# 17 Oceania – Islands of Contrasts

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**Abstract:** The islands which comprise the 24 nations and territories of Oceania range from the continental scale of Australia to the smallest atolls of the Pacific. These islands, their forests, and people are diverse and geographically dispersed. They have high levels of endemic biodiversity, much of which is or may become threatened. Forests in Oceania range from mangrove to montane, and many forested landscapes reflect high levels of management under traditional land use systems. Trees and forests are of fundamental importance to Oceania's peoples and environments. Their importance in the contemporary economies of Oceanic countries varies greatly, but their non-market and environmental services values are now widely recognised. Customary land tenure and rights systems have been maintained in most countries, and are being restored in others, and present both opportunities and constraints for forest conservation and sustainable forest management. All Oceanic countries with significant areas of native forest have experienced an era of unsustainable exploitation, which continues in some richly forested countries. There have also been significant losses of trees from agricultural landscapes. Conservation and sustainable management of remaining natural forests and forested landscapes represent a shared aspiration across the region, although the means by which they are sought and the extent to which they have been realised vary widely. Plantation forests are important in the larger countries, where they and other forms of planted forest are now expected to deliver a diverse range of benefits. Decision processes about forests are increasingly recognising the diversity of values and interests in societies, and governance arrangements and delivery of services are depending more on partnerships between the public, private and non-government sectors.

Keywords: Traditional land use systems; customary tenure; customary rights; sustainable forest management; indigenous people; Oceania.

## 17.1. Introduction

The Oceania region encompasses the islands of the Pacific and its neighbouring seas. These islands range in size from the continental scale of Australia and New Guinea to coral atolls of only tens of square kilometres, such as Tuvalu. Diversity – of ecosystems, economies and societies – characterises the region. The majority of islands are tropical, but New Zealand (NZ) is entirely temperate, as is around two thirds of Australia. The region is often subdivided into the sub-regions of Australasia, Melanesia, Micronesia and Polynesia (Map 17.1), reflecting the origins of its indigenous peoples. All Oceanic states have a relatively recent colonial past superimposed on their much longer-standing indigenous histories. All have forest histories in which modern forms of forest exploitation, forest management and forest conservation have been superimposed on a variety of historical and often sophisticated local-scale relationships between indigenous people and forests.

The states and territories comprising Oceania are listed in Table 1. Most of these comprise many islands with varying degrees of dispersal, although some (e.g. Niue, Nauru) are single islands. Other islands or island groups in the region – American Samoa, French Polynesia, Guam and New Caledonia – remain territories of other nations rather than independent states (Thaman 2002). All but Australia and New Zealand (jointly described as Australasia), which have advanced economies, are classified as Small Island Developing States (SIDS) (Wilkie et al.

**Table 1. Key statistics about forests and people in Oceania**

| Sub-region & Country | Land area (sq. km) | No. of islands | Population 2002 (1000) | Population density people/sq.km | Forest area per capita (ha) | Forest area (1000 ha) | Forest area % of land area | Forest plantation area (1000 ha) |
|---|---|---|---|---|---|---|---|---|
| AUSTRALASIA | | | | | | | | |
| Australia | 7 687 000 | 1 mainland + 1L | 19 547 | 2,5 | 8,3 | 164 000 | 21 | 1 600 |
| New Zealand | 268 680 | 2 L | 3 910 | 15 | 2,1 | 8 200 | 30 | 1 800 |
| MELANESIA | | | | | | | | |
| Fiji | 18 380 | 2L + 300 | 856 | 47 | 1 | 935* | 51 | 100 |
| New Caledonia | 18 575 | 1 L + 11 | 208 | 11 | 1,8 | 370* | 20 | 10 |
| Papua New | | Mainland + 7L + | | | | | | |
| Guinea | 462 243 | 593 | 5 172 | 11 | 6,5 | 36 000* | 78 | 43 |
| West Papua | 421 981 | Mainland + 12 | c.2 200 | | – | 33 000* | 81 | c. 30 |
| Solomon | | | | | | | | |
| Islands | 28 370 | 7L + 985 | 495 | 17 | 5,9 | 2 200* | 88 | 30 |
| Vanuatu | 12 190 | 80+ | 196 | 16 | 2,4 | 914* | 75 | 3 |
| MICRONESIA | | | | | | | | |
| Federated States | | | | | | | | |
| of Micronesia | 702 | 607 | 136 | 702 | 0,1 | * | – | – |
| Guam | 541 | 1 | 161 | 293 | – | * | – | – |
| Marshall Is | 181 | 34 | 77 | 181 | – | * | – | – |
| Nauru | 21 | 1 | 12 | 587 | – | * | – | – |
| Northern | | | | | | | | |
| Mariana Is | 471 | 17 | 77 | 162 | 0,2 | * | – | – |
| Belau | 488 | 200 | 19 | 42 | 1,8 | 35* | 76 | – |
| POLYNESIA | | | | | | | | |
| American Samoa | 200 | 5 in 2 groups | 69 | 199 | 0,2 | 12 | 60 | – |
| Samoa | 2 935 | 8 | 179 | 61 | 0,6 | 105 | 37 | 4 |
| Tuvalu | 26 | 9 | 11 | 429 | – | * | (77% coconuts) | – |
| Kiribati | 810 | 33 in 3 groups | 96 | 119 | 0,3 | 28* | 70 | * |
| Cook Islands | 240 | 15 in 2 groups | 20 | 87 | 1,2 | * | – | 1 |
| French | | | | | | | | – |
| Polynesia | 3 521 | 118 in 5 groups | 258 | 62 | 0,5 | – | – | 1 |
| Niue | 258 | 1 | 2 | 8 | 3 | 6 | 25 | – |
| Tokelau | 12 | 3 | 1,5 | 125 | – | * | – | 2 |
| Tonga | 649 | 170 | 106 | 142 | – | 4* | 6 | – |
| Wallis & Futuna | 255 | 3 | 16 | 57 | – | – | – | – |

(Carew-Reid 1989; Brown 1997; NZMAF 2001; Wilkie et al. 2002; Australian Government 2003a; Brown and Durst 2003; SPREP 2003; Alhamid 2004; Wikipedia 2004)
Note: * Forests either largely agroforestry systems (AFS) or combined AFS and natural forests; L = large island

2002). Trees and forests are of fundamental importance to traditional livelihoods in all nations and to varying degrees part of the market economy; in some, such as New Zealand or the Solomon Islands, the forestry sector is of major economic importance, but it has only modest or negligible status in others.

Consequently, relationships between forests and society in Oceania are complex and dynamic, but a number of common themes recur. Principal amongst these are:

- the importance of trees and of various forms of forests to traditional livelihoods and cultures and to ecosystem function;
- the recognition or assertion of indigenous rights over land and resources, with important consequences for both forest policy and practice;
- high levels of forest biodiversity and endemism, and thus significant conservation imperatives;
- significant environmental degradation and associated economic and social challenges, generated by unsustainable exploitation of forests;
- the emergence of social conflicts over forests, reflecting the different values associated with them, and of efforts to resolve these conflicts;
- profound emerging challenges, such as those posed by environmental degradation or climate change, or those associated with human capacity and governance.

The people of Oceania are responding to these issues in ways that reflect the diversity of their circumstances, environments and societies. This chapter outlines the contexts and issues fundamental to understanding forests, societies and environments in Oceania; it is necessarily synoptic and incomplete, but we hope it stimulates your interest in the region, and its people and forests.

## 17.2 Oceania – Environments, Forests and Societies

### *A Brief History*

In general terms, the forest histories of the Oceanic countries can be described in terms of their indigenous, unsustainably exploitative, and post-exploitative foci, recognising that these elements continue to run contemporaneously to varying degrees. Each focus is characterised synoptically below.

Indigenous peoples' relationships with forests in Oceania have spiritual, cultural, economic and livelihood dimensions. All of these dimensions are captured in the phrase "land is life", used politically by contemporary Aboriginal Australians (Baker 1999), which typifies the terms in which indigenous peoples of the region explain the fundamental importance to their identity and wellbeing of their land and its resources (e.g. Siwatibau 2003). Oceania's indigenous peoples modified forests extensively, in a variety of ways – for example, by the use of fire and by hunting (e.g. Flannery 1994), and by deliberately manipulating the vegetation, as Kennedy and Clarke (2004) illustrate with extracts from earlier descriptions of the forests of the island of Tikopia in the Solomon Islands:

*rather than being "... heavily wooded with small and infrequent patches of cultivation in the neighbourhood of scattered villages ... the whole of Tikopia ... is in a high state of economic utilisation, …gardens are made right up in the mountain, and …what appears to be bush is really a collection of trees and shrubs, each having its own value to the people, either for its food or in their material arts"* (Firth 1936).

*… the "... terrestrial environment of Tikopia is virtually its agricultural system. Its forest-like canopy, from the shorelines to the ridges and summits of the volcanic massifs of the incomplete crater rim, acts as a camouflage of the high state of economic utilization"* (Kirch and Yen 1984).

Indigenous relationships with forests are dynamic as well as deeply rooted historically, and have adapted in various ways to the profound changes of the past few centuries following European contact. For example, particular trees and places retain their spiritual and cultural significance; "trees outside forests" remain at least as important, and often more so, for many livelihoods and environments than those in "natural" forests (Thaman 2002); in some countries, indigenous communities have gained significant economic benefits from engagement with modern plantation forestry (NZMAF 2001; Schirmer and Roche 2004). A wide range of non-wood forest products continues to be important for a diversity of uses (Thaman 2002; Siwatibau 2003). The interdependency of people and forests remains the common theme (Box 17.1).

All countries in the region with native forests of commercial value or standing on land deemed suitable for agriculture have experienced a phase, sometimes lengthy and in some cases still ongoing, in which these forests have been unsustainably exploited for timber production and conversion to other land uses. Australia and New Zealand have the longest history of such exploitation, and of progressively addressing it (e.g. Dargavel 1995; NZMAF 2001). Large-scale exploitation of the forests of the Pacific Island SIDS is more recent, but often dramatic, as Ward (1995) describes for the case of Western Samoa since 1978, where all accessible forests were exploited.

Forest harvesting for log export accelerated significantly in the 1990s in Papua New Guinea (PNG) and the Solomon Islands, as South East Asian timber companies exploited economic and political opportunities. Harvesting, primarily for log exports, continues to be a major source of national revenue and to have major environmental and social impacts (Hunt 1998; Dauvergne 2001). As Siwatibau (2003) notes:

*"high exploitation is driven by governments' desire to maximize employment, gross domestic product, revenue and export income; and by corrupt deals between individual landowner leaders and aggressive logging companies. Landowning communities are persuaded with promises of development. Most times, they are much worse off after logging than before."*

Each of the Oceanic nations has also sought to move to more sustainable forms of forest management, albeit in different ways and with varying degrees of success. These moves involve, variously, reservation of forests from harvesting, implementation of more sustainable harvesting practices in both native and planted forests, and greater consideration of the social and environmental issues associated with forestry activities. At one extreme, New Zealand ceased harvesting of public native forests and introduced greater controls over harvesting of private native forests (NZMAF 2001). Australia has established a much-expanded "comprehensive, adequate and representative" forest conservation reserve system, and introduced more rigorous controls over harvesting of the native forests that remain available for production (Australian Government 2003a).

Christian Cossalter

**The combined plantation forest area in Australia and New Zealand is approaching 4 million hectares. Large areas have been planted with eucalyptus species like *Eucalyptus tereticornis* and *Eucalyptus crebra* as here in Queensland, Autralia.**

For reasons discussed subsequently, the large scale reservation of forests from production and the control of forest practices have not been easy to achieve in the Oceanic SIDS; as well, harvesting levels and practices in the forest-rich nations of PNG and the Solomon Islands continue to be demonstrably unsustainable (Hunt 1998, 2001; Dauvergne 2001). However, countries in the region have committed to the implementation of the Code of Practice for Forest Harvesting in Asia-Pacific (APFC 2000). Vanuatu has resisted the scale and most of the adverse impacts of forest exploitation experienced in PNG and the Solomon Islands, principally by banning log exports, and forest production in Fiji has shifted principally to plantations (Brown 1997).

As plantation forests become more important in the region, there is growing emphasis on their sustainability in broader rather than narrower terms (e.g. Carnus et al. 2003; Kanowski 2003; Keenan et al. 2004; Salt et al. 2004). The incorporation and management of trees in farming systems and rural landscapes are now recognized as important elements of sustainability in Australia and NZ (Australian Government 2004a; NZ Landcare Trust 2004), as they have long been in other countries of the region (Thaman 2002).

## *Forests and People in Oceania's Sub-Regions*

***Australasia:*** Australia and New Zealand

Australia and New Zealand share comparable forest histories, albeit on different scales. Indigenous peoples – the Australian Aboriginals and Aotearoa Maori – had significant impacts on forests, through hunting wildlife and through their use of fire (e.g. Flannery 1994; Hill 2003; Whitehead et al. 2003). Maori reduced the area of forest in New Zealand by about a third prior to the arrival of Europeans, who cleared a further third (Roche 1990). In Australia, both Aboriginal and European use of fire altered the landscape pattern and structure of forests, and European settlers converted about a third of Australia's forests to other land uses (Australian Government 2003a).

In both countries, the initial reliance on native forests for wood products has been progressively supplanted by wood from plantation forests, which were first established in the late 19th century, and the area of which is now approaching 2 million ha in each country. This transition has been effected almost completely in New Zealand, where plantation forestry is among the nation's most important industries. While wood production from native forest remains significant in many Australian states, its absolute and relative magnitudes are diminishing

## BOX 17.1 Key Issues for People, Forests and Environment in the Pacific Island Countries

*Saisuri Bulai and Otheniel Tanganiau*

Pacific islanders have always had a very close attachment to their environments, including the sea, the land and the forests and trees. With knowledge accumulated over generations, Pacific islanders were able to arrive at and implement traditional systems of use and management of their natural resources that had served them well and which had ensured their sustainable well being.

Forests and trees and associated genetic resources have always provided timber, posts, thatch, food, fuel, medicines, traditional and cultural materials, soil and water protection, and shelter from the sun and rain – all crucial to the sustainable livelihoods of the largely rural Pacific island communities. However, increased population and the demand for economic growth, often coupled with unsustainable forest and tree use and harvesting practices, have resulted in serious depletion and degradation of the forest and tree resources in the Pacific islands. This gives rise to a situation of increasing demands being placed on a decreasing and degraded resource base. Consequently, Pacific island countries urgently need to consider ways and means for using and managing their remaining forest and tree resources on a sound, sustainable basis.

While much effort has been made at the international, regional and national levels, major challenges continue to confront Pacific island countries. The fundamental challenge faced by Pacific island countries is to use and manage their forest and tree resources sustainably, while at the same time continue to respond adequately to the demands for development and the social pressures exerted by their increasing populations.

Key issues confronting Pacific island countries in responding to this challenge include:

- Need for adequate policy and legal frameworks to properly support Pacific Island countries' activities towards the sustainable use and management of their forest and other tree resources.
- Need for political will, and for adequate national capacities (including better awareness), to effectively implement activities relating to the sustainable use and management of forest and tree resources.
- Need for effective participation of resource owners in the management of their forest and tree resources.
- Lack of land use policy and proper land use planning, and continuing unsustainable forest and tree harvesting practices.
- The higher cost of implementing sustainable forest management, which make it a financially less attractive land use option.
- Loss of both traditional knowledge and forest genetic resources.

as native forests are reserved for conservation, and plantation forests and production expand. In both countries, disagreements between the forest industry and conservation movement about both native and plantation forestry have also led to forest agreements of various forms and degrees of acceptance, e.g. Australia's Regional Forest Agreements (Australian Government 2003a, 2003b,) and New Zealand Forest Accord (NZMAF 2001). In both countries, there is now considerable focus on restoring trees to agricultural landscapes through both commercial and environmental plantings (NZMAF 2001; Australian Government 2003a).

***Melanesia:*** Fiji, New Caledonia, Papua New Guinea and West Papua, Solomon Islands and Vanuatu

In comparison to the countries of the Micronesian and Polynesian sub-regions, the Melanesian countries are large, geographically and ecologically varied, and extensively forested. They have high levels of biodiversity and endemism. The people of New Guinea's highland valleys may have been among the world's first agriculturalists (Flannery 1994), and highly developed agroforestry systems were developed and adapted throughout Melanesia (Kennedy and Clarke 2004). Agricultural cash crops – including plantation crops, initially of coconut, coffee and sugar, and more recently of oil palm – have assumed increasing importance, displacing traditional tree-crop systems.

While sandalwood has been a significant export product from Vanuatu for more than a century (Brown 1997), the forests of Melanesian countries have been heavily exploited for commercial wood production since the end of World War 2, and especially since the 1980s. The levels, scales and impacts of exploitation have been greatest in PNG and the Solomon Islands (Filer and Sekhran 1998; Dauvergne 2001). Vanuatu's forests generally have less commercial value than those of its northern neighbours, and the country curtailed the worst impacts of large-scale harvesting by progressively introducing log export bans in the mid-1980s. Impacts on native forests have been significant in Fiji, but on a smaller scale; Fiji's forestry sector is now based primarily on 100 000 ha of plantations, and there are smaller areas of plantations in other Melanesian countries (Table 1). Contemporary issues for forests and people in the island of New Guinea are outlined in Box 17.2.

***Micronesia:*** Federated States of Micronesia, Guam, Marshall Islands, Nauru, Northern Mariana Islands and Belau

Countries of the Micronesian sub-region can be characterized as groups of small islands, often only raised atolls or low-lying islands, and usually with very large sea boundaries. Customary land tenure and land use systems (Box 17.4) prevail to varying

## BOX 17.2 Forests, Society and Environment in the Island of New Guinea

*Martin Golman, Ruth Turia and Hidayat Alhamid*

### *Introduction*

There are about 69 million hectares of forests in New Guinea (includes the Independent State of Papua New Guinea, PNG and West Papua, WP, a province of Indonesia) – 36 million ha in Papua New Guinea (PNG Forest Authority 1996) and 33 million ha in West Papua (Matthews 2002). These forests house the largest remaining block of tropical forests in the Asia Pacific region and the third largest in the world after the Amazon and Congo Basins. Divided between Papua New Guinea and West Papua, these extensive tracts of rainforest are biologically among the richest on earth containing an estimated 16 000 species of flowering plants and, among other things, the most extensive and diverse mangroves in the world (Paijmans 1976). They are home to almost all of the world's bird of paradise species and tree kangaroos and include exemplary remnants of the most ancient pines, flowering plants and animals of the super-continent of Gondwanaland. New Guinea's forests contain commercial genera including *Anisoptera, Calophylum, Instia, Flindersia, Pometia, Palaquim* and *Hopea* in the lowlands; *Araucraria, Agathis* and *Castanopsis* on the foothills and in the submontane areas; and *Nothofagus* and *Libocedrus* in the higher montane forests (Hammermaster and Saunders 1995; Johns 1997).

In addition to economic and ecological benefits from the forests, the indigenous peoples of New Guinea have their own uses of the forests, and it is seen as an asset, not so much in terms of monetary value but with high social and spiritual value (van Helden 2001), to meet their specific needs. The use of forests is based on traditional knowledge and technology passed on from one generation to the next. However, traditional use has changed and is changing due to global economic pressures where the state, logging companies, and development agencies see advantages in exploiting the forests for economic development.

### *Ownership of Forests*

The distinguishing feature of forest and forest management in New Guinea is that rights to land and to the forest resource itself are owned by customary groups and not the State. The State has the constitutional and legal mandate to access the forest to practice forest management. In PNG, the State had to gain access through agreements with the customary owners. Agreements are made between the State and the customary owners of the land and the forest to allow the government to have access to the forest; the forest resource is then allocated to a timber developer for a particular period for utilization and some form of forest management under government supervision. (See also Box 17.4)

WP has undergone two different phases in access to forest resources. In the first phase, during the Suharto regime (1965–1999), the state claimed full access to the forest and exploited it under a system called HPH (Hak Pengusahaan Hutan / Forestry Concession Rights). In the second phase, under the present regime of "Special Autonomy" (Otsus), community cooperatives (Kopermas) formed by customary owners are allowed to negotiate directly with timber companies to log the forest on the land that they claim as theirs under *adat* (customary rights regimes).

### *Forestry Development*

Since the 1980s, the major emphasis of the policies of both states has been to increase the volume of log exports, to boost the economy of their respective countries and, particularly for WP, to increase harvesting of NTFPs to alleviate poverty. This increase in forestry activities, combined with lack of management resources or political will on the part of the State, saw the forest industry become "out of control" in PNG (Barnett 1989) and in effect in WP (Alhamid 2004). In WP, Otsus and other administrative changes have led to a substantial increase in illegal logging. Illegal timber harvesting in WP is estimated to yield 600 000 $m^3$ per month, nearly three times legal production (Bisnis Indonesia 2003).

The Barnett Inquiry of 1989 prompted major reform in the forest sector in PNG in the early 1990s, both in Forest Policy (PNG 1991) and Forest Legislation (PNG 1993 and subsequent amendments). Both the policy and legislation emphasized sustainable forest management principles, effective participation and benefits to landowners, and effective monitoring of forestry

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degrees. Population densities are usually relatively high, and forest and tree resources limited (Table 1). Most Micronesian countries have limited economies and some association, whether formal or not, with the United States of America, on which they are also dependent to varying degrees for financial assistance. The exception is Nauru, which has a comparable relationship with Australia.

The typically small size of islands, poor atoll soils and low rainfall on some, and population and land use pressures on most, limit the extent of subsistence gardening, and preclude commercial land use activities other than small-scale cropping. Nevertheless, sophisticated agroforestry systems have been developed; the coconut palm is ubiquitous and important in many of these systems, both in its own right and as a shelter for the development of other species such as bananas, breadfruit, nuts and pandanus (Brown 1997; Thaman 2002). Cultivation of trees near villages and in house yards, and the protection and extension of strand vegetation, are important, and there are a wide range of husbandry practices including deliberate planting of seeds and propagules, transplanting of draft and self-sown plants, and mulching and protection (Thaman 2002). Many of these trees have multiple uses, averaging 11 per species, with a maximum reported of 121, for coconut (Thaman 2002).

***Polynesia:*** American Samoa, Cook Islands, French Polynesia, Kiribati, Niue, Tokelau, Tonga, Tuvalu, Wallis and Futuna and Western Samoa

The geography, population and forest characteristics of the countries of the Polynesian sub-region are generally similar to those of the Micronesian countries described above. Similarly, customary land tenure and use systems prevail (Box 17.3). Domestic economies are typically small, although tourism is

operations. The unstable political situation prevailing in WP has not allowed Otsus policy to become fully implemented, and Presidential Decree No. 1/2003, which divides WP Province into three new provinces, will potentially increase the pressure on natural resources.

*Current Concerns*

None of the three objectives of the forest sector reforms in PNG are being fully realised (Independent Forestry Review Team 2001). In WP, as a result of both the activities of the cooperatives (Kopermas) and illegal logging, more customary land is being harvested unsustainably and converted to other uses, with no regard for long-term forest management. Moreover, local welfare is being diminished rather than increased by forestry activities in West Papua, with significant social problems such as increased rates of HIV/AIDS (Aditjondro 2002), and physical confrontations associated with persistent conflict between local communities and logging companies and government agencies (Inside Indonesia 1992; Down to Earth 2002).

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significant for some islands, and there is increased dependency on imports. Significant proportions of each country's population live in diaspora, with those remaining at home dependent on regular remittances from abroad.

Traditional land use systems prevail to varying degrees, as described for Micronesia. Deforestation and the related phenomenon of "agro-deforestation" (Thaman 2002), driven mostly by the expansion of cash crops but in a few cases (e.g. Western Samoa) by logging, have severely impacted on the forests and trees of some islands, with many adverse environmental impacts (Brown 1997). Home and subsistence garden plantings of selected indigenous and exotic trees, shrubs and other plants continue to be significant for a variety of uses – e.g. coconuts, kava, fibre and bark species, perfumery and medicinal plants and ornamentals (Thaman 2002; Tilling and Holzknecht 2001).

## 17.3 Key Issues for Forests, People and Environment in Oceania

A number of common themes emerge as key issues for forests, people and environment across Oceania. Each of these is reviewed below.

### *Biodiversity, Species Extinction and Threatened Ecosystems*

The Oceanic islands and the Australian continent have high levels of endemic biodiversity, reflecting their evolutionary and geographic isolation, and a rich diversity of habitats. Endemism rates of 80% are common (SPREP 2003a). Oceanic countries also have the world's highest rates of recent and predicted species extinction or endangerment, a consequence of exploitation, habitat loss, the introduction of invasive animal and plant species, and land use and land management change (NZ Ministry for the Environ-

Markku Kanninen

**Melanesian countries have high levels of biodiversity and endemism, which continue to be threatened by the unsustainable harvesting levels and practices especially in PNG and the Solomon Islands.**

Markku Kanninen

**Coastal and mangrove forest have received belated attention as forest ecosystems of particular importance in the island environments and economies of the region.**

## BOX 17.3 Sustainable Management of Maori-Owned Forests

*Robert Miller*

Before Maori arrived in New Zealand (NZ) around 1200 AD, forest covered an estimated 75% of the country. Maori forest clearance had reduced forest cover to 50% by the time European colonization started in the late 1700s (Roche 1990). These settlers contributed to further deforestation, mainly by clearing forest for agriculture, so that New Zealand's indigenous forest cover is now 23% (6.4 million ha), with another 6% in exotic plantations (NZMAF 2001).

Maori's spiritual connections to the forests (through Tane mahuta, god of the forests and birds) is as strong as their connections to the earth (Papa tua nuku, the Earth Mother), to the sky (Ranginui, the sky father) and to the rivers, lakes and sea (Tangaroa, god of the sea). The majority (77%) of NZ's remaining indigenous forest cover is in national parks and conservation forests owned by the state. About 1.4 million ha of forest is in private ownership; Maori own 31% of this, mostly in the North Island.

Concerns with overuse and clearance of NZ's forests in the 1970s and 1980s led government to decide to end all harvesting of indigenous forests on public land by 2002, and to the introduction, under the 1993 Forests Act, of sustainable forest management regulations for all privately owned native forests. These regulations require managed harvesting of forests to ensure that forest growth is replaced, and that the forest's structure and ecosystems are disrupted as little as possible and its natural values maintained. Forest owners may apply for either an SFM Plan (registered against the land title for 50 years) or for a more limited SFM Permit.

NZ indigenous forests are dominated by softwoods such as kauri (*Agathis australis*) and rimu (*Dacrydium cupressinum*), and hardwoods such as the southern beeches (*Nothofagus* species) and tawa (*Beilschmiedia tawa*). The softwoods have long been sought for shipbuilding, house construction and furniture, so that the available volumes are now quite limited. In the future, NZ beeches will be the main source of native timbers. All the main commercial species are well represented in Maori-owned forests, and are being harvested and utilised. Maori-owned forests tend to be owned by trusts, each often representing many hundreds of families (e.g. in one clan or tribe). To date, 36 Maori owners have taken up either SFM Plans or Permits, totalling 34 000 ha. The estimated potential area of Maori forest land suitable for growing timber is around 150 000 ha.

Mechanisms for involving Maori in the sustainable management of forests include:

- Option 1: Assign cutting rights to a contractor, with the payment of stumpage or royalty to owners. This is the preferred mechanism at present; it offers the least risk but probably also the lowest returns, and may not offer employment opportunities.
- Option 2: Joint venture with a processor.
- Option 3: Full participation in forest management and downstream processing.

A significant challenge, which the Maori are seeking to address, is increasing their level of participation in forest management and processing. Although the principal focus of SFM, and the reason for its introduction into the Forest Act, has been to regulate timber harvesting, the concept goes much further than just timber. Sustainable forest management offers additional opportunities for Maori including:

- management for environmental services, such as carbon credits;
- management for a range of other products, including honey, sphagnum moss, and natural pharmaceuticals (e.g. tea tree oil);
- development of other industries based on forests (e.g. eco-tourism).

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ment 1997; United Nations 2000; NLWRA 2002; SPREP 2003a,b). The extent of many ecosystems has been severely reduced, and the integrity and persistence of others threatened.

Recognition of the magnitude of these losses and threats has prompted a much stronger focus on conservation in the past few decades, including the establishment of national parks in Australia and New Zealand, the initiation of various forms of conservation partnerships between governments or conservation NGOs and landowners, the establishment of national and regional conservation networks, specific species and habitat recovery projects, and a focus on more sustainable forms of forest management (NZ Ministry for the Environment 1997; United Nations 2000; Australian Government 2002a; SPREP 2003a,b). In some cases, these responses may arrest species and ecosystem decline; in others, the processes of land use and environmental change, population fragmentation and reduction, and the impacts of exotic organisms mean that subsequent waves of extinction or depauperation are inevitable (e.g. Australia Terrestrial Biodiversity Assessment 2002).

## Conservation and Sustainable Management of Native Forests

Because of the threats to biodiversity described above, conserving representative areas of native forest from exploitation – as part of a landscape-scale approach to biodiversity conservation and maintenance of ecosystem function – has become a shared concern across the region; additionally, coastal and mangrove forests have received belated attention as forest ecosystems of particular importance in the island environments and economies of the region (Siwatibau 2003). The rise of environmental movements in both Australia and New Zealand over the past two decades has been reflected in forest policies, which progressively reserved native forests from wood pro-

duction (Dargavel 1995; Perley 2003). In the New Zealand case, all harvesting from public forests ceased in 2002 (Box 17.3; NZMAF 2001); in Australia, a "comprehensive, adequate and representative" forest conservation reserve system was established in regions with significant areas of commercial native forest (Dargavel et al. 2000; Australian Government 2003b); in some regions, state governments decided that wood production from public forests should be significantly reduced immediately or is be phased over an extended period.

The classical North American "national park" model, of establishing "protected areas" from which people are excluded other than as visitors, is not at all suited to Oceania, where landscapes reflect the outcomes of human interventions over millennia (Thaman 2002; Kennedy and Clarke 2004), and where customary land tenure systems have been retained and landowners' opportunities for economic development are limited (United Nations 2000). Even in Australia and New Zealand, which have implemented conventional "protected area" models of conservation, there is belated recognition of both the moral and practical imperatives for more collaborative management arrangements with indigenous peoples (Baker et al. 2001; NZ Ministry for Environment 2004). Consequently, conservation initiatives in Oceanic SIDS have focused on community-based approaches "which generate income from natural resources without destroying them" (United Nations 2000), and have thus sought to use mechanisms such as Integrated Conservation and Development Projects, conservation trust funds, and conservation covenants to facilitate integrated conservation and development outcomes which continue, at least in part, traditional forms of land use (e.g. Hunt 1998; Tacconi 2000; Siwatibau 2003).

Although the interpretation of sustainable forest management outside conservation forests varies between countries, and SFM remains more aspirational than operational in those with log export-dominated forest economies, the issue of SFM is strongly on the agenda in all Oceanic countries (e.g. SPC 2000, 2003). It is not only the adverse environmental impacts of unsustainable forest harvesting practices that are of concern, but also the adverse social impacts often associated with large-scale timber harvesting. These include increased levels of conflict within communities, about resource rights and the distribution and use of income from their sale, and between communities, logging companies and government agencies (Filer and Sekhran 1998; Fry 2000). These conflicts are particularly acute in the Melanesian countries, where there are strong commercial pressures for large-scale forest exploitation (Box 17.2; Siwatibau 2003). There are also serious pressures on valuable non-industrial forest species such as eaglewood (Gunn et al. 2004) and sandalwood (Channel and Thomson 1999), which similarly demonstrate the difficulties of sustaining these species in the face of strong market demand and the absence of effective conservation and management strategies.

Achieving more sustainable forest management outcomes – defined by both higher levels of community acceptance and better environmental outcomes – has proven politically, socially and operationally challenging in all Oceanic nations. It has been the focus of substantial public investment in Australia, most recently through the Regional Forest Agreement process, which sought to continue public native forest management for wood production as well as for other forest values (e.g. Dargavel et al. 2000; Australian Government 2003b). In contrast, harvesting of native forests in New Zealand is now restricted to privately and Maori owned forests (Box 17.3; NZMAF 2001). In all Oceanic countries, the focus on sustainable forest management has broadened to include all tenures and forms of forest and forestry.

### *Trees Outside Forests and Planted Forests*

Thaman (2002) argues that: "for many of the SIDS of the Pacific, trees outside forests constitute, perhaps, the single greatest foundation for the life and health of our islands, soils, rivers, beaches, coastlines, people and the other plants and animals on which we depend".

Across Oceania, there is now a renewed emphasis on the economic role of trees outside forests, as well as on their environmental benefits (see also Tilling and Holzknecht 2001). Various agroforestry systems (summarised by Thaman 2002) are well established in Oceanic SIDS, and commercial farm forestry is now well developed in some regions of Australia and New Zealand (e.g. NZMAF 2001; Australian Government 2003c).

In Australia, where environmental degradation associated with dryland salinity already threatens agricultural production across almost 7 million ha, an area expected to nearly treble by 2050, some innovative large-scale tree crop systems, such as Western Australia's oil mallee alleys (Oil Mallee Company 2004), have been developed to address both commercial and environmental goals (e.g. CSIRO et al. 2001). However, public policy and institutional arrangements in Australia and New Zealand are only belatedly recognising the situation for the Oceanic SIDS; this is reflected in Kennedy and Clark's (2004) characterisation of Pacific islands landscapes, and described by Thaman (2002):

*"In traditional Pacific Islands societies, activities such as forestry, agriculture, home economics, medicine and industry were not compartmentalised into economic sectors or 'departments' as they are in modern development. Rather, they were integral components of agroforestry systems tailored, over time, to the environmental and societal needs of each island ecosystem".*

## BOX 17.4 Customary Resource Tenure and Use Systems in Oceania

*Hartmut Holzknecht*

Many customary resource tenure and use systems continue to be entrenched and functionally active throughout Oceania. They are defined and constrained by the kinship and inheritance patterns operating in each particular Oceanic society. The most common is the patrilineal system through which permanent resource rights across a number of fields are inherited and passed down the male line. The proportion of matrilineal systems increases towards southern Oceania, where natural resource rights are passed down the female line (though males in each generation still manage the associated resources on a day-to-day basis). Some tenure systems combine elements of these two. Chiefly and strongly hierarchical systems are relatively few in the northern part of Oceania and increase towards the south of the region.

Some common characteristics of the tenure systems are:

- Tenure systems are essentially based on privatised resource ownership and use systems, which function according to established societal principles.
- A wide range of rights (inheritance, use, access, control) are vested in customary groups and individuals within them. These groups are kin-based according to local customs. Final decisions regarding land and other resources can be made at different levels of the group; for example, in Melanesia, these decisions are usually made at the clan level, but in some cases also at the sub-clan or extended lineage level.
- Membership in a customary group is inherited at birth and is confirmed by self and mutual recognition. Permanent rights holders can invite in temporary users (e.g. to make a garden together), but this does not give residual rights to temporary users.
- The right to use land for a specific purpose (e.g. new subsistence garden) is based on agreement with group elders and usually lasts for one growing season.
- Different rights may apply to the same parcel of land; for example, ownership and inheritance rights, temporary gardening rights, right to build a house, rights over economic trees, fishing rights, hunting rights, etc. The rights may also be held communally, constituting a common property. Since a range of tenure and use rules apply, resources are not under open access.
- Rights to economic trees (e.g. coconuts, nut trees, pandanus, etc.), usually planted and maintained by an individual, are held by that individual and may be transferred to any other individual (but usually a family member).
- These tenure systems are dynamic; to a large extent they have been very resilient and have coped with significant pressures and changes (e.g. high rates of population increase and planting of perennial tree crops, such as coconuts, coffee and cocoa).

Modern developments across Oceania, particularly in Melanesia, continue to place great strain on customary tenure systems, especially where logging of large areas is associated with corruption and manipulation. The active presence of emerging Melanesian elites in each country has resulted in promises of economic advancement that remain mere promises for the vast majority of customary resource rights-holders, with only a very small proportion of individuals gaining significant material benefits from exploitative activities. In addition, there are avenues by which certain individuals register areas of land in their own names, to the detriment of their fellow group members who have also held rights to those resources and have benefited from activities on those areas.

Nevertheless, Oceania's peoples have repeatedly shown that they wish to retain customary tenure systems, and as regional conservation initiatives discovered, public policy about natural resource conservation and use in Oceania needs to work with, rather than against, these customary systems (United Nations 2000).

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Thaman (2002) argues that understanding this history, and the land use systems it fostered, provide the best foundation for addressing the deforestation and agro-deforestation experienced in Oceanic SIDS as a consequence of increased population densities, and of commercial agriculture and forestry. Given the persistence of dual economies in most Oceanic nations, and the continuing reliance of many people in the region on their forest or forestland for subsistence (Siwatibau, 2003), achieving sustainable forest management across the whole landscape is both a priority and a significant challenge (Wilkie et al. 2002).

The coconut palm is the archetypal plantation tree of the Pacific, with some 121 reported uses, including biofuel (Harries 2001; Thaman 2002). In Australia and New Zealand, industrial plantation forestry has become one of the defining features of forest policy, forestry practice, and the forest-based industries over the past century (NZMAF 2001; Keenan et al. 2004). Public policy has strongly supported the expansion of plantation forests and private sector interest in them (Schirmer and Kanowski 2004; Schirmer and Roche 2004); forest plantation areas in each country are now approaching 2 million ha, and support significant processing industries, which supply the majority of domestic forest products and generate substantial export income from both processed and unprocessed products. Smaller-scale forest plantation programs have been successful in some Oceanic SIDS, notably Fiji, and to a lesser extent in PNG, the Solomon Islands, and Vanuatu (Brown 1997).

## BOX 17.5 Australia's Indigenous Peoples and Forests

*Sue Feary*

Australia is one of the most prosperous countries in Oceania, yet its indigenous peoples are some of the most disadvantaged in the world. In 1788 the British began a legacy of dispossession and cultural denial, from which indigenous people have not fully recovered. The Australian High Court recognised native title in the landmark Mabo case in 1992; this was a significant step in the healing process (McGlade 2003). An understanding by the wider Australian population of the spiritual association that Indigenous people have with their traditional lands, and the nature of its application in contemporary society, is a critical component of the processes of self-determination and reconciliation (Young 1995; Rose 1996).

Australia was perhaps the first Oceanic country to be peopled and, from at least 40 000 years ago, indigenous communities have exploited aquatic and terrestrial ecosystems as part of a seasonal round of socio-economic activities (Mulvaney and Kamminga 1999). Sustainable use of resources was determined through an intimate knowledge of the natural world, encapsulated within complex religious and kinship systems (Berndt and Berndt 1977; Baker 1993). Apart from the desert peoples, forest resources were significant in this hunter-gatherer economy, providing plant and animal foods, medicines, and raw materials for shelter and tools (Feary 1988). " Fire stick" farming was used to increase production e.g. green pick for macropods (Jones 1969), although the impact of fire on vegetation has long been contested (Horton 1982; Hill 2003). Forested landscapes such as mountains were and still are spiritual places of immense significance, and Aboriginal people have fought hard for their protection (see Egloff 1979; Feary and Borschmann 1999).

Traditional use of forest has all but disappeared; indigenous people retain and renew their knowledge base through elders teaching younger generations about " bush tucker" and " bush medicine" (Baker 1999). Bush tucker is a growth industry, both as a tourist attraction (ATSIC and DPIE 1997) and in agroforestry (Bristow et al. 2003), and brings significant revenue to some communities, demonstrating the capacity of indigenous communities to mould traditional practices to benefit from contemporary capitalist economies.

Timber harvesting was not a traditional practice, but Aboriginal people have been involved in the timber industry in Australia since the Europeans arrived. There are few written records, but a wealth of oral history testifies to forest industries' being a significant employer of Aboriginal men (Feary 1988). Also, there was some surprise when the Aboriginal community as a whole did not side with the conservationists during the logging debates of the 1980s; many Aboriginal people felt a loyalty to the industry and were reluctant to participate in opposing it (Thompson 1985).

Indigenous involvement in forestry is currently very low in Australia (BDO 2004). Most state government forestry agencies employ some indigenous people, but there is virtually no engagement with the private sector. In an effort to redress this, the Australian government decided in 2003 to develop a National Indigenous Forestry Strategy (NIFS) (Australian Government 2004). A reduction in harvesting native forests as a result of Regional Forest Agreements, combined with the government's policy for plantation expansion, seemed to be an opportunity for indigenous people to set up joint ventures with the private sector. There are potential benefits for both parties, especially if industry could, under acceptable arrangements, access part of the 18% of Australia's landmass and 13% of forestland, now under indigenous ownership, to grow trees.

A consultation process with Aboriginal communities across Australia in connection with NIFS produced varied responses. An urgent need for initial capacity-building was identified nationally. Also universal was the desire to combine commercial tree growing with other enterprises that had more of a land nurturing quality, such as establishing nurseries and re-vegetation of degraded lands.

The outcomes of this consultation process suggest that indigenous communities' desire to be involved in timber harvesting is inversely related to the degree of retention of traditional lands and knowledge. For example, the people of the Tiwi Islands, near Darwin, have entered into a joint venture with a large company to cultivate a fast growing species of Acacia to produce woodchips (BDO 2004). At the other end of the scale, the Tasmanian Aboriginal people, who have arguably suffered the greatest loss of their culture, have expressed reluctance to be involved in any partnership that would potentially lead to further destruction of their cultural heritage in timber production forests.

For the NIFS to be successful, its implementation must recognize and take into account many powerful forces: an historical legacy leading to indigenous social and economic disadvantage; a distrust and cynicism about government programs; governance and kinship obligations in indigenous communities and, above all, a need to meet environmental, social and cultural – as well as economic – objectives.

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Oil palm plantations are expanding in PNG and the Solomon Islands, typically on sites from which natural forest has been harvested; while these estates may eventually be considered forest resources, they are currently considered their antithesis, largely because their establishment is causing the loss of natural forest.

## Retention or Restoration of Customary Resource Rights

The constitutional protection of traditional ownership of land and forests throughout the Oceanic SIDS is a defining and distinctive feature of the region (Box 17.4); in Australia and New Zealand, these rights are being progressively restored to indigenous peoples after periods of denial or diminution (Boxes 17.3 and 17.5). Customary tenure has been perceived as both an asset and a liability from the perspectives of both forest-based development and forest conservation (Brown 1997). In practice, the presence of many landowners, with disparate interests and often poorly defined claims to specific resources, has provided both opportunities for and constraints to forest exploitation and conservation (Box 17.4; Brown 1997; Filer and Sekhran 1998). Given the severely disadvantaged economic circumstances of most traditional landowners in most Oceanic nations, developing institutional arrangements that provide economic opportunities without prejudicing other forest values is a regional imperative and the focus

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of considerable attention (e.g. Hunt 1998, 2001; Tacconi 2000). As is already the case in many Oceanic nations (e.g. Filer and Sekhran 1998; United Nations 2000), non-government and community-based organisations are likely to have a particularly important role in achieving this goal.

As Box 17.4 notes, land tenure in the Pacific is dynamic; de facto individual ownership is becoming more common with the expansion of cash cropping. A number of development theorists and institutions (e.g. Hughes 2004) have suggested that these customary tenure systems represent significant obstacles to development, and have advocated instead the creation of individual title as the basis for economic development in the Oceanic SIDS. However, there seems little support for, and substantial opposition to, this option within countries of the region.

In Australia and New Zealand, where ownership rights have been progressively restored to traditional owners, indigenous peoples have a strong interest in deriving economic as well as non-material benefits from their forests (Box 17.3 and Box 17.5; Hammond 2001; Whitehead et al. 2003; Australian Government 2004b; Schirmer and Roche 2004). Mechanisms for giving effect to this intent are better developed in New Zealand than in Australia, but in both countries, indigenous peoples are benefiting from products of both native and planted forests. In at least some regions of Australia, the most valuable forest products may be those supporting traditional arts and crafts rather than more industrially oriented wood production (Altman 2001; Australian Government 2004b).

## *Emerging Markets*

The emergence of markets for the environmental services provided by forests offers some opportunities for Oceanic nations, though most have yet to be realised (see Landell-Mills and Porras 2002 for a global review; Wilkie et al. 2002 for discussion in the context of SIDS). Biodiversity conservation, catchment services, carbon sequestration and ecotourism are considered the best prospects, and there have been at least pilot scale projects seeking to develop each of these possibilities (e.g. Hunt 1998; CSIRO et al. 2001; Wilkie et al. 2002; NZ Climate Change Office 2004a). As for all market mechanisms, differences in the value ascribed to the environmental service by the resource owners and the prospective purchasers limit the extent to which owners' choices can be influenced. Hunt (1998) describes this in the particular case of some Oceanic biodiversity conservation projects, and Landell-Mills and Porras (2002) discuss these issues more generally. However, well-designed market mechanisms can be effective in helping achieve public good outcomes: examples from the region include the Australian state of Victoria's "Bush Tender" scheme, which uses a tendering process for financing biodiversity conservation priorities on private land (DSE 2004), and the conservation lease arrangements which support Vanuatu's Erramango Kauri Protected Area (Tacconi 2000).

There are a number of constraints to the establishment of environmental services markets within the region. In the Oceanic SIDS, difficulties in securing

## BOX 17.6 South Pacific Regional Initiative on Forest Genetic Resources (SPRIG)

*Lex Thomson*

For Pacific Island peoples, forest genetic resources constitute a capital inheritance that, until recent times, was passed on relatively intact or in some cases enhanced from one generation to the next. Together with other plant and animal genetic resources, forest genetic resources are the "capital" needed for development and maintenance of rural Pacific Island communities, and upon which most cash and other forms of income are based. However, forest genetic resources, one of the essential elements for sustainable rural development in the Pacific Islands, are being steadily eroded through population pressure and land use change leading to loss of forests, poor logging practices, climate change, and invasive species.

SPRIG, an Australian Government-supported development assistance project, aims to strengthen conservation, management and utilization of forest genetic resources in the Pacific Islands, including Cook Islands, Fiji, Kiribati, Niue, Samoa, Solomon Islands, Tonga and Vanuatu. The project has:

¤ acted as a catalyst in raising awareness of the importance of conserving forest genetic resources and of the opportunities for their better utilization and development;
¤ provided training to Forestry Department counterparts in subject areas relevant to the management of forest genetic resources;
¤ planned for conservation and sustainable utilization of priority tree species;
¤ initiated research and development activities on key tree species leading to identification and production of superior tree germplasm; and
¤ enabled deployment of superior and more diverse forest genetic resources in rural development and tree planting programs.

SPRIG has adapted simple tree domestication processes, developed for Australian trees, to important Pacific species. Notable examples include whitewood (*Endospermum medullosum*) and sea almond (*Terminalia catappa*). Rapid growth and flowering/fruiting at a young age makes both species ideal model candidates for such work, and substantial gains are being evidenced in these and other priority tree species, such as Canarium nuts, sandalwoods (*Santalum spp.*) and mahogany (*Swietenia*).

long-term rights over trees growing on customary land and the limited areas available for tree planting in the smaller states mitigate against investment under the flexibility mechanisms of the Kyoto Protocol to the Framework Convention on Climate Change (Kanowski and Wasson 2001). Australia, which could be in a position to benefit substantially from investment in planted forests for carbon sequestration (CSIRO et al 2001; Kanowski and Wasson 2001), has yet to ratify the Kyoto Protocol, thus limiting such investments to showcase levels. While an Australian market for freshwater allocation has been established (Murray-Darling Basin Commission 2004), policy settings remain inconsistent in their treatment of forests; for example, there are proposals to tax water use by trees differently from that by other crops (Keenan et al. 2004), but no mechanism to recognise the catchment services provided by forests.

### *Global Climate Change*

The low-lying Oceanic SIDS are amongst those nations most vulnerable to and threatened by global climate change, with both sea level rise and increased frequency and intensity of predicted extreme climatic events, and with no control over the underlying causes of these threats (Wilkie 2002). Significant changes, with considerable impacts for forest conservation and production, are also expected in the larger Oceanic nations (Australian Government 2002b; Hay et al. 2003; NZ Climate Change Office 2004b).

The implications for the people of the low-lying Oceanic SIDS are potentially drastic, and exacerbated by limited adaptation and mitigation options; as Wilkie (2002) notes, resettlement or migration of part or even entire populations may be necessary for some islands and states. The implications for forests are also profound, with likely enhanced saltwater intrusion in the coastal zones of islands, altered rainfall and storm patterns, and perhaps a greater fire frequency; impacts on biodiversity are expected to be substantial, with higher levels of disturbance likely to favour exotic invasive species (Wilkie 2002). It is for these reasons that the Oceanic SIDS in particular are so concerned about the potential consequences of global climate change.

### *Institutional Capacity*

Institutional capacity relevant to forest conservation and sustainable forest management remains a severe constraint throughout Oceania. It is particularly acute in many Oceanic SIDS, in which limited human and financial resources constrain capacity development. Regional networks and partnerships have been fostered as means of addressing this situation (e.g. Box 17.6; Bulai 2002; SPREP 2003c). Institutional capacity for forest governance has been particularly challenged in the Melanesian states with high levels of export log harvesting. The people and forests of both PNG and the Solomon Islands have suffered significantly from the corrupted forest governance regimes (Filer and Sekhran 1998; Hunt 1998; Dauvergne 2001).

In the larger, advanced economies of Australia and New Zealand, prevailing political philosophies

since the 1980s have favoured substantial reductions in public sector expenditure in the forest sector. In general, this has led to the privatisation or corporatisation of public forestry agencies and reduced attention to non-commercial functions, such as recreational provision and research (e.g. Schirmer and Kanowski 2004; Schirmer and Roche 2004).

## 17.4 Paradigm Shifts Concerning Forests in Oceania

Paradigm shifts in two areas concerning forests are dominant in Oceania: sustainable forest management, and rights and interests in forests, both with a number of dimensions. There are also shifts in paradigms of governance and capacity. Seen in a wider historical context these paradigm shifts, now evident in the relationships between societies and forests in Oceania, might be better described as the progression between phases in a cycle, rather than as a linear shift. Each of these themes reflects underlying societal issues, principally the values accorded to forests, their relative importance amongst economic development opportunities, and the basis of resource rights and decision processes about natural resources.

Different countries in the region are at different stages of these paradigm shifts, which themselves interact, creating a complex policy dynamic within any one country and across the region. The principal common elements and implications are discussed below.

### *Sustainable Forest Management*

The sustainable forest management paradigm emerging in Oceania has, as elsewhere, three principal elements: how forests are sustained on a landscape scale; how extractive uses of forests are managed; and how decisions about these issues are made and implemented. The first two of these elements are discussed in this section, and the third in the subsequent section.

#### *Sustaining Forests on a Landscape Scale*

A focus on landscape-scale forest management recognises the contributions of all forms of trees in the landscape in sustaining forest and environmental values within a wider spatial and temporal context. Landscape-scale forest management recognises the importance of forest pattern, composition and structure in the enhancement and maintenance of ecological processes, and recognises the reality of social and economic processes as embedded within functioning landscapes. Landscape-scale forest management includes and emphasizes the roles of trees outside forests, including those in planted forests, and the roles of forests managed for production as well as those managed for conservation, in the achievement of sustainable forest management goals (see Kanowski 2001; Kanowski et al. 1999). The renewed focus on this paradigm (e.g. CIFOR 2004; Dudley and Pollard in press) can be seen as a contemporary reinterpretation of roles and values of forests and trees in traditional land use systems in the Oceanic islands (Thaman 2002; Kennedy and Clarke 2004).

The renewed focus on the landscape scale redresses the narrower scope, where certain environmental, social and economic forest values were marginalised, which had been adopted by many forestry organizations during much of the 20th century. During the first part of the century, this narrower approach was limited principally to only those elements within the forested landscape of value for industrial wood production; progressively, the focus broadened to include those ecological elements valued for biodiversity conservation, and subsequently to other forms of trees and forests. This narrow utilitarian paradigm was paralleled in agriculture by a focus on intensification and increased production, which diminished the roles of trees in agricultural systems. Over the past few decades, this narrow focus within agriculture has also evolved to include a wider set of socio-ecological values with the emergence of sustainable agriculture as a critical part of sustainable land use (e.g. Vanclay and Lawrence 1995; Thaman 2002).

Increasing pressure on water resources throughout much of Oceania has also focused attention on the significance of trees and forests in catchments (e.g. Carpenter and Lawedrau 2002; Keenan et al. 2004). Consequently, throughout the region, there is a growing policy emphasis on sustaining and enhancing the roles and multiple functions of trees and forests in all parts of the landscape, for ecological values (e.g. biodiversity, dispersal and reproduction processes, etc.), social values (e.g. aesthetics and recreation) and environmental services (e.g. water purification, soil conservation, flood mitigation, etc.), as well as for commercial products.

In general, these policies are predicated on recognition and realisation of the actual or potential economic values of trees in farming and land use systems, including their value for providing ecosystem services and maintaining the environmental base upon which economic land management depends. This policy focus acknowledges that, while non-monetary motivations for maintaining or restoring trees and forests are important for particular landowners, particular values, and particular places, economic returns are a fundamental requirement for landscape-scale enhancement of the contributions of trees and forests to sustainable natural resource management. Therefore, there has been renewed emphasis on farming systems, which harness the commercial potential of both traditional and novel

forms of tree growing, and a high level of interest in the potential of environmental services markets to deliver some financial benefits to tree growers and forest owners (e.g. CSIRO et al. 2001). Similarly, both in policy and in practice, the importance of other traditional land management practices, such as the burning regimes of Aboriginal Australians, to sustainable natural resource management are beginning to be recognised (e.g. Whitehead et al. 2003). The evident unsustainability of many of the 20th century land use practices and their environmental legacies (Brown 1997; NZ Ministry for the Environment 1997; Australian Government 2002a; Thaman 2002) means that sustainable management of trees and forests in the landscape will assume greater rather than lesser significance in the future across Oceania.

*Sustaining the Use of Forest Resources*

While all Oceanic countries are committed to the principle of sustainable forest management (e.g. SPC 2003), the extent and means by which this intent has been realised varies, reflecting the varied circumstances and different options of countries for economic development. In the smaller island nations without forests of industrial scale or commercial value, the focus is only on the sustainable management of trees outside forests. In the more forested nations, the characteristic cycle is one which begins with unsustainable levels and forms of exploitation associated with the transformation of natural to financial capital and with the change from forested to non-forested land use; this is the paradigm of forest-based development first promulgated, and then renounced, by Westoby (1987). All countries with significant areas of forest have experienced this phase, and some – principally PNG and the Solomon Islands – have not yet progressed beyond it in other than particular cases.

The second phase is characterised by the significant reduction of harvest levels from native forests, usually in association with the maturing of plantation forests. Australia, Fiji, New Zealand and Vanuatu illustrate this, although at different scales and in different forms. This typifies the multiple-use paradigm of the last quarter of the 20th century (e.g. Kirkland 1989). The third phase is that of the increasing reservation of native forests from production, the implementation of much more conservative forest management practices in native forests, and the recognition of goals other than wood production in the management of plantation forests. Australia and New Zealand exemplify different interpretations and forms of this phase; the latter has chosen to forego wood production from remnant native forests almost entirely, embodying the post-productivist paradigm (Mather 2001), and many Australian conservation organizations advocate a similar path for Australia (Australian Conservation Foundation 1995). In the countries with large plantation forest estates, the management of these forests is progressively recognising and accommodating values other than wood production (e.g. Carnus et al. 2003; Keenan et al. 2004).

In most countries of the region in which forests are important, there is strong debate at both community and political levels about the issues associated with each of these paradigms and the shifts between them. In forest-rich but economically-poor countries with few alternative economic development pathways, typified by PNG and the Solomon Islands, the debate and operational practice focus less on whether the forest should be harvested, and more on how it should be harvested to minimise adverse environmental and social impacts (e.g. Hunt 1998, 2001). Reduced-impact industrial-scale logging (APFC 2000) and small-scale "eco-forestry", characterised by the use of portable sawmills (Groves 2001; Hunt, 2001; Tilling and Holzknecht, 2001), are two common elements of the paradigm shift; greater capture of the profits flowing from forest harvesting, by both government, customary landowners and the communities they represent, are another (Hunt 2001; Siwatibau 2003). Many communities see eco-forestry as a preferable alternative to industrial logging because they can exercise much greater control over it, and may derive a broader set of benefits from it.

Hunt's (2001) comparison of the economic and non-monetary outcomes of industrial-scale logging, eco-forestry, and direct subsidisation of conservation management helps illustrate why the latter two options remain less, rather than more, common. The analysis suggests that eco-forestry and logging generate different suites of costs and benefits – for example, the income stream from eco-forestry is modest and extended over time, whereas that from industrial logging is greater initially, but likely to be a one-off lump sum; eco-forestry requires the community to raise start-up costs, although these are often met by donors, and industrial logging is likely to generate higher levels of foreign exchange and tax revenue, at least in the short term; the environmental effects of eco-forestry are generally minor, but industrial logging facilitates conversion to agriculture, which landowners may find attractive. Hunt's (2001) analysis found that the income streams generated by eco-forestry and direct subsidisation for conservation were likely to be comparable, but both were substantially less than the more common model of industrial logging, particularly where it is followed by conversion to agriculture. These results illustrate both the many dimensions of, and the challenges in, moving to more sustainable forest management.

In the economically developed countries of Oceania, the debate has been principally between productivist and post-productivist (Mather 2001), or resourcism and preservationist (Perley 2003), paradigms. The land allocation and use outcomes of this debate have been discussed in preceding sections; the associated paradigm shift has also enabled the

historically strong distinction between attitudes to the management of public and private land in Australia and New Zealand to be progressively overcome, leading to the more consistent regulation of forest practices on all land tenures (NZMAF 2001; Australian Government 2003a). The other dominant features of this debate are the recognition of a diversity of interests in forest policy and forest management, and the exploration of the means by which this diversity is accommodated; these issues are discussed further below.

## *Rights and Interests in Forests*

The paradigm cycle associated with rights and interests in forests in Oceania is characterised by two parallel elements: the progressive restoration of indigenous rights where they have been denied in the past, and the increased recognition in policy and management of the plurality of interests in forests. Indigenous rights over forests were never denied in the Oceanic SIDS; while they were recognised in New Zealand through the 1840 Treaty of Waitangi, they had little effect until the 1975 Treaty of Waitangi Act (Matunga 2000; NZMAF 2001); prior indigenous rights over resources were not recognised in Australia until a 1992 High Court decision (Box 17.5; McGlade 2003).

### *Indigenous Rights and Interests*

In the Oceanic SIDS, the focus of discussion between customary landowners and others with interests in forests is now on the most appropriate forms of partnership arrangements for achieving forest management goals. The history of forest exploitation in the richly forested nations of PNG and the Solomon Islands illustrates many of the unsatisfactory elements of such partnerships, in environmental, economic and social terms (e.g. Filer and Sekhran 1998; Hunt 1998, 2001; Dauvergne 2001). Conversely, a number of forest-based development and conservation projects illustrate that, while it may be challenging, it is not impossible to develop partnerships which protect the environment as well as enhance peoples' livelihoods (e.g. Hunt, 1998, 2001; Tacconi 2000).

One of the challenges common to forest-based development throughout the Oceanic SIDS is the difficulty of securing investment in local value-added processing, and thus delivering higher levels of livelihood benefits than through the export of unprocessed product. Such investment is constrained by the limitations of forest resource access, poor infrastructure and the local skill base, as well as by the more general factors determining investment, such as the extent of comparative advantage (Brown 1997). While there are various economic opportunities associated with non-timber forest products (Box 17.6; United Nations 2000; Thaman 2002), the potential value of wood products has generally been the focus of external investor interest. Successful wood processing enterprises have been established in Fiji, based on plantation forests, and in Vanuatu, based on both native and planted forests. As discussed above, "eco-forestry" – based on processing by small-scale portable sawmills – has been promoted in Oceania as a means by which landowners can engage in economic activity and exercise a higher degree of control over forest harvesting, enhance product value recovery and maximise the value of the retained forest, provided various constraints are addressed (Hunt 2001; Tilling and Holzknecht 2001). The emergence of alternatives to industrial-scale forest harvesting, which also empower landowners, represents an important paradigm shift in Melanesia, and is also relevant elsewhere in Oceania, for example to Maori and Aboriginal communities. Indigenous communities all over Oceania are increasingly expressing their concerns about logging and value-adding activities which are seen as "too large" and in which they do not have direct participation.

In the cases of New Zealand and Australia, where Maori and Aboriginal rights were denied to varying degrees and for varying periods, the restitution of those rights defines a fundamental paradigm shift. This restitution has progressed furthest in New Zealand, where Maori are now significant landowners and stakeholders in both indigenous and plantation forestry (Box 17.3; Schirmer and Roche 2004). Aboriginal Australians now manage 18% of Australia's land; although much of this is only sparsely forested, its management nevertheless offers opportunities to address both economic and social needs, as well as deliver environmental benefits associated with more sustainable management (Altman 2001; Baker et al. 2001, Whitehead et al. 2003). While the rights and interests of Aboriginal people are also increasingly recognised by those who manage other public and private forests (Australian Government 2003a), the mechanisms to institutionalise those rights and interests remain at an early stage of development (Australian Government 2004b).

### *Recognising the Plurality of Interests in Forests*

In contrast to the forests of the Oceanic SIDS, for which customary ownership is the starting point for decisions about how forests will be managed, the native forests of Australia and New Zealand have been largely under either public or individual private ownership. In both countries, plantation forestry started as a state enterprise, but has become completely privatised in New Zealand and either privatised or corporatised in Australia (Schirmer and Kanowski 2004; Schirmer and Roche 2004). The rise of the environmental movement over the past 30 years has profoundly altered the emphasis and conduct of forest policy and management in both Australia

and New Zealand and, to a lesser but nevertheless significant extent, in Oceanic SIDS (Dargavel et al. 2000; Roche 1990; Hunt 1998). One important dimension of these changes has been the recognition of the plurality of interests in forests, and the initiation of processes to facilitate greater community input into decision processes about public forests.

These processes take three general forms. The first comprises various consultative and participatory mechanisms established and managed by governments, primarily about public forest policy and management in Australia and New Zealand – where there has also been an increased focus on private forest policy – and about customary forests in Oceanic SIDS. The second comprises forest certification processes and their mechanisms for stakeholder involvement (e.g. Australian Forestry Standard 2004; Forest Stewardship Council 2004). The third, currently less common than the two preceding, is the establishment of collaborative forest management arrangements in the sense generally understood internationally (e.g. Petheram et al. 2003).

At the highest level of public policy formulation, Vanuatu has the distinction, uniquely, of having developed its national forest policy through a highly consultative public process (Wyatt et al. 1999). At the level of forestland allocation and use, the greatest number of consultative and participatory processes about public forests in the region has been in Australia, reflecting in part its extensive areas of native forest and the long history of community debate about their appropriate management. The national Regional Forest Agreement process (Dargavel et al. 2000; Australian Government 2004b), and related state-based processes which preceded and followed it, engaged stakeholders in decisions concerning forest allocation and use to a much greater extent than previously, although not to all parties' satisfaction. In both Australia and New Zealand, private forest owners have become subject to a higher level of regulation, under the provisions of various Australian state arrangements, e.g. Tasmania's Forest Practices Code (Forest Practices Board 2004) or New Zealand's Resource Management Act (NZMAF 2001), or forest certification requirements. At the forest management unit level, a variety of stakeholder consultative and negotiating processes are employed throughout the region (e.g. Buchy et al. 1999 for Australia; Filer and Sekhran 1998 for PNG; Brown 1997 for the region).

To date, forest certification has been pursued principally for some plantation forests in Australia and New Zealand, and for some small-scale native forest management projects in Oceanic SIDS (Tolfts 2000; Kanowski 2001; NZMAF 2001). Consequently, certification has not yet impacted significantly on stakeholder involvement in forest management other than for those relatively few forests and forest operations that have been certified (e.g. Forest Stewardship Council certification now covers 34% of New Zealand's plantation forests, mainly small and medium forests). Certification's impact is likely to increase as forest owners and processors in the region pursue certification with either Forest Stewardship Council or Pan-European Forest Certification accreditation.

Because of the prevalence of customary land ownership in the region, collaborative forest management in the sense of "community forestry" (e.g. Arnold 2001) is not directly applicable in the Oceanic SIDS. However, joint action by landowners, and their collaboration with government, to achieve a common purpose – whether conservation or development related – is common (e.g. Filer and Sekhran 1998; Hunt 1998; Tacconi 2000), and collaborative partnerships for forest management are recognised as the basis for sustainable development in the Oceanic SIDS (United Nations 2000). Collaborative forest management has unrealised potential in Australia and New Zealand, where small-scale pilot initiatives, or research to support them, are underway (e.g. Petherham et al. 2003; Langer and Tomlinson 2003). It is likely that forms of collaborative forest management will expand in Oceania as policy and practice evolve, and will complement other mechanisms for recognising the plurality of interests in the region's forests. This will be facilitated by a growing acknowledgement of the value of traditional knowledge of forests, and the potential for integrating traditional and modern knowledge in contemporary forest management (e.g. Boxes 17.3, 17.5 and 17.6; United Nations 2000; Whitehead et al. 2003).

## Governance and Capacity

The dominant paradigm shifts underway in Oceania in relation to governance and capacity are from a public forestry agency to other government agencies and to "new generation" regulatory instruments, and from the public sector to private and community organisations. New Zealand led this shift, with changes in its forestry agency associated with privatisation, and with the 1991 Resource Management Act focusing on effect-based, rather than prescriptive, approaches (NZMAF 2001). The Australian states have followed to varying degrees (Kanowski 2001), with the state of Tasmania exemplifying many aspects of "new generation" environmental instruments (Gunningham and Sinclair 2003) in its forest practices system (Forest Practices Board 2004). PNG outsourced key elements of log export monitoring to a private company, SGS Pty, Ltd., and is considering further outsourcing of forest administration and management (Stocker 2001).

These changes are consistent with contemporary thinking about good governance in the forestry sector (e.g. Mayers and Bass 1999; RECOFTC 2002), and – to the extent that they enhance and diversify overall capacity, empower civil society, and thus add resilience – they are to be welcomed. For example,

community-based organizations in Australia and PNG, such as Greening Australia (Greening Australia 2004) or the Village Development Trust (Hunt 2001; Holzknecht et al. 2002) respectively, have become important agents for engaging with the community, promoting sustainable forest management and delivering services on behalf of government.

However, these changes also reflect a diminishing public sector capacity to levels that are of concern in many Oceanic nations. This is particularly the case in the Oceanic SIDS, where the capacity of relevant agencies has always been limited, but it is also becoming an issue in Australia and New Zealand as the public sector downsizes and the funding necessary to maintain alternative capacity is seldom committed over the long term (Dovers 2003). This loss of capacity is also reflected, to varying degrees, in forest-related research, which is characterised by an increasingly commercial focus, and in tertiary education relevant to forests. While there has been an encouraging diversification in the institutions and individuals engaged in forest-related research and education, it has generally been at the expense of critical mass and breadth of coverage, and therefore of the capacity underpinning research and education. One of the responses to these challenges has been the initiation of joint endeavours between previously distinct organizations, such as the joint venture between Australia's CSIRO (Commonwealth Scientific & Industrial Research Organisation) Division of Forestry and Forest Products and New Zealand's Forest Research Institute (CSIRO and NZFRI 2004), and the fostering of regional research networks such as that represented by the South Pacific Regional Initiative on Forest Genetic Resources (SPRIG) Project described in Box 17.6.

Consequently, throughout Oceania, governments are now likely to invest in public sector activities related to forests only in partnership with either or both the private sector and community-based or non-government organisations. This shift from the public sector paradigm of much of the 20th century reflects both the more general global shift in political ideology, and the related set of choices about the use of scarce public funds. While partnership approaches have much to recommend them, they do need to be adequately resourced if they are to meet societal needs. Given that they are often associated with diminished resource provision, there is increasing concern amongst environment and resource management professionals and communities about the adverse consequences of this shift for sustainable forest management across the landscape, and thus its longer-term environmental and social impacts. However, these concerns have yet to impact significantly on prevailing political paradigms in the region.

## 17.5 Conclusions

Relationships between societies and forests in Oceania illustrate many common themes. The principal of these are:

- the rich histories of indigenous use and management of trees and forests, and their livelihood and cultural values;
- the high levels of forest biodiversity and endemism, some of it sustained by traditional practices, and much of it vulnerable because of land use and global change;
- the more recent substantial loss and degradation of trees and forests associated with exploitative forest practices and agricultural conversion, and the consequent environmental and social implications;
- the challenges of progressing towards more socially inclusive and ecologically sustainable forest management, and of accommodating the diversity of values and interests in forests;
- the emerging and profound challenges posed by global change.

The challenges of managing the increased complexity manifested by these relationships are occurring at a time when some key forest sector capacities, such as those for forest research, education and policy development, are facing increasing resource and human capacity constraints across the countries of Oceania.

These relationships also exemplify many contrasts. The more striking contrasts are between those large areas of forests which remain under traditional and conservation-oriented management, and others which are subject to intense exploitation or management; between societies that value forests for services rather than products, and those that seek principally to realise the value of forest products; between recognition and denial of traditional rights over forests; between some of the world's best forest practices and some of the worst; between traditional heterogenous polycultural land use systems and modern industrial plantation forestry; between sustainable value-adding forest industries and those which remain largely exploitative; and between nations which are large exporters of forest products and those that depend almost entirely on imports.

The common themes and interests across the region facilitate cooperation, and a number of mechanisms exist to foster this. Conversely, the great differences in levels of economic development, and thus in access to basic services, across the region mean that there are quite different priorities for forests between wealthy and less wealthy nations. Reconciling these differences through consensus processes can be challenging. It is apparent that the Oceanic countries with advanced economies have much to learn from the other nations of the region about many aspects of the relationships between people and forests; it is also apparent that the experiences of the advanced economies with their forests can and should inform

the forest-related choices which other countries make on their paths to economic development.

The paradigm shifts associated with forests in Oceania – towards more sustainable forest management at both landscape and stand scales, towards more meaningful engagement of the plurality of interests in forest policy and management, and towards more contemporary models of governance and capacity – reflect the efforts of societies in the region to find balance among the diverse values and benefits of forests, and the costs associated with particular choices. Both traditional and modern knowledge and practice can and should contribute to this dynamic and ongoing process of reconciling the benefits forests and trees can offer, with the demands which the people of Oceania make of them.

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**Map 17.1 Forest cover in Oceania (percent of land area) and total forest area per country**
(Data: FAO FAOSTAT 2005; map designed by Samuel Chopo)