

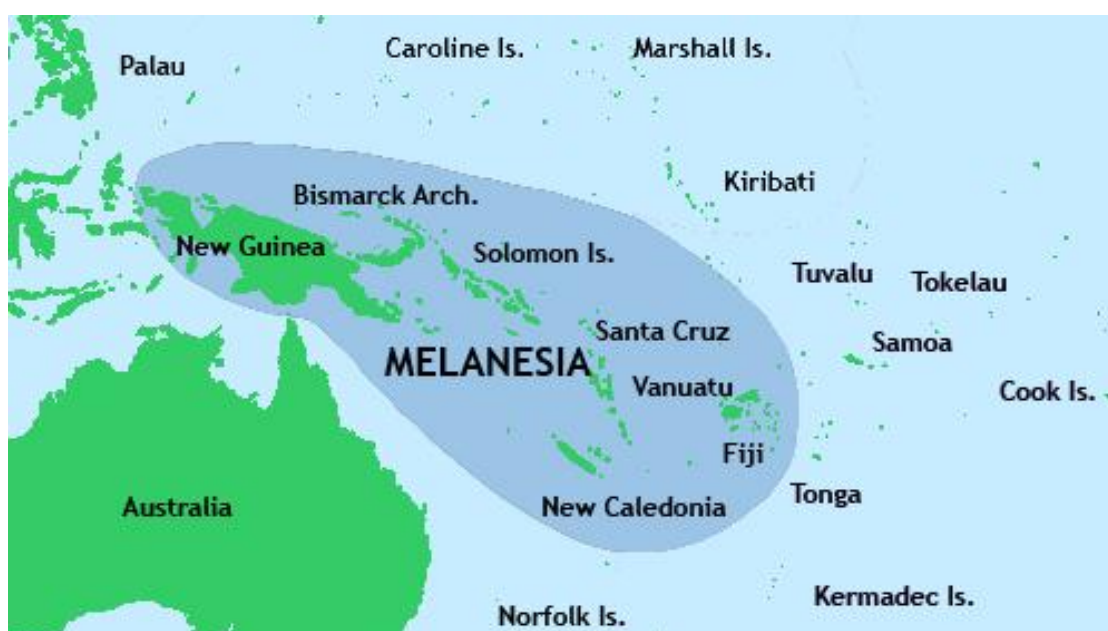
MSG Forestry Baseline Study



MSG Secretariat
Secretariat du GFLM
Melanesian Spearhead Group | Le Groupe Fer de Lance Mélanésien

THE CONTESTED FORESTS

Searching for New Visions for Forestry in Melanesia



This study was commissioned by the Melanesian Spearhead Group (MSG) Secretariat through the Pacific Integration Technical Assistance Project (PITAP) which is funded by the European Union under the 10th European Development Fund (EDF).

Port Vila, 13.11.2016

Study carried out by:

Johannes Bauer*, David Hopa and Stanley Wapot*****

*Program Director, Climate Change, Forests & Biodiversity, Australian Institute of Ecological Agriculture (AIEA), Orange, NSW **, *** Melanesian Spearhead Group, Port Vila

Contact: e-mail. johannesj.bauer@gmail.com Tel. + 61 2 63375771

Table of Contents

MSG Forestry Baseline Study	i
Acronyms	iv
Foreword	vii
CHAPTER 1: SITUATIONAL ANALYSIS OF FORESTRY	1
1.1 Overview	1
1.1.1 The Objective of the Forestry Feasibility Study	1
1.1.2 Regional context	1
1.1.3 Global context	4
1.1.4 Adding Climate Change to the Equation	6
1.1.5 The Tropical Timber Trade and Sustainable Development	6
1.1.6 Changing perceptions on forests and their role in Ecologically Sustainable Development (ESD)	7
1.1.7 Products from Forests - beyond timber	7
1.1.8 Forests and Climate Change	8
1.1.9 Forestry's Millennium Challenge	9
1.1.10 The 'New MSG Forest Economy'	9
1.1.11 Living with a New World Order	10
1.1.12 The Multiple and holistic use of forests and forestry for sustainable development	10
1.2 The Forestry Transition Model in MSG as a Framework to understand Change and develop Visions	11
1.2.1 Financing the transition	12
CHAPTER 2: PACIFIC FORESTS AS A COMMON GOOD	13
2.1 The Invisible Forest	13
2.2 Forests as Community Livelihood and Spirit world	13
2.2.1 Case Study 1: NTFP markets in Vanuatu: Mr A.'s NTFP export market	13
2.2.2 Case Study 2: Research on Indigenous Nut trees in the Solomon Islands	15
2.2.3 Case Study 3: Noni (<i>morinda citrifolia</i>)	16
2.2.4 Case Study 4: Black Bean Tree, Moreton Bay Chestnut (<i>castanospermum austral</i>)	16
2.2.5 Case Study 5: Mangrove Forest Management and Mud crab harvest in New Caledonia	17
CHAPTER 3: FORESTS AS AN ECONOMIC RESOURCE FOR FOREIGN INDUSTRY	20
3.1 The Changing Timber Production and Timber trade in Melanesia	20
3.1.1 Changing Raw Material Sources	20
3.1.2 Building a Timber Champion in the region.	21
3.2 The Timber Trade in PNG	21

3.3 Forests as a Formal and Domestic Economic Resource	23
3.3.1 Value added Timber Products.....	24
3.4 Timber and Timber markets from Fiji	24
3.5 Domestic Timber Consumption and Internal MSG Timber Market	24
3.5.1 Case Study 7: Timber Market Collapse in Fiji.....	24
3.5.2 Case Study 8: Bois (wood).....	28
3.6 Cocowood as a regional new product	29
3.6.1 Case Study 9: Classic Series Products for cocowood	31
3.7 The promising story of whitewood	32
3.7.1 White wood Characteristics	32
3.7.2 Case Study 10: The Vanuatu Whitewood Export Market to Japan.....	33
3.7.3 Whitewood Export Industry in Vanuatu	33
3.8 Addressing Competition from Similar Products	35
3.9 Value added domestic timber ventures	36
3.9.1 Case Study 11: Techno Bois Déco: A Top-End Furniture, House and Interior Designer using Pacific Timber from Vanuatu.....	36
3.10 Wood carvings in Melanesia: A major wood product and a source of livelihoods.....	37
3.10.1 Case Study 12: Wood carvings in Melanesia: Carving spirits, Culture and Identity	37
3.10.2 Case Study 13: A Vanishing Carving Culture	38
3.10.3 Case Study 14: The Wood carvers from Lau - A story of physical community survival through carving	39
CHAPTER 4: A NEW MSG FOREST ECONOMY AS A WAY FORWARD	40
4.1 Recommended Actions	40
4.1.1 Summary of Recommended Actions	40
4.1.2 Financing the New Forest Economy (NFE):.....	41
4.2 A Vision for the New MSG Forest Economy	41
4.3 Details of Recommendations	43
4.3.1 Introduction.....	43
4.3.2 Moratorium on new concessions (PNG and Solomon Islands).....	43
4.3.3 Re-accreditation of existing concessions	43
4.3.4 Establishment of an MSG Timber and forest product (certification scheme).....	43
4.3.5 Product Differentiation and Value Maximisation	43
4.3.6 Climate as a New Forestry Portfolio.....	44
4.3.7 Case Study 15: Appalachian Carbon Partnership	44
4.3.8 The Corporate-Community Forestry transition.....	45
4.3.9 From Single Product Cooperatives to the Mixed CO-OP Livelihood Centre.....	46

4.3.10 MSG Guidelines and Policy on Forestry	46
4.4 The Development of the Informal Forestry Industry	47
4.4.1 Non-Timber Forest Products (NTFPs).....	47
4.4.2 Looking for inspiration from Abroad.....	47
4.5 Transition forestry for Mine site rehabilitation	50
4.6 Silvi-cultural Management of Logged sites and Secondary Forest	53
4.7 Replanting Programs for Native Forests	53
4.8 Establishment of a Community nursery industry	53
4.8.1 Case Study 16: A new Business - Nurseries for plantations in Bhutan	53
4.9 Financing the MSG-NFE:	54
4.50 From Research and Training to a Business Plan & Bank	54
4.5.1 Case Study 17: Agarwood as a Community forestry opportunity ‘par excellence’ in PNG 55	
4.5.2 Description of the product Agarwood.....	55
4.5.3 Case Study 18: An innovative National Loan Scheme to promote Business development in the Environmental -hospitality Industry. An example from Bhutan	57
BIBLIOGRAPHY	59
Brunet, S., Bauer, J.J. and T. DeLacy and K. Tshering, (2001): <i>Tensions between Tradition and Modernity-Tourism Development in Bhutan</i> . J. Sustainable Tourism 9 (3):243-263.	61
Appendix I: List of Stakeholders Consulted	76
Appendix II	78
Resource Document 1. Current Forest Situation in Melanesia	78
Appendix III.....	78
Forest Carbon and REDD+ in Melanesia	78

Acronyms

ACIAR	Australian Centre of International Agricultural Research
ADB	Asian Development Bank
AusAID	Australian Agency for International Development (defunct)
BfW	Brot fuer die Welt
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention on Combating Desertification
CCPIR	Climate Change in the Pacific Island Region
CEPF	Critical Ecosystems Partnership Fund
CFMG	Community Forest Management Group
CHICCHAP	Choiseul Integrated Climate Change Programme
CI	Conservation International
CITES	International Convention on the Trade with Endangered Species
CROP	Council of Regional Organizations in the Pacific
DMF	Dutch Millennium Foundation
EDF	European Development Fund
EFF	Eco Forestry Forum (PNG)
EIA	Environmental Impact Assessment
ESD	Ecologically Sustainable Development
FAO	Food and Agriculture Organization of the United Nations
FAO -GFRA	Food and Agriculture Organization of the United Nations- Global Forest Resources Assessment
FD	Forestry Department
FDB	Fiji Development Bank
FFF	Future Forests Fiji Limited
FHCL	Fiji Hardwood Corporation Limited
FIBOS	Fiji Islands Bureau of Statistics
FIRC	Foreign Investment Registration Certificate
FIRCA	Fiji Islands Revenue and Customs Authority
FLEGT	Forest Law Enforcement Governance and Trade
FLNKS	Le Front de libération nationale kanak et socialiste
FMP	Forest Management Plan
FORCERT	Forest Service and Product Certification Service (WNB-based)
FPL	Fiji Pine Limited
FRA	Global Forest Resources Assessment
FRIMS	Forest Resources Information Management System
FSC	Forest Stewardship Council
GBR	Great Barrier Reef
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
Gt	Gigatonne
GTZ	German Technical Cooperation
Ha	Hectare
HDI	Human Development Index
IAS-USP	Institute of Applied Science at the University of the South Pacific

ICA	International Cooperative Alliance
ILG	Incorporated Landowner Group
INA	Institute for National Affairs (PNG)
ISIC	International Standard Industrial Classification of All Economic Activities
IUCN	International Union for Conservation of Nature
IUFRO	International Union of Forest Research Organisations
MESCAL	Mangrove Ecosystems for Climate Change Adaptation & Livelihoods
JICA	Japan International Cooperating Agency
KFPL	Kolombangara Forest Products Limited
LTA	Land Transport Authority
MECCLP	Mangrove Ecosystems for Climate Change and Livelihoods Project
MSG	Melanesian Spearhead Group
NACE	Statistical Classification of Economic Activities in the European Community
NBSAP	National Biodiversity Strategy Action Plan
NGO	Non-Governmental Organization
NISAP	National Invasive Species Action Plan
NLTB	Native Land Trust Board
NRDF	Natural Resources Development Foundation (SI)
NRM	Natural Resource Management
NTF	National Trust of Fiji
NWFP	Non-wood Forest Product
NZAID	New Zealand Assistance for International Development
PCCL	Partial Canopy Cover Loss
PEFC	Programme for the Endorsement of Forest Certification
PEFC	Programme for the Endorsement of Forest Certification
PFE	Permanent Forest Estate
PFM	Participatory Forest Management
PICs	Pacific Island Countries
PICTs	Pacific Island Countries and Territories
PII	Pacific Invasive Initiative
PILN	Pacific Invasive Learning Network
PIP	Pacific Invasive Partnership
PITAP	Pacific Integration Technical Assistance Project
PNG	Papua New Guinea
PNGFA	PNG Forest Authority
PNGFIA	Papua New Guinea Forest Industries Association
PPP	Public Private Partnership
RAMSI	Regional Assistance Mission to the Solomon Islands
RBF	Reserve Bank of Fiji
REDD	Reducing Emissions from Deforestation and Forest Degradation
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RH	Rhibunan-Hijau
RSPO	Roundtable on Sustainable Palm Oil
SABL	Special Agricultural and Business Leases (PNG)
SDG	Sustainable Development Goal
SFED	Social Forestry Extension Division (Bhutan)
SFM	Sustainable forest management
SI	Solomon Islands

SIDS	Small Island Developing States	
SIFM	Solomon Island Forest Management	
SIG	Solomon Island Government	
SMEs	Small and Medium Enterprises	
SP	South Pacific	
SPC	Secretariat of the Pacific Community	
SPC/GTZ-CC	SPC/GTZ Pacific-German Regional Programme on Adaptation Climate Change	to
SPC/GTZ-PGRFP	SPC/GTZ-Pacific German Regional Forestry Programme	
SPREP	Secretariat of the Pacific Regional Environment Programme	
TDA	Tetepare Descendants Association	
TRAFFIC	Wildlife Trade Monitoring Network	
IUFRO	International Union of Forest Research Organizations	
UNDP	United Nations Development Programme	
USAID	American Aid	
USP	University of the South Pacific	
VPA	Voluntary Partnership Agreement	
WAF	Water Authority of Fiji	
WCMC	World Conservation Monitoring Centre	
WMG	Wildlife Management Area	
WNB	West New Britain (PNG province)	
WTMA	Wet Tropics Management Authority	
WTP	Willingness to Pay (A marketing evaluation model)	

Foreword

The forestry sector in Melanesia has been in decline in three countries (Vanuatu, New Caledonia and Fiji) and has been greatly underfunded in the remaining two (PNG and Solomon Islands) for at least 20 years. There is a danger that despite of evidence of growing collaboration from and between international stakeholders to address the crisis in forestry, the extent of that is insufficient. There is also concern that climate change action around forests becomes a disjointed foreign intervention by many different stakeholders instead of a new portfolio for forest departments.

This study will attempt to gain a comparative understanding of the forests and forestry sector of four MSG States and New Caledonia, a French Territory, each with hundreds of islands scattered over a vast region of the world which is as diverse as it is unique. It is called Melanesia by some. Others call it the South West Pacific.

With rapidly growing activities from many segments of national and international communities, around climate change and environment related actions, a regional Forum with political and economic clout for forest and related Natural Resource Management (NRM) activities is required.

It is recommended to establish in perpetuity a regional (Melanesian) body which, after five years will (through government contributions, Green Climate Fund (GCF), Development Aid, memberships fees, Philanthropy contributions, Industry Transition levies, grants and Global Crowd-sourcing/Raffles) have a regional funding and governance organisation to drive sustained and fully incorporated activities within Forestry departments and their partners. This will drive implementation and Sustainable Forest Management (SFM), development of the Melanesian Restoration Initiative (targeted 50 000 ha/yr. in the region), redesigning forest-based industry and livelihoods and the implementation of various regional agreements (e.g. of the Lifou Declaration aims). A target of US\$ 100 million a year, with a minimum operation budget of US\$ 50 million will be required to operate (and grow) that fund to sustain the complex range of action required indefinitely.

The State of the World's Forests 2016 shows that some countries have been able to reconcile the aspirations of the different sectors, increasing the agricultural productivity and food security of their populations while also halting and even reversing deforestation. The report presents case studies for seven such countries, and others have made similar transitions. The challenge today is to encourage such positive trends in countries – especially low-income countries – in which food insecurity is still rife and where forests are still being lost. Integrated land-use planning provides an essential strategic framework for balancing land uses. Importantly, such planning processes must be participatory – because it is farmers and other rural people who must ultimately put the plans into practice, and will do so only if they meet their needs and interests.

José Graziano da Silva,

FAO Director-General In his Foreword to State
of the World's Forests, 2016

CHAPTER 1: SITUATIONAL ANALYSIS OF FORESTRY

1.1 Overview

1.1.1 The Objective of the Forestry Feasibility Study

The overall objective of the study is to recommend sectoral reforms that could be implemented by members in relation to natural resource based sectors to ascertain the level of productivity and strategies to take advantage of value addition and new commercial opportunities in order to achieve sustainable growth and development opportunities and improve the living standards of the people.

More specifically, the study will:-

- Review country level studies on commercial forestry development with emphasis on downstream processing and identify forestry production and productivity levels in each MSG member including opportunities for improvements;
- Identify comparative and competitive advantages of each MSG member in terms of forestry production, forestry investment, business opportunities and exports and Review market access opportunities and identify potential value added forestry products where MSG can benefit from regional and international forestry product trade; and
- Analyze the types and level of tax revenue derived from forestry development in each member country, in particular the identification of the utilization of forestry Government revenues in National Budgets, and proposed measures to maximize tax revenues from forestry resource utilization in each country [the supporting on this objective will be completed in the relevant heading in the body of the report later, most likely in the validation workshop. As this information is with National Forest Departments/Ministries].

1.1.2 Regional context

The exploitation of natural resources forms a major part of many national economies in the Melanesian Spearhead Group (MSG) sub-region of the Pacific Islands. In the five member countries, Fiji, PNG, Solomon Islands, Vanuatu and FLNKS of New Caledonia, it is estimated that as many as 10 million people are directly dependent upon forests for at least part of their livelihoods. The value of natural resources, including those outside forests, is estimated at several hundred dollars *per capita*. This suggests that across the MSG sub-region as a whole the equivalent economic value of biodiversity may well run into several billion dollars annually. Every country throughout the MSG sub-region has adopted a stated policy of protecting environmental standards, wild habitats and species. However, implementation of these policies is often poor. A policy of words, not supported by action, may have negative effects, as it hides the true situation. Putting biodiversity into "real" development policies will be one of the major challenges in future. Almost all member countries have adequate conservation legislation on paper. Those without are fast adopting suitable legislation. In all countries legislation relating to biodiversity conservation is complex and scattered in separate laws on forestry, marine regulations, pollution regulations and environmental law. This may often be further confused by conflicts between national law, state or provincial laws and religious laws and local customs. Members should be encouraged to streamline the relevant

rulings so that these can be better known by the public, developers, law enforcement agencies and the judiciary. A major problem is law enforcement which must be tackled as one of the major hurdles in achieving the sustainable management of renewable resources. Most biodiversity is generally out of sight or in sparsely populated areas where law enforcement is a distant irrelevance to daily life. Villages make up their own rules to control their own daily affairs and edicts from a distant central government are almost meaningless. A new approach must be developed so that villagers themselves adopt suitable rules and control methods to ensure that natural resources are used wisely.

Forests are currently conserved through two main means: protected areas established for the conservation of biodiversity, and through the activities of forestry agencies. A third and growing conservation trend is the management role played by local communities. Forests contribute in many ways to the well-being of nations and in the small island world of the Pacific these services are on an equal footing and complementary to agriculture and fisheries. For the purpose of this study we may make the following differentiations:

1. Direct benefits to the people and communities
2. Direct benefits to the national economy
3. Direct benefits to various government levels
4. Indirect benefits to society through
 - Coastal Protection
 - Watershed Services to agriculture and urban spaces
 - Forest Products - Timber and NTFPs (Non-Timber Forest Products)
 - Cyclone Protection

One aim of sustainable forest management is to ensure that forests provide in perpetuity the above range of goods and services. All of them are essential and preferences cannot be given. According to FAO (2016) in 2011 approximately 3 billion m³ of wood were removed globally, equivalent to about 0.6 percent of the total growing timber stock. The figure for Melanesia is around 6.5 million for industrial production (mostly round logs from PNG and Solomon Islands). According to the State of the World's Forests (FAO, 2014), the forest sector in 2011 contributed an estimated total amount of USD 600 billion to global GDP, or about 0.9 percent of global GDP. While the much larger income of high income countries (41%) however only contributes 0.1% to GDP, the much smaller one of low income countries (5%) contributes 1.4% to the GDP

TABLE 1 TOTAL INCOME FROM THE FORESTRY SECTOR AND NUMBER OF PEOPLE EMPLOYED IN THE SECTOR IN MELANESIA

	Fiji	New Caledonia	PNG	Solomon Islands	Vanuatu
Total Revenue from Forestry Sector (US\$)	18,481,398 (2013 figures)	unknown	t.b.i.	t.b.i.	1,509,116 (2013 figures)
% GDP	<3	<1	1.4%	17%	<3
No. of People Employed	Several 100	<100	Few 1000	several.100	Several 100

In Melanesia also, as national incomes increase, dependence on forests decreases. With the isolated nature of many of the islands however forest product contribution to GDP will remain important for the foreseeable future, unaccounted as it may be. Most importantly, value added from forestry is less important at the national level but crucial for local economies, communities and regions which are and will remain highly dependent upon forest-derived income.

Rural communities experiencing forest logging in their land continue to voice growing concerns over forest degradation due to poor logging practices and the role of forest departments and private companies in sustainable forest management. Both in PNG and Solomon Islands where foreign logging is still carried out to a massive extent, forestry departments are greatly under-resourced to supervise operations and compliance to forest policy and, if available, Codes of Practice. There is even less ability to enforce punitive steps as fines e.g. in the Solomon Islands are far too low to be able to act as a deterrent. Due to these and other restraints, state regulated approaches have largely failed. Community forestry is the logical answer to relieving the burden of the government controlling and protecting forest area, whilst also promoting rural development and allowing the enlightened self-interest of local communities to drive management. Communities throughout the MSG sub-region have played and continue to play important roles in forest management and growing demographic and resource pressures are making intensified forest management increasingly attractive to communities, stimulating local interest to invest in sustainable use systems. Generally, governments are extending management rights and responsibilities to local communities and local authorities. This can only work however if effective extension and support services can be given by forest departments. Both systems work well in some places (Solomon Islands, West New Britain in PNG) however need to be replicated elsewhere.

Ongoing deforestation for various reasons is another important factor. The process of deforestation occurs at two levels: agents and causes. The agent of deforestation refers to those who physically convert forests to non-forest uses: small-holder farmers; owners of plantations and estates; forest concessionaires; infrastructural development agencies). Causation refers to all the factors that shape the agents' decisions to deforest. These factors may be market-driven (e.g., international prices of agro-export commodities), economic (e.g., a sudden large currency devaluation), legal or regulatory (e.g., a change in land tenure laws), institutional (e.g., decision to deploy more forest rangers to particular area), or political (e.g., a change in the way forest concessions are allocated). It is necessary to understand these underlying causes in order to influence the behaviour of agents and lessen the deforestation rate.

Information on forest dynamics is routinely provided by countries through the **Global Forest Resources Assessment (FRA)** of the Food and Agriculture Organization of the United Nations (**FAO**). FRA Reports suggest that individuals and businesses deforest inappropriately because it is their most profitable alternative. To motivate landowners not to deforest, either deforestation must be made less profitable or other alternatives must be made more profitable. Deforestation can be made less profitable by reducing the demand for products produced on cleared land, increasing the unit costs and riskiness of production, or eliminating speculative gains in land markets. Alternatives to deforestation can be made more profitable by increasing the profitability of maintaining forests and increasing the opportunity costs of labour and capital. Each national situation is different, much uncertainty remains about key cause and effect relations, and there are usually trade-offs between policies' effectiveness, ability to be targeted, political viability, and direct and indirect costs.

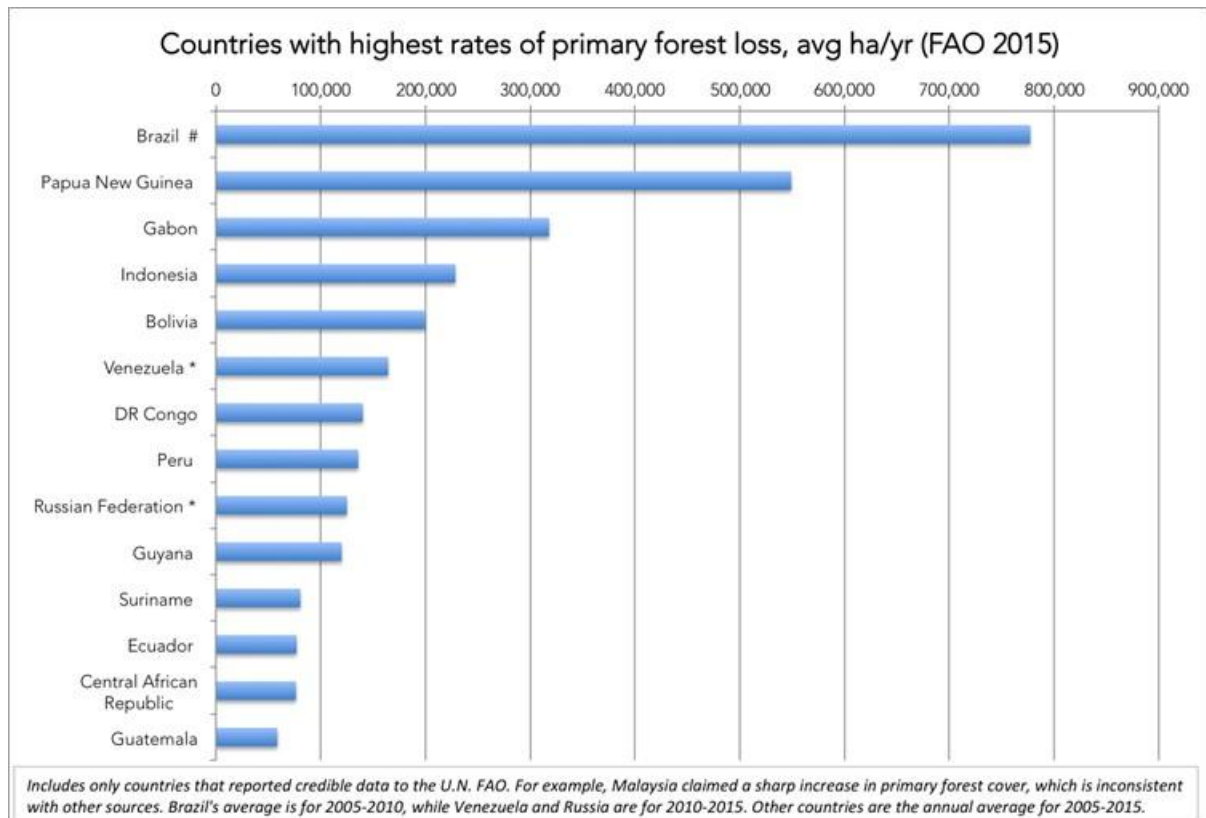
Logging companies decisions about whether or not to log depend on expectations of future returns. Those with secure tenure may decide to sustain, even improve their forests, if they are confident future benefits will be greater than the alternatives. Unfortunately, in many countries, such conditions are not met as logging companies think future forest values will be low, costs will increase, they fear political uncertainty or they have other more attractive financial options.

The overall objective of the study is to recommend sectoral reforms that could be implemented by members in relation to natural resource based sectors to ascertain the level of productivity and strategies to take advantage of value addition and new commercial opportunities in order to achieve sustainable growth and development opportunities and improve the living standards of the people.

1.1.3 Global context

The resulting outlook in the global context is riddled with paradox. Carbon sequestration requires that forests remain intact. Industrial utilization of wood involves the felling of forests. Both objectives call for more forest as the global consumption of wood for industrial purposes and for fuel wood, especially in developing countries, continues to grow. While the rate of growth in wood consumption has slowed in recent years it is still running around 0.8 percent per annum. This means that about 25 to 30 million m³ of wood, including wood used to produce energy, are being added annually to world demand. Two other trends evident in this respect have thus become relevant. On the one hand China, and to a lesser extent India, are emerging as major importers of wood and sawn wood products, rivalling the United States, Japan and the European Union as wood importers. Thus the Asia-Pacific region now accounts for a substantial proportion of a growing world market for wood. On the other hand, the area of the world's forest plantations is being added to by about 4 to 5million hectares per annum. Thus the potential global wood supply – 10 to 20 years in the future – is growing roughly twice as quickly as consumption is increasing. Most of the increase in world consumption of industrial wood has taken the form of pulpwood for the manufacture of paper and re-constituted wood. By comparison, demands for saw and veneer logs are relatively stagnant, if not in decline.

FIGURE 1: A COMPARATIVE GRAPH SHOWING COUNTRIES WITH HIGHEST RATES OF PRIMARY FOREST LOSS AVG HA/YR



The Fiji case in particular indicates the global importance of forests in addressing the common global phenomenon of Climate Change, as highlighted in “The summary of the changing forest function and value for Fiji” by FAO (Leslie, 2009) which holds and has, with the signing of the Paris Agreement, gained grim political reality. Let us recall what he suggested:

1. **Forests are becoming increasingly valued for their carbon sequestration (absorption and storage of atmospheric carbon) capacity.** Climate change is now a major issue in international affairs. The generally accepted, although by no means unanimous, scientific opinion is that climate change is occurring quite rapidly, that it is taking the form of global warming, and that a key driving force is the burning of fossil fuels. Forests (as carbon sinks) therefore have a key role in off-setting carbon emissions from increasing consumption of fossil fuels and long-term stores of the absorbed carbon.
2. **Wood, as a raw material for industrial use, is tending to become a minor forest by product.** The carbon sequestration capacity of forests is overhauling the industrial utilization of wood as the main forest product. Combined with environmental services of forests rising in relative importance and the growth of an increasingly affluent, environmentally conscious middle class means that much of current thinking and practice of forestry is obsolete. Most traditional forestry practices are directed at increasing and improving wood production for industrial use. Management under this system has thus been oriented to what the legal

owners of forests say they want. But what those nominal, legal owners say they want is less important, to an exporting country, than what customers in importing countries say they want.

3. ***Forests are being increasingly regarded as a global resource, but what people other than the owners want, is becoming more important than what the nominal owners want.*** *With exports being the dominating factor in Fijian forest policy, what people in prospective export markets think of how the forest sector in Fiji is being handled will affect the changes or success with any export-driven strategy.*

Forestry contributes to a country's gross domestic product (GDP) in both formal and informal economic sectors. In many countries with rapidly expanding economies, the relative share of forestry and logging is decreasing at the national level. Yet the economic impact of revenue from forestry and logging is often felt most at the local level. Changes in the contributions of the within-forest activities reported in FRA 2015 reflect its economic importance at the national level. The value added is weighted by the total size of the economy; therefore this indicator reflects the performance of forestry and logging and GDP.

1.1.4 Adding Climate Change to the Equation

If the reader should not be convinced by now that from a holistic perspective, any forest in the world is of great importance for the ecological functioning of the earth (water cycle, carbon cycle, nitrogen cycle, etc.), its food and water support systems and so on and on, inappropriately and poorly valued at many trillions of dollar because of their existential nature, forest conservation becomes an economic as well as a survival imperative for the world.

With the evidence of greatly advancing valuation of forest services - and a growing and imminent willingness of the rich world to pay for them, it is a greatly disingenuous economic reasoning for any country to continue to destroy forests. It just does not make sense in any way any longer. Not even just economic sense.

The international community has indicated that it is willing to pay for climate change adaptation and mitigation. Considering that value in a very simplified manner. USD 100 Billion are a current annual target for Climate Change Adaptation in the lesser developed tropical world, which no doubt will grow along with impacts. If one assumes very simplistically that forest destruction accounts for 15 % of emissions that would be USD 15 Billion/yr. If we assume that there are 15 million sq.km of forest in the world which need to be protected with payments, USD 1 Billion would be ready for One Million sq.km of forest. That would amount to USD 1000/sq.km or USD 10/ha. Not quite enough but a good start. For Melanesia's forests of some 400 000 sq.km that payment would amount to payments of 400 million per-annum. Certainly much more than what is currently generated through forest destruction while in no way distracting from sustainable use of their many goods.

1.1.5 The Tropical Timber Trade and Sustainable Development

Thirty four years ago Vincent (1992) suggested that the tropical timber trade has promoted neither sustained forest management nor the sustained forest-based industrialization of tropical countries. He suggested that while the boom-and-bust export pattern, typical for this market is often blamed on fluctuating demand by developed countries through (1), high import barriers (2), and low international wood prices and (3), it is rather rooted in tropical countries' own policies on timber concessions and wood-processing industries. He further suggested that as these policies suppress timber scarcity signals, they must be revised if the

trade is to promote sustained economic growth. Even if this is done however the trade may not promote sustained-yield forestry in individual countries', he finally suggested.

Now 34 years later, when many countries in Asia have completed their 'race to the bottom' in forest exploitation, as the TOR aptly called it and progressively ceased timber export due to the exhaustion of their forests, both factors identified by Vincent (1992) remain just as strong and neither the establishment of the International Tropical Timber Organisation (ITTO) to improve the trade and support tropical countries to develop more sustainable forestry, nor all the many other activities (certification schemes, governance schemes, etc. (e.g. Bekele, FAO, 2001) have alleviated this issue.

So how can this stand-off be ended? How can the imminent or future collapse of the timber industry in the countries be softened and their forests be restored? And how can forest authorities in this declining industry continue to exist and fulfil their growing functions? And how can forestry, which has to balance all these conflicting, often money-distorted demands, keep its relevance where the angry voice of the west and the cities, demands increasingly loudly that it is about time to stop that and protect it - while still wanting all its timber as cheap as it can get it.

1.1.6 Changing perceptions on forests and their role in Ecologically Sustainable Development (ESD)

If we have followed the development of tropical forestry and of the timber trade over the past 30 years we have seen the emergence of environmentalism along with scientific and technological advances as they kept tracking the devastation of many of earths environments and in particular forests. During this discourse, as it progressively included the emerging role of forests in mitigating the impacts of climate change, we have witnessed three major shifts. For once, forests and forestry have cemented their place in the international development agenda, ecologically sustainable development and achievement of the Millennium Development Goals (MDGs). For seconds, there has been a seismic shift in how forests and forestry are being viewed and they are now looked at in a much more holistic and ecologically appropriate fashion. And thirdly, there has been a growing realisation that the privatisation and corporatisation of forests and forestry has perhaps not been such a good idea. We can now see in a growing number of papers and projects the offered solution of small scale forestry, value-added products and Community forestry (Decentralisation). It is not surprising that "***The Future "Development of Small-scale and Community Forestry in Times of Global Change"***" is also the theme of this year's IUFRO Conference.

1.1.7 Products from Forests - beyond timber

We want to redefine "forestry" to mean "all contributions to sustainable development that are made possible through forests and trees". Few would argue with the proposition that forests and trees provide a very wide range of benefits in the form of forest products and services. Global or local, for poor or for rich, monetary or intangible, these are benefits in which we all partake (Peter Holmgren, Director CIFOR, Blog 3 August 2016)

The conventional income and tax generating activities from forests, timber mostly, are now being challenged and complemented by the 'new uses' we have identified. There are for example the many traditional non-timber forests products (NTFP) that provide, mostly in informal economies, essential items for forest dependant people, revenue for new nationa and need and potential goods for future markets. Some of them, e.g. Betel nut, are both, yet are also controversial (see Sharp 2013a, b). There are others, like Sandalwood, which are currently being 'rediscovered'. There might also be new products (and payments), for example, related to the medicines for the west, a huge number of them based on rainforest

plant chemistry. For all these, there are developments and changes in biodiversity and wildlife legislation, intellectual property rights and current market models, which provide new opportunities. (e.g. Bauer, 2016 at-el). Many of those remain however poorly explored and most are unsupported, often defied, by government policy. This also applies to the tourism industry and its form of engagement with environmental concerns - and rhetoric. Although fundamentally dependant on reefs, forests and the communities for the attractiveness and success of their ventures, they have often failed to meaningfully engage - and pay for - these environments. Similarly, governments in the Pacific, as Sofield et al. showed (2004) have failed to appreciate the importance of the potential of this industry for community development and supported it accordingly.

This pattern also persists in MSG states, and over the past years, and in particular since the Paris Agreement on Climate Change, successful case studies were established and agreements reached. International Literature, including the thematic areas of ITTO (once only established for timber) make it clear that in this new world of traded forest goods timber will be just one of many products. The challenge remains to make this happen in a way that ensures profits, provides benefits for the local communities as well as for the national states and the global community which is watching all that.

1.1.8 Forests and Climate Change

The role of forests and forestry in climate change is set to change forestry forever. It took hold of the world's development agenda in formerly almost unimaginable ways, but also promised for forests and forestry a reprieve they had never seen before. Now, for the first time in human history, the conservation of forests was not the brainchild of some western 'wildlife huggers' any longer but an urgent act of compelling self-interest. As it became clear in the progressive publication of IPCC reports, the retention and restoration of forests has emerged as the fastest, cheapest and most effective way to reduce GHG emissions. Once one could put a price on that, a mechanism could be established to derive financial benefits from the retention of forests.

Yet how to implement this vision and hope remains elusive. With deliberations (and much disagreement) around the process (Reducing Emissions from Deforestation and Forest Degradation, in short REDD) to make this happen now in their 11th year, and extended towards Sustainable Forest Management, Enhancement of Carbon Stocks and Biodiversity conservation (REDD+) ongoing, there is now, after the Paris Agreement during Paris COP 21, a mechanism in place, tested and improved during many years, which can revolutionise the role and payments from the environmental services forests provide. There is however still one major obstacle which remains. Whether it should be the markets to do this, or whether the rich countries, the causers of the problem, should pay for it. The United Nations Framework Convention on Climate Change (UNFCCC) so-called regulated market already has a mechanism called the Clean Development Mechanism (CDM) under the Kyoto Protocol implemented since the start of the First Commitment Period (Jan 2008 - Dec 2012) and in the Second Commitment Period (Jan 2013 – Dec 2020) whereby developed countries can off-set emissions amongst themselves through Joint Implementation (JI) or with developing countries using Afforestation/Reforestation (AR) and Forest Management activities with specific rules. Other smaller private markets operate outside of the UNFCCC, including the Voluntary Carbon Standards (VCS) market. The AR rules state that reforestation should be done on lands deforested before December 1989. Opportunities to undertake Afforestation and Reforestation under the CDM rules requires proper profiling of forest deforestation (e.g inventory of all logged areas) within each country, of particular

interest to PNG and Solomon Islands with a historical trend of logging operations and to some extent Fiji and Vanuatu.

1.1.9 Forestry's Millennium Challenge

For forestry it will be the millenniums challenge on how to incorporate payments for the climate services, once (if) that happens. The task to make that new portfolio fit into their conventional budget which was mostly around the production of timber is more formidable than most appreciate. There is also a lot of 'competition' for that new portfolio. For example in PNG, where a Climate Change & Development Authority (CCDA) with policy focus and virtually no technical field capacity, or forestry know-how, is set up to manage REDD+ as a lead government agency working closely with the PNG Forest Authority (PNGFA). The new forest departments, in order to rise to that enormous challenge, will need to be resourced, trained up, but also become part of national decision making in ways never envisaged before. While this might be considered a major headache by government organisations which are in most counties greatly under-resourced and stretched to their limits, it is probably more appropriate to see it as the biggest opportunity it ever had. The internal national forestry management arrangements of government have their own challenges and more than ever, very robust, comprehensive and effective national systems for forestry management will be required as a sound policy intervention into the future to protect, conserve and benefit from forests and the ecosystem services they provide to sustain the environment and communities.

1.1.10 The 'New MSG Forest Economy'

All of the above applies in particular to MSG countries, which are still rich in forests, in particular degraded ones (which could be 'profitably' restored once payments for such are in place), and are subjected to impacts of climate change as few other countries are. With an estimated ten million people depending fully or partly on forests in the Pacific MSG countries, these must provide a wide range of benefits with timber and timber products being only one of them. Current utilisation patterns are showing unsatisfactory and declining benefits in driving national development (e.g. Pauku, 2009 for the Solomon Islands, Filer et al., 2009 for PNG) and these benefits are not meeting community needs (let alone improving community livelihoods) and safeguarding fragile environments. They are also not set up to include and implement new portfolios around wildlife management (conservation of native species, restoration of endangered species, control of often exotic invasive species, utilisation of species which can be harvested yet are at times currently endangered (e.g. Flying Foxes, Native Pigeons, Coconut Carbs, Mudcrabs (etc.) and climate change.

Hence there is an urgent need to rethink the role of forests in the national economies and match them with a new vision of sustainability in the context of development of communities and livelihoods as a chosen theme and purpose of this study the '**New MSG Forest Economy**'. In this new economy, changes around the many goods and services these forests (must) provide for communities, for the good and for the bad, must be addressed. As forests degrade, and as is currently the case in the Solomon Islands (Pauku, 2009) where they have almost reached the end of their commercial exploitability (because of over exploitation, in the TOR this is called in the Solomon Islands 'race to the bottom') a great need arises to restore their old functions and to make them valuable again for future generations. This is realistic because as we know now from experience, many of these forests are, after having been logged in the past, regrown and are even being logged again. For this, visions must be developed to accommodate the new demands, for example in giving island nations special

resources to address the threat of climate change. Islands, especially small islands (Small Island Developing States, SIDS) already bear the brunt of this threat.

1.1.11 Living with a New World Order

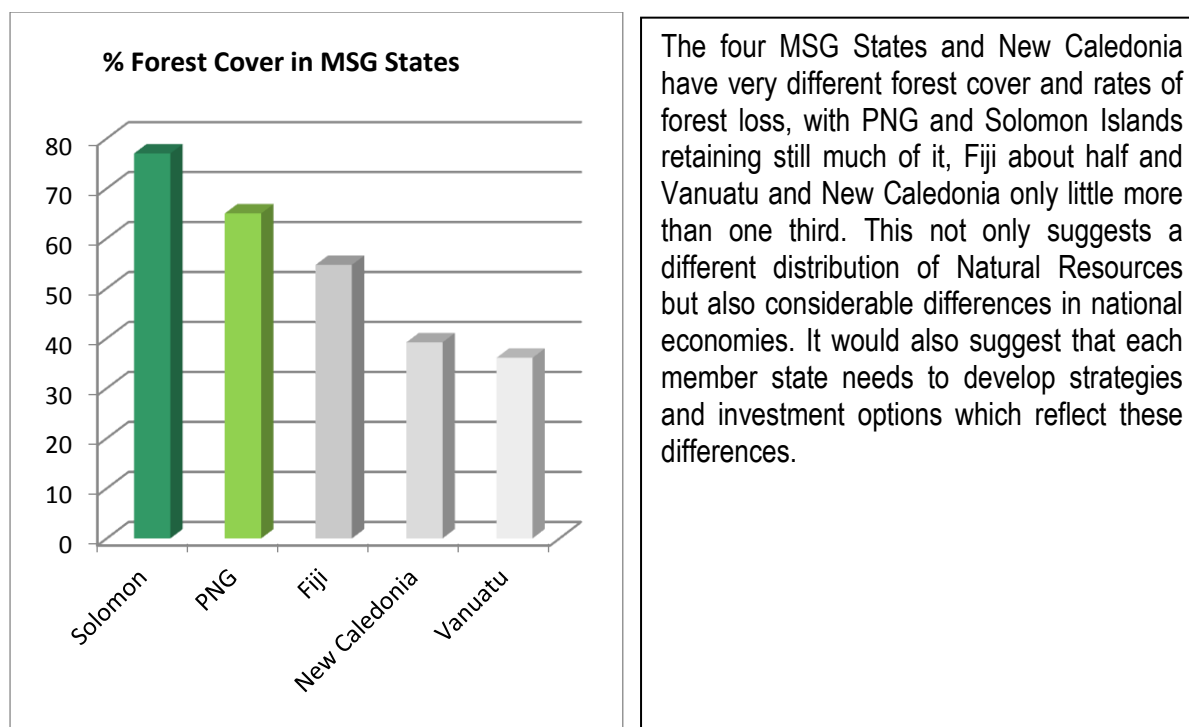
There are clearly positive changes MSG countries can expect in this new world order. The world has shrunk along with its forests and many foreign (Global) 'needs' now enter national sovereignties. While these bring a range of new responsibilities there are also more attention and financial resources directed to its states. While SIDS are most vulnerable to a changing climate with rising sea levels and ever more powerful cyclones threatening communities and their livelihoods from fisheries, forestry, agriculture and tourism, there is a growing range of opportunities to receive foreign support and investment in addressing these challenges. There are also new potential benefits from Payments for Environmental Services (PES), including REDD and REDD+, which can be VERY significant. Any economic forestry outlook which ignores this major shift, would lose and neglect the area where, in all likelihood, the major source of action and future income will lie. Perhaps, most importantly, within this new order it will have to be decided - and resolved - who is doing what. Should action be driven and guided by the growing power of INGO's which have so far been the main recipients from action, replacing government departments and working with communities. Or should the departments be resourced and supported in new ways - allow them to own the action.

1.1.12 The Multiple and holistic use of forests and forestry for sustainable development

Part of that shift in forestry will, so it is hoped, *'take advantage of value addition and new commercial opportunities in order to achieve sustainable growth and development opportunities and improve the living standards of the people'*. As experience from other countries shows, protection of forest estate can be a way to do this, but only if it is accompanied by efforts in community tourism development. Few countries have shown this foresight and for MSG states with their traditional ownership it is inappropriate to follow the western State-owned Protected Area Model.

In order to achieve sustainable growth and better standards of living for people in MSG states, there are new benefits from a range of products and services from their forests (they can realise if they start looking after them (manage sustainably), which are unprecedented in the history of humankind). These benefits can only be realised if states plan boldly and develop new ways of managing natural resources including forests. Only then can we meet the grave threats from a changing climate and only then can MSG states fully play their role in addressing them and receive the resources needed, and the benefits and payments that are possible. This is possible because of the current state of their forests. A look at their remaining forest resources shows however significant differences. From an economic point of view it suggests a resource differential within the MSG Trading Block which has been, as we will show in this report, insufficiently used. For example, we have learnt that most of New Caledonia's and increasingly Vanuatu's needs in softwood are met from NZ and Australian's cheap imports. This is despite the fact that MSG states have better domestic resources which cannot develop because of the imports. Timber is just one product where this applies.

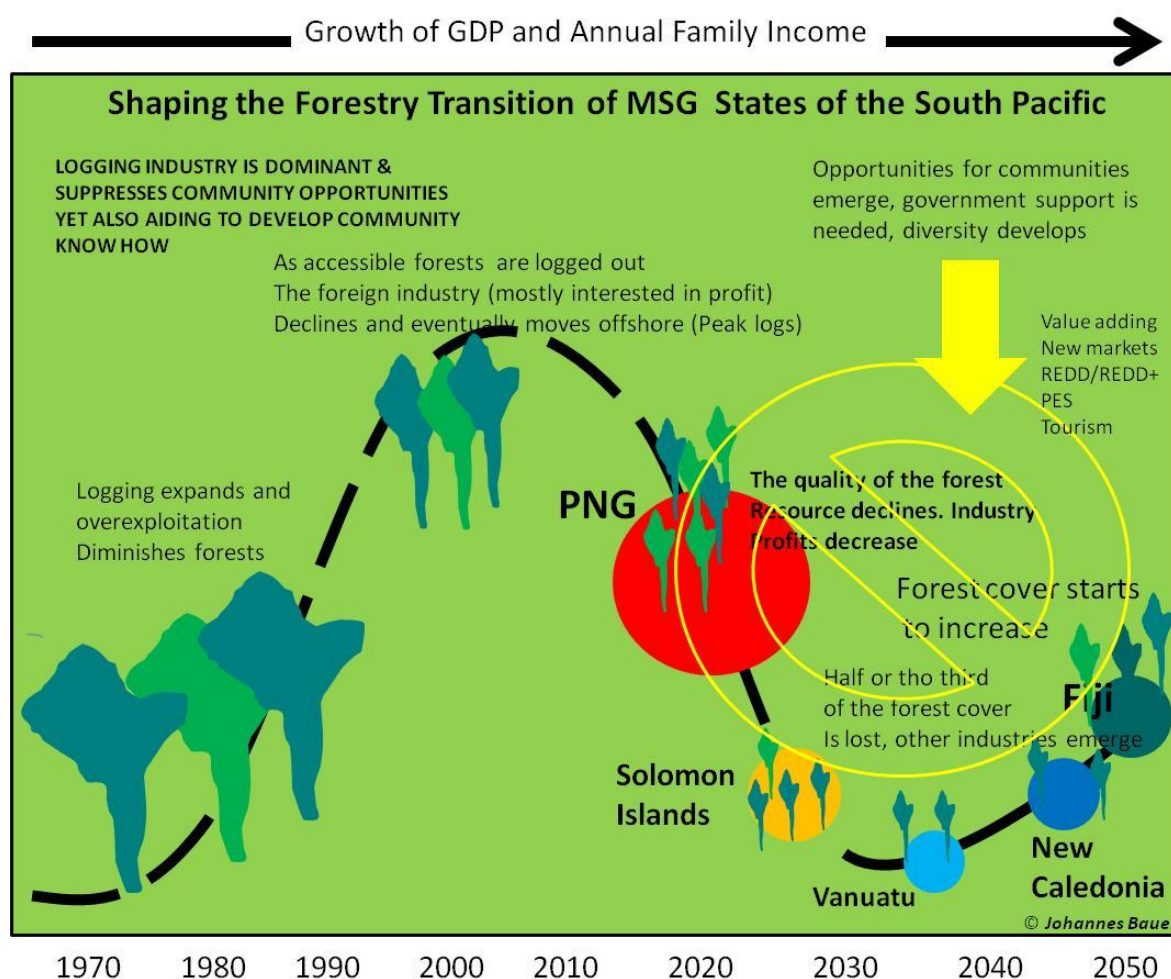
TABLE 2: FOREST COVER IN MELANESIA



1.2 The Forestry Transition Model in MSG as a Framework to understand Change and develop Visions

Looking at the current differences of forest cover, GDP and rate of forest loss in the MSG states, The Mathers (1992; Mathers & Needle, 1998) model of '*Forestry Transition*' will be used to embed the analysis and the drivers of change into a conceptual framework. To develop a strategy for each country it will be possible to use the transition trajectories of the other states to understand and predict the potential pathways and actions needed to choose between them.

FIGURE 2: FOREST TRANSITION MODEL IN MELANESIA



If we place MSG countries within a hypothetical framework of the status of its timber resources (e.g. forest coverage, (declining) timber export and quality and quantity of forest resources also for communities a cycle emerges which follows the ‘forest transition model’ of Mather (1992) and Mather & Needle (1998). It is suggested that this transitional continuum will be suitable to guide and understand comparative aspects.

1.2.1 Financing the transition

Economists will suggest that only the appropriate financial model will be able to drive the fundamental changes required. Sociologists will reply that only if that money manages to reach community action will this happen. We will agree with both, yet add, that they will only make sense and work, if they are applied within the ecological system, its potential yet also constraints. Financing the transition means safeguarding the future. In this, we have two fundamentally opposing models. There is one, what one could term ‘The *Nauru Syndrome*’, too close for comfort to MSG countries, and there is another, ‘*Norway’s Way*’, one could also call it ‘*Bhutan’s Middle Path*’, which has shown the way to the world in how (and WHO) to use precious and exhaustible/degradable resources and how to develop those by using what the west offers with the caution and confidence of the ones who know what their country needs.

CHAPTER 2: PACIFIC FORESTS AS A COMMON GOOD

2.1 The Invisible Forest

Firstly, his report focuses on ‘informal activities’ in the forestry in Melanesia, the forest, and the livelihoods-economies around it. While it is captured in national policies and legislations, it is accorded the least priority, as it cannot be measured adequately (e.g. FAO, Fiji Forest Profile). The desired outcome is to break from this economic tradition, as it brushes aside the importance and value forests contribute to the Melanesian communities and distorts the real contribution of the forestry sector to the MSG economies. Being part of the informal sector, forests play a crucially important role in providing and improving the livelihoods of over 10 million people in Melanesia. There is potential in enhancing the benefits and returns of the sector to improve the well-being and livelihoods of the people as 80% or so of them are intricately connected in many ways to their forested land.

Secondly, the purpose of this study is to use a comparative perspective where forestry is moving in the different countries of Melanesia. It aims to identify what is shaping its directions and it wants to find out whether there are opportunities after the Paris Agreement on Climate Change to adjust its pace and its direction. We have chosen to set the borders of this study within the framework of what has become known as ‘the forest transition model’. This natural space which nations, as they seek the better life, have tended to use, and at times greatly deplete, even destroy the forests. This model fits the island nations in Melanesia well and will help them describe and better understand the logic of the various pathways and trajectories. It will also help the MSG countries define crucial phases and find intervention points where trajectories might be changed and bettered.

For this to happen it needs to regain lost ground in a small - vast world of small island nations in the blue of the Pacific. In order to preserve this unique and precious island nations and livelihood systems, it will need to play a crucial role in seeking that legitimate ‘better life’. Recently these rural indigenous voices have started to dissent, with compelling reasons. These dissenting voices need to be heard in a world where the western conservation chorus, has increasingly shaped, and often ‘alienated’, the legitimate concerns and development aspirations of small minorities. Not necessarily to the better of wildlife and biodiversity which is best served by allowing people to remain part of the wilder world, using it, but also care for it.

It is hoped that this view from a MSG regional perspective can contribute to a joint vision of a sustainable and prosperous future for this precious and enchanted sub-region of a thousand islands and the largest total land mass and forest cover in the Pacific Islands.

2.2 Forests as Community Livelihood and Spirit world

There are a vast number of informal exchange and trade mechanisms around Melanesia’s hundreds of islands and even in PNG, some of those are still carried out (e.g. less than two hours drive from Port Moresby) as part of an informal bartering economy involving no money. Most of the products do not enter communities or nations but when they rarely persist and grow as goods which can be exported as they receive not enough support to develop the market knowledge, start up resources and continued support. Our case study from Vanuatu can demonstrate that.

2.2.1 Case Study 1: NTFP markets in Vanuatu: Mr A.’s NTFP export market

Mr A. might well be the prototype of the island trader who, throughout his life has worked hard to find NTFPs, nuts, oils, juices, sandalwood and so on, to export from Vanuatu. He is

innovative, cares for farmers, does his own research and, more often than not, faces a lot of challenges doing his family operated business. The most obvious reason is the fickleness of markets, of Western, Chinese tastes and demands and lack of information for effective planning. Some 20 years ago, he had big plans for Sandalwood derived from Santo's west coast. However, difficulties with transport, landowner expectations and so on did not make that work. He is currently investing in the growing Black Bean market he sees as an opportunity. Assistance from the government in the understanding of trade trends and markets are critical issues to be addressed to support the NFTP industry.

Mr. Aman has tried it all and has rarely given up producing various NFTPs. He has recently started producing Black Pepper again, after unsuccessfully trying to export it, 20 years ago. He still smiles, is passionate about research into new products, the exploration of new markets and supporting the community of farmers in particular. He is also very frustrated as, no matter how many times he says he talks with government, his good ideas were not listened to and while there is so much land and landowners who want to derive income from it, there is just no cooperation, funding and opportunity to get it going. Working out how best to grow and process things all by himself is a heady task for a small producer.

A bit of support in research and also on markets, and more collaboration would go a long way to improve the situation. There are currently so many new products, like Noni for example but also Black Beans that it will be just so important to get going before others do.

The noni fruit is just one of many. Another is the Tanava fruit with its cream. Mr A. is working on them also, also on Black Bean which is developing into an interesting garden market plant. The plant which really shows however just how high such unexplored market potential are, are the nut trees. An ACIAR study on Solomon nuts shows its rather staggering potential of an annual income of AUD 45 million just from collecting nuts from the wild. Such potential, in terms of community income and industry, would dwarf the current 'benefits' from round logs.

FIGURE 3: THE PICTURES BELOW SHOW MR. A.'s NFTP BUSINESS (LEFT TO RIGHT BLACK BEAN BEING PREPARED FOR EXPORT TO NEW ZEALAND; AND PROCESSING OF TAMANU SEEDS)



FIGURE 4: THE PICTURES BELOW SHOW THE INSIDE OF MR AMAN’S PACKAGING SHED



2.2.2 Case Study 2: Research on Indigenous Nut trees in the Solomon Islands

Indigenous nut trees, growing on many hundred thousands of hectares in Solomon’s rainforests, might well be an agricultural product with a big future. It could be exploited by further efforts in domestication or, it could be just collected in the natural forests as people do now. Perhaps both. Evans (1996) has studied the potential of that nut in detail. It remains to be realised.

Indigenous nuts are an integral part of the complex arboricultural, agricultural and sociobiological systems that have evolved to suit the diverse biophysical conditions of the south Pacific Islands. Selection, conservation, cultivation and exchange of superior cultivars over thousands of years by Pacific Islanders has produced a wide range of indigenous nut morphotypes, a unique wealth of ethnobotanical knowledge, and strong cultural and spiritual affinities with the crops. Despite the introduction of exotics and a corresponding change in diets, indigenous nuts remain a seasonally important part of rural people’s diet. (Evans et al 1996)

TABLE 3: LIST OF INDIGENOUS NUT TREES IN MSG COUNTRIES

Scientific name	English Name
Canarium indicum	Canarium nut
Ngali salomonese	Canarium nut
Adoa ngali harveyi	Canarium nut
Santa Cruz	
Barringtonia procera	Cutnut
Cutnut edulis	
Cutnut novae-hiberniae	
Terminalia catappa	Bush Cutnut
Alite kaernbachii	Sea almond Sea almond
Inocarpus fagifer	Bush alite
	Tahitian Chestnut

As well as being important in the domestic economy, indigenous nut trees have considerable potential as an export crop, despite the fact that government projects to commercialise indigenous nut production have been largely unsuccessful so far. Some Pacific Island countries (PICs) have become interested in emulating the successful Hawaiian and Australian macadamia industries. However, the development of a macadamia industry in SI is not recommended. A small new industry would be at a distinct disadvantage against large,

established industries in Hawaii, Australia and South Africa. Moreover, macadamia nuts are not suited to locations that are cyclone prone. It would be better to devote resources to unique indigenous nuts than to invest in an already well-known Australian forest nut. Macadamia nuts have now made the transition from a niche product that is always in short supply to a commodity with more of the characteristics of cashews and almonds.

Evans (1996) estimated that in 1995 the volume of ngali produced annually in SI was 45 000 tonnes of nut-in-shell (NIS). If just 25% of this quantity were harvested and had a farm gate value of \$4/kg, it would represent an industry valued at \$45 million. The export value of the oil palm industry at its peak was \$94 million

Another product of the Pacific which is currently taking off is the Noni tree which can be mixed readily with other (tree) crops.

2.2.3 Case Study 3: Noni (*morinda citrifolia*)

Noni is used throughout the Pacific Islands, where it grows wild. It is used as a traditional herbal medicine for a whole range of ailments. In recent years, noni products, particularly noni juice, have become popular in Western countries. A market boom has led to a proliferation of noni enterprises in many PICs, including, recently, SI. At least three commercial noni enterprises have been established in SI. The most substantial of these is Solomon Morinda Pty Ltd. This company has invested several million dollars in plant that processes green noni fruit and is targeting the Korean and Japanese markets. At the moment Noni Extract (10:1) Powder (*morinda citrifolia*) - For Weight Loss, Energy Boost AU \$9.98 to AU \$48.45.

FIGURE 5 PICTURE SHOWING NONI FRUITS AND BOTTLED NONI JUICE AFTER BEING PROCESSED.



The Noni plant from Tahiti is getting more and more sought for its medicinal properties as diabetes and high blood pressure medicine.

2.2.4 Case Study 4: Black Bean Tree, Moreton Bay Chestnut (*castanospermum austral*)

FIGURE 6 BLACK BEAN



- A rainforest tree from Queensland growing in rich soil at riverbanks
- Tree, up to 35 m high with trunk up to 1.5 m diameter
- The valuable timber is hard, dark brown and ideal for cabinet making
- Sought after for parks, garden and specimen trees
- Leaves, seed and bark can be toxic to humans and livestock
- The immature seed is poisonous, though mature seeds are edible.
- Australian aborigines finely sliced the seeds and soaked them in running water for 10 days before roasting them and grinding them into a powder. This powder could be stored for later use
- It fixes nitrogen and improves soil
- The seed yields compounds called castanospermine that are under investigation as HIV inhibitors and might be useful in the treatment of AIDS
- After more research this plant may be useful in treating cancer
- It is also grown in Vanuatu
- An attractive pot plant of growing reputation
- A 'new' export product from Vanuatu for the Australian and US Pot plant market

As we can see from this list many trees are more than 'just' timber. The trader Aman & Son from Santo in Vanuatu, after investigating – and having problems- with supplies and quality (cracking) of seeds he obtains from producers has now collected a good quantity to export this year. As usual, a promising yet unknown and fickle, therefore risky market, which would need to be better investigated and supported. With its known and potential uses it is a tree worth watching and carefully investing in.

Many reports on NTFPs have started to shy away from animals as harvest issues are often unpalatable to the western 'consumers' which are, INGO's will not forget, behind much of their funding. For this reason there is little written about Flying Foxes, a delicacy in Vanuatu and Kanaks, in fact throughout the Pacific (and a conservation problem), while, over in Australia the Department of Primary Industries distributes flyers on how to destroy flying Fox pests. Many issues of animal harvest are connected to conservation and harvest related decline (see Turtle Moratorium in Fiji, harvest issues of pigeons). As there are however wildlife harvest issues connected with those (e.g. mud crabs and coconut crabs), a better understanding of that would be essential. Here we have only chosen the example of mud crabs in New Caledonia which show yet another NTFP whose importance as food and cash sale item is poorly appreciated, even in New Caledonia where Kanak-French scientists have carried out some very revealing studies.

2.2.5 Case Study 5: Mangrove Forest Management and Mud crab harvest in New Caledonia

Mud crabs (*Scylla serrate*) are large, crabs from the Family Portunidae associated, in fact, depending with/on mangrove ecosystems throughout the Indo-Pacific region. There, they usually are the basis of small- to moderate-scale coastal fisheries which, needing minimal

equipment, support many thousand, often poor households (Bonine et al., 2008; Brown, 1993; Lee, 1991). The wild catch of *S. serrata* has continuously increased for the last decades through growing consumer demand especially from Asia. Annual estimates grew from 8000 ton/annum during the 80s to ~30,000 ton/annum since 2005 (FAO, 2007). A combination of commercial pressure and significant loss of mangrove habitats has raised serious concerns about the preservation of this resource.

FIGURE 7 MANGROVE TREES ARE GOOD FISHING GROUNDS AND HABITAT FOR MUD CRAB (*SCYLLA SERRATA*)



Mud crab (*Scylla serrata*) fishing as a major Mangrove-based industry

Reduced catch rates and crab sizes, observed in many areas signal lack of sustainability and therefore many traditional fisheries face sustainability issues. According to Ladra and Lin, 1991; Macintosh et al., 1993; Sivasubramaniam and Angell, 1991 this is of particular importance in small Pacific countries where they may represent major sources of cash for local communities. In many countries across the South Pacific, lack of fisheries and local ecological data make mud crab resource assessment and management very difficult (Brown, 1993; Hay et al., 2005), however there is also a recent study by Dumas et. al. which shows that traditional systems can manage that resource well, once mangroves are protected and user rights outlined. In this way, the protection of mangroves are not only essential to protect coast lines from weather events but also to safeguard the livelihoods of many people, including the very poor in MSG countries.

Mud Crab Fishing in the Mangroves of New Caledonia

In New Caledonia, according to Dumas et. al. (2012) small-scale mud crab fishery has been poorly studied until recent years. Although hundreds of households are involved over the 259 km² extent of mangrove forests (Marchand and Dumas, 2008), only punctual, anecdotic catch data were generally recorded from non-professional fishers. Relevant information about the spatial and temporal dynamics of mud crab populations is urgently needed to address emerging management issues: annual landings are likely to reach 400 to 500 t at the country scale given unpublished data available from local surveys, corresponding to an overall fishing pressure of 1.5 to 2 t km⁻² year⁻¹. Anapa from New Caledonia tells us the story of his mother who, after the death of her husband has found a good and reliable income source from the mud crabs she collects in the mangrove forests next to her house close to the beach.

FIGURE 8 MANGROVE ESTUARY AS HABITAT FOR MUD CRABS WHICH IS IMPORTANT IN SUSTAINING INDIGENOUS LIVELIHOODS



Mud crabs and coconut crabs, are only two, forest/tree dependant prime tourism resource for which sustainable management (and higher yield) schemes need to be developed to sustain increased pressure (and opportunity) from opening up island economies.

CHAPTER 3: FORESTS AS AN ECONOMIC RESOURCE FOR FOREIGN INDUSTRY

3.1 The Changing Timber Production and Timber trade in Melanesia

3.1.1 Changing Raw Material Sources

According to ITC 2002 *Tropical timber products Development of further processing in ITTO producer countries*. UNCTAD/ITTO, the production level of large-sized logs from natural forests of the Timber

producer member continue to decline most rapidly in the primary and industries have their

technologies and Increasingly, logs produced on fast- (rubberwood, eucalyptus, teak, and Thailand have

The Government of Fiji through the Ministry of Fisheries and Forests has taken measures to maximize tax revenues from forestry resource utilization e.g., supporting efficient forest based trust for production and marketing of products for local and overseas markets and promoting small and medium scale investment in diverse forest based industries and enterprises.

International Tropical Organization (ITTO) countries is expected to over the coming years, Asia-Pacific region. The further processing already started to adapt manufacturing methods, designs accordingly. of smaller dimensions growing plantations gmelina, acacia, etc.) will be used. Malaysia already demonstrated the

potential for such plantation wood by producing 80% of their furniture exports in rubberwood. In the Latin America-Caribbean region, Brazil is making progress towards establishing eucalyptus as an environmentally benign material for solid wood furniture and joinery products. Where end-use specifications allow, plantation-grown teak is partly replacing teak supplies from natural forests, which are becoming increasingly scarce in the key Asian producer country, Myanmar. While the international tropical timber trade tends to concentrate on a limited number of well-known species, in marketing manufactured wood products there are other elements, such as technical specifications and aesthetic appearance, that come into play, and which are not necessarily species-related. A well-known species may bring a 'plus' to a product, but it may not be a sine qua non of additional processed products. **Future expansion of the further processing and related trades cannot come from increased logging alone; it has also to be derived from adding value to the gradually diminishing volumes harvested from natural forests, which are more and more being brought under sustainable management systems.** Further processing will create opportunities for new applications of the lesser-used species. However, for these to be fully exploited, **there will need to be significant shifts in market acceptance and established trade flows, both of which appear unlikely to happen unless there is a concerted effort by the industry.** Reconstituted wood, whether in the form of wood-based panels or laminated solid wood products, will be used in increasing volumes to make up for the dwindling supplies of tropical logs from natural forests. Greater use, for example, will be made of new bio-composite board manufactured from oil palm residues, coconut shell or flattened bamboo. Various combinations of wood, bamboo, rattan and other fibrous plants with metal frames have already been used to good effect in the Philippines, and achieved some commercial success. Imported woods, mainly North American hardwoods, are also now partially replacing tropical timbers in further processing in the Asia-Pacific region.

3.1.2 Building a Timber Champion in the region.

The future target for the timber industries in producing/exporting countries and for conservation is to replace the quantity of round logs for export with high quality and valuable processed timber and build a positive timber champion both regionally and internationally. Eventually, once this transition is achieved in future, timber quality will drive demand, as a result of better quality timber for projects and having a wide range of products that meet market requirements. This positive spin-off will be realised in increased revenue and employment, potentially ensuring resource availability for promoting forest sustainability and stability and that conservation values of forests remain high. If biodiversity and wildlife are carefully managed in the production of forests a forest system can be developed which is potentially richer than the old one, can be manipulated for the needs of particular species (which can be endangered or which might be important wildlife harvest species).

If we look at PNG and Vanuatu and compare the figures with their aspirations (to phase out round timber production over the next five years), it does not look very encouraging. All three processed forms (sawn, veneer, ply) had a slow start some 25 years ago and have after a very modest peak 10 years ago, all but fizzled out. The trends are similar in Fiji, where, despite of the development of more than 100 000 ha of softwood and hardwood plantations, some 20,000 ha of softwood at harvest age, plantations, failed to become viable export industries. The reasons for that may be the market conditions, competition or simply the industry at home. Most recently they have not even been able to compete on domestic markets due to supply problems with own produce as saw millers claimed which made them look for round logs from NZ.

3.2 The Timber Trade in PNG

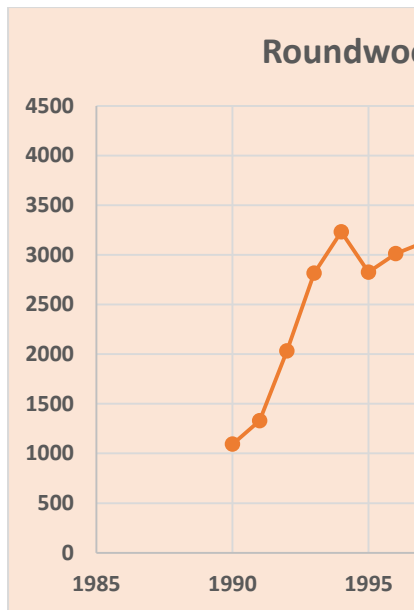
Over the past years, PNG has become the world's largest exporter of industrial round logs. This high export of timber, in 2015 was 3.9 million cubic meter of round logs was produced by PNG's natural forests

FIGURE 9 PAPUA NEW GUINEA'S EXPORT OF ROUND WOOD

FIJI

Policies, legislations and revenue:

- 2013 Forest Harvesting Code of Practice 2013
 - 2007 Forest Policy Statement
 - 1992 Forest Decree
 - 1990 Fiji Preservative Treatment Regulation
 - 1975 Forest Guard Regulation
 - 1968 Fiji Sawmills Regulation
- Fiji Revenue and Customs Authority (FRCA) collects around 86% of total government revenue. In 2014, it surpassed the \$2 billion mark, collecting a total revenue of around \$2.115 b which is a 13.7% growth compared to 2013. The 2015 tax revenue target stands at \$2.4b, an increase of 13.8% compared to the 2014 revenue collection (Source: Fiji Revenue and Customs Authority)



Source: ITTO ANNUAL REVIEW
STATISTICS DATABASE
[www.itto.int/annual_review-
output/](http://www.itto.int/annual_review-output/)

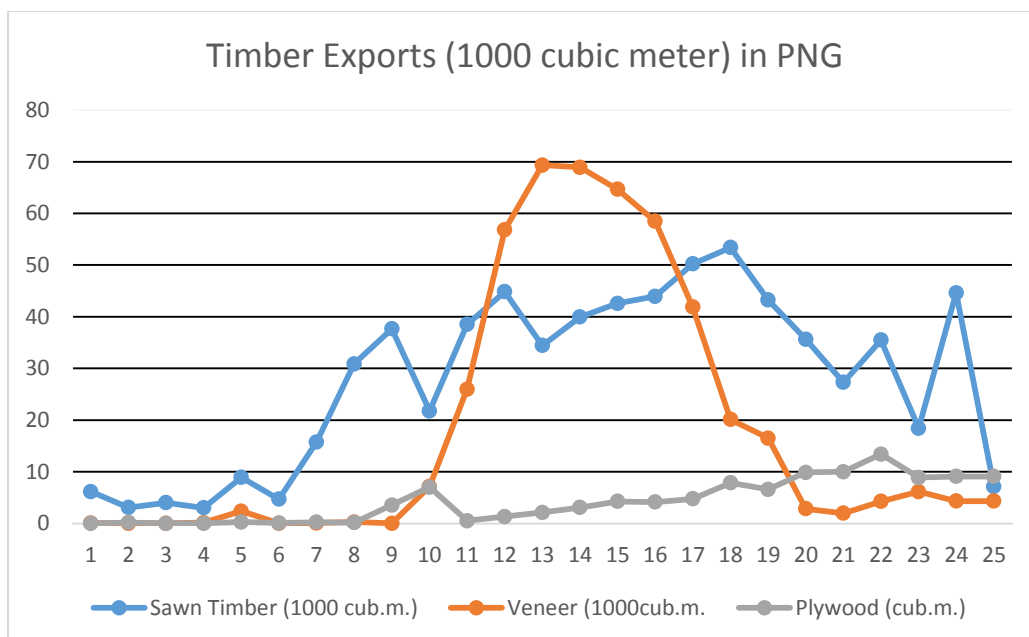
Unlike in the Solomon Islands where the export of 2.2 million cubic meter exceeds the estimate of sustainable harvest (250,000 cubic meter) nine-fold, this is not the case in PNG where PNGFA estimates sustainable yield around 3.4 million cubic meter of timber. According to PNGFA (p. comm.) timber harvested exceeds the annual production due to agricultural lease conversions.

PNG: a snap shot

- 2014, the government issued 10 million hectares of logging concessions.
- 2014, 3.8 million cubic meters of timber was exported.
- In addition to revenues derived from its general income tax regime, government currently receives approximately 34 percent of gross receipts from the sale of logs by way of the Log Export Tax. Average government receipts continue to increase. They were around 10 percent in the 1980's and 20 percent in the early 1990's.
- PNG Forest Authority (PNGFA) contributes more than K300 million of taxes to the internal revenue.
- Landowners received up to more than K100 million in terms of royalties from operators and investors in the logging industry.
- Benefits of royalty, premium and annual benefits provided directly to land owners total approximately 15% of the gross receipts from the sale of logs.

(Source: <http://www.redd-monitor.org>)

FIGURE 10 TIMBER EXPORTS FROM PNG IN 1000 CUBIC METER



Source:
REVIEW
DATABASE

ITTO ANNUAL
STATISTICS

MANDERO TIMBER (ARUA NAFUKI)

A LOCALLY OWNED BY A YOUNG NI-VANUATU, MR NAFUKI SOURCES HIS TIMBER LOCALLY. IT WAS ESTABLISHED AFTER TC PAM IN 2015 TO MILL TREES FELLED BY THE TC. HE IS BEGINNING TO WORK WITH OTHER SMALL SCALE MILLERS TO SET UP A FORESTRY COOPERATIVE AIMING AT PRODUCING TIMBER FOR BOTH LOCAL AND EXPORT MARKETS IN AUSTRALIA AND NEW ZEALAND. THE FOLLOWING TREE SPECIES (WITH LOCAL NAMES) HAVE BEEN SAWN FOR TIMBER, PRODUCTION COMPOSITION AND PRICE PER CUBIC METER: WILD NAKAVIKA (30%) VT65, 000, WHITE WOOD (10%) VT45, 000, MELEK TREE (10%) VT30, 000, KOYU (20%) VT145, 000, NAKATAMBOL (20%) VT70, 000 AND ROSE WOOD (10%) VT90, 000.

www.itto.int/annual_review-output/t

3.3 Forests as a Formal and Domestic Economic Resource

The development of the forests of Melanesia into an economic timber resource has been shaped by a colonial phase under the British and French, the proximity of two British colonies, Australia and New Zealand, each with its own important timber industry which had been in decline due to over-exploitation, and the drive for independence and self-determination between 1970 and 1980. As independence for Fiji (1970), PNG (1975), Solomon Islands (1978) and Vanuatu (1980) coincided with a phase of rapid development in Asia and in particular in Japan, followed by Malaysia, each of the nations with its easily accessible timber wealth proved irresistible targets for expanding logging companies from both nations. Always on the look-out for new timber rich countries, once old destinations had become over-exploited, Japan and Malaysia rapidly moved into the easily accessible island world (except in New Caledonia whose primary forests had been overexploited when it was a French prison colony and whose political status prevented Asian logging companies to enter as easily as in the newly independent nations) where timber was easily accessible from it along coastlines (many islands in particular PNG and the Solomon Islands are very long and narrow, making them easily accessible from ships).

Fiji and Vanuatu's decline of natural old growth forest led to the expulsion of timber companies, while Solomon Island and in particular PNG with their comparatively much

larger resources lasted longer and have become two of the most important timber exporting nations in the world.

3.3.1 Value added Timber Products

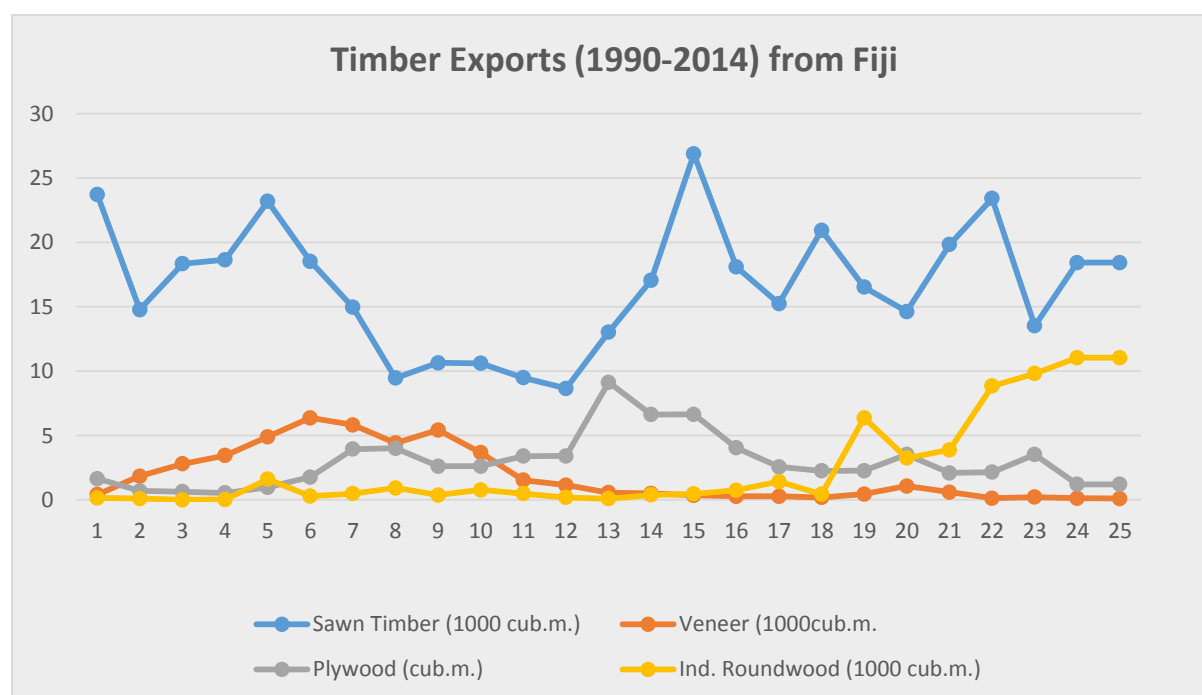
Currently, a differentiation of products is taking place as illustrated in case studies included in this report, many with successful attempts of value added timber exports, to promising new timber markets, interestingly from the agricultural sector (sandalwood, agar wood, coconut wood and rubber wood), also a drive to develop plantation timber industries in all states.

With the role and potential of state forestry to expand into the mostly customary owned land , and its facilitating role for foreign logging companies which has either ended or are in decline, forest departments are growing into this new portfolio. It will be shaped by the new opportunities from the agricultural sectors, the growing plantation momentum as part of Climate Change Mitigation and a growing movement around the world to (re) develop an approach to forestry which is less driven by large multi-national corporates but by an increasingly forestry-savvy community of landowners supported by the State.

3.4 Timber and Timber markets from Fiji

Evaluating the timber export industry in Fiji over the past 25 years we can see that the export of sawn timber, already high 20 years ago, has picked up again, this time from plantation timber and, less positively, an increasing amount of that is being exported as round-logs again. In Fiji, the development of a veneer and plywood industry for the last 25 years was also not successful.

FIGURE 11 FIJI TIMBER EXPORTS PRODUCTS BETWEEN 1990 AND 2014



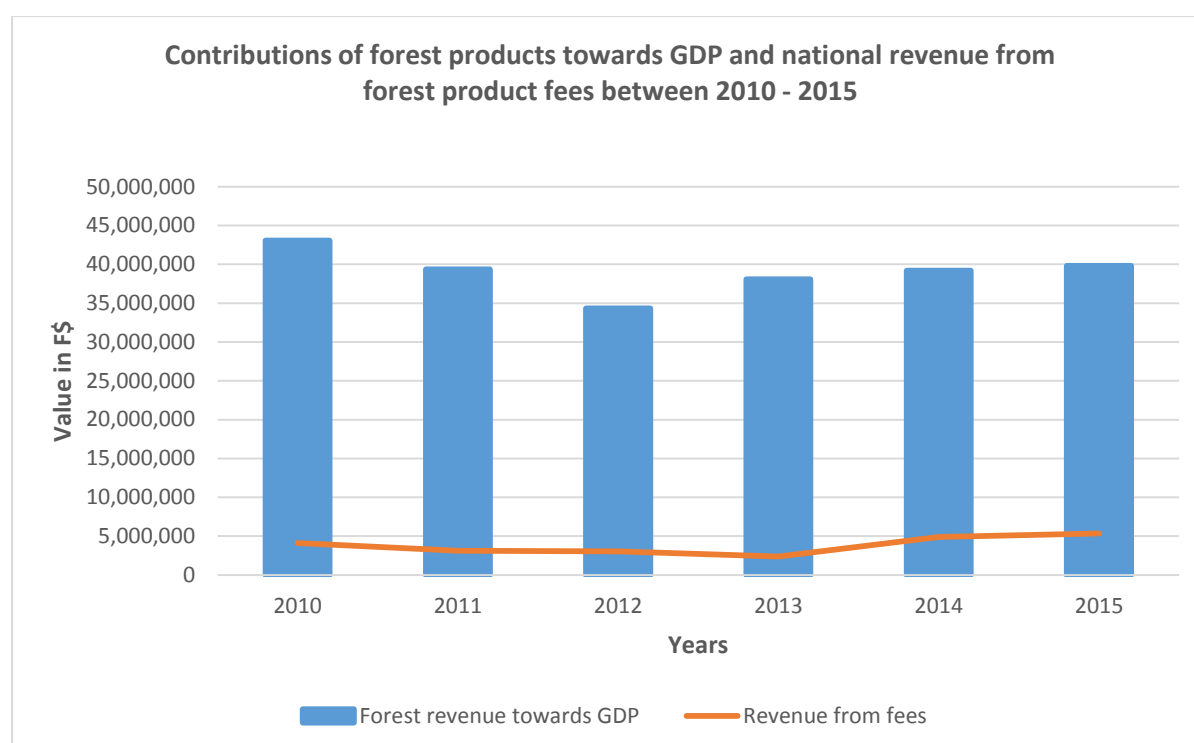
3.5 Domestic Timber Consumption and Internal MSG Timber Market

3.5.1 Case Study 7: Timber Market Collapse in Fiji

All MSG member states can still be considered timber rich, with a relatively high amount of natural forest available to meet hardwood timber needs and a good number of softwood plantations growing aimed at providing export revenue and meeting more modern domestic

demands. Therefore, it makes sense to ensure that domestic demand could potentially be met as well from its own sources and if not, with the existence of MSG member states as a trading bloc through its Free Trade Agreement (FTA), to source timber from other members. This also makes sense as it reduces the expensive transport footprint of timber. The recent (2014) collapse of the domestic pine market (*P. caribbea*) in Fiji is an example that developing a plantation system and timber factories is not enough. It has to be matched by the development of infrastructure and sourcing system within the landholder community to meet a continuous supply.

FIGURE 12 CONTRIBUTIONS OF FOREST PRODUCT REVENUE TOWARDS FIJI'S NATIONAL GDP AND REVENUE BETWEEN 2010-2015.



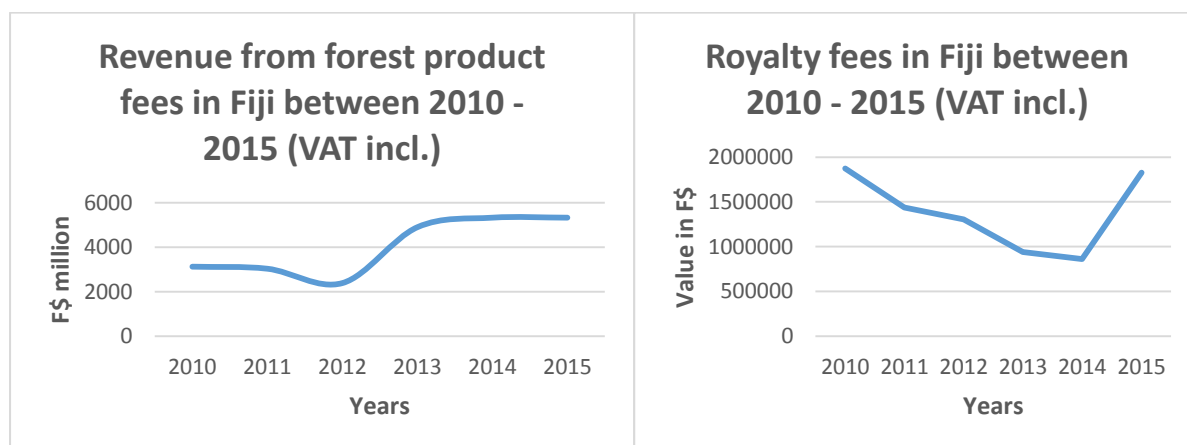
Source: Ministry of Economy, Economic & Fiscal Update & FBIOS and Ministry of Fisheries and Forest of Fiji

From Figure 12 above, the forest sector's contribution towards Fiji's GDP has declined more than F\$3.2 million which represents 7.6 percent between 2010 and 2015. On the other hand, revenue collected from fees (e.g. licence fees) have increased over 29 percent in the same period from F\$4,124,630 to F\$5,327,600.

According to the Fiji Times (2014) **Market collapse** (by Ropate Valemei) "*ONE of the biggest challenges for Future Forests (Fiji) Ltd has been the market collapse of the pine industry in the past financial year. And according to the company's 2014 annual report, this was because government had allowed pine lumber to be imported from New Zealand (for milling operations). It said the hardware and timber retailers argued to government that a consistent supply of construction timber for the Fijian domestic market was not forthcoming from domestic suppliers.*" *The introduction of New Zealand lumber in May 2014 flooded the market to a point that the company lost all buyers for its pine timbers. Such an event may be considered ill-timed.*" This event had far reaching impacts on the company's cash flows and plantations development." The report continued that '*there was a slowdown*

in pine consumption prior to the national election in September 2014, which [also] impacted on the market. It said the seedling nursery performed well, yet its impacts were also experienced where major replanting program had been delayed because of inter-government processes and delays. While market forces and extenuating circumstances affected other departments within the company, the plantation estate was managed and maintained”.

FIGURE 13 FOREST PRODUCTS REVENUE AND ROYALTY FEES IN FIJI 2010-2015

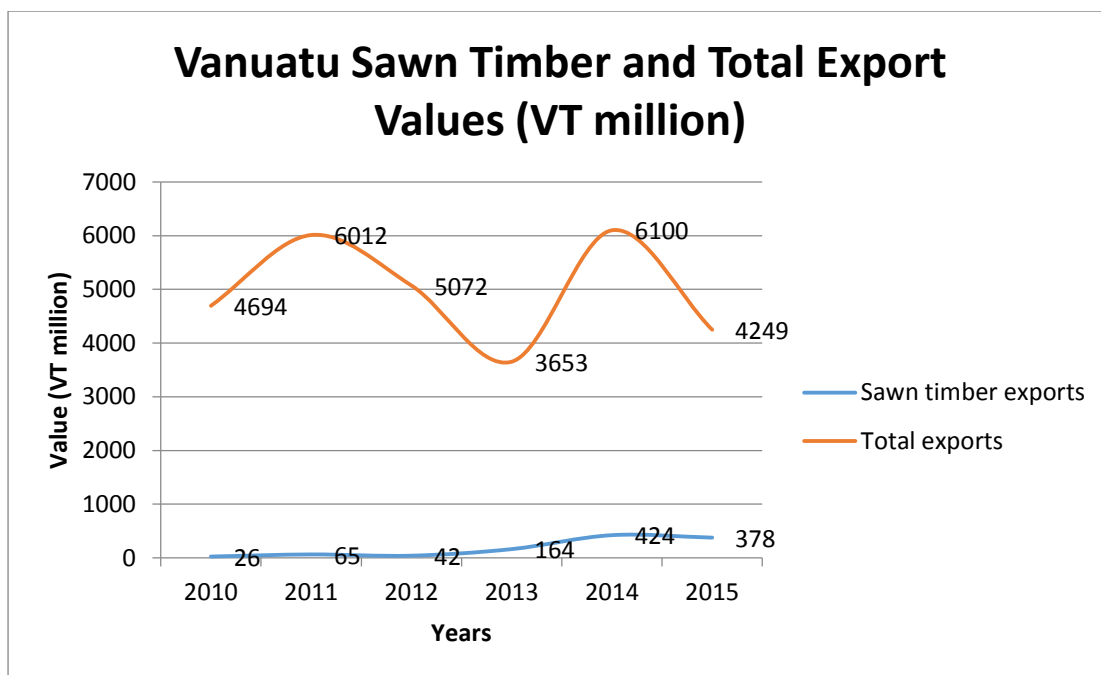


Source: Ministry of Economy, Economic & Fiscal Update & FBIOS and Ministry of Forest, Fiji

Despite an increase in forest revenue fees between the five years (2010 – 2015), fees from royalties saw a decline of about 2.5 percent in the same period.

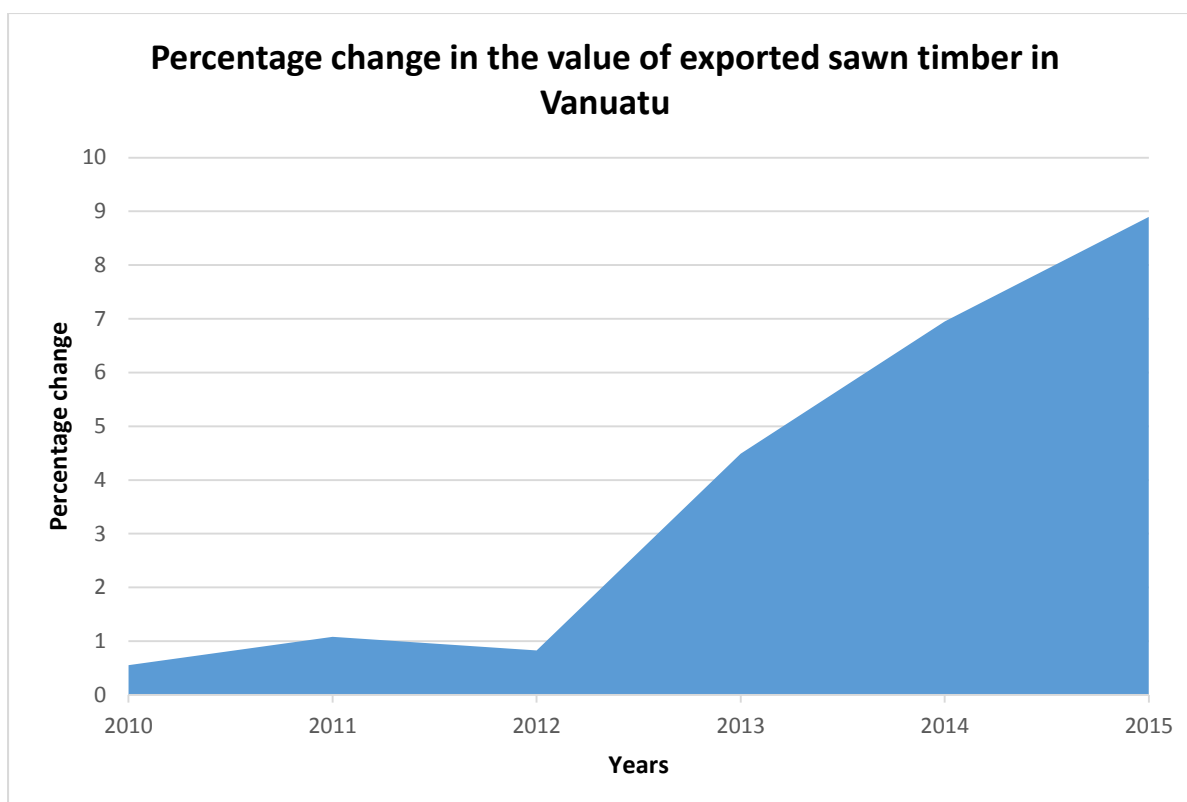
However, replacing these imports with a local supply faces a number of challenges. First, **timber production and supply to the local and national market is dominated by small sawmills which source their timber from landowners, often small holders, who are often unable to meet the exact quality standards, credit demands and services** required from the tourist industry in resort building such as house construction, inside joinery, and an increasing urban market). However, with adequate support from governments, and working in groups, one of the best long term solution could be the setting up of producers' cooperatives that could better meet these demands. The development of the Techno-Bois Deco joinery and cabinet making workshop in Vanuatu with more than 30 trained employees doing wood joinery and construction design for both markets in Vanuatu and New Caledonia is an example that this is possible.

FIGURE 14 SAWN TIMBER AND TOTAL EXPORT (VT MILLION)



Source: Vanuatu National Statistics Office

Vanuatu has seen fluctuations in its overall exports between 2010 and 2015. The impact of natural events is evident with the worst hit periods in 2013 and 2015 as the country was hit by tropical cyclones Lusi and Pam respectively which severely damaged infrastructure and cash crops such as coconuts and cocoa. Figure 14 shows however also that the exports of sawn timber have steadily increased during the same period, supported by cyclone felled trees which could be rescued. This shows that unlike other agricultural crops, felled trees from tropical cyclones can still be milled and utilised as timber for construction and exported, making them an important tool (if prepared) to overcome cyclone impacts economically.



Source: Vanuatu National Statistics Office

3.5.2 Case Study 8: Bois (wood)

It is important to look at government regulations when exploring the range of quantitative and qualitative data surrounding timber trade, substitution and the ease of new timber products entering the local markets and competing with locally produced timber products. For example in Vanuatu where new rules about the use of timber in government buildings has greatly affected the domestic whitewood industry, as it has standards in place which insure that NZ *Pinus radiata* is now the species to be used in the construction industry. This clearly works against the viability of the domestic whitewood industry and prevents its development.

It will be crucially important to identify the critical factors that need to be addressed by policy makers if domestic producers are going to be able to supply the growing urban and tourist markets. Domestic timber consumption in Melanesia is driven mostly by demand in the construction industry in urban centres. Other factors influencing demand include:

1. The availability of domestically supplied timber;
2. Ease of continuous sourcing of own timber;
3. Price differentiation between domestic and overseas timber ;
4. Demand mostly in the construction industry;
5. Trade rules and arrangements; and
6. Other regulations which affect the above.

TABLE 4 DOMESTIC DEMAND AND SOURCES OF TIMBER IMPORTS*

MSG Country	Domestic Demand	Own Production	Import	Origin	Type	MSG Import	Issues
Fiji		Far in excess	Too much	NZ	P. radiata	Some hardwood	Poorly developed timber sourcing
New Caledonia	17 000	3 000	14 000	NZ	P. radiata	M (F)	Outcompetes own P.

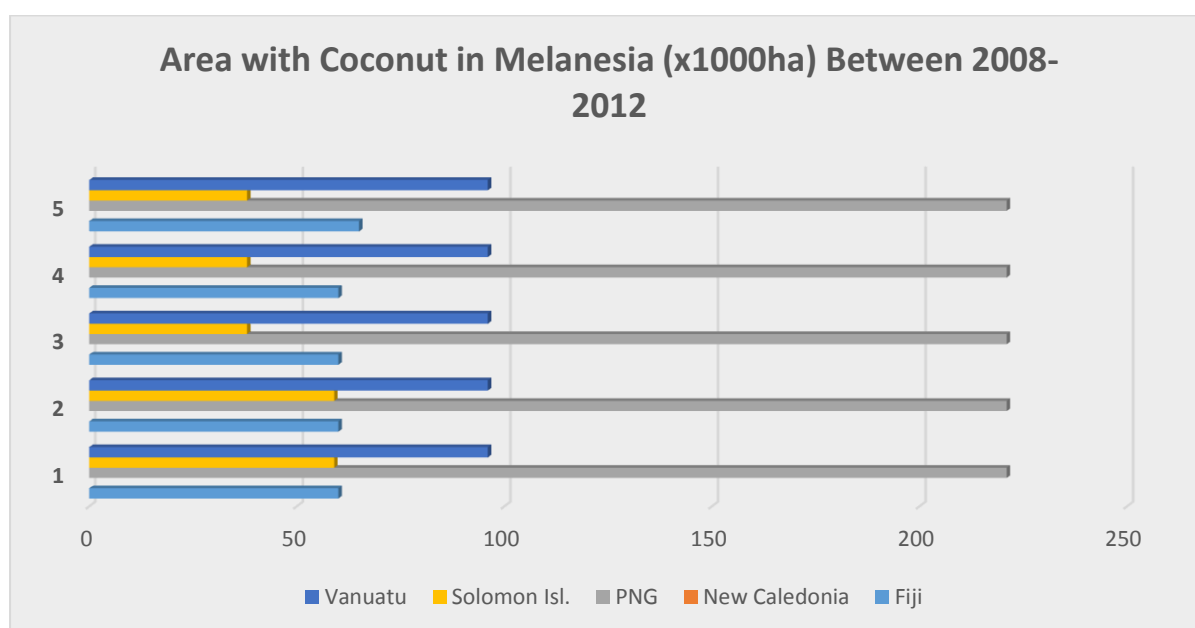
			Hardwood	PNG-MSG		K(V) HW (PNG)	caribea
PNG	60-70 000	most					
Solomon Isl.							
Vanuatu		Sufficient Hardwood Surplus whitewood		NZ,A,	P. radiata		
TOTAL							

* Figures will be upgraded as soon as new estimates can be sourced.

3.6 Cocowood as a regional new product

Coconut Plantations, while formally part of the agricultural sector are now recognised as an undervalued resource of a high quality timber. There is a complementarity between the nuts and the timber, which is maximised as they work at different product cycles. The former are produced up until 50- 60 years of age, while from then on the timber value takes over. As there is a current need to rejuvenite a large cohort of overaged cocopalms with young trees, there is the potential for a bumper harvest which needs to be prepared for. For this, forestry with its skills and ways of looking at things are perfectly placed to collaborate with agriculture. In Melanesian culture this is easier than in many other places as both or integrated at the village level. It is the government level which needs to ADJUST.

FIGURE 15 TOTAL LAND AREA WITH COCONUT TREES IN MELANESIA BETWEEN 2008 AND 2012



It is fortunate that such an effort would be supported by current market conditions. There is a growing market for senile coconut palms for timber, particularly for manufacturing high quality furniture. A Fiji-based company, Pacific Green (PG), has led the development of high-value upmarket furniture. There are also encouraging signs that this market expands. Over the period 1997–2000, **some 93 000 senile trees were logged at a farm value of about F\$200 000** (Canadian International Development Agency (CIDA) Annual Report 2001).

The manufacture of high-value furniture requires however quite sophisticated methods, for which PG holds a number of patents. PG has plans to shift its furniture-making operation from Fiji to China however there seem to be delays in realising that aim. Hence, it is highly unlikely that the company would be interested in setting up operations in SI. However, PG

has expressed interest in sourcing coconut timber slabs from Fiji and other PICs (John Teiwa, CEO Fiji Coconut Industry Development Authority, pers. comm, September 2004). Ten years later, Pacific Green has neither relocated to China as far as we are aware, we had a good meeting with its CEO. Nor has the coconut timber industry taken off so it seems. From all available evidence, his words, the impressive exhibition hall we met in and the information available at its website, it is clear that Pacific Green is producing superb furniture which it sells at the upper market end around the world (single armchairs go between US\$203000, dining tables with eight chairs for US\$ 18000) and doing well. Looking for evidence of more coconut being used for house construction, furniture etc. We find on the street market in Honiara, superb bowl carvings/turnings made of coconut available (US\$ 300 - 600). It would be obviously important that governments (MSG led) put steps and policies in place which are attractive enough for PG to reconsider its position and for other new companies to develop the opportunities around coconut timber. This development is certainly supported by the product. According to FAO economics of coconut timber production, coconut wood has proven to be comparable to conventional wood in terms of durability, sturdiness, and versatility often at considerably lower costs (half or a little more than half the price of conventional wood). The use of cocowood as a substitute material for building construction could also bring down the cost of housing units. The key to profitability in the utilization of coconut wood, given availability of raw material supply and product demand, is the mechanical conversion of coconut logs into lumber and the development of government policy and mechanism to support the development of this opportunity.

The mechanical methods of primary conversion of coconut logs into lumber are the chainsaw, the mounted portable and stationary sawmills. The preference of using chainsaw over mounted portable or stationary sawmills is its low investment cost and complete portability by a single operator. Mounted portable sawmills, although could be operated near the raw material source, require a number of personnel. The use of stationary sawmills or portable ones, although efficient in terms of lumber recovery, is as yet very limited because of prohibitive initial investment in putting them up coupled with the perceived irregularity of raw material supply availability which may delay the recovery of investment and the desired profit.

Lastly, it should be emphasized that an essential pre-requisite for the establishment of a coconut wood industry is an assurance of an adequate supply of over mature or otherwise disposable stems of known volume. A precise estimate of the availability of the raw material must be made if industrial investment is contemplated. Coconut lumber production among smallholders' is usually done by chainsaw. In the *Philippines where a significant number of cocowood lumber producers and sellers are operating on a small scale*, coconut lumber is usually produced by a team who cut the coconut trees and saw the logs with the use of chainsaw. These operators either sell the lumber to a lumber yard owner or sell them directly to big buyers.

FIGURE 16 COCONUT TIMBER USED FOR FURNITURE MAKING



As a country with a long standing tradition established around the coconut tree, Sri Lankans have had a few traditional uses for coconut wood from producing furniture and household items to using them in roofing as rafters. Conversely Pacific Green (see PG arm chair to the right) has become a market leader through its superb and innovative designs.

Today, after a phase of considerable investment and innovation, high- density **coconut wood** is widely used in structural construction in the form of coconut wood pillars, trusses, rafters, windows & door frames, **coconut flooring**, **coconut tile** decking, stairs & railings and floor joists while furniture manufacturers locally and globally have adopted **coconut timber** in various designs such as flooring and wall panelling in exteriors and interiors. In Sri Lanka, furniture makers are developing various functional and decorative items with coconut wood including modern and traditional furniture ranging from reclining chairs, ornamental stools and outdoor furniture to **modern kitchen cabinets and contemporary dining room furniture**, suitable for local and export markets but also a discerning local industry for tourism resort building for tourists with ‘green’ preferences (a rapidly growing market). Meanwhile, **coconut palm panels** with enhanced natural freckles and colours are being celebrated across the world and are being utilised to its maximum by global designers, promoting green design technologies. **Coconut wood furniture and novelty items** command premium prices in the export markets. Exporters are willing to buy high-quality and very attractive coconut wood products that include furniture, decorative interior walls, parquet floors, novelties and curio items like walking sticks, ash trays, hammer handles, egg cups, plates, bowls, vases and other items. There are also products called composed panels produced from small-diameter **coconut logs** for use as inner cores for block boards and for small furniture items like small cabinets, trays and plant hangers. All this suggest still major opportunities for Melanesia to assert itself in a rapidly growing Asian mass market. It is clear that PG approach is one that works well. Also, in neighbouring Australia and NZ.

3.6.1 Case Study 9: Classic Series Products for cocowood

Uniqwa Furniture is the distributor of Cocomosaic products in Australia & New Zealand. Cocomosaic coconut tiles and recycled wood tiles were originally introduced to the Australian market in July 2011 by Uniqwa Surfaces, a division of Uniqwa Furniture Imports Pty Ltd with its launch at Furnitex Melbourne. After receiving an overwhelming response and interest Uniqwa Surfaces have been distributing Cocomosaic products throughout Australia to many reputable Display Home Builders, Interior Designers, Architects and Stockists, as well as being used in a handful of commercial projects. Due to the uniqueness of the product as well as its eco-friendly appeal, it is gaining a wide interest in the design community. It is easy to install and gives a natural textured finish to enhance any room and with a variety of colours and designs; there is a finish to complement any decor theme. Cocomosaic Tiles are made from shells of natural coconuts that are abundant and found in many parts of Indonesia. Coconut shells are readily available and so far only a small portion of it has been used as a low economic solution.

The coconut wood prices in the Chinese Trade Website are indicated below. This highlights the market potential in China on Pacific coconut timber products.

TABLE 5 COCONUT WOOD PRICES IN THE CHINESE MARKET

Item	US\$
Coconut timber floor sq.m.	3.9-8.5

Coconut wood decking sq. m.	22.99
Coconut timber cub. m.	200-600
FSC HQ Coconut timber cub. m.	300-350

3.7 The promising story of whitewood

Whitewood is a soft, medium density timber in which both heartwood and sapwood have a straw colour that lightens on exposure (Thomson 2006). The texture is even and it is particularly easy to kiln dry and not prone to surface checking (Thomson 2006). In Vanuatu, it is used for light construction, furniture and interior building materials and has potential for veneer and plywood production. Vanuatu Whitewood exports to Japan have primarily been ‘main board’ panels, primarily for use in the general market. Discussions with market sources in Japan highlighted that Vanuatu whitewood (there are sources elsewhere) is favoured in the Japanese market for the following primary reasons/characteristics:

3.7.1 White wood Characteristics

Ecological characteristics

- It is native to Vanuatu and an important species to support endemic levels of biodiversity e.g. through its abundant seeds etc. being an important food for the diverse native pigeon fauna.
- It shows high resilience to cyclones and recovers faster than most comparable species.
- It is a species which is known to mix well with vegetable production
- It is an endemic species which does not hold any ‘bad surprises’ as exotics do (e.g. diseases).
- It has an exceptional potential for being used in mixed (also with agriculture) plantings for climate change mitigation with extra payment potential if climate becomes part of the ‘product mix’.

Timber characteristics

- Vanuatu Whitewood is perceived in the Japanese market as an adaptable timber, particular suited to ‘face and back veneer’ uses.
- Light colour makes the timber easy to stain.
- Japanese consumer tastes over the last decade have shifted towards lighter coloured timbers for interior application (Cohen & Gaston 2001).
- As low-density timber (440 kg/m³, for a mean air-dry density (12% moisture content)) whitewood is easy to process (Thomson 2006).
- Easy to dry, in the kiln drying process: reduction of moisture is easy to control, in comparison to other timbers.
- High recovery rate: depending on what is being made, the recovery rate is high, in comparison to other timbers.

Production characteristics

- From a production perspective, whitewood is favoured primarily due to its:
- Short rotation: tropical hardwoods take a comparatively longer time to grow than Whitewood, even in plantations. Japanese market sources noted that whitewood can be harvested “within 15 years, or even 7 years, if the plantation is properly thinned” (pers. comm.).

Market characteristics

The main competitors for Vanuatu whitewood in Japan include Papua New Guinea and Central and West African timbers. Specifically from PNG, PNG Basswood and from West and Central Africa - *Triplochiton scleroxylon*, also known as African maple or depending on country of origin, Obeche, Ayous or Wawa. While PNG Basswood has the same botanical name as Whitewood, Japan market sources noted that it's 'hardness is slightly different to Vanuatu whitewood' (pers.comm.). African Maple, a light density (370-410 kg/m³) and light coloured timber is well known in the Japanese marketplace and was noted as the favoured substitute for Vanuatu Whitewood. The trade name PNG Basswood refers to several *Endospermum* species, including *Endospermum medullosum*, and at least one other species which has lighter softer wood. This makes PNG basswood a variable and inferior product to Vanuatu whitewood.

3.7.2 Case Study 10: The Vanuatu Whitewood Export Market to Japan

Vanuatu's capability to meet market requirements and the ban on round log exports has been maintained by the Vanuatu government with the aim of facilitating employment opportunities and value-adding timber products, prior to export. A 2007 ITTO/SPC-funded report noted that under Vanuatu's present tax and fiscal structure, the value-added component of exported lumber is captured mostly by the processor, with little change in the share captured by either the landowner or the government (Adams 2007). The report further noted that while the attraction of domestic processing is the increased economic activity associated with adding value, it is uncertain whether industry is willing to make the necessary investment in processing "when it is becoming increasingly difficult...to secure regular supplies of round logs for sawn wood production to satisfy domestic & export demand and to satisfy the raw material needs of the fledgling downstream wood processing industries" (Adams 2007). Interviews in Japan confirmed this, with Mr Norikuni Yoshida noting that the reconditioned, second-hand machinery currently in use in Vanuatu is incapable of producing high quality value-added products, such as finger-jointed panels and plywood (pers. comm.). Vanuatu also offers no advantage in terms of labour cost. A legal minimum rural wage of vatu 26,000 (AUD 300) /month is set for unskilled labour in formal employment. It is for this reason that Vanuatu is no longer competitive in plantation agriculture. High labour costs will also pose a major constraint on the viability of larger scale plantation forestry that relies on hired labour. In Vanuatu, in contrast to plantation agriculture, crops such as copra and cocoa have thrived when grown as part of traditional farming systems utilising household labour. This is because cash crops grown in this manner provide a sufficiently attractive return to household effort, even when prices and productivity are low.

A discussion paper by Siga, K., ACIAR 2009. on the Prospects for Endospermum medullosum (whitewood) from Vanuatu, with particular emphasis on the Japanese market reported that in 2007, TransAsia Partners Ltd, one of the Japanese customers of Vanuatu whitewood 'stopped importing Vanuatu whitewood, due to the suspension of a pilot reforestation program on Santo'. There were no reported whitewood exports between 2007 and 2009 and Melcoffee, one of the major exporters on Santo told us that this situation could not be resumed due to cheap Malaysian products and is now exploring Chinese round wood markets, hardly a market which could compensate for the lost Japanese market.

3.7.3 Whitewood Export Industry in Vanuatu

The whitewood industry of Vanuatu is an example of a once successful export oriented industry of a native timber *Endospermum*, grown in plantations, to a high end market, in Japan. The whitewood trade has been operating for almost 25 years, has been threatened by changed market conditions in Japan and aging processing machineries. From the interview

session with the owner of Melcoffee Sawmill, the main producer of whitewood timber and reading from reports (e.g. ACIAR, 2015), the decline of this industry based on Santo would be a waste of a unique investment potential which should be government supported and linked with climate change mitigation and adaptation.

Whitewood in Vanuatu - The Croucher Story

FIGURE 17 (FROM LEFT TO RIGHT) WHITEWOOD LOGS OF 6 TO 8 METERS LONG FELLED FROM EASTERN SANTO. WHITEWOOD SAWN TIMBER READY FOR EXPORT. WHITEWOOD SEEDS BEING HARVESTED READY FOR DRYING AND WHITE WOOD TREE IN THE VICINITY OF THE MELCOFFEE SAWMILL FACTORY



Mr Stephen Croucher and his father moved to Santo in Vanuatu from NZ to start up the business in whitewood. The Crouchers secured an 800 hectares land lease with traditional land owners and planted over 300 hectares with whitewood trees. It has developed a good working relationship with the Santo landowners and in ensuing long term sustainability in supply to secured markets, the company have supplied over 85,000 seedlings to farmers. The company employs about 25 workers (50 percent are skilled) have established its market in Japan supplying 200 cubic meters of finished products each month. Noumea is one of their key markets in the region. In addition, Mr Croucher has secured a new niche market in China which it exports whitewood mouldings worth USD800 per cubic meter. In terms of production, a total of 50 cubic meters of sawn timber is produced each day.

Clearly, the Melcaffee story shows the potential for the right type of ethical foreign investment, community support and commitment which develops good industry practices.

3.8 Addressing Competition from Similar Products

The market collapse of Fiji's Pinewood industry was caused by the inability of domestic producers to supply the timber needs of a growing industry which therefore sourced it from somebody who could- Pine suppliers in New Zealand. As we can see from the quote below this is also the major problem in whitewood markets in Vanuatu which have to compete with a similar product, 'Obeche', from Africa.

The major advantage of West African Obeche is that the timber is readily available in large volumes. International Trade Centre data show the fob value of Obeche lumber exports from Cameroon at USD 65.6 million in 2005, down from USD82.6 million in 2004 (2009). A small Vanuatu plantation based whitewood industry is likely to have higher costs due to its relatively high wage structure, obsolete machinery and diseconomies of scale.

With regards to whitewood, the building manufacture market relates specifically to interior application including cabinetry, flooring, panelling, windows, doors and other interior products. **Recent years have seen a growing trend in the Japanese market for non-structural wood products for interior application** (Cohen & Gaston 2001), largely driven by increasing consumer demand for use of light coloured timbers. With increasing consumer interest in 'healthy, breathing homes,' wood is also steadily replacing materials such as steel and plastics in building interiors (Cohen & Gaston 2001). Given the non-structural usage of whitewood, housing start information does not provide a full picture of trends. Data on housing refurbishments and renovations, which are more difficult to quantify, would provide a clearer illustration of market trends. However, it could be expected that renovations would be closely correlated to housing starts given that they are both driven by income expectations.

The above descriptions of characteristics and market trends show that whitewood is a highly attractive timber product in particular for the potentially large US and Japanese markets, that the Vanuatu's species is probably the most attractive one, yet that its current share of the market of the comparable products is tiny and has now disappeared. If Whitewood could become a major species for Climate Change Mitigation (REDD+) in Vanuatu (with an ACIAR estimate of 49 000 ha potential in Santo alone, the additional economic benefits from that and the marketing advantage (A TRULY GREEN WAY OF CLIMATE CHANGE MITIGATION)) a strong business case for this species could be made. This needs however out- of the box thinking. If Vanuatu could develop a dependable and large market for that products it would be much better placed to compete with the products from Africa and PNG.

The current drive to develop large plantations in the Pacific as part of climate action and to derive climate payments might now well be the factor which could promote the large whitewood plantations envisaged in the past. These would then not only sequester large volumes of CO₂ but would be able to provide the larger volume and consistency required for the development of overseas whitewood timber (and perhaps later timber product) markets. In Vanuatu the replacement need of outdated machinery (Melcoffee) makes that currently unfeasible and unjustifiable (with market uncertainty and the collapse of the Japanese market). There is a clear case of government and international community support.

However, replacing these imports with local supply faces a number of challenges. First, **timber production and supply to the local and national market is dominated by small sawmills which source their timber from landowners, often small holders, who are often unable to meet the exacting quality standards, credit demands and services** required also

e.g. by the tourist industry in resort building (house construction, inside joinery, and an increasingly urban market. However, with adequate support from the government, and working in groups, best as cooperatives producers could better meet these demands. The development of Bois on Vanuatu with more than 30 trained employees doing wood joinery and construction design both in Vanuatu and in New Caledonia is an example that this is possible.

3.9 Value added domestic timber ventures

3.9.1 Case Study 11: Techno Bois Déco: A Top-End Furniture, House and Interior Designer using Pacific Timber from Vanuatu

Techno Bois Déco, at the forefront of joinery for nearly 15 years, showcases the perfect blend between Vanuatu's most common natural resource, Melanesian arts, and western techniques. David Girardeau arrived in Vanuatu in 1991 to work with the INTV 'National Institute of Technology', after 8 years of study across France. Today he's managing a team of about thirty, including some of his previous students. Ever since, individuals and professionals alike are relying on their competence: the lasting quality of their creations is an undeniable testimony to their expertise.

Figure 18 **Techno Bois Déco Team: A teacher with his students**



FIGURE 19 TECHNO BOIS DECO FURNITURE WORKSHOP



David Girardeau's Joinery which targets its markets' upper building markets including hotels and resorts clearly stands out for its quality, as described on its website. Situated on the road

to Bauerfield, Efate's International airport it also exports its luxury wood much of it made from Kwila New Caledonia. It has also made the interior wood work for hotels such as the 'Melanesian', and Holiday Inn.



A personal selection from its website shows simple and handcrafted yet quite beautiful timberwork as the Pacific can produce from its own timber, and export to places such as New Caledonia. The factory employs 33 staff many of them trained technicians and woodworkers by Gerard.

The timber is sourced from Vanuatu (mainly local hardwood):

Techno bois markets include private houses, hotels, resorts, restaurants, etc.

3.10 Wood carvings in Melanesia: A major wood product and a source of livelihoods

If one looks at the value of forests and of timber in Melanesia for its people, grossly undersold by foreign logging companies in past and present, one would be amiss if one would not identify and try to understand its great cultural heritage- and value- of wood carvings. These not only present some of the very essence of Melanesian people but also a very significant part of their economic reality, much more important for the survival of many households than foreign logging companies. Uniquely they are also a product which is of current great significance to enable local communities to participate in the growing major industry tourism, by having a timber product they can sell directly. As such products can be superb, they can be developed into a major driver of the tourism industry.

3.10.1 Case Study 12: Wood carvings in Melanesia: Carving spirits, Culture and Identity

The island world of the South Pacific also called Melanesia, is rich and unique in the life they harbour and the human cultures they have created. With almost 1500 distinct languages spoken one can only imagine what differences one encounters on such a comparatively small area and what spiritual richness is hidden behind that vanishing 'OLD' world as it rapidly changes and modernizes. The visitor still observes, along roadsides mostly, a rich display of handcraft, many of them carved wood items and much of it qualifying as 'ART'. Most of them have a distinctiveness which probably comes with a different language for example. Many of the wood carvings if we trace their journeys, have come from other islands and often the carvers have too. One can easily get lost just to look at the many themes, wonder where they came from, what they mean and who saw them that way- and which wood they are made from. Each carving is a journey into a hidden spirit world. It is unique!

FIGURE 20 SOLOMON ISLANDS TRADITIONAL CARVING CALLED THE 'NGUZU NGUZU'



One of the four wood carvings in the international lounge of Honiara airport (Kwila wood~ 0.70m x 1.80m). It depicts village life on the Solomon Islands including a war party led by NGUZU NGUZU *

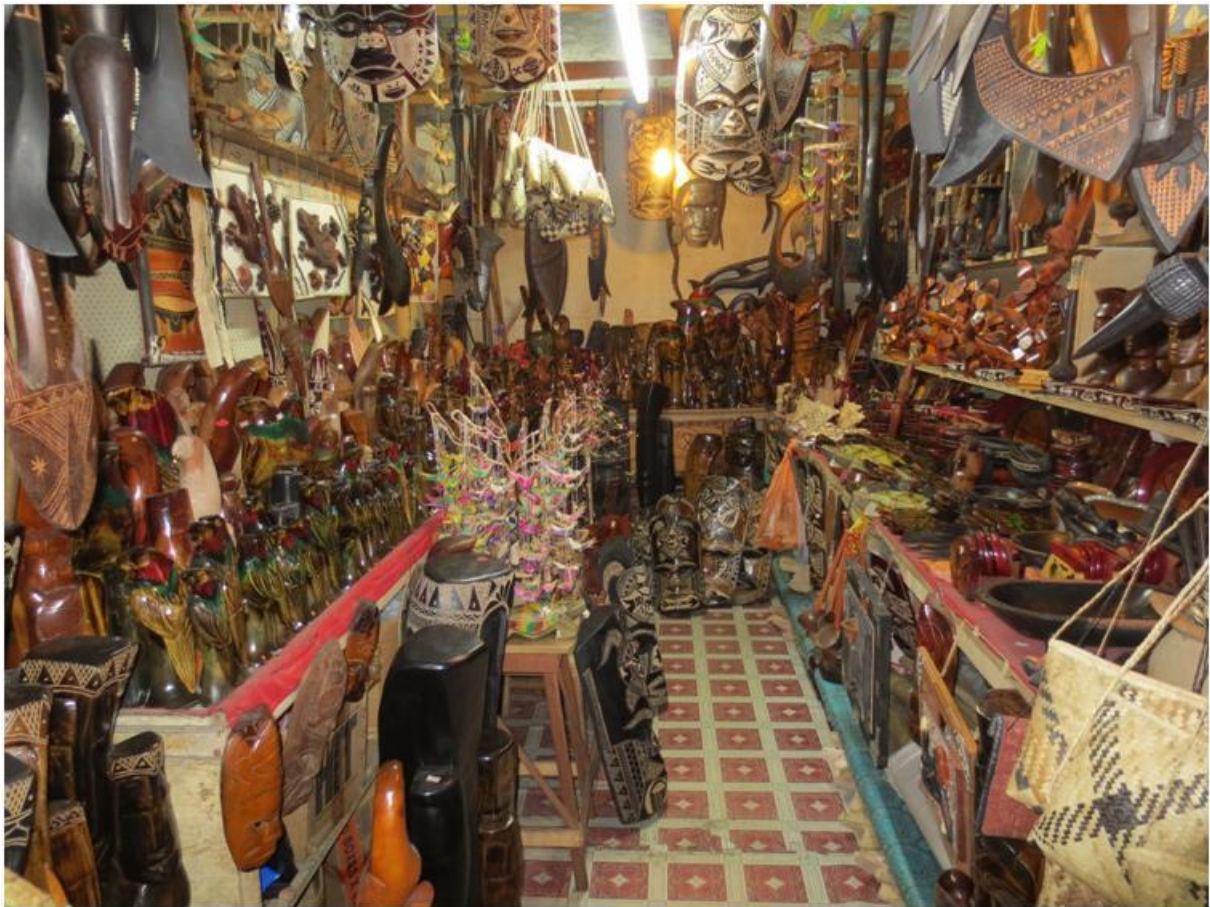
It is described as follows:

The traditional Nguzu Nguzu is an icon for Western Province people [in the Solomon Islands.] It is usually donned in front of the traditional Western Province War Canoe called the Tomoko. The Nguzu Nguzu was said to have been used to ward off dangerous sea spirits particularly that of the Kesoko sea spirit. The figurehead is said to be a protector of the Tomoko riders as they travel to conquer surrounding islands during the head hunting days. "The Nguzu Nguzu is kind of like a guiding spirit and during the 19th to the 20th century, our ancestors travel for tribal wars with the Nguzu Nguzu in front of the canoe as a protection. This gives the Western Province people the confidence to travel the great ocean and conquer other warring parties," says Julious Koneho of Roviana Lagoon. Nowadays however, with the tribal wars over and the introduction of Christianity, both the Tomoko and the Nguzu Nguzu are only seen when Solomon Islands host big celebrations like that of the Solomon Islands Independence. The Nguzu Nguzu is now commonly found in the carving shops and on the Solomon Islands \$1 coin.

3.10.2 Case Study 13: A Vanishing Carving Culture

There is more to carving however. In a recent article on wood carving in Fiji, 'Woodcarvers look to earn more from their craft', Ravai Vavo'ou examines the carving industry in Fiji, worth 10 million Fijian dollars and representing a large potential to be developed. He laments the demise of that culture, the fickleness of the buyer's markets and a lack of recognition of its importance. If one visits the central handcraft market in Suva one can see what he means. There are many magnificent carvings on display in many shops. There are also many which seem to represent another standard altogether, quick commoditised copies for the tourist who does not want to spend too much money- a good carving may be- and should be- quite costly. And, as Bob, one of the old hands said in the interview that there is now much coming in from the Solomon Islands which is being sold here (in Fiji). It is the same over in Honiara, or in PNG, Vanuatu or in New Caledonia. An incredible rich and distinctive carving culture -the ultimate forest product-from many islands, which are currently merging into something much less valuable- for the tourist, which is a tragedy. It is also a grave threat to the hundreds of carving communities which depend on carving for their livelihoods.

FIGURE 21 BOOTH OF HANDICRAFTS AND CARVINGS INSIDE THE FIJI NATIONAL HANDICRAFT SHOP



A room with a wide range of carvings waits for the few buyers. One doubts that the seller knows exactly where it comes from, let alone who carved it and there is a fair chance that the artist has moved from his homeland, uses what wood he can get while starting to forget the rich spiritual culture behind it. Art is in danger to become a product which, while not mass produced as in China or many parts of Asia, *loses its connection to the land. To the people and the timber.*

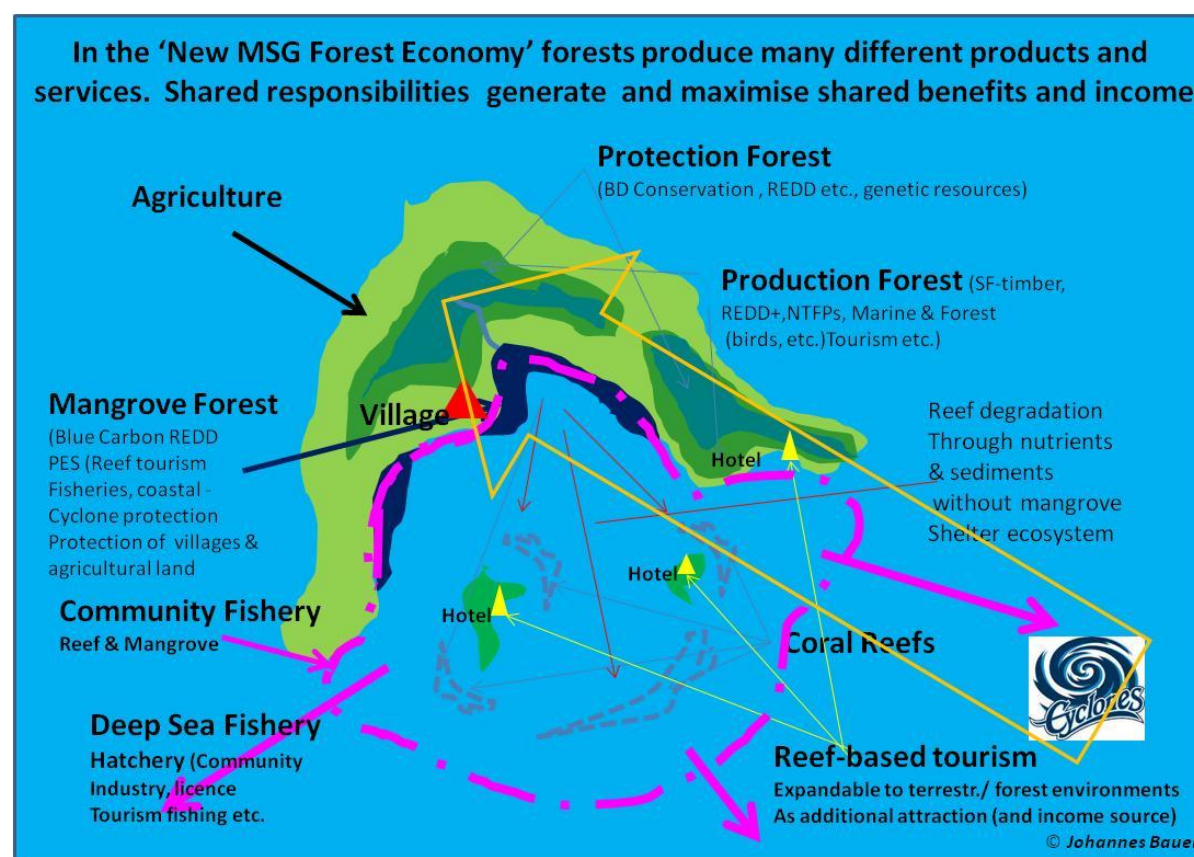
3.10.3 Case Study 14: The Wood carvers from Lau - A story of physical community survival through carving

On the road to Sigatoka from Suva, Simione our guide and mentor from the Fijian government, stops at a rusty tin shed some 20 m off the road. When we walk into its dimly lit interior we are met by a youngish man and four gentlemen in their sixties and seventies so it seems sitting on the cement floor, each with a chisel and a piece of wood in front to them for carving. To our growing surprise we learned that the 12 or so carvers in that shed represent the livelihood backbone of a community of 2-300 people for the past 40 years or so. The community had decided then to leave their ancestral homelands on the Lau islands, in the eastern part of Fiji for better education opportunities for their children. They have been given the right to farm some land and grow much of their food. Around 20 of them now work in nearby tourist resorts. The most significant income however comes from these elderly carvers who have, so we learn, over the past 40 years provided the major means of livelihood in this

community. This is by no means exceptional, they tell us. They tell us there are thousands of people like them around the main islands.

CHAPTER 4: A NEW MSG FOREST ECONOMY AS A WAY FORWARD

Clearly, the economy around timber and forests in the islands needs to be redesigned. A new MSG Forest Economy is needed which, as many reports including this recommend, needs to get away from (cheap) timber only. A regional movement which celebrates this unique diversity, combines the forest products, timber and non-timber, value adds, and works with new opportunities around tourism and climate change action. We recommend the following actions which can kick-start that new MSG Forest Economy, an idealised version of which is shown in the figure below. Forest departments will be the backbone of that change but they need to be supported to adapt to those new (and old and neglected) forest portfolios.



An Alternative Forest Economy Model for Melanesia

4.1 Recommended Actions

Recommended actions are described in more detail in a document prepared for MSG Leaders. They can be summarized as follows:

4.1.1 Summary of Recommended Actions

- Introduction**
- Moratoriums on New Concessions**
- A Reaccreditation Process for Existing Companies**
- The development of an MSG Forestry Policy & Certification Process**

- e. **Product Differentiation and Value Maximisation as Market Strategies**
- f. **Climate as the New Forestry Portfolio**
- g. **The Corporate-Community Forestry transition**
- h. **The Development of the Informal Forestry Industry**
- i. **From Single Product Coop to the Mixed CO-OP Livelihood Centre**
- j. **A Sub-Regional Forest Restoration Program**
 - Transition forestry for Mine site rehabilitation
 - Silvi-cultural Management of Logged sites and Secondary Forest
 - Replanting Programs for Native Forests
 - Establishment of a Community nursery industry
- k. **A Regional University-based Forest/NRM Education & Career Program**
- l. **Establishment of a Community Forestry Service**

4.1.2 Financing the New Forest Economy (NFE):

From ‘Research and Training’ to a Business Plan & a Bank
Under one Roof- Mixed Livelihood COOP support Centres as a Business model
The *Forest Transition Fund (FTF)* as an independent Regional Funding Body

4.2 A Vision for the New MSG Forest Economy

In the New Forest Economy of MSG countries foreign logging companies have run their destructive cycle and now they either fully comply with national legislation or they have left. The Forest authorities now have more access to resources from the international community and around climate change action. They will also be supported by the ***MSG Forest Transition Fund (MSG-FTF)*** which, instead of being part of National Revenue (and e.g. being used by the state at times to fix holes in other budgets, is independent. One large payment from Norway, in excess of USD one billion for a ***MSG Moratorium on Foreign Logging Concessions*** has started that. It will be supported increasingly by the Green Climate Fund. It will also be funded by a growing Forest Revenue stream in that economy, which include payments for technical advice to customary landowners as they increasingly access PES payments yet need forestry departments to carry out administrative and technical work on their behalf. The growing NTFP economy is now regulated and formal but will require to build up over time. Funding from multilateral and bilateral aid will be supplemented by an ***MSG coordinated Forest Business Development Sector*** which is increasingly successful in securing loans and trade for small to medium sized companies on new foreign products, many of them in partnerships with government or foreign ethical investors. Many of the loans will come from the Bank sector, in particular Mutual Banks (e.g. RABO Bank). In this new forest there is no need to create ‘National Parks’ on community land. Resources are being managed (yields set and overseen, research if necessary, product improvement etc. protection of necessary) sustainably from ***Mixed Village Cooperatives*** which are also, once products are fully operational, responsible for revenue collection for the state. Career path development around the many aspects of this new economy will have become a major opportunity for collaborating regional universities and teaching colleges, including accredited (I) NGOs and closely integrated with a large scale ***MSG Regional Forest Restoration Program***. This program is overseen by national forestry departments and regionally coordinated and governed by an independent umbrella organization. It will ensure that climate action aims of replanting closely reflect- and enhance- community forestry, SFM and NTFP product development. The development and sustainability of these activities will be ensured by ***MSG***

FTF which ensures a regular income stream from transition levies from foreign industry (mining, logging, industrial agriculture, tourism and fisheries), maintained and grown from Government contributions, Climate Change funds, contributions from development partners including the INGO sector, and business loans.

4.3 Details of Recommendations

4.3.1 Introduction

Implementing the emphasis of the EU already 20 years ago (Danagro 1996) on the importance of a multi-sectoral approach to forestry and heeding the development in that, including around climate change and REDD, we will, for lack of a better word suggest in this proposal that a '*New MSG Forest Economy*' needs to be visioned, framed and implemented around the central role of forests in MSG economies. The basis of this implementation is spelled out in the MSF Forestry Terms of Reference. If forests and forest products are to be maintained, their conventional profitability will have to be boosted not only through the commercial forest products but additional NTFPs, including Payments for Services and benefits which are currently for FREE. After the Paris Agreement this is now a realistic new economy around forests. It can only be realised if the mechanism for them are defined and developed for the MSG member states also. It requires however as a first step to phase out the type of foreign logging which currently takes place.

The new MSG Foreign Logging Industry

It is recommended that MSG nations establish a process to regulate and improve current logging operations in SI and PNG and to put a system in place which will effectively regulate any future operations in forestry by foreign companies.

4.3.2 Moratorium on new concessions (PNG and Solomon Islands)

As currently trialled in Indonesia a moratorium on new logging concessions not only sends an important signal to the international community that one is getting serious about change, but can secure a lot of money. Such signals are now sought and the sooner one moves the better. Many more will do so in the future. We have described the advantages of such a moratorium in chapter four, also the lessons which can be learnt. In PNG the best justification for such a moratorium would be the recent National Forest Inventory. The granting of new concessions would now need to reflect that new knowledge. This will also be a new pressure point and should be perused along with certification. As Indonesia is currently, and increasingly successfully so it seems, reforming its forestry sector, with the signing of a timber export agreement to EU, the international watchdog for sustainable timber sourcing, such a Moratorium might well be essential to maintain Melanesian timber markets.

4.3.3 Re-accreditation of existing concessions

While new concessions will need to reflect the findings of the NFIs, this newly available information will serve as the justification of a review of current concessions and a re-accreditation process. The process should be realistic and give the industry time to improve their operations. They should also however be made to realise that the global community is behind that move.

4.3.4 Establishment of an MSG Timber and forest product (certification scheme)

It is recommended that MSG develops, in close consultation collaboration with one of the major Forest Product certification schemes a regional certification schemes which is being trialled and implemented with suitable small scale operators. A marketing and funding strategy should be developed for the small country operators e.g. in Vanuatu and Solomon and PNG which can do that. We suggest to approach FORCERT in West New Britain province (WNBP) of PNG with its own advanced model of Community Forestry and Product Certification.

4.3.5 Product Differentiation and Value Maximisation

A message from Corporate America

A new Forest Economy for the US!? Here is the layperson's complete guide to the New Forest Economy, in which small- and medium-sized logging companies and mills thrive' in which we nurture our value-added industries instead of selling off our raw materials at too high a volume and too low a price, in which old forests are protected and new ones are planned and cultivated intelligently, in which the company town gives way to the integrated community, in which there are enough jobs and enough trees, in which the Clayoquot crisis and cries of "Brazil of the North" are history. Best of all, say the authors, the resources for a major change are already in place, from the trees to the mills to the bargaining table. And everyone - even big business and big government - knows it's time for a new approach. At the heart of Forestopia is how we get from here to there: how we can stop the momentum of current high-volume raw lumber sales and make room for smaller, labour-intensive outfits, how the new economy works in the context of the world marketplace, and how we're going to pay for it

A Review on: [Michael M'Gonigle](#) and [Ben Parfitt](#), 1994. **Forestopia: A Practical Guide to the New Forest Economy Paperback– June 1, 1994.**

The forest owners in the US have/had, so it seems, the same problems as PNG and the Solomon face. In their case also it was 'big business and big government' which caused the problem. Looking that book over, even corporate America has got the message so it seems. It is not so easy in that country to turn the clock back once the corporate sector is so entrenched and the state has retreated so much. Large corporate timber empires, even home grown ones are not the way to go M'Gonigle and Parfitt (1994) tell their country people up in the State of Oregon as happens elsewhere with many such arrangements: It is a race to the bottom and nobody except the corporates win.

4.3.6 Climate as a New Forestry Portfolio

Climate and climate finance must become a new important portfolio for forest departments to survive (see also our Addendum to this report). On the other hand, climate finance has to be made to understand that only forest departments have the infrastructure to make much of the envisaged climate change action happen. Not foreign NGO's, not even World Bank and Foreign AID can do this. National ownership can only give the longevity required for such. It also has to be made to understand that climate finance can go much further, both as community development tool as well as SUSTAINED climate action, once it is fully integrated with timber (and NTFP) production aims. For. Carbon Plantations (and we are talking not about exotic or native single species plantations but traditional diverse native AND exotic integrated forest-agriculture-wildlife production systems) will, once they become productive, produce MUCH more income from timber and NTFP than from carbon, which is an entirely different and foreign market and a fickle one at that. There is room for the development of direct investment and offset schemes which could be voluntary or part of a future compliance market. In this business model carbon is one part of a diverse action and investment portfolio. An example of an existing and successful model of that kind of voluntary approach is the US based Appalachian Carbon Partnership.

4.3.7 Case Study 15: Appalachian Carbon Partnership

The Appalachian Carbon Partnership (<http://www.appalachiancarbonpartnership.org>).

The Appalachian Carbon Partnership (ACP), a project of the Mountain Association for Community Economic Development (MACED), is a powerful new model for promoting the practice of sustainable forest management on private, non-industrial forestland. This program is the first in Central Appalachia to compensate forest landowners for the carbon sequestered by their sustainably managed forests, linking the global issue of climate change directly to local sustainable development in Central Appalachia. The ACP's goal is to create a community of landowners and partners that works together to increase:

- The practice of sustainable forest management.
- The ecological health and economic value of forests in Central Appalachia.
- Wealth for forested communities in a region typically dominated by extractive industries.

* ACP is an organisation which inspired myself when I set up the *Australian Carbon Cooperative* now sadly defunct, three years after we went National- so we thought. What I failed to understand is the debilitating situation in Australia where neither the State supports such a venture nor the farming community has a strong and deep culture of farm forestry as the one in the Appalachians. I can imagine that for the Pacific such network, supported by State foresters and the international community (as part of the Foundation) would have the integration to do such. What I do like about the APC is the integration of all kinds of aspects of forests, forest industry, with carbon just another product.

4.3.8 The Corporate-Community Forestry transition

With more than 90% of the land owned by customary landowners 'state forestry', which manages public land on behalf of communities in other countries has a small portfolio in Melanesia. It is unfortunate that in the wake of the vacuum created by the colonial powers which had that system, forestry departments had little time and opportunity to focus on their REAL job, community forestry, as they were asked to cater for the needs of the new masters, the foreign loggers. With this changed now in three states and soon to be changed in the remaining two, there is now a need and opportunity to develop community forestry in all MSG states. This will need an unprecedented development of a new career path, the one of community forester (as opposed to corporate forester) and will have to be- and can be- financed out of climate funds. We believe this is a unique opportunity for forestry in Melanesia and could become an inspiration around the world. It would deliberately redesign the role of the forester as tree custodian and government supported local agent for sustainable development.

As the large and foreign corporates leave or comply, domestic industry, the small and fickle ventures who could never grow in their dark shadow are being released. This phenomena is well known to the ecologist, where it is called 'mesopredator release', who now, without being in fear of their lives from their big cousins can work more effectively and have also more work available. We can see that clearly in all the three MSG countries, Vanuatu and Fiji, to a lesser extent New Caledonia and we can also see it even in PNG, where an astonishing own sawmill sector has been developing under the shadow of the foreign corporates. This is a situation which is also very well known in fisheries where big industrial vessels not only destroy the fish populations but also the often community based venture and where now, in places, they have been able to claw back lost ground, generally after the fish stocks have collapsed and the corporates leave. It is a tragedy around the world that this has happened so often and still happens and many governments have made themselves equally

culpable and should probably stand condemned in history for the role they played in that (see Bauer 2016 d). As is evident in Solomon's governments vision, and as we have found in most others, Product Differentiation and Value Maximisation as Market Strategies are a priority to achieve this transition. As their lack of success over 20 years however clearly demonstrated they will require more investment. This can be sought from banks such as RABI Bank, a bank designed around cooperatives and the agricultural sector, once governments and communities reach agreements.

Forestry departments in Melanesia are the only body which can manage this transition from corporate facilitators to community forestry. Countries such as Bhutan give inspiration that this is possible (e.g. Bauer et al, 2015a,b).

4.3.9 From Single Product Cooperatives to the Mixed CO-OP Livelihood Centre

We have seen that most advice for community business development in just about every report and study we have read, suggests the cooperative business model. This model was in wide use for community business before colonization which, in the latter stages did away with it assuming state control but also paved the way for foreign corporates which, mostly in the wake of new markets (e.g. timber) but also for emerging old ones (e.g. Sandalwood) assumed dominance. To recapture ground again is now difficult (as e.g. in Australia where the situation is quite similar (see ACC, 2013) as governments while often over-compliant with the corporate industry, are neither informed nor often sympathetic or supportive for Cooperatives (although this is now, following the International Year of Cooperatives celebrations in 2013 and the release of a report “ *Who knew that Cooperatives are so important*’ by The Australia Institute (TAI). There is also an increasing paucity of cooperative lawyers who understand them and can help establish them. As is the case in MSG countries, most of the products which would benefit from a cooperative business model are not viable to support it, especially during a difficult phase of establishment which, as I have seen in own hard experience (see the Australian Carbon Cooperative Ltd.) mostly overtakes technical resources and financial ones. To us, the way out would be to develop **MIXED CO-OPs where administration of various coops could be done together with the successful ones helping others in the startup phase and where resources can be combined to an economy of scale**. Such a combination of resources would also make it much easier to develop coop market outlets, research and training, and the securing of loans and grants. Business Australia, a new Pro-cooperative organization and the International Cooperative Alliance (ICA) would be interested, perhaps even be excited in such a model for Melanesia. This would also include RABO Bank which will be most sympathetic and interested in the cause.

4.3.10 MSG Guidelines and Policy on Forestry

MSG's Role in the New Forest Economy of the Pacific

- a) Development of a New MSG Forest Policy
- b) MSG as the organisation to host the MSF Forest Transition Fund
- c) MSG as a Trade, Exchange and business development hub
- d) MSG as Grant Hub

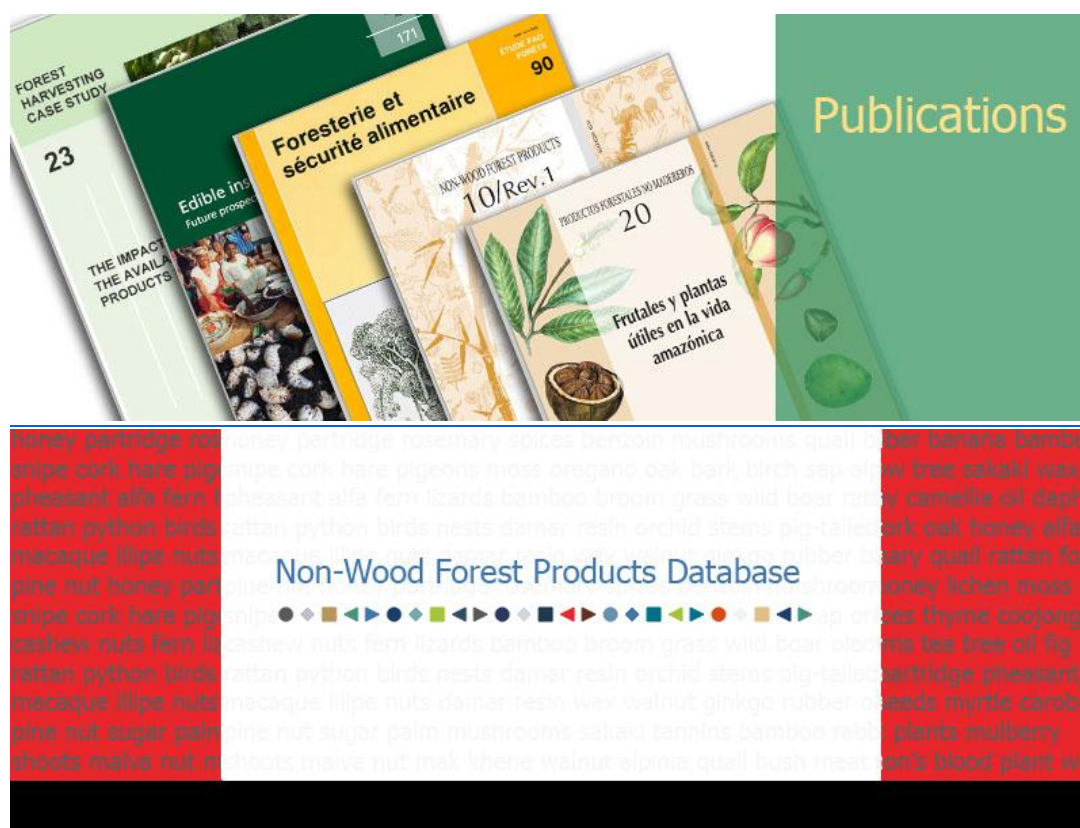
4.4 The Development of the Informal Forestry Industry

4.4.1 Non-Timber Forest Products (NTFPs)

NTFPs play a big role in the forests of the South Pacific, even more so than in mainland Asia as communities living on Small Islands (there are several 1000) are more dependent on local goods than others. So how can the many activities around NTFP be better organised and better supported. How can it be ensured that local collection systems are sustainable while larger markets are being explored? One of the recommendations of this study is the development of an MSG-NTFP network for communities which depend on NTFPs for their subsistence and cash income. NTFPs and NTFP-derived products such as furniture, carvings, honey, varnish, beeswax candles, dyes, oils and wildlife (mud crabs, pigs, pigeons, fishes, flying foxes etc.) and herbal medicine have markets in rural areas, urban centres and in tourism. However, communities often have no access to strategic information, practical technology, and financial support to make viable enterprises and sell their produce. There is also no organisation available which can start keeping records and develop sustainable and regulated enterprises on what is currently an unregulated informal market. Again the Mixed Cop model seems the way forward in this. If we look abroad such a development of networks is happening and Melanesia can become part of that.

4.4.2 Looking for inspiration from Abroad

Already an example exists of a network which does amazing things and can be replicated (asked for support) in the Pacific. Either as part of the already existing network or if that is not possible as an MSG initiative. This initiative could be attached to the transition fund and also carry out such activities as envisaged in carving art.



Established in 1991, the promotion and development of non-wood forest products (NWFP) is one of the priority areas of FAO's Forestry Department <http://www.fao.org/forestry/nwfp/en/>

Our mission is to improve the sustainable utilization 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 programme accomplishes this mission through three main areas:

- *gathering, analysis and dissemination of information;*
- *appraisal of NWFP socio-economic contributions to rural development; and*
- *technical assistance.*

Non-Timber Forest Products Exchange Programme

NTFP-EP

From: <http://ntfp.org/2016/07/2015-annual-report/>

WHO WE ARE About a hundred million people living in and around forests in South and Southeast Asia depend on NTFPs for their subsistence and cash income. NTFPs and NTFP-derived products such as furniture, honey, varnish, beeswax candles, and herbal medicine are necessities in urban centers too. However, communities often have no access to strategic information, practical technology, and financial support to make viable enterprises. A handful of organizations that saw the link between sustainable use of forest resources and economic development for indigenous peoples (IPs) and forest communities started helping these communities, and the **Non-Timber Forest Products-Exchange Programme for South and Southeast Asia (NTFP-EP)** sprung from the need for these groups to come together. The NTFP-EP is a collaborative network of over 60 non-governmental organizations (NGOs) and community-based organizations (CBOs) working with forest-based communities to strengthen their capacity in the sustainable management of natural resources in Cambodia, India, Indonesia, Malaysia, Philippines, and Vietnam.

WHAT WE DO For centuries, communities in the region have been using traditional ecological systems, knowledge, and practices to protect forestlands, which have in turn provided them with their basic needs. Our shared goal is to promote forest conservation through the empowerment of forest-dependent communities and the sustainable management of NTFPs. Employing a participatory strategy, **NTFP-EP helps strengthen the capacity of forest-based communities and their support organizations by serving as a platform for information and knowledge exchange of appropriate resource management and forest based livelihood techniques and experiences.** The network also provides technical support and training, assistance in strategy formulation, documentation of best practices and success stories, mobilization of resources, advocacy for local initiatives, and lobbying efforts for enabling policies.

EXCEED 
The NTFP Academy

Expanding Community Enterprise and Economic Development or **EXCEED** is the Training and Advisory Program of the NTFP-

EP targeted to support the work of NGOs, government agencies and community-based organizations in the South and Southeast Asian Region on expanding and strengthening livelihoods and community-based enterprises anchored on sustainable resource management in rural, forest and protected areas.

EXCEED envisions successful community-based enterprises, based on value-added NTFPs and with embedded sustainable resource management mechanism, that enhance rural and forest-based livelihoods and promote the conservation and sustainable use of natural resources.



Initiatives supported by the PDR SGF

In the spirit of Pastor Delbert Rice, the PDR-SGF facility aims to support community-based projects with themes that were close to Pastor's heart, especially in the field of forest conservation:

- Community-based forest restoration; including incorporating NTFP species with larger tree species;
- Sustainable NTFP management including resource management and sustainable utilization;
- Traditional ecological knowledge in sustainable forest management and food security. Involvement of the youth is especially desirable;
- Customary land rights and ancestral domain recognition to secure long term incentives to conservation; and
- Advocacies against development aggression, especially in forest areas with high conservation values.

This overall grant window will be made accessible to more communities in forested areas throughout Asia including the countries of NTFP-EP partners such as Cambodia, India, Indonesia, Malaysia, Philippines, Vietnam and possibly other Mekong countries. A call for proposals will be launched in early 2015. NTFP-EP thanks Both ENDS, Broderlik Delen and Samdhana Foundation for initial contributions to the fund. NTFP-EP continues to accept donations to the fund. For more information contact grants@ntfp.org

The New Caledonian Palm Flora- A Unique World Heritage

The New Caledonia forest, including its palm flora is remarkable for its diversity and consists for the palms of 16 genera, 15 of which are endemic, and 37 species, all endemic also (Pintaud et.al. 1999). New Caledonia has the highest number of endemic genera of palms, and especially monotypic genera, in the world (Johnson 1996). Most New Caledonia palms are noteworthy for their limited distribution: twelve species are known from a single locality and 22 occur in only one phytogeographical sector as defined by Jaffré and Veillon (1989). Moreover, nearly all species are confined to primary forest ecosystems and are consequently very sensitive to habitat disturbance (Pintaud et.al. 1999). Thrie potential for products and horticultural is immense. If the trees belonging to the ancient conifer family Araukaria (NC, small island world it is, has 18 of the worlds 44 species), and the world's oldest flower,

Amborella, sequenced at Yale University in the US in 2013, rewriting chapters of plant evolution (and potential for bio engineering), are added, there are clearly major potentials in the indigenous forests. These will need to be part of the climate action, not forgotten in a rush.

5.2. A Regional Forest Restoration Program

- Transition forestry for Mine site rehabilitation
- Silvi-cultural Management of Logged sites and Secondary Forest
- Replanting Programs for Native Forests
- Establishment of a Community nursery industry

4.5 Transition forestry for Mine site rehabilitation

In a good number of MSG islands, there was a mining wealth which, so was thought, hoped for, and speculated with, would drive development and prosperity. PNG and New Caledonia are the two examples how that vision has ‘worked out’: It was not prosperity and harmony it brought, but in the case of PNG the vast majority of communities would agree that ‘resource curse’ is the most appropriate description of what happened. Like in forestry but even at a much larger- and perhaps even greedier- scale. Few of these mines or logging ventures- and we would suggest to treat them together as they are part of the same phenomena and need a synchronized approach to rectify. With a growing number of mines, and logging concessions, now well advanced towards exhaustion of ores or timber we see an enormous environmental damage in their wake, whose scale is different to appreciate to the ones who have not seen it firsthand. Mining – and logging companies- after such enormous harm, and then, after they had finished, are allowed to just walk off. As we have seen over the past months, for coal in Indonesia, for Nickel and coal also in Australia, also in PNG, if they cannot do that: they just declare close down, declare bankruptcy and move elsewhere, where they start the devious cycle again. In our opinion the failure to manage that process is the biggest failure in governance in human history and future generations are settled with mounting costs, the present is hardly able to meet. This applies particularly in Melanesia where mining and logging companies found it easier to manipulate communities than government.

There are now an increasing number of class actions of communities from development countries against foreign industry which have destroyed their environments

The conclusions of THE PTTEPAA Mining Blowout Inquiry in Indonesia

Conclusion - The overall outcome appears to be as follows: a).PTTEPAA failed to properly investigate the circumstances and likely causes of the Blowout. Its failure to do so was manifestly unreasonable; b). in the seven months since the Blowout PTTEPAA has supplied a good deal of false and misleading information to NOPSA and to this Inquiry; c). PTTEPAA only acknowledged the nature and extent of its deficiencies with respect to well control at the Montara Oilfield in circumstances where, practically and legally, and could not do otherwise This was the inquiry from 2010 (), Now 3.8.2016, 13 000 fishermen from Indonesia whose livelihood in see weed harvesting was destroyed have fined the company for 200 million.

Figure 22 Mine site Rehabilitation as a new Community Industry



This Wikipedia image shows a typical Nickel mining legacy on New Caledonia. The nickel has been in most likelihood just been ‘transported’ (slid) down the slope to the coast and as was the case in Canala, it has destroyed a deep sea harbour which would have been one of the great locations for the 308 000 Australians alone which visit NC on Cruise ships every year.

How can communities which have are/been badly affected by present/past mining be restored after mines are closed down. Perhaps they can be restored along with the land, by becoming the agents of restoration after mine site desertion. It is suggested that with the current need and opportunity of revegetation/reforestation for climate change mitigation there is an obligation of the mining industry (in a ‘climate’ of world opinion, which has become much less forgiving as to their transgressions) an obligation of governments to make that happen and an opportunity for government departments working with INGOS and communities to make that happen (Pintaud et al.,1999).

If one looks at the endemism of unique species of the region, reads about the wide range of plant products just from several species of palms in the Pacific, all poorly used and documented as FAO laments, and adds a discerning multi-billion horticultural industry around the world, there is indeed scope for development.

Nor is the scope of development restricted to ‘conventional’ and visible forest products. As the Member of Parliament from Bougainville, Timothy Masin dreams, there is even redemption potential for a mine such as Panguna (more or less the cause of a civil war) Melanesian people start dreaming about.

Case Study: FROM MINING TO MINE- SITE RESTORATION AND TOURISM

After decades of destructive, divisive -to the point of war- foreign mining and logging in Melanesia there are increasingly calls to reverse that process. They have also been gaining momentum and give more substance and impetus for a general reformation in the mining and forestry sectors which gives

precedence to restoration and community ownership. None of them goes as far as the vision of South Bougainville MP Timothy Masiu expressed in the Post Courier 19. October, 2016 in Port Moresby, PNG.

‘Old Panguna mine site is a tourism gold mine’



From: Post Courier, OCTOBER 19, 2016 · 11:04 AM

SOUTH Bougainville MP, Timothy Masiu says the old Panguna mine site is a tourism gold mine. It can become the gold mine for the Bougainville region if it is developed as a tourism attraction, he said.

“Rather than talking about re-opening the mine, I am saying let us turn the old mine site into a major tourism attraction by building the necessary infrastructure. Tourism in Panguna is our new gold mine. “There are a lot of former foreign employees of Panguna mine who would want to revisit the mine site with their children. Yes, there may be law and order issues but let us build around it. It is a problem experienced everywhere in the world so that should not stop us.”

Mr Masiu outlined his dream for the former gold mine while acknowledging and supporting plans by the Siwai District Tourism Association to develop tourism in the district. Like-minded business individuals in the Siwai district which is in South Bougainville electorate have formed the association as the first step towards developing the tourism venture. On Friday last week, association secretary Peter Siunai held an impromptu meeting with the Member and outlined the association’s ambitions. He told the leader the association has set a timetable within which to work and achieve certain targets but needed a good business structure (plan). He said the association has identified tourism products and needed support to develop attractive and viable tour packages. Mr Siunai spoke passionately about the huge tourism potential which include abundant war relics and tracks, bush tracking, bird watching, cultural activities and traditions, and surfing at Mamagota beach. Member Masiu told Mr Siunai that he would assist to get the association registered with the Tourism Promotion Authority. He encouraged the association to develop affordable tour packages and establish a local tourism network.

While such rather ambitious tourism vision is unlikely to become reality in the near future it draws our mind into an alternative path, a process of healing and the responsibility of the miners who implemented such past horror visions of WRONG, to address them. It also shows a ‘willingness for change’ which might, just might, make that possible. The tourism vision would no doubt gain dramatically if it would be around the restoration of the mine site and there is a path to the funding provided by the ones who were responsible for it. It is called addressing old wrongs. We do not believe that mines, which make many billions from landscape wide destruction as in Panguna mine should be exempt from providing the funds to restore the sites. This is now happening in New Caledonia where in 2013 a law has been passed as to that effect. Melanesia has to make sure it happens in all the other mines, providing the jobs and resources they failed to provide while the operation was ongoing.

4.6 Silvi-cultural Management of Logged sites and Secondary Forest

With millions of hectares of logged over forest, the need and opportunity to restore those is a potential which exceeds that of (I)NGOs. It will have to be one of the main tasks for the new community foresters who guide communities, carry out technical tasks, help develop and organize product sales and oversee plantation and forest restoration activities. Funding for that will come from the FTF and progressively supplemented with product sales. All this would be the state's contribution to community development, slowly complemented from revenue and taxes from the sale of products.

4.7 Replanting Programs for Native Forests

One of the major jobs for the community foresters in MSG will be to give communities technical support and oversee the silvi-cultural treatment and assisted planting and regeneration of logged over and degraded forests. For the vast areas in Vanuatu where an exotic climber prevents native regeneration CFs will not use expensive, unaffordable and environmentally destructive herbicides but will rely on livestock pastoral management techniques and carefully managed competition from re-growing native species. There is a considerable body of research supporting those aims.

4.8 Establishment of a Community nursery industry

If, as the ACIAR study on the establishment of 69 000 ha of whitewood plantations on Santo/Vanuatu alone, would be carried out (we would of course recommend a mix of species) at a planting rate of 200 -500 plants per hectare this would require a total of 7- 18 or so millions of seedlings for Efate alone. If we now assume that this would be a growth industry which would accompany planting there would be an annual requirement of some 1-2 million plants. At a price of several vatu, with additional sales of Sandalwood and other plants the Team of Dick the forester already experiments with, one would estimate that some 10 nurseries employing 5- 10 people, preferably women who tend to be better at that, would be a nice little village industry which could develop around planting on that island alone. If we extrapolate such nursery ventures around the MSG countries, combining them with mine site rehabilitation paid for by the mines as we saw in Canala, New Caledonia, training programs for that, also paid for by the mines, one can see that with some seed funding to get it started a community movement around planting and nurseries and forest rehabilitation could be started employing thousands of people. It would also, as a co-benefit, establish 69 000 hectares on that island alone of carbon plantings which will sequester at least 25 tonnes of CO₂/ha x 69, 000 which would equal at USD 10/tonne, a carbon income of more than USD 15 million. More importantly the valuable whitewood, which can be sold sawn on the Japanese markets for USD 700+, if it is produced, processed and marketed properly, there would be a timber resource around that which would be worth much more than that. A win-win situation however one looks at it. Only forestry departments can make it real

4.8.1 Case Study 16: A new Business - Nurseries for plantations in Bhutan

In the Mongar district of Eastern Bhutan where we funded the local Community Forestry Management Group (CFMG) group (one of more than 600 across Bhutan) to establish a plantation for the area, the farmer who grew the little trees they needed, several 1000, was

enthusiastic when we visited him. He had found out, that planting aside, just growing the seedlings had turned into good business. He tells us that last year he made more from the sale of surplus seedlings than from his agriculture. He is going to keep it on.

4.9 Financing the MSG-NFE:

The amount of funding put aside for environmental management including forestry in developing countries has grown progressively over the past years but there are also many recipients around, including ones which have become the middlemen of a transactional industry dominated by western and developed nations. We believe, that instead of developing more and more projects, UN etc. ones but also increasingly run by INGO's, (which, to be frank, compete with forest departments, often by recruiting some of their best staff as I have observed in many parts of the developing world over 30 years) and it is of the utmost importance now to (re) develop, better fund and in some ways redesign the government institution which was developed to look after forests: Forestry Departments. Much of the funding as currently mobilised is now going towards transactional studies on Carbon Forestry, methodologies and restoration projects at the community level. It needs to be ensured that these are coordinated and owned by the states, fully supporting these institutions instead of competing with them (for funds and staff). In order to do so however the state has to develop forestry around communities. It also has to develop the capacity which comes too often from projects. Far from being a hindrance this is probably more likely to be the catalyst which can make this happen.

The former will require the training of hundreds of new community foresters in the region and there is now the opportunity and funding to do that. The institutions are there. The expertise is there. The university sector is there and just needs the funding to develop such program, in collaboration with colleges and NGO's at lower and complementary levels. Even foreign universities to participate, if such is a good idea, are there. Career paths need to develop for the students which come out of that training.

At the same time there needs to be an unprecedented effort in the development of forest related business. Such does not require community education or awareness programs. They need the development of a business plan and funding for starting.

We suggest, that a focus on the development of sustainable business around forest products is a priority now, and this includes small scale tourism and that a regional funding body is one to ensure that a grant and project culture can be transformed into sustained and supported action environment which will increasingly be supported by the countries themselves. We suggest three strategic changes to sustain such a transition:

- From 'Research and Training' to a Business Plan & a Bank;
- Under one Roof- Mixed Livelihood COOP support Centres as a Business model; and
- The Forest Transition Fund (FTF) as an independent Regional Funding Body.

4.50 From Research and Training to a Business Plan & Bank

So what is the 'development model' for the Pacific, and in particular its forest estate with its many conservation treasures? There are as many ideas around that as are development partners, government agencies, INGO's and travelling academics. They all agree that research and more of it is required. SO is training, community training in particular the INGOs tell us. And then of course we need to establish protected areas and world heritage areas, and now, with climate change plant many and more trees, especially mangroves. We

should also, some conservationists tell us, not eat Native Pigeons or Flying Foxes, a speciality across much of the Pacific (YAK!) and coconut crabs should be off the menu because too many tourists want them and some villagers who want to make some cash collect too many, and for the turtles we best make a moratorium as Fiji has done, proudly assisted by WWF.

While all that is very well, we are all for it, in moderation at least and in principle, it has often failed to deliver. The point is we have been doing this over the past 30 years yet rarely seen the changes needed. Sure, there will be many little and not so little successes, more failures we fear, but as long as we care, the money will keep rolling in. Business for all and Business As Usual (BAU) as we say proudly in our economo-lingo we all started to talk.

Let us make an example on that not so easy transition between research and training and a good idea, and a business which works. A good example how this can be started seems to be the Agar wood trade in a remote community in PNG and students from a US university:

4.5.1 Case Study 17: Agarwood as a Community forestry opportunity 'par excellence' in PNG

Community Forestry can only work if forest products can be found in sufficient quantities and quality and do not require expensive investment. Communities do not have that money and our current bank system (perhaps except RABO Bank) would never give them loans. I can think of two products however, and I am sure there are more, where a well written business plan would secure the funding. This criteria is being met by two tree species agarwood and sandalwood which are sold by the kg not cub metre. Let me briefly describe here the situation for Agarwood.

4.5.2 Description of the product Agarwood

Gaharu or Agarwood (or just Agar) is the resinous heartwood from *Aquilaria* trees, large evergreens native to southeast Asia. The trees occasionally become infected with mold and begin to produce an aromatic resin in response to this attack. As the infection grows, it results in a very rich, dark resin within the heartwood. The resin is commonly called gaharu, jinko, aloeswood, agarwood, pokok karas or oud (not to be confused with 'Bakhoor') and is valued in many cultures for its distinctive fragrance, and thus is used for incense and perfumes.

Here are some figures I found on internet:

- Annual Gaharu exports from Malaysia amounted to RM72mil a year.
- **Agarwood Harvest Returns:** Plantation grown Agarwood trees are able to be harvested after only 7 years. Inoculation process is applied when the tree is 5 years old and produces excellent Agarwood over the 2 years.
- Biggest consumers of agarwood products are the Middle East, Taiwan and Japan. NOTE: China is now the biggest consumers of gaharu with an import of 500 tons a year. info source
- Biggest exporter of gaharu is Indonesia.
- Indonesia's highest quality of gaharu comes from the *Aquilaria filaria* species.

A growing number of business people have of course already realised that potential and develop the markets. Even just selling seedlings for the development of that industry is already an interesting little business

Gaharu seedling for sale. For sales enquiry, please write to gaharuonline@gmail.com. Prices range from RM10 to RM20 per sapling

Cultivated Agarwood - Training programs and Research in Papua New Guinea

PNG with its seemingly endless potential for natural surprises comes in again. With the usual cycle of exploitation and agarwood decline in full swing in Indonesia, Papua New Guinea has emerged- and been referred to- as the "Last Frontier" for agarwood (also called eaglewood, oud or gaharu) in natural forests. In PNG, species of *Aquilaria* and *Gyrinops* produce agarwood and trees may still be found in relatively large numbers at some remote forest locations. The genus, *Gyrinops*, is closely related to *Aquilaria* and in the past all species were considered to belong to *Aquilaria*. Morphological differences suggest to some researchers, however, that *Gyrinops* is a more appropriate genus to classify the trees growing in PNG.

Agarwood was first discovered and harvested in PNG in the late 1990's. Although the harvesting of trees for agarwood began only a few years ago, there are already now serious concerns that indiscriminate cutting will rapidly deplete the natural *Aquilaria* and *Gyrinops* resources as it has done in Vietnam and other countries.

There are initiatives now to prevent this from happening and they describe their activities as follows:

'A program for the sustainable production of agarwood has been initiated. Our work in PNG, in cooperation with the Rainforest Project Foundation and the United Nations Food and Agriculture Organization, includes research and training programs for rural villagers to produce cultivated agarwood. The sustainable management of Papua New Guinea's agarwood will help protect and preserve old growth trees while supplying cultivated agarwood from managed forest sites. Our training programs and workshops are bringing new technology to the people of PNG. Pilot field demonstration sites are being established in four provinces (Central Province, East Sepik Province, Enga Province and the Gulf Province).'

The promoters of this project, students from a US University with their lecturer are ready to collaborate and I know of a range of initiatives like this which have taken off. Many of them however also have collapsed, in development and developed countries, because the business model was not right.

'These research and training efforts are an enormous endeavor and we actively seek new funding sources to carry out this important work. If you or your employer are interested in supporting our efforts, tax deductible donations can be made to a special fund at the University of Minnesota. See the "contributions page" of this web site'.

So how can that plan- and it is a good one we think- be transformed into appropriate development. we suggest for this project on new livelihoods, here around NTFPs, and for all the other good ideas: training and research can go on and are important, they might even become an income earner itself (there is a still hugely unexplored potential in education and research tourism- the Minnesota students are a good example for that). But what is MUCH more important, is **a visit to a Bank- with a Business Plan in hand- NEVER WITHOUT.**

Training Programs and Research are normally what the Academic sector can think of and how could we ridicule them for that. That is their job. But it requires more, essential as a good start as it is. It requires the interest, support and funding of investors who have the money, a vision and are what we call 'ethical' (see ethical investors). There are some around, also in the Pacific such as **RABO Bank** and **Mutual Banks** (working as Cooperatives with their unique and UN supported system of governance, benefit sharing and community ethics),

making them, surprising to some, also the most efficient banks. During discussions with them for the founding of the Australian Carbon Cooperative Ltd. (ACC), at a high level mutual bankers CEO meeting in Sydney, an initiative to develop a structure which supported landowners to participate and benefit from natural forest regrowth on their farms, they were all (their CEOs) highly interested, thought it was a great idea and were ready to invest in it. BUT THEY ALL WANTED A BUSINESS PLAN (which we eventually had, useless as it proved as the government had, with its resistance towards climate change action, removed the major business case). We suggest that there would be many business worthy projects which would receive guarantee's given by UN, WB even an INGO. Banks just have to be told about it. They HAVE NO IDEA, we found, but are great listeners and come up, once they understand, with promising plans. They are not the usual banks, but they also want a viable business plan. There would be enough business people in the business sector, including lawyers, who would fit that bill, they just mostly do not know about such 'ventures' because they rarely meet, let alone talk to developers of such projects.

A Green Business Development Forum – MACROECONOMICS-at MSG Secretariat

MSG is a political trade agreement. It still seeks its role in the Pacific which has quite a few and much larger regional organisations such as SPC and SPREP. Organisations and development partners such as the regional UN and INGO who are doing many good things and are-would be- great partners for MSG should not be considered competitors but complementary partners of development for the common good of all.

Bringing together such unlikely partners could well become one of the major roles of MSG Secretariat (and of course around the MSG Regional Transition Foundation) and there would be no better place to start than with forestry which hovers, haplessly so, between a compromised and not very happy past and a potential future role around new concepts, products and climate change action which can define its and the region's future. Agarwood is just one of the many minor products. Similar ones are Sandalwood, or whitewood or Kwila plantations even coconut crab ranching, community& industry based tourism partnerships, wood carving, coconut, and nursery businesses of the many millions of plants needed and so on and on and on.

The 'want to be developers' of such products, like the agarwood communities with 'their' students from Minnesota University, are all out there, we have met quite a few in Vanuatu, for example who try very hard and try, unsuccessfully so, by themselves to develop a black bean market. What they do need is meet the right people, be supported with business information, be able to exchange ideas, develop industry codes of practice and standards, negotiate and develop of the right business ideas and get development grants. In short, they need a guidance and forum to make this happen. MSG Secretariat comes to mind.

4.5.3 Case Study 18: An innovative National Loan Scheme to promote Business development in the Environmental -hospitality Industry. An example from Bhutan

A Bhutanese friend and colleague, also Bhutan's National REDD+ expert, is currently building a reasonable sized hotel in one of its most beautiful locations (and that says something). He received a bank loan for that. With a commendation from the government, he went to the National Bank with a Business Plan and now he is building the Hotel – to be completed end of the year. The Bank loan he received will charge no interest for the first two years; the government will not tax him for some number of years. The Bank's security is the Hotel which, once finished, will certainly exceed the value of the loan. This seem to be an excellent idea as it spreads the risk and allows something to happen which would never happen without such arrangement.

One could imagine that an organisation such as MSG could, with its status and such a model, approach one of the major ethical Banks, RABO for instance - it manages already many agricultural and innovative loan schemes for small farmers in the Pacific. MSG would fulfil the critical role of finding and helping develop the projects and a business plan and go to the bank partner to secure funding.

It could be as simple as that and it happens in just about every sector it seems except in the environment and with environmental products. There, so it seems, it is always the opportunistic and the crooked who move first, while the State fails to regulate, the UN writes reports and has meetings and so on.

BIBLIOGRAPHY

AGDFA&T, 2016. SOLOMON ISLANDS Fact Sheet

Ambia V., 2005. *Global forest resources assessment 2005: Papua New Guinea country report*. PNG Forest Authority, Port Moresby.

Amborella Genome Project. ,2013. *The Amborella Genome and the Evolution of Flowering Plants*. Science 2013, vol. 342, no. 6165, 1241089; doi: 10.1126/science.1241089

Ames, M., 1998. *Assessing the Profitability of Forest-based Enterprises*. pp 107-136 in: Wollenhaupt, E and A. Ingles (eds.), 1998. *Incomes from the Forest- Methods for the Development and conservation of forest products for local communities*. Center for International Forestry Research, Bogor, Indonesia. MST Grafika Desa Putera, Indonesia.

Annual Market Review, pp. 107–116. Geneva, United Nations Economic Commission for Europe (available at www.unece.org/fileadmin/DAM/timber/publications/10.pdf).

Annual Reports, Central Bank of Solomon Islands. < <http://www.cbsi.com.sb/index.php?id=105> > (accessed).

Anon. (2002) *Solomon Islands human development report 2002: building a nation*. Volume 1. Main Report. Honiara: Government of the Solomon Islands.

Anon. (2009) *2009 national population and housing census*. Port Vila: Vanuatu National Statistics Office.

Anon. (2012) *Preliminary figures, Papua New Guinea census 2011*. Port Moresby: National Statistical Office of Papua New Guinea.

Anon. (undated) *Republic of Vanuatu national adaptation programme of action*. Port Vila: National Advisory Committee on Climate Change.

Aru, R, JD Nichols, JC Grant, AJ Leys, K Glencross, M Sethy and K Convery, and R Viranamangga 2012. *Constraints to whitewood (Endospermum medullosum) plantation development on Santo Island, Vanuatu*. International Forestry Review Vol.14(4), 2012

Austin, Kemen, Ariana Alisjahbana, Taryono Darusman, Rachmat Boediono, Bambang Eko Budianto, Christian Purba, Giorgio Budi Indrarto, Erica Pohnan, Andika Putraditama, Fred Stolle. 2014. *“Indonesia’s Forest Moratorium: Impacts and Next Steps.”* Washington, DC: World Resources Institute. Available at www.wri.org.

Auty, Richard M. 1993. *Sustainable Development in Mineral Economies: The resource curse thesis*. London: Routledge.

Baines, G. 1981. *MANGROVE RESOURCES AND THEIR MANAGEMENT IN THE SOUTH PACIFIC*. SPREP/Topic Review 5. Available at:

- Barker, P., 2011. *Special Agricultural Business Leases (SABLs): A Preview*. Institute of National Affairs, February 2011. Available at: http://www.inapng.com/pdf_files/SABL%20brief%20-%20for%20March%20Girls%20OP%20workshop%20Feb%202011.pdf, accessed 13 September 2012.
- Bauer, J., 2016a. *Wildlife Management in the Tropics -An Overview*. *Tropical Forestry Handbook*, Springer-Verlag Berlin Heidelberg.
- Bauer, J., 2016b. *How Environmental and Societal Changes affect Wildlife in the Tropics*. *Tropical Forestry Handbook*, Springer-Verlag Berlin Heidelberg 2015
- Bauer, J., 2016c. *The Development of Wildlife Governance, Science and Management*. *Tropical Forestry Handbook*, Springer-Verlag Berlin Heidelberg 2015
- Bauer, J., R. Olthof, D., Pathel, W. 2007. *Community Based Tourism at the South Andaman Coast*. Interim Report. Andaman Coast Sustainable Tourism Project. Government of Queensland and Office of Tourism Development , Bangkok
- Bauer, J., T. Samdrup, and T. Wangchuk, 2015. *18. Participatory Forest Management and Climate Change Mitigation*. Outcomes from National Workshop Series (20.7 - 30.7.2015). 1st Interim Report FAO Project, TCP/BHU/ 3501.
- Bauer, J., T. Samdrup, and T. Wangchuk, 2015. *Strengthening the Role of Communities in Climate Change Mitigation through Participatory Forest Management in Bhutan- Profiling five Pilot studies*. Outcomes from National Workshop Series (20.7 -30.7.2015). 2nd Interim Report FAO Project, TCP/BHU/ 3501.
- Bauer, J.J., Birkhead, J., Sakulas, H., DeLacy, T., Thwaites, R., B. Furze & J. Iland (1999) *Biosphere Reserves in Papua New Guinea- A model for the Future?* Wau Ecology Institute, Wau, Papua New Guinea. Report, Johnstone Centre, Charles Sturt University
- Bauer., 2013. *Australian Carbon Co-operative* Guest Blog International Year of the Co-operative 2012. Available at: <http://www.australia2012.coop/news-and-events/latest-news/april-2013/new-co-ops-provide-exciting-prospects>
- Bauer., 2013. *Australian Carbon Co-operative* Guest Blog The Ecological Agriculture Australia Association. Available at: <http://ecoag.org.au/australian-carbon-co-operative/>
- Bauer,J, S. Wapot, D. J. Birkhead, and A. Herr (2012). *From Bystander to Actor: Developing cooperative frameworks and models for indigenous and landowner participation in REDD+ and climate change adaptation -perspectives from PNG and Australia*. Invited paper, UN Expert Meeting on: Climate Change Mitigation with Indigenous Peoples: Practices, Lessons Learned and Prospects.”Cairns, 26-28th March.
- Bauer,J., S. Noakes and S. Plathong, 2008. *Reef-based Tourism and Tourism Networks*. Report. Andaman Coast Sustainable Tourism Project. Government of Queensland and Office of Tourism Development , Bangkok
- Bayliss-Smith, T., Hviding, E. and Whitmore, T. 2003. Rainforest composition and histories of human disturbance in Solomon Islands. *Ambio* 32: 346-352. CBSI, 1995 - 2014.
- Bekele, M, 2001. *THE FOREST REVENUE SYSTEM AND GOVERNMENT EXPENDITURE ON FORESTRY IN ETHIOPIA*, Ministry of Agriculture,, Addis Ababa, Ethiopia, FAO

- Forestry Policy and Planning Division, Rome, Regional Office for Africa, Accra, July 2001
- Belcher B and K Schreckenberg, 2007. *Commercialisation of Non-timber Forest Products: A Reality Check*. Development Policy Review, 25(3).
- Bennett, J. A. 2000. *Pacific Forest*. Cambridge, UK: The White Horse Press.
- Bennett, J. A. 2000. Pacific Forest: A History of Resource Control and Contest in the Solomon Islands C.1800-1997: Brill Academic.
- Berdach, J. T. and Llegu, M. (2007) *Solomon Islands: country environmental analysis*. Manila: Asian Development Bank Mainstreaming Environmental Considerations in Economic and Development Planning Processes Project.
- Berdach, J. T. and Mandeakali, L. (2004) *Papua New Guinea: country environmental analysis*. Manila: Asian Development Bank Mainstreaming Environmental Considerations in Economic and Development Planning Processes Project.
- Birckhead, J., J. J. Bauer & H. Sakulas, (2000) *Caring for Country today- towards an ecopolitics of indigenous land management regimes*. In Craig, J. and D. Saunders (eds.) Conservation in Production Landscapes, Surrey Beatty and Sons. Sydney.
- Bird, A, A Wells, F van Helden, R Turia, 2007. *What can be learnt from the past? A history of the forestry sector in Papua New Guinea*. Papua New Guinea Forest Studies 1 Overseas Development Institute January (ODI) 2007. Available at:
- Brack C.L. 2011. Improving forest inventory in Papua New Guinea: moving away from the 1% strip-line survey. In 'Native forest management in Papua New Guinea: advances in assessment, modelling and decision-making', ed. by J.C. Fox, R.J. Keenan, C.L. Brack and S. Saulei. ACIAR Proceedings No. 135, 69–76. Australian Centre for International Agricultural Research: Canberra.
- Brown, J. K. 1974 Handbook for inventorying clowned woody material. U.S.D.A. Forest Service General Technical Report INT-16. Intermountain Forest & Range Experiment Station, Ogden, UT. 24 pp.
- Brown, C 1997. *ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY WORKING PAPER SERIES*
- Bruenig, E F, 1990, *Tropical forest resources, Resource Management and Optimisation*,
- Brunet, S., Bauer, J.J. and T. DeLacy and K. Tshering, (2001): *Tensions between Tradition and Modernity-Tourism Development in Bhutan*. J. Sustainable Tourism 9 (3):243-263.
- Bryan, J. 2011. Forest Inventory Mapping System Pilot Upgrade and Biomass Assessment. University of Papua New Guinea, Remote Sensing Center, Papua New Guinea.
- BSIP, British Solomon Islands Protectorate. 1960-1970. Annual reports. Solomon Islands National Archives, Honiara: Solomon Islands.
- CEPF, 2013. *Ecosystem Profile East Melanesian Islands Biodiversity Hotspot*. Critical Ecosystem Partnership Fund. avail.at.: http://www.cepf.net/SiteCollectionDocuments/east_melanesian_islands/EMI_ecosystem_profile.pdf

CHAIN OF CUSTODY PROCEDURES FOR TIMBER AND TIMBER PRODUCTS, Draft
Version 2, A MANUAL PREPARED UNDER THE ACP/FLEGT SUPPORT
PROGRAMME (GCP/INT/064/EC) FOR SIERRA LEONE available at:
http://theredddesk.org/sites/default/files/coc_procedure_timbpdtsv21_1.pdf

Chamala et al. *Assembly and Validation of the Genome of the Nonmodel Basal Angiosperm Amborella*. Science 2013, vol. 342, no. 6165, pp. 1516-1517; doi: 10.1126/science.1241130

Choiseul Integrated Climate Change Programme. Briefing Note. Accessible at:
[https://www.sprep.org/attachments/Publications/CC/CHICCHAP Solomon Islands Briefing note.pdf](https://www.sprep.org/attachments/Publications/CC/CHICCHAP_Solomon_Islands_Briefing_note.pdf)

CIA , 2014. Import Partners of New Caledonia". CIA World Factbook. 2014. Retrieved 2015- 07-18.

CIA, 2014. Export Partners of New Caledonia". CIA World Factbook. 2014. Retrieved 2015- 07-18.

CIFOR. 2016. *CIFOR Strategy 2016–2025: Stepping up to the new climate and development agenda*. Bogor, Indonesia: CIFOR.

Colchester M., Boscolo M., Contreras-Hermillosa A., Gatto F.D., Dempsey J., Lescuyer G., Obidzinski K., Pommier D., Richards M., Sembiring S.S., Tacconi L., Rios M.T.S., and Wells A., 2006. *Justice in the forest: Rural livelihoods and forest law enforcement*. Forest Perspectives 3, Center for International Forestry Research, Bogor.

Colfer, CJP, and Daro Minarchek, R. 2013. *Introducing 'the gender box': A framework for analysing gender roles in forest management*. International Forestry Review 15 (4):1-16.

com/documents/acrobat/sbdmr.pdf Mather, A., 1992. *The forest transition*. Area 24, 367–379.

Cooper "TF, M.P. Lincoln Smith", J.D. Bellr and K.A. Pitt ', 2000. *Assessing the effects of logging on coral reefs in Solomon Islands*. Proceedings 9 6 International Coral Reef Symposium, Bali, Indonesia 23-27 October 2000, Vol. 2

Danagro, 1997. *Forestry Issues in the Pacific: Summary of an EC-commissioned Study*. Available at: <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/1122.pdf>

Dauvergne, P. 1997. Corporate Power in the Forests of the Solomon Islands, Working Paper 1997/6, Department of International Relations, Research School of Pacific and Asian Studies, The Australian National University, Canberra.

Davis, A. Graham and John E. Tilton. 2002. *Should Developing Countries Renounce Mining? A perspective on the debate*. A study for the International Council for Mining and Metals. <http://www.icmm.com/uploads/62TiltonDavisfinalversion.pdf>

De Jong, Wil, Mari Momii and Daisuke Naito, 2016. *Timber consumer countries should join forces and coordinate legislative measures to eliminate illegally sourced timber from their markets. addressing illegal timber in Asian supply chains*, Summary and Findings.

- February 29th, 2016. Inamori Center, Kyoto University Kyoto Japan. Available at: <http://www.cias.kyoto-u.ac.jp/event/?p=426>.
- degradation in Papua New Guinea*. Annals of Forest Science, Springer Verlag/EDP Sciences,
- Department of Reform Planning. Development Plan (NERRDP) 2003 –2006. Honiara, Solomon Islands: *during 2000 2013 on Choiseul, Solomon Islands* On behalf of: SPC/GIZ Regional Project
- DiJohn, Jonathan. 2002. 'Mineral Abundance and Violent Political Conflict: A Critical Assessment of the Rentier State Model.' Crisis States Programme Working Paper Series No. 1. London: Development Studies Institute, LSE.
- Dinnen, S. and Firth, S. Eds. 2008. Politics and state building in Solomon Islands. The Australian National University E Press and Asia Pacific Press.
- Economist Intelligence Unit (2003) *Country profiles: Pacific islands 2003*. New York: Economist Intelligence Unit.
- Environment Concerns Action Network of Solomon Islands (ECANSI). 2004. *Reports on Forest Advocacy Workshops in Kolombangara and Isbael*. Honiara, Solomon Islands
- Environmental GROUP 2011. *A PROPOSED PES S Y S T E M F O R PAPUA NEW GUINEA*. Environmental GROUP A home grown operational framework, ensuring transparent & equitable benefit sharing, with maximum benefits reaching the actual environmental serviceproviders; the local communities. MEMBERS Mama Graun Conservation Trust Fund (PNG), Amazon Fund (Brazil), other Conservation Trust Funds, Sovereign Wealth Fund (PNG and other countries), Superannuation Fund (PNG), PNG Sustainable Development Program. For more information contact ECG Coordinator Peter Dam: peter.c.dam@gmail.com Draft 2.0 September 2011
- Evans BR (1996). Overview of resource potential for indigenous nut production in the South Pacific. In: Stevens ML, Bourke RM and Evans BR (1996). *South Pacific Indigenous Nuts*, ACIAR Proceedings No. 69.
- FAO (2011b) *State of the world's forests*. Rome: Food and Agriculture Organization of the United Nations.
- FAO, 2001. *The forest revenue system and government expenditure on forestry in Nigeria* A paper prepared for the FAO work-programme component on financing sustainable forest management, Working paper: FSFM/WP/02. avail. at:
- FAO, 2016. GLOBAL FOREST RESOURCES ASSESSMENT 2015 How are the world's forests changing? Second edition, Rome 2016. <http://www.fao.org/3/a-i4793e.pdf>
- FAO. 2010. Global Forest Resources Assessment 2010. Rome (available at www.fao.org/forestry/fra/fra2010/en/).
- FAO. 2013. FAO Yearbook of Forest Products 2009–2013. Rome (available at www.fao.org/3/a-i4746m.pdf).
- FAO. 2014. State of the World's Forests 2014. Enhancing the socioeconomic benefits from forests. Rome (available at www.fao.org/forestry/sofo/en/).

- FAO. Country Reports. Rome (available at www.fao.org/forest-resources-assessment/current-assessment/country-reports/en/).
- FAO/USP, 2008. *Regional Seminar on Good Governance in Land Tenure and Land Administration*, Suva, 16-18 July 2008,
- FAO/USP/RICS, 2002. *Foundation South Pacific Land Tenure Conflict Symposium*, Suva, 10-12 April 2002, University of the South Pacific School of Land Management and Development
- Fernholz, K. & Kraxner, F. 2012. Certified forest products markets, 2011–2012. UNECE/FAO Forest Products
- Fiji, Forestry Department, 2011. *Fiji REDD+ Policy*. Secretariat of the Pacific Community
- Filer C, RJ Keenan, BJ Allen and JR Mcalpine, 2009. *Drivers of Deforestation and Forest Degradation In Papua New Guinea*. Ann. For. Sci. 66 (2009) 813 Available online at: INRA, EDP Sciences, 2009 www.afs-journal.org DOI: 10.1051/forest/2009067
- Filer, C, Rodney J. Keenan, Bryant J. Allen, John R. Mcalpine., 2009. *Deforestation and forest degradation in Papua New Guinea*. Ann. For. Sci. 66 (2009) 813.
- Filer, C. [ed.]. 1997. *The political economy of forest management in Papua New Guinea*. NRI monograph 32.NRI, Port Moresby and IIED, London.
- Filer, C. 1990. 'The Bougainville Rebellion, the Mining Industry and the Process of Social Disintegration in Papua New Guinea.' In R. J. May and Matthew Spriggs (eds), *The Bougainville Crisis*, Bathurst: Crawford House Press. pp. 112–40.
- Filer, C. 2012. *Why green grabs don't work in Papua New Guinea*. J. Peasant Stud. 39, 599-617.
- Filer, C. with Sekhran, N. 1998. *Loggers, donors and resource owners. Policy that works for forests and people* series no. 2: Papua New Guinea. NRI, Port Moresby and IIED, London.
- FLEGT, TACKLING FOREST ILLEGALITY IN AFRICA, THE CARIBBEAN AND THE PACIFIC SUCCESSES, CHALLENGES AND WAYS FORWARD available at: <http://www.fao.org/forestry/37833-023fbe0b4e72feefe4b823e2ffe4d19fb.pdf>
- Forestry and Timber Section Issue : 2015 *UNECE Forests, Land and Housing Division Begin Year* : 2010 United Nations End Year : 2014 Palais des Nations CH-1211 Geneva 10, Switzerland E-mail : stats.timber@unece.org
- Fox J.C., Yosi C.K. and Keenan R.J. 2011b. Assessment of timber and carbon stocks for community forest management. In 'Native forest management in Papua New Guinea: advances in assessment, modelling and decision-making', ed. by J.C. Fox, R.J. Keenan, C.L. Brack and S. Saulei. ACIAR Proceedings No. 135, 42–52. Australian Centre for International Agricultural Research: Canberra.
- Fox J.C., Yosi C.K., Nimiago P., Oavika F., Pokana J.N., Lavong K. et al. 2010. Assessment of aboveground carbon in primary and selectively harvested tropical forest in Papua New Guinea. *Biotropica* 42, 410–419.

- Frazer, I. 1997. *The Struggle for control of Solomon Island forests*. The Contemporary Pacific 9: 39-72.
- FSC (The Forest Stewardship Council A.C.) 2010. KFPL public certification report. (URL:<http://fsc.force.com/servlet/servlet.FileDownload?file=00P40000004bnvjEAA>). (Last access: March 2013).
- FSC (The Forest Stewardship Council A.C.): URL: <https://ic.fsc.org/> -(last access: March 2013).I
- Gilman, E., H. Van Lavieren, J. Ellison, V. Jungblut, L. Wilson, F. Areki, G. Brighthouse, J. Bungitak, E. Dus, M. Henry, I. Sauni Jr., M. Kilman, E. Matthews, N. Teariki-Ruatu, S. Tukia, K. Yuknavage. 2006. *Pacific Island Mangroves in a Changing Climate and Rising Sea*. UNEP Regional Seas Reports and Studies No. 179. United Nations Environment Programme, Regional Seas. Available at: <http://www.unep.org/PDF/mangrove-report.pdf>
- Gilman, E., H. Van Lavieren, J. Ellison, V. Jungblut, L. Wilson, F. Areki, G. Brighthouse, J. Bungitak, E. Dus, M. Henry, I. Sauni Jr., M. Kilman, E. Matthews, N. Teariki-Ruatu, S. Tukia, K. Yuknavage. 2006. *Pacific Island Mangroves in a Changing Climate and Rising Sea*. UNEP Regional Seas Reports and Studies No. 179. United Nations Environment Programme, Regional Seas Programme, Nairobi, KENYA.
- Greenpeace, 2011. *Papua New Guinea Not ready for REDD*. www.greenpeace.org.au
- GIZ 2010-2015. 'Climate Protection through Forest Conservation in Pacific Island Countries'. 2009, 66 (8), Accessible at: <https://www.giz.de/en/worldwide/18149.html>
- Goro Nickel Project, 2011. Mining-technology.com. "Goro Nickel Project, New Caledonia". Retrieved 2011-02-10.
- GREGORY ALAN STEWARD , 2011. GROWTH AND YIELD OF NEW ZEALAND KAURI (AGATHIS AUSTRALIS (D. DON) LINDL.) A thesis submitted in fulfilment of the requirements for the Degree of Master of Forestry Science in the University of Canterbury by School of Forestry College of Engineering University of Canterbury New Zealand 2011
- Hall, A. (2008) Paying for environmental services: the case of Brazilian Amazonia. Journal
- Hanington Tate, 2013. *VANUATU FORESTRY OUTLOOK STUDY ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY II WORKING PAPER SERIES* Working Paper No. APFSOS II/ WP/ 2013/ 36
- Haughton, J., 1998. *CALCULATING THE REVENUE-MAXIMIZING EXCISE TAX* . African Economic Policy Discussion Paper Number 13. Suffolk University and Harvard Institute for International Development, USAID.
- Health Section, 2003. *Guidelines for Implementing a Multi-Sectoral Approach to HIV/AIDS* in Commonwealth Countries. Revised Version. Health Section. Social Transformation Programmes Division Commonwealth Secretariat Marlborough House, Pall Mall, London SW1Y 5HX United Kingdom March 2003
- Henderson, R., 2015. *REDD+ Demonstration Activities in Choiseul, Solomon Islands* International Climate Initiative Regional Project Climate Protection through Forest Conservation in Pacific Island Countries, Secretariat of the South Pacific and GIZ.

On behalf of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

Holzknicht, H. 1996. *Policy reform, customary tenure and stakeholder clashes in Papua New Guinea's rainforests*. Rural Development Forestry Network Paper 19c. ODI, London.

Horiguchi, K. and Sakulas, H. 1990. *A medicinal plant database of Papua New Guinea*. Science in New Guinea 16(1): 31-34.

<http://dfat.gov.au/trade/resources/Documents/solo.pdf>,

http://ips.cap.anu.edu.au/sites/default/files/SSGM%20IB%202013_10_Sharp.pdf

http://redd.unfccc.int/uploads/63_35_redd_20120817_recoftc_adaptation_case_studies.pdf

<http://siteresources.worldbank.org/INTEEI/214574-1112740068165/22251637/CostaRica09-LandUseChange.pdf>

<http://www.csdila.ie.unimelb.edu.au/publication/journals/Dispute%20resolution%20for%20customary%20lands.pdf>

<http://www.fao.org/docrep/003/x6818e/x6818e04.htm>

<http://www.unece.org/forests/fpm/onlineidata.html>

<http://customarylandsolutions.files.wordpress.com/2013/06/2007000053-boydell-et-al-2007-pifs-lmcm-3-1-review-of-financial-management-of-customary-and-other-land-in-the-pacific.pdf>

https://www.academia.edu/1640938/Baines_G.B.K._1981._Mangrove_resources_and_theirmanagement_in_the_South_Pacific._Topic_Review_South_Pacific_Regional_Environment_Programme_mimeo_6_pp

<https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/90.pdf>

Hunt, C. (ed.). 2002. Production, privatisation and preservation in Papua New Guinea forestry. Instruments for sustainable private sector forestry series. IIED, London.

Independent Forestry Review Team. 2001. *Review of forest harvesting projects being processed towards a timber permit or a timber authority*. Observations and Recommendations. Report prepared for the Inter-Agency Forestry Review Committee, the Government of Papua New Guinea.

Institut de la statistique et des études économiques de Nouvelle-Calédonie (ISEE). "Chiffres clés" (in French). Retrieved 2011-02-10.

Institut de la statistique et des études économiques de Nouvelle-Calédonie (ISEE). "Bilan économique et social 2007 - Échanges Extérieurs (on page 23)" (PDF) (in French). Retrieved 2008-05-29.

Islands Forestry Management (SIFM) Project Report. Honiara, Solomon Islands: URS Sustainable Development

- Jackson, R. 2005. *'The Challenge of Sustaining Mining Benefits.'* Mining and Environmental Management. London: Mining Communications Limited. pp. 6–9.
- Johannes Bauer 2013. *The Australian Carbon Cooperative (Bathurst based)* Ecological Agriculture Australia Association Blog. Available at: <http://ecoag.org.au/the-australian-carbon-cooperative-bathurst-based/>
- Johannes Bauer, 2016. *NO HOAX!-Finally: The Paris Agreement on Climate Change "a monumental triumph for people and our planet"-implications for Australia and Australian landowners.* Views from the 4Hills. 7. January 2016. <http://ecoag.org.au/towards-the-2015-paris-climate-agreement/>
- Johannes Bauer, Nov 2015. *Towards the Paris 2015 Paris Climate Accord.* 27.11.2015. Ecological Agriculture Australia Association Blog. available at: <http://ecoag.org.au/towards-the-2015-paris-climate-agreement/>
- Kabutaulaka, T. T. 2000. Rumble in the jungle: land, culture and (un)sustainable logging in Solomon Islands. In A. Hooper (Ed.), *Culture and Sustainable Development in the Pacific* 33: 88-97.
- Kabutaulaka, T., T. 2006. Global Capital and Local Ownership in Solomon Islands' Forestry Industry. Stewart F. (ed.). *Globalisation and governance in the Pacific Islands. State, society and governance in Melanesia. Studies in State and Society in the Pacific*, No. 1. Canberra pp. 239-257 (URL:http://epress.anu.edu.au/ssgm/global_gov/pdf/globalgov-whole.pdf). (Last access: March 2013)
- Kaiku, P., 2016. PAPUA NEW GUINEA DEVELOPMENT STRATEGIC PLAN 2010-2030 AN ASSESSMENT OF ITS CONSISTENCIES AND CORE ASSUMPTIONS Report commissioned by ACT NOW! This report is a follow-up to A Critical Analysis of Papua New Guinea Vision 2050 (2015) which is available here <http://actnowpng.org/publications/reports>
- Katovai, E., Edwards, W. and Laurance, W. F. 2015 *Dynamics of logging in Solomon Islands: The need for restoration and conservation alternatives.* Tropical Conservation Science Vol. 8 (3): 718-731.
- Keresi R. Fonmanu, Lisa Ting. Ian P. Williamson (undated) *Dispute Resolution for Customary Lands: some lessons from Fiji.*
- Koch, M., DA Kehop, B Kinminja, M Sabak, G Wavimbukie, KM Barrows, Teatulohi K. Matainaho, LR. Barrows, 2015. *An ethnobotanical survey of medicinal plants used in the East Sepik province of Papua New Guinea.* Ethnobiol Ethnomed. 2015; 11: 79.
- Kolombangara Forest Products Limited (KFPL). "Kolombangara Forest Products Limited," KFPL, <http://www.kfpl.solomon.com.sb>.
- Koyama, Samuel K. 2005. *'Black gold or excrement of the devil? The externalities of oil production in Papua New Guinea.'* Pacific Economic Bulletin, 20, 1.
- Krott, M., 2005. *Forest Policy Analysis.* European Forest Institute and Springer.

- Krott, M. 2001, *Politikfeldanalyse Forstwirtschaft*, 1st edition 2001 by Parey Buchverlag im Blackwell Wissenschafts-Verlag GmbH, Berlin.
- Lapeyrea, R., R Pirardb, , B Leimonac, 2015. *Payments for environmental services in Indonesia: What if economic signals were lost in translation?* Land Use Policy. Volume 46, July 2015, pp. 283-291
- Larson, A.M. 2011 *Forest tenure reform in the age of climate change: Lessons for REDD+*. Global Environ. Change 21 (2): 540-549 doi:10.1016/j.gloenvcha.2010.11.008
- Lecup, I, K Nicholson, H Purwandono and S.Karki, 1998. pp 85-116 in: Wollenhaupt, E and A. Ingles (eds.), 1998. *Incomes from the Forest- Methods for the Development and conservation of forest products for local communities*. Center for International Forestry Research, Bogor, Indonesia. MST Grafika Desa Putera, Indonesia.
- Leslie, A and O Tuinivanua 2009. *FIJI FORESTRY OUTLOOK STUDY*. ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY II WORKING PAPER SERIES Working Paper No. APFSOS II/ WP/ 2009/ 20
- Luttrell, C, K Schreckenber and L Peskett, 2007. *The implications of carbon financing for pro-poor community forestry* Forestry Briefing 14, Overseas Development Institute (ODI) December 2007. From: <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/610.pdf>, accessed, 21.8.2016
- Luttrell, C, K Schreckenber and L Peskett, 2007. *The implications of carbon financing for pro-poor community forestry* Forestry Briefing 14, Overseas Development Institute (ODI) December 2007. From: <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/610.pdf>, accessed, 21.8.2016
- Madsen, Becca; Carroll, Nathaniel; Moore Brands, Kelly; 2010. State of Biodiversity Markets Report:
- Marchand, C., Dumas, P., 2008. *Typologie et biodiversité des mangroves de Nouvelle-Calédonie*. Available from Rapport de programme ZoNeCo, Noumea, Nouvelle-Calédonie http://www.zoneco.nc/IMG/pdf/Rapport_Mangroves_ZoNeCo_2006_2007.pdf
- Mather, A., Needle, C., 1998. *The forest transition: a theoretical basis*. Area 30, 117–124.
- McGregor, 2006. *Solomon Islands Smallholder Agriculture Study Volume 3 Markets and Marketing Issues*. Australian Government, AusAID. Available at: http://dfat.gov.au/about-us/publications/Documents/solomon_study_vol3.pdf
- M'Gonigle, M and B Parfitt, 1994. *Forestopia: A Practical Guide to the New Forest Economy* Paperback – June 1, 1994
- Midgley, S and R Laity, 2009. *Development of a Market Information System for Solomon Islands Timbers*. Facilitating Agricultural Commodity Trade Project (FACT) March 2009. Secretariat of the Pacific Community Suva, Fiji Prepared by: Salwood Asia Pacific Pty Ltd Canberra, Australia

- Ministry of Development Planning and Aid Coordination (Solomon Islands Government) 2007. Solomon Islands: Agriculture & rural development strategy – Building local foundations for rural development. (March 2007).
- Mongabay.com (no year). Solomon Islands Forest Information and Data. (URL: http://rainforests.mongabay.com/deforestation/2000/Solomon_Islands.htm). (Last access: March 2016).
- Montgomery, P. 1995. Forestry in Solomon Islands. *Pacific Economic Bulletin*, 10, 2. pp. 74–6.
- Multi-donor Economic Governance Mission (MEGM). 2003. Solomon Islands
- Naughton-Treves, L. and C. Day. eds. 2012. *Lessons about Land Tenure, Forest Governance and REDD+. Case Studies from Africa, Asia and Latin America*. Madison, Wisconsin: UW-Madison Land Tenure Center. Available at: <https://www.nelson.wisc.edu/ltc/docs/Lessons-about-Land-Tenure-Forest-Governance-and-REDD.pdf>, accessed, 21.8.2016
- Naughton-Treves, L. and C. Day. eds. 2012. *Lessons about Land Tenure, Forest Governance and REDD+. Case Studies from Africa, Asia and Latin America*. Madison, Wisconsin: UW-Madison Land Tenure Center. Available at: <https://www.nelson.wisc.edu/ltc/docs/Lessons-about-Land-Tenure-Forest-Governance-and-REDD.pdf>, accessed, 21.8.2016
- Nelson, Paul N, J Gabriel, C Filer, M Banabas, S Murom, A Jeffrey, GN Curry, G Koczberski, and o Venter, 2014. *Oil palm and deforestation in Papua New Guinea*. *Conservation Letters*, 7 (3). pp. 188-195.
- New Agriculturalist <http://www.new-ag.info/en/country/profile.php?a=2924>
- Nimiago P.L. 2011. Assessment of forest soil carbon stock in Papua New Guinea. In ‘Native forest management in Papua New Guinea: advances in assessment, modelling and decisionmaking’, ed. by J.C. Fox, R.J. Keenan, C.L. Brack and S. Saulei. ACIAR Proceedings No. 135, 100–104. Australian Centre for International Agricultural Research: Canberra. Guillemot, N., Leopold, M., Cuif, M., Chabanet, P., 2009. *Characterization and management of informal fisheries confronted with socio-economic changes in New Caledonia (South Pacific)*. *Fisheries Research* 98, 51–61.
- Oliver, R. 2015. *Europe’s changing tropical timber trade: baseline report of the Independent Market Monitoring initiative*. ITTO Technical Series No.45. International Tropical Timber Organization, Yokohama, Japan.
- Olivier, D. and Siwatibau, S. 1999. *Mid-Term Review of the EC-Funded South Pacific Community Eco Forestry project (SPCEF)*. Vanuatu: Foundation for the People of the South Pacific International. P.O. Box 14041, SUVA, Fiji
- Oram, J 2014. *The Great Land Heist. How the world is paving the way for corporate land grabs*. ActionAid International

- Papua New Guinea Forest Authority, 2009. *PAPUA NEW GUINEA FORESTRY OUTLOOK STUDY*. ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY II WORKING PAPER SERIES Working Paper No. APFSOS II/WP/2009/19
- Parsons, David and David Vincent. 1991. *'High Stakes: Mineral and Petroleum Development in Papua New Guinea.'* Institute of National Affairs Discussion Paper No. 49. Port Moresby, Papua New Guinea.
- Pasgaard, M., & Chea, L. (2013). Double inequity? *The social dimensions of deforestation and forest protection in local communities in Northern Cambodia*. ASEAS - Austrian Journal of South-East Asian Studies. 6(2) 330-355.
- Pauku, RL 2009, *SOLOMON ISLANDS FORESTRY OUTLOOK STUDY I* ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY I, WORKING PAPER SERIES Working Paper No. APFSOS II/WP/2009/31 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, REGIONAL OFFICE FOR ASIA AND THE PACIFIC, Bangkok, 2009
- Pesce, F. and P. Lal 2004. The profitability of forest certification in tropic hardwood plantation: a case study of the Kolamagarra Forest Products Ltd. from the Solomon Islands. Environment Management and Development Discussion Paper 5. Australian National University. Canberra.
- PNGFA, 2016. *Forest Industry Overview*. <http://www.forestry.gov.pg/site/page.php?id=40>
- Price Waterhouse, 1995. Forestry, Taxation, and Domestic Processing Study, Consultancy Report for the Solomon Islands Government, Ministry of Finance and the Ministry of Forests, Environment and Conservation.
- Programme, Nairobi, KENYA. Sakulas, HW, J Bauer and J Birckhead, 2013. *Community Participation in Biodiversity Conservation and Development Projects: A Papua New Guinean Perspective*. Environment Papua New Guinea, Vol. 2 (1) 1-13.
- RECOFTC 2014. *Current status of social forestry in climate change mitigation and adaptation in the ASEAN region Situational analysis*. –RECOFTC The Center for People and Forests May 2013
- RECOFTC 2014. *Current status of social forestry in climate change mitigation and adaptation in the ASEAN region Situational analysis*. –RECOFTC The Center for People and Forests May 2013
- RECOFTC 2014. *Current status of social forestry in climate change mitigation and adaptation in the ASEAN region Situational analysis*. –RECOFTC The Center for People and Forests May 2013
- Rice, D. W.; Alverson, A. J.; Richardson, A. O.; Young, G. J.; Sanchez-Puerta, M. V.; Munzinger, J.; Barry, K.; Boore, J. L.; Zhang, Y.; dePamphilis, C. W.; Knox, E. B.; Palmer, J. D. (19 December 2013). "Horizontal Transfer of Entire Genomes via Mitochondrial Fusion in the Angiosperm *Amborella*". *Science* **342** (6165): 1468–1473. doi:[10.1126/science.1246275](https://doi.org/10.1126/science.1246275).
- Rist, L., Feintrenie, L. & Levang, P. 2010). *The livelihood impacts of oil palm: smallholders in Indonesia*. Biodivers. Conserv. 19, 1009-1024.

- Roger, F., 2011. Plantation Management Plan (in Review), Kolombangara Forest Products Limited. Honiara. Solomon Islands.
- Rudela, TK, OT Coomes, E Moranc, F Achardd, A Angelsene, JXuf, E Lambin g, 2005. *Forest transitions: towards a global understanding of land use change*. Global Environmental Change 15 (2005) 23–31
- Rudrud RW. Forbidden sea turtles: *Traditional laws pertaining to sea turtle consumption in Polynesia (Including the Polynesian Outliers)*. Conservat. Soc. 2010; 8:84-97
- Sakulas, H., Bauer, J.J., Lawrence, T., Birckhead, J. & T. DeLacy (2000) *Integrated Conservation and Development- Some lessons from Wau Ecology Institute* In Craig, J. and D. Saunders (eds.) Conservation in Production Landscapes, Surrey Beatty and Sons. Sydney.
- Sakulas, HW., J Bauer and J Birckhead, 2013. *Community Participation in Biodiversity Conservation and Development Projects: A Papua New Guinean Perspective*. Environment Papua New Guinea, Vol. 2, Issue 3 (September, 2013).1-13.
- Schloenhardt, A. 2008. The illegal trade in timber and timber products in the Asia–Pacific region. Research and Public Policy Series No. 89, Australian Institute of Criminology. <<http://www.aic.gov.au/documents/B/D/4/%7BBD4B2E50-33B4-47F1-815E901C0ACC7A43%7Drpp89.pdf>> (accessed Dec 2014).
- Seifert-Granzin, J., Dorys Mendez Zeballos 2014. *Detection and Quantification of Deforestation*
- Sevilla, C.P., (no year). The Solomon Islands: headed for self-destruction? (URL:<http://www.gdrc.org/oceans/csevilla.html>). (Last access: March 2013).
- Shackleton C & S. Shackleton, 2004. *The importance of non-timber forest products in rural livelihood security and as safety nets: a review of evidence from South Africa*. South African Journal of Science 100, November/December 2004.
- Sharp, T.L.M. 2012. *Following Buai: The Highlands Betel Nut Trade, Papua New Guinea*. PhD thesis, Australian National University
- Sharp, T.L.M. 2013, *Baias, Bisnis, and Betel Nut: The Place of Traders in the Making of a Melanesian Market*. In F. McCormack and K. Barclay (eds). Engaging with Capitalism: Cases From Oceania. Bingley, UK: Emerald, 227–56.
- Sharp, T.L.M. 2013. *Fear and Loathing in Port Moresby: Chewing Over the Betel Nut Ban*. ANU In Brief, 2013/10. The State, Society & Governance in Melanesia Program (SSGM). Australian National University. Available at:
- Shearman P.L., Ash J., Mackey B., Bryan J.E., and Lokes B., 2009. *Forest conversion and degradation in Papua New Guinea 1972–2002*. Biotropica 41: 379–390.
- Shearman P.L., Bryan J.E., Ash J., Hunnam P., Mackey B., and Lokes B., 2008. *The state of the forests of Papua New Guinea: Mapping the extent and condition of forest cover and measuring the drivers of forest change in the period 1972–2002*, University of Papua New Guinea, Port Moresby.
- Sills, E; R Arriagada, P Ferraro, S Pattanayak, L Carrasco, E Ortiz, S Cordero, K Caldwell and K Andam, 2009. Chapter 9. Impact of the PSA Program on Land Use. in: G.

Platais and S. Pagiola (eds.) Ecomarkets: Costa Rica's Experience with Payments for Environmental Services,. available at:

SMH, 2007. BIODIVERSITY TRADING, 2007. Two firms in biodiversity credit venture
From: <http://news.smh.com.au/business/two-firms-in-biodiversity-credit-venture-20071128-1ddw.html>, accessed 21.6.2008

Smit, R. L. 2002. Solomon Islands Trade Directory. Honiara, Solomon Islands: BJS Agencies Ltd.

SNR Consultancy & Associates. 1998. The Evaluation of the Isabel Sustainable Forestry Management Project, School of Natural Resources. Honiara, Solomon Islands:

Sofield, T., J. Bauer, T. DeLacy and S.McDougherty (2004). *ST~EP, The Role of Tourism in Poverty Alleviation*. Monograph, STCRC Press. Griffith University, Queensland.

Sofield., T. Oloff, D., A. Snidvong, S. Noakes, J. Bauer.,S.Plathong and R.MacTaggart, 2008. *Tourism Destination Action Plan*. Andaman Coast Sustainable Tourism Project by the Government of Queensland. STRATIS (GRM International and Sustainable Tourism CRC) and South East Asia START Regional Centre, Chulalongkorn University, Bangkok. Thailand

Solomon Islands College of Higher Education.

Solomon Islands Forest Resource Assessment Update 2011 – Final Report. Sinclair Knight Merz ABN 37 001 024 095. Australia

Solomon Islands Forestry Management (SIFM) Project Presentation. 2004. *Honiara, Solomon Islands*: URS Sustainable Development.

Solomon Islands Government (SIG). 1969. *Forest Resources and Timber Utilization Act 1969*. Honiara, Solomon Islands: Unpublished report.

Solomon Islands Government (SIG). 2003b. *National Economic Recovery, Reform and Development Plan (NERRDP) 2003 –2006*. Honiara, Solomon Islands: Department of Reform Planning.

Solomon Islands Government (SIG). 2003c. *National Forest Resources Assessment, Solomon Islands Forestry Management (SIFM) Project Report*. Honiara, Solomon Islands: URS Sustainable Development.

Solomon Islands Government (SIG). 2004. *Draft Forest Act 2004*. Honiara, Solomon Islands: Unpublished report.

Solomon Islands Government 2003. National economic recovery, reform and development plan –2003 - 2006. Strategic and action framework: Final Report. Honiara (October 2003)

Solomon Islands Government. 2003a. Code of Logging Practice (COLP). Honiara, Solomon Islands: Department of Forestry.

Solomon Islands Government. 2003b. National Economic Recovery, Reform and

Solomon Islands Government. 2003c. National Forest Resources Assessment, Solomon

- Soltis DE, Albert VA, Leebens-Mack J, Palmer JD, Wing RA, dePamphilis CW, Ma H, Carlson JE, Altman N, Kim S, Wall PK, Zuccolo A, Soltis PS. *The Amborella genome: an evolutionary reference for plant biology*. Genome Biol. 2008;9(3):402.
- STCP Engenharia de Projetos Ltda, 2009. *Encouraging Industrial Forest Plantations in the Tropics* Report of a Global Study ITTO Technical Series no 33
- Stern N., 2007. *The economics of climate change: The Stern Review*, Cambridge University Press, Cambridge.
- Suva, Fiji Islands, 2011
- Suzuki, R., 2012. Linking Adaptation and Mitigation through Community Forestry Case Studies from Asia. RECOFT, available at:
http://redd.unfccc.int/uploads/63_35_redd_20120817_recoftc_adaptation_case_studies.pdf
- Suzuki, R., 2012. Linking Adaptation and Mitigation through Community Forestry Case Studies from Asia. RECOFT, available at:
http://redd.unfccc.int/uploads/63_35_redd_20120817_recoftc_adaptation_case_studies.pdf
- Taylor, S. and Kumar, L. 2016. Global Climate Change Impacts on Pacific Islands Terrestrial Biodiversity: a review. *Tropical Conservation Science* Vol. 9 (1): 203-223. Available online: www.tropicalconservationscience.org
- TEEBcase (2012): Benefits of Forest Certification, Solomon Islands, by, Padma N. Lal, available at: TEEBweb.org.
- Ticktin, T., 2004. *The ecological implications of harvesting non-timber forest products*. Journal of Applied Ecology. 41(1) 11-21.
- Timber Bulletin ECE/TIM/BULL/68/2, TOPIC REVIEW No.5. SPREP and UNEP
- Tokaut, M., 2006. Solomon Islands, the untold story: Logging corruption ruins a Nation. (URL: http://www.illegal-logging.info/uploads/Masala_iT_corruption_in_the_Solomons.pdf). (Last access: March 2013).
- Tshering, K., Bauer, J. and DeLacy, T. (2013) *An evaluation of the integrated conservation and development programs (ICDPS) in the protected areas of Bhutan*. In: Merson T and Brown P (Eds). *Conservation through Sustainable Use*, UNSW Press, Sydney.
- USGS, 2011. Nickel" (pdf). USGS. 2011. Retrieved 2011-02-10.
- Verdone, Michael and Seidl, Andrew (2012). *Fishing and Tourism in the Vanuatu Economy*. Gland, Switzerland: IUCN. 20pp
- Vigulu, V. W. (no year). FSC certified plantations and local communities workshop: Solomon Islands case study. Kolombangara Forest Products Limited and subsistence farming by neighbouring local communities (URL: <https://ic.fsc.org/plantationscommunities.483.htm>). (Last access: March 2013).
- Vincent, J. 1992, The Tropical Timber Trade and Sustainable Development Science 256 (5064): 1651-5 Vol 7, No 1, pp 67-95.

- Wairiu, M. (undated after 2005). *Forest Certification in Solomon Islands*. Yale school of forestry & environmental studies. Available at:
http://environment.yale.edu/publication-series/documents/downloads/0-9/07_Solomon_Islands.pdf
- Whitmore, T. C. 1989. Changes over 21 years in the Kolombangara rain forests. *Journal of Ecology* 77: 469-483. ADB (2010) *Responding to climate change in the Pacific: moving from strategy to action*. Manila: Asian Development Bank.
- Wilson, C., 2016. *Communities see Tourism Gold in derelict Bougainville Mine*. From: <https://ramumine.wordpress.com/2016/09/08/communities-see-tourism-gold-in-derelict-bougainville-mine/>, accessed, 9.9.2016.
- Wollenhaupt, E and A. Ingles (eds.), 1998. *Incomes from the Forest- Methods for the Development and conservation of forest products for local communities*. Center for International Forestry Research, Bogor, Indonesia. MST Grafika Desa Putera, Indonesia.
- Wollenhaupt, E., 1998. *Methods for Assessing the Conservation and Development of Forest Products: What we know and what we have yet to learn*. Pp 1-16 in: Wollenhaupt, E and A. Ingles (eds.), 1998. *Incomes from the Forest- Methods for the Development and conservation of forest products for local communities*. Center for International Forestry Research, Bogor, Indonesia. MST Grafika Desa Putera, Indonesia.
- Woodley, E. Goellenboth, F., Holdsworth, D.K., Sakulas, H., Thredgold, H., and Yauiieb, A. 1991. *Medicinal plants of Papua New Guinea. Part 1*. Morobe Province. Verlag Josef Margraf, Germany
- Woodley, E. Goellenboth, F., Holdsworth, D.K., Sakulas, H., Thredgold, H., and Yauiieb, A. 1991. *Medicinal plants of Papua New Guinea. Part 1*. Morobe Province. Verlag Josef Margraf, Germany
- WRI, 2014. *The Governance of Forests Initiative (GFI) Guidance Manual: A Guide to Using the GFI Indicator Framework*. World Resources Institute, Washington, DC.
- Zbinden S, Lee D. 2004. Payment for environmental services: an analysis of participation in Costa
- Zeng., B., RW. Carter, T. DeLacy and J. Bauer., 2008. *Effects of Tourism Development on the Local Poor People: A Case Study in Taibai Region, China*. Pp. 443-460 In: Jauhari., V. (ed.) *Global Cases on Hospitality Industry*. The Haworth Press. New York and London.
- Zhuge, R., Chen, T., De Lacy, T. and Bauer, J (2003) *Encouraging local community participation in natural resource management: A design for a tourism cooperative company in Fujian Wuyishan national nature reserve*. [Chinese] *Journal of Environmental Sciences (China)* (in Chinese)
- Zhuge, Ren , DeLacy, T., J. Bauer, & Wu, Haohan (2000) *Sustainable Development and Biodiversity Conservation through Community Forestry in Wuyishan Biosphere Reserve, Fujian Province, China*. In Craig, J. and D. Saunders (eds.) *Conservation in Production Landscapes*, Surrey Beatty and Sons. Sydney

Zuccolo A, Bowers JE, Estill JC, Xiong Z, Luo M, Sebastian A, Goicoechea JL, Collura K, Yu Y, Jiao Y, Duarte J, Tang H, Ayyampalayam S, Rounsley S, Kudrna D, Paterson AH, Pires JC, Chanderbali A, Soltis DE, Chamala S, Barbazuk B, Soltis PS, Albert VA, Ma H, Mandoli D, Banks J, Carlson JE, Tomkins J, dePamphilis CW, Wing RA, Leebens-Mack J. *A physical map for the Amborella trichopoda genome sheds light on the evolution of angiosperm genome structure*. Nature. 2011 May 5;473(7345):97-100.

Appendix I: List of Stakeholders Consulted

COUNTRY	NAME	POSITION	INSTITUTION	EMAIL ADDRESS/PHONE
VANUATU	Mr. Hannington Tate	Director	Depart of Forestry	htate@vanuatu.gov.vu
	Mr. Dick Tomker	Officer in Charge in Santo	Depart of Forestry	dtomker@vanuatu.gov.vu
	Mr. Arua Nafuki	Wokabaot sawmill manager	Mandero Timber	
	Mr. Jimmy Kaloran	General Manager	North Efate Timber Manager	northefatetimber@gmail.com
	Mr. Stephen J. Bartrop	Managing Director	The Summit	sjbartrop@icloud.com
	Mr. Jim Batty	Managing Director SP Sandalwood Ltd.	The Summit	Jim.batty@thesummitvanuatu.com
	Mr. Steve Croucher	General Manager	Melcoffee sawmill	melcoffeesawmill@vanuatu.gov.vu
	Mr. Daniel Lamoure	General Manager	Wokabaot sawmill	
FIJI	Mr. Simione Rokolaga	Director Foreign Affairs	Ministry of Foreign Affairs	simione.rokolaga@foreignaffairs.gov.fj
	Mr. Elik Senivasa	Conservator of Forests	Ministry of Forests and Fisheries	Elik.senivasa@gmail.com
	Mr. Epeli Waqavinovono	Government Statistician	Department of Statistics	
	Mr. Mason Smith		IUCN	
	Mr. Gluseppe Dal Bosco	CEO	Fiji Harwood Corporation Ltd.	
	Mr. Isoa Korovulavula		IAS, USP	
	Ms. Maria	Land Use Planning Manager	SPC	
	Ms. Christine Fung	Deputy Team Leader	GIZ	Christine.Fung@giz.de
	Mr. Bjoern Hecht	REDD+ Team Leader	GIZ	bjoern.hecht@posteo.de
	Mr. Peni Cavuilagi	Director	Fiji Arts Council	cavuilagip58@gmail.com
	Ravin Chandra	General Manager	Pacific Green	pgfiji@connect.com.fj
NEW CALEDONIA	Mr. Henry Sechet	General Manager	Scierie de Netchaot	Scienet.lagoon.nc

	Mr. Thierry Reydellet	Direction de l'Commerce		thierry.reydellet@province-su
	Ms. Karta Diwiria		Ministry of Ecology	
	Mr. Michael Forrest	FLNKS	Rep Foreign Relations	mickael forrest <m-forrest@loyalty.nc>
SOLOMON ISLANDS	Dr. Vaeno Vigulu	Director	Department of Forestry	ps@mofr.gov.sb
	Mr. Jimmy	General Manager	Estate	
	Mr. Frank Maninga	Carver/Artist		(677) 7793220
PNG	Mr. Goodwill Amos	Acting Managing Director	PNG Forest Authority	GAmos@pngfa.gov.pg

Appendix II

Resource Document 1. Current Forest Situation in Melanesia

(attached)

Appendix III

Forest Carbon and REDD+ in Melanesia

(attached)