THE STATE
OF THE WORLD's
**FOREST GENETIC RESOURCES**

# COUNTRY REPORT

# REPUBLIC OF FIJI

This country report is prepared as a contribution to the FAO publication, The Report on the State of the World's Forest Genetic Resources. The content and the structure are in accordance with the recommendations and guidelines given by FAO in the document Guidelines for Preparation of Country Reports for the State of the World's Forest Genetic Resources (2010). These guidelines set out recommendations for the objective, scope and structure of the country reports. Countries were requested to consider the current state of knowledge of forest genetic diversity, including:

- Between and within species diversity
- List of priority species; their roles and values and importance
- List of threatened/endangered species
- Threats, opportunities and challenges for the conservation, use and development of forest genetic resources

These reports were submitted to FAO as official government documents. The report is presented on www. fao.org/documents as supportive and contextual information to be used in conjunction with other documentation on world forest genetic resources.

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# STATE OF THE

# FOREST GENETIC RESOURCES IN FIJI

**Department of Forests**
Ministry of Fisheries and Forests for The Republic of Fiji Islands and the
**Secreatriat of Pacific Communities (SPC)**

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**Abbreviations and acronyms**

| | | |
|---|---|---|
| **ACIAR** | **-** | **Austrilian Center for International Research** |
| **APAFRI** | **-** | **Asia Pacific Association of Forestry Research Institutions** |
| **APFISN** | **-** | **Asia Pacific Forest Invasive Species Network** |
| **CBD** | **-** | **Convention on Biological Diversity** |
| **COWRIE** | **-** | **Coastal and Watershed Restoration of Island Environments** |
| **DoF** | **-** | **Department of Forests** |
| **EMA** | **-** | **Environmental Management Act 2005** |
| **ENSIS** | **-** | **English Nature Site Information System** |
| **EPS** | **-** | **Endangered and Protected Species Act 2002** |
| **FD** | **-** | **Forest Decree** |
| **FGR** | **-** | **Forest Genetic Resources** |
| **FNBMA** | **-** | **Fiji National Biodiversity Management Act** |
| **NBSAP** | **-** | **National Biodiversity Strategy and Action Plan** |
| **FORENET** | **-** | **Forestry Research Network** |
| **ISPM** | **-** | **International Stansdards for Phytosanitary Measures** |
| **ITTO** | **-** | **International Timber and Trade Organization** |
| **MDG** | **-** | **Mellium Development Goals** |
| **MESCAL** | **-** | **Mangrove Ecosystem for Climate Change and Livelihoods Project** |
| **MIDD** | **-** | **Mahogany Industry Development Decree** |
| **MOA** | **-** | **Memorandum of Agrement** |
| **MOU** | **-** | **Memorandum of Understanding** |
| **MSG** | **-** | **Melanesian Spearhead Group** |
| **MTA** | **-** | **Material Transfer Agreement** |
| **NES** | **-** | **National Environmental Strategy** |
| **NFI** | **-** | **National Forest Inventory** |
| **NFTP** | **-** | **Non Forest Timber Products** |
| **NGOs** | **-** | **Non-governmental Orgnizations** |
| **PICTs** | **-** | **Pacific Island Countries and Territories** |
| **PGSP** | **-** | **Pacific Govenance Support Program** |
| **PRA** | **-** | **Pest Risk Analysis** |
| **RLUP** | **-** | **Rural Land Use Policy** |
| **SPC** | **-** | **Secretariat of Pacific Communities** |
| **SPRIG** | **-** | **South Pacific Regional Initiative on Forest Genetic Resources** |
| **TLTA** | **-** | **Taukei Land Trust Act** |
| **WANI** | **-** | **Wateshed and Nature Initiatives** |

# Executive Summary

The history of forest conservation in Fiji dates back to the 1880's when the first forest conservation area was being established. The vision of the Fiji Forest Policy 2007 states: "Sustainable wellbeing and prosperity from diversified forests". The first key policy area covers the "Conservation of forests and biological resources", with six (6) key policy fields, policy field four (4) focuses on "Biodiversity Conservation". A total of four (4) government organisations, 23 NGOs, and half a dozen community based groups are working on national conservation outcomes with a total annual expenditure of over F$13 million. These activities has been further enhanced with the technical and financial assistance from the Australian government through its South Pacific Regional Initiative on Forest Genetic Resources (SPRIG) project, and the German government financial and technical assistance addressing sustainable forest management. Both of these assistance programmes played a key role and in the strengthening and the laying of a strong foundation for the conservation of Fiji's forest bio-diversity.

Fiji has a total land area of 1.827 million hectares of which 58% is covered with Forests, consisting of 85.3% natural forests, 2.4% pine *(Pinus Carribaea)* plantations and 5.0% of mahogany *(Sweitenia macrophylla)* plantations. Fiji' forests are home to at least 1,518 species of vascular plants, of which 50.1% are endemic and 9.9% of Fiji is protected under IUCN categories. The national program for the protection of Fiji's forest biodiversity is contained within Fiji's "National Biodiversity Strategy and Action Plan" (NBSAP 2010). Forest degradation due to number of issues ranging from economic, social, and demographic, were identified in 2009 as a major issue posing a great degree of threat to the sustainability of Fiji's forest ecosystem.

The Forestry Department addresses forest genetic conservation issues through its programs of ex-situ and in-situ conservation activities and establishment of forest conservation areas, contributing to achievement of its national goals and that of Mellium Development Goals (MDG) 1 and 7.

Despite all these efforts, conservation objectives are still far from being realised due to a number of challenges ranging from land and forest tenure systems to resources and technical capacities on the conservation of Fiji's forest genetic resources. In addition to addressing these challenges, strengthening of a number of key processes are vital which includes the strengthening of necessary legal enforcement procedures, and the contribution of forest genetic resources to the broader national outcome areas such as health, food security, and poverty alleviation.

# Introduction

***Geographic Location***

Fiji Islands is geographically located in the southern Pacific Ocean, northeast of Australia and about 1,500 kilometers directly north of New Zealand. Some 110 of the country's 332 islands are inhabited. The two largest islands, Viti Levu and Vanua Levu, account for more than 85% of the country's 18,270 square kilometers of land area.


***Population***

The 853,445 people of the Fiji Islands are from diverse backgrounds. Some 55% (471,033) of the population belongs to the native Melanesian ethnic group, 37% (313,181) are of Indian origin and the remaining 8% (69,231) are Europeans, Chinese, and other Pacific islanders. The population trend has been very slight increases since 2003 to 2009 and then a decline after that which could be due to migration at large.

***Land Use and Forest Types***

The principal types of land use are: open grazing 2,700 $km^2$ including 950 $km^2$ of roadsides, compounds and sugar cane residues, 280 $km^2$ grazing under coconuts or forest trees, 380 $km^2$ of crop or fallow under coconuts, 1,950 $km^2$ ha of arable and tree crops other than coconuts, 1,000 $km^2$ of plantation Mahogany and Caribbean pine.

Fiji's total forest cover is approximately 1,054,419 hectares in relation to the total landmass of 18,376 km2 or 58% of Fiji is forested, according to FAO. Of this 17.5% (177,000 ha) is classified as primary forest, the most biodiverse and carbon-dense form of forest.

Forest cover includes the following:

- Indigenous Forest: 739,340 ha
- Hardwood Plantations: 51,490 ha
- Pine: 43,200 ha

Forest is also categorized according to potential management practices such as:

- Multiple Use Forests: 514,680 ha
- Protection Forests: 240,560 ha
- Preserved Forests: 55,000 ha

Reclassification into FRA 2010 categories

Vegetation cover is classified as follows:

- Dense Forest: Crown density (75 – 100%)
- Medium Dense Forest: Crown density (45 – 80%)
- Scattered Forest: Crown density (15 – 20%)

Fiji had 177,000 ha of planted forest.

***Trends in forest changes***

Change in Forest Cover: Between 1990 and 2010, Fiji lost an average of 3,050 ha or 0.32% per year. In total, between 1990 and 2010, Fiji gained 6.4% of its forest cover or around 61,000 ha. Fiji's forests contain - million metric tons of carbon in living forest biomass.
54.7% —or about 1,000,000 hectares—of Fiji is forested. Of this, 89.4% —or roughly 894,000 hectares—is classified as primary forest, the most biodiverse form of forest.

Change in Forest Cover: Between 1990 and 2000, Fiji gained an average of 2,100 hectares of forest per year. This amounts to an average annual reforestation rate of 0.21%. Between 2000 and 2005, the rate of forest change decreased by 100.0% to 0.00% per annum. In total, between 1990 and 2005, Fiji gained 2.2% of its forest cover, or around 21,000 hectares. Fiji lost -1,000 hectares—0—of its primary forest cover during that time. Deforestation rates of primary cover have decreased 0.1% since the close of the 1990s. Measuring the total rate of habitat conversion (defined as change in forest area plus change in woodland area minus net plantation expansion) for the 1990-2005 intervals, Fiji gained 0.0% of its forest and woodland habitat.

Biodiversity and Protected Areas: Fiji has some 164 known species of amphibians, birds, mammals and reptiles according to figures from the World Conservation Monitoring Centre. Of these, 28.7% are endemic, meaning they exist in no other country, and 15.2% are threatened. Fiji is home to at least 1,518 species of vascular plants, of which 50.1% are endemic. 9.9% of Fiji is protected under IUCN categories.

***Land Tenure System***

About 86% of the Country's land is owned by the indigenous units, 5% is managed by the state and 9% is freehold land.

***Economy***

Arable land is primarily used for sugar cane, cocoa, rice and other agricultural crops cultivation. Approximately 55% of the land is covered with natural and plantation forests. Economically, agriculture dominates the domestic export of about 43% and 36% from sugar for foreign exchange. However, Tourism industry offers the most income source to the country and investment prospective.

***Natural Resources, Timber, Fish, Gold, Offshore Oil Potential, Hydropower***

The Forestry sectors' contribution to the Gross Domestic Product (GDP) is expected to dramatically increase to $100 million within the next 5 years due to the value adding processing and production line from the Mahogany and Pine plantation forests. The foreign earnings from the export of timber and other wood based products averaged $42 million a year in the last decade. In 2004, earnings totaled $37 million. This contributes 2.3 per cent to the countries Gross Domestic Product (GDP).

The forestry sector in Fiji has a total forest cover of 1,054,419 ha, covering 58% of the total land area. This consists of:

899,229 ha of native forest,
116,488 ha of plantation forest (52,419 ha of hardwood plantations, 25,327 ha of softwood plantations and 38,742 ha of mangrove forest).

The native forest consists of:

5,738 ha of nature reserves,
16,109 ha of forest reserves, and
1,300 ha of recreational parks

Export earnings from timber and other wood-based products average around $42 million each year. In 2004, the recorded earnings were $42.9 million.

Total wood production in Fiji is presently approaching 500,000$m^3$ annually with 100,000$m^3$ from native forests, 100,000$m^3$ from mahogany plantations, and 300,000 $m^3$ from pine plantations.

The Department of Forests in 2009 completed the National Forest Inventory exercise. The National Forest Inventory, the formalization of the Fiji Forest Policy Statement and the National Forest Program provides the framework for the sustainable management of Fiji's forest resources. These tools represent a paradigm shift in the management focus away from timber production towards conservation and sustainable management.

***LEGAL AND PLANNING***

***International Conventions***

Fiji has become party to 35 international agreements/conventions/treaties.

Major Environment Legislation in Fiji:
21 major environmental legislations are in place and all decisions on use of land/sea and practices need to abide by these legislations.

***Importance of Forests and Trees to the Country's Environment***

The people depend largely on the trees and forest resources for subsistence and income generation. Local communities are losing more than tree alone through logging e.g. the changing micro environmental benefits, clean water and soil stability and other biological diversity. The forest product trade at the local market is gradually expanding but the resources are declining. The problem may be more associated with management approaches and strategies. Harvesting of forest and trees exceeding sustainable production yield leads to forest and land degradation.

Sustainable forest management is a potential aspect that has been favorably incorporated in to the forestry management plan to enable holistic approach in addressing the diversity of needs whether economical, ecological or social. Reforestation using local species is also a promising restoration effort that has been particularly pursued by some communities. A good example is the restoration of Vesi *Intsia bijuga*, with WWF initiatives with the wood carving traders in Kabara Island.

The creation and management of natural forest reserves and protected sites under state and non-governmental organization sees a significant contribution to the long term conservation of biodiversity in collaboration with the custodial communities. It brings about awareness and participation at the landscape level as well as ensures sustainability, ownership and equity sharing. Natural Forest Reserves and Protected Areas are rich in fauna and flora, wildlife, diversity and have immeasurable benefits. Securing of the long term conservation initiatives is however a great challenge considering the need for compensation payment. A case in point recently for Fiji is the securing of the Sovi Basin through the funding initiative from Conservation International.

Fiji now has a new forest definition which was used during the latest NFI which was carried out from 2006 – 2008. Under the new forest definition, the former Dense and Medium Dense Forest classes are now combined to form the current forest class "Closed Forest", the former class "Scattered Forest" is now called "Open Forest".

The classes "Non Forests" and "Inland Water Bodies" are now calculated for the first time.

Forest Areas are calculated using satellite data recorded in 2000, NFI mapping and field verification were done from 2006 – 2008, the dataset is referred to as 2006 dataset.

***Calibration***

**Table 1: Forest characteristics and areas (FRA)**

| **National class (1,000 ha)** | **1,000 hectares** |
|---|---|
| Closed forest | 556.385 |
| Open Forest | 342.845 |
| Pine plantations | 93.524 |
| Hardwood plantations | 60.448 |
| Coconut plantations | 27.137 |
| Non-forest | 629.835 |
| Inland water | 19.208 |
| **Total land area** | **1,729** |

**Source: FRA Report 2010**

***Calculating the calibration factor***

| | |
|---|---|
| Total land area according to FAOSTAT | 1.827 |
| Calibration factor | 1.05644675 |

**Source: FRA Report 2010**

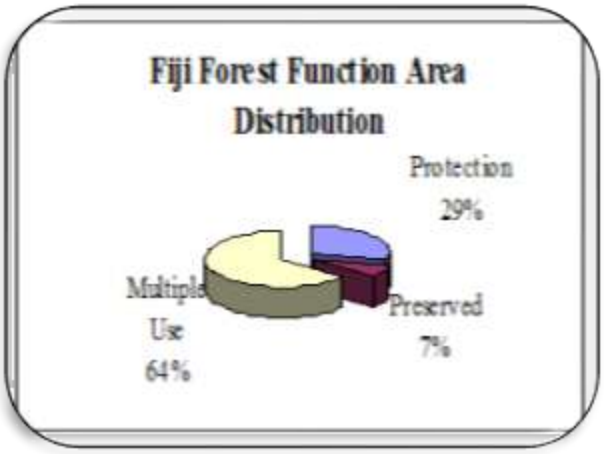
***Calibrated National data***

| **National class (1,000 ha)** | **1,000 hectares** |
|---|---|
| Closed forest | 587.791 |
| Open Forest | 362.198 |
| Pine plantations | 98.803 |
| Hardwood plantations | 63.860 |
| Coconut plantations | 28.669 |
| Non-forest | 665.387 |
| Inland water | 20.292 |
| **Total land area** | **1,827** |

**Source: FRA Report 2010**

***Forest Types and Ecological zone breakdown***

**Major Forest Types:**



**Fiji's Forest Cover:**

| | |
|---|---|
| **Total Land Area (ha)** | **1,827,000** |
| **Total Forest Area (ha)** | **1,000,000** |
| **Percent Forest Cover** | **54.73%** |
| **Primary Forest Cover (ha)** | **894,000** |
| **Primary Forest, % total forest** | **89.40%** |
| **Primary Forest, % total land** | **48.93%** |

**Source: FRA Report 2010**

**Forest Types (FRA definition):**

| | |
|---|---|
| **Tropical (% forest area)** | **100%** |
| **Subtropical (% forest area)** | **0%** |
| **Temperate (% forest area)** | **0%** |
| **Boreal/polar (% forest area)** | **0%** |

**Source: FRA Report 2010**

**Breakdown in Forest types:**

| | | |
|---|---|---|
| **Primary forest (ha \| %)** | **894,000** | **89.4%** |
| **Modified natural (ha \| %)** | **5,000** | **0.5%** |
| **Production plantation (ha \| %)** | **101,000** | **10.1%** |

**Source: FRA Report 2010**

**Ownership of forest land, 2000:**

**Table 2: Forest ownership and area (FRA)**

| | |
|---|---|
| **Public (%)** | **6.8%** |
| **Private (%)** | **93.2%** |
| **Other (%)** | **0.0%** |

**Source: FRA Report 2010**

| | |
|---|---|
| **Vascular Plant Species, 2004** | |
| **Total** | **1518** |
| **Number endemic** | **760** |
| **Number of Threatened Plant Species, 2004** | |
| **Species threatened** | **66** |

**Source: FRA Report 2010**

# Chapter 1: The Current State of the Forest Genetic Resources

In general, forest genetic diversity in Fiji is well distributed in the two main islands but there are some cases of species endemism to specific sites only. Santulum yasi for example is known to have a wider distribution range, two specific sites in Vanua Levu and Viti Levu, to a certain extent in part of Kadavu and some sporadic pattern in few atolls in the Lau group. Obviously, it is prudent to initiate biodiversity study to determine the main endemic species in order to develop genetic conservation strategies for the important species.

On the utilization side, the major commodity exploited from the forest is that of timber trade through forest logging. Over thirty different tree species are classified obligatory and there-by can be extracted and traded at the local and export market. Non forest timber product (NFTP) resources utilization is not well documented except for Santulum trade which is going on at some unregulated intensity. There had also been low demand for seed sales while medicinal plants are well appreciated in the different sector of the community. Trees serve at least 12 ecological functions, 70 cultural uses and provide up to 75% rural income. Main species that characterize the forest types that is relatively common and widespread in major forest types that can be found in Annex 1.

## 1.1 Priority Forest Tree Species

A total of 17 native tree species has been identified as priority forest tree species due to deforestation causing the decline of populations in any forest types. These species has a number of significant uses basing on their economic potential in the trade market and moreover it's traditional significance to communities. Furthermore, its endemism and threatened status is also considered for its management and conservation. Forests and trees are also an integral part of country's cultural activities; they are of importance in improving soil fertility, water quality and supply, and environmental protection. Continual deforestation and forest degradation primarily resulting from unsustainable practises, coupled with extreme climate events, including climate change, have highlighted urgency for better conserve, manage and use of forest and tree genetic resources. The priority species include timber, fruit/nut trees, and shrub species as well as those trees resistant to cyclones, their contribution to coastal protection and their ability to adapt to atoll conditions.

*Intsia bijuga* has been classified as vulnerable to extinction on the IUCN Red List. It therefore needs priority action given the fact that the species has been heavily sorted for heavy duty construction as well as been exploited for carving trade.

*Santalum yasi* will continue to be of importance given the rate of exploitation, slow rate of growth and the increasing market demand. It is particularly important to safeguard the local gene pool especially against the more aggressive *Santalum album*.

The local coniferous species such as *Agathis macrophylla*, *Decussocarpus vitiensis*, *Gmelina vitiensis*, *Dacrycarpus nidulum* and *Podocarpus neriifolius*, will continue to be significant priority due to their lower regeneration capacityin the wild and their increasing exploitation through logging.

Other important trees species include *Fagraea gracilipes*, *Alphitonia zizyphoides*, *Heritiera onithocephala*, *Degeneria vitiensis*, *Myristica* spp, *Metroxylon vitiense* Sago Palm and traditional/totem trees.

**Table 2: Priority forest tree species of Fiji**

| Priority Species | | | Reason for priority |
|---|---|---|---|
| **Scientific Name** | **Tree (T) or other (O)** | **Native (N) or exotic (E)** | |
| ***Acacia richii* Qumu** | T | N | Economic and traditional importance |
| ***Agathis macrophylla* Dakua Makadre** | T | N | Economic importance |
| ***Alphitonia zizyphoides* Doi** | T | N | Traditional importance |
| ***Dacrycarpus imbricatus*** | T | N | Economic importance |
| ***Dacrydium nidulum* Yaka** | T | N | Economic importance |
| ***Decussocarpus vitiensis* Dakua salusalu** | T | N | Economic importance |
| ***Degeneria vitiensis* Masiratu** | T | N | Endemic |
| ***Endospermum robbienum* Kauvula** | T | N | Economic importance |
| ***Fagraea gracilipes* Buabua** | T | N | Economic importance |
| ***Gmelina vitiensis* Rosawa** | T | N | Economic importance |
| ***Heritiera onithocephala* Rosarosa** | T | N | Economic and traditional importance |
| ***Intsia bijuga* Vesi** | T | N | Economic importance |
| ***Myristica* spp.Kaudamu** | T | N | An important NFTP that has been unceremoniously neglected but continues to be of significant importance in the market |
| ***Podocarpus neriifolius* Kuasi** | T | N | Economic and traditional importance |
| ***Santulum yasi* Yasi** | T | N | Economic and traditional importance |
| ***Sterculia vitiensis* Waciwaci** | T | N | Economic and traditional importance |
| ***Metroxylon vitiense* Sago Palm** | O | N | Economic and traditional importance |

**Source: Fiji Forestry Data**

## 1.2 Forest Plant Species Actively Managed For Human Utilization

The country's original poeple developed a diversity of cultures as they adapted to the wide variety of forest types that clothed the islands. These forests have important commercial and non-commercial roles. Many local communities continue to rely on forests and trees for subsistence needs, and maintenance of cultures. Official institutions recognize the importance of native forests and trees but fail to take effective action to

promote sustainable use. Demands on forest land for agriculture and other needs of growing populations result in rapid deforestation that threatens associated cultures. As forest diversity decreases, so do local cultures of human communities that become increasingly drawn into the global economy with loss of distinctive identity. Forest and tree conservation is urgently required in order to meet human needs and enrich human culture in the future. Forest plant species actively managed for human utilization can be found in Annex 2.

### 1.3 Main Forest Tree or Other Woody Plant Species Actively Managed or Identified for Environmental Services

During recent years, much concern has been voiced about deforestation in the country. The resultant situation of decreasing capacities of natural forests to provide essential products and services is further aggravated by a widespread occurrence of various forms of forest degradation, as well as by overexploitation of tree resources outside the forest. To encounter this situation, we need much increased rates of forestation than in the past. Such forestation includes afforestation, reforestation or tree planting. A general forestation theory should be developed to stimulate successful creation of new forest and tree resources.

Deforestation is one of the most serious threats to biodiversity in the country. It causes floods, soil erosion and disease (owing to the loss of organisms that help to control vector populations), degrades watersheds and destroys wildlife habitats. Deforestation reduces genetic diversity within populations. The Government and non-governmental organizations and local communities must all be involved in the reforestation and restoration of forests. For forest restoration and conservation of forest trees it is importnat that the ecological characteristics of the tree species are understood for their environmental services and values. Detailed list of useful trees that provide essential environmental services and have significant social value can be found in Annex 3.

### 1.4 Forest Tree and Other Woody Species which are Endemic

Fiji forests are known for the large number of endemic species and higher taxa (McGinley, 2007). In particular, there are 1,769 vascular plants native to Fiji with about 23% endemism (McGinley, 2007). Some of the species of flora that are endemic to Fiji include the following:

- Degeneraceae.- *Degeneria vitiensis* Masiratu
- *Cycas rumphii* Logologo
- *Agathis macrophylla* Dakua makadre
- *Dacrydium nausoriense* Yaka
- 24 native palm species

### 1.5 Tree and Other Woody Forest Species Identified as Being Threatened

Study conducted by Doyle (1998) as cited in World Wildlife Fund (2001) stated that a number of Fiji's 10 gymnosperm species are considered endangered including the endemics *Podocarpus affinis*, *Acmophyle sahniana*, and *Dacrydium nausoriense.* Building on this idea, another study conducted by Doyle & Fuller (1998) as cited in World Wildlife Fund (2001) stated that 24 native palm species are endemic to Fiji and at least 8 out of the 24 are endangered or critically endangered including *Neoveitchia storckii.* Tree and other woody forest species identified as being threatened are detailed in Annex 4:

### 1.6 Regular Assessment of Threatened Species

Assessment of threatened species in Fiji over the years was mostly done on an ad hoc basis, mostly through project site specific vegetation surveys. This has been becoming more frequent now as the result of he increasing number of community based forest conservation project sites developing, whereby one of the critical requirement is the initial collection of the baseline datas not only of forests but of the whole biological diversities to take stock of the real situation on the ground before any intervention is undertaken. It basically provides a wealth of updated records of critical tree species reference level.

### 1.7 Tree Species for which there is Insufficient Information to Determine Whether or not they are threatened

***Dacrydium nausoriense***
Yaka, one of Fiji's renowned primitive conifers, is a member of the family Podocarpaceae.

***Cynometra falcata***
Cibicibi is a slender tree that can grow up to 4m in height.

***Medinilla waterhousei***
The Tagimaucia is a liana (woody vine), that forms thickets high up in the canopy, much similar to the growth of the duva, Derris trifoliata.

***Balaka microcarpa***
This species of Balaka is usually a small palm, but it can grow up to 13m in height, with an 8 cm diameter trunk.

***Balaka macrocarpa***
Balaka macrocarpa is a small palm that grows to only 8 m high with a trunk from 5-10 cm in diameter.

***Santalum yasi***
Yasi is a small shrub or tree that grows up to 8-10 m in height.

***Agathis macrophylla***
The Pacific kauri is a gymnosperm, and can become a tall tree, growing up to 40 m in height, with a trunk up to 3 m in diameter.

***Pterocymbium oceanicum***
The Yanita is a beautiful tall tree that can grow from 15-30m in height.

***Acmopyle sahniana***
Drautabua is a gymnosperm belonging to the family Podocarpaceae, and a member of the wider and better known Pine family.

***Metroxylon vitiense***
The Soga is a large conspicuous palm that grows to 15m in height.

***Cyphosperma tanga***
Taqwa is a moderately stout, small understorey palm that grows up to 5 m in height, with a trunk to 15 cm in diameter.

***Balaka streptostachys***
This palm is the stoutest of all Balaka growing to a height of 4-7 m with a trunk up to 10cm in diameter.

***Alsmithia longipes***
Alsmithia longipes is a medium-sized palm, the trunk of which grows up to 10m in height.

***Heterospathe phillipsii***
This is a solitary and generally slender palm that grows up to 15 m in height.

***Neoveitchia storckii***
Vilaito is a solitary, moderately stout palm with a light coloured trunk on an expanded base. The trunk normally grows up to 12 m in height and is stout, at about 25 cm in diameter.

## 1.8 System for Documenting Forest Reproductive Material

The South Pacific Regional Forest Genetic Resources Expert group, an informal group of experts from Government, industry and NGOs, met twice during Phase 1 and provided technical guidance and information on regional priorities. During implementation of Phase 1, a very broad and diverse group of organizations and persons working on and/or with responsibility for forest and tree genetic resources in the South Pacific was identified, contacted and included in a SPRIG-maintained database. It is planned that these organizations and individuals be further involved and updated on SPRIG Phase 2 through the Pacific Islands Forests and Trees newsletter and electronically (through e-mail), and given all opportunity to input ideas and exchange information. The Pacific Sub-Regional Plan for the "Conservation, Management and Sustainable Use of Forest and Tree Genetic Resources" developed in Apia in 1999, will continue to provide an overview of regional priorities.

## 1.9 Current Sate of Forest Reproductive Material (Native and Exotic) Identification (Seed Sources, Provenances Zones) and Utilization (Including Vegetatively Propagated Material). Volume of Seed of main Species used:

One of the core roles of the Forestry Department is seed collection for the primary purpose of research on the various aspects coming under seed technology section are seed collection, seed processing, seed testing, seed storage and seed marketing.

Objectives or goals or aims of seed technology include:

- Supply high quality seeds, means seeds of high yielding varieties, varieties with resistance to diseases and pests.
- To increase production by supply of quality seed.
- To assure rapid seed multiplication of desirable varieties.
- Timely supply of seeds i.e. well before the sowing season.
- Supply of seeds at reasonable prices.

Furthermore, our annual seed collection is also primarily based on the demand of seeds for reforestation and afforestation programs in the country. Main species mostly include economical species, ideal species for forest restoration in degraded areas, plantation species, soil improvement, soil stabilization, biodiversity, and ecosystem and water managment purposes. During the last five years 39 tree species were targeted for seed collection and bulk of the seed collections were made from seeds stands, plantations and natural stands (plus and superior trees). Largest seed collection made was for *Sweitenia macrophylla* on annual basis for plantation and woodlot establishment purposes. The mean annual quantities of seed produced is 371 kg for the last five years and the current state of forest reproductive material of the main forest tree and other woody species in the country can be found in Annex 5. Simultaneously, seedlings productions are also a core activity of Forestry Department for replanting programmes in the country. Currently there is a huge demand for seedlings from both the public and private sectors for seedlings to be used in their replanting and reforestation programmes with specific attention given to the thematic areas such as forest degradation, climate change mitigation and adaptation, global warming, watershed management, food security, gene conservation, ecosystem, biodiversity and soil stability. The Forestry Department has four state nurseries where one nursery is specifically for research purposes while three nurseries are for seedlings production for forestry extension activities. Other nurseries producing large volumes of seedlings include the following institutions:

- Fiji Pine Limited – *Pinus* spp, *Eucalypus* Spp, *Acasia mangium*
- Fiji Pine Trust – *Pinus* spp

- Fiji Hardwood Cooperation Limited – *Swietenia macrophylla*
- Conservation International – Indigenous tree species
- Future Forests Limited – *Tectona grandis*
- Ministry of Agriculture – Fruit trees
- Schools – Fruit trees, ornamentals and shade trees

There are also a handful of privately owned nurseries in the country specialized particularly in ornamental plant species production and to some extent they also produce tree species ideal for landscape restoration. Nevertheless, there is no system in place to monitor the annual seedling productions for the different tree species produced from these private nurseries. Under the Government's programs and also in partnership with NGO's, in its efforts to empower communities with the sustainable management and use of their remaining forest resources, the DoF has developed nurseries for communities where there is a lot of interests being displayed for the restoration of forests and replanting in degraded areas. Furthermore, the COWRIE, WANI, One Million Tree, Sandalwood Development and Forest Ecosystem Rehabilitation projects have provided an avenue to develop nurseries for the communities seriously involved with forestry developments on their land. Majority of the seedlings produced in these community based nurseries are used in their replanting programs and surplus seedlings are sold to support their livelihoods. Mean annual number of seedlings production for the last five years for forest tree and other woody species can be found in Annex 6.

## 1.10 Current State of Genetic Characterization of the Main Forest Tree and Other Woody Plant Species in the Country

Many species that occur in Fiji are logically divisible into smaller taxa, either subspecies, varieties, or forms (*International Code of Botanical Nomenclature*, Art. 4; Stafleu et al.1972). In some cases these are merely mentioned, while in other cases they are treated in full in the same sequence of informational headings noted above for species. The three major infraspecific ranks of taxa have been variously interpreted by botanists, and agreement on their usage is not universal. In very general terms, *subspecies* are usually allopatric; they occupy different ranges (e.g. different archipalegoes) and ordinarily they have begun to develop isolating mechanisms, so that one may think of them as incipient species. If such populations should be brought together artificially, or by the future removal of geographic barriers, they would presumably be interfertile. Usefulness of the rank *subspecies* seems somewhat limited to many students of oceanic plants, who often prefer to recognize spatially isolated but related populations, if distinguishing morphological features are obvious, as full *species. Varieties* are not necessarily allopatric; they are infraspecific populations with sometimes overlapping ranges and without fully operative isolating mechanisms. As a role, *varieties* are quite distinct in certain parts of the range of a species, but elsewhere they seem to have a questionable morphological basis. *Forms* are usually ecological in nature, to be expected here and there within the range of a species and probably without real isolating mechanisms; they are often sporadic and are recognizable only on the basis of a single morphological character.

Too often, in taxonomic work, the recognition of ranks of taxa below that of species indicates uncertainty on the part of an author. Only painstaking experimental work will indicate the degree to which, in any given case, isolating mechanisms within a specific population are effective. Nevertheless, like most taxonomists, they occassinally utilize these ranks of taxa; but in the present *Flora* their usage is reduced as much as possible.

**Table 3: Forest species for which genetic variability has been evaluated**

| Species | | Morphological traits | Adaptive and production characters assessed | Molecular characteristics |
|---|---|---|---|---|
| Scientific name | Native (N) or Exotic (E) | | | |
| Indigenous spp. | N | Flora Vitiensis | Flora Vitiensis | Flora Vitiensis |

## 1.11 Information on Forest Genetic Resources as Part of National Forest Surveys

Plant checklists are the most rudimentary form of documenting vegetative life in any area of study. Given they are quite diverse in form and structure, one must take heed of the task at hand as it requires one of formal botanical training or experience (to say the least) for proper and credible accounts of the group/taxa observed or reviewed. As such, the opportunity presented is a culmination of notable works undertaken by established botanists who dedicated 10-20$^{+}$ years of their lives studying and formally delineating the floristic composition that collectively is unique to Fiji's archipelago. Thus, the executive summary is based on the ferns and the seed plants of Fiji by Brownlie (1967) and Smith (1979-1991), respectively. The tree species and commercial timber species are extracted from Smiths and Brownlie's floras. The checklists of other potential ornamentals for Fiji are extracted from A. Whistler (1998) in consultation with the Curator of the South Pacific Regional Herbarium. Please note, the acronym syn. means synonym. These are plant names that were formally used but have become invalid because of findings from recent research.

For this work plant is a collective term of reference to what fundamentally is referred to as ferns and seed plants. These two groups make up the primary classification in the plant world. Ferns are spore reproducing plants that essentially requires an aquatic medium for any chance of reproduction. Seed plants obviously are the non-spore bearing groups that are by far more diverse in form, structure and habitat. The reproductive versatility of seeds allows them to opportunistically evolve and adapt to survive various environmental conditions. As such, we have seed plants that are scientifically intriguing – e.g. cycads and those that have been highlighted as commercially viable – timber tree species. The depth of diversity and complexity within these groups is overwhelming and any indications of their wealth will most definitely supersede the purpose of this document. Thus, we restrict our knowledge to the basics or more so what it is that's required of a checklist – these are the scientific names of individual species, which are always *italicized* and then followed by the authority or person (s) that discovered them; the formal consignment to their family and also an indication whether each species is indigenous, endemic or introduced to the area of interest, in this case Fiji. Summary to the flora claasifications of ferns and seed plants formally recorded in Fiji can be found in Annex 7.

## 1.12 Genetic Conservation Strategies/Programmes (including in situ and/or ex situ) for Specific Forest Tree or Other Woody Plant Species

Forest and trees play significant roles in the economic, social, environmental and cultural lives of the community. However, significant loss of the bio-diversity has become a major concern due to destructive human activities associated with mining, agricultural clearing and unsustainable logging.

In April 1999, a regional plan was developed outlining practical actions that could be taken at international, regional, national and local levels to curb the loss of forest and tree genetic resources not only for the country but for the Pacific Island countries and territiories (PICTs). Although this action plan had served the Pacific region well, it was felt that it needed to be reviewed and updated.

With the support of AusAid, through the Pacific Govenance Support Program (PGSP), and SPC, GIZ and ENSIS, a workshop was held in Nadi, Fiji (June 2007), entitled development of a Pacific Islands Regional Research and Development Agenda and Action Plan for Improved Govenance in the Conservation, Management and Sustainable Utilization of Forest Genetic Resources.

This action plan is a significant document that will serve as a framework for planning and implementing the conservation, management and sustainable use of forest and tree genetic resources within PICTs. It sets priorities for implementation over the next eight years, acknowledging that these have changed since 1999. It also builds on previous work and incorporates new knowledge.

The plan will thus be a useful guide to PICTs in developing and implementing relevant policies and activities within their own regional, national and local settings, and will contribute to the security and development of Pacific forest and tree genetic resources for present and future generations.

Protection/conservation areas tie with "***NBSAP*"** document including "***Palms of Fiji Islands*"** and "***Conservation Strategies 2005 – 2007***", "***Forest Tree Genetic Conservation, Management and Sustainable Use in Pacific Island Countries and Territories Priorities, Strategies and Actions 2007 – 2012***".

**Table 4: For in-situ and ex-situ gene conservation, tabulated below is the *Santalum yasi* gene conservation plots established to date**

| Location | Date Established | Stand Type | Gene Source | Spacing | No of trees | Area (ha) | Host Species |
|---|---|---|---|---|---|---|---|
| **Nawailevu** | Jan 2004 | In-situ | Nawailevu | 4m x 2m | 400 | 0.32 | *C. calothyrsus* |
| **Lekutu** | Jan 2004 | In-situ | Lekutu | 4m x 2m | 400 | 0.32 | *C. calothyrsus* |
| **Colo-i-Suva** | 08/11/09 | Ex-situ | Lakeba | 3 m x 3m | 40 | 0.04 | Existing vegetation |
| **Rokovuaka** | 07/07/10 | Ex-situ | Naivaka | 3m x 3m | 150 | 0.14 | *Citrus* species |
| **Tore, Cuvu** | 04/08/10 | Ex-situ | Noro | 4m x 4m | 100 | 0.16 | *Citrus* species |
| **Nalesi, Naitasiri** | 03/11/10 | Ex-situ | Noro | 3m x 3m | 60 | 0.05 | *Citrus* species<br>Indigenous tree species |
| **Nadogoloa, Burewai, Ra** | 16/12/10 | Ex-situ | Naivaka | 4m x 4m | 96 | 0.15 | *C. calothyrsus* & Indigenous tree species |
| **Savatu, Nadarivatu, Ba** | 09/02/11 | Ex-situ | Noro | 4m x 4m | 50 | 0.08 | *C. calothyrsus* & Indigenous tree species |
| **Naigani Island Resort, Tailevu** | 14/12/11 | Ex-situ | Naivaka | 4m x 4m | 51 | 0.08 | *C. calothyrsus* & Indigenous tree species |
| **Nananu, Tailevu** | 21/12/11 | Ex-situ | Noro | 5m x 5m | 50 | 0.13 | *C. calothyrsus* & Indigenous tree species |
| Total | | | | | **1,397** | **1.47** | |

**Source: Fiji Forestry Department**

The flora varies considerably between the leeward and windward side and is divided into the following categories:

1. Beach flora: The common species found in Fiji beaches are similar to those species found on other islands of the tropical Pacific. These trees include *Barringtonia asiatica*, B. *racemosa, Calophyllum inophyllum, Intsia bijuga, Hernandia peltata, Guettarda speciosa, Terminalia litoralis, Maniltoa grandiflora, Acacia simplicifolia, Leucacena leucocephala, Hibiscus tiliaceus and Pandanus odoratissimus*. The shrubs that are found in the beach flora include *Desmodium umbellatum, Cerbera manghas, Sophora tomentosa, Scaevola taccada var. sericea, Vitex trifolia, and Messerschmidia argentea*. The creepers include *Canavalia maritime, Ipomoea brasiliensis and Vigna marina*. The grasses include *Sporobolus virginicus and Thuarea involuta* (Parham, 1972:15).
2. Mangrove Flora: The mangrove flora is found near the coasts, estuaries and river mouths. The common species of the mangrove trees are Bruguiera gymnorhiza, Rhizophora mangle, R. mucronata, Lumnitzera coccinea and Xylocarpus granatum; the creepers Derris trifoliate and Entada phaseoloides. The species of fern include *Acrostichum aureum* and the species of grass include *Paspalum distichum* (Parham, 1972:17).
3. Dry Zone Flora: The flora covering the dry zone areas includes the introduced grass Pennisetum polystachyon. The ferns include Pteridium esculentum and Dicranopteris linearis and the shrubs include *Dodonaea viscose, Hibbertia lucens, Leucopogon cymbulae* and *Decaspermum fruticosum.* The small trees are *Marinda citrifolia, Alphitonia spp., Mussaenda raiateensis, Acacia richi, Syzygium richii, Casuarina equisetifolia. Pandanus odoratissimus* and *Cycas rumphii f. seemannii*. Other essential species of flora on the dry zone are reeds. The species of reeds include *Miiscanthus floridulus* and the *grasses, Sporobolus elongates, Paspalum orbiculare* and *Heteropogon contortus, Dichanthium caricosum* and *Panicum maximum* (Parham, 1972:18).

4. Intermediate Zone flora: Areas of intermediate zone flora include the mixed cover on the leeward hill slopes that includes the grasses and small shrubs and the windward sides are covered with light forest (Parham, 1972:19).
5. Wet Zone Flora: The wet zone flora is usually found on the windward sides of the larger islands and the flora consists of forests. The combination of the forest trees varies and it is difficult to give a good picture of the flora that is present in the wet zone of Fiji. Some of the wet zone areas of Fiji consist of *Agathis vitiensis and Dacrydium nidulum* var. *nidulum.* The most common forest flora in addition to those mentioned are the trees *Podocarpus neriifolius, Dacrycarpus imbricatus, Decussocarpus vitiensis, Calophyllum vitiense, Fagracea gracilipes, Intsia bijuga, Syzygium effusum, Serianthes Melanesia, Endospermum macrophyllum, Dysoxylum*, spp., *Burckella* spp., *Casuarina nodiflora, Myristica castaneifolia, Ficus* spp., *Elaeocarpus* spp., *Balaka* spp. and the undershrubs include *Psychotria* spp., *Cyrtandra* spp., *Alpinia* spp., *Freycinetia* spp. In the wet zone flora numerous tree ferns are found as well as epiphytic orchids, mosses and giant lianes (Parham, 1972:20).

A study conducted by Balgooy (1971) as cited in Department of Environment (1997:6) stated that the vascular flora of Fiji is taken as an addition to the Indo-Malesian floristic province. Further, about 90% of all seed plant genera found in Fiji is present in New Guinea. Study conducted by Doyle (1998) as cited in World Wildlife Fund (2001) stated that a number of Fiji's 10 gymnosperm species are considered endangered including the endemics *Podocarpus affinis, Acmophyle sahniana*, and *Dacrydium nausoriense.* Building on this idea another study conducted by Doyle & Fuller (1998) as cited in World Wildlife Fund (2001) stated that 24 native palm species are endemic to Fiji and at least 8 out of the 24 are endangered or critically endangered including *Neoveitchia storckii.*

The levels of threat to Fiji's forest genetic resources are immeasurable generally contributing to loss of biodiversity in the country that is of great concern. Some of the major threats identified in the country impacting the forest genetic resources include the following:

- Wildfires;
- Cyclones/hurricanes – each year approximately 4 cyclones pass through our maritime zones;
- Shifting cultivation – subsistence farming leading to encroachment into protected areas and upper water catchment areas;
- Unsustainable and poor land use practices;
- Over exploitation of forest resources;
- Invasive species;
- Pests and diseases;
- Rising sea levels (global warming) – contributing to coastal erosion;
- Flooding – climate change (extreme climatic conditions);
- Soil erosion and landslides; and
- Excessive clearing of land for specific developments such as agriculture, urbanization, tourism, mining of mineral resources, housing, etc.

List of trees and other woody forest species considered to be threatened in all or part of their range from genetic point of view can be found in Annex 8.

# Chapter 2: The State of *In-situ* Genetic Conservation

A total of 102,613 hectares is protected under the Forest Decree 1992 as Forest Parks and Reserves, which is around 10 percent of the total forest area in Fiji. As of to date a total of 17-forested areas have been proclaimed and maintained as Forest Reserves and 7 areas proclaimed as Nature Reserves as tabulated below. Other areas of significance are protected and managed by other organizations such as the National Trust of Fiji. Further more, other important areas of significance that are used by NGOs for research studies and conservation of forest genetic resources include Nabukelevu – important bird area, Dogotuki - REDD-Plus, Emanu – REDD-Plus, Drawa – Sustainable Forest Management (SFM), Nakavu – SFM, Kubulau – Ridge to Reef, Tunaloa – important bird area, Natewa – important bird area, Navua – river gordge and Nasuata Island in Rewa – marinf terrestrial.

**Table 5: Nature and forest reserves**

**Forest Reserves**

| # | Location / Name | Province | Established Proclaimed | Area (Ha) |
|---|---|---|---|---|
| 1 | Suva & Namuka Harbour, including Draunibota, Labiko, Kioba & Vuo Island | Rewa | 1963 | 19 |
| 2 | Naboro | Rewa | 1969 | 19 |
| 3 | Naitasiri (Lot 45, M3/1) | Naitasiri | 1955 | 30.4 |
| 4 | Savura | Naitasiri | 1963 | 447.9 |
| 5 | Colo-i-Suva | Naitasiri | 1963 | 369.8 |
| 6 | Maranisaqa & Wainiveitoa | Naitasiri | 1955 | 77.4 |
| 7 | Qoya | Rewa | 1955 | 67.2 |
| 8 | Vago | Naitasiri | 1959 | 24.7 |
| 9 | Yarawa | Serua | 1962 | 162 |
| 10 | Buretolu | Ba | 1926 | 1,198.8 |
| 11 | Nadarivatu-Nadala | Ba | 1954 | 7,406.2 |
| 12 | Saru Creek | Ba | 1973 | 3.2 |
| 13 | Tavua | Ba | 1958 | 2 rods |
| 14 | Lololo | Ba | 1968 | 8.3 |
| 15 | Korotari | Cakaudrove | 1961 | 1,047.7 |
| 16 | Taveuni | Cakaudrove | 1914 | 11,299.5 |
| 17 | Ravilevu | Cakaudrove | 1959 | 4,018.7 |

**Nature Reserves**

| # | Location / Name | Province | Established Proclaimed | Area (Ha) |
|---|---|---|---|---|
| 1 | Daunibota & Labiko | Rewa | 1959 | 2.2 |
| 2 | Vuo Island | Rewa | 1960 | 1.2 |
| 3 | Nadarivatu | Ba | 1956 | 93.2 |
| 4 | Tomanivi | Ba | 1958 | 1,324.4 |
| 5 | Naqaranibuluti | Ba | 1958 | 279.5 |
| 6 | Ravilevu | Cakaudrove | 1959 | 4,021.7 |
| 7 | Vunimoli | Cakaudrove | 1968 | 20.3 |

**Other Parks and Reserves**

| # | Location / Name | Province | Established Proclaimed | Area (Ha) |
|---|---|---|---|---|
| 1 | J. H. Garrick Memorial Park | Serua | 1986 | 427 |
| 2 | Namenalala Island Nature Reserve | Bua | 1984 | 43 |
| 3 | Tavakubu | Ba | 1970 | 1 |
| 4 | Saweni Beach | Ba | 1970 | 0.5 |
| 5 | Lomolomo | Ba | 1970 | 0.5 |
| 6 | Nukulau Island | Rewa | 1970 | 8 |
| 7 | Yadua Taba Island | Bua | 1981 | 50 |
| 8 | Waisali Forest Amenity Reserve | Cakaudrove | 2005 | 120 |
| 9 | Vaturu Forest Amenity | Ba | 2651209 – ref no. | 160 |
| 10 | Sigatoka Sand Dunes | Nadroga | 1989 | 240 |
| 11 | Wasavulu | Vanua Levu | 1981 | 1 |
| 12 | Batiwai Protected Forest | Serua | 1956 | 15,749.6 |
| 13 | Bouma Forest Park | Taveuni | 1991 | 80.9 |
| 14 | Waikatakata Archaeological Park | Nadroga | 1991 | 70 |
| 15 | Tavuni Hill Fort | Nadroga | 1992 | 3 |
| 16 | Mount Evans Forest Park | Ba | 1993 | 210 |
| 17 | Lavena Coastal Walk & Nature Attractions | Taveuni | 1994 | |
| 18 | Sovi Basin | Naitasiri | 2012 | 16,400 |
| 19 | Wabu Nature Reserve | Ra | 1992 | 2,907 |

**Source: Forestry Department Data 2007**

## 2.1 Genetic Conservation of Forest Tree and Other Woody Plant Species in Protected Areas (National Parks, Ecological Reserves (Viable Population Sizes, Connectivity of Populations, Designation of areas in Different Genecological Zones)

The forests of Fiji have a rich value of bio-diversity and endemic species and plants and had been a signatory of the convention on biodiversity. The National Biodiversity Strategy and Action Plan is the country's initial response to this obligation. Currently, there are two significant areas for conservation purposes namely Sovi Basin and Wabu Nature Reserve by the Conservation International Society (CIS).

There are about 17 proclaimed Forest Reserves altogether in Fiji with a totoal area of 26.203 hectares and 7 Nature Reserves covering an area of 5,470 hectares. The Sigatoka Sand Dunes in the western part of the Viti Levu have been declared as a National Heritage Park.

Special interest areas have been initiated and managed by the local communities with technical advice from the Forestry Department. This includes forest parks, bird watching areas and old war fort. These areas are currently being used for ecotourism development. The locations of these areas where the Forestry Department was involved with the development and establishment of these ecotourism projects that were initially funded by foreign donor agencies. A total of 7 sites have been developed under such ecotourism projects. The conservation of forest trees and other woody plant species in protected areas can be found in Annex 9.

## 2.2 Population of all native tree and other woody forest species are conserved in-situ and What Population of Threatened Tree and Other Woody Species is Included in Conservation Programmes

The major threat for low land and high land rainforest is unsustainable logging systems as low consideration is given on the rarity of the species level and the fact that the trees that reach 35cm in dbh are allowed for logging without considering the potential maximum attainable growth diameter. Another significant threat to the nature systems is the infiltration of farm development through shifting cultivation from the increasing demand for higher productivity as well as increasing population. Opening up of the natural forest can also result in the increasing rate of invasive species conglomerates into the site that sooner or later smother and totally dominate the natural vegetation. On the drier forest, the major risk is wild fire that can cause forest degradation.

***Threats to the forests in the various types:***

- Threat from pests: The Ambrosia beetle is a major threat on Mahogany plantations and causes pinholes in Mahogany;
- Threat from fires: The threat of fire is always a problem in pine plantations. The Fiji pine Limited has to live with this as thousands of planted pine are affected each year and cost of damages sustained is significantly high;
- Threats by natural disaster: Fiji is prone to tropical cyclones which occur mostly during the period November to April, with the greatest frequency frequencies around January and Febrauary;
- Loss of forests due to developments (road construction, mining, etc); and
- Threats by invasive trees and grass: The African tulip an introduced tree of no commercial values and it has widespread occurrences particularly in the wet zones of the large islands and it is a real threat to farmetrs and the rural communities at large. Its ability to adapt and to recapitulate natural forest is of great concern. On forest denuded areas, grass (Mission grass) and bamboo often take over to re-vegetate the area. Where forests trees grows side by side with bamboo it is often found that bamboo would encroach over them and to some later stage predominates over the tree forests.

**Table 6: In-situ conservation program**

| Location | Species (scientific name) | Date Established | Stand Type | Gene Source | Spacing | No of trees | Area (ha) | Host Species |
|---|---|---|---|---|---|---|---|---|
| Nawailevu | *Santalum yasi* | Jan 2004 | In-situ | Nawailevu | 4m x 2m | 400 | 0.32 | *C. calothyrsus* |
| Lekutu | *Santalum yasi* | Jan 2004 | In-situ | Lekutu | 4m x 2m | 400 | 0.32 | *C. calothyrsus* |
| **Total** | | | | | | | **0.64** | |

**Source: Fiji Forestry Department Data**

## 2.3 Programme for In-situ Conservation of Forest Genetic Resources

One of the major activities is the conservation of the local *Santalum yasi* family. This has resulted in the establishment of gene conservation stands for the Lakeba, Bua and Kadavu families, in research sites at Vunimaqo, Colo-i-Suva and Lololo. Sandalwood seed stands had also been established in Colo-i-Suva and Vunimaqo, which has greatly contributed to increasing amount of viable seed source for local research as well as for the extension needs. Two sites in Fiji have been identified due to extensive exploitation of sandalwood resource particularly at Nawailevu and Lekutu in Bua, Vanua Levu and for the conservation of the *Santalum yasi* gene under the Forest Departments program, two in-situ gene conservation stands have been estabslished.

Simultaneously development of conservation gene pools is ongoing for other priority timber species such as *Agathis macrophylla, Intsia bijuga, Dacrydium nidulum, Dacrycarpus imbricartus* and *Deccusocarpus vitiensis.*

**Table 7: Target forest species included within in-situ conservation programs/units**

| Species (scientific name) | Purpose for establishing conservation unit | Number of populations or stands conserved | Total area (ha) |
|---|---|---|---|
| *Santalum yasi* Yasi | Gene conservation | 2 | 0.64 |

## 2.4 Main Constraints in Improving Genetic Conservation Programmes

- Human practices and urban encroachment which result in deforestation, forest degradation and forest fragmentation;
- Changed physical and biological environment brought about factors such as extreme climatic events, invasive weeds, pests and diseases, and indiscriminate burning;
- Land use policies and land tenure issues that constrain or inhibit efficient and sustainable management of FGR; and
- Lack of capacity (trained human resources, infrastructure and finances) to develop, implement and monitor FGR projects, and general lack of awareness of the importance of conserving and sustainably utilizing FGR.

## 2.5 Priorities for Future In-situ Conservation Actions (Research, Capacity Building, etc.)

Priority research areas include the following components:

- Germplasm supply;
- Food security, nutrition and health;
- Reforestation and forest rehabilitation;
- Climate Change;
- Traditional knowledge;
- Ecosystem functions and services provided by forests;
- Invasive species, pests and diseases;
- Forest and tree products market development;
- Community and agro-forestry management;
- Endangered species, species populations and habitats; and
- Sustainable forest management.

Capacity building for the following components highlighted above:

- Strengthen cooperation, coordination and collaboration with research institutions in relation to the conservation, management and sustainable use of forest and tree genetic resources;
- Strengthen capacity in areas identified in each priority research;
- Strengthen knowledge of medicinal plants and island foods;
- Develop propagation techniques;
- Community based land use planning – participatory land-use planning;
- Domestication of indigenous tree species;
- Agro-forestry production system design and implementation;
- Product and market development;
- Mobilize effective partnerships to address probable impacts of climate change;
- Training in all aspects of impact adaptation, insofar as they affect FGR;
- Capacity supplementation through other organizations;
- Capacity building is needed in all aspects of collecting, preserving, promoting and using existing traditional knowledge, including the documentation of knowledge of FGR with market potential such as fruits and nuts, essential oils, fibers such as tapa cloth, dyes and other products, documentation of knowledge of FGR with institutional importance, and methods of processing and preservation, documentation of knowledge of the existing range of FGR provenances through in-situ conservation and maintenance of the knowledge base one captured and preserved followed by integration with extension programs and school curricula's;
- Build partnership and capacities between government, rural people and non-government organizations;
- Increase scientific capabilities for qualifying the environmental services provided by forest ecosystems and their FGR;
- Development and mobilization of partnerships between affected groups in order to identify, report, and plan and implement appropriate measures;
- Characterizing the ecological/biological features of invasive species in order to develop effective control measures (for University and scientific groups);
- Identification and survey of invasive species (for Government officers, NGO's and communities);
- Implementation of appropriate control measures;
- Appropriate training for bio-security officers;
- Capacity needs to be developed in all fields related to the priorities identified;
- A primary deficiency is a lack of entrepreneurial skills among both the public and private sectors, and means must be found to identify and develop them;
- Training is needed on bio-security and quarantine issues for inter-island and international trade;
- Enhance the capacity of extension services;
- Build working partnerships between researchers and farmers;
- Training of government, university and other groups in developing and providing improved agricultural agro-forestry systems is needed;
- Communities need training in the establishment and operation of agro-forestry systems which are demonstrably superior for the required outputs;
- Government, university and NGO extension services need to be improved;
- Training on nursery systems, agro-forestry systems and forest management in rural communities will be essential;
- Train sufficient numbers of people in interested groups, including government agencies, universities and rural communities in survey methods, data handling and eventually in effective conservation methods;
- University based training in the biology and ecology of certain endangered FGR species;
- Awareness raising among governments and other decision makers of the importance of these endangered FGR, and ensuring that sufficient resources are forth coming to address the problems;

- There is a serious need for training of technical support staff to implement, monitor, evaluate, document and report SFM;
- Rural communities need to be engaged and supportive;
- SFM must be linked to other land management practices such as agriculture and agro-forestry, within adjacent areas; and
- Effective Codes of Forestry Practice, especially for forest harvesting, must be developed, implemented and enforced.

## 2.6 Other Relevant Information on In-situ Conservation

Training requirements to strengthen forest genetic work in Fiji is of paramount importance. Training plays a vital role to upgrade the level of skill and knowledge. The training in the following fields of forest genetics would be desirable for its application in the field of research:

- Elementary trial design – optimal plot size, choice of trial design (e.g. provenance trials vs progeny trials) and randomization;
- Data capture and data editing – various practical editing methods;
- Analysis of variance;
- Calculation of genetic correlations – correlations such as age – age, trait and site – site;
- Estimation of genotype by environmental interaction;
- Repeatability;
- Selection of forward, backward and clonal selection;
- Review and updating national policies – strengthening human resource capacity;
- Mainstream into curriculum development and translation;
- Traditional knowledge;
- Awareness on Nagoya Protocol to communities; and
- Carbon stock assessment training.

## 2.7 Species that are Conserved On-farm (circa situ) or Conservation on Farms of Trees Useful in Agro-forestry

Traditional conservation of important tree species is known to be widely practiced in the local community whereby traditional owners retain tree species that they know have significant importance such as medicinal plants and shade trees. In the absence or limitation in knowledge there can be higher risk of tree removal for agricultural purposes. In the traditional agricultural practices few trees are often left behind as shade trees, buffer trees and for erosion control. A list of important plants conserved and tree species useful in agroforestry systems can be found in Annex 10.

# Chapter 3: The State of *Ex situ* Genetic Conservation

## 3.1 List of Target Species Included in *Ex-situ* Conservation/Programmes/Units

**Table 8: Ex-situ conservation**

| Species | | Field collection | |
|---|---|---|---|
| Scientific name | Native (N) or exotic (E) | Collections, provenances or progeny tests, arboreta or conservation stands | |
| | | No. stands | No. acc. |
| ***Agathis macrophylla* Dakua makadre** | N | 13 | |
| ***Callophyllum vitiense* Damanu** | N | 1 | |
| ***Dacrycarpus imbricatus* Amunu** | N | 2 | |
| ***Decrydium nidulum* Yaka** | N | 5 | |
| ***Decussocarpus vitiensis* Dakua salusalu** | N | 4 | |
| ***Endospermum macrophyllyum* Kauvula** | N | 1 | |
| ***Flueggea fluxousa* Baumuri** | E | 1 | |
| ***Fragraea gracilipes* Buabua** | N | 1 | |
| ***Gonystylus punctatua* Mavota** | N | 1 | |
| ***Intsia bijuga* Vesi** | N | 1 | |
| ***Kingiodebdrum platycarpum* Moivi** | N | 1 | |
| ***Myristica* spp Kaudamu** | N | 1 | |
| ***Podocarpus neriifolius* Kuasi** | N | 1 | |
| ***Santalum album* Yasi ni Idia** | E | 1 | |
| ***Santalum austro-caledonicum*** | E | 1 | |
| ***Santalum yasi* Yasi** | N | 13 | |
| ***Terminalia pterocarpa* Tivi** | N | 1 | |

## 3.2 Main Constraints to Improving *Ex-situ* Conservation

Lack of research on endangered species, populations and habitats in Fiji contribute to loss of biodiversity. The factors contributing to their endangered status include invasive species, pests and diseases (and increasingly climate change) as well as poorly informed decisions and actions in land-use planning and land development (unsustainable practices). Research for this area will increase and improve education and awareness, especially among decision-makers, to mitigate some of these indesirable trends.

## 3.3 Priorities for Future *Ex-situ* conservation Actions

A serious need for training of technical support staff to implement, monitor, evaluate document and report status of endangered species, populations and habitats in Fiji. The involvement and engagement of the rural communities will also ensure that some level of training and awareness on ex-situ conservation. Sustainable land management practices such as agriculture and agroforestry within adjacent areas of ex-situ conservation would be ideal to ensure the continuity of the area conserved.

## 3.4 Other Relevant Information on *Ex-situ* Conservation

Protected forests are areas of highly sensitive native forest by virtue of their topography, climate, soil type or combinations of timber harvesting. Forestry operations such as minor forest products and manual or non-mechanized timber extraction would be restricted on protected forest cover. Forestry operations are restricted on protected forest cover because these operations would have negligible effect on forest cover, stand composition or hydrological conditions of areas of protected forests in Fiji.

Conserved areas are areas of natural forest to be maintained in an undisturbed natural condition and for the preservation of specific biological values. It includes the Forestry Department Nature Reserves, other legally established reserved and other areas of known unique, rare or consideration for formal preservation. This includes the formal proposals or recommendations for World Heritage, Nature Reserves or National Park Status. Mangrove areas were originally classified as conserved areas because of their high biological diversity, national and international importance. Mangroves are not included in the forest function mapping as our mappng is only to the coastline.

# Chapter 4: The State of Use and Sustainable Management of Forest Genetic Resources

## 4.1 Annual quantity of Seed Transferred internationally

**Table 9: Seed and vegetative propagules transferred internationally per annum (average of the last five years)**

| Species | | Quantity of seed (kg | | Number of vegetative propagules | | Number of seedlings | | Purpose |
|---|---|---|---|---|---|---|---|---|
| Scientific name | Native (N) or exotic (E) | Import | Export | Import | Export | Import | Export | |
| **Mahogany** ***Swietenia macraphylla*** | E | - | 7.2 kg | - | - | - | - | Research |
| **Makita** ***Parinari glaberrima*** | N | - | 5.0 kg | | | | | Research |
| **Kaudamu** ***Myristica* spp.** | N | - | 0.9 kg | - | - | - | - | Research |
| **Yasi** ***Santalum yasi*** | N | - | 0.009 | - | - | - | - | Research |
| **Total** | | | **13.1 kg** | | | | | |

**Source: Fiji Forestry Department Data**

## 4.2 Species which are presently Subject to Tree Improvement Programmes

- Selection of plus trees of key species for seed production;
- Clonal seed orchard – Mahogany & *Santalum yasi*;
- Progeny/provenance trials – Mahogany & *Santalum yasi*;
- Provenance resource stands/Family selection - Mahogany;
- Seed collection & propagation of tree species;
- Re-production biology - Mahogany;
- Inbreeding studies – Mahogany;
- Gene conservation of *Santalum yasi;* and
- Grafting of *Santalum yasi* and tree species (*Agathis macrophylla, Instia bijuga, Santalum yasi and Sweitenia macrophylla*).

## 4.3 Main Tree Improvement Objective (timber, pulpwood, fuel wood, non-wood products, other)

- To establish progeny trials and combined progeny/provenance trial;
- To estimate the breeding value and general combing ability of parent trees;
- Estimate heritability of height, form & vigor;
- Estimate genetic value of the progenies and provenances;
- Create new generation of the breeding population; and
- To establish clonal seed orchard of *Santalum yasi* using completely randomized design.

**Table10: Forest tree improvement programmes**

| Species | | Improvement programme objective | | | | | |
|---|---|---|---|---|---|---|---|
| Scientific name | Native (N) or exotic (E) | Timber | Pulpwood | Energy | MP* | NWPP** | Other |
| *Agathis macrophylla* | N | √ | | | | | Traditional |
| *Instia bijuga* | N | √ | | √ | | | √ |
| *Santalum yasi* | N | | | | | √ | √ |
| *Swietenia macrophylla* | E | √ | | | | | |

## 4.4 Data for each Species (number of Plus Trees and Genetic Tests)

**Table 11: Tree improvement trials**

| Species | | Plus tree | Provenance trials | | Progenies trials | |
|---|---|---|---|---|---|---|
| Scientific name | Native (N) or exotic (E) | Number | No. of trials | No. of provenances | No. of trials | No. of families |
| ***Acasia mangium*** | E | | 2 | | | |
| ***Acasia auriculiformis*** | E | | 1 | 1 | | |
| ***Acasia crassicarpa*** | E | | 1 | 1 | | |
| ***Acrocarpus fraxinifolius*** | E | | 2 | | | |
| ***Agathis macrophylla* Dakua makadre** | N | | 1 | | | |
| ***Allibizia falcata*** | E | | 5 | | | |
| ***Anthocephalus cadamba*** | E | | 8 | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| ***Aucoumea klaineana*** | E | | 7 | | | |
| ***Cedrela odorata*** | E | | 3 | | | |
| ***Cinnamomum camphora*** | E | | 4 | | | |
| ***Cordia alliodora*** | E | | 9 | | | |
| ***Eucalyptus calamldulensis*** | E | | 2 | 2 | | |
| ***Eucalyptus citriodora*** | E | | 2 | 2 | | |
| ***Eucalyptus deglupta*** | E | | 15 | | | |
| ***Eucalyptus grandis*** | E | | 2 | 1 | | |
| ***Eucalyptus pellita*** | E | | 1 | 1 | | |
| ***Eucalyptus tereticornis*** | E | | 2 | 2 | | |
| ***Eucalyptus Urophylla*** | E | | 1 | 1 | | |
| ***Gmelina arborea*** | E | | 4 | | | |
| ***Instia bijuga* Vesi** | N | | 1 | | | |
| ***Khaya grandifolia*** | E | | 8 | | | |
| ***Nauclea diderichii*** | E | | 5 | | | |
| ***Pinus caribaea*** | E | | 1 | 1 | | |
| ***Santaim austro-calidonicum*** | E | | 1 | 1 | 1 | 2 |
| ***Santalum yasi* Yasi** | N | | 11 | 4 | 11 | 10 |
| ***Securinega samoana*** | E | | 6 | | | |
| ***Swietenia macrophylla*** | E | | 3 | 15 | 3 | 80 |
| ***Tabebuia heterophylla*** | E | | 13 | | | |
| ***Tectona grandis*** | E | | 2 | | | |

**Source: Fiji Forestry Department and Fiji Pine Limited Data**

**Table 12: Seed orchards**

| Species (scientific name) | Seed orchards | | |
|---|---|---|---|
| | Number | **Generation (1st, 2nd, 3rd, etc breeding cycle) | Area (ha) |
| *Agathis macrophylla* Dakua makadre | 1 | - | 0.72 |
| *Instia bijuga* Vesi | 1 | - | 0.20 |
| *Santalum yasi* Yasi | 3 | - | 0.69 |
| *Swietenia macrophylla* Mahogany | 4 | - | 1.06 |

**Source: Fiji Forestry Department Data**

## 4.5 Information System Established on Tree breeding (what information is collected and stored)

The opportunity to manipulate crops is a key attraction of growing large areas of a single or small number of species. This occurs in both agriculture and forestry. The results of various tree breeding programmes around the world have been very impressive in terms of increased volume growth, better form, increased disease resistance, and improved opportunities to manage the silvicultural requirements of the stand.
Mahogany, while grown in many parts of the tropical world, has not been as intensively "managed" in a tree breeding sense as many other species. The reasons for this have not been widely canvassed, but may include such factors as the primary focus of plantation development in the tropical world to be planted area rather than genetic improvement, and hence increased per hectare output. Put another way the focus has been on quantity (of hectares) rather than the quality of those hectares. This may in part be due to the aid syndrome focussed on numbers of trees in the ground rather than the quality and end use of those trees.

The form of the current Fijian mahogany plantations is not particularly good, and there is a belief that a tree improvement programme would generate significant gains. Seed for nursery use is presently collected from the forest floor under existing plantations thus perpetuating the present poor form. There has not been attempt even to select seed from elite trees.

The prolific seeding of the existing stands is seen by some as a low cost means of re-establishing the forest by natural regeneration. This conflicts in two ways with any attempt to improve the stands through genetics. Firstly there is the cost of the tree breeding programme followed by the cost of planting the new, genetically improved trees, (as opposed to the 'free' re-establishment achieved through natural regeneration) Secondly there is the cost of removing the unimproved natural regeneration which competes with the planted stock.

These types of issues face many plantation managers. Decisions which trade off current costs against long term gains are always difficult to resolve. The problem is compounded when the funding is from government or aid, where there are competing demands for funds and economic outcome is rarely the only deciding factor.

## 4.6 Species of which Quantities of Improved Seed, Pollen, Scions and/or other Reproductive can be made Available, at Request

**Table 13: Type of reproductive material available**

| Species (scientific name) | Type of material | Available for national requests only | | Available for international request | |
|---|---|---|---|---|---|
| | | Commercial | Research | Commercial | Research |
| *Cassis mangium* | Seed | √ | √ | √ | √ |
| *Myristica spp.* | Seed | √ | √ | | √ |
| *Pinus caribaea* | Seed | √ | √ | √ | √ |
| *Santalum yasi* | Seed | | √ | | √ |
| *Sweitenia macrophylla* | Seed | √ | √ | √ | √ |
| *Tectona grandis* | Seed | √ | √ | √ | √ |

# Chapter 5: The State of National Programmes, Research, Education, Training and Legislation

## 5.1 National Forest Programmes on Forest Genetic Resources

Stipulated in the Fiji Forest Policy Statement November 2007, Fiji Natinal Forest Program 2010 - 2012 and The Regional Strategies and Action Plan for the Conservation Management and Conservation of FGR 2007 - 2015.

Role of government is to ensure the provision of adequate resources to implement Fiji Forest Policy and in facilitating the forestry development includes:

- Coordination;
- Planning;
- Legislation and Regulations;
- Government as entrepreneur;
- Capacity builder;
- Supporting research, disseminating knowledge; and
- Government as public interest protector.

**General terms/specific actions mentioned are as follows:**

- Forest resource management;
- Knowledge of the forest resources;
- Environment and nature conservation;
- Landowner and community involvement implementing SFM;
- Research programmes;
- Ecosystem stability through conservation of forest bio-diversity, water catchments and soil fertility;
- Sustainable supply of forest products and services by maintaining a sufficiently large permanent forest area under efficient and effective management;
- Engagement by landowners and communities in sustainable forest management and an equitable distribution of benefits from forest products and processors including ensured protection of intellectual property rights;
- Conservation of forests and biological resources;
- Land use planning and forest classification;
- Forest inventory;
- Bio-diversity conservation;
- Watershed management and soil conservation;
- Integrated forest resources management;
- Delimitations of management units for sustainable forest management (SFMU);
- Management plans;
- Forest management systems;
- Forest protection;
- Community forestry;
- Awareness and training;

## 5.2 Institutions (Government, University, Private, etc.) Actively Engaged In Conservation and Sustainable Forests Genetic Resources

The Fiji Forest Policy Statement was endorsed by the Fiji Cabinet in November 2007. The following is the outline of the policy areas:

1. Conservation of forest and biological resources
2. Integrated forest resources management
3. Resource owners community inmvolvement in sustainable forest management
4. Upgrading of the forest industries and promotion of high quality products
5. Institutional framework and human resources

The government departments and institutions that can influence forestry matters in Fiji are detailed in Annex 11.

## 5.3 National Coordination Mechanism to Include Different Institutional or a National Programme for Forest Genetic Resources

**National Framework for Forest Policy**

The first National Forest Policy was adopted in 1950 and gave rise to the 1953 Forest Act, which together viewed forestry primarily in the context of forest management for timber production. The Forest Act was replaced in 1992 by the Forest Decree which simplified the preceding legislation and made an initial attempt to address several decades of changing and broadening requirements of the forestry sector to take into account social, economic, environmental, cultural and political developments. In the 21$^{st}$ century, forest related policies continued to change with a sharpened focus on sustainable forest management, increased landowner aspirations, climate change mitigation and adaptation and globalization.

Due to the changes in the operating environment the need to reform Fiji's General Forest Policy has become more acute, not only by a recent development of the forest sector and the latest results from Fiji's forestry and environment review, but also because of global concern for the environment.

**National Conservation and Nature Protection Strategies**

The country's major instrument for conservation and environment are the National Environment Strategy (**NES**) and the National Biodiversity Strategy and Action Plan 2010 (**NBSAP**), which outlines the implementation of commitments under **CBD**. The **NES** and **NBSAP** have been endorsed by Cabinet and set the framework for conservation of biological diversity in Fiji's natural forests. According to **NBSAP**, conservation and sustainable management of Fiji's natural forests is the single most important means of conserving the vast majority of Fiji's endemic fauna and flora. It provides further directives for the establishment of a comprehensive and representative system of forest reserves and conservation areas, and emphasizes the role of resource owners and local communities in conservation and sustainable management of natural forest.

The Environment Management Act 2005 (**EMA**) regulates the application of principals of sustainable use and development of natural resources. It provides *inter alia*, requirements for natural resources management and environmental impact assessments.

The Rural Land Use Policy (**RLUP**), as endorsed by Cabinet in 2005, provides the umbrella framework for forest policy with regard to forest land use planning and sustainable use of forest resources. It stresses the need for a sound forest land use classification, based on comprehensive national forest programme and appropriate legislation, and proposes a National Forest Inventory (**NFI**) and the designation of a permanent forest area that also provides for forest conservation. The Rural Land Use Policy makes specific reference to protection, rehabilitation and sustainable management of natural forests as well as the sustainable use of forest plantations with regard to maintaining site quality. It touches upon sound forest land use that prevents land degradation and emphasizes on soil and watershed conservation.

Domestic and international compliance with bio-security and quarantine regulations is important to protect our natural forest and plantations from invasive species, as well as compliance with the regional and national policies and strategies for the handling and storage of chemicals and the management of waste.

## 5.4 Structure and Main Functions

**Policies, strategies and legislation**

The Fiji Forest Policy Statement was endorsed by the Fiji Cabinet in November 2007. The following is the outline of the policy areas:

1. Conservations of forest and biological resources
2. Integrated forest resource management
3. Resource owners and community involvement in sustainable forest management
4. Upgrading of the forest industries and promotion of high quality products
5. Institutional framework and human resources

Other major national policies, strategies and legislation that have substantial implications on the forestry sector are outlined below:

- Rural Land Use Policy for Fiji (**RLUP**);
- Environment Management Act (**EMA**);
- Native Land Trust Act (**NLTA**);
- Mahogany Industry Development Decree (**MIDD**);
- Fiji Pine Decree (**FPD**);
- Forest Decree (**FD**);
- Forest and Tree Genetic Resources Conservation, Management and Sustainable Use in Pacific Island Countries and Territories 2007 – 2015;
- NBSAP-IF Priorities 2010 to 2014;
- REDD-Plus Policy; and
- Climate Change Policy.

## 5.5 Trends in Support for Forest Genetic Resources

Support for forest genetic resources have become stronger over the last ten years with a lot of support from global, regional and local organizations/institutions. As well as funding has been increased for research, education and training. In addition, Fiji has established its Protected Areas Committee to look into its proper management and ensure the continuity of the sites being protected for research studies and moreover maintaining biodiversity within these protected areas. The GEF will be providing financial support for all activities to be undertaken particularly research of the protected areas.

## 5.6 Budget Allocated to Forest Genetic Resources Research

| | |
|---|---|
| USP-IAS: | FJ$150,000 equivalent to US$83,799 (Bio-diversity surveys) |
| Department of Forests: | FJ$5.82 million equivalent to US$3.29 million (FGR activities and programs, parks and reserves management, reforestation programs, forest ecosystem rehabilitation, extension advisory programs, permanent forest plot establishment, conservation and management of forest biological biodiversity of Fiji) |

## 5.7 Courses and Universities and Forest Genetic Resources explicitly covered

Fiji National University: Diploma in Forest Management and USP-IAS: Masters Degree and PhD in Forest Genetics, Taxonomy and Botany.

## 5.8 Needs and Priorities for Research, Education and Training to Support the Conservation and Sustainable Use of Forest Genetic Resources

- Taxonomy and botany training;
- Elementary trial design – optimal plot size, choice of trial design (e.g. provenance trials vs progeny trials) and randomization;
- Data capture and data editing – various practical editing methods;
- Analysis of variance;
- Calculation of genetic correlations – correlations such as age – age, trait and site – site;
- Estimation of genotype by environmental interaction;
- Repeatability; and
- Selection of forward, backward and clonal selection.

## 5.9 Legislation or Regulation that are Relevant to Forest Genetic Resources (Phytosanitary, seed production, community rights, patent legislation, other)

1. Forest Decree 1992
2. Environment Management Act 2005
3. Endangered and Protected Species Act 2002 (**EPS**)
4. Standard Material Transfer Agreement 2004 (**MTA**)
5. Bio-security Promulgation 2008
6. International Standards for Phytosanitory Measures (**ISPM** 01, **ISPM** 11 and **ISPM** 12)
7. CITES/Red List
8. Patents Act 1978.
9. Plants, Trees, Seeds, Trade Agreement
10. Trade Related Aspects of Intellectual Property Rights Agreement
11. Fiji Intellectual Property Office – litidation and advisory

## 5.10 Legal Framework for Forest Genetic Resources Strategies, Plan and Programmes

**Fiji's Environment (Biodiversity) Priorities for 2010 (Framework 2010 – 2014)**

In April 2009 all key stakeholders' met under the leadership of Department of Environment (and supported by the Roundtable) to develop a roadmap for reviving and streamlining the implementation of the following key thematic areas of the National Biodiversity Strategy and Action Plan (**NBSAP**):

- Forest conservation management
- Invasive alien species
- Inshore fisheries
- Coastal development
- Species conservation: Threatened and endangered species (trade and domestic consumption)
- Protected areas
- Inland waters

Ongoing concerns which needed to be addressed included - inadequate clarity on national priorities, inadequate coordination and collaboration among partners, and a lack of mechanism to track and access progress.

A detailed set of agreed results (strategies, objectives, actions) were identified by stakeholders for the period 2010 – 2014 for each of the above mentioned thematic areas. A total of 63 stakeholders participated in these discussions thus ensuring these results frameworks reflect the views of key actors in the sector.

Framework for each of the above thematic areas was identified. These results frameworks provide a comprehensive reference guide on the focus of government and partner efforts in each thematic area. They also provide the basis for the development of annual priorities and outputs over the period 2010 – 2014.

## 5.11 Needs for Developing or Strengthening Forest Genetic Resources

**Table 14: Needs for developing forest genetic resources legislation**

| Needs | Priority level | | | |
|---|---|---|---|---|
| | Not applicable | Low | Moderate | High |
| **Improve forest genetic resources legislation** | | | √ | |
| **Improve reporting requirements** | | | √ | |
| **Consider sanction for non-compliance** | | | | √ |
| **Create forest genetic resources targeted regulations** | | | | √ |
| **Improve effectiveness of forest genetic resources regulations** | | √ | | |
| **Enhance cooperation between forest genetic resources national authorities** | | | | √ |
| **Create a permanent national authority commission for conservation and management of forest genetic resources** | | | | √ |
| **Other (promote sustainable management and use of FGR)** | | | | √ |

## 5.12 Initiatives Necessary for Greater Viability for Forest Genetic Resources

Research and development to improve forest genetic resources conservation, management and suitable utilization is an investment for a better future of current and future generations.

**Other enabling strategy areas -Financial and other resource acquisition and management:**

- Various sources of external funds will be identified in relation to the research and development themes and the project ideas. Hopefully these will provide support for FGR related activities for the country's initiatives.
- Explore ways in which we can more effectively apply external funds and other resources which are currently available, and will seek other sources of locally generated funds to augment funds from constrained government budgets.
- It will be important to involve the private sector in new projects and activities, especially in relation to the development of forest based products.

**Monitoring and evaluation of all activities:**

- Monitoring and evaluation of the progress and performance of actions and initiatives established under the strategic plan for each research and development theme will be conducted on an annual basis.
- Lessons learnt from project successes and failures will be documented and share among key stakeholders to enhance the success of future activities and projects.

## 5.13 Specific Awareness Programme Developed for Forest Genetic Resources

***Sandalwood Development Project, Fiji:***

- Empowering communities at national level to propagate and cultivate sandalwood (*Santauln yasi*) and moreover to conserve the *Santalum yasi* gene;
- Activities include creating awareness on the importance significance of the species, management and conservation;
- Conservation and better utilization of the genetic resources of sandalwood in Fiji;
- Replanting programs continued where sandalwood occurs naturally and introduced to other parts of Fiji;
- Gene conservation (both in-situ and ex-situ) and seed stands of sandalwood established on communal land to ensure that there is a continuous supply of seeds for future use;
- Research undertaken on sandalwood for the development of a scientifically sound conservation and management strategy;
- Conserved genetic resources of *Santalum yasi*;
- Department of Forests (**DoF**) working closely with landowners that have sandalwood populations/stands for its conservation on the islands;
- Landowners are encouraged for the conservation of sandalwood populations/stands on the islands that are potentially good seed source; and
- Sandalwood manual and video documentary production.

***COWRIE Project (Towards Coastal and Watershed Restoration for the Integrity of Island Environments) & WANI (Water and Nature Initiative)***

Training manuals for communities produced in English and Fijian vernacular languages:

- A Guide to Planting Local Tree Species for Forest Restoration;
- How To Build a Simple, Low-cost Community Nursery;
- What is a Watershed and Why Look After It: and
- Vetiver - The Proven Soil Conservation Technique.

In addition, a set of five-series posters highlighting watershed management issues were produced in the Fijian, English, Hindi and Bislama languages and distributed to shools and communities in Fiji and Vanuatu. Awareness and management planning workshops were implemented for communities in 2 districts in the Ra province on the importance of restoring and protecting their upper catchment headwaters. Training on how to build simple community nurseries and the propagation of native tree species for restoration of upper catchment areas of the Nakorotubu district in Ra was undertaken.

***Other forestry community/formal education awareness components:***

- Stop deliberate burning of forests - Arson Decree 1999;
- Awareness programs on existing forest regulations;
- Environmental forestry education;
- Conservation of forests - awareness program;
- One million tree – a reforestation program;
- Forest ecosystem rehabilitation – a reforestation program;
- Sustainable Forest Management (SFM) – sustainable use of forest resources;
- Climate change adaptation and mitigation - awareness program;
- REDD Plus - awareness programs;
- Permanent Sample Plot's (PSP's) – awareness program on conservation of forest in any forest type for data collection on growth dynamics of tree species and species composition; and
- Reef resiliance program – awareness on the ridge to reef concepts.

## 5.14 Needs and Priorities for Raising Awareness of Forest Genetic Resources Issues

**Table 15: Awareness raising needs**

| Needs | Priority level | | | |
|---|---|---|---|---|
| | Not applicable | Low | Moderate | High |
| **Prepare targeted forest genetic resources** | | | | √ |
| **Prepare targeted forest genetic resources communication strategy** | | | | √ |
| **Improve access in forest genetic resources information** | | | | √ |
| **Enhance forest genetic resources training and education** | | | | √ |
| **Improve understanding of benefits and values of forest genetic resources** | | | | √ |

# Chapter 6: The State of Regional and International Collaboration

***International networks:***

## 6.1 Regional, Sub-regional, Forest Genetic Resources-bases or Thematic Networks for Forest Genetic Resources

- Deliver capacity is an area in need of strengthening for the research and development themes;
- Develop and strengthen extension, technology transfer and communication between researchers and user communities;
- Preparation of extension materials for local communities in local languages and use of appropriate media channels for dissemination are essential.

## 6.2 Needs and Priorities to Develop or Strengthen International Networks for Forest Genetic Resources

- Capacity building needs of research and development themes in a coordinated and collaborative way;
- Enabling skills development project proposals for funding and meeting the requirements of funding agencies; and
- Management training in general is recognized as an area in need of strengthening in many of the key institutions involved in FGR conservation and management.

***International programmes:***

## 6.3 International/Regional Programmes for Forest Genetic Resources

**Programmes:**

- South Pacific Regional Initiative on Forest Genetic Resources (SPRIG).
- Regional Strategies and Action Plan for the Conservation Management and Utilization of FGR in the Pacific.
- Aichi targets (CBD strategic plan 2011 to 2020) to be incorporated into NBSAP.
- South Pacific Access and Benefit Sharing Capacity Building (SPREP/GIZ)
- Programme of work for protected areas
- Fiji Invasive Species Task Force (with SPREP)
- Melanesia Spearhead Group (MSG) meetings
- South Pacific Regional Herberium
- Regional Climate Change Policy Guidelines (GIZ)
- SPC/GIZ "Climate protection through forest conservation in the Pacific Island Countries". The overarching Project goal is '*the conservation of forest ecosystems in the Pacific island countries is supported in order to mitigate climate change and preserve biodiversity'.*

## 6.4 Agencies and Main Results of the Programmes

**Results: Government agencies, private sectors and institutions:**

- Institutional strengthening and regional networking;
- Conservation and sustainable management of priority species;
- Tree improvement; and
- Demonstrating linkages between conservation, tree improvement and enhanced rural incomes.

## 6.5 International Financial Support to Forest Genetics Resources

1. **SPRIG Project Funding partners:**

- CSIRO Forestry and Forest Products, Australia;
- Queensland Forestry Research Institute (QFRI), Australia; and
- FORTECH (now URS Sustainable Development), Australia.

2. **ACP-EU FORENET:**

FORENET project will contribute towards the strengthening of capabilities in partner countries to undertake collaborative applied forest related research that will produce results directly applicable for the sustainable management of humid tropical forest, and has been seen to fall within the project concept theme of "***Enhancing capacity of local people and institutions to manage forest ecosystems***".

The main goal of this project is to introduce a simple forest vegetation classification system using the structural/physiognomic proforma method to be used within the western pacific.

The specific objectives of the project to achieve the goal are:

- To develop staff capacity of collaborating organization on the use and application of the proforma method;
- To carry out data collection using the structural/physiognomic proforma; and
- To field test the forest classification system.

3. **Global Environmental Funding (GEF):**

Under the Global Environment Facility, $USD 3.706 million has been provided for Fiji in the 4$^{th}$ cycle to assist in the conservation and management of the terrestrial forest biological diversity. Fiji, along with Samoa, Vanuatu and Nuie collectively form 2 of the world's 34

Biodivseristy Hot spots, which are the richest, diverse but most threatened reservoir of plants and animals and for these countries, the total area under any form of conservation or protection accounts for only 2.7% of their total land area; in Fiji this area is as low as 2.4% of the total land area. The main objective of the project titled "Forest and Protected Area Management" is to increase the representation of biological diversity under a systematic protected area network and in the production landscape. There are six (6) components to the project, focusing particularly on the review and reform of the Policy, Legal and Institutional arrangements for protected areas.

**4. EU-FACT Project:**

The Facilitating Agriculture Comodity and Trade project is using their existing expertise and combining it with their own, to also give rural farmers a possibility to reach international markets. Making trade accessible for developing nations is one of the main targets within the eighth Millennium Development Goal. The FACT project is helping local farmers and factories in 14 Pacific Countries, to make their products suitable for international trade. It's very important that these countries can trade, because obviously they need certain goods that they can't manufacture themselves. They might for example want computers or motorcars, so they need to look at products that they can produce and trade compatible on the world market, so often it comes from the agriculture and forestry sector.

**5. CRISP (COWRIE Project):**

- Reforestation program by increasing forest cover and protectecting upland forests.

**6. MESCAL Project:**

- Mangroove biomass assessment and rehabilitation.

**7. ITTO**

- Sustainable Forest Management practices and reduced impacts of logging.

**8. Forest Law Enforcement Governance and Trade – EU funding**

**9. Coral Triangle Pacific - ADB funding**

## 6.6 Needs and Priorities for Future International Collaboration

**Table 16: Needs for international collaboration and networking**

| Needs | Level of priority | | | |
|---|---|---|---|---|
| | Not applicable | Low | Medium | High |
| **Understanding the state of biodiversity** | | | | √ |
| **Enhancing *in situ* conservation and management** | | | | √ |
| **Enhancing *ex situ* conservation and management** | | | | √ |
| **Enhancing use of forest genetic resources** | | | | √ |
| **Enhancing research** | | | | √ |
| **Enhancing research and education** | | | | √ |
| **Enhancing legislation** | | | | √ |
| **Enhancing information management and early warning systems for forest genetic resources** | | | | √ |
| **Enhancing public awareness** | | | | √ |

***International agreements:***

## 6.7 International Agreements, Treaties, Conventions, or Trade Agreements Relevant to the Sustainable Use, Development and Conservation of Forest Genetic Resources

**Table 17: International Conventions - Fiji has become party to**

| No. | International Conventions | Year |
|---|---|---|
| **1.** | Convention on the High Seas | 1970 |
| **2.** | International Plant Protection Agreement | 1956 |
| **3.** | Convention on the Continental Shelf | 1970 |
| **4.** | Plant Protection Agreement of the South East Asia | 1971 |
| **5.** | Convention on Fishing and Conservation of the Living Resources of the High Seas | 1971 |
| **6.** | Treaty Banning Nuclear Tests in the Atmosphere, Outer Space and Underwater | 1972 |
| **7.** | Treaty on Non – proliferation of Nuclear Weapons | 1972 |
| **8.** | International Convention for the Pollution of the Sea by Oil | 1972 |
| **9.** | Convention on the prohibition of the Development, Production, and Stockpiling of bacteriological and toxic Weapons and their Destruction | 1973 |
| **10.** | International Atomic Energy Agency | 1973 |
| **11.** | International Convention Relating to the Intervention in the High Seas in Cases of Oil Pollution Casualties | 1975 |
| **12.** | International Convention on Civil Liability for Oil Pollution Damage | 1975 |
| **13.** | South Pacific Forum Fisheries Agency Convention | 1979 |
| **14.** | United Nations Convention on the Law of the Sea | 1982 |
| **15.** | International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage | 1975 |
| **16.** | South Pacific Nuclear Free Treaty and Protocol | 1985 |
| **17.** | Vienna Convention and Montreal Protocol on Substances that Deplete the Ozone Layer | 1989 |
| **18.** | Convention on the Conservation of Nature in the South Pacific (Apia Convention) | 1989 |
| **19.** | Convention for the Protection of Natural Resource and Environment of the South Pacific and their Related Protocols (SPREP Conventions) | 1989 |
| **20.** | Convention Concerning the Protection of the World Cultural and Natural Heritage | 1990 |
| **21.** | United Nations Framework Convention on Climate Change | 1992 |
| **22.** | Transboundary Movement of Hazardous Waste in the South Pacific Region (Waigani Convention) | 1996 |
| **23.** | Convention on International Trade in Endangered Species on Wild Fauna and Flora | Dec 1997 |
| **24.** | Kyoto Protocol (Climate Change Convention) | 1998 |
| **25.** | Cartagena Protocol on Bio-safety | 2001 |
| **26.** | Stockholm Convention on Persistent Organic Pollutants (POPS) | June 2001 |
| **27.** | Rio Declaration (Agenda 21) | 1992 |
| **28.** | Convention on Biological Diversity [9 Oct 1992(S); 25 Feb 1993 (R)] | 2003 |
| **29.** | International Tropical Timber Agreement | 2006 |
| **30.** | Montreal Protocol | 2010 |
| **31.** | Nagoya Protocol on ABS | Ratification in process |
| **32.** | Ozone Depleting Substances | 2007 |
| **33** | Convention on Combat Desertification | 1992 |
| **34.** | Plant, Trees, Seeds, Trade Agreement | 1993 |
| **35.** | Trade Related Aspects of Intellectual Property Rights Agreement | Jan 1995 |

## 6.8 Impact of these Agreements with Regard to the Conservation and Sustainable Use of Forest Genetic Resources

**All the international conventions – national laws, acts, under CBD – EPS, EMA, Bio-security – what convention**

- EPS developed
- Positive impacts
- Strengthened policies
- MTA Agreements developed

## 6.9 Impact of any International Convention, Treaties or Agreements with Regard to the Conservation and Sustainable Use of Forest Genetic Resources

CBD, CITES List and NBSAF report.

## 6.10 Current International Collaboration

EU-FORENET, ITTO, ACIAR, APAFRI and APFISN.

## 6.11 Regional, Sub-regional, Forest Genetic Resources-based or Thematic Networks for Forest Genetic Resources

**Table 18: Overview of the main activities carried out through networks and their outputs**

| Network name | Activities | Genus/species involved (scientific name) |
|---|---|---|
| **Secretariat of Pacific Communities (SPC)** | Germplasm exchange and information exchange. | *Endospermum medullosum* Whitewood<br>*Techtona grandis* Teak<br>*Santalum yasi* Yasi<br>*Swietenia macrophylla* Mahogany<br>*Agathis macrophylla* Dakua makadre<br>*Flueggea flexuosa* Baumuri<br>*Instia bijuga* Vesi<br>*Pinus caribaea* Pine |

## 6.12 Needs and Priorities for Future International Calloboration

**Table 19: Needs for intenational calloboration and networking**

| Needs | Level of priority | | | |
|---|---|---|---|---|
| | Not applicable | Low | Medium | High |
| **Understanding the state of bio-diversity** | | | | √ |
| **Enhancing in-situ management and conservation** | | | | √ |
| **Enhancing ex-situ management and conservation** | | | | √ |
| **Enhancing use of forest genetic resources** | | | | √ |
| **Enhancing research** | | | | √ |
| **Enhancing education and training** | | | | √ |
| **Enhancing legislation** | | | | √ |
| **Enhancing information management and early warning system for forest genetic resources** | | | | √ |
| **Enhancing public awareness** | | | | √ |

# Chapter 7: Access to Forest Genetic Resources and Sharing of Benefits Arising from their Use

***Access to forest genetic resources:***

## 7.1 Regulations with Respect to Access and Benefit Sharing of Forest Genetic Resources

Material Transfer Agreement (MTA) for Fiji has been compiled and endorsed for its implementation. There is no formal regulation for Fiji at the moment. However, the guidelines of Nagoya Protocol could be adopted and the Sustainable Development Bill 1997: Bio-prospecting is also a document that provides guidelines with respect to access and benefit sharing of forest genetic resources.

## 7.2 Legislation that Limit Access and Movement of Forest Genetic Resources

Bio-security Promulgation 2008 and draft Bio-safety Bill and Framework are the current existing legislation that limits access and movement of forest genetic resources.

## 7.3 Improve Access

Material Transfer Agreement (**MTA**) implementation and Pest Risk Analysis (**PRA**) guidelines to be adopted for best practices. However there is a great need for regulation to be developed to improve access to forest genetic resources and sharing of benefits arising from their use.

***Sharing of benefits arising out of the use of forest genetic resources:***

## 7.4 Mechanisms for Recognizing Intellectual Property Rights Related to Forest Genetic Resources

Contracts, Memorandum of Understanding's (**MOU**'s) and Memorandum of Agreements (**MOA**'s) are used in Fiji and are legal binding documents.

## 7.5 Mechanisms of Sharing Benefits Arising Out of the Use of Forest Genetic Resources

Draft Traditional Knowledge and Expression of Culture Legislation with SG's office in Fiji awaiting validation and endorsement.

# Chapter 8: Contribution of Forest Genetic Resources to Food Security and Poverty Alleviation

Approximately half of Fiji's people live in rural areas, and they depend heavily on the natural forests and agroforests for many things, from food and medicines to building and weaving materials. Forests are also of economic importance to the rural communities, through royalties from logging and also sales of carvings and non-wood forest products outside the villages. List of tree species known for contribution of forest genetic resources to food security and poverty alleviation can be found in Annex 12.

## ANNEX 1

**Main species that characterize the forest types i.e. relatively common and widespread**

| Major Forest Types | Area covered by forest type | Main species for each type | |
|---|---|---|---|
| | | Trees | Other species if applicable |
| Low land forest – 600 m | | Damanu *Calophyllum vitiense*, Sacau *Palaquim* hornei, Kaudamu *Myristica* spp., Damabi *Endiandra elaeocarpa*, Dakua makadre *Agathis macrophylla*, Yasiyasi *Syzygium* spp., Kauvula *Endopermum macrophyllum*, Mako *Trichospermum calyculatum*, Kaunicina *Haplolobus floribundus*, Vutu kana *Barringtonia edullis*, Rosarosa *Heritera ornithocephala*, Laubu *Garcinia myrtifolia*, Doi *Alphitonia zizyphoides* | |
| Upland forest – above 600 m | | Dakua makadre *Agathis macrophylla*, Sasawira *Dysoxylum richii*, Yaka *Dacrycarpus imbricatus*, Vuga *Metrosideros collina*, Kuasi *Podocarpus neriifolius*, | Drega *Alstonia montana*, Molau *Glochidion* spp., Bovu *Mussaenda raiateensis* |
| Montane forest – 800 m | | Vuga *Metrosideros collina*, Yasiyasi *Syzygium spp.* | Palms |
| Cloud forest | 50 – 100 square kilometers scattered above 600 – 900 m on the ridges and peaks of Fiji. | Balabala *Cyathea spp.*, *Dicksonia brackenrigei*, Maletawa *Dysoxyllum gillespieanum*, Niuniu *Hernandia moerenhoutiana*, *Clinostigma exorrhizum*, *Weinmaennia* spp., Yasiyasi *Syzygium spp.*, Mama *Macaranga seemanii*, Kuasi *Podocarpus affinis*, Vuga *Paphia vitiensis* | *Leptopteris* ferns, climbing *Freycinetia* spp., *Weinmannia* and *Paphia vitiensis* |
| Dry forest | | Yaka *Dacrydium nidulum*, Buabua *Fragaea gracilipes*, Velau *Gymnostoma vitiense*, Kuasi *Podocarpus neriifolius*, Kaudamu *Myristica* spp., Yasiyasi *Syzygium* spp., Sasawira *Dysoxylum richii*, Logologo *Cycas seemanni*, Sa *Parinari insularum*, Vesi *Intsia bijuga*, Yasi *Santalum yasi*. | |
| Deciduous Coastal dry forest | | Wiriwiri *Gyrocarpus americanus*, Vesiwai *Pongamia pinnata*, Manui *Pleiogynium timoriense*, Yamo *Garuga floribunda*, Manawi *Koelreuteria elegans*, Moivi *Kingiodendron platycarpum*, Bausa *Planchunella grayana*, Baubulu *Manilkara*, Cevua *Vavaea amicorum*, Kaukauloa *Diospyros samonensis* | |
| Mangrove forest | 38,742.191 ha | Tiri *Rhizophora*, Dogo *Bruguiera gymnorrhiza*, Dabi *Xylocarpus granatum*, Sagali *Lumnitzera littorea*, Kedra ivi *Heritiera littoralis*, Sinu gaga *Excoecaria agallocha*, | |
| Coastal strand forest | | Lawere *Ipomoea pes-caprae*, Drautolu *Vigna marina*, Vevedu *Scaevola taccada* Dralakaka *Vitex irifolia*, Dilo *Callophyllum inophyllum*, Veis *Intsia bijuga*, Tatadia *Acacia simplicifolia*, Tavola damu *Terminalia litoralis*, | Vau *Hibiscus tiliaceus*, Vadra *Pandanus tectorius* |
| Freshwater wetland forest | 19,207.813 ha | Kuta *Eleocharis* spp., Qatu *Dicranopteris* spp, Utonibulumakau *Annona glabra*, Vutuwai *Barringtonia racemosa*, Ivi *Inocarpus fagifer*, | Vau *Hibiscus tiliaceus*, Vadra *Pandanus tectorius* |
| River vegetation | | Yasiwai *Syzygium seemannianum*, Loseloseniwai *Ficus bambusifolia*, Kadakada *Acalypha rivularis* | |
| Disturbed forest | | Qato *Dicranopteris linearis*, Gasau *Miscanthusfloridulus*, Vadra *Pandanus* spp., Wase *Dodonea viscosa*, Draga *Alstonia montana*, Siti *Grewia citrifolia*, Kura *Morinda citrifolia*, Bovu *Mussaendaraiateensis*, Maqo *Magifera indica*, Nokonoko *Casaurina equisitifolia*, Vaivai *Leucaena leucocephala*, | |
| Secondary forest | 181,108.941 ha | Doi *Alphitonia* spp., Davo *Macatanga* spp., Salato *Dendrocnide harveyi*, Mako *Trichospermum* spp., Pisipisi *Spathodea campanulata* | |

**Source: Palms of the Fiji Islands**

## ANNEX 2

**Forest plant species actively managed for human utilization**

| Species (Scientific Name) | Native (N) or Exotic E) | Current uses (code) | If managed, type of management system (e.g. natural forest, plantation, agro-forestry) | Area managed if known (ha) |
|---|---|---|---|---|
| ***Agathis macrophylla*** | N | 1 | Natural forest | 28.48 |
| ***Agathis robustum*** | E | 1 | Natural Forest | 3.97 |
| ***Aglaia archboldiana*** | N | 4 | Agro-forestry | 6.32 |
| ***Aleurites fordii*** | N | 4 | Natural forest | 0.36 |
| ***Annona muricata*** | E | 4 & 5 | Agro-forestry | 0.07 |
| ***Barringtonia edulis*** | N | 4 | Natural forest | 3.35 |
| ***Bischofia javanica*** | N | 1 & 6 | Natural forest | 37.13 |
| **Dogo *Bruguirea gymnorhiza*** | N | 3 | Mangrove foret | 161.61 |
| ***Burchella brachypoda*** | N | 1 | Natural forest | 1.06 |
| ***Calliandra callothyrsus*** | E | 5 | Agro-forestry | 15.4 |
| ***Calophyllum vitiense*** | N | 1 | Natutal forest | 14.75 |
| ***Calophyllum inophyllum*** | N | 1 | Natural forest | 2.81 |
| ***Canaga odorata*** | N | 6 | Natural forest | 2.76 |
| ***Casaurina equisetifolia*** | N | 4 & 6 | Natural forest | 5.7 |
| ***Casaurina nodiflora*** | N | 1, 4 & 6 | Agro-forestry | 3.32 |
| ***Cerbera manghas*** | N | 4 | Agro-forestry | 0.06 |
| ***Cinnamomum fitianum*** | E | 4 &5 | Agro-forestry | 3.04 |
| ***Citrus sp.*** | N | 4 | Natural forest | 6.04 |
| ***Cