ltd	6	5,569.00
2000 Total =			42 tons	36,269.00
2001	102028	Forest Management Services	4	
	104012	San Hin Development (PNG) Ltd	5.2	7,800.00
	105001	Resources International P/L	16.8	10,824.00
	108069	Union Stream Enterprises	6	9,345.00
	108096	Hinoki Timbers Ltd	8	5,047.90
	111134	Hinoki Timbers Ltd	8	5,887.50
	102035	Union Stream Enterprises	7	10,371.00
	112047	Hinoki Timbers Ltd	8	6,078.40
2001 Total =			63.00 tons	55,363.80
2002	201019	Hinoki Timbers Ltd	8	6,670.80
	201104	Hinoki Timbers Ltd	15	13,262.80
	203037	Hinoki Timbers Ltd	15	13,058.80
	204013	Hinoki Timbers Ltd	8	7,366.40
	205119	Hinoki Timbers Ltd	8	7,393.60
2002 Total =			54.00 tons	47,762.40
over All Total			2220.00 tons	281,261.20

Source: PNG FA 2002

4.1.2.4 Stakeholders in the Sandalwood Business in Papua New Guinea

The stakeholders in the Sandalwood business in Papua New Guinea involves,

- The Government.
- The Forest Industries
- The Forest Resource Owners
- NGO'S and
- Other International Partner Organizations

4.1.2.5 Economic benefits of the sandalwood trade to stakeholders.

Economic benefits can be classified into direct and indirect economic benefits. For instance, the PNG government benefits directly through PNGFA by collecting the imposed 10% tax on exports, the forest resource owners also directly benefit by obtaining cash from the sale of their sandalwood whether maximum. The Forest Industries, the NGO's and the other International Partner Organizations benefits indirectly through sharing of information.

4.1.2.6 Appraisal of the impact of International trade in sandalwood

There is a great impact on the Papua New Guinea Forest Resource Owners who from without knowing the silvicultural treatments of Sandalwood to the harvesting and preparation of the wood down to the grading and at the selling point, by the general trading at the international level. Because of the higher market price the simple Forest resource owners are applying the very primitive methods of tending and harvesting which always devalues the wood itself and by the time the wood reaches the market place it already loses quality.

5 Application of trade related instruments to trade in NWFP in Papua New Guinea.

Due to the importance of NWFP to local communities, national governments and the international community, many local, national, regional and international initiatives and institutional arrangements have been organized to ensure that the benefits from NWFP are maximized and equitably shared and sustained. Some example of these NWFP would be rattan, bamboos and fibours from various plants.

Some NWFP are traded at regional and/or international levels, meaning that the role of national legislatures and regulations may not suffice to control trade transactions in their products. The most discernible reason is that such products would be smuggled from

Many NWFP consumed or traded as food items, medicines or fashionable products are subject to restrictions and regulations on their use and commercialisation. NWFP trade is, accordingly, far more complex and difficult to understand and regulate, as NWFP can not be successfully regulated as a uniform commodity.

The international trade in NWFP is regulated through a broad range of trade-related instruments. Some of these, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and certain national species conservation measures have their basis in the conservation of biodiversity, while others, such as import tariffs or phytosanitary certificates are used for capturing revenue, or for food health and quality control. There are also many trade-related instruments such as trade rules within the World Trade Organisation (WTO) that are based on enhancing trade liberalization, covering a broad range of products in international trade. For these

instruments NWFP are not the key commodities being targeted and the impacts are not always supportive of sustainable use and trade.

Eaglewood and Sandalwood are very few NWFPs that can be traded and that these sectors in forestry developments have not been developed because the Government is concentrating on the large scale conventional logging and as thus the National Forestry Act, has little or nothing on NWFPs but is concentrated on Large scale logging industry.

In PNG there are no specifications in regulation regarding NWFP:

The PNG Forest Authority currently facilitates donor funded projects including the Domestication Project by ACIAR CSIRO that was conducted by FRI and other NGOs like FPCD that include Sandalwood and Eaglewood and FAO funded Eaglewood project. Apart from that PNG NFA commits no more funding commitment to develop NWFPs. The companies that trade eaglewood and sandalwood pay FOB taxes to NFA and that is their share of contribution to the development of these two resources

At current the traders just pay for the wood they harvest and that there is no planning for large scale industries as the resource is scarce and there is a need for silvicultural improvement of the species traded so that large scale industries would be developed in future that will lead to improving the living standards of the people involved in the trade of the species. As the it at current the resources natural sources decreases and there is likely decline in the production of Eaglewood or sandalwood products.

Mainly Asian traders control eaglewood and sandalwood trade in PNG and other stakeholders involved in it are indigenous resource owners, NGOs who try to assist in research and resource management and play advisory roles in the meetings and that resource owners are also represented and included in the original research and discussion meetings

The National Forest Authority (NFA) imposed taxes reduces the amount to a lower price received by the local resource owners there is no permanent employed staff in Eaglewood industry except those staff employed under FAO funded project and that living standards of the Eaglewood resource owners who harvest and trade have yet to be improved.

Sandalwood resources are harvested at an unsustainable rate and only from the natural forests. That the resources supply are declining because the natural forests that produce sandalwood is declining and there is reduced quantity and low quality sandalwood products being traded.

The customary landowners harvest sandalwood resources from their own land and at other times the sandalwood resources are being stolen from other peoples' land, the harvesters of sandalwood normally respond to buyers demand. There is no full time job with Sandalwood industry and money received from Sandalwood is normally used for household necessities. The price ranges offered depends on the buyers involved and the prices declines as it approaches the villages.

5.1 Institutional aspect of Eaglewood production and trade

Conventions and other international, regional, national laws and policies concerning the conservation and sustainable use of biological diversity, access to benefit sharing and the protection of traditional knowledge govern the exploitation of NWFP in Papua New Guinea. Papua New Guinea is a contracting party to the Convention on Biological Diversity (CBD) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The following section examines how trade-related laws and regulations have been used to control the trade of Eaglewood in Papua New Guinea.....

5.1.1 Papua New Guinea Forest Legislation:

Trade in Sandalwood began between 1890 and 1910 during colonial times and has continued intermittently ever since till current and the resource base is therefore in a depleted state with 9,000 tonnes of Sandalwood being harvested between 1891 to 1980 (Howcroft 1990). However sandalwood is not properly regulated therefore sandalwood was harvested without any control.

There was no scientific research and control on the species until after a sandalwood workshop 1996 when the interest was initiated by CSIRO and ACIAR under domestication project when, experiences in Australia and elsewhere are being used to assist PNG to do research and commit itself to manage its sandalwood resources.

As part of Rapid Rural Appraisal (RRA) questions different stakeholders including the sandalwood resource owners were interviewed and their views were included in the Sandalwood management and conservation strategy

At the moment, trade is in complete absence of sandalwood allocation control so the resource is unsustainably managed resulting in complete depletion of the species from its natural stands. Sustainable business from sandalwood trade is not developed, because it is not transparent and uncontrolled, without tangible benefits to the local communities or is cheated. Up to the time of writing this report Sandalwood trade is still uncontrolled and regulated apart from levies collected by the NFA.

The current Forest industry application (FIP) application process includes sandalwood when the commercial activity exceeds the value of PGK 20,000.00 annually. And that export taxes are charged on every export of sandalwood.

5.1.2 Appraisal of National laws and regulations

In Papua New Guinea there are no specifications in regulation regarding NWFP and as yet Eaglewood is classified as a NWFP there is no proper regulation governing the trade related to Eaglewood. From this trend the government is facilitating avenues such as international research and funding organization to fund and carry out more research to formulate laws and regulations to monitor and govern the sustainable use of the NWFP (including Eaglewood and Sandalwood).

5.1.3 CITES Legislation

In October 2004 at the 13th Conference of parties of CITES Acquilaria and Gyronops where included in Appendix II, requiring all PNG eaglewood export have a CITES permit. For Sandalwood, it has not been included in CITES and that all Sandalwood resources have been exhausted having no untouched natural stands. PNG will have increased ability to monitor Eaglewood trade and proper checks and balances on trading permits. CITES Listing of Gyronops and Acquilaria should enable the local Eaglewood resource owners to have increased income:

Recognition within CITES of the Sustainable Use Guidelines

CITES Res. Conf. 13.2 titled: *Sustainable Use of Biodiversity: Addis Ababa Principles and Guidelines* notes the potential use by CITES of the Sustainable Use Principles in CITES Article IV implementation and recognizes that the principles are to be tested through case studies. The Resolution urges parties to make use of the principles in making non-detriment findings.

5.1.4 The Convention on Biological Diversity (CBD).

The CBD was signed by 150 government leaders at the 1992 Rio Earth Summit and entered into force in December 1993. There are currently 188 Parties to the Agreement. The three objectives of the Convention are: the conservation of biodiversity, the sustainable use of biological resources and the fair and equitable sharing of benefits arising from the use of genetic resources. The principles of the CBD are broad in scope and unlike CITES, the CBD does not contain detailed provisions on implementation. Accordingly, implementation of the CBD depends on the incorporation of the Convention and associated policies and guidelines into the national legislation of Member States.

Equitable access to biological resources and the sharing of benefits arising from the use of these resources are regulated in the CBD through Article 15. Following the establishment of a Panel of Experts at the 4th Conference of the Parties to the CBD, and the subsequent ad hoc open ended Working Group on access and benefit-sharing, the Working Group developed what are now known as the Bonn guidelines on Access and Benefit-Sharing. These guidelines are to be followed by the Parties to the CBD on a voluntary basis and their purpose is to provide guidance to policy makers and national legislators when taking legislative, administrative or policy measures. These guidelines are useful to all stakeholders through for instance provisions on roles and responsibilities in access and benefit-sharing, and suggested elements for Material Transfer Agreements (Guendling, 2003).

The Bonn guidelines themselves could not be described as trade-related measures as they cannot be enforced at a national level and implementation and enforcement depends on the development of national-level legislation. Numerous countries and regions have, however, either adopted or are in the process of adopting access and benefit-sharing policies and legislation.

Examples at a regional level include The Andean Community of Nations (Venezuela, Colombia, Ecuador, Peru and Bolivia), which has developed The Common Regime on Access to Genetic Resources, 1996; and, The Organization of African Unity (which consists of 52 African States) which has developed The African Model Law on the Protection of the Rights of Local Communities, Farmers and Breeders and for the Regulation of Access to Biological Resources, 1998.

