3 WHAT WILL INFLUENCE THE FUTURE STATE OF FORESTS AND FORESTRY?

Perhaps the most well-known quote attributed to Jack Westoby[1] is his famous assertion that *Forestry is not about trees, it is about people. And it is about trees only insofar as trees can serve the needs of people*. Westoby's context might easily be inverted, to encompass the concept that the factors that most influence and affect forests and forestry derive from people and, especially, that many of the most important drivers of change derive from extra-sectoral pressures, including international pressures, rather than factors that are within the control and purview of forest managers.

The drivers of change that most affect forests and forestry can be categorized as either 'direct drivers' (where the effects are immediate); or 'indirect drivers', which impact on forestry by catalysing a chain of events. Often, it is the indirect drivers that have the most far-reaching impacts of forests. As detailed in Box 3.1, drivers of change for Pacific forests and forestry can be categorized into six groups:

- Demographic changes;
- Economic changes;
- Changes in societies' perceptions and demands;
- Environmental changes;
- Technological and scientific advances; and
- Political and institutional evolution.

All of these factors bring a variety of influences and pressures to bear on forests and forestry that dictate, or generate responses in, the way that forests are managed. Collectively, the drivers of change and sectoral responses will determine how forestry in the Pacific evolves in the future. This chapter provides an overview of the main drivers of change likely to affect Pacific forests and forestry through to 2020.

1 J.C. Westoby (1913-1988). Director for Programme Co-ordination and Operations FAO Forestry Department. The quotation is drawn from 'Problemas actuais da economia florestal' (Lisbon, February 1967).

Box 3.1: Drivers of change for forestry in the Pacific

During an APFSOS Pacific national focal points meeting in 2007, a brainstorming exercise on Drivers of change in the region and their impacts through to 2020 developed a list of major drivers of change in the Pacific. The exercise sought to identify the most important factors that will catalyse change in Pacific forestry to 2020. The drivers of change identified were categorized into six groups – Demographic, Economic, Social, Environmental, Technology, and Political/Institutional.

Demographic

- Population increases
- Workforces (labour)
- Increasing urbanization
- Decreasing populations

Economic

- Infrastructure
- Economic recovery and development
- Conversion of forest lands to oil-palm
- Corruption
- Changing land use
- Very limited resources
- Agricultural developments (e.g taro leaf blight)
- Declining natural forest resource base
- Narrow-based economies
- Narrowing resource base
- Increasing incomes
- Economic rise of India and China
- Low earnings
- Continuing poverty
- Public economic expectations of forests
- Finance, capital and investment
- Domestic markets
- Trade agreements
- Export markets

Social

- People
- Increasing awareness and training
- Public awareness
- Unemployment (youth)
- Landowner demands
- Better-informed populations
- Increasing knowledge on climate change
- Access to land – land tenure
- Resource owners mobilized to reclaim lands
- Availability of land (scarcity)
- Problems between landowners and others
- Demands for people's participation
- Increasing landowner participation
- Education
- Rights – indigenous, human, etc
- Increasing participation by women

Environmental

- Climate change
- Sea-level rise – inundation
- Environmental concerns
- Strength in the green movement
- Soil erosion
- Tourism
- Personal interest in lifecycles of trees
- Natural disasters
- Sustainable forest management
- Certification
- Invasive species
- Dominance of fast-growing species (plantations)
- More things demanded from fewer forests

Technology

- Efficient, value-added, integrated processing
- Efficient, small-sized processing plants
- Cheap substitutes for wood
- Energy
- Need for infrastructure development – esp. roads
- Information technology
- E-technology

Political and institutional

- Stakeholder participation
- Political problems
- Policies and legislation
- Political reforms – changes
- Move/look North policies materialize
- Politics – changing governments
- Stability of governments
- Political directions
- Assistance from donor agencies
- Regional cooperation
- NGO input
- Stability of governments
- Political directions
- Assistance from donor agencies
- Regional cooperation
- NGO input
- Donor/international priorities

3.1. Demographic drivers of change

The Pacific subregion comprises a very small proportion of the global population; just one-half of 1 percent of the world's people lives in the subregion. It comprises some of the least densely populated countries in the world, but also some densely populated countries. Sparsely populated countries include Australia (2.6 people/km^2), Papua New Guinea (12.4 people/km^2), New Zealand (15.2 people/km^2), the Solomon Islands (16.8 people/km^2) and Vanuatu (17.6 people/km^2). Consequently, it is not particularly surprising that, generally, domestic demands for wood and other forest products and services in these countries can (or could) largely be met sustainably from their own forest resources. It is largely where forests have been cut to meet export demands that difficulties have arisen.

Conversely, Tuvalu (400 people/km^2), Tonga (141.4 people/km^2), Kiribati (134 people/km^2) and Samoa (63.3 people/km^2) all have relatively high population densities. This is reflected in relatively greater scarcity of wood, particularly close to urban areas where undergrowth, particularly, may be degraded from fuelwood collection – as well as greater dependency on imports of industrial wood products.

At current population growth rates, the region's population will increase by approximately 6 million people by 2020. Three-quarters of this increase will occur in Australia and New Zealand, predominantly in urban areas, and is anticipated to have relatively low impacts on forests and forestry, with a moderate increase in demands placed on forests for recreational purposes, but with increased demands for wood products expected to be comfortably met by increasing harvests from plantation forests.

Table 3.1: Total and rural populations in Pacific

Country	Population ('000s)	Average annual change in popⁿ. (%)	Rural population (% of total)	Rural population (% of total)
	2007	2006-2007	2007	1990
Australia	21 020	1.5	11.6	14.6
New Zealand	4 230	1.0	13.7	15.3
Fiji	830	0.5	48.0*	-
Papua New Guinea	6 320	2.0	86.5	86.9
Solomon Islands	500	2.3	84.0	-
Vanuatu	230	2.3	75.0*	-
Samoa	180	0.5	77.0*	-
Tonga	100	0.4	75.0*	-
Tuvalu[2]	12	1.6*	51.0*	-
Kiribati	100	1.6	56.0*	-

Primary source: World Bank (2008)

Overall, the most significant impacts of population changes on forests are likely to be observed in the densely populated parts of the very small islands of Kiribati and Tuvalu. For example, at the current rate of population increase, Tuvalu's population will exceed 14 000 people by 2020, with a population density increasing to around 470 people per square kilometre. It is, however, notable that for most Pacific countries, the rate

2 * Source: CIA (2009).

of population growth has declined since 1990. In Tuvalu, for instance, the growth rate declined from 4.1 percent in 1990 to 1.6 percent in 2007. Some significant environmental degradation is being reported in these small islands in relation to dense populations, for example, rubbish disposal in Funafuti, Tuvalu – with reports of scarcity of fuelwood being a manifestation of forest degradation due to population pressures.

A significant demographic trend that impacts forests is rural to urban migration. Table 3.1 shows that, since 1990, the rural proportions of Australia and New Zealand's populations have declined significantly, (although in absolute terms, New Zealand's rural population has increased). In Pacific island countries, current rates of urbanization[3] are relatively high in Vanuatu (4.1 percent) and the Solomon Islands (4.1 percent), while in all other countries the rate of urbanization varies from 1.3 percent (Tuvalu) to 1.9 percent (Papua New Guinea). This change will be most significant in Vanuatu where, by 2020, almost 40 percent of the population can be expected to be living in urban areas, thereby reducing subsistence and semi-subsistence dependence on forests, but likely increasing demands on forests close to Port Vila and other urban areas.

A variety of other demographic variables may impact less directly on forestry in the Pacific. Two significant trends are in terms of net migration, and in changes in population age structures (i.e., the proportion of population in various age groups). Four trends may be of particular significance for forests:

i. Increasing mobility of labour: A major phenomenon in the Pacific is cross-border migration of workers seeking better livelihood opportunities in nearby countries. As one example, New Zealand has had a net migration deficit with Australia in most years, while both these countries are key destinations for Pacific island migrants. For example, New Zealand census data shows 265 000 residents (6 percent of the national population) of Pacific islands' ethnicity. Of these, Samoans (131 100 people, 40 percent migrants, 60 percent born in New Zealand), Tongans (50 478 people, 46 percent migrants), Fijians (9 861 people, 56 percent migrants) and Tuvaluans (2 625 people, 63 percent migrants) were among the seven largest Pacific ethnic groups. The significance of this migration is readily apparent in that New Zealand has Samoan and Tongan ethnic populations that are more than half the size of the parent countries.

Problems of increasing scarcity of labourers to carry out unattractive physical forestry work in Australia and New Zealand may be increasingly be solved by migrant workers from less developed countries. However, this may in turn deprive the developing countries of skilled labour.

ii. Ageing populations: This issue is rapidly becoming a concern, particularly in Australia and New Zealand, where ageing populations may create significant employment challenges in forestry, especially in physically demanding tending and harvesting activities. For example, NAFI & A3P (2006) note that, in Australia:

Over the next five years the estimated impact of population ageing will be equivalent to a shortfall of 195 000 workers. Modeling has shown that every industry is likely to be adversely affected by population ageing. While employment is expected to grow over that period, it is likely to be substantially less than it would otherwise have been if the population age structure were to have remained unchanged. As the population ages, skills shortages will become even more acute, particularly in industries where there is already a high proportion

3 Annual rates of change, i.e., change in the proportion of population living in urban areas (CIA 2009).

of older workers. For example, the proportion of workers who are 45 years and older ranges from 52.1 per cent in the agriculture, fisheries and forestry industries to 24.4 per cent in the retail sector.

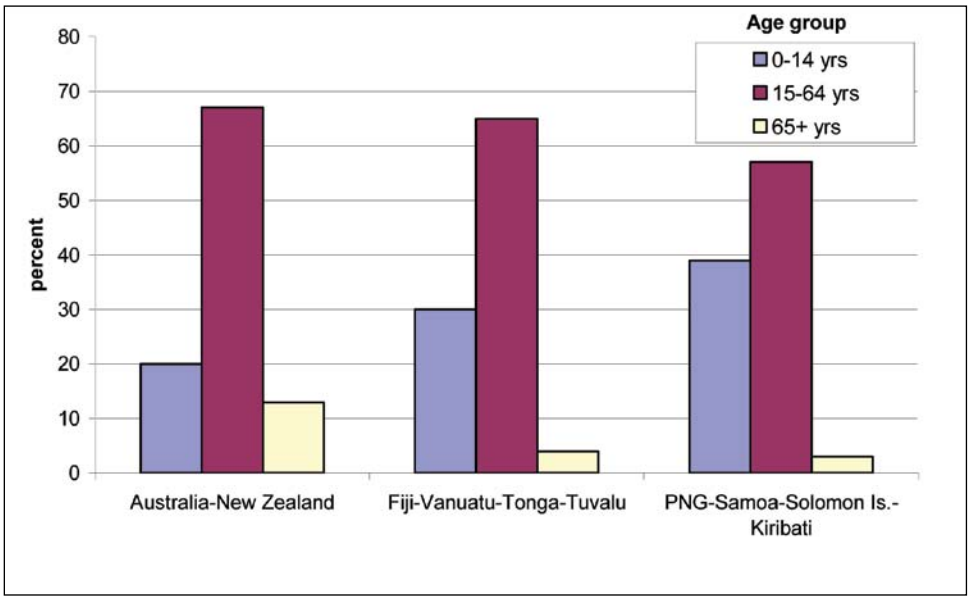

Figure 3.1: Population age structures in the Pacific 2008

Source: CIA (2009)

iii. Declining birthrates: Evident in most Pacific countries are significant declines in birthrates in the past 25 years. For example, since 1980, the birthrate in Vanuatu has declined from 39 births per 1 000 people, to 22 births per 1 000 people. Similarly, in Papua New Guinea, the birthrate has declined from 39 births, to 28 births, per 1 000 people. Australia and New Zealand have the lowest birth rates in the Pacific, with just 13-14 births per 1 000 people. In most countries, populations will continue to increase, but at slower rates, and in ways that will change overall population structures as well as household structures. In the long run, this may potentially change consumption patterns for forest products and services with, for example, potentially lower demand for new housing or a shift towards smaller dwellings for smaller family units.

iv. High proportion of population in the workforce: The large proportion of the Pacific island populations currently aged less than 15 years, in tandem with declining birthrates, implies significant increases in the proportion of people in workforce age-brackets to 2020 (see Figure 3.1). This will likely mean increases in (particularly urban) purchasing power and possibly changes in overall consumer preferences for forest products and services, as well as in employment markets including forestry. A likely move towards smaller households may have profound implications in households with subsistence and semi-subsistence dependence on forests. Divisions of labour and methods of collecting forest products may need to be markedly altered to increase productivity and ensure all household needs are met.

3.2. Economic drivers of change

Economic conditions in the Pacific will continue to play an enormous role in determining future paths and trajectories for forests and forestry. Forestry plays a significant role (and in some cases a dominant role) in the economies and landscapes of most countries in the Pacific. Consequently, changes in national and international economic conditions strongly influence decision-making and capacities for change in forests and forestry.

(i) GDP and per capita income

Table 3.2 lists per capita income in US dollar purchasing power parity (PPP) terms for Pacific countries. There is a notable dichotomy between incomes in the developed countries (Australia and New Zealand) and incomes in the other developing countries. It is readily apparent that these lower incomes render countries and their inhabitants significantly more vulnerable to economic shocks and downturns, such as the current (2009-2010) recession.

Table 3.2: Income indicators in Pacific countries

Country	Per capita income (US$PPP)	GDP real growth (%)	Proportion of pop'n below poverty line (%)	Gini coefficient
	2008	2008	(survey year)	(survey year)
Australia	38 100	2.2	-	35.2 (1994)
New Zealand	27 900	0.2	-	36.2 (1997)
Fiji	3 900	1.2	39.5 (2002)	-
Papua New Guinea	2 200	6.3	53.8 (2005)	50.9 (1996)
Solomon Islands	1 900	7.3	-	-
Vanuatu	4 600	6.3	40.0 (2002)	-
Samoa	4 900	3.3	20.3 (2002)	-
Tonga	4 600	1.2	22.3 (2002)	-
Tuvalu[4]	1 600	3.0	-	-
Kiribati	3 200	3.7	50.0 (2000)	-

Sources: World Bank (2008); CIA (2009); Asian Development Bank (ADB) Web site

The relative wealth of Australia and New Zealand makes it difficult to envision that economic factors will drive any major structural changes to the underlying policies and directions that govern forestry through to 2020; though undoubtedly, economic factors can have major impacts on the profitability and composition of the forestry industry. In the short term, the wood-processing industry is most susceptible to the economic downturn – through reduced output and sales, potentially leading to job losses and mill closures. In the longer term, effects might also become significant in terms of, for example, plantation establishment, tending regimes and forest health programmes – if an extended period of low returns makes investment in these activities uneconomic.

Conversely, in most Pacific island countries, forests still constitute a subsistence safety net, both for people who still live in or near forests, as well as for people who may live and work in more distant urban areas, but retain forest ownership rights elsewhere.

4 Tuvalu – GDP growth 2006, per capita PPP 2002.

Table 3.2 shows that overall GDP per capita in Pacific island countries is moderate to low, while a significant proportion of Pacific islanders live below the poverty line. For those living a largely subsistence or semi-subsistence lifestyle, without formal employment, the impacts of a global recession are likely to be relatively minimal – with many of their economic transactions occurring outside the formal economic sector. However, where the recession causes job losses and major changes to people's incomes and levels of welfare, it is likely to force some of them back towards more subsistence-level and forest-dependent livelihoods.

(ii) Forestry sector contribution to GDP

As a base measure, the forestry contribution to GDP gives a broad indication of the importance of forestry within each national economy. Lebedys (2008) calculates the average forestry contribution to GDP in the period 1995-2006 for many Pacific countries. As Figure 3.2 shows, forestry is a major contributor (more than 5 percent) to GDP in the Solomon Islands and Papua New Guinea, and an important contributor (1-5 percent) in Samoa, Fiji, Vanuatu and New Zealand.

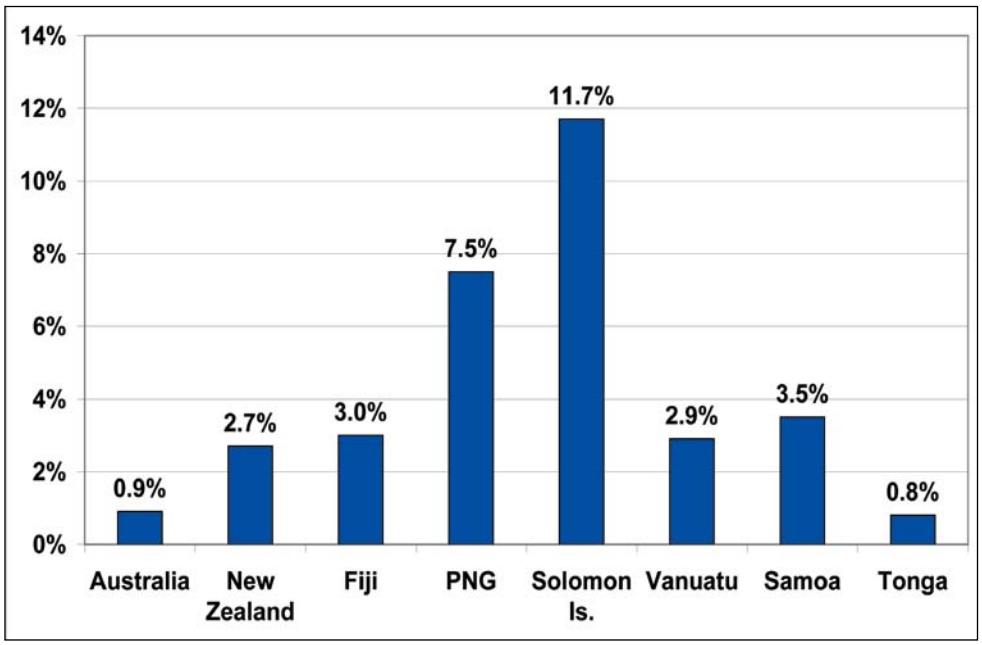

Figure 3.2: Average contribution of the forestry sector to GDP 1995-2006

Source: Lebedys (2008)

Overall, the proportion of the forestry contribution to GDP in the Pacific region has declined since 1995, largely as a result of a decline in forestry's contribution in the largest forestry countries, i.e., Australia, New Zealand and Papua New Guinea (Figure 3.3). For example, in Australia, the contribution to GDP declined from 1.2 percent in 1995, to 0.8 percent in 2006. Similarly, in New Zealand, the contribution declined from 3.3 percent to 2.1 percent; while in Papua New Guinea, the contribution has declined from 9.4 percent to 6.7 percent. For these countries, the general interpretation is that other sectors in the economy have generally grown faster than forestry. In Papua New Guinea, however, it also reflects a significant curtailment in log exporting from its peak in 1997 (of more than 3 million cubic metres) to around 2 million cubic metres in 2006.

Conversely, in several countries, forestry contribution to GDP increased during the same period. For example, in the Solomon Islands the contribution expanded from a low of 7.3 percent in 1998 (resulting from the Asian economic crisis), to 16.7 percent in 2006; Fiji increased from 2.1 percent in 1995 to 3.4 percent in 2006; and Vanuatu from a low of 1.3 percent in 1997 to 3.5 percent in 2006. In these countries, the forestry sector has generally grown faster than other sectors of the economy.

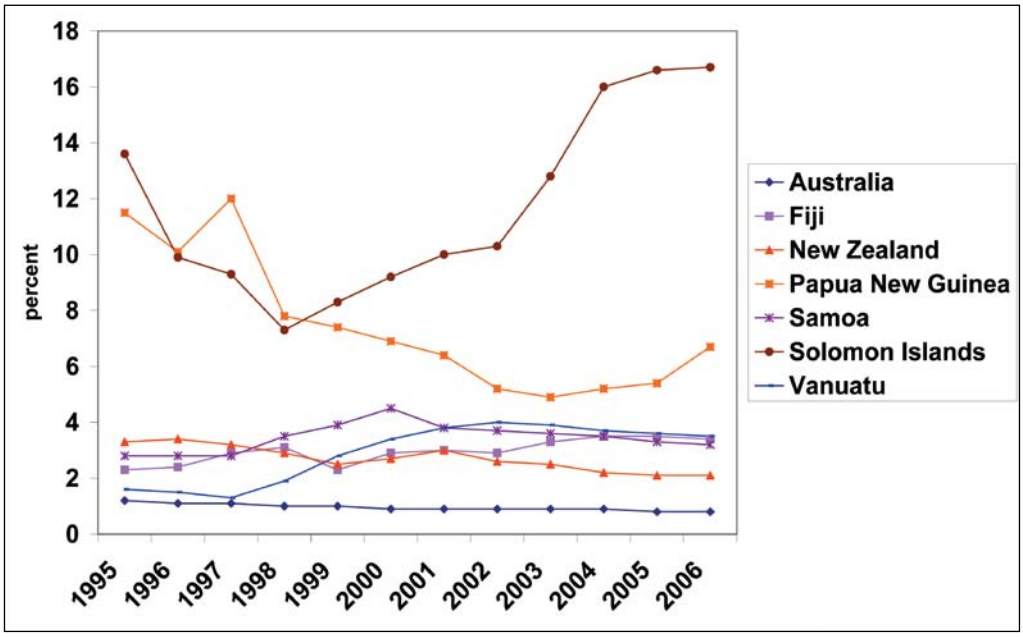

Figure 3.3: Forestry sector contribution to GDP (1995-2006)

Source: Lebedys (2008)

For the latter group of countries, some specific observations can be made:

- In the Solomon Islands, data reflect a significant acceleration in log exporting through much of the period. However, data also reflect a major contraction in GDP in 1999 and, especially, 2000 (-14.3 percent), due to increasing ethnic tensions, violence and related governance problems;
- In Fiji, increasing plantation harvests have driven steady increases in forestry's contribution to GDP; and
- In Vanuatu, data for 1998-2006 reflect a marked increase in production and exporting of sawntimber and processed products, while the earlier decline reflects the imposition of a log export ban.

(iii) Contribution of the forestry sector to merchandize exports

As a general reflection of forestry's contribution to GDP, the forestry contribution to merchandize exports also provides a useful indicator of forestry's national economic contribution, especially in terms of earning foreign currency and helping the national Balance of Payments (BoP).

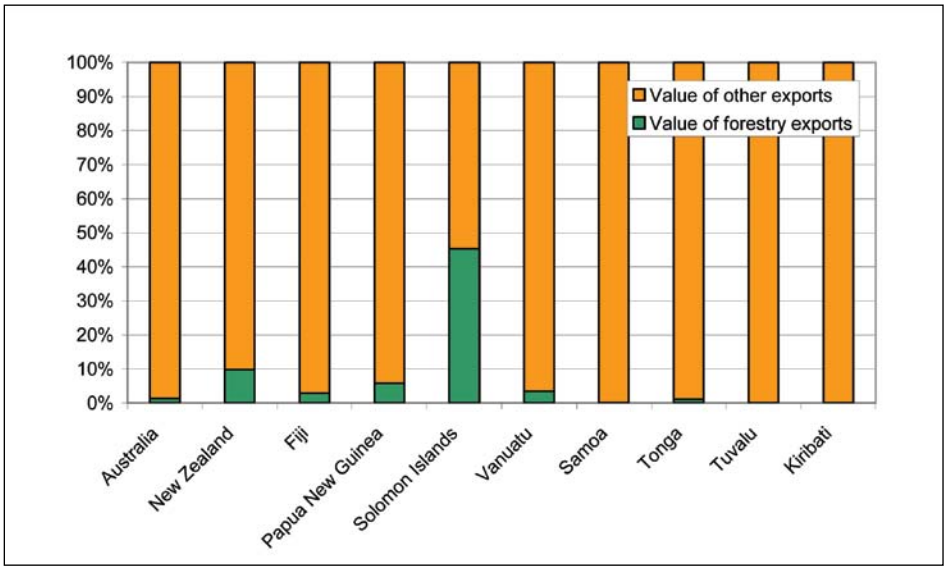

Figure 3.4: Forestry exports as a proportion of total national exports 2006

Sources: FAO (2009c); CIA (2009)

Figure 3.4 reinforces the notion that the Solomon Islands is the most forest-dependent economy in the region, with almost 45 percent of its national export earnings deriving from forest products. This high degree of exposure to forestry creates considerable risks, both to the Solomon Islands' economy and to the country's forests. A particular concern for the Solomon Islands is that the current rate of harvest is far in excess of a sustainable annual cut and the area of merchantable forest is rapidly dwindling. Pauku (2009) observes:

In 2004, it was reported that around 1 million cubic metres of logs were harvested, in contrast with the sustainable harvest level estimated at around only 200 000 m^3. In 2007, round log exports increased by 28 percent to 1 446 003 m^3 from 1 130 365 m^3 in 2006... the Forest Management Project (FMP) has recently predicted that the natural forests will be exhausted by 2015.

The economic consequences of the demise of the Solomon Islands' primary engine of growth are likely to be severe and protracted for the country, as is discussed elsewhere (Section 4.3).

Forestry is also an important contributor to merchandize trade in New Zealand (9.8 percent), Papua New Guinea (5.8 percent), Vanuatu (3.5 percent) and Fiji (2.9 percent).

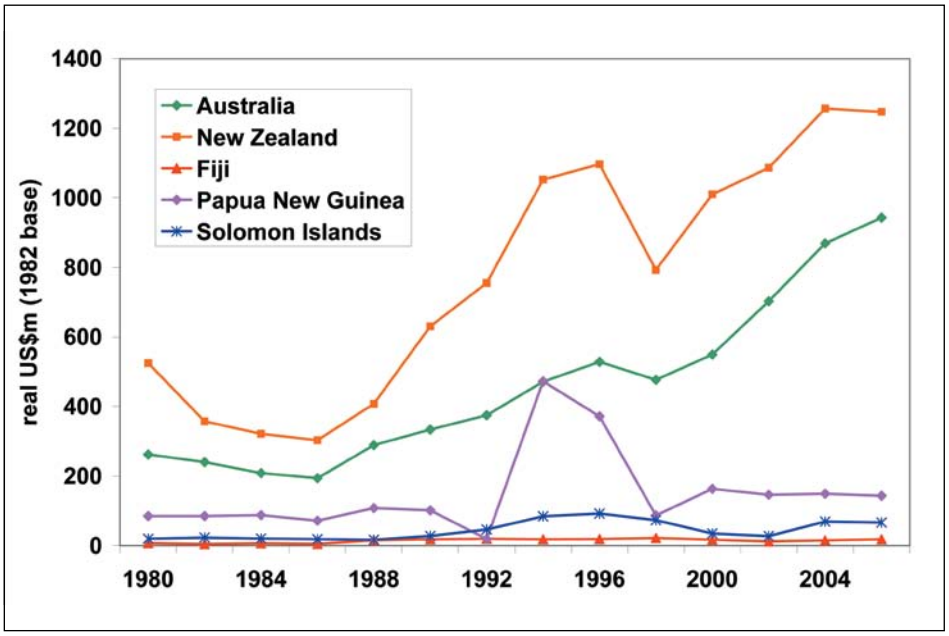

Figure 3.5: Value of forestry exports from Pacific countries

Source: FAO (2009c)

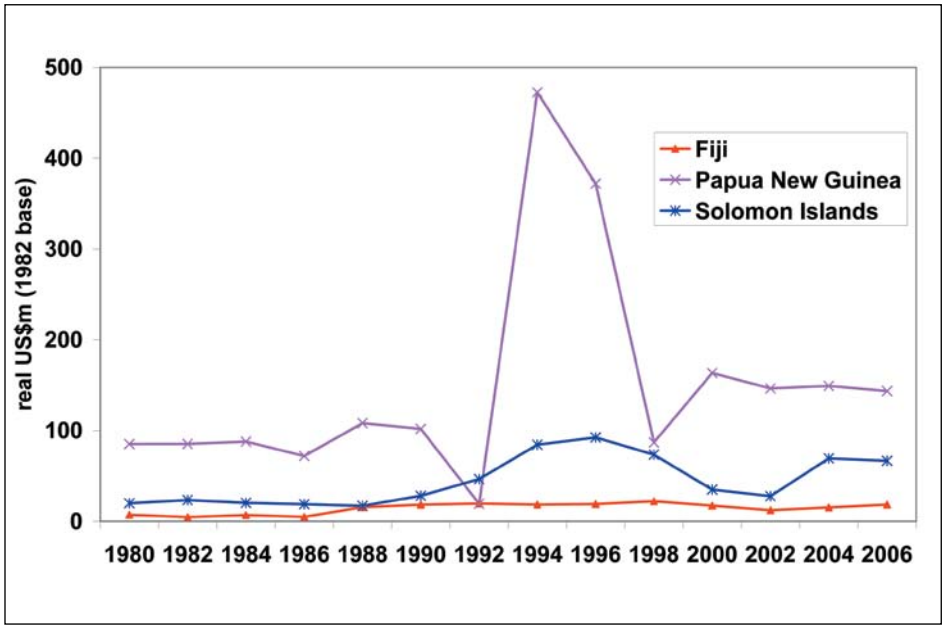

Figure 3.6: Value of forestry exports from selected Melanesian countries

Source: FAO (2009c)

Figures 3.5 and 3.6 chart the values of forestry exports from major Pacific forestry exporting countries. Strong growth in exports from Australia and New Zealand reflect increasing harvests and the increasing development and maturity of wood-processing sectors. Similarly, Fiji demonstrates a relatively stable growth path.

The outstanding feature of the charts is the significant volatility in export values from Papua New Guinea and, to a lesser extent, the Solomon Islands. For Papua New Guinea,

a major spike in the period 1992-1996 largely reflects major increases in earnings from a log price spike generated by the imposition of log export bans in other countries (particularly in the United States and Malaysia). A spike in New Zealand and Solomon Islands export earnings during the same period also reflect this. Some of the troughs in Papua New Guinea and Solomon Islands export earnings reflect government efforts to curb log exports through increased taxes and other measures, as well as the civil unrest in the Solomon Islands.

(iv) Cross-sectoral interface issues

Changes in the overall structures of national economies, especially the relative share of agriculture, manufacturing and services sectors in income and employment, may have important direct and indirect implications for forests and forestry. Typically, forestry's greatest sectoral interface is with the agriculture sector and is typified by competing demands for land; although, where labour is scarce, the two sectors may also compete for workforce resources.

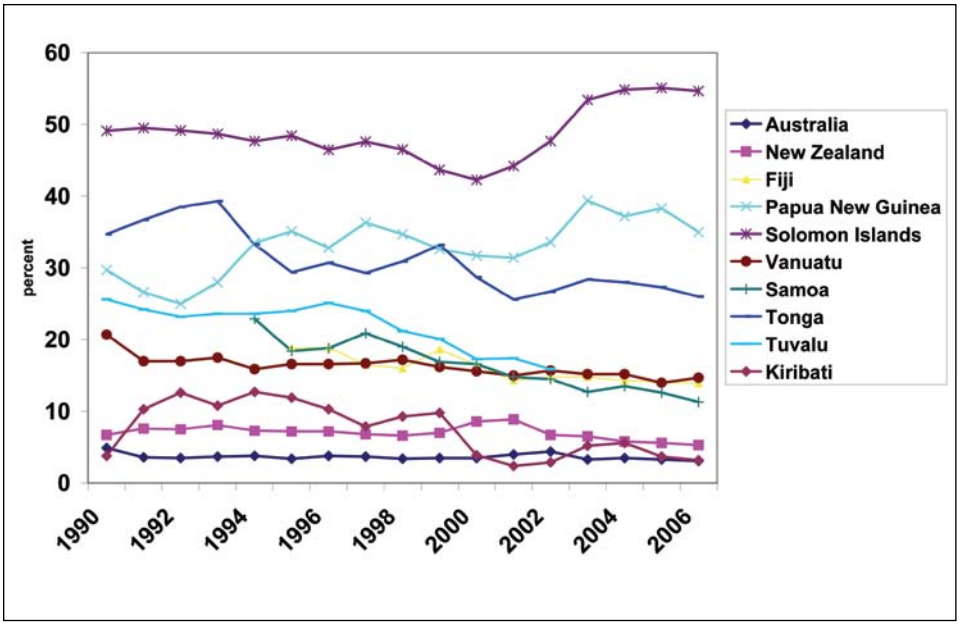

Figure 3.7: Contribution of agriculture[5] to GDP

In most Asia-Pacific countries the contribution of agriculture to national GDP is declining (Figure 3.7) and this trend is reflected in Australia and New Zealand, as well as most of the Pacific island countries – Fiji, Vanuatu, Tonga, Samoa, Kiribati and Tuvalu. However, compared to many countries in Asia and the Pacific, the trend is less pronounced. In many of the Pacific island countries, a protracted fall in copra prices is a key contributor to this decline, though in Samoa the taro leaf blight has also seriously affected that crop and its export. Both the Solomon Islands and Papua New Guinea have bucked the trend, though significantly, this aberration largely reflects the inclusion of logging activities within the agriculture statistics.

5 Including silviculture and logging (but not wood processing).

Table 3.3: Principal agricultural commodities in the Pacific

Country	Product (1)	Product (2)	Product (3)	Product (4)
Australia	Beef cattle	Sheep	Sugar cane	Wheat
New Zealand	Dairy	Beef cattle	Sheep	Fruit
Fiji	Sugar cane	Rice	Copra	
Papua New Guinea	Coconut	Sweet potatoes	Copra	Coffee
Solomon Islands	Fish	Copra	Palm oil & kernels	Coconut oil
Vanuatu	Coconut	Copra	Bananas	Cocoa
Samoa	Coconut	Copra		
Tonga	Coconut	Copra	Bananas	
Tuvalu	Coconut	Bananas	Copra	
Kiribati	Copra	Seaweed		

Primary source: ADB Web site (various country pages)

In general, there are relatively low levels of conflict between competing land uses (i.e., between agriculture and forestry) in the Pacific, partially because many countries have relatively large land areas per capita; where land is scarce agroforestry regimes tend to prevail. Nonetheless, in most countries, the best agricultural land is also the best forest-growing land, and in those instances, intensive agriculture usually takes precedence due to higher financial returns generated. In most of the smaller Pacific island countries, agroforestry is the predominant land use. This symbiotic system means that trees (especially tree crops) and agricultural crops are complementary, rather than competing land uses.

In New Zealand, throughout most of the 1990s, plantation forests expanded to encompass approximately 500 000 hectares (almost 2 percent of the national land area) of largely marginal grazing lands. In more recent times, areas of plantation forest that are suitable for dairy farming have been converted to the latter purpose due to the very high returns generated in dairying. Some communities have raised concerns that large areas of plantation forests have displaced farming families and hence affected community infrastructure and the viability of various community services.

In Australia, perhaps the most significant conflicts relate to competition for water in dry areas. For example the MPIGA (2008) notes:

Public concern has been raised about water consumption. Water use by plantations can have positive environmental effects by lowering saline watertables but can also affect water availability for other uses, such as irrigated agriculture, in some cases.

In the Melanesian countries, the development of oil-palm plantations, particularly where it is accompanied by natural forest clearance, is a source of controversy, as it is in a number of other countries in Asia and the Pacific. Monocultural oil-palm plantations are criticized for negative impacts on biodiversity, soil conservation, water quality and local communities. Significant oil-palm plantations have been established, or are planned in Papua New Guinea, the Solomon Islands, Vanuatu and Fiji.

Box 3.2: Oil-palm development in Melanesia

Palm oil is becoming a major crop in PNG, which is reputed to produce the world's highest quality.

Kulim Berhard of Malaysia, whose main owner is the Johor state government, owns 80% of New Britain Palm Oil in PNG, probably the largest agricultural enterprise in the islands, and plans to spread through the Pacific and provide downstream manufacturing.

An offer from the government of Malaysia to develop 20 000 hectares of oil palm in Fiji is being evaluated…. The governments of Vanuatu and China are now working on a 3 000 hectare oil palm project, and promoting the crop to individual farmers also.

Source: Crocombe (2007)

(v) Narrow economic bases and competitiveness

Overall, the relatively narrow resource and economic bases in the Pacific island countries, allied with their generally small size, relatively small domestic markets and distance from most international markets create major challenges for these countries.

Box 3.3 and Figure 3.8 describe the key components of the Porter Diamond, a model that outlines the key components of international competitiveness in industries. For most Pacific island countries, economic successes have been built largely on strong factor endowments; forests, minerals, agriculture, tourist attractions and fisheries. However, elements of strong domestic competition and well-developed supporting infrastructure and supporting industries are often lacking, as characterized by forestry in a number of countries, where logging is dominated by overseas companies and log exporting is the primary industry.

Box 3.3: The Porter Diamond

The Porter Diamond (Porter 1998) suggests that national competitive advantage in an industry can be achieved by bringing together the following four key elements:

1. Firm strategy, structure and rivalry – strong domestic competition, forcing firms to develop efficient structures and clear strategies for success, is a core component of success;
2. Factor endowments – some degree of natural advantage, such as a large natural resource or a skilled labour force;
3. Demand conditions – viable markets exist and these are characterized by strong and efficient competition; and
4. Related and supporting industries – a strong supporting infrastructure, enabling cost effective delivery to markets.

Source: Porter (1990)

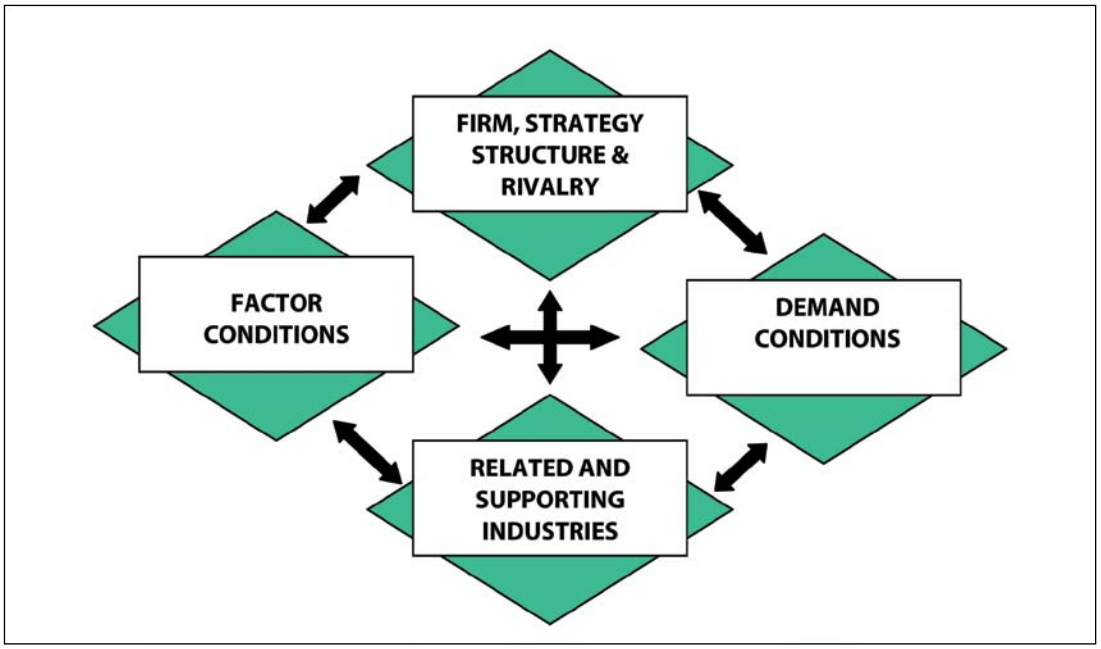

Figure 3.8: Porter Diamond model of competitiveness

Source: Porter (1990)

In general, many aspects of forestry in most Pacific countries are lacking in the core dimensions of the Diamond framework:

- Australia, New Zealand and the Melanesian countries all have significant factor endowments in terms of forest resources;
- Australia and New Zealand probably have adequate pools of skilled labour, reasonable supporting infrastructure and, technologically, vary between some state-of-the-art and some long obsolete. These types of factor endowments are much scarcer in the Pacific island countries;
- Rivalry among firms in Australia and New Zealand is reasonably competitive, at least in some industries; and in some locations there are strong clusters of supporting industries. Again, these drivers are largely absent elsewhere in the Pacific.
- No country has a particularly large domestic market in which to hone its competitiveness; in comparison with, for example, Japan, the United States or European Union countries.

Consequently, it is probably not particularly surprising that all the countries in the region export relatively large volumes of unprocessed products – logs and chips – compared with processed products, and none have found it easy to develop internationally competitive wood-processing industries. For the Melanesian countries, effectively the sole major point of comparative advantage is in terms of raw resources, while the small island countries have no international comparative advantages in forestry and, not surprisingly, play little or no role in international markets.

In terms of narrow economic bases, the heavy dependence of particularly the Solomon Islands (and also several other island countries) on the forestry sector is already noted, while the relative importance of agriculture in island economies is demonstrated in Figure 3.7. Countries such as Fiji, Vanuatu and Samoa have developed thriving tourism industries, with tourism being the leading economic activity in these countries. Most

other Pacific island countries also view tourism as an important potential economic contributor, but have less developed industries.

Fiji, the Solomon Islands and especially Papua New Guinea have minerals industries including gold, nickel, lead, zinc and silver, while oil exploration is already yielding dividends for Papua New Guinea and holds hope for the future, elsewhere.

Fisheries are a common and major resource for all of the island countries, though one that, through scarcity of, and difficulties in accessing, investment capital, are generally exploited by overseas companies that purchase fishing rights.

Finally, the importance of remittances from overseas workers and overseas development assistance in national economies warrants mention, particularly for countries such as Samoa, Tonga, Tuvalu and Kiribati. In the current (2009-2010) recession, opportunities for migrant workers are likely to be scarcer, while development assistance budgets are also likely to be tighter. This may increase dependence on land and resources such as forests, at least in the short term.

The relative strengths of other economic sectors can impact on forestry competitiveness by altering the national terms of trade, for example, through exchange rate appreciations or depreciations (such effects are discussed in economics literature in the context of 'Booming Sector' models).

3.3. Governance and the political environment

The overarching political and institutional environment will provide an important driver of change in most Pacific countries. Chapter 2 provided an overview of the current situation *vis-à-vis* policies and institutions within the forestry sector. This section will focus on the wider political situation, governance issues and their likely impacts on forestry.

(i) Governance and politics

The Pacific encompasses a range of political and electoral systems, ranging from constitutional monarchies in Australia, New Zealand, Papua New Guinea, the Solomon Islands and Tuvalu (each sharing Queen Elizabeth II as Head of State, with parliamentary democracy) Tonga (with its own King George Tupou V), and the republics of Fiji, Vanuatu, Samoa and Kiribati.

A number of the island countries have suffered political and civil disturbances in the recent past, and these disturbances have had flow-on effects into the economies of the countries concerned including, in some instances, disruption to civil society, loss of production and exports, diversion of tourism and reduced attractiveness to investors.

At present, the highest profile governance challenges relate to Fiji, where a succession of coup d'etats since 1987, culminated in a military takeover in 2006 and the fall of the Qarase Government. In April 2009, the Fijian president suspended the Constitution of Fiji, appointed himself head of state and reappointed the 2006 coup leader as prime minister. Subsequently, Fiji has been suspended from the Pacific Forum for its failure to hold democratic elections. In 2008, Fiji's GDP was estimated to have declined by 6.6 percent. In early 2009, tourist numbers to Fiji were reported to have declined by 25 percent, as a result of the unstable political situation, coupled with a serious tropical cyclone and the global financial downturn. In the immediate wake of the 2000 coup, Fiji's

tourist trade was estimated to have fallen by 40 percent. In terms of the visible industrial forestry sector, past political unrest appears to have had little impact on production or exports, with the value of forestry exports retaining a relatively stable path regardless of the political situation. The greater effects have probably been in terms of reduced institutional stability, including changes in senior personnel and policies.

The political situation in the Solomon Islands has improved in recent times, but remains potentially volatile. For more than a decade the political landscape has been characterized by severe ethnic tensions (particularly between Malaitans and Guales), particularly in the late 1990s. In 2000, the Prime Minister of the Solomon Islands was kidnapped and forced to resign to secure his release. Subsequently, the signature of the Townsville Peace Agreement relieved some tensions, but a breakdown in law and order was sufficiently severe by 2003 to require a Regional Assistance Mission to the Solomon Islands (RAMSI) comprising 2 200 police and troops from Australia, New Zealand and other Pacific nations, to restore order. In 2006, allegations of corruption against a new Prime Minister led to mass rioting in Honiara and a vote of no confidence that deposed the Prime Minister. These troubles have had severe impacts on the national economy including visible impacts on the industrial forestry sector in terms of reducing production and exports, while some control was also lost of activities in the forests as noted in Box 3.4.

Box 3.4: Effects of unrest in the Solomon Islands

A debate on an oil-palm joint venture at Vangunu in the Solomon Islands' parliament records:

The Ministry continues to monitor this project from 2002 until 2005 and highlighted issues of concern but the government was unable to act because of the social unrest. In 2006 and 2007, Mr. Speaker, there was no monitoring in place. In early 2008, Mr. Speaker, a team was sent to the project site to reassess and recommend to the Ministry possible options to be undertaken. However, it was indicated that the total remaining oil palm planted area was estimated to be around 300 to 400 hectares only and the whole plantation covered with creepers and weeds. This could be due to lack of monitoring by the government in 2006 and 2007 (Hon. Riumana, Minister for Agriculture and Livestock Development, 1 September 2008).

Source: National Parliament of Solomon Islands (2006)

Several other countries have also experienced political instability in the past 20 years. In Papua New Guinea, a civil war was waged on the island of Bougainville, as it sought to secede to the Solomon Islands and eventually became an autonomous region in 1997. In Tonga, moves toward a more democratic system of government triggered serious rioting in Nuku'alofa in 2006, when much of the downtown area was burned and several people were killed. In a major change in Tonga, a first parliament was elected in November 2010 (with the pro-democracy Democrat party winning 12 of the 17 available seats).

In Australia and New Zealand, significant political change has also taken place in recent years, with the longstanding Howard and Clark governments respectively being voted out of office – with respective political shifts towards the centre-left (Australia) and the centre-right (New Zealand). In Australia, the change of government ushered in a significant policy shift in relation to the country's climate change stance (including

ratification of the Kyoto Protocol). In New Zealand, an important change was the adoption, in 1996, of a Mixed-Member Proportional Representation electoral system. This has conferred significant power to minority parties, such as the Green Party, which has a major interest in forests and forestry policies.

(ii) Governance and participation

Traditional social structures in most Pacific countries were collectivist systems, based on tribal or clan groupings, with collective landownership and, in some societies, some degree of collective decision-making (though others were authoritarian). In some countries, especially in Polynesia, modified versions of traditional village councils remain important decision-making forums. However, in others, especially in Melanesia, despite much of the forest being under customary ownership, the government has acted relatively independently and autocratically in formulating forest policy, and it is only relatively recently that consultative and participatory approaches have been engendered. Similarly, in New Zealand and Australia, until the 1970s, government forestry agencies tended to operate with relatively little community consultation.

With people in all countries having ambitious aspirations for development and demanding greater voice in forest management, consultative approaches, encompassing all stakeholders – including communities, NGO groups and international donors and agencies – mean forest management is taking (and will continue to take) increasingly broad objectives and new directions into account; for example, the preparation of a draft National Forest Policy for Tonga in 2007-2008 (Box 3.5). Similarly, Vanuatu is in the process of revising its national forest policy during 2010 to address new and emerging issues.

Box 3.5: Developing a draft National Forest Policy for Tonga

A draft national forest policy for Tonga was: *"developed as a collaborative venture between the Government of Tonga, forest sector stakeholders in Tonga and the Food and Agriculture Organization of the United Nations.*

…The government of Tonga approached the Food and Agriculture Organization of the United Nations (FAO) in 2006 for assistance in developing a National Forest Policy. FAO consultants met with government officials and other stakeholders for three weeks in October 2007, two weeks in March 2008 and three weeks in July 2008. There was considerable stakeholder involvement in developing this policy.

…The forest policy is needed to consolidate the view of all stakeholders on how Tonga's forest and tree resources should be managed, to act as an agreed basis for planning and subsequent action, and to provide the basis for enacting legislation.

Source: Government of Tonga (2008)

(iii) Governance and corruption

One of the most important underlying influences on forest degradation is corruption. It facilitates the illegal harvesting and removal of timber, and associated trade; it reduces government revenues from royalties and taxes; it may suppress prices for legal timber; where endemic, it raises transaction costs through the need for additional procedural

auditing as well as costs of graft payments; it repels investors looking for safe havens for their funds; and it undermines confidence in governments and their forestry agencies. Elges (in FAO 2009a) notes:

Forest-related corruption has many manifestations, ranging from fraudulent logging concessions, to log smuggling and illegal logging, to the laundering of illicit proceeds, fraud, tax evasion and illegal trade.

Transparency International compiles a Corruption Perception Index (CPI) that:

Measures the perceived levels of public-sector corruption in a given country and is a composite index, drawing on different expert and business surveys. The 2008 CPI scores 180 countries (the same number as the 2007 CPI) on a scale from zero (highly corrupt) to ten (highly clean).

For Pacific countries, the performance is variable (Table 3.4). New Zealand scores equal highest in the world as a 'clean' country, while Papua New Guinea and Tonga both fall into the lowest quartile, with perceived high levels of public sector corruption.

Table 3.4: Perceived levels of corruption in the Pacific

Global country rank	Asia-Pacific country rank	Country	Surveys used	CPI score 2007	CPI Score 2006	CPI score 2005	CPI score 2000
1	1	New Zealand	6	9.4	9.6	9.6	9.1
11	3	Australia	8	8.6	8.7	8.8	8.3
57	11	Samoa	3	4.5	-	-	-
84	14	Kiribati	3	3.3	-	-	-
98	18	Vanuatu	3	3.1	-	-	-
111	19	Solomon Islands	3	2.8	-	-	-
162	26	Papua New Guinea	6	2	2.4	2.3	-
175	31	Tonga	3	1.7	-	-	-

Source: Transparency International (2008)

Elges (in FAO 2009a) compares Corruption Perception Index scores with the global Environmental Sustainability Index scores compiled by the World Economic Forum and finds that corruption is highly correlated with poor environmental stewardship and high rates of deforestation. Evidence from the Pacific tends to affirm these findings.

In the Melanesian countries, where forestry has been an important industry and a major source of revenues, forestry has also been prone to significant corruption, with Papua New Guinea and the Solomon Islands, particularly, garnering poor reputations. Siwatibau (in FAO 2009a) cites a former Prime Minister of Papua New Guinea saying,

Governance has been particularly poor in the area of forestry with the side effect of promoting corrupt practices and undermining sustainability.

The current Prime Minister of the Solomon Islands, the Rt. Hon. Derek Sikua was even more damning in his assessment during parliamentary debate in September 2008:

In 1989, we began suffering from 'cubic disease', the effect of big money suddenly available to us as a result of the massive extraction of virgin forests from our islands for export overseas.

Despite the millions and millions and millions of dollars worth of logs we sold overseas, within 10 years our country was technically bankrupt…

…how did we get to that pitiful state? Briefly I think the leadership of the times saw a lot of money moving around from the export of logs. Discipline broke down in governance. No one wanted to listen to good advice. Money from logs was like manna from heaven except that we found the manna was a disguise for mammon. [The Prime Minister at the time] tried valiantly to stop the madness and ensure government did the right thing. He was unsuccessful because Judas and Machiavelli were working for the other side."

Source: National Parliament of Solomon Islands (2006-2010)

In essence, when very large amounts of money become visible and accessible, particularly in impoverished countries, a fertile seed bed for corruption is established. Strong systems of checks and balances are required in governance and these have generally been lacking.

Similarly, overall standards of governance have generally been weak. A 2006 United Nations Development Programme (UNDP) Pacific Centre report argues that poor economic growth in most of the island countries largely arises from *political developments, poor macroeconomic management, corruption and poor governance* (UNDP Pacific Centre 2006). The relative instability of governments, regular allegations of corruption, low levels of investment and volatility of growth are all symptomatic of governance problems.

3.4. Impacts of globalization and regional and subregional integration

(i) Export market developments

For wood-exporting countries, particularly Australia, New Zealand, Fiji, Papua New Guinea, the Solomon Islands and Vanuatu, developments in export markets and global and regional patterns of trade will be of critical importance in the future development of their forestry and wood-processing industries.

Table 3.5 provides a broad indication of the major export destinations for forestry exports from Pacific countries. While, clearly, the statistics are relatively incomplete, notable features are the relative importance of North Asia and Southeast Asia as export markets, as well as intra-Pacific trade (dominated by bilateral trade between Australia and New Zealand). Conversely, forestry exports to European countries are relatively modest, while trade with Africa and Latin America is negligible. While not included in Table 3.5, the Near East is also a growth area for Pacific exports.

Table 3.5: Directions of exports 2006 (US$1 000 value)

From ↓ To →	East Asia	Southeast Asia	Pacific	Other Asia	Europe	North America	Total[6]
Australia	270 233	138 650	153 861	26 889	72 013	58 818	1 425 926
New Zealand	862 297	280 877	466 083	41 293	13 234	208 041	1 951 980
Fiji	50	26	6 417	35	96	737	23 132
Papua New Guinea	377 110	11 586	12 296	0	892	40	225 826
Solomon Islands	170 479	11 104	3 920	0	153	39	104 926
Vanuatu	0	0	509	0	0	0	3 151

Source: FAO (2009c)

In terms of the 12 largest export destinations for (identifiable) Pacific forestry exports, the importance of East Asia is highlighted in Table 3.6, with three of the top four spots occupied by China, Japan and Republic of Korea. The complementary bilateral relationship between Australia and New Zealand enables these two countries to occupy two spots within the top six export destinations and also partially reflects the importance of these two countries as markets for forestry products from the Pacific island countries. The United States is an important forestry market for New Zealand, Australia and Fiji. Southeast Asian countries and India occupy the lower six spots in the list below, representing increasingly stronger ties with these burgeoning markets, particularly as timber supply conditions in these countries become increasingly tight or constrained.

Table 3.6: Value of identifiable Pacific forestry exports by country of destination 2007

Country	Value of identifiable exports (US$ million)
China	948
Australia	436
Japan	371
Rep. of Korea	361
United States	262
New Zealand	148
Indonesia	125
Philippines	113
Malaysia	70
Thailand	56
India	52
Viet Nam	47

Source: FAO (2009c)

6 Note that the residual value of exports (i.e., the total value of exports less the values exported to all specified regions or subregions) incorporates specified values exported to other regions or subregions (e.g., Africa), exports to unspecified countries and the (often large) 'Others (adjustment)' value specified in FAOSTAT. Refer to FAOSTAT for further details.

Overall, these dominant export destinations reflect a significant trend to increasingly *look north – to Asia*.

Box 3.6: The changing face of New Zealand's export markets

Figure 3.9 demonstrates this increasing diversity in destination markets for New Zealand's exports of forest products. In 1990, 64 percent of New Zealand's forestry exports were destined for either Australia or Japan. By 2008, only 39 percent of the country's exports went to these two markets. Meanwhile the United States and China have grown substantially in market importance, from collectively accounting for 3 percent of New Zealand's exports in 1990, to 25 percent in 2008.

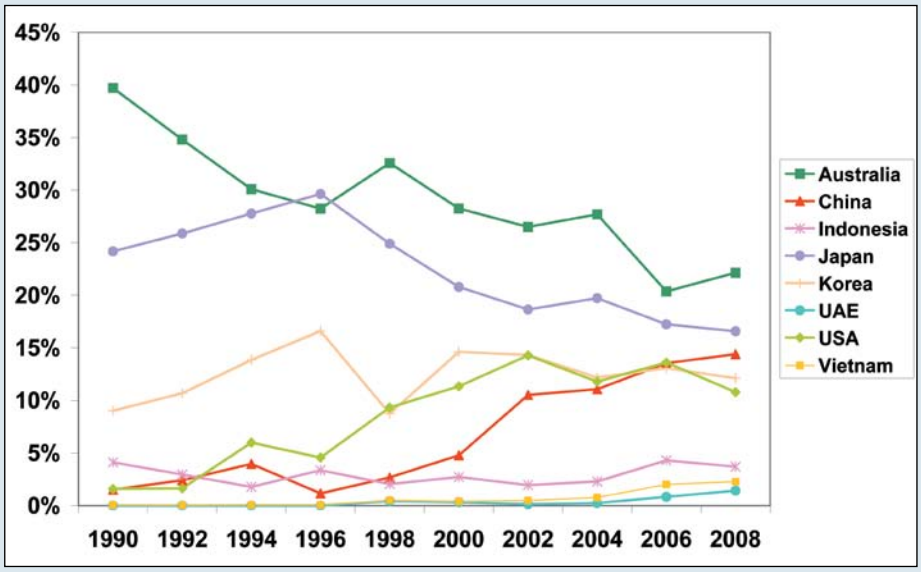

Figure 3.9: Proportion of New Zealand forestry exports by countries of destination

Source: New Zealand Ministry of Agriculture and Forestry Web site

Table 3.7 further elucidates changes in destinations for New Zealand's forestry exports. The development of major markets in China, Republic of Korea and United States are accompanied by development of new, less traditional markets in the Near East (such as the United Arab Emirates and Saudi Arabia) and in South Asia (Pakistan) and Southeast Asia (Thailand and the Philippines).

Table 3.7: Regional changes in New Zealand forestry export destinations (%)

Region/subregion	1990	2008
Pacific	43.1	25.1
North Asia	42.1	46.4
Southeast Asia	10.4	10.7
North America	1.8	11.0
South Asia	1.2	3.1
Near East	0	2.8
Europe	1.2	0.8

Source: New Zealand Ministry of Agriculture and Forestry

Increased globalization over the past two decades makes similar trends as displayed in Box 3.6 likely for forestry exports from other Pacific countries, both now and in the future. In particular, the enormous potential markets created by the economic rise of vastly populous countries such as China and India may provide huge opportunities for relatively low-populated and forest-rich Pacific countries; provided the opportunities are adequately harnessed by domestic economies. At present, these markets are mainly characterized by increasing demands for raw materials and cheap labour, providing a low cost manufacturing base that has intensified competition in markets for processed products in major developed country markets (Morton and Applegate, in FAO 2009a).

A major challenge for most Pacific island countries is to develop wood-processing industries of sufficient scale to overcome disadvantages associated with distance, small and relatively unsophisticated domestic markets, and transportation costs. Partial solutions may be to look for re-export opportunities through larger neighbours, or to seek reputable joint venture partners that can provide ready access through developed marketing chains.

(ii) Trade agreements

Most Pacific countries participate in global trade forums (especially the World Trade Organization [WTO]) and are parties to a variety of multilateral and bilateral trade agreements. Australia, Fiji, New Zealand, Papua New Guinea, the Solomon Islands, and Tonga are members of the WTO, while Samoa and Vanuatu are observer governments.

Three subregional trade arrangements help to govern and promote trade among countries in the Pacific subregion:

1. The South Pacific Regional Trade and Economic Cooperation Agreement (SPARTECA) governs intra-regional trade between member countries of the Pacific Islands Forum. SPARTECA was established in 1981 to ease import restrictions on goods produced in island countries that are imported into Australia and New Zealand, and to promote economic growth and trade. In 1987, Australia and New Zealand removed all duties and quotas on goods produced in island countries.
2. The Pacific Island Countries Trade Agreement (PICTA) is a free-trade agreement among member countries of the Pacific Islands Forum. PICTA is designed to promote regional integration and trade development through creation of a single regional market. It came into force in 2003.
3. The Pacific Agreement on Closer Economic Relations (PACER) provides a framework for "economic integration of the economies of the Forum members in a way that is fully supportive of sustainable development of the Forum Island Countries and to contribute to their gradual and progressive integration into the international economy".

In addition, Australia and New Zealand signed a bilateral free-trade agreement – Australia New Zealand Closer Economic Relations Trade Agreement (ANZCERTA) – in 1983.

Pacific ACP (African, Caribbean and Pacific Group of States) countries are presently negotiating an Economic Partnership Agreement with the European Union to cover trade in goods and services, investment and development cooperation.

All of these arrangements should help to promote trade in forest products.

(iii) Other international agreements and assistance

International conventions, agreements and organizations

Most Pacific countries are members or signatories to most global international and intergovernmental organizations and agreements that relate directly to forestry. Table 3.8 outlines membership status to a range of forest-related arrangements and institutions.

Table 3.8: Status of ratification and/or membership of international conventions, agreements and organizations (2009)

	CBD (ratification)	UNFCCC (ratification)	Kyoto Protocol (ratification)	UNCCD (ratification)	CITES (ratification)	Ramsar Convention (ratification)	World Heritage Convention (acc. or ratif.)	FAO (membership)	APFC (membership)	ITTO (membership)
Australia	■	■	■	■	■	■	■	■	■	■
Fiji	■	■	■	■	■	■	■	■	■	■
Kiribati	■	■	■	■			■	■	■	
New Zealand	■	■	■	■	■	■	■	■	■	■
Papua New Guinea	■	■	■	■	■	■	■	■	■	■
Samoa	■	■	■	■	■	■	■	■	■	
Solomon Islands	■	■	■	■	■		■	■	■	
Tonga	■	■	■	■			■	■	■	
Tuvalu	■	■	■	■				■	■	
Vanuatu	■	■	■	■	■		■	■	■	■

Additionally, a range of Pacific-based institutions and agreements deal with subregional issues including forestry. The most significant of these include:

- *The Pacific Islands Forum (PIF)*: The PIF is a political grouping of 16 independent and self-governing states, including all ten Pacific countries that are members of the APFC. The PIF is an intergovernmental organization with a mission to "work in support of Forum member governments, to enhance the economic and social well-being of the people of the South Pacific by fostering cooperation between governments and between international agencies, and by representing the interests of Forum members in ways agreed by the Forum".

- *Secretariat of the Pacific Community (SPC)*: The SPC is an international organization that provides technical assistance, policy advice, training and research services to 22 Pacific island countries and territories in areas such as health, human development, agriculture, forestry and fisheries.
- *South Pacific Regional Environment Programme (SPREP)*: SPREP is a subregional organization established by the governments and administrations of the Pacific region to protect and manage the environment and natural resources.

Assistance from donor agencies

A wide range of donor countries and agencies provide technical and development assistance and aid to developing Pacific countries in relation to forestry.

Australia and New Zealand have historically provided significant assistance to forestry programmes in Pacific island countries including assistance in plantation establishment, watershed protection, addressing invasive species and forest inventories. However, development assistance for forestry from Australia and New Zealand has increasingly been integrated into broader environmental programmes, focusing particularly on community management, partnerships and, particularly, climate change. For example, NZAID's Pacific Regional Environment and Natural Disasters Programme *currently allocates NZ$6 million a year for regional programmes designed to protect and enhance the Pacific region's natural resource base for sustainable development and poverty reduction*.

Japan, the United States, European Community countries and, increasingly, China are also major donors to Pacific countries. The Organisation for Economic Co-operation and Development (OECD) statistics on aid in support of the environment provide an indication of OECD member contributions to Pacific countries (Table 3.9).

Table 3.9: Selected OECD members' aid in support of environment contributions and to Pacific countries (indicative) (2007)

Country	Total environment-focused aid (US$ M)	Total aid to other Asia[7]-Pacific countries (US$ M)	Proportion of total aid budget (%)	Pacific countries among top 10 recipients of aid
Australia	86	1 391	56.5	PNG, Solomon Is., Samoa
New Zealand	32	186	71	Solomon Is., Niue, Tokelau, PNG, Tonga, Vanuatu, Samoa
Japan	3 898	4 609	35	None
United States	-	995	4	None
European Community	1 701	603	4.5	None
Germany	2 007	1 277	12.5	None
France	-	837	10.5	None

Source: OECD (2010)

7 'Other Asia' is Asian countries outside South and Central Asia (OECD classification). For some donors, the bulk of the contribution was clearly to Southeast Asian countries.

A range of international agencies also provides financial and technical assistance to forestry programmes in Pacific Island Countries including FAO, ITTO, UNDP, the World Bank and ADB. The Global Environment Facility (GEF) is currently providing funding for several forestry projects within the framework of the Pacific Alliance for Sustainability (PAS) programme. Current GEF PAS forestry projects include:

- Improving the representativeness of Papua New Guinea's terrestrial protected area system;
- Conserving Fiji's biodiversity via an integrated system of protected areas;
- Sustainable management of forest resources on Savaii Island (Samoa);
- Sustainable management and conservation of forests in Vanuatu; and
- Sustainable use and management of Niue's forest resources.

(iv) New directions for Pacific countries

During the past several decades, both Australia and New Zealand have significantly shifted their export focus from the traditional ties to Britain and Europe, to closer and increasingly affluent Asian markets, as well as to North America. A similar trend is taking place in the Pacific island countries, which since the late 1980s have also been increasingly *Looking North* to Asia and away from their previous heavy dependence on Australia and New Zealand.

In forestry, this trend is particularly important, given that both Australia and New Zealand are significant net exporters of wood products and hence their demand for timber from the island countries is almost exclusively for specialty timbers and products. For example, New Zealand still imports tropical hardwood timbers from Pacific island countries for applications such as outdoor furniture and decking. However, much larger volumes of hardwood logs (and sawntimber) are exported to Asia by especially Papua New Guinea and the Solomon Islands, while Japan provides an important market for Fijian woodchips. The United States is an important market for Fiji's mahogany sawntimber.

Along with the shifting focus on export markets, the Pacific countries are also seeking investment capital in broader markets, and developing new political alliances and becoming more vociferous in international negotiations. Many Pacific island countries are members of the G-77 coalition of developing nations, while almost all are members of the Alliance of Small Island States. Similarly, Australia and New Zealand's foreign policies, including international forestry policies, are likely to be more divergent from Pacific island interests than in the past.

Countries are also recognizing the benefits of integrating investment from companies in principal export markets. For example, during New Zealand's plantation privatization process, firms from Japan, the United States, Malaysia and China purchased significant areas of plantations. Subsequent investments in plantations and processing facilities have helped to develop a highly internationalized sector. Other countries are also eagerly seeking foreign investment in forestry. Box 3.7 outlines priorities outlined in Fiji's Forest Policy Statement 2007 designed to enhance the country's attractiveness to foreign investors.

Box 3.7: Foreign investment strategies in Fiji's Forest Policy Statement 2007

Fiji is working to improve its attractiveness to foreign investors in forestry, particularly in view of the rapidly maturing and highly valuable mahogany resource. For example, the national Forest Policy Statement 2007 includes the following statements:

The development of joint ventures for logging, forest management, and timber processing between incorporated landowner groups and both domestic and foreign investment partners will be strongly encouraged (page 44).

Establish a favourable investment climate and coordination mechanisms to promote efficient, profitable and internationally competitive forest industries (page 47).

The Government will encourage expanded value-added processing of timber by both large-scale processing plants and portable sawmills. Foreign investment priorities will be for high technology, capital intensive, value-added processes and for the establishment of commercial plantations on land already cleared (page 48).

Source: Government of the Republic of the Fiji Islands (2007)

3.5. Social changes

A range of social issues will be key drivers of change, particularly as people's attitudes to forestry and the environment are shaped and altered. Of particular importance are changes in the balance of goods and services that people demand from forests, especially an increasing focus on services of forests.

(i) People's changing attitudes

In general, access to information and ideas has increased enormously with improved education, the advent of the Internet, increased international travel and modern communications. At the same time, far greater efforts are being made by civil society groups, governments and the private sector to promote their messages and to shape values, including those relating to the environment, forests and forestry. Consequently, public conceptual knowledge and awareness of forest values has increased markedly in recent years.

Conversely, with urbanization comes an increasing disjunction between people and the natural environment, so that practical knowledge and empathy for forests and forestry may well be declining across populations. This substitution of 'information' for 'personal experiences' is particularly likely to be the case in more developed and more urbanized countries, such as Australia and New Zealand, compared with less developed, less urbanized island countries. In developed countries, especially, civil society organizations have been effective in shaping attitudes, and particularly driving a movement away from the historically predominant paradigm that wood production is paramount.

This success is somewhat reflected in a small handful of very simple, but key, attitudes that appear widespread among the general public in regard to forests and forestry, including:

- Forest conservation is good and logging, particularly in natural forests, is bad;
- Foresters and forestry are closely associated with timber harvesting and forest exploitation; and
- Timber products are natural and hence good – though sourcing them from (especially natural) forests is bad.

Naturally, people with an interest or stake in forestry will hold more complex and divergent views while, at the same time, many members of the public will be indifferent about forests and forestry and give them little or no thought. Nonetheless there is a strong groundswell of support for forest conservation and ecosystem approaches to forests and the services they provide, which drives a range of forest policies throughout the Pacific, often at the expense of economic opportunities. This has resulted in changes in the roles of foresters who must adapt to the idea of forestry as the community sees it, not as foresters think it should be (Volker, in FAO 2009a).

Experience of the past 30 years has taught most stakeholders the importance of influencing public and political opinion, and working with – rather than confronting – other stakeholders with different views and values. Partnership approaches between governments, industry, NGOs and communities are increasingly common. Hence, government processes have become more consultative, private sector companies have increased the transparency of their operations and some actively report on their performance in regard to various environmental and social values, and actively market their corporate responsibility. Greater attention is paid to improving skills in community engagement and consultation. The NZ Wood initiative (Box 3.8) provides an example.

Box 3.8: The NZ Wood programme: targeting consumer perceptions

The NZ Wood programme is a comprehensive range of projects and initiatives managed by a cross-section of the forestry and wood industry to promote New Zealand forests and increase consumption of wood and wood-based products. The NZ Wood programme brings together the diverse members of the wood and forestry industry to pursue common objectives, with an overarching objective to help to establish a 'wood culture' and improve perceptions of forests and wood. Other core objectives are:

- Growing the domestic market share for wood;
- Increasing per-capita consumption of wood in New Zealand;
- Growing public awareness of the economic and environmental contribution that the forestry and wood industry makes to New Zealand; and
- Helping New Zealand fight climate change and global warming.

Source: NZ Wood Web site 2010

In general, the concept of sustainable forest management has gained substantial traction in the Pacific – even if the term itself is little used outside the forestry sector. People recognize the need for forests to be managed sustainably, government policies are centred around sustainable forest management, and forest owners, managers and users (with some exceptions) are adopting sustainability practices; sometimes willingly, or to comply with regulations, or in recognition that it is increasingly difficult to do business if forestry operations are not carried out responsibly.

(ii) People and forest ownership

Throughout much of the Pacific – especially the island countries – family, clan and community ownership of lands and forests predominates. As landowners increasingly demand higher standards of living, including improved education, health care and other services, forests are increasingly viewed as a vehicle for funding development. Papua New Guinea provides one example (Box 3.9), though a similar trend is apparent in Fiji, the Solomon Islands, Vanuatu and, increasingly, for indigenous groups in New Zealand and Australia.

Box 3.9: Forests and development – Papua New Guinea

Forests are also seen by many people as a means to bring development to their undeveloped or lesser developed communities. Development in the sense of cash income, infrastructure, and basic services, especially health and education. These developmental needs often force landowners to seek government assistance to bring in timber companies to harvest the trees in their forest. In return, landowners earn an income through timber royalties, employment, create access to urban areas through roads, jetties, or airstrips, and are able to access health and education services and other basic services that are generally non-existent in rural communities.

Source: Papua New Guinea Forest Authority (2009)

As part of this drive for development, many indigenous groups are mobilizing to reclaim forests and lands that have been unlawfully or inequitably taken from them (especially in Australia and New Zealand) or mobilizing to gain greater control and autonomy (from government agencies and concession holders) over lands to which they retain ownership. At the same time, as the financial value of forests has become evident, some old ownership disputes among indigenous groups have flared. On smaller islands, scarcity of land and forest areas has become an issue as populations have burgeoned; for example, on South Tarawa in Kiribati.

(iii) Employment and forestry

Forestry is a relatively modest employer in most Pacific countries. Total employment in forestry and logging and first stage processing in Pacific countries totaled approximately 127 000 people in 2006 (Table 3.10), with Australia, New Zealand and Papua New Guinea being the largest employers. As a proportion of the total labour force, forestry employs approximately 2 percent in the Solomon Islands, while in Australia, Papua New Guinea, Vanuatu and Fiji, forestry activities account for approximately 1 percent of all employment. However, as a proportion of the formal labour force, especially in island countries such as Papua New Guinea and the Solomon Islands, the proportion is significantly higher.

Table 3.10: Employment in forestry and first stage processing industries, 2006 (thousand employees[8])

Country	Forestry & logging	Wood industry	Pulp & paper	Furniture industry	Forestry sector
	ISIC 02	ISIC 20	ISIC 21	ISIC 3610	ISIC 02,20,21
Australia	11	42	21	32	74
New Zealand	7	16	5	8	28
Fiji	0	2	1	1	3
Papua New Guinea	8	4	-	1	12
Solomon Islands	8	0	-	-	8
Vanuatu	0	1	-	-	1
Samoa	0	0	-	-	1
Tonga	0	0	0	0	0
Kiribati	-	-	-	-	-
Tuvalu	-	-	-	-	-
Total	**34**	**65**	**27**	**42**	**127**

Source: Lebedys (2008)

As countries develop, a notable feature in employment is a drift away from primary production sectors, such as agriculture and forestry, and towards industry and services. In Australia, for example, employment in agriculture is relatively very low – and still declining – with just 5 percent of males and 3 percent of females employed in the sector. In contrast, the services sector employs 65 percent of males and 88 percent of females, with the remainder employed in the industrial sector (World Bank 2008). A similar pattern is observable for New Zealand. Conversely, in Papua New Guinea, approximately 85 percent of the population is employed in the agriculture sector (many in the informal sector) and similar patterns are observable – to a greater or lesser extent – in the other island countries (Box 3.10).

Box 3.10: Employment statistics for Fiji, 2007

In Fiji, the potential labour force (people aged 15 years or more) in 2007 was estimated at 594 000. Of these, 327 000 were classified as 'economically active' (in the labour force). People classified as 'not economically active' (full-time homeworkers, retired, students, etc.) totaled 267 000. Of the economically active, 299 000 people were employed and 28 000 were unemployed. Of the employed, 252 300 were in paid employment, while 46 600 were engaged in subsistence agriculture. In 2005, those employed in agriculture, forestry and fishing totaled 1 389, those engaged in manufacturing numbered 25 527 and 96 388 people were employed in service industries.

Source: Fiji Islands Bureau of Statistics (2009 & 2010)

In general, forestry employment is relatively static, increasing slowly in countries where the industry is expanding (Australia, New Zealand and Fiji) and decreasing slowly in countries where the timber industry has been in decline (the Solomon Islands, Vanuatu, Samoa).

8 Employment is rounded to the nearest 1 000. Less than 500 persons is rounded to 0.

In several countries, unemployment – especially youth unemployment – is a significant problem, with frustrations leading to crime and sometimes spilling over into civil unrest, as in, for example, the Solomon Islands and Tonga.

In Papua New Guinea, HIV/AIDS is prevalent (estimates of the number of cases ranged between 5 500 and 22 000 in 2000) and the disease is expected to have a significant negative impact on the country's economy. The capital-intensive nature of the timber industry means that impacts are likely to be somewhat lower in forestry compared to the general economy (dominated by smallholder agriculture). Nonetheless, HIV/AIDS is forecast to reduce gross production output in plantation agriculture (including forestry) by 2.9-7.9 percent by 2020 (Centre for International Economics 2002).

A particular issue for all countries is shortages of forestry professionals and skilled workers. In Australia and New Zealand, particularly, declining rolls in tertiary forestry education institutions are creating shortages of professional foresters. In Australia, there were 75 university forestry graduates in 2000, but only 35 in 2005. This is likely to have flow-on effects for Pacific island countries, in terms of future access to training in Australasia, and in terms of accessing Australasian foresters to work abroad.

In addition to scarcity of professional foresters, the Australian *Wood and Paper Products Industry Skills Shortage Audit* also identified particular difficulties in accessing harvesting operators and 'quality' unskilled labourers, while processing industries identified shortages of cross-sectoral professions such as electricians, fitters and engineers.

3.6. Technological changes within and outside the forest sector

Technological changes have the capacity to significantly affect how forestry is carried out in the Pacific region.

Technological research and development in forestry is relatively concentrated among a handful of agencies in Pacific countries. In Australia, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) is the national science agency, carrying out research across a wide range of sectors, including forestry (Box 3.11). The Australian Centre for International Agricultural Research (ACIAR) operates as part of the Australia's development cooperation programmes, encouraging Australian scientists (including forestry scientists) to use their skills for the benefit of developing countries and Australia.

Box 3.11: CSIRO's forestry research

"CSIRO's forestry research activities range from quantative genetics to precision plantation management to smart paper and wood products of the future. On a global scale, CSIRO plays a significant role in the application of Australian forestry knowledge and expertise. CSIRO provides forestry research and development within several research divisions covering:

- *Forest system science;*
- *Forest genomics; and*
- *Forest polymers and fibres.*
- *Helping New Zealand figh*

CSIRO offers skills and research expertise, as well as opportunities for partnerships across all areas of the forestry value chain, including:

- *Breeding better forests for maximum returns;*
- *Developing management systems for productive and sustainable forests;*
- *Protecting forests from pest, pathogens, weeds, fire and wind;*
- *Extracting value from wood and fibre resources;*
- *Working in wood processing and wood products to ensure the place of wood in a modern market; and*
- *Optimizing pulp, paper and packaging processes and products."*

Source: CSIRO Web site (2010)

In New Zealand, forestry science is centred at SCION (formerly the New Zealand Forest Research Institute), a Crown Research Institute dedicated to strengthening the international competitiveness of the New Zealand forest industry. SCION's major research areas include sustainable design, forest science and bioproduct development.

In Papua New Guinea, the Forest Research Institute (PNGFRI) operates as a directorate of the PNG Forest Authority. PNGFRI provides forest-related research services based on collaboration with users in government, industry and communities.

A range of other forest research providers exists, including universities, private sector firms (forestry companies and consulting agencies) and cross-sectoral agencies.

Groundbreaking forestry science is particularly carried out in Australia and New Zealand, particularly in relation to a limited range of tree species including *Eucalyptus* species and radiata pine. For example, extensive research (much in the Pacific) relating to radiata pine has led to claims that it is the world's "most researched tree species". However, the subregion's limited research capability demands substantial technology transfer from elsewhere, and a focus on adaptive research.

Key subregional forest research priorities will continue to include:

- Strengthening efficient, value-added, integrated processing;
- Development of efficient, small-sized processing plants (Pacific islands);
- Reconstituted wood products – composites and polymers;
- Wood substituting for less environmentally friendly products;
- Wood products as a carbon store;
- Bioenergy and second generation biofuels;
- Biotechnology;
- Tree improvement and tree breeding;
- Biosecurity, forest health and forest fires; and
- Building sciences.

Extra-sectoral technology and infrastructure development is also critical, including developments in transportation and roading, information and E-technologies, and competitive implications of technological developments in other sectors including agriculture and energy.

3.7. Environmental issues and policies and their impacts on the forest sector

A range of environmental issues will act as key drivers of change. In part, these strongly relate to social changes, and the increasing precedence being given to the environment and the services provided by forests, compared to a historical focus on wood production.

(i) Climate change

For the past several years, climate change has dominated the forestry agenda and returned forestry to the centre-stage of global environmental discussions. Of particular relevance to Australia, New Zealand and the Melanesian countries has been the significant contribution that deforestation makes to global emissions, and prospects for significant financial windfalls for forestry through mechanisms such as REDD and carbon trading schemes. However, the uncertainty surrounding the outcome of climate change negotiations for forestry has likely acted as an impediment to forestry action and development, with the murky policy environment encouraging forest owners and potential investors to adopt 'wait-and-see' strategies. The relatively weak and uncertain outcomes of the Copenhagen Accord are likely to further extend this limbo in which the forestry sector finds itself.

Generally, it seems unlikely that climate change funding will prove to be a panacea for the range of challenges confronting Pacific forestry, particularly the island countries. Overall, the levels of climate change funding pledged for development assistance are perceived to fall far short of optimal requirements and shortfalls will doubtless impact on forest funding through mechanisms such as REDD. At the same time, most of the forestry measures proposed for reducing forestry emissions and enhancing sequestration are already encapsulated within the framework of sustainable forest management. Failures to implement sustainable forest management are attributable to a wide range of variables, many – such as poverty, greed, institutional capacities, corruption, and policy and legislative weaknesses – are only indirectly related to financing issues. To date, many countries have tackled these issues with very limited success, and new and additional funding will only go part of the way to solving the problems. In light of past deficiencies, the forestry sector needs to be careful that it can deliver on future promises – especially in relation to potential climate change funding.

Pacific countries will also need to be wary of seeing forestry-related climate change funding as a 'free lunch'. Funding such as proposed under REDD will be payments for opportunities foregone, and these opportunity costs will have to be borne by the countries, while there will also be requirements for significant (and costly) upgrading of monitoring and reporting capacities.

For the smaller Pacific countries, such as Kiribati and Tuvalu, potential sea-level rise and inundation are core drivers of national policies across a wide range of sectors. In these countries, forestry may have additional roles in foreshore and agricultural protection, while also potentially being affected by cross-sectoral policies such as energy policies.

(ii) Natural disasters

Many Pacific countries are vulnerable to cyclones and hurricanes and these have helped to shape forest policies in several countries including Samoa, Fiji and New Zealand. Forestry policies relating to watershed and erosion protection have been formulated in

many countries, while wind-firmness has been a major determinant in plantation species selection in a number of countries and has had substantial impacts on plantation policy in Samoa (Box 3.12).

Box 3.12: Impacts of cyclones on plantation development in Samoa

The perceptions of forest plantations as an extremely high risk investment after the devastating impacts of Cyclones Ofa and Val continue to haunt the Forestry Division. Despite significant investment hitherto made in forest plantation infrastructure (i.e., roads, office station, accommodation quarters, nurseries, mechanical workshops), NZAID's assistance was phased out because plantations were deemed too risky. Transferring this risk to local communities was obviously considered more acceptable. Today, there is keen interest from AusAID for a forest replanting programme, targeting local villages and individual households. If this is to proceed, then the ownership of planted woodlots in private ownership will increase.

Source: Sesega (2009)

In September 2009, a tsunami hit American Samoa, Samoa and Tonga, destroying a number of coastal villages, killing around 200 people, and forcing the evacuation of thousands. Forestry coastal protection strategies, similar to those implemented in some Asian countries, could be used to mitigate against the impacts of future tsunamis.

Australia is particularly vulnerable to major bushfires, which caused substantial loss of life (173 people killed) and enormous destruction in Victoria in the Black Saturday bushfires of February 2009. Australia is investigating a range of policy and forest management options to attenuate the impacts of bushfires including improved management of fuel loads and increased emphasis on fire risk in considering establishment of forest parks and reserves.

In New Zealand, a magnitude 7.1 earthquake struck the central South Island in September 2010, severely affecting Christchurch city and surrounding areas. The costs of damage are estimated at NZ$4 billion and are expected to provide a major boost to wood products and building industries.

(iii) Plantation policies

Progressively, the world is demanding more goods and services from fewer forests and smaller forest areas. Consequently, intensification of management through establishment of forest plantations is increasingly important in wood production. Plantations are already an extremely important source of Pacific wood supplies, especially in Australia, Fiji and New Zealand, while other countries are recognizing the importance of developing plantations to compensate for dwindling natural forest wood supplies.

Plantation policies will be important drivers of wood supply in the region, though largely for beyond 2020, except for short rotation pulp crops (mainly in Australia). During the next decade, decisions on utilization of maturing plantations will be more important, with the Fijian mahogany resource, especially, being of crucial importance to that country.

(iv) Drive towards sustainable forest management

Overall efforts towards sustainable forest management have the potential to be important drivers of change. However, it seems likely that progress will largely be incremental, rather than a quantum leap, especially given recent developments in the climate change agenda. Some progress can be expected in expanding the extent of certified areas, implementing codes of practice and improving performance in relation to the various criteria and indicators of sustainable forest management; however, greatest progress is likely in the more wealthy developed countries and least progress in the least developed and poorest countries, where earning revenues from forests is paramount. Potentially the area offering greatest gains is to improve engagement of forest owners and stakeholders. Given the extensive customary ownership of forests in Pacific Island Countries, it is critical to have the forest owners on-side and supportive of government policies, if real progress is to be made.

3.8. Summary of key factors that are likely to impact forestry in the next 20 years.

(i) Australia and New Zealand

The forestry sectors in Australia and New Zealand generally have a sound basis for the future. Both countries have stable and maturing forestry sectors. A key to forestry development is an increasing dichotomy between natural forests for provision of environmental services and increasingly locked into conservation estates, and plantation forests for production forestry.

The actual paths forestry will take in these countries during the next decade will largely depend on the length and depth of the current recession and future economic conditions – while developments in the climate change agenda will dictate any significant structural changes.

Forest policy directions in both countries are largely firmly set, with changes likely to come in the form of fine tuning rather than radical policy shifts. The major uncertainties relate to climate change outcomes, and the extent to which forests are included in national strategies to mitigate or adapt to climate change. In New Zealand, an emissions trading scheme is close to being finalized, but has yet to be put into practice. It is a moot point whether the scheme will be revisited in the light of future outcomes in global negotiations. In Australia, the Carbon Pollution Reductions Scheme (CPRS) has been deferred until 2011; it is not yet clear whether forestry will be included in whatever form the CPRS might be implemented. In both countries, it is fair to say that "where climate change goes, forestry will likely follow".

(ii) Melanesia

Forestry in Melanesia might be best characterized by rich forest resources that have been extensively exploited, but only rarely harnessed to assist national development. In most countries, the most accessible natural forests have largely been harvested and significant questions have been raised about the efficacy of continued natural forest logging. With small domestic markets, returns from forestry for Melanesian countries are dependent on external market conditions. Climate change and REDD offer some

prospects for new revenue avenues, though it seems unlikely that substantive payment mechanisms will be established until late in the forecast horizon.

Fiji is relatively well placed to further develop its forestry sector. A priority for Fiji's forestry sector is to get acceptance and support of all stakeholders to utilize forest resources in a more sustainable manner. The land tenure system means that responsibility for natural forest management rests largely with private and customary landowners, except during brief periods while forests are logged. A major challenge for Fiji is to successfully market its increasing plantation resources, while maximizing local benefits through domestic processing. These objectives are likely to continue as a focus for the sector for the foreseeable future, with policy designed to facilitate niche marketing and to enhance competitiveness. A key will be to develop value-added processing potential, especially for its substantial mahogany resource. A part of this challenge will be to attract investment capital; assuring investor confidence in political, economic and policy stability will be an important component. At the same time, Fiji needs to strengthen its efforts in forest conservation and work with landowners to ensure a satisfactory proportion of representative forest types are accorded adequate protection.

Papua New Guinea is a relatively resource-rich country, with extensive reserves of oil, minerals and forests. However, to date, the country has failed to adequately harness these reserves to improve living standards. The overarching issue in Papua New Guinean forestry is unsustainable and destructive logging. A number of initiatives have been implemented to afford greater control over logging, but there still remains much scope for improvement. Clear-felling for oil-palm plantations, agricultural and roading schemes, and unsustainable levels of permitted harvest, are major issues. In general, a continuation of current levels of natural forest logging and log exporting is expected, although REDD may assist at the margins. Corruption is an issue acknowledged by the government and logging companies wield a significant degree of financial influence. There is also evidence that much of the legislation is not effectively enforced, with many logging companies operating without recognition of the mandatory provision of environmental impact assessments, projects approved that do not appear in the National Forest Plan and breaches of the Forestry Act. Most of the government land available for plantation forestry has been planted and further planting is reliant on achieving lease agreements with customary landowners. Obtaining such agreements is a laborious task and, allied with the loss of some existing long-term leases, this is jeopardizing government planting programmes. The present protected areas system is inadequate in view of the country's biodiversity and has proven difficult to establish on account of the land tenure system. Landowner awareness of forestry roles, practices and legislation needs improvement. While traditional beliefs and customs have helped to protect the environment in the past, the integrity of the environment is under increasing threat from population growth pressures. The key challenge is for the country to harness its resource wealth for development, rather than have it continue to line the pockets of a few and be exploited by outsiders.

The overriding forestry concern in the **Solomon Islands** is unsustainable logging and the economic, environmental and social implications arising from this. During the past decade, the timber industry has regularly contributed around 20 percent of government revenues, and often more than 40 percent of export revenues. Reducing the logging rate would therefore cause a drastic reduction in national income. Conversely, if logging rates continue at current levels, merchantable forests will, in any case, be logged out in the next decade, with the accompanying environmental degradation. A weak administrative capacity and lack of resources limits the ability of the Solomon Islands' Government to respond to these challenges. A range of other challenges and problems

is associated with unsustainable logging including a lack of education and training programmes and facilities, geographic dispersion of the islands and the transportation and communications challenges this imposes, and problems associated with land tenure, including those associated with collective and conflicting ownership, and the desire by indigenous people to reap the economic benefits available from logging. The country's high dependency on forestry inevitably raises questions as to what will happen when forestry revenues inevitably contract. Balance of payments crises and potentially a return of civil unrest seem likely; in a worst case scenario democratic and capitalist systems may break down, possibly leading eventually to a return to traditional collectivism.

The principal forestry concerns in **Vanuatu** relate to deforestation and forest degradation. Large areas of lowland forest have been cleared, and this has raised concerns over loss of biodiversity, as well as the promotion of severe soil erosion. Coastal erosion is also a significant problem in some areas. Overgrazing and burning of forests in the uplands is also a significant cause of soil and watershed degradation. The country's lack of environmental management experience, as well as limited funding, have been identified as major constraints to achieving sustainable resource use. There are also concerns over the capacity of the Department of Forests to adequately monitor logging operations and fulfill roles envisaged in the Reduced Impact Logging guidelines. A number of challenges also pertain to logging concessions, beginning with a history of poor logging practices, inadequate training of operators and the short tenure of many concessions, which reduces the incentives for good management. The focus on only a few timber species also promotes high-grading of forests, and consequent degradation. To help protect forests and encourage its developing processing industries, Vanuatu has operated an intermittent log export ban since 1994. A lesson here might be that for small, vulnerable economies, where some of the fundamental tenets of governance may be lacking, adherence to the open market prescriptions may be a recipe for disaster. Rather, Vanuatu has used the ban as a mechanism to develop a modest wood-processing industry, mainly focused on domestic markets, while the country is focusing much more on tourism, in which forestry plays a role, as an earner of foreign exchange.

(iii) Polynesia and Micronesia

The Polynesian and Micronesian islands are generally too small to sustain large-scale forestry industries and in most countries, merchantable natural forests have largely already been harvested. With increased import dependence looming, a key challenge for these countries is sustainability and replenishment of wood supplies for domestic consumption (largely through plantation establishment) and conservation of remaining natural forests.

For Samoa and Tonga, the future – in forestry and beyond – offers choices of dependency or self-sufficiency. Beyond the initial liquidation of their merchantable natural forest – now largely complete, neither country is large enough to host a significant forestry export industry. Indeed, both countries are increasingly dependent on forestry imports, while both are also aiming to establish new planted forest resources as a means of moving towards future self-sufficiency, at least in terms of wood (as opposed to paper) products. In the meantime, forests continue to provide for subsistence needs and serve as a backdrop, and potentially a future focus, for tourism.

Deforestation is the most immediate environmental challenge in **Samoa**, arising chiefly from an expansion of agriculture, although commercial logging has also played a very

significant role. Environmental problems associated with this deforestation include watershed degradation, erosion and soil depletion, and loss of biodiversity. The remaining merchantable natural forest is expected to be exhausted within five years, and plantation forestry is not yet in a position where it can offer an alternative source of timber. Thus, an important economic sector will enter a resource-based recession, and there are likely to be significant economic and social repercussions arising from this slow down. A shortage of financial resources to implement forestry programmes is a significant issue in Samoa. For example, enforcement of forestry-related regulations is constrained by resources. Financing for forestry has been scaled back following the discontinuation of some bilateral assistance programmes. Shortages of professional human resources and a shortage of human resources in general, are ongoing concerns for the Samoan forestry sector. Other challenges arise from the land tenure system, and uncertainties over the future direction of core forestry programmes.

The principal forestry concerns in **Tonga** relate to deforestation and forest degradation – and an associated need to conserve much of the remaining forest land in the face of continuing demands for consumption. Most areas of lowland forest have been cleared, and this raises concerns over loss of biodiversity, as well as the promotion of soil erosion and the spread of anthropogenic grasslands. Coastal erosion is also a significant problem in some areas, particularly on Tongatapu. The increase in commercial farming of short-term crops instead of the traditional agriculture practices is the main cause of forest loss on private lands and remains a key land-use issue in Tonga. Some Tongan islands are vulnerable to the adverse impacts of climate change and sea-level rise. The country's lack of environmental management experience, as well as limited funding, have been identified as major constraints to achieving sustainable resource use. In terms of managing the forest resources the Forestry Department has limited resources and lack of funding has negatively impacted on forestry training and the availability of qualified forestry staff. The current development of a new forest policy will encompass new priorities and directions for Tongan forestry.

For the small atoll countries of Tuvalu and Kiribati, absence of economies-of-scale and their very remoteness substantially hinder development. Forests mainly play roles in subsistence livelihoods, agroforestry, coastal protection and for basic building products and fuel, as well as playing a role in ecotourism. The economies of both countries are highly dependent on remittances and aid money. For both countries, people are the major resource – and the broad development focus should surely be on education, skills and provision of services. Both countries are deeply concerned about potential sea-level rise and inundation, and forests may have a role in protecting against this.

The greatest threat to many of **Kiribati's** islands is from global warming, which threatens to inundate much of the country's land area. Population pressures, particularly on South Tarawa (the most densely populated Pacific island) are creating major problems for sustainable resource management. Problems confronted by mangrove stands on South Tarawa, for example, include: destruction through land reclamation and during the construction of fishponds and inter-islet causeways; degradation through harvesting for fuelwood and structural materials; and habitat pollution through dumping of rubbish. Land management difficulties arise from the customary inheritance law, which has led to continuous subdivision and widespread fragmentation of landholdings.

The overriding environmental concern in **Tuvalu** is global warming and associated rising sea levels that threaten the islands' underground water tables and eventually may result in inundation of these low-lying atolls. Coastal erosion is already seriously affecting shorelines, and seawater has seeped into the groundwater, killing coconut

trees and flooding taro pits. In terms of forests a key concern is excessive clearance of forest undergrowth for use as fuel. On Funafuti the situation is particularly serious, with increasing costs and dependency on fossil fuels also driving demand for alternative fuel sources, notably wood. A variety of other concerns including overgrazing of the very limited arable land, standardization of garden and agricultural crops, and indiscriminate use of pesticides all have impacts on forest areas (FAO 2009b).

4 PROBABLE SCENARIOS AND THEIR IMPLICATIONS

4.1. Rationale for scenario definition

Scenario development is a valuable tool that enables the construction of a variety of alternative potential futures, based on variations in a limited number of parameters.

Scenarios are particularly useful in that they enable systematic consideration of various circumstances that may arise in the future, analysis of the causative factors that will drive the evolution of such circumstances, and hence contribute to the development of strategic plans that will work to encourage favourable outcomes and mitigate less favourable features.

The scenarios presented in this report have followed a largely linear process, in which:

i. A broad group of subregional drivers of change were identified during workshop brainstorming processes;

ii. National workshops and authors of national reports identified key drivers of change likely to most profoundly influence forestry in their countries over the coming decade, and used them to develop national scenarios for forestry development;

iii. The above analyses were coalesced into this report to identify overall subregional scenarios that will help to analyse potential changes and provide some 'feel' for likely magnitudes of change, thereby enabling a realistic narrative description of how forestry in the Pacific is likely to evolve and provide a broad narrative of how we should expect forestry to 'look' in 2020.

The large social, economic and geographic differences among the developed countries of Australasia, the larger island countries of Melanesia and the much smaller island countries of Polynesia and Micronesia suggest both that the most significant driving forces affecting each group may be markedly different and that the impacts and implications arising from change might also vary significantly. Consequently, in this chapter, separate sets of scenarios have been developed for each group.

4.2. Elements (parameters) used in defining scenarios

(i) Australasia

Australia and New Zealand are developed, industrialized countries with forestry sectors characterized by relatively strong and stable policies and regulations, developed industrial sectors with well-defined processing and export chains, clearly demarcated and effective conservation and protected areas, and affluent societies with strong civil society dialogue and virtually no-one dependent on forests for subsistence livelihoods.

The size and stability of Australia and New Zealand's forestry sectors make it highly unlikely that radical departures from current trends will occur during the next decade. Industrial elements are sufficiently robust to weather all but a catastrophic economic downturn, while the stability of policy environments is highly unlikely to countenance radical shifts that would change the face of forestry. Barring a significant change in the natural environment that would markedly affect forests, such as massive forest die-back as predicted under some climate change scenarios, the forestry sectors in Australasia should be expected to evolve in a relatively predictable and orderly fashion.

Nonetheless, there are significantly differing paths that forestry in Australasia might venture along during the coming decade. These would cause major variations and implications for the much longer term evolution of the sectors. Potential pathways are presented in three scenarios:

Scenario 1: Business-as-usual scenario

The business-as-usual scenario provides a point of reference and comparison against which the implications of significant changes described in alternative scenarios can be measured. The business-as-usual scenario assumes no changes in existing policies, that sectoral trajectories remain constant and that recent data trends (particularly assuming that the current economic downturn will be short-lived) can simply be extrapolated over the forecast period (to 2020).

Scenario 2: Severe and protracted economic recession scenario

The current economic downturn seems likely to persist into 2011 but, despite dire forecasts of it being "the worst economic downturn for 70 years", presently there is no clear evidence as to whether it will be a relatively short and sharp correction, similar to the Asian Economic Crisis, from which recovery was in evidence within 18 months of the onset; or whether the crisis might be much more protracted, such as the Great Depression of the 1930s.

This scenario examines potential impacts on Australasian forestry of a recession of the length and severity similar to the Great Depression. The scenario envisages an economic decline extending through to a low in 2013, encompassing high unemployment, plummeting consumer spending and commodity prices, falling asset prices and minimal capital investment.

Essentially, this represents a worst-case economic scenario, in which the severity of effects is magnified compared with a shorter and shallower global recession (represented in the business-as-usual scenario).

Scenario 3: Green economy scenario

For the next decade, for many countries, there is a strong perception that "where the climate change debate goes, forestry will follow". This is likely to be particularly true for New Zealand and Australia, with New Zealand finalizing and implementing an ETS that encompasses forestry, and Australia still considering a pathway forward that seems likely to incorporate some form of ETS. In both countries, uncertainty surrounding policy development and regulations relating to forestry and carbon sequestration has led many forestry managers or potential investors to take a 'wait and see' approach to forest investment, or even – in a few cases – to exit forestry in the light of possible land-use change levies.

This scenario focuses on likely and potential climate change policy developments that will affect forestry – and are most likely to drive developments towards a 'green economy' – and the likely impacts and effects of such policies on forests and forest management.

(ii) Melanesia

The large island countries of Melanesia (Fiji, Papua New Guinea, the Solomon Islands and Vanuatu) are characterized by relatively high levels of forest cover, but with much of the accessible merchantable forest either already logged, or under threat. All the Melanesian countries are classified as Small Island Developing States (SIDS), with the Solomon Islands and Vanuatu on the United Nations list of Least Developed Countries (LDCs) (Papua New Guinea was recommended for inclusion in the list in the 2006 review). As such, these countries are likely to be vulnerable to economic downturns, while policy (and indeed political) and legislative stability, resource exploitation, governance, law enforcement and corruption are all issues for some or all of the countries.

Scenario 1: Business-as-usual scenario

The Melanesian business-as-usual scenario provides a point of reference and comparison against which the implications of significant changes described in alternative scenarios can be measured. The business-as-usual scenario assumes no changes in existing policies, that sectoral trajectories remain constant and that recent data trends can simply be extrapolated over the forecast period (to 2020).

Scenario 2: Industrial forestry scenario

This scenario envisages that economic imperatives, particularly people's demands for development, will be the primary forces driving forestry in Melanesia to 2020. The narrative describes a situation where logging remains the primary means of generating cash incomes from forests to ensure livelihoods and provision of basic infrastructure and services. The scenario assumes a continuation, and in some cases acceleration, of the current situation under which logging in most countries is predominantly carried out by timber concessions and where the bulk of the production is in the form of logs or sawntimber, though with some new investment in downstream processing facilities.

Scenario 3: Green economy scenario

Scenario 3 for Melanesia examines a significantly different path for forestry in the large island countries, largely based around an assumption that very rapid and successful progress is made in developing and implementing mechanisms such as REDD and development of forest-based carbon trading instruments. The scenario envisages a significant shift in forestry focus towards a 'green economy' encompassing forest conservation, forest rehabilitation and plantation establishment and a shift away from industrial forestry.

(iii) Polynesia and Micronesia

The smaller island countries of Polynesia and Micronesia (Samoa, Tonga, Kiribati and Tuvalu) are particularly vulnerable to change, due to their small size and particularly the small size of most of the individual islands that constitute the countries. Small island ecologies tend to be diminutive, fragile and easily disturbed, disrupted and destroyed.

All of the APFC member countries of Polynesia and Micronesia are also classified as SIDS, and Samoa (recommended for graduation from the list in 2006), Kiribati and Tuvalu are also classified as LDCs.

Scenario 1: Business-as-usual scenario

The Polynesian business-as-usual scenario provides a point of reference and comparison against which the implications of significant changes described in alternative scenarios can be measured. The business-as-usual scenario assumes no changes in existing policies, that sectoral trajectories remain constant and that recent data trends can simply be extrapolated over the forecast period (to 2020).

Scenario 2: Severe and protracted economic recession scenario

As in the Australasian case, this scenario envisages the impacts on forests and forestry in Polynesia and Micronesia of a protracted recession of similar length and severity of the Great Depression. However, because industrial forestry operations are small or non-existent on most islands, the effects of a recession are likely to be significant more in terms of potential changes towards subsistence demands on forests.

Scenario 3: Rapid economic recovery and growth scenario

A converse scenario to protracted economic recession, Scenario 3 envisages a rapid economic recovery and sustained economic growth through to 2020. This scenario envisages a more affluent path through the next decade and potential consequent effects for forestry in Polynesia and Micronesia.

Table 4.1: Analysis of scenarios and countries

	Business-as-usual	Severe and protracted economic recession	Industrial forestry	Green economy	Rapid economic recovery and growth
Australasia	Australia, New Zealand	Australia, New Zealand		Australia, New Zealand	
Melanesia	Fiji		Fiji	Fiji	
	PNG		PNG	PNG	
	Solomon Is.		Solomon Is.	Solomon Is.	
	Vanuatu		Vanuatu	Vanuatu	
Polynesia & Micronesia	Kiribati	Kiribati			Kiribati
	Samoa	Samoa			Samoa
	Tonga	Tonga			Tonga
	Tuvalu	Tuvalu			Tuvalu

4.3. Business-as-usual scenarios

(i) Australasia

Australia

The forestry sectors in Australia and New Zealand have developed over a century into robust, stable and largely sustainable entities which – excluding substantive change in a handful of parameters – can be expected to follow a largely predictable course over the next decade.

A business-as-usual scenario would see the total area of forest in Australia remain largely static – with perhaps a continuation of marginal decline. Areas of forest loss through drought, bushfires, clearance for agriculture and forest harvesting would be offset by natural regeneration, including within the expanded conservation estate, and through forest plantation establishment. The area of public natural forests available for wood production would continue a declining trend – from 11.4 million hectares in 2000-2001 to 9.4 million hectares in 2005-2006 – with perhaps less than 5 million hectares available for harvesting by 2020. Figure 4.1 projects a potential path for harvest levels in Australian public and private native (natural) forests post-2007, based on declining trends.

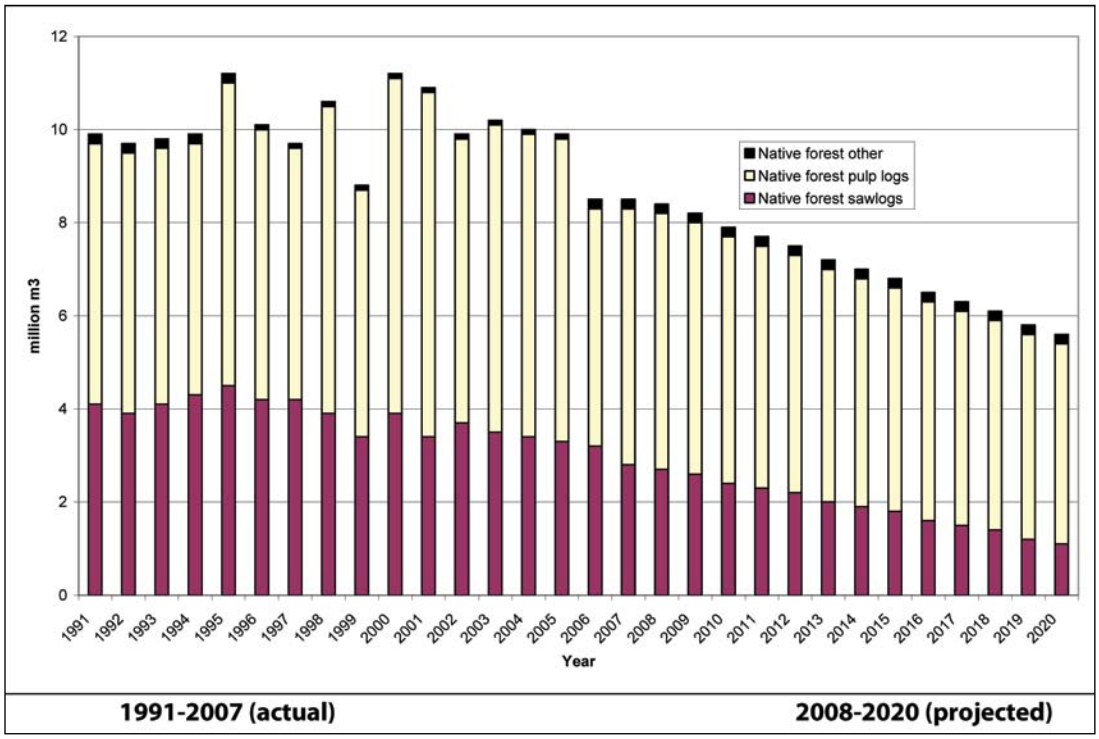

Figure 4.1: Potential harvest levels in Australian public and private native forests

Source: Actual data DAFF-BRS (2008); author's projection

The forest conservation estate in Australia increased by 1.5 million hectares between 2003 and 2008 to a total of 23 million hectares. A continuation of this trend would see a further 4 million hectares of forests added to the conservation estate by 2020.

Under the *Plantations for Australia: The 2020 Vision* strategy, the government and forest industry have set a target of expanding the national plantation area to 3 million hectares by 2020. In 2008, the country's plantation estate stood at 1.82 million hectares, thus, achieving the target will require further expansion of 1.28 million hectares over the 12-year period from 2008. Most of the expansion is likely to be in hardwood species, and mainly for pulpwood production. Figure 4.2 shows estimated future plantation wood supplies in Australia to 2024.

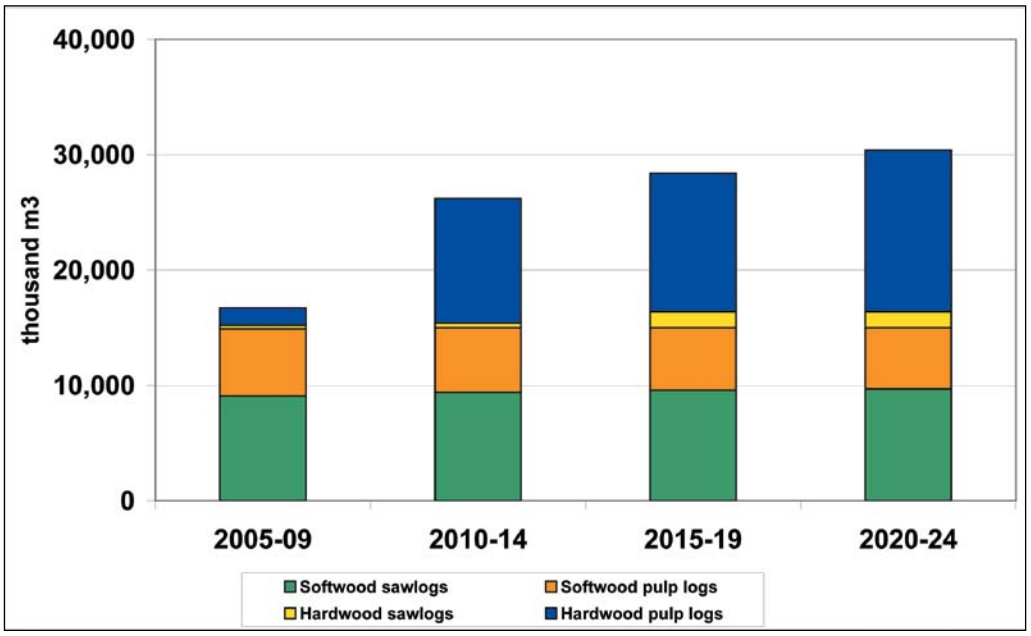

Figure 4.2: Projected annual plantation wood supplies in Australia

Source: NAFI/A3P (2006)

By 2020, Australia's industrial roundwood production might be expected to be approximately 36 million cubic metres – with 30.4 million cubic metres obtained from forest plantations and the remainder from natural forests – with most of the increase in the form of hardwood pulp logs.

A business-as-usual scenario suggests a modest expansion in Australian wood processing facilities, with hardwood pulp and paper manufacturing most likely to see the greatest expansion. Significant volumes of increased pulp log production may also be chipped for export. Wood pellet production for fuel is also expected to develop into an increasingly important sector. One Australian company is proposing to establish 13 pelletizing plants during the next several years, with planned capacity of 1.5 million tonnes of pellets *per annum*.

Overall, under a business-as-usual scenario the Australian forestry sector will progress in an orderly fashion; continuing industrial development, plantation expansion and strengthening conservation efforts.

New Zealand

As noted earlier, the vast majority of New Zealand's 6.4 million hectares of natural forests are under legislative protection. Around 77 percent of the natural forests are owned by the Crown and managed by the Department of Conservation for recreation,

conservation and heritage values. A significant amount of the 23 percent of natural forests that are privately-owned is also either protected under covenant arrangements, or is inaccessible for logging. Only 140 000 hectares of natural forests are presently available for harvesting and these areas are required to be managed sustainably under stringent legislation. For the natural forests of New Zealand, the business-as-usual scenario will see the vast majority of the forests remain protected in national parks and reserves. Tourism and recreation will remain the principal human use of these forests, though any change in the scale of either will be small, especially under a business-as-usual scenario.

The natural forest estate will most likely increase marginally during the next decade, as areas of marginal agricultural land and deforested public lands naturally revert to young forest. The small natural forest logging and wood-processing industry which, in the year to September 2008 harvested just 15 000 cubic metres of logs, has been in almost constant decline for the past 50 years. It can be expected to remain as a very small, niche element of the New Zealand forestry sector.

Any significant changes in New Zealand forestry will almost certainly relate to the production plantation estate.

As Figure 4.3 indicates, trees already planted will mature over the coming decade, with potential to increase New Zealand's current plantation harvest by more than 50 percent. Figure 4.3 shows a roundwood harvest of 26.6 million cubic metres in 2020 under the assumption that large forest owners harvest according to current intentions. By harvesting at lower target ages, the New Zealand wood harvest could exceed 30 million cubic metres by 2020.

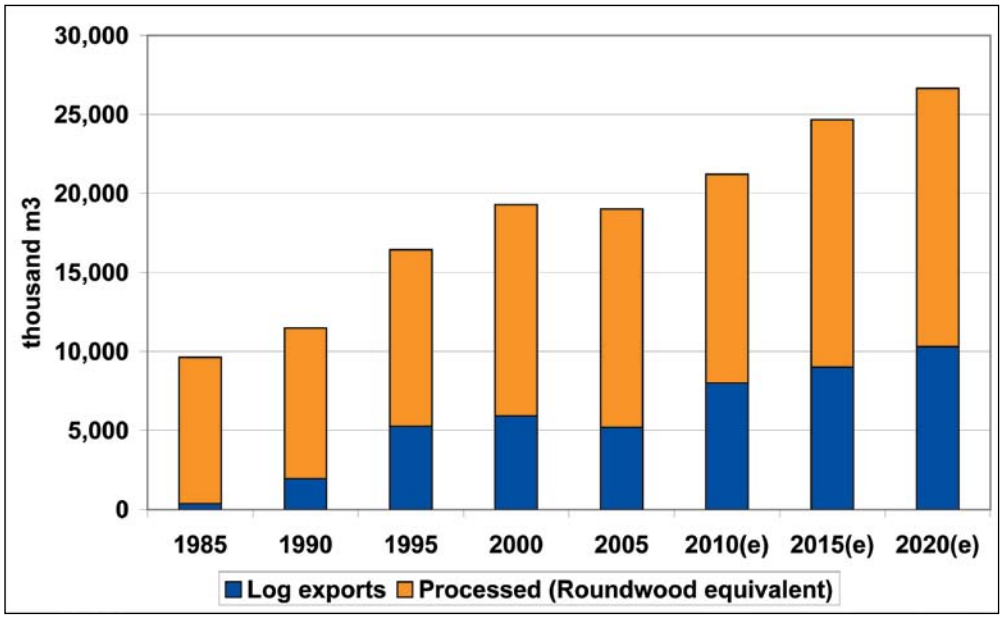

Figure 4.3: Development of New Zealand's harvest profile and log export trade

Source: NZMAF (2009b). Log exports/processed proportions are author's estimates

A business-as-usual scenario suggests there will be modest investments in new wood-processing capacity in New Zealand, but that some expansion in annual volumes of log exports will be necessary to absorb a rapid acceleration in harvest volumes. New primary processing capacity would most likely be in sawmilling and fibreboard manufacture.

The importance of exports to the New Zealand forest industry means that export growth, in value and in volume terms, is a crucial measure of industry success. The increasing roundwood harvest, allied with modest increases in processing capacities and predominantly in prices received for forest products (at a constant exchange rate), suggest that by 2020, the value of New Zealand's forestry exports is likely to total around NZ$5.3 billion (Table 4.2).

Table 4.2: New Zealand annual value of exports (NZ$ million[1])

Product	1990	1995	2000	2005	2010(e)	2015(e)	2020(e)
Logs and chips	251.5	668.8	653.5	431.9	1 000	1 170	1 545
Sawntimber	188.5	486.3	733.9	781.0	720	882	1 104
Panel products	146.5	413.8	433.0	568.6	430	600	840
Pulp and paper	689.4	813.5	1 027.1	995.3	940	1 067	1 200
Other forest products	109.9	250.1	399.8	406.7	520	550	650
Total	**1 385.8**	**2 632.5**	**3 247.3**	**3 183.7**	**3 610**	**4 269**	**5 339**

Source: Historical data NZMAF; future estimates by the author

Almost a decade ago, the New Zealand forest industry developed a *Vision 2025*, which outlined ambitious economic development targets for forestry in 2025 (Box 4.1). For most of the variables outlined in *Vision 2025*, a business-as-usual scenario incorporating current trajectories suggests that the industry will likely fall substantially short, with investment in plantation establishment and in processing capacity failing to keep pace with the required track.

Box 4.1: New Zealand Forest Industries Council –Vision 2025 targets

2004	2025
NZ$5 billion outputs	> NZ$20 billion outputs
4% GDP	> 14% GDP
23 000 employed (100 000 indirectly)	60 000 employed (250 000 indirectly)
NZ$3.3 billion exports	> NZ$14 billion exports
3rd largest exporter	Largest exporter
Top 20 global suppliers	Top 5 global suppliers
1.8 million hectares of plantations	3.5-4 million hectares
21 million m3 harvest	> 40 million m3 harvest
NZ$100 million supporting technologies industry	NZ$1 billion supporting technologies industry.

Source: Forest Enterprises Ltd. Web site.

For example, in terms of employment, the forestry workforce has actually declined during the past 10-15 years; from 24 000 people employed in forestry and first stage

1 Estimates in 2010 New Zealand dollars.

processing in 1995, to 20 900 people in 2006. This decline has occurred across almost all categories of employment, except timber re-sawing and dressing and fabricated wood manufacture, mainly as a result of increased mechanization. Nonetheless, *Vision 2025* does provide a useful assessment of the potential capacity for forestry in New Zealand.

A notable area of decline is in employment in tree planting and silviculture. Tree planting in New Zealand has declined substantially from its peak approaching 100 000 *per annum* in the mid-1990s (see Figure 4.4). Low forestry profitability allied with high prices in competing land-use sectors (especially dairying) and uncertainty over carbon trading provisions, are principally blamed for the stagnation in forest plantation establishment. A business-as-usual scenario based on the average of annual new planting since 2000 (13 400 hectares) would anticipate that the area of the New Zealand forest plantation estate will increase only marginally from the current 1.8 million hectares to 2020. At the same time, a significant trend towards less silvicultural management – less pruning and less thinning – reflects profitability issues, as mentioned above, allied with greater emphasis on manufacture of reconstituted wood products.

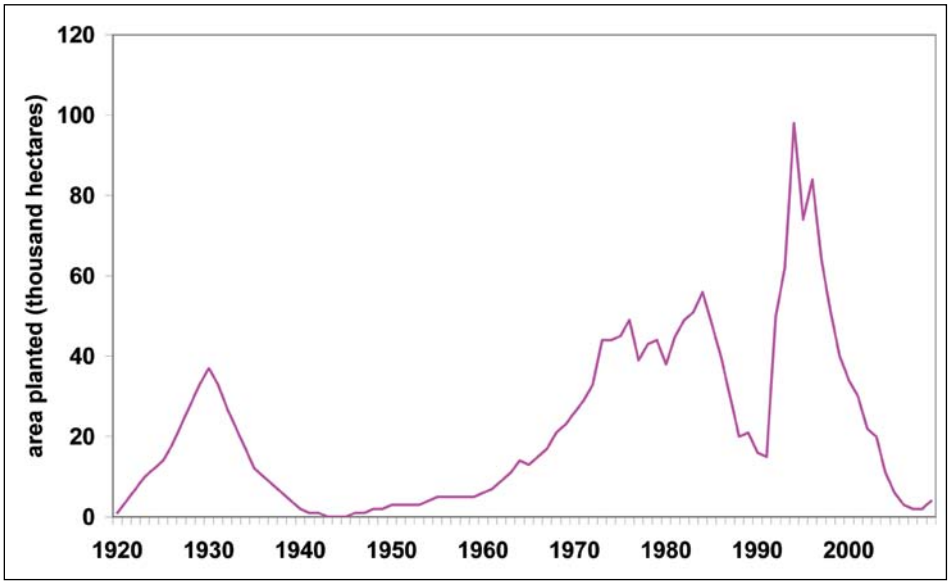

Figure 4.4: New forest planting in New Zealand, 1920-2007

Source: NZMAF (2008)

(ii) Melanesia

The developing Melanesian countries and their forestry sectors are relatively less stable than the Australasian countries in terms of political and policy landscapes, robustness of economies, social upheaval and the size and critical mass of their forestry sectors (smaller firms, industries and sectors are often more susceptible to significant changes). However, the business-as-usual scenario assumes no major extra-sectoral shocks, and a continuation of current intra-sectoral trends.

Fiji

In Fiji, a business-as-usual scenario will see forest area remain largely static, although a significant expansion in wood harvest is to be expected, consistent with a maturing planted forest resource. At the same time, harvests from natural forests are expected to

remain static or decline. Leslie and Tuinivanua (2009) estimate the harvest from Fijian forests could reach 1.1 million cubic metres by 2020, more than twice the current level (Figure 4.5).

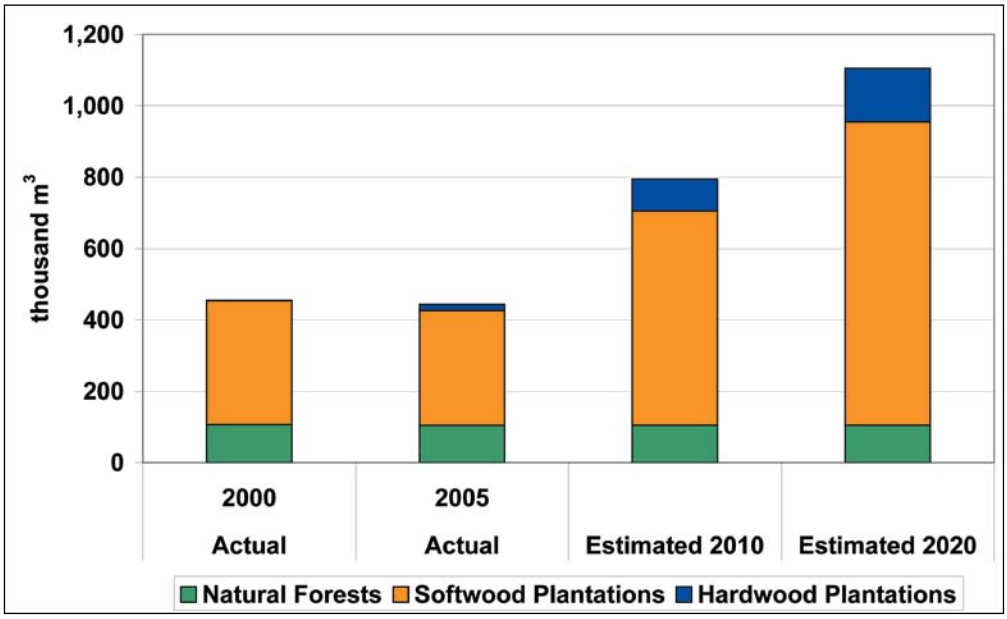

Figure 4.5: Projected log harvest from Fijian forests

Source: Leslie and Tuinivanua (2008)

The increased log out-turn will be matched by an increase in primary processing, particularly in production of softwood chips and mahogany sawntimber. Fiji's log export ban should ensure significant increases in production of primary products. However, it seems likely that all woodchips will continue to be exported and any increase in wood processing will most likely be in terms of mahogany-processing capacity, with particular opportunities to develop secondary processing facilities for finished products.

Employment in the forestry sector should increase moderately in response to increased harvesting and wood processing, with opportunities probably also arising to replant harvested areas and possibly plant new areas.

Beyond industrial forestry, a business-as-usual scenario in Fiji will focus on pursuit of the key policy goal and objectives outlined in the Fiji Forest Policy Statement 2007. Under this statement, the national goal for the forest sector is: *Sustainable management of Fiji's forests to maintain their natural potential and to achieve greater social, economic and environmental benefits for current and future generations.*

The five key policy objectives are:

1. *Ensured ecosystem stability through conservation of forest biodiversity, water catchments and soil fertility.*
2. *Ensured sustainable supply of forest products and services by maintaining a sufficiently large permanent forest area under efficient and effective management.*
2. *Increased engagement by landowners and communities in sustainable forest management and an equitable distribution of benefits from forest products and processes including ensured protection of intellectual property rights.*

3. *Increased employment in the forestry sector, sufficient supply of domestic markets and increased foreign exchange earnings through sustainable forest-based industry development and trade.*
4. *Enhanced national capacity to manage and develop the forest sector in a collaborative approach with involvement of all stakeholders.*

These can be expected to be priorities for development, and hence progress towards each of these goals can be expected under a business-as-usual scenario.

Papua New Guinea

Papua New Guinea presently has almost 29.5 million hectares of forests, of which approximately 11.4 million hectares have been allocated as timber concessions. Timber concession allocation peaked through the 1980s and 1990s, with almost 8 million hectares being allocated. There has been a substantial lessening in timber concession allocation since 1999, with 751 000 hectares of concessions allocated in the period 2000-2007. A business-as-usual scenario would see a continuation of this trend, with a relatively small area of new concessions – possibly less than 500 000 hectares – issued in the period 2010-2020.

Table 4.3: Timber concession allocation and expiry in Papua New Guinea

Period	Area of concessions allocated (ha)	Area of concessions expiring (ha)
1940-1949	1 519 -	
1950-1959	78 625	
1960-1969	1 551 521	
1970-1979	905 921	
1980-1989	2 063 654	98 720
1990-1999	5 841 952	327 826
2000-2009	751 231[2]	2 057 401
2010-2019	500 000 (e)	870 907
2020-2029		1 142 223
2030-2039		575 510
2040-2049		4 539 406
2050-2056		751 231
Unknown dates	166 730	500 000(e)
Local Forest Areas		997 588
Total	**11 360 812**	**11 360 812**

Source: PNGFA (2009); (e) = author's estimate

Nonetheless, most timber concessions presently allocated have expiry dates beyond 2020, so present levels of wood harvests should be expected to continue throughout the forecast horizon. During the past decade, Papua New Guinea has exported approximately 90 percent of its roundwood harvest (ranging from 1.8 million cubic metres to 3.7 million cubic metres) and a business-as-usual scenario will see this trend continue, probably at volumes exceeding 3 million cubic metres *per annum*. The government has drafted a Domestic Wood Processing Policy, the relative success of which is discussed under the industrial forestry scenario. Under a business-as-usual

2 Concessions allocated to 2007.

scenario, there is little change in wood-processing capacity; most development will be in portable sawmilling, mainly for domestic use.

The government's reforestation policy is assumed to take modest effect (2 000-3 000 hectares planted annually) under a business-as-usual scenario, with more robust reforestation discussed under the green economy scenario. Potential developments under REDD and other climate change mechanisms are also discussed under the green economy scenario.

Overall, a business-as-usual scenario envisages a moderate decline in Papua New Guinea's forest area, largely in response to a potential acceleration in forest clearance for proposed oil-palm and agroforestry projects – some of which is related to current forest harvesting; although some doubts have been cast over these proposed future developments.

Solomon Islands

A business-as-usual scenario for the Solomon Islands will see a continuation of current harvesting levels accompanied by high proportions of log exporting. However, forecasts suggest that such a scenario will rapidly exhaust the remaining merchantable forest – possibly as early as 2015. Production volumes can be expected to decline markedly over the next decade, while quality of log out-turn will also decline if efforts are made to further log cut-over areas. Some timber will be harvested from maturing plantation areas, but overall the forestry industry will suffer a marked decline (Figure 4.6).

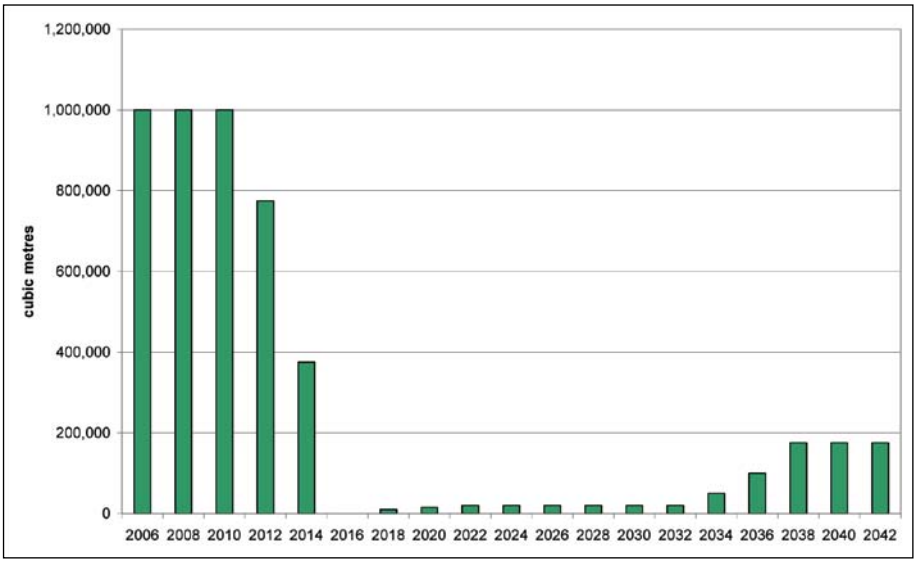

Figure 4.6: Predicted natural forest woodflows in Solomon Islands, 2006-2042

Source: URS in Pauku (2009)

This will have serious implications for the Solomon Islands' economy – and potentially social structures – with reduced employment, reduced foreign exchange earnings and reduced government revenues all likely to be part of a significant economic contraction. Wood-processing industries, mainly sawmills, will struggle to source supplies and some may close. The country may have to import wood products or, in some cases, do without. There will surely be a tangible risk of social unrest as a direct consequence of the decline of the forestry sector. Under a business-as-usual scenario, the forest

protected area network will remain relatively static, comprising mainly inaccessible forests in mountainous regions. In general, a business-as-usual scenario is likely to result in negative and detrimental outcomes for the Solomon Islands.

Vanuatu

During the past decade, logging in Vanuatu's forests has reduced markedly – from levels reported variously up to 100 000 cubic metres per year, down to less than 6 000 cubic metres in 2007 (Figure 4.7). Many areas available for harvesting are relatively inaccessible and costly to log. Hence, commercial timber harvesting has scaled down and mainly portable mills are in operation. A business-as-usual scenario envisages a continuation of these low harvest levels – significantly below sustainable yield levels, and below maximum harvest quotas – mainly processed by portable sawmills for domestic use.

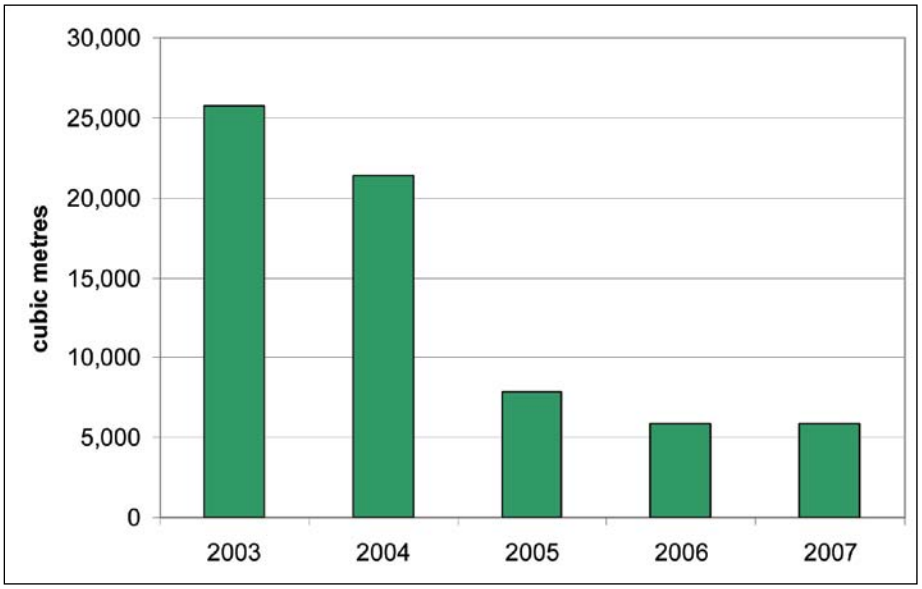

Figure 4.7: Recent annual log harvests in Vanuatu

Source: Tate (in prep.)

Plantation establishment is a key to sustaining and increasing future wood supplies in Vanuatu. However, attracting investment funds has proved challenging and, since 2000, the annual planting rate has been approximately 100 hectares *per annum*. Under a business-as-usual scenario, this trend will continue – meaning Vanuatu would have approximately 6 000 hectares of plantations by 2020. Community reforestation efforts in establishing woodlots as part of agroforestry systems are gathering momentum and may provide significant sources of planted timber in the future – beyond 2020.

A greater focus on sustainable forest management and environmental and conservation values, allied with very low rates of forest harvesting, should enable significant forest regeneration and rejuvenation in degraded areas. Several forest conservation areas have been established in recent times, with the challenge being to now manage these effectively.

Overall, forestry in Vanuatu appears to be on a pathway towards more sustainable forest management and under a business-as-usual scenario, significant improvements in many forest indicators should be observed over the coming decade. The risk is that many measures are somewhat tenuous, with resources and capacities stretched to

effectively monitor and manage programmes and potentially economic and social pressures to move back towards more exploitative forestry.

(iii) Polynesia and Micronesia

Samoa

Wood production in Samoa – particularly production of sawnwood – has declined dramatically during the past 20 years, as merchantable forest areas have increasingly been exhausted. A business-as-usual scenario will see very low levels of industrial roundwood production, probably less than 1 000 cubic metres *per annum*, and possibly falling close to zero, through to 2020 when maturing plantation supplies will come on stream. For the next decade, almost all wood product demand will have to be met from imports.

Some acceleration in plantation establishment in Samoa can be expected, though there is debate as to whether the government, private sector or communities should take the lead. Most likely, the bulk of new plantings will be in the form of community and household woodlots, potentially established in conjunction with an Australian Agency for International Development (AusAID) project (refer Box 3.12).

Significant expansions to Samoa's network of parks and reserves have been made since 2000, with two new national parks being designated, and ten additional reserves and botanical gardens. This trend suggests potential for modest further expansions in protected areas during the next decade, where land is available and recognized as a priority for conservation. Approximately 6 000 hectares of new reserved land are currently being negotiated for protection (Sesega 2009). Similarly, good progress in watershed maintenance and rehabilitation will continue under a business-as-usual scenario.

A trend towards integrated management of natural resources, including holistic forest management, is encapsulated in proposed new forest legislation that appears to place greater emphasis on the conservation and service functions of forests within a multiple-use framework. In any case, by necessity as well as design, the production functions of forests will diminish.

Tonga

A business-as-usual scenario for Tonga will be characterized by a relatively static forest estate, accompanied by ongoing declines in production of wood products supplemented by increased imports. Moderate increases in reforested areas could be expected as a result of government and community programmes, particularly on land leased by the government on E'au, where 2 000 hectares is potentially available for reforestation. Tree planting could provide a modest increase in the level of employment in forestry. Most forest area will remain in agroforestry systems, primarily providing subsistence products, shelter and shade. The development of a national forest policy for Tonga highlights a shift away from a focus on wood production, and towards conservation and service values. The key objectives of the new policy are to manage the forests and trees of Tonga, in a sustainable manner to provide benefits for current and future generations; and to manage the forest for conservation of biodiversity, soil, water and other environmental values. This pursuit of service functions of forests is likely to be the primary driver of forestry change in Tonga over the coming decade.

Kiribati and Tuvalu

Business-as-usual scenarios for Kiribati and Tuvalu largely see a continuation of forests as a source of subsistence products and livelihood services. Forests continue to provide materials for building and handicrafts, fuel and NWFPs, while also providing a vital component of agroforestry systems, shelter (including from seaspray), shade, soil stabilization, nutrient recycling and coastal protection. Business-as-usual would involve largely sustainable utilization of forest resources, so that forest environments will remain largely in the status quo through to 2020, although there may be increasing scarcity of fuelwood on densely populated islands. There is little scope for increasing terrestrial protected areas. Modest increases in levels of imports of forest products can be expected, in line with economic development.

4.4. Probable shifts and alternative scenarios

(i) Australasia

Australasia Scenario 2: severe and protracted economic recession scenario

A severe and protracted global recession would most substantially impact on forestry in Australia and New Zealand by reducing both international and domestic demand for forestry products. Initial symptoms of the recession would be inventory buildup, quickly followed by supply-side reactions encompassing reduced production of processed products, reduced logging volumes, plant closures and unemployment. Related impacts would be a curtailing of investments in silviculture and forest management, new equipment and processing facilities, along with reduced government budgets for state-funded forestry activities.

Box 4.2: The economic recession of 2008-2009

The roots of the current economic recession are mainly attributed to the development of debt-fuelled speculative bubbles in housing markets. In particular, lax standards in lending criteria and lending instruments that created institutional separation between borrowers and lenders in the United States promoted excessive lending to high risk borrowers in the so-called 'sub-prime'[3] market. Rising interest rates forced a rapid acceleration in mortgage default rates in the United States, a major weakening in the housing market and a spate of bank collapses and bail-outs. Loss of confidence in the economic outlook has rapidly manifested itself in declining consumption and production of goods and services, reduced investment, plummeting share markets, job losses and recession.

A technical recession is defined as two consecutive quarters of quarter-on-quarter contractions in GDP. The United States entered a technical recession in December 2007, while New Zealand went into technical recession in the second quarter of 2008. Australia avoided slipping into technical recession until March 2009, while data for Pacific island countries is still forthcoming. Nonetheless, by many less formal measures, all of the Pacific countries can probably be considered to be in recession.

3 Sub-prime is description of non-optimal, high risk borrowers who may have less-than-perfect credit histories including: past payment delinquencies or bankruptcies, low repayment capacities and high debt-to-income ratios. Source: Wikipedia (2009).

The impacts of the current recession (Box 4.2) are evident in recent production data for sawntimber in New Zealand (Figure 4.8). A marked tail-off can be noted since December 2008. It is particularly notable that production in the March 2009 quarter is the lowest March quarter production since 1999. However, for the two most recent quarters (to September 2009), some resurgence in sawntimber production has been notable.

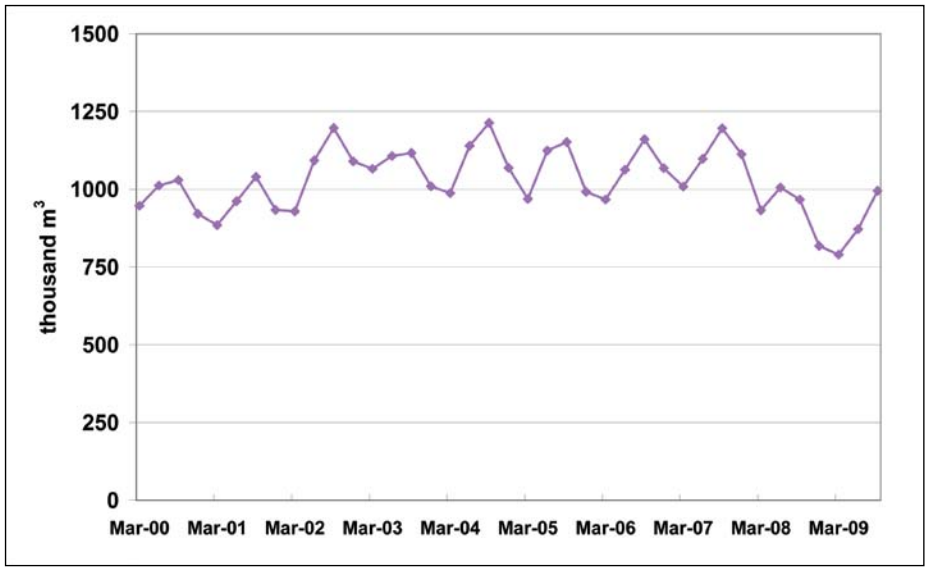

Figure 4.8: Quarterly New Zealand sawntimber production, 2000-2009
Source: NZMAF (2009b)

Not surprisingly, other forestry and construction statistics show similar and significant declines for 2008. The volume of New Zealand's sawntimber exports in the year to September 2008 declined by 14.7 percent on the previous September year. Similar declines were recorded for volumes of log exports (3.6 percent), wood-based panels (8.2 percent) and total value of forestry exports (6.6 percent).

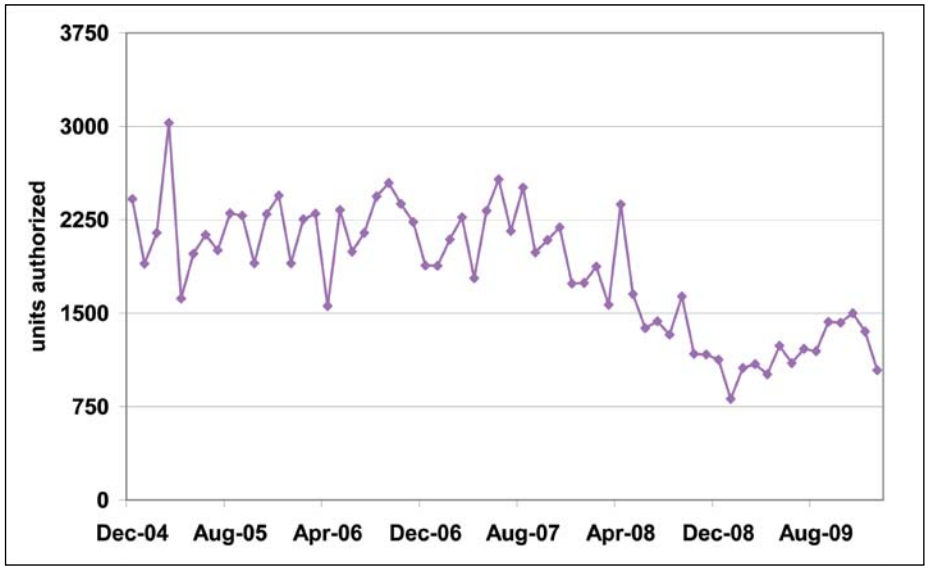

Figure 4.9: New Zealand monthly new dwelling consents (Dec. 2004 to Jan. 2010)
Source: Statistics New Zealand (2009)

However, perhaps the most telling decline was in the monthly number of new dwelling authorizations issued. In January 2009, just 812 new dwelling units were authorized, the lowest monthly total since records began in 1965. As Figure 4.9 shows, this is a 73 percent decline from the highest recorded level of authorizations in March 2005. Notably, however, there was significant bounce from this lowpoint in subsequent months.

Compared to most countries, Australia has – to date – escaped relatively lightly from the global recession. Australia entered a technical recession in the March 2009 quarter, but by September 2009 some signs were already emerging of an economic upswing. After a brief period of downturn through 2008-2009, many key indicators have returned to their pre-downturn levels including unemployment rates, housing indicators, merchandize export values, consumer sentiment and business profit expectations, though notably the Federal Government is running a significant budget deficit (Figure 4.10).

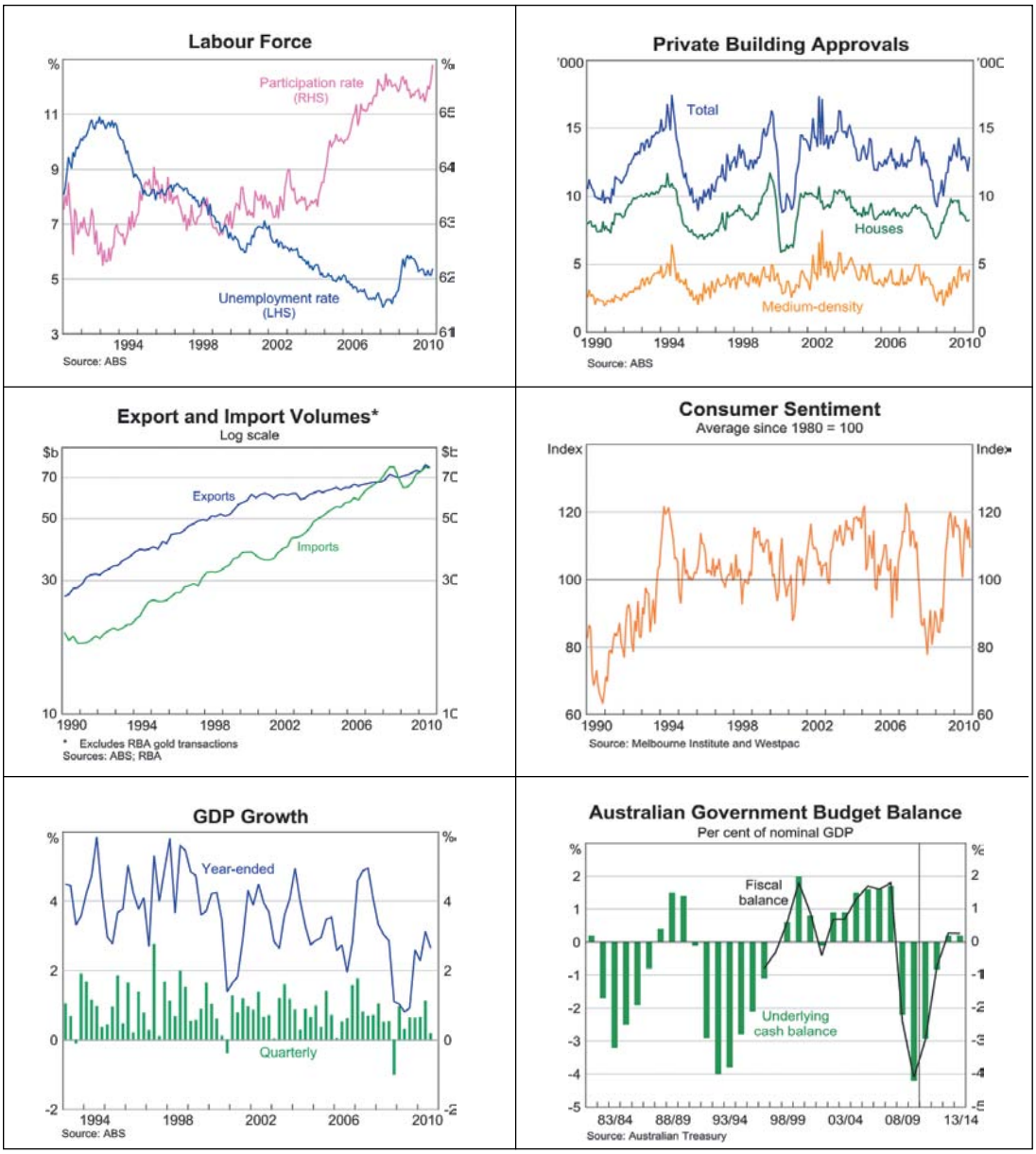

Figure 4.10: Key economic indicators for Australia
Source: Reserve Bank of Australia (2010)

A key question is "how much worse might the recession get"?

At present, most commentators are anticipating modest improvement continuing throughout 2011. However, this prediction is dependent on the various economic stimulus packages put together by governments being successful in restoring confidence in the global economy and in national economies.

If confidence is not restored then a collective fear of job losses, investment losses, reduced earnings, mortgage foreclosures and general lack of financial security will likely depress consumer spending and reinforce a downward spiral. A worst-case scenario might see a depression similar to that of the 1930s (Box 4.3).

Box 4.3: The Great Depression: Impacts in New Zealand

New Zealand suffered badly during the depression, with overseas trade hit particularly hard. It is estimated that exports nearly halved during the Depression. Wool prices dropped 60%, and dairy prices dropped, albeit by lesser amounts. As well as suffering from a trade downturn, New Zealand's balance of payments was weakened by a large overseas debt burden. National income is estimated to have fallen by 40% over the three worst years of the depression. However, the unemployment rate in New Zealand may have been lower than in other countries. The number of unemployed was possibly around 70 000, in a population of 1.5 million. Numbers were not officially counted, and there were no benefit payments. Instead, the unemployed were given so-called "relief work". From a welfare perspective, the country was quite unprepared for a major shock relative to today, and entered the depression without any provision for unemployment benefits. The "slump", as it was also known, brought widespread poverty, which led to riots in cities.

Source: ASB Quarterly Economic Forecast – 12 February 2009

For New Zealand, a comparable scenario to The Great Depression would see unemployment escalate to around 200 000 people (in a population of 4.2 million), or an unemployment rate of around 9 percent. For Australia, a similar rate of unemployment would see around 1 million people out of work.

For both Australia and New Zealand, the key forestry impacts of a severe and protracted global recession would mainly be visible within the forest industry. Declining demand for wood products would reduce forest harvesting – notably in forest plantations, which would increase plantation growing stocks. Wood-processing industries would suffer diminished demand resulting in some plant closures and staff redundancies. Given that the key driving forces of recession for these countries would likely relate to severely depressed overseas markets, the effects on the export-oriented forest industries in Australia and, particularly, New Zealand would likely be severe relative to more domestically-focused industries.

During the Great Depression of the 1930s, significant areas of plantations were established in New Zealand, as part of employment relief programmes. In the advent of a severe recession similar programmes could potentially be initiated to offer relief employment in tree planting, silviculture or potentially intensify protected area management. Presently, such initiatives seem rather far-fetched, and a seeming upsurge in economic conditions makes prospects of their future consideration unlikely.

Australasia Scenario 3: Green economy scenario

A green economy scenario for Australia and New Zealand envisages a substantial shift towards enhanced forest conservation, natural forest regeneration and rehabilitation, and accelerated plantation establishment. These activities are most likely to be maximized if both countries have established ETS that favourably incorporate scope for forest carbon offsets. A broader green economy scenario also incorporates pursuit of an inclusive approach that addresses social and ecological problems, paving the way for the development of green economies. Considerable thrust is given to human resource development and improving the efficiency of energy and raw material use. Key elements in the wider green economy scenario would include:

- Increased investments in green technologies, including renewable energy sources and significant reductions in the use of fossil fuels.
- Significant reductions in per capita carbon emissions.
- Greater interest in paying for ecosystem services produced in developing countries.

New Zealand has an already-established ETS incorporating forestry. To date, the main impacts of the ETS policy have been a significant reduction in conversion of planted forests to other land uses (principally pastoral for dairy farms and some lifestyle blocks) although some harvested forest land is presently lying fallow awaiting a land-use decision. The ETS has provided owners of registered pre-1989 forests with additional cash flow without the need for additional investment other than transactions costs. Owners of these forests have, however, undertaken additional risks (relating to wind and fire damage) and NZUs issued will constitute liabilities (units to be surrendered) when the registered forests are harvested. The ETS have yet to have any marked impact on afforestation rates, but there is definite interest in planting new areas. (Lane, personal communication).

New Zealand's Minister for Climate Change Issues notes:

There are two areas where the scheme is having a very positive impact. The first is in respect of forestry. In the years 2005 to 2008 we had the highest level of deforestation since records began in the 1930s; that has been reversed, with plantings now exceeding felling in both 2008 and the projected figures for 2009. I am also encouraged by reports from nurseries that the forward orders for 2011 are the most positive for more than a decade.

Source: New Zealand Parliament (2010)

Presently in New Zealand, 1 NZU (1 tonne of carbon) sells for NZ$18. One hectare of radiata pine will sequester approximately 25 tonnes of carbon *per annum*, generating potential revenue of NZ$460 *per annum*. Thus, for marginal agricultural land where lower returns are presently being earned, a land-use change to forestry may be desirable.

Various studies (Table 4.4) suggest there may be as much as 6 million hectares of land available for afforestation in New Zealand although, more realistically, up to 2 million hectares of land might be viably afforested.

Table 4.4: Areas available for potential afforestation in New Zealand

Study	Potential area (ha)	Comments
Harris *et al.* (1979)	6 million	Reduced from reported 7 million ha to account for actual 1980-2007 afforestation.
MAF	1 179 900	Class VII and VIII land that should be taken out of production
Trotter *et al.* (2005)	1 450 000	Marginal pastoral farmland suitable for natural revegetation
Royal Society (2006)	587 000	North Island
	2 525 000	South Island
		Energy farming using *Salix*.
		Excluded land: > 1 000
		m in elevation, land over 15° in slope, land parcels less than 1 ha, conservation land and native forest, land already in plantations, dairying and horticulture land, and land returning over US$350/ha/year
Hall and Gifford (2008)	Minimum:	
	86 513 +	North Island
	744 367	+ South Island
	Maximum:	
	5 127 000	Minimum: low producing grassland, depleted grassland, gorse and broom, mixed exotic shrubland and Agribase farm types beef, sheep, deer, and minor unallocated categories.
		Maximum: includes Land Use Change Class IV land, altitude < 1 000 m,
		medium quality pasture.

Table source: Landcare Research (2009)

For New Zealand then, an element of a green economy scenario would encompass a major surge in confidence in forestry as an investment. In particular, investment would likely be driven with a view to obtaining carbon credits, although increasing prices for logs in East Asia currently being experienced might also drive significant afforestation, including regeneration of natural forests. Later in the decade, new planting rates might again approach the 100 000 hectares *per annum* achieved in the early 1990s, with a planted forest estate potentially approaching 2.5 million hectares by 2020.

The deferral of Australia's CPRS and the uncertainty over whether forestry would be included in any future scheme means there are fewer clear parameters to guide analysis of carbon-driven afforestation. Given this uncertainty, it is highly likely that 'carbon forestry' in Australia will likely develop later and more slowly than in New Zealand. Nonetheless, there is substantial scope for such planting with industry already envisaging a planted forest estate of 3 million hectares by 2020, under the *Plantations for Australia: The 2020 Vision* strategy (as noted under the business-as-usual scenario). In Australia, water rather than land is likely to be the key physical constraint to plantation establishment.

At present, it seems likely that if significant carbon afforestation is to occur in Australia before 2020, then some variant of a CPRS would have to be approved within the next two or three years. This might enable a scheme to be operational by around 2015, though with the likelihood of phased entry, a fully-fledged scheme would likely only be in force towards the end of the decade.

(ii) Melanesia

The importance of industrial forestry in most Melanesian countries suggests the potential for a substantial dichotomy between policy choices that result in intensification of industrial forestry, and policy choices that accord priority to conservation and forest rehabilitation.

Melanesia Scenario 2: Industrial forestry scenario

An industrial forestry scenario in Melanesia is most likely to result from people's demands for development driving more aggressive industrial forestry scenarios – though a loosening of government forestry policies resulting in increases in logging quotas and allocation of new concessions could also drive such a scenario. This seems most likely to occur if recovery from the current global economic recession is relatively swift, and the global economy returns to buoyancy, characterized by high consumption demand and high prices. However, other conditions could also drive such a scenario – for example, the log price spike of the early 1990s was driven by perceived scarcity of log supplies in the wake of export bans and restrictions implemented in the United States and Malaysia.

An industrial forestry scenario envisages a significant acceleration in forest harvesting, compared with the business-as-usual scenario. The scenario would be especially significant for **Papua New Guinea**, which still retains considerable reserves of merchantable forests. An acceleration in forest harvesting in Papua New Guinea would almost certainly result in a corresponding increase in log exporting, as harvests continue to vastly outstrip processing capacities. Such acceleration would likely intensify detrimental environmental and social effects, with harvesting outstripping sustainable levels, as well as being likely to outstrip capacities for effective monitoring and surveillance. While revenues to local communities and government would be expected to increase in gross terms, in all likelihood per unit revenues to local stakeholders would fall in the absence of adequate controls. Potential opportunities for corruption would increase and tensions among landowner groups in areas where ownership is disputed could escalate as the opportunities to make quick money increase. On the positive side of the ledger, increased revenues could accelerate opportunities for development if harvesting revenues really could be harnessed for socio-economic development, rather than enriching the elites; unfortunately history is littered with the failures of resource depletion for development policies.

An industrial forestry scenario for **Fiji** would see a significant acceleration in harvesting, particularly in plantation forests. In the pine plantations, much of the additional harvesting would doubtless be exported as woodchips, while in the mahogany plantations exports would be of sawntimber – with harvesting outstripping potential for additional downstream processing development. Employment opportunities in forestry would increase in the short term, but the degree to which revenues were able to be captured for development would dictate whether higher employment levels would

be sustainable in the longer term. In the relatively volatile political environment of Fiji, a need for transparency in operations and dispersal of revenues could be of paramount importance in allaying any suspicions of corruption attending a significant increase in harvesting.

In the **Solomon Islands**, an industrial forestry scenario would hasten the inevitable exhaustion of merchantable forests, and advance the consequences of resource depletion outlined in the business-as-usual scenario. As in the case of Papua New Guinea, a rapid acceleration in forest harvesting would likely outstrip monitoring capacities and exacerbate social tensions. A particular risk for the Solomon Islands is that a harvesting acceleration could be viewed as a final resource grab and add fuel to any social upheaval that results from the demise of the forestry industry.

For **Vanuatu**, an industrial forestry scenario would entail a significant reversal of recent policy directions. Overall, given the relative scarcity of accessible supplies, it seems a somewhat unlikely scenario for Vanuatu – at least, on a large scale. Such a scenario would probably require a substantive increase in wood and timber prices to alter the economics of logging in Vanuatu. Similarly, under an industrial forestry scenario, the current log export ban would probably have to be revoked, since Vanuatu's sawmilling industry now largely comprises mobile mills that are poorly suited to supporting an export industry.

Melanesia Scenario 3: Green economy scenario

A green economy scenario for Melanesia would entail significant shifts in current practices and policies in most countries, but particularly in Papua New Guinea and the Solomon Islands, where natural forest logging remains a staple of national economies. In general, the most likely stimulus for an abrupt shift towards a green scenario would come from rapid international progress in putting in place workable, accessible and well-resourced REDD (and other carbon-related) funding mechanisms. However, even in the absence of REDD, the Melanesian countries are making some independent efforts to enhance forest conservation and rehabilitation, and edge towards 'greener' pathways.

Key elements of a '*deep* green' forestry scenario in Melanesia might include:

- Major reductions in natural forest logging; at minimum to fully sustainable levels, though a deep green scenario would envisage significantly greater reductions;
- Implementation of best practices in remaining forest harvesting, including elements such as full management and chain-of-custody certification, full implementation and enforcement of codes of logging practice and widespread adoption of optimal reduced impact logging techniques;
- Implementation of comprehensive forest health monitoring systems and fire prevention systems;
- Development of natural forest regeneration and rehabilitation programmes for areas affected by logging;
- Accelerated planted forest establishment programmes to bolster future wood supplies;
- Expansion of formal conservation areas to meet or exceed World Conservation Union targets, with effective management applied to all areas; and
- All forestry programmes carried out in accordance with criteria for social sustainability.

At present, such targets are mainly well beyond the resources available to Melanesian countries. As such, they are more representative of the end goals of green pathways (hence *deep* green), rather than the pathways themselves.

Papua New Guinea has considerable scope to shift forest management towards green pathways. However, given the country's high dependence on forestry – especially harvesting natural forests – such a shift will probably need to be catalysed by mechanisms that provide revenues that would substitute for lost logging revenues. REDD mechanisms presently appear to offer the greatest possibilities. However, significant moves towards a green scenario would entail major structural changes in the forestry industry, and would be complex. For example, issues of compensation for logging concession holders would arise. Significant dislocation of workers presently employed in logging industries would occur (though some of these could be diverted into new rehabilitation and accelerated tree-planting programmes). It seems evident that no overnight transformation is likely to occur in Papua New Guinea. Rather, 'greening' of the forestry industry will occur in small incremental steps, with carbon funding potentially helping to smooth and accelerate the process.

The first steps in moving towards a green economy scenario for **Fiji** are largely encapsulated in the 2007 *Fiji Forest Policy Statement*. This statement outlines a roadmap of objectives and actions to achieve a national goal of *Sustainable management of Fiji's forests to maintain their natural potential and to achieve greater social, economic and environmental benefits for current and future generations*. A green scenario would see greatest focus placed on environmental and social goals, particularly in provision of environmental services. With rapid access to REDD funding, harvesting in Fiji's natural forests could significantly decline, with industrial forestry revenue losses offset by payments for reduced emissions. Rehabilitation work in degraded areas could be accelerated. Increased attention to plantation establishment could be encouraged by payments for carbon sequestration, as well as potential future incomes from harvesting. Successful marketing of the existing mahogany resource could also provide significant stimulus to new planting.

The current situation in the **Solomon Islands** will shortly necessitate – at least de facto – some sort of shift towards a green economy scenario. With merchantable forests rapidly approaching exhaustion, Solomon Islands' planning should increasingly be focusing on a post-industrial forestry period. As logging winds down, forestry focus should shift towards plantation establishment to ensure future wood supplies, rehabilitation of deforested and degraded areas, land uses that can supplement incomes and livelihoods, and various structural adjustment measures. Policies and institutions may need to be redeveloped to support the changed priorities (and changed government forestry budgets). Carbon funding may provide support to efforts to regenerate and rehabilitate forests.

Vanuatu's current forestry operations have already made significant moves towards green pathways, with major reductions in forest harvesting. A green scenario would see current efforts accelerated and enhanced, particularly in regard to plantation establishment, management of reserved forests and protected areas, and in forest monitoring, reporting and verification. Funding to help initiate such programmes could eventually be forthcoming through carbon mechanisms.

(iii) Polynesia and Micronesia

Polynesia and Micronesia Scenario 2: Severe and protracted economic recession scenario

For most Polynesian and Micronesian countries, a large proportion of the economy operates within the informal sector – with households depending at least partially on subsistence agriculture and cash cropping for their livelihoods. However, national development is largely dependent on the formal economic sector, with five key components largely dependent on global economic conditions:

- Exports from a limited range of mainly primary industries, including agriculture, fishing and (increasingly limited) forestry;
- International tourism;
- Remittances from workers employed overseas;
- Development assistance and aid; and
- Payments from special bilateral economic arrangements, for example, sale of fishing rights; for example, over the past 30 years Kiribati has licensed fishing fleets from various countries to access its tuna fisheries.

A severe and protracted global recession that extended well into the next decade would likely negatively impact on all of these sources of revenue, with reduced demand and lower prices for export goods, reduced international tourism, lower demand for migrant workers and lower wages for those that are able to find work, lower international aid budgets and fewer prospects for special economic arrangements. Hence a major recession would likely cause major declines in national revenues and GDP in Polynesian countries. This would lead to significant increases in dependence on the informal sector and subsistence and semi-subsistence livelihoods.

A severe recession scenario could be expected to have significant detrimental effects on Polynesian and Micronesian forests, especially in countries and localities with high population densities. A recession scenario would likely see significant substitution of freely available subsistence goods for imported goods; for example, woodfuel substituting for fossil fuels, locally harvested wood substituting for imported construction timbers and increased forest clearance for gardening and cropping, rather than store-bought goods. At the same time, government tree planting, conservation and rehabilitation programmes could be expected to suffer as funds become increasingly scarce.

Polynesia and Micronesia Scenario 3: Rapid economic recovery and growth scenario

Converse to the severe recession scenario, if the global economy recovers rapidly and robustly then prospects for significant improvements in the quality of forests and forestry in Polynesian and Micronesian countries are very good. Under a rapid economic recovery and growth scenario, national revenues in small island countries could be expected to increase significantly from increased demand for exports and tourism, increased migrant remittances, higher international aid budgets and improved conditions for special international arrangements.

Prospects would be good for expansion of formal economic sectors and reduced dependence on informal and subsistence livelihoods. For example, measures such as Tuvalu's efforts to shift to 100 percent renewable energy (Box 2.9) would likely be

implemented more quickly and successfully, reducing woodfuel pressures on forests. Similarly, greater consumption of imported forest and food products would substitute for local subsistence production, reducing pressures on trees and forest areas and reducing forest degradation. Government forestry programmes would likely be better funded and, consequently, more successful.

Unlike the Melanesian countries, in the absence of significant supplies of merchantable forests, it is unlikely that buoyant international demand for timber would impact detrimentally on Polynesian or Micronesian forests.

Nonetheless, such an optimistic scenario would be dependent on political will and drive to see such positive developments occur. This would necessarily require attention to strengthening of institutions and policy implementation.

4.5. The most likely situation

These various scenarios illustrate a range of possible, but divergent, pathways of development for forestry in the Pacific. However, in many respects they also demarcate boundaries of best- and worst-case outcomes responding to a limited set of drivers of change. The broad social, economic, political and institutional diversity in the region, allied with the many sometimes conflicting drivers of change suggest that what actually emerges will most likely be a mix of all scenarios, depending on the policies pursued at the local, national and international levels. The broad outcomes in the subregion through to 2020 will likely reflect:

- Many elements of the business-as-usual scenario continuing to dominate. Generally, forestry has a long time horizon and rapid, dramatic changes at national levels in the Pacific appear unlikely, except those already clearly envisaged and enforced; for example, the declining harvest in the Solomon Islands. In Australia and New Zealand with developed economies as well as strong and robust political systems and well-developed forestry policies, radical change is difficult to envisage. In the Pacific countries, strong traditional cultures and attitudes are prevalent and these also tend to insulate against radical change. In general, most change is likely to be modest, steady and incremental.
- Industrial forestry seems most likely to continue in line with business as usual, rather than any significant acceleration as envisaged in the industrial forestry scenario for Melanesia. Various checks and balances including better-informed populaces, active NGO monitoring and advocacy, and increasing diligence in avoiding 'controversial' timber sources by many markets (for example, the effects of the amended Lacey Act in the United States) mitigate against major accelerations in logging in Pacific countries.
- A weak and drawn out recovery from the economic downturn presently seems the most likely economic pathway over the next several years. However, the likelihood of a worst-case protracted full recession scenario presently seems low. Many economic indicators have turned upwards through 2010, albeit that recovery and confidence have been fragile. The forestry industry has been particularly aided by strong demand growth in some Asian economies, especially China.
- The 'swings and roundabouts' of the international economy suggests that a period of strong and sustained economic growth is highly likely during some parts of especially, the middle to latter parts of the decade. This is likely to bring

many benefits for forests and forestry, but also will create pressures to accelerate logging in natural forests in some countries.

- The relatively disappointing outcomes of the Copenhagen Accord and prospects for stalling in negotiations in the immediate future suggest that only limited progress will be made in developing climate change market instruments and funding mechanisms. Progress will be slower and less positive for forestry in the Pacific than the best case scenarios described under the green economy scenarios. Nonetheless, later in the decade substantive on-the-ground progress towards green economies may be made.

The unfolding of the various scenarios will have important implications on the forest sector, as outlined in the next chapter.

5 WHAT WILL WE SEE IN 2020?

Although the global economic downturn may have shifted economic and forestry baselines to lower levels, overall the relative stability of the Pacific and the long time horizons of forestry suggest that the business-as-usual scenario will dominate many forestry variables through the next decade. An examination of various drivers of change suggests few that are likely to radically change forestry at a subregional level, though certainly significant changes in some localities will occur.

The drivers of change (from Table 3.1) that appear likely to have the greatest impacts in the Pacific during the decade to 2020 include:

- Climate change (especially policy development);
- Economic conditions;
- Agricultural changes driving land-use change (including conversion of forest lands to oil-palm);
- The economic rise of India and China (and other export markets);
- The strength of the green movement; and
- Natural disasters.

Notably, the drivers with potential to create the most significant changes in the forestry sector are drivers that are external to, and largely beyond the control, of the forestry sector. More incremental change and longer term change will be propelled by many of the other drivers listed in Table 3.1. Working against these drivers, a number of factors inherent to forestry mitigate against rapid change at a subregional level. In particular:

- Most countries have relatively stable forest policies and policy directions already in place;
- Social structures and local/subsistence uses of forests are stable in most countries;
- Sufficient checks and balances are in place to restrict the potential of reckless and rapid large-scale forest conversion or harvesting at least at national levels;
- In any case, much of the most economically-vulnerable forest has already been logged;
- Long time horizons for forest growing limit potential for rapid increases in forest growing stocks;
- Wood supplies through to 2020 will be determined by trees already in the ground; and
- Wood processing to 2020 will be carried out at mills already constructed or at least on the drawing board.

5.1. Forest resources in the next two decades

Subregional forest area is likely to remain relatively stable, with moderate losses in some areas at least partially offset by gains in others. Australia, Papua New Guinea and the Solomon Islands are the countries most likely to record significant declines in forest areas, while New Zealand, Fiji, Vanuatu and Samoa are more likely to record modest gains. The total regional situation will be dictated by Australia, which dominates forest cover statistics. However, anthropogenic forest loss in Australia is likely to continue to diminish, with forest area gains possible under some scenarios.

(i) Natural forests

A business-as-usual scenario will see a continuation of relatively heavy natural forest logging in Papua New Guinea and the Solomon Islands. In Papua New Guinea, 8.7 million hectares of forests are presently allocated as forest concessions and a substantial proportion of them will have been logged over by 2020. Most of this forest area will be degraded, often heavily, but a much smaller area will be recorded as deforested. The situation in the Solomon Islands will be similar, except by the end of the decade the merchantable forests will be logged out and most logging operations can be expected to have ceased. A key question for the Solomon Islands' forests will be whether most logged-over areas are left to regenerate into natural forests, or whether substantial areas might be cleared for agriculture, oil-palm, or even forest plantations. Modest natural forest logging (most likely less than 100 000 hectares *per annum*) will also continue in Fiji. These impacts would be exacerbated under an industrial forestry scenario.

The area of natural forest available for harvesting in Australia has been declining and this trend seems certain to continue. As noted in Section 4.3. (i), by 2020 it is likely that only 5 million hectares (approximately) will be available for logging. However, the high risk of bushfires in many areas require some means of controlling fuel loadings in forests and this may enable some forms of selective logging to reduce loadings, or clearfelling for firebreaks. Areas of forest clearance for agriculture can be expected to dwindle to negligible levels. Areas where forest die-back has been recorded as a result of drought and areas burned in bushfires may regenerate, but it is difficult to forecast whether areas of natural regeneration will exceed areas of natural losses.

In New Zealand, natural forest logging will be negligible and some gains in natural forest area can be expected from forest regeneration on marginal agricultural lands. Similarly, small areas of forest regeneration can be expected in Vanuatu, Samoa and Tonga, while little change is anticipated in Kiribati and Tuvalu.

Under the green economy and protracted economic recession scenarios, some modest increases in natural forest areas can be anticipated. The most significant impacts are likely to be if significant and effective REDD funding becomes available to the Melanesian countries, especially Papua New Guinea and, if it arrives quickly, possibly the Solomon Islands. This would be most effective in reducing forest degradation, though some slowing of deforestation could also be anticipated.

Under a business-as-usual scenario, Table 5.1 projects a total regional area of natural forests of 182.2 million hectares, a decrease of 3.97 million hectares on 2010 levels.

(ii) Planted forests

The largest expansions in planted forest areas will occur in Australia and New Zealand. In Australia, a business-as-usual scenario should see plantations expand by approximately 50 000 hectares *per annum*, to 2.4 million hectares by 2020. In New Zealand a business-as-usual scenario would see a more modest expansion in planted forests, of perhaps around 20 000 hectares *per annum*, taking the plantation estate to around 2 million hectares by 2020. More modest increases in plantation areas in the Pacific island countries are shown in Table 5.1.

Figure 5.1 shows projections of potential planted forest estates under the various scenarios for Australia, New Zealand and Fiji. Projected planted forest areas are highest under a green economy scenario where carbon markets play a significant role in generating new planting, and lowest in the case of a protracted economic recession scenario where investment in tree planting is very low.

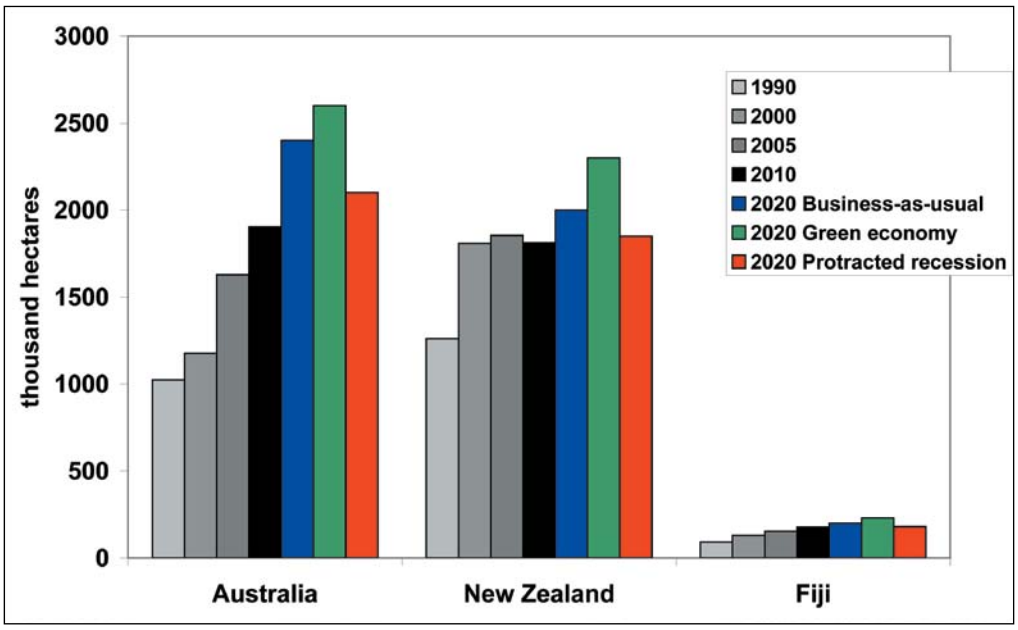

Figure 5.1: Projected areas of planted forests under various scenarios

Sources: Historical data – FAO (2010b). Projections – author

Table 5.1: Pacific: projected forest resources in 2020 – business-as-usual scenario

Country	Land area	Forest area 2020					Area change 2010-2020 (total forest)		Other wooded land	
		Natural forest	Forest plantation	Total forest cover						
	000 ha	000 ha	000 ha	000 ha	%	ha/ capita	000 ha/year	%	000 ha	%
Australia	768 228	145 000	2 400	147 400	19.2	6.2	-239.7	-0.16	135 367	17.6
New Zealand	26 771	6 700	2 000	8 700	32.5	1.9	24.3	0.38	2 557	9.6
Fiji	1 827	835	200	1 035	56.7	1.2	-0.2	-0.02	78	4.3
Papua New Guinea	45 286	27 000	100	27 100	59.8	3.2	-164	-0.57	4 474	9.9
Solomon Islands	2 799	2 100	40	2 140	76.5	3.2	-8.6	-0.39	129	4.6
Vanuatu	1 220	450	7	457	37.5	1.5	1	0.23	476	39.0
Samoa	283	145	34	179	63.3	1.0	0.6	0.43	22	7.8
Tonga	73	9	1	10	13.7	0.1	0.1	1.25	0	0.0
Kiribati	81	12	0	12	14.8	0.1	0	0.00	0	0.0
Tuvalu	3	1	0	1	33.3	0.1	0	0.00	0	0.0
TOTAL	**846 571**	**182 252**	**4 782**	**187 034**	**22.1**	**4.8**	**-386.5**	**-0.21**	**143 103**	**16.9**

(iii) Other wooded land

Data on areas of other wooded land tend to be somewhat volatile, with changes in reported areas resulting more often from variability in definitions and survey techniques rather than mirroring on-the-ground change. In general, areas of other wooded land may increase when forests are degraded into scrub or savannah woodlands, or when grasslands or wastelands regenerate into scrublands or savannah. In the absence of accurate data on recent changes in other wooded land in the Pacific, it is assumed that the area remains constant in the period 2010-2020.

(iv) Areas under production and conservation

In several countries in the Pacific the balance of production and conservation forests will likely remain relatively constant. Certainly in the smaller island countries there is limited scope for allocation of additional forest areas to conservation estates and virtually no forests that could be allocated to production. In New Zealand, the demarcation between almost all natural forests being in the conservation estate and most planted forests being for production leaves little scope for the balance to change.

In Australia, a large proportion of forests are classified as multiple-use forests (39 percent) or leasehold forests (44 percent), neither class of which is regarded as being for conservation or production (FAO 2010b). Consequently, there is significant potential for state-owned multiple-use forests in particular to be redesignated – most likely allocated to conservation (see Section 4.3 [i]) in line with trends towards reduced harvesting in natural forests. Muddying the waters somewhat, however, is the likelihood of new management regimes to reduce the risks of devastating bushfires that may see increased harvesting to reduce fuel loadings.

Similarly, in Papua New Guinea, the Solomon Islands, Fiji and Vanuatu, large areas of forests are designated as multiple-use forests, or are not yet designated for either conservation or production (for example, 'reserved forests' in Papua New Guinea). Consequently, there is potential for new conservation areas or new harvesting concessions (especially in Papua New Guinea) to be allocated. However, given that most of the forests are under customary ownership in these countries, any changes in designation will be a negotiated process.

5.2. Wood and wood products

Production of wood products in the Pacific during the next decade will be driven by increasing supplies of wood from maturing plantations in Australia, New Zealand and Fiji. Production of all types of wood products is expected to increase (Figure 5.2), with increasing volumes of sawntimber expected to be produced in Australia, New Zealand, Fiji and Papua New Guinea, while increasing volumes of pulp and paper and panel products are expected to be produced mainly in Australia and New Zealand.

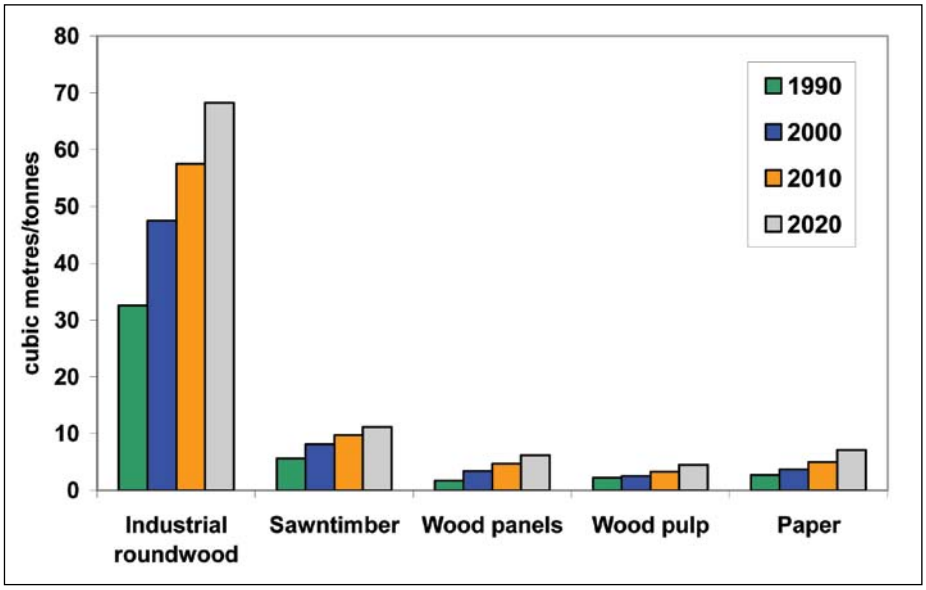

Figure 5.2: Projected wood products production[1] in the Pacific to 2020

Source: Jonsson and Whiteman (2009)

(i) Logging and log trade

As noted in Section 4.3, by 2020 Australia's roundwood harvest is anticipated to be around 36 million cubic metres, while New Zealand is anticipated to produce 26.6 million cubic metres. In Fiji, planted forest production is also expected to soar:

Whilst native forest harvesting will remain constant and/or decline till 2020, pine harvesting is expected to increase to 850,000 m^3 and mahogany logging to 200,000 m^3 by 2020. Log production from 2020 would be reaching 1.1 million m^3/year mainly from plantation forests (Leslie and Tuinivanua 2009).

Baseline modeling by Jonsson and Whiteman (2009), which broadly equates to business-as-usual scenarios, suggests the Pacific region as a whole may produce 68 million cubic metres of industrial roundwood in 2020 (Figure 5.2). Projected volumes of industrial roundwood production from the major producer countries are shown in Figure 5.3, with increasing harvests projected from Australia, New Zealand, Fiji and Papua New Guinea, but a significant decline forecast for Solomon Islands in line with anticipated merchantable forest depletion.[2]

1 NB. Industrial roundwood, sawnwood and panels are shown in cubic metres, woodpulp and paper in tonnes.
2 NB. The Jonsson and Whiteman model results for the Solomon Islands have been amended to reflect this forest depletion.

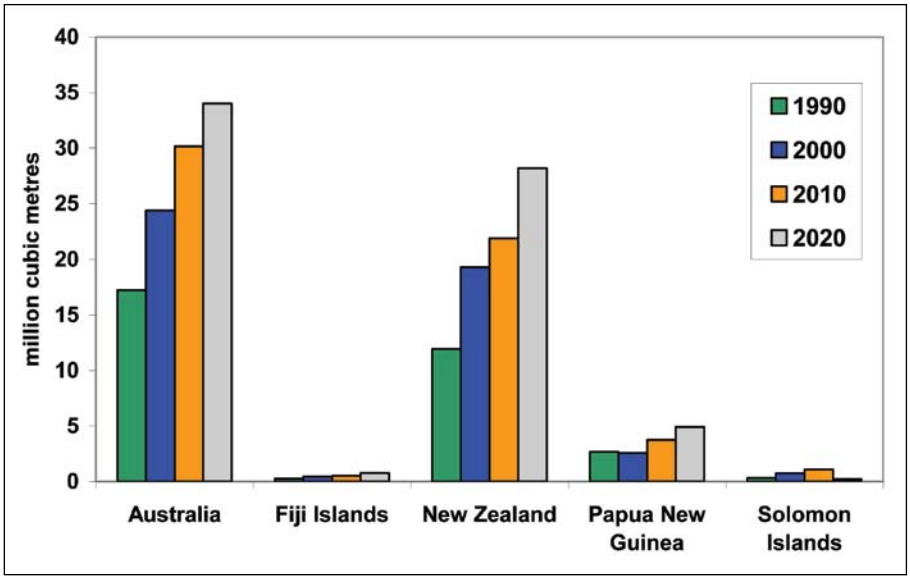

Figure 5.3: Projected industrial roundwood production in the Pacific to 2020

Source: Jonsson and Whiteman (2009)

Significant volumes of Pacific roundwood will continue to be exported as logs, with harvest production continuing to outstrip processing capacity, particularly in New Zealand and Papua New Guinea. As Figure 4.3 shows, New Zealand's log exports may exceed 10 million cubic metres in 2020, while Papua New Guinea will likely continue to export approximately 90 percent of its industrial roundwood harvest. The Solomon Islands will also remain a significant log exporter for the next several years. There is some potential for Australia to modestly increase its volume of log exports with moderate increases in production of plantation-grown hardwood sawlogs potentially available for export.

With increasing demand for industrial roundwood in Asia, especially from China – but also from emerging large markets in South Asia – allied with increasing tariffs on logs exported from the Russian Federation, demand for Pacific roundwood should remain strong and prices should be attractive. High prices are the most likely driver of an industrial forestry scenario, which would see higher log harvests and an acceleration in log exports. Conversely, a severe and protracted recession scenario envisages weak overseas demand, with lower harvesting and dwindling log exports. A green economy scenario would likely see lower harvesting levels in natural forests and potentially even lower or deferred harvests in planted forests with some owners preferring to collect carbon payments.

(ii) Woodchips

Under a business-as-usual scenario Australia will remain a major producer and exporter of woodchips during the next decade. A rapid expansion in supplies of plantation-grown hardwood pulp logs (Figure 4.2) will be chipped and used in domestic pulp and paper production – in part substituting for decreasing supplies of pulpwood from natural forests – and exported. By 2020, Australia is expected to produce almost 14 million cubic metres of plantation grown hardwood pulp logs. At present, almost all of Australia's woodchip exports are sold to Japan. However, emerging markets such as

China, India and Indonesia should also offer significant potential.

Similarly, expanding harvests from Fiji's pine plantation should also result in increasing woodchip exports. Leslie and Tuinivanua (2009) estimated that Fiji will increase its woodchip production from around 240 000 cubic metres in 2007 to 650 000 cubic metres in 2020. As international woodchip markets recover for the global economic downturn, New Zealand will likely recommence its modest woodchip trade.

As with log exports, high prices for woodchips may drive accelerated logging and chipping under an industrial forestry scenario, while woodchip exports could be markedly lower under a severe recession scenario. Under the green economy scenario woodchipping logs from natural forests would likely fall considerably in number.

(iii) Sawntimber

Sawntimber production in the Pacific will increase significantly according to baseline modeling (business-as-usual) by Jonsson and Whiteman (2009) (Figure 5.4). Subregional production is estimated to increase to 11.2 million cubic metres by 2020 from the 9.6 million cubic metres produced in 2007. Australia and New Zealand will be the largest producers, but Fiji and Papua New Guinea will also produce significant volumes. Fiji's production of mahogany sawntimber will constitute an important niche product. Most other Pacific countries will continue to produce modest volumes of sawntimber mainly for domestic consumption.

New Zealand will remain a significant exporter of sawntimber with export volumes likely exceeding 2 million cubic metres by 2020. New Zealand exports sawntimber mainly to a wide range of Asia-Pacific markets and to the United States. Australia, Fiji, Papua New Guinea and the Solomon Islands will export smaller volumes of sawntimber.

Sawntimber production and exporting under various scenarios will likely reflect similar patterns to log harvesting. If harvesting increases, sawntimber production would likely increase proportionately and, similarly, if harvesting declines sawntimber production and exporting could be expected to decline.

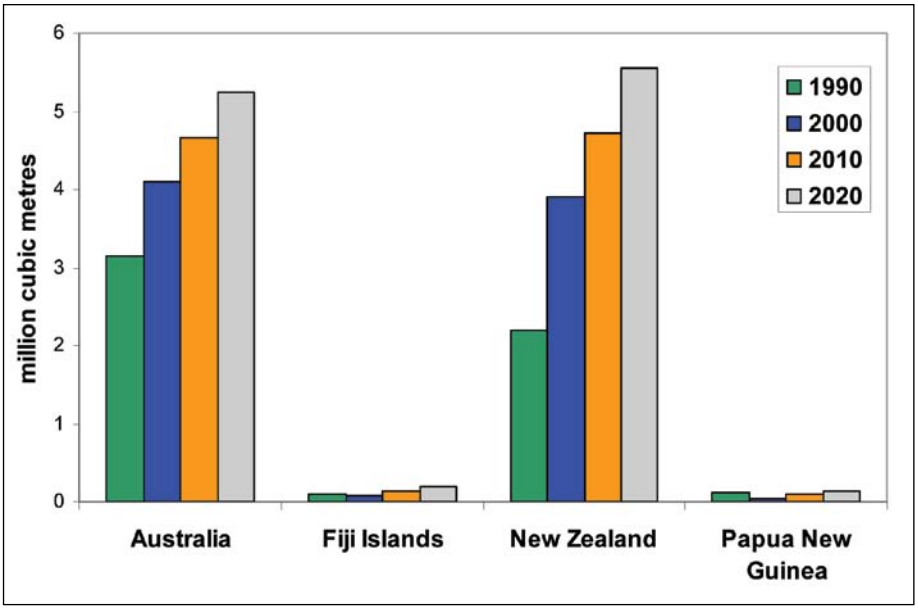

Figure 5.4: Projected sawntimber production in the Pacific to 2020

Source: Jonsson and Whiteman (2009)

(iv) Pulp and paper

Australia and New Zealand will remain the sole producers of pulp and paper in the Pacific subregion to 2020. Major increases in pulp and paper production will be dependent on new capacity being installed. In Australia, a 700 000 tonne pulp mill to be built at Penola, South Australia has been approved and legislated (Protavia Ltd 2010). The necessary state and federal permits have also been obtained for a 1 million tonne pulp mill planned to be built at Bell Bay, Tasmania (Gunns Ltd 2010). These mills will likely boost exports of woodpulp and commensurately reduce exports of woodchips. Increases in production efficiency at other pulp and paper mills, including occasional upgrades, can be expected to moderately increase production of pulp and paper products. Jonnson and Whiteman's (2009) baseline modeling results for Pacific pulp and paper production appear in Figure 5.5.

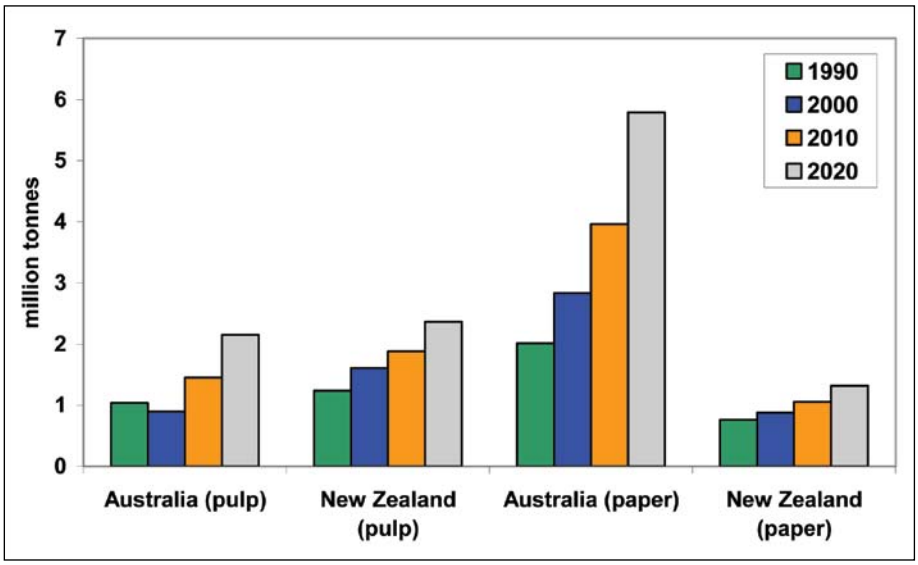

Figure 5.5: Projected pulp and paper production in the Pacific to 2020

Source: Jonsson and Whiteman (2009)

(v) Panel products

Wood-based panel products have been a major focus of production increases in Australia and New Zealand during the past two decades and this trend is projected to increase in the period to 2020. Jonsson and Whiteman (2009) project that Pacific production of wood-based panels will exceed 6 million cubic metres by 2020 (Figure 5.6). In Australia, particle board will remain the dominant wood-based panel product ahead of plywood and fibreboard, while in New Zealand fibreboard will continue to dominate production. Fiji and Papua New Guinea will continue to produce and export modest volumes of plywood and veneer. New Zealand will continue to be a major exporter of wood panels, especially fibreboard, while most of Australia's production will be consumed domestically.

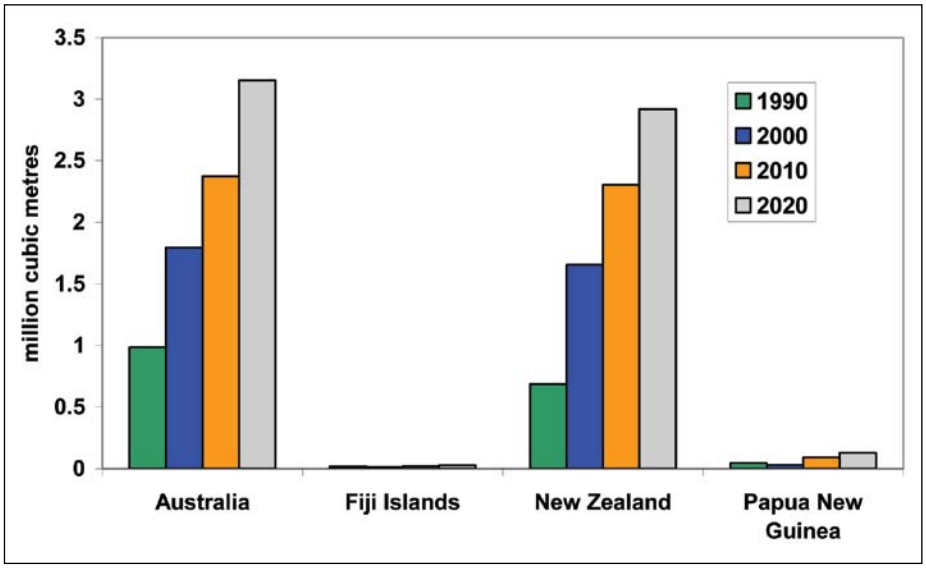

Figure 5.6: Projected wood-based panel production in the Pacific to 2020

Source: Jonsson and Whiteman (2009)

5.3. Wood as a source of energy

With wood likely to remain relatively plentiful in most localities in the Pacific, woodfuel is anticipated to remain an extremely important source of energy. In the Pacific island countries, all things being equal, woodfuel consumption can be expected to increase broadly proportionate to population increases. However, woodfuel consumption is relatively elastic in response to price changes in substitute fuels. In particular, when fossil fuel prices increase, woodfuel consumption rises – as does international interest in other forms of energy including bioenergy.

To date, investment in bioenergy production and processing facilities has been relatively modest in the Pacific with Australia the centre of most activity. Prospects for substantial production of bioenergy in the Pacific largely rest on the establishment of dedicated woody bioenergy crops, such as oil-palm and oil-mallee to produce second generation fuels, with limited scope for using agricultural and forestry wastes and residues. Papua New Guinea, the Solomon Islands and Fiji all have prospects for significant establishment and expansion of oil-palm where scale economies are available. Oil-mallee offers significant potential for dryland development in Australia. Under a business-as-usual scenario, development of dedicated bioenergy resources is likely to be relatively muted. However, under a green economy scenario, particularly where a key driving force is higher prices for fossil fuels, new impetus and enthusiasm for bioenergy may be generated.

Production of wood pellets provides a significant opportunity for Pacific countries, with Australia showing considerable interest. As Figure 5.7 shows (and as discussed in Section 4.3), Australia is anticipated to become a major global supplier of wood pellets during the next decade.

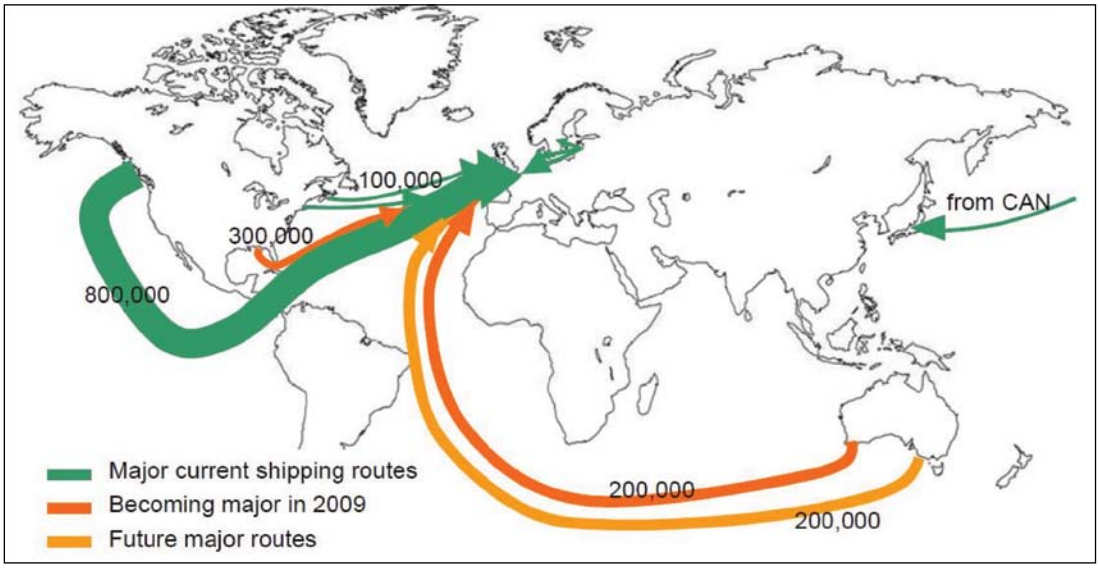

Figure 5.7: Global wood pellet trade (tonnes)

Source: New Energy Finance and CIBC World Markets Inc. in Bull (2009)

5.4. Service functions of forests

In keeping with most of the rest of the world, demands for forest ecosystem services are increasing in the Pacific. As population pressures mount in the small island countries, increasing pressures are being placed on forests to meet these services, while in the developed countries, as people become more affluent and urbanized, they are demanding higher management standards, better quality of services and more sophisticated infrastructure and experiences.

(i) Significance of forest-based recreation and ecotourism

Demands for forest-based recreation appear to be correlated with economic development and likely degree of urbanization. In Australia and New Zealand there is relatively high demand for a wide variety of forest recreational facilities, while in the less developed countries demand for forest recreation appears relatively muted. In the Australasian countries, continued investment in developing, improving access to and maintaining forest areas for recreation can be expected. In New Zealand, for instance, the government has initiated a nation-wide cycleway project to boost tourism, create jobs and revitalize small communities. This will encompass some forest areas. In the Pacific island countries where tourism and ecotourism are significant earners of revenue – especially Fiji, Samoa, Tonga and Vanuatu – site-specific ecotourism developments can be expected. Development of dedicated forest-based attractions such as canopy walkways appears to offer good prospects for ecotourism ventures. In general, demand for recreation and ecotourism will be highest under the rapid economic recovery and growth scenario whereby people are increasingly affluent and international tourism is likely to flourish. Similarly, investment in supporting infrastructure for forest recreation and tourism is likely to be greatest under the rapid growth and green economy scenarios.

(ii) Forests and water

Forests and water issues are accorded high priority in most Pacific countries. In the smallest island countries the fragility of freshwater supplies means significant attention is given to ensuring they are adequately protected and preserved. However, rising sea levels and other effects of climate change are being blamed for recent saltwater infiltration into groundwater on Funafuti and Vaitupu islands of Tuvalu and several islands of Kiribati. These challenges may be exacerbated over the coming decade (Box 5.1).

Box 5.1: Saltwater infiltration in Kiribati

As projections from the IPCC have shown, there is strong evidence that water resources and distribution of rainfall on small islands will be compromised with climate change. In Kiribati, for instance, a 10% reduction in average rainfall by 2050 would lead to a 20% reduction in the size of the freshwater lens. In addition, increased frequency of extreme weather events, sea level rise and resulting land loss, are likely to increase the stress on freshwater lens on atolls. For example, studies in Tarawa, Kiribati, demonstrated that a 50 cm rise in sea level accompanied by a reduction in rainfall of 25% would reduce the freshwater lens by 65%. These negative impacts of climate change cumulated with population increase put the availability of fresh water resources at risk. Water quality is likely to be degraded by salt water infiltration.

Such events may increase dependence on rainwater and forest areas could have an important role in collection and filtration.

Source: Islands First (2010)

Other important forest and water issues include attention to watershed protection and protection from cyclonic damage, soil salinization in Australia and maintaining forest-based fisheries especially in mangrove areas. In general, all of these issues will garner greater attention and investment under a rapid economic recovery and growth scenario and green economy scenario, while less attention and investment will occur under the severe and protracted recession scenario.

(iii) Managing forests for biodiversity

Under a business-as-usual scenario, little change can be expected in the management of forests for biodiversity. Throughout the region, investment in forest biodiversity conservation is relatively low. As noted earlier, large areas of forests are designated as conservation areas, but most are under largely *laissez-faire* management regimes. Most effort appears to go into rehabilitation efforts for forest birds and animals, including pest control, although in Australia fire prevention strategies have been accorded high priority. As with other ecosystem services, the greatest investment in biodiversity conservation is likely to occur under the rapid economic recovery and growth and green economy scenarios. Lower levels of investment are likely under the severe and protracted recession scenario.

(iv) Forests as carbon sinks

Many of the likely impacts and outcomes of climate change policies on forests have been discussed under the green economy scenario analyses in Section 4.4. However, several

final points can be made in relation to what we may see in relation to forests and carbon in 2020. As this paper goes to press the 16th Conference of the Parties to the UNFCCC is meeting in Cancun amidst enormous uncertainty and continuing disagreement. While agreement to implement REDD+ appears imminent, agreement on how it will be funded remains elusive. With solid directions and outcomes on climate change still seemingly distant and continuing uncertainty, undoubtedly confidence in existing climate mechanisms and the potential for future forestry funding are being damaged. While Pacific countries do well to hold onto hope of positive outcomes, they should not neglect to plan for futures where climate outcomes are disappointing and prospects of financing through forest carbon are negligible. It is also important that countries recognize that even if substantial funding becomes available, like any investment, higher prices will be paid for greater quality. In the case of forest carbon, it seems likely that the greater certainty (for example in measurement) and stability of purchasing carbon rights to well-managed planted forests in stable, developed countries with strongly enforceable property rights will be more attractive and more valuable than a less certain, poorly demarcated natural forest in a less stable and secure developing country. Where funds are scarce they will likely flow towards areas of greatest value rather than the areas of greatest need.

5.5. An overview of the future of forests and forestry in 2020

For **Australia** and New Zealand, a relatively stable future for forestry is projected. Net forest cover will remain relatively stable regardless of how scenarios unfold (Table 5.1). These countries have developed and mature economies in which supplies and demands for forest goods and service will unfold in a predictable and well-regulated manner. A key to forestry development is the increasing dichotomy between natural forests for provision of environmental services and increasingly being locked into conservation estates, and plantation forests for production forestry. Future forestry directions will be determined through democratic governance where civil society organizations, governments, the private sector and other stakeholders mutually establish checks and balances. Robust policy and regulatory environments help to ensure that values such as sustainability in natural resource management cannot be easily undermined. The actual paths forestry will take will vary somewhat – depending on the length and depth of the current recession and future economic conditions – while developments in the climate change agenda will dictate any significant structural changes.

In the less developed Pacific island countries, the future is more fluid. Securing a positive future for forestry will require that governments demonstrate strong commitment to the forestry sector and to balancing social, economic and environmental imperatives. At the same time, most Pacific governments face severe constraints in the financial resources available for allocation to forest resource development.

In **Fiji**, the situation is particularly characterized by the foresight shown in establishing the planted forests, which provide significant opportunities into the future. The key to a positive future appears to be in strengthening other areas of comparative advantage to enable the development of a value-added processing potential – especially to take advantage of the highly valuable mahogany resource. To do so, probably means attracting external investment capital, and the key here is to provide a more stable and secure investment environment. The starting point must be to improve political stability – with efforts also to improve economic and policy stability.

For **Papua New Guinea** there is unlikely to be significant deviation from the current path of developing natural forest concessions, logging and log exporting. It will be difficult to develop other areas of competitive advantage in the medium term. With the concession system remaining dominant, major financial benefits will continue to be shared among logging companies, resource owners and the government. Inside the next decade, it seems likely that REDD funding will be too late to assist beyond the margins. Nonetheless, Papua New Guinea is a resource-rich country – in terms of oil, minerals, fisheries and forests. The challenge is for the country to harness this wealth for development.

In the **Solomon Islands**, to paraphrase Prime Minister Derek Sikua, the country has been suffering from 'cubic disease' – the sale of millions of dollars of logs, accompanied by breakdowns in governance, irresponsibility and corruption. The merchantable forests are near to exhausted, but their depletion has not been accompanied by economic development. In many ways it seems capitalism and open markets still face many challenges if they are to serve the Solomon Islands and its forests. New pathways will need to be found, probably centring on people and traditional collectivism.

In **Vanuatu**, the imposition of a log export ban that has operated intermittently since 1994 has been used as a mechanism to develop a modest wood-processing industry, mainly focused on domestic markets, while the country is focusing much more on tourism, in which forestry plays a role, as an earner of foreign exchange. A lesson in this might be that for small, vulnerable economies, where some of the fundamental tenets of good governance may be lacking; adherence to the open market prescriptions may create significant difficulties will be difficult to reverse.

For **Samoa** and **Tonga**, the future – in forestry and beyond – offers choices of dependency or self-sufficiency. Beyond the initial liquidation of their merchantable natural forest – now largely complete – neither country is large enough to host a significant forestry export industry. Indeed, both countries are increasingly dependent on forestry imports, while both are also aiming to establish new planted forest resources as a means of moving towards future self-sufficiency, at least in terms of wood (as opposed to paper) products. In the meantime, forests continue to provide for subsistence needs and serve as a backdrop, and potentially a future focus, for tourism.

For the very small and isolated atoll countries of **Kiribati** and **Tuvalu** the absence of economies-of-scale and the remoteness of their location substantially hinder development. Forests mainly play roles in subsistence livelihoods, agroforestry, coastal protection and for basic building products and fuel. In the future, forests may have a role in some form of ecotourism based on their very remoteness. The economies of both countries are highly dependent on remittances and aid money. For both countries, people are the major resource – and the broad development focus should surely be on education, skills and provision of services. Both countries are deeply concerned about potential sea-level rise and inundation, and forests may have a role in protecting against this during the early stages.

Table 5.2: Forestry trends to 2020 under different scenarios

	Business-as-usual	Severe and protracted recession	Rapid economic recovery and growth	Industrial forestry	Green economy
Forest cover	↓	↑	↓	↓↓	↑↑
Forest quality	↓	↑	↓	↓↓	↑↑
Planted forest area	↑	↓	↑	↑	↑↑
Wood-self-sufficiency	←→	↑	↑	↓	↑
Forest product demand	↑	↓	↑↑	↑↑	←→
Forest-based livelihoods	↓	↑↑	↓	↓	←→
Woodfuel dependence	←→	↑↑	↓	←→	←→
NWFP demand	↑	↑↑	↓	←→	↑
Foreign direct investments in forestry	↑	↓	↑	↑	↑
Forestry contribution to GDP	↓	↓	↓	↑	←→
Public spending in forestry	↑	↓	↑	↓	↑↑
Forestry governance capacity	↑	↓	↑	↓↓	↑↑
Willingness-to-pay for environment	←→	↓	↑	←→	↑↑
Corporate social responsibility and governance	←→	↓	↑	↓↓	↑↑

↑ = increasing ↑↑ = strongly increasing
↓= decreasing ↓↓ = strongly decreasing ←→ = variable or uncertain

Table 5.2 summarizes trends in key variables at a regional level under various scenarios. In some instances income and substitution effects may be working in different directions and outcomes will depend on which is dominant or be variable or uncertain.

6 HOW CAN WE CREATE A BETTER FUTURE?

Concluding sections of technical recommendations to improve forestry often tend to be somewhat generalized, and somewhat prescriptive. Elsewhere – in the main report of the *Asia-Pacific forestry sector outlook study* (FAO 2010) – a range of technical recommendations is made identifying priorities and strategies. These are relevant for the countries of the Pacific as well as the wider region and are summarized below for the Pacific context.

6.1. Priorities

- *Rebuilding natural resource bases and conservation of existing resources:* In several countries of the Pacific forest resources have been substantially depleted. Industrial wood supplies have been largely liquidated, losing the potential for a sustainable forest products' industry and creating a dependence on imports of industrial wood products. At the same time, forest clearance has undermined the provision of some ecosystem services such as watershed protection, coastal protection, forest recreation and carbon sequestration. Attention needs to be given to rebuilding forest resources, particularly in the Solomon Islands, Vanuatu, Samoa, Tonga and Tuvalu, as well as parts of Kiribati.
- *Rural development, employment generation and poverty alleviation:* Poverty alleviation remains a significant challenge in all of the developing countries in the Pacific, with many families still dependent on subsistence or semi-subsistence livelihoods. In countries such as Papua New Guinea and the Solomon Islands leasing forests for timber concession development is often the primary means for customary forest owners to generate revenues to lift themselves from poverty and undertake rural development. However, such strategies have often resulted in only short-term benefits and greater impoverishment in the long run.
- *Enhancing efficiency of raw material/energy use:* Achieving greater efficiency in resource use is a challenge for all countries. For more industrialized countries it can confer a source of international competitive advantage, while for smaller island countries it helps to ensure scarce resources are used productively.
- *Governance:* Weak governance is a significant issue in several Pacific countries, both in general terms as well as specifically within the forestry sector. Poor governance increases the risks attached to investments in forestry development including provision of overseas development assistance, plantation development, education programmes, carbon sequestration, wood processing and forest management. Governance will also be a critical prerequisite to attracting REDD and other carbon financing. Countries with poor governance will be severely disadvantaged in competing for funds, with money gravitating to where investors have confidence.

6.2. Strategies

- *Improving policy, legal and institutional frameworks:* Policies, legislation and institutional arrangements should empower people to undertake individual and collective actions, helping to resolve conflicts and establish acceptable trade-offs between competing and conflicting objectives. In many Pacific countries significant weaknesses exist in policy implementation and in institutional resources and effectiveness. For many of the Pacific island countries, seeking development assistance to strengthen institutional capacities should be a key priority. A reality is that given the extremely small size of some Pacific island countries, with very small populations, land and forest areas and negligible forestry institutional capacities, it makes sense to think less about 'forestry' and much more about natural resources management in the context of multidisciplinarity and multisectoral approaches.
- In all countries, creation of enabling environments in which incentives reward 'good' behaviours and penalize the 'bad' should be given priority. Policies should empower people to make decisions to help themselves, through innovation and entrepreneurship, while government emphasis should be on regulation to ensure activities are not exploitative or destructive.
- *Building capacities for grassroots forestry:* Many day-to-day field activities that determine the physical future of forests and forestry are often overlooked in national and, especially, international discussions. A variety of grassroots activities including forest demarcation, growing timber, collection of fuelwood and NWFPs, logging techniques and systems, manufacturing wood products, fire management, monitoring of forest health and vitality, and collection of forest statistics are often overshadowed by the present enthusiasm for climate change, forest law enforcement and governance. Pacific countries – especially the island countries – need to ensure that their scarce institutional resources primarily focus on the day-to-day realities of forest management, and avoid the trap of excessive investments in more esoteric discussions and dialogues.
- *Strengthening science and technology capacities:* For many Pacific countries, forest research capacities are small or non-existent and it would make little sense to attempt to establish significant facilities. In general, the focus should be on identifying and transferring relevant science and technology, with scientific capabilities focusing on adapting knowledge to local conditions.
- *Improving education and awareness:* A lack of skilled human resources in many Pacific countries points to a clear need to improve education and also to increase awareness in relation to forests and natural resources. The subregion's growing population and the skew towards younger generations in many countries places emphasis on the need for improved forestry education and awareness if the mistakes of the past are not to be repeated by future generations.
- *Developing societal consensus:* Continuation and acceleration of efforts towards achieving societal consensus in how forests should be managed, and for which purposes, will be a key element in effective forest management in the coming decade. The core elements of these strategies are well understood including attention to livelihoods, participation, consultation, democratic decision-making and principles of equity. These elements are of particular importance for Pacific countries where a high proportion of forests are outside direct government ownership or control.

- *Strengthening leadership and communication:* A major challenge for forestry is to strengthen its sectoral profile and to develop more powerful champions, advocates and leaders. While some of this development undoubtedly comes through intangible factors, it could be promoted through provision of specialized training opportunities, greater encouragement and empowerment of staff, and significant institutional culture changes. This is important at all levels of forestry, but the emergence of more eloquent and powerful leaders and advocates at national and international levels could be a major driving force to shift forestry onto 'greener', better and more sustainable pathways.

6.3. Conclusion

Most of these technical recommendations are largely well understood and will help to provide a sound basis for forestry to develop in an orderly fashion, and to progress towards sustainable forest management. Some more general recommendations – sometimes more philosophical than technical – are given below to conclude this report.

In Australia and New Zealand, forestry has developed over recent decades through attention to the sorts of technical issues listed above. These countries generally need little help or advice – and where such assistance is needed they are well placed to seek or purchase it. Their forestry sectors are evolving into mature entities within developed economies.

However, for some of the island countries it seems – regardless of endless efforts to revamp national forest policies, development aid projects, forest pilot projects, development of codes of practice, criteria and indicators, and a host of other initiatives – development has been slow, uneven and, in some cases, little evidenced.

Often, it seems there is an abundance of advice, opinions and prescriptions on what should be done. Despite all this advice, little seems to change, and sometimes things seem to go from bad to worse. A key challenge for policy-makers and stakeholders is to understand why so much advice cannot be implemented or goes astray and why so many initiatives fail to make a difference.

In part, it may be that those putting forth solutions need to blend their advocacy with a healthy dose of realism. For countries, part of the solution may be to select what is sensible and practical and stick with it; to concentrate efforts on achieving the core parts of their forest policies – ignore the dogmas, fads and fashions – and dare to say 'no' to distractions, even when they come linked to money.

More generally, forestry cannot be treated as an island; divorced from the general economy. Weaknesses in overall economic, political and social structures impinge severely on the Pacific forestry sector. In particular, wherever investment is needed, greater efforts are needed to clean up perceptions of political instability, imbalances and misuse of power, corruption and lack of security. These are diseases in economic systems that will tax and kill growth and prosperity.

A major challenge for Pacific forestry is to build elements of comparative advantage. It seems evident this should be in terms of developing niche products – though it is significantly less obvious what these niches might be. Given the disadvantages that most island countries labour under – particularly economies of scale and isolation from markets – sustainable competitive advantages probably require that countries identify unique attributes in production that cannot be readily replicated elsewhere. Fiji's investment in mahogany growing (the absence of shoot-tip borer conferred a

major competitive advantage) provides an excellent example. Other valuable species might similarly be investigated, where the relative isolation of Pacific islands might offer protection from pests that are endemic elsewhere – including for species beyond timber trees, such as medicinal plants, and even endangered species such as birds, reptiles and mammals.

Countries need to take stock of their strengths and weaknesses and develop ways of working that maximize the strengths and nullify the weaknesses. While forest resources are an evident strength for some countries, people – including family and community units and the unique ways they work together – are a key strength that should be invested in (by the forestry sector and others). The small and intimate nature of many Pacific societies means that unique and informal means of dialogue, decision-making and doing business are often more relevant than modalities used by outsiders.

Community structures can also be a key weakness, where collective approaches penalize the most productive and reward the idle. People need to have incentives to work hard and rewards for performance. Isolation, underdevelopment, lack of infrastructure, scarcity of capital and reliance on aid are other weaknesses in many Pacific localities. Countries need to find ways to work with and around these weaknesses.

It is clear that countries should treasure their natural resources. They are neither infinite nor permanent if they are not highly valued. Countries need to ensure they are not blinded by promises of ready money. According to the old saying, "Money is for a minute, the land is forever". In any case, money is a secondary issue in development. Disappointing experiences in the way some logging revenues have been spent or squandered, demonstrate that even if money is abundant, there will be little progress without significant and sustained attitude changes.

Finally, Pacific countries should keep in mind that "God helps those who help themselves". Countries need to ensure that the forestry programmes they pursue are what is really needed and can be implemented. 'Pacific-specific' solutions to the challenges are undoubtedly the best way forward. Not all help pro-offered should be welcomed with open arms – especially when the help comes tagged with financial or political costs. 'Do-it-yourself', is sometimes a much better option than sharing profits with outsiders. Pacific countries can certainly take a firmer grasp on their own destinies.

For Pacific countries, the *Asia-Pacific Forestry Sector Outlook Study* presents a wealth of information in the form of national reports, thematic studies, a main report and this and other subregional studies. It is a forward-looking initiative, presenting a range of possible futures – including some potentially harsh realities – and describing broad scenarios for how such futures might unfold.

However, these futures are not prescriptive. Countries have choices as to the pathways they take. The principal aim of the report is to promote widespread discussions on the type of future people want for their countries. Such visioning can then lead to more relevant strategic planning to develop policies and map out plans that will deliver what people want.

The key is to ensure that all of the policies, plans, institutional structures and budgets align with the overall vision and can place that future within reach.

SELECTED REFERENCES

Arancon, R.N., Jr. 2009. *The situation and prospects for the utilization of coconut wood in Asia and the Pacific*. APFSOS Working Paper APFSOS II-2009-15. Bangkok, FAO.

Asian Development Bank. Web site. Available at http://www.adb.org (accessed 2009-2010).

ASB Bank Limited. 2009. *ASB quarterly economic forecast – 12 February 2009*. Available at: http://reports.asb.co.nz/index.html (accessed February 2009).

Bioenergy Knowledge Center and Hancock Timber Resource Group. *Biomass supply and demand challenges: commercial reality*. Presentation by Hancock Timber Resource Group. Available at: http://www.bkc.co.nz/Portals/0/Workshop%20Presentations/UCBiomassMeet4IndustryHancockChrisBailey.pdf (accessed May 2009).

Bakeo, R., Kalsakau, T., Smith, A & Tau, D. 2003. *Development of forest health surveillance systems for Pacific countries and Australia: Country report –Vanuatu*. Pacific Forest Health Workshop, Suva, 31 March to 3 April 2003. ACIAR Project FST/2001/045. Available at: http://www.spc.int/pps/ACIAR/PDF_files/Country%20report%20Vanuatu.pdf (accessed December 2010)

Brown, C. 1997. *Regional study – The South Pacific*. Rome, FAO.

Brown, C. & Ortiz, G. 2001. *The forest processing investment environment*. A report prepared for the New Zealand Ministry of Agriculture and Forestry by Forest Research. MAF Technical Paper 01/05. Wellington. Available at: http://www.maf.govt.nz/mafnet/rural-nz/profitability-and-economics/trends/forest-processing-investment/index.htm

Bull, G.Q. 2009. *The global forest products industry 2012: changing times*. Presentation to the New Zealand Forest Owners and Wood Processors 2009 Conference. Nelson, New Zealand.

Central Intelligence Agency (CIA). 2009. *The World Factbook* Web site. Available at https://www.cia.gov/library/publications/the-world-factbook (accessed May 2009).

Centre for International Economics. 2002. *Potential economic impacts of an HIV/AIDS epidemic in Papua New Guinea.* Report prepared for AusAID. Available at: www.ausaid.gov.au/publications/pdf/hivaids_png.pdf

Clarke, M.P. 2010. Creating space for private-sector financing in forestry – removing constraints to investment: New Zealand case study. *In Growing green assets: Removing constraints to private sector investment in forestry in Asia and the Pacific.* Bangkok, FAO.

Conn, B.J. & Damas, K.Q. 2006+. *Guide to trees of Papua New Guinea*. Available at: http://www.pngplants.org/PNGtrees (accessed March 2009).

Conservation International. 2009. *Biodiversity hotspots* Web site. Available at http://www.biodiversityhotspots.org/Pages/default.aspx (accessed May 2009)

Crocombe, R. (ed). 1987. *Land tenure in the Pacific*. Suva, University of the South Pacific. Suva.

Crocombe, R. 2007. *Asia in the Pacific islands: replacing the west*. University of the South Pacific. Institute of Pacific Studies.

Commonwealth Scientific and Industrial Research Organisation (CSIRO). 2010. *Forestry research*. Available at:http://www.csiro.au/org/Forestry.html (accessed June 2010).

Department of Agriculture, Fisheries and Forestry, Bureau of Resource Sciences (DAFF-BRS). 2008. *The changing face of Australia's forests*. Commonwealth of Australia.

Driscoll, D., Milkovits, G. & Freudenberger, D. 2000. *Impact and use of firewood in Australia*. CSIRO Sustainable Ecosystems. Available at: http://www.environment.gov.au/land/publications/pubs/firewood-impacts.pdf (accessed May 2009).

Fiji Islands Bureau of Statistics. 2009. *Statistical news: 2007 census of population and housing*. No. 09/2009. Suva.

Fiji Islands Bureau of Statistics. 2010. *Key statistics March 2010: employment and wages*. Suva.

FAO. 2009a. *The future of forests: proceedings of an international conference on the outlook for Asia-Pacific forests to 2020*. Bangkok, FAO.

FAO. 2009b. *FAO forestry country profiles*. Available at: http://www.fao.org/forestry/country/en/ (accessed March 2009).

FAO. 2009c. FAOSTAT database. Available at http://faostat.fao.org/default.aspx.

FAO. 2010a. *Asia-Pacific forest and forestry to 2020: Asia-Pacific Forestry Sector Outlook Study II*. Bangkok, FAO.

FAO. 2010b. *Global forest resources assessment 2010*. Rome, FAO.

Forest Enterprises Ltd. Web site. Available at: http://www.forestenterprises.co.nz/fgen/finz/nzforestry.htm#New%20Zealand%20Forest%20Industry%20Vision%202025 (accessed December 2010)

Government of the Republic of the Fiji Islands. 2007. *Fiji forest policy statement – November 2007*. Suva, Fiji, Department of Forestry.

Government of Tonga. 2008. Draft national forest policy for Tonga. Available at: http://www.tonga-energy.to/wp-content/uploads/2009/12/Draft-Tonga-Natl-Forest-Policy-5Aug2008.pdf (accessed November 2010)

Gunns Ltd. 2010. Web site. *Bell Bay pulp mill*. Available at: http://www.gunnspulpmill.com.au/factsheets.php (accessed December 2010).

Islands First. 2010. Web site. *Water security*. Available at: http://www.islandsfirst.org/issues/water_security_more.html (accessed December 2010)

Jonsson, R. & Whiteman, A. 2009. *Global forest products projections*. Rome, FAO.

Landcare Research. 2009. *Carbon stocks and changes in New Zealand's soils and forests, and implications of post-2012 accounting options for land-based emissions offsets and mitigation opportunities – including appendices*. Landcare Research Contract Report: LC0708/174. New Zealand, Lincoln. Available at: http://www.landcareresearch.co.nz/publications/researchpubs/LULUCF_Report_Apr_09.pdf (accessed December 2010).

Lebedys, A. 2008. *Forest finance: contribution of the forestry sector to national economies 1990-2006*. Working Paper FSFM/ACC/08. Rome, FAO.

Leslie, A & Tuinivanua, O. 2009. *Fiji forest sector outlook 2020 report*. Bangkok, FAO.

Montreal Process Implementation Group for Australia (MPIGA). 2008. *Australia's state of the forests report 2008*. Canberra, Bureau of Rural Sciences.

National Association of Forest Industries (NAFI) and A3P. 2006. *Wood and paper products industry skills shortage audit*. Available at:

http://www.nafi.com.au/skills/Skills_Audit_Full_Version.pdf

National Parliament of Solomon Islands. 2006-2010. *Hansard reports – 8th Parliament*. Available at: http://www.parliament.gov.sb/index.php?q=node/289 (accessed November 2010)

New Zealand Home Heating Organization (NZHHO). 2009. Web site. *Design standard for new wood burners.* Available at: http://www.homeheat.co.nz/_webapp_10472/Design_Standard_for_New_Wood_Burners (accessed May 2009).

New Zealand Ministry of Agriculture and Forestry (NZMAF). 2008. *A national exotic forest description (2007)*. Wellington, Ministry of Agriculture and Forestry.

NZMAF. 2009a. *Carbon forestry options for landowners*. Available at: www.maf.govt.nz/sustainable-forestry/ets/options-for-landowners.pdf (accessed July 2010).

NZMAF. 2009b. *New Zealand wood availability forecasts 2010–2040.* Wellington.

Available at: http://www.maf.govt.nz/mafnet/publications/wood-availability/new-zealand/new-zealand.pdf

NZMAF. *Forestry production and trade statistics.* Web site. Available at: http://www.maf.govt.nz/statistics/forestry/ (accessed periodically).

New Zealand Parliament. 2010. Hansard. 16 November 2010. Questions for oral answer — questions to ministers. Available at: http://www.parliament.nz/enNZ/PB/Debates/Debates/8/7/8/49HansD_20101116_00000068-Questions-for-Oral-Answer-Questions-to-Ministers.htm (accessed December 2010)

NZ Wood. Web site. Available at: http://www.nzwood.co.nz/corporate/ (accessed February 2010).

Nukalofa Herald. *Royal Lands Commission hears testimony on land leases, tenancy agreements.* 27 May 2010. Available at: http://nukualofaherald.to/uncategorized/royal-lands-commission-hears-testimony-on-land-leases-tenancy-agreements/ (accessed November 2010).

Organisation for Economic Co-operation and Development (OECD). 2010. Web site. *Aid statistics, aid to environment at a glance.* Available at http://www.oecd.org/countrylist/0,3349,en_2649_34447_38026990_1_1_1_1,00.html (accessed February 2010).

Papua New Guinea Forest Authority (PNGFA). 2009. *Papua New Guinea forestry outlook study.* Bangkok, FAO.

Pauku, R.L. 2009. *Solomon Islands forestry outlook study.* APFSOS II/WP/2009/31. Bangkok, FAO.

Porter, M.E. 1990. *The competitive advantage of nations*. London, MacMillan Press Ltd.

Protavia Pty Ltd. 2010. Web site. *Penola pulp mill*. Available at: http://www.protavia.com.au/penola-pulp-mill.php (accessed December 2010).

Reserve Bank of Australia. 2010. *A collection of graphs on the Australian economy and financial markets - November 2010.* Available at: http://www.rba.gov.au/chart-pack/graphical-summary.pdf (accessed December 2010).

Reuters. 2009. *At risk from rising seas, Tuvalu seeks clean power*. Available at: http://www.reuters.com/article/GCA-GreenBusiness/idUSTRE57D4AC20090814 (accessed August 2009).

Sesega, S. 2009. *Samoa forestry outlook study.* APFSOS II/WP/2009/01. Bangkok, FAO.

Southem™. 2010. *History made in tribal forest land deal - New Zealand.* Available at: http://www.southem.com/index.php?option=com_content&task=view&id=973&Itemid (accessed July 2009)

Statistics New Zealand. 2009. Web site. Available at: http://www.stats.govt.nz (accessed February 2009).

Tate, H. (in prep). *Vanuatu forestry sector outlook study*. Bangkok, FAO.

Transparency International. 2008. Corruption Perceptions Index 2008. Available at : http://www.transparency.org/policy_research/surveys_indices/cpi/2008

United Nations Development Programme Pacific Centre. 2006. *Annual report 2006.* Available at: http://www.undppc.org.fj/_resources/article/files/annual_report_06_web.pdf (accessed November 2010).

United Nations Environment Programme – World Conservation Monitoring Centre. 2008. *World database on protected areas. Summary of protection by country and territory on the 31st January 2008.* Available at: http://www.unep-wcmc.org/wdpa/mdgs/WDPAPAstats_Jan08_download.xls (accessed May 2009).

Wikipedia, the free encyclopedia. 2009. *Subprime lending*. Available at: http://en.wikipedia.org/wiki/Subprime_lending (accessed February 2009).

Wikipedia, the free encyclopedia. 2009. *Soil salinity*. Available at: http://en.wikipedia.org/wiki/Soil_salinity (accessed February 2009).

World Bank. 2008. *World development indicators 2008*. USA, Washington, DC.

The people of the Pacific know their own situations best, and need to consider 'Pacific-specific' solutions to the challenges that currently face forestry. The key will be to ensure that related policies, plans, institutional structures and budgets align with the overall vision and place the desired future within reach.

The second *Asia-Pacific Forestry Sector Outlook Study* is a forward-looking initiative, presenting a wealth of information on a range of possible futures for forestry – including some potentially harsh realities – and describing broad scenarios for how such futures might unfold. This subregional report for the Pacific constitutes an important contribution to the overall initiative. Although an integral part of the wider Asia-Pacific region, the Pacific encompasses a range of geographic, ecological, socio-economic, cultural and ethnic differences that distinguish it as a significantly different entity to Asia, with its own distinct and unique challenges – including for forestry.

The report provides an invaluable compendium of information and analysis on the current forestry situation in the Pacific subregion and likely future developments. Working from a baseline assessment, key drivers of change in forestry are identified and their future impacts assessed; potential future scenarios are also developed. The report culminates in a description of the likely situation in 2020 and identification of priorities and strategies to steer the sector towards more favourable outcomes. The report synthesizes observations and findings from Pacific country reports, numerous thematic studies and a wide-ranging review of past and recent data and publications.

The report aims to promote widespread discussions on the futures that people want for forests and forestry in their countries. Such discussion can then lead to more relevant strategic planning to develop policies and map out plans that will deliver what people want.

ISBN 978-92-5-106755-0 ISSN 1020-6221

9 789251 067550

I2007E/1/12.10