The CBD Sustainable Use Guidelines

The Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity consist of 14 interdependent practical principles, operational guidelines and a few instruments for their implementation that govern the use of components of biodiversity to ensure the sustainability of such uses.

The Fourth Open-ended Workshop for the Sustainable Use of Biological Diversity in 2003 saw the development of a set of fourteen practical principles and operational guidelines for the sustainable use of biodiversity. These were subsequently forwarded to the Seventh Meeting of the Conference of the Parties (COP 7) in February 2004 where they were adopted.

Building on the outcome of the Addis Ababa workshop, the Conference of the Parties to the CBD requested the Executive Secretary to undertake further work on issues pertaining to use, of terms for sustainable use, adaptive management, monitoring and indicators and to convene a series of technical experts workshops on ecosystem services assessment, financial costs and benefits associated with conservation of biodiversity, and sustainable use of biological resources (Anon., 2004b).

The principles provide a framework to assist governments, resource managers, indigenous and local communities, the private sector and other stakeholders on how to ensure that their use of the components of biodiversity will not lead to the long-term decline of biological diversity. The principles are intended to be of general relevance, though not all principles will apply equally to all situations, nor will they apply with equal rigor.

While these guidelines are very general and, like the Bonn guidelines, do not strictly qualify as trade-related measures, their merit lies in their long-term assimilation and impact on the development of national and possibly regional or international laws and agreements or measures. The following Principles are relevant to the trade in NWFP.

Practical Principle 3: International, national policies, laws and regulations that distort markets which contribute to habitat degradation or otherwise generate perverse incentives that undermine conservation and sustainable use of biodiversity, should be identified and removed or mitigated.

Practical Principle 12: The needs of indigenous and local communities who live with and are affected by the use and conservation of biological diversity, along with their contributions to its conservation and sustainable use, should be reflected in the equitable distribution of the benefits from the use of those resources.

Although forests may play an important role in the international response to climate change, Parties to the United Nations Framework Convention on Climate Change (FCC) have often reached different conclusions regarding the proper role of forests and appropriate national legislation to foster that role. To date, national legislative activity (including trade-related provisions) on the issue of forests and climate change has been limited and Countries have relied more on the creative use of existing legislation than the creation of new legislation. (Markus Burgener April 2005)

Under the FCC, the international community is committed to reducing net greenhouse gas emissions. The Kyoto Protocol to the FCC entered into force on 16 February 2005 and gives Parties listed in Annex I of the Protocol (mostly developed countries and countries with economies in transition) specific reduction targets. They can meet these targets by reducing emissions or by promoting carbon sinks and the reductions can be accomplished domestically or through cooperative actions involving other Parties to the Convention. The potential link to NWFP lies in the opportunities created through the Kyoto protocol for forest conservation and accordingly then to NWFP conservation (Rosenbaum *et al*, 2004).

5.1.5 NWFP Certification and trade

5.1.5.1 Procedures for the export of NWFP

The legal documents required by the companies exporting or dealing with NWFPs include

- Industry Participant (FIP) Certificate
- Export License (declaration of Export) for each Shipment.
- Packing list
- Conformity declaration
- Bill of landing
- Quarantine and inspection.
- Certificate of Company Registration
- Timber License

In November 2001 Forest Board also approved imposition of a 10% FOB export Levy on every eaglewood export and was gazetted in January 2002 and the levy was for management, development and research of eaglewood industry and is to be paid by holders of timber permits, timber authorities and license of effect.

5.1.5.2 International Agreements Influencing NWFP (Sandalwood and Eaglewood)

(a) Green Certification

In PNG as almost all timber industry and the governments do not support Forest Certification it will be equally hard to certify non-wood forest products

Non-wood forest resources are more difficult to certify than timber because of their diverse nature and Social and Ecological Complexity (Shanley et al 2002)

The FORCERT group certification, which certifies medium and small-scale forest industries and forest management, is also concentrating on timber products only.

Certification in PNG is moving slowly beginning with Timber products and there is hope that non-wood products might be certified in the near future if Government supports it.

(b) Other international agreements

PNG is also signatory part of several international agreements related with NWFP, such as the International Tropical Timber Organization (ITTO), the convention on Biological Diversity. United Nations FAO gathers and provide regulatory measures to ensure the harvesting methods are sustainable and sound management practices are applied

6 Conclusions and trends in the application of trade related instruments to the trade in NWFP.

In PNG other NWFP are widely used for cultural purposes but both Sandalwood and Eaglewood rarely have any cultural significance and is currently providing economic benefits and the living standards of the people are yet to be improved. What is earned from sale of these two products are rarely managed for sustainability, and that no tangible benefits are observed nationally expect for those who trade the products and few people on whose land the products occur and that FOB exports levies collected by the government. The poverty alleviation part that is played by these two product are yet to be seen

Non-wood forests products (NWFP) have an important role to play in the livelihoods of many rural communities, particularly in developing countries, where they provide a broad range of subsistence and commercial livelihood opportunities. While much of the trade is domestic, for some NWFP species and products, the international trade is significant and generates income for the resource harvesters and collectors as well as many other actors in the commodity chain. The dearth of information on the trade in wild plants and animals makes it difficult to estimate total and relative levels of use for both domestic and commercial purposes, and this is complicated by the difficulty in distinguishing between subsistence use and trade for commercial purposes. The value of international trade, for which data is comparatively better, has recently been estimated at US\$11 billion per annum.

Effective NWFP trade faces practical challenges as NWFP are often small in size, come from many different sites and a far bigger range of species and products exists than for the two key traded

resources – timber and fisheries. NWFP trade is, accordingly, far more complex and difficult to understand and regulate, as NWFP can not be successfully regulated as a uniform commodity.

The international trade in NWFP is regulated through a broad range of trade-related instruments. Some of these, such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and certain national species conservation measures have their basis in the conservation of biodiversity, while others, such as import tariffs or phytosanitary certificates are used for capturing revenue, or for food health and quality control. There are also many trade-related instruments such as trade rules within the World Trade Organisation (WTO) that are based on enhancing trade liberalization, covering a broad range of products in international trade. For these instruments NWFP are not the key commodities being targeted and the impacts are not always supportive of sustainable use and trade.

NWFP trade is also affected by voluntary trade measures developed by the private sector, such as certification and eco-labeling schemes, that generally aim to achieve the dual aim of biodiversity conservation and the equitable distribution of benefits to the communities for whom such trade plays a key livelihood role.

Trade-related instruments, such as CITES, that aim to ensure biodiversity conservation do not always achieve this goal and in certain cases, have had a negative impact both on the species concerned as well as those whose livelihoods are linked to the trade. There are, however, a number of examples of win-win situations and there is increased recognition within the biodiversity conservation sector of the need to incorporate the determination of livelihood impacts into decision-making processes for the regulation of trade in wild plants and animals.

Tariffs are used by both importing and exporting countries as a means of generating revenue and, normally in the case of developing countries, as a protectionist measure. Excessive tax rates can be counter-productive as they may encourage illegal trade in the products in order to avoid the tariff. This situation often results in a lower price being paid to collectors and harvesters.

While tariff-based trade measures can have an impact on the trade in NWFP, the impact of non-tariff measures is probably greater. For instance, phytosanitary controls can become a trade constraint where they cause delays and they are normally more onerous on small cooperatives and local communities who may lack the resources to meet the required standards. Non-tariff import controls can prove restrictive as well as complex and overlapping, creating unnecessary burdens on both enforcement personnel and traders. Further, such a regulatory environment is frequently more open to exploitation.

Certification and labeling schemes have focused mainly on timber products, and the certification of NWFP has only been available in forest-related certification schemes for the last half-decade. Because of this, it is difficult to assess the performance of certification for NWFP as there are insufficient case studies and sources of information available. In general, NWFP are not considered ideal for certification programmes as the products are generally traded on a small scale in local markets and where they are traded internationally, it is frequently for a specific industry and on a relatively small scale. Therefore, only some of the more popular products are considered suitable for certification and related initiatives should be carried out on a case by case basis.

There are a number of areas where inadequate research has been carried out and inadequate literature exists to determine the impact of the trade-related measures. These include international and regional trade agreements, regional and bi-lateral biodiversity-related agreements, as well as tariff and non-tariff measures. In the latter case, the existing literature needs to be updated.

It is clear that NWFP play a critical role in the lives of millions of people around the world and that trade-related instruments do have an impact, both positive and negative, on the sustainable use and conservation of NWFP and the livelihoods of those dependant on them. Resource users, regulators,

non-governmental organizations, policy-makers and all other stakeholders accordingly need to continue emphasizing the important role of NWFP and advocating for the adoption of trade-related measures that are supportive of their conservation and sustainable use.

6.1 Export instruments

Export licenses and permits to export Eaglewood and Sandalwood are issued and controlled by the National Forest Authority and companies, In order to Qualify for any Forestry related activities Forest Industry participant (FIP) All the steps necessary for a company or an association of local producers to export can become a barrier since all the legal requirements are based in formal medium size and large companies. Small producers some times are not in a legal company form and cannot get all the export documents.

There is resource development and allocation processes developed by the national forest Authority and forest developments must comply with the National Forest Plan 1996, however Eaglewood and Sandalwood development plans are not included.

- Forest Land to be developed for Long Term Production Forestry
- Landowner Awareness Programs
- Development Options Study
- Forest Management Agreement
- Call for Project Proposal
- Selection of Preferred Developer
- Developer Feasibility Study
- Project Agreement
- Approval of Project Agreement under Environment Planning Act
- Timber Permit
- Performance Bond and Operational Planning Approvals
- Harvest Authorizations

There are three basic arrangements for obtaining rights to harvest timber: timber permits, timber authorities and timber licenses. There used to be Local Forest Areas (LFA) arrangements where landowners dealt directly with logging companies but these have been eliminated in the 1991 amendments to the Forestry Act. However, some LFAs that have not expired remain.

According to Walter (2003) there are four main categories of certification schemes that are of major relevance to the production, processing and commercialisation of NWFP

- i) Forest management certification;
- ii) Social certification;
- iii) Organic certification; and
- iv) Product quality certification

Timber permits are issued by the National Forest Minister to logging companies and constitute Forest Management Agreements (FMA) with big volumes for periods of over 10 years. Timber Permits are the major avenues for forest development in the country. The projects take place after necessary documents are signed between the Government, the land owners and the company. According to PNG National Forest Policy 1991, the following steps are to be followed when issuing a Timber Permit:

- PNGFA enters into a FMA with land owners that sets out who is to carry out the forestry operations, what is required of them under the timber permit conditions, and how the benefits to be received by land owners for the rights granted are to be distributed.
- All FMAs are to specify the volume and quantity of merchantable timber, with terms of sufficient duration for proper forestry management to be applied; a map of forest area; certainty of tenure (either via legal land title or written assent to the agreement). The Provincial Forest Management

Committee (PFMC) must also be satisfied as to the authenticity of the land tenure claims of the resource owners.

- Forestry operations are permitted on state land approved by the National Forest Board (NFB), on state leasehold land where the lessee consents (and subject to lease conditions), and on customary land where a FMA has been entered into customary owners and PNGFA.

Where the PNGFA enters into a FMA, the NFB consults resource owners and the relevant provincial governments with respect of its intentions in the allocation of timber permit over the forest area covered by the FMA.

6.2 FSC Forest Certification

- FSC National standards are being developed in PNG and that no forests or NWFPs are being certified as yet. The FSC Chain of custody also gives us an opportunity to include certification of NWFPs.
- The certifiers are already getting interested in certifying forestry in Papua New Guinea but nothing much is done in NWFPs as part of the recommendation for strategies management and conservation of the two species it is included in the strategies.
- Other certification models
After the Workshop in 2002, the FIA is propagating a different certification system that is similar to Malaysian Timber Certification Council (MTCC). However all the schemes concentrate on timber and forest management certification and less attention is given to non-wood forest products including Eaglewood and sandalwood. Certification processes are expensive and local communities and small companies can't have a chance to be certified by them. Without Government or other type of support these instruments will represent a trade barrier.
- ITTO Criteria for Sustainable forest management is being worked on currently

In Papua New Guinea other approaches are being taken to lower the cost of Certification as Certification process is seen as very expensive for the small NGO groups which upholds the FSC guidelines. The government does not show commitment and support therefore to minimise the cost of Certification process Group Certification is being pursued in Papua New Guinea. Examples of these are: FORCERT and ICF. ICF covers the Papua New Guinea Forest Resources Owners who are currently working with FPCD.

Fairtrade is also an option for NWFP certification although only for southern producers.

6.2.1 The International Organization for Standardization (ISO)

Currently there are no national standards for Eaglewood and Sandalwood resources. The resource are just prepared and sold without quality controlled but the traders themselves control quality.

6.2.2 General Agreement on Trade and Tariffs (GATT) and the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs).

In PNG other NWFP are widely used for cultural purposes but both Sandalwood and Eaglewood rarely have any cultural significance and is currently providing economic benefits and the living standards of the people are yet to be improved. What is earned from sale of these two products are

rarely managed for sustainability, and that no tangible benefits are observed nationally except for those who trade the products and few people on whose land the products occur and that FOB exports levies collected by the government. The poverty alleviation part that is played by these two products are yet to be seen.

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6.2.3 Complementary measures

The Papua New Guinea government in collaboration with NGOs (both National and International), and other agencies should formulate laws and regulations that would maximize the income for the Eaglewood owners and provide technical guide on proper silvicultural treatments, tending and sustainably viable harvesting methods.

6.3 Trade-related instruments affecting trade in Sandalwood in Papua New Guinea.

6.3.1 Regulations on the capture of Sandalwood in Papua New Guinea.

Trade of Sandalwood began in the colonial times and the inclusion in the PNG legislation could have meant the species was fairly traded and that the resources was maximised, however it was harvested without any control and too there was no scientific research and control of the species until very recently when the interest was initiated by CSIRO and ACIAR under domestication project when, experiences in Australia and elsewhere are being used to assist PNG to do research and commit itself to manage its sandalwood resources. As part of RRA questions regarding legislation of the species from what was called complete trade in legislative and regulation of the total Sandalwood industry by the designated Authority the NFA and there is complete confusion.

At the moment, trade is in complete absence of sandalwood allocation control so the resource is unsustainably managed resulting in complete depletion of the species from its natural stands. Sustainable business from sandalwood trade is not developed, because it is not transparent and uncontrolled, with productive chains from which the local communities missing out in tangible benefits or are cheated. Up to the time of writing this report Sandalwood trade is still uncontrolled and regulated apart from levies collected by the NFA.

6.3.1.1 Administrative file

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6.3.1.2 Technical file

As sandalwood is economically important species, there should be enough considerations given to it in order for further development.

There is no Sandalwood Survey and research until recently but trade is over 100 years, however it is never too late for PNG to start sustainable Sandalwood management programmes because there are enough genetic materials to start, especially through community managed sandalwood woodlots.

Sandalwood species is in a depleted state from over harvesting, continual burning, grazing and removal due to other land use practises (Bun et, al 2002).

If the species is not cultivated it poses a great danger of it being extinct at least from its current natural habitats. The product chain is not carefully monitored and that and thus the resources are unsustainably harvested with many areas being completely destroyed, despite the species being internationally traded it is the trade is not carefully monitored and that it is not listed under any of the CITES listings as a resulted all known natural stands are depleted.

6.3.1.3 Exportation of Sandalwood.

In the official record kept by the PNGFA the written information can only be traced back to 1997. According to a Rapid Rural Appraisal (RRA) Conducted in 2001 as part of a Strategy developed for Domestication of Sandalwood resources, Prices paid for sandalwood by traders ranged from K0.50 – K15.00 kg. (@ K1.00 = US\$0.30).

Table 5: showing information on exports of Sandalwood (*Santalum macgregorii*) from PNG between 1997 and 2002 (source PNGFA 2002)

Export year	No of licenses	Quantity (tonnes)	Ave Price USD/tonnes (range)	FOB value USD
1997	1	22	2,134(2,100)	46,958
1998	3	20	2,350(1500-4500)	47,000
1999	3	19	2,381(1390-4827)	47,930
2000	3	42	863 (800-1000)	36,269
2001	8	63	754 (5200)	47,553
2002(to April)	4	46	877	40,358
Total		105	800-5000	

6.3.1.4 Difficulties encountered in monitoring of activities in areas of cutting in the field

The Sandalwood are harvested and cleaned at the village level and then transported to the roads by shoulder and then when accessible areas reached the products are transported through vehicles to the point of sale, those points are in the very remote villages if buyers go there if not they are sold in Port Moresby. Earnings from the sale of wood are used to meet basic household needs.

Whilst no statistical data is available, it is anticipated that *S. macgregorii* wood purchased by sandalwood buyers is mostly exported for use in carving and extraction of oil, as is the case of other sandalwood species.

Monitoring strategies were not clearly defined and identified therefore documentation of proper procedures from harvesting point to the point of sale were not properly track by which difficulties can be identified.

6.3.1.5 Impact of CITES on sandalwood trade in Papua New Guinea.

The Association of Southeast-Asian Nations (ASEAN) Statement on CITES on the Occasion of the Thirteenth Meeting of the Conference of the Parties to CITES, Bangkok was announced on October 11 2004. It focuses on six key areas of cooperation, including improved law enforcement cooperation, development of comprehensive legal frameworks, and increased scientific information to guide wildlife trade management by CITES authorities. The 10 ASEAN nations agreed to develop an action plan for 2005-2010. The agreement aims to further promote regional cooperation through the establishment of bilateral and multilateral arrangements between enforcement agencies responsible for common boundaries, to achieve more effective control of illegal international trade in wild fauna and flora and their products. The potential thus exists for the ASEAN statement to ultimately develop into a trade-related instrument as well as spur further specific trade-related agreements, which would include components on NWFP. Sandalwood would be classified under NWFP in regards

6.3.1.6 Appraisal of the Effectiveness of CITES

In order to make CITES a better tool for sustainable development there is a need to make sure that CITES decisions are based on socio-economic as well as biological information through increasing

awareness of livelihoods issues within the 'CITES community'; including socio-economic information in the supporting statements for CITES proposals; ensuring that consumer decisions are based on livelihood as well as conservation concerns by increasing consumer awareness that the listing of a species in CITES is not necessarily a sign that it is threatened, and is not equal to a trade ban; and, exploring the potential to link CITES trade controls with certification schemes or other trade-related measures.

It is necessary to ensure that learning resulting from research on community-based wildlife management and NWFP development is brought into and informs decisions taken regarding the international wildlife trade in order to increase the potential for achieving conservation and development aims.

6.3.1.7 Role of importing governments on sandalwood trade

The role of importing government should be more concentrate on improving implementation of trade controls: In addition to better implementation of regulatory mechanisms in source countries, it would be done to strengthen implementation of trade controls at the point of import. The Sandalwood industry should also be encouraged to participate in developing workable trade controls in support of sustainable management principles. (James Compton TRAFFIC OCEANIA MAY 2002)

6.3.1.8 Impact of campaigns and boycotts on the trade in sandalwood

Where campaigns and boycotts are being considered as a regulatory measure, country benefits need to be balanced against the environmental (including NWFP) and governance impacts in neighboring countries. Country-specific studies could help with better understanding the associated economic and environmental trade-offs in different contexts. In Papua New Guinean Sandalwood producers' case, the boycotts and campaigns will promote sound and sustainable Sandalwood management practices which in return maximize the benefit to the sandalwood resources owners.

7 Conclusions and trends in the application of trade related instruments to the trade in NWFP.

In PNG other NWFP are widely used for cultural purposes but both Sandalwood and Eaglewood rarely have any cultural significance and is currently providing economic benefits and the living standards of the people are yet to be improved. What is earned from sale of these two products are rarely managed for sustainability, and that no tangible benefits are observed nationally expect for those who trade the products and few people on whose land the products occur and that FOB exports levies collected by the government. The poverty alleviation part that is played by these two products is yet to be seen.

8 Policy recommendations/ Proposed areas for Further Research

8.1 Generic Recommendations.

The appropriate authorities should develop regulatory mechanisms and enforcement/management capacity in PNG.

8.2 Recommendations more specific to Eaglewood trade

The following recommendations are made for sustainable use of Eaglewood thus increase economic viability and improvement local livelihoods of Papua New Guinean Eaglewood resource owners:

- Border control and surveillance tracking down the illegal movement of Eaglewood from PNG to West Papua province of Indonesia.
- Develop regulatory mechanisms and enforcement/management capacity in PNG: As part of the development of a National Management Strategy on Agarwood producing species, more comprehensive regulatory mechanisms to control and monitor harvesting and trade of Agarwood are required, this should include adequate legislative provisions, appropriate personnel, resources and prioritization by relevant PNG authorities. Further enhancement of co-operative efforts between PNG and Indonesia, would benefit the management of Agarwood harvest and trade.

8.3 Recommendations more specific to trade in Sandalwood.

8.3.1 Recommended conservation and management actions

The following is recommended to foster the Sandalwood and Eaglewood industry, for value adding and making a fair distribution of the economic benefits to all the stakeholders:

Ten recommendations are presented in this strategy for conserving, managing and better utilizing *Santalum macgregorii* in PNG. More details on each recommendation are given in the body of the text under Section 4.3.

Recommendation 1: Present this report to the National Forest Board and the PNG Forest Authority (PNGFA) in order to seek support for the implementation of the recommendation including the appointment of a steering committee to oversee the development and management of Sandalwood in PNG.

Recommendation 2: Address social needs as part of developing a management and conservation strategy and identify key personnel interested in the development of sandalwood.

Recommendation 3: Technical issues. There needs to be public education and awareness as well as distribution of relevant technical information for management of existing stands and raising of new stands.

Recommendation 4: Undertake an inventory of sandalwood including planted trees.

Recommendation 5: Consideration be given to a moratorium on harvesting from areas where the species has been severely depleted and NFS to consider restrictions on the minimum cutting-size and limit annual cutting rates based on current sandalwood resources. Since sandalwood occurs on customary land, any policies need to be established in close collaboration with the landowners and managed for their benefit.

Recommendation 6: Develop a viable market strategy for sandalwood through assessing the sandalwood resource, reviewing the current market situation, identifying issues, exploring market opportunities and developing a market strategy.

Recommendation 7: Provide education on the impact of fire on sandalwood and methods to be adopted to reduce the impact.

Recommendation 8: Support for *in situ* and *ex situ* conservation stands of sandalwood.

Recommendation 9: Undertake research on sandalwood necessary for the development of a scientifically sound conservation and management strategy.

Recommendation 10: Support specific actions to protect and manage the sandalwood in the Western Province.

8.4 Future research areas for Eaglewood

- Do research through case studies and assess social impact of the Eaglewood industry on rural livelihoods, job creation and improvement of livelihood.
- National eaglewood resources inventory and find out the status and new evaluation of the population and environmental assessment of the Program to study the actual impact of sustainable use of *Gyronops*, *Acquilaria* and other Eaglewood producing species.

8.5 Future Research areas for Sandalwood parrots

The ten recommendations given above should form the basis of future research into Sandalwood trade in Papua New Guinea.

9 Other notes

Non-wood forest products are of great benefit to human Society in both developed and developing countries, however foresters have so far developed little attention to enhancing many non-wood uses of forests (FAO, 2002) In some countries the policies hardly include the development and control of NTFPs and in PNG constitution and Forest policies it is no mentioned needs forest policies need to be amended so that non-wood forest Products policies including Sandalwood and eaglewood, Sandalwood Rattan and others wild fauna forest products will be included.

Promote use of non-wood products from forests as a valuable component in the process of economic development and poverty alleviation.

The use of NTFPS was since the prehistoric times,

Management of resources harvesting, processing, and trade of the products and there are diverse and commercially important.

While NTFPs of many of many parts have local importance in legends, folklore, mythology and religions (FAO, 2002) Symbols in military, wisdom, strength and reliability sandalwood and Eaglewood has no known such uses.

Formulation of forest Policies. Introduce, small-scale forest harvesting systems that rely on basic or intermediate technology (Cruz, 1988). Non-wood forest products have economic value for rural people.

Investigate small scale harvesting operations, time and production standards and recommend improvements in work phases and tools.

Eaglewood and Sandalwood both have a place in national and international markets.

Resource assessment, indigenous knowledge, product development, socio-economic benefits, environmental impact, institutional and policy aspects will help project design and implementation.

For domestication Scientists and farmers should be involved so that what is developed by the scientists will be used by the local farmers to farm the trees using the improved silvicultural methods developed.

Species that are most appropriate for domestication, which of all possible traits would be improved by genetic selection, likely to provide the necessary incentives for market expansion.

AFRICAN PROVERB.

If many little people, in many little places, do many little things, they can change the face of the earth.

- New conceptual frameworks for policy development required ensuring the economic viability of small-scale farmers.
- Under what conditions are small-scale productions competitive with large-scale production?

Domestication to enhance productivity and sustainability, conservation of genetic resources, preservation of natural habitats and improvement of gemplasm.

Advantages of domestication, reliable production, relieving pressure on forests, income generation, ease of harvesting, improved growth rates, increased value of crops.

Disadvantages increased susceptibility to pests, lost of ecological function, reliance on new sources of wild seed, added benefit to large corporate entities.

(FAO, 2001) ability to properly design and negotiate contractual arrangements.

Capacity to administer monitor and enforce contracts.

Legal and institutional frameworks for design and administration of eaglewood and sandalwood are non-existent or very poor in PNG. Role of contractual arrangements in management, conservation and development.

Institutional framework, managerial condition, required for, design, awarding, administration, design awarding, administration contractual arrangements, function successfully. How to design, develop, implement, and re-enforce contract administration and enforcement.

Forests and forestland occupy 1/3 of the worlds land surface.

There is an intimate relationship of rural population of the forests, in form of provider of materials, fuel food and employment needs no further elaboration. FAO.

Forest policy specifies certain principles regarding the use of society's forest resources, which is felt, will contribute to the achievement of some of the objectives of that society.

The country's forest policy, conservation, protection administration management and utilization of forests affect Forest activities. Environmental protection, forest industries and marketing of forest products. Forest Policies are to benefit society not the trees, land or products.

Forest Policy has the following

Statement of objectives

Body of registration

Structure and administration of a government forestry organization

Planning budgeting and execution of programmes of the governmental forest organization.

9.1 Policy environment,

Technical qualifiable or verifiable, ecological factors, economic factors, state of knowledge, operational or administrative practicability, policies in other related sectors, legislation, government priorities and commitments, social and cultural influence, policies of private owners. Cost and benefit analysis of policies, operational or administrative practicability. A propose objective is better not included in a policy.

Since Eaglewood and Sandalwood occur in customary land objectives and activities of these groups must be taken into account when formulating or amending the PNG national forest policy.

Policies provide ideas, experience, and evidence, of value in formulation and execution of official and that they do not conflict with it.

Objectives regarding Role of Forestry sector in the country economic and social sector.

Forest policies generated by basic differences in ecological, social, economic and political characteristics of the country.

The regulation of NTFPs in 1992 DEC imposed a total ban on the wild orchids (Kabaru, 1992) Metroxylon sagu (Sago) an edible palm species in PNG is exploited for stem starch, which is both a subsistence and commercial product, (Johnson, 1997).

Timber products are almost always seen as the only contributions of forestry to national economies, but non-wood products are also very important and often most significant to local economies well being of the local people (Booth & Wickens 1988).

Papua New Guinea should have sound policy framework has clear objectives and goals that will guide forest management into the future. It should take into account public interest and demands.

9.2 Personal Comments by Kulala Mulung Head of Department PNG Unitech. (April 2005)

There are policy constraints influencing the current traded of forest products.

Policies can be developed that will direct markets or allow the markets to develop and later develop policies.

Policies should be geared towards use of resources.
Users should dictate policies.

NWFPs are not included in the informal sector, but should be include in the legal framework. Most of NTFPs are traditionally significant because people have been using it since the pre-historic times.

Eg. Fibres of certain tree species were used to make bilums,

The UNITECH Forestry Department is not involved in discussion of Eaglewood and Sandalwood Committees and are often overlooked however the staff can give valid discussion.

The outside organizations and Institutions are often involved and they come under protocols, which are a be autocratic situation, no collaboration. There is a need for involvement of educational institutions that have facilities and deal directly with forestry like the UNITECH to be involved. The Scientists and resource owners should be allowed to
NGOs should be viewed has agents for development

9.3 Recommendation

Avail loans by government and private institutions into developing eaglewood and sandalwood industries and encourage the resource owners to organize themselves and form co-operatives to pool products and avail themselves to access these funds.

At present there is a real lack of proper co-ordination by the national forest authority, there fore it is recommended that in any development work the institutions should be involved to take lead in terms

of research in any commercially important NWFPs including Eaglewood and Sandalwood and the NFA to facilitate policies once the scientific information is made available.

There is need for change of attitude by the NFS, often-junior officers who do not have the ability and knowledge are involved and there is under performance, which stagnates and frustrates the all projects involved.

PNG has of its citizen's forest dwelling and NWFPs and opportunities to NWFPs should be formalized

There are wide ranges of developments that can take place including management and operations, which will involve village people, business houses, technical experts that will promote trade and industry.

Sandalwood and Eaglewood should be operated as a business entity and being certified by forestry departments but at current forestry is too protective which can hinder and drive trade under ground.

9.4 Policy Support.

There should be a proper study of the Papua New Guinea Forest Policy to define, update and modify the national forest policy to increase the contribution of the forestry sector to the national development through the sustainable use of their forest resource including the non-timber forest resources like Eaglewood and sandalwood. Forest policy should function as a guide and complementary strategies should be driven to benefit the state and maximization of the forest resources.

The components of forestry including geography, economy, resources Forests policies are to be carefully studied and at the same time forest elements like forest estate, industry, revenue, local trade, handicrafts, tourism, people and non-timber forest products.

9.5 The forth National Goal (Directive Principle).

“For PNG natural resources and environment to be conserved and used for the collective benefit of us all and to be replenished for the benefit of all and for the benefit of the future generations”.

When ownership of resource is concerned here they should be given the highest priority in terms of distribution of the benefits from the forests.

Total landmass of PNG is 46 million ha.

Objectives for PNG Eaglewood and sandalwood resources should be that they are managed and protected as renewable natural assets.

Utilization of Eaglewood and sandalwood resources should be to achieve economic growth, employment creation, greater Papua New Guinean participation and increased viable onshore processing.

When taking about development of NWFP one has to look at social, economic, ecological, geographic al and cultural aspects of management taking into consideration that sustainable management of our two products being the guiding principle.

The eaglewood and sandalwood resources being managed for continuous production with the aim of maintaining at the earliest, practical time, desirable net growth at least in balance with harvest (NFP, 1991).

9.6 Eaglewood

Help local people and manage and conserve their own eaglewood resources as well as managing their earning in order to improve their livelihoods (Gun and Avosa 2004).

Genus *Acquilaria* belongs to Family Thymelaeaceae in the order Thymelaeales and *Acquilaria* comprises about 15 species distributed from India eastwards through South East Asia to New Guinea (Hou, D.1960). By the 12th Century

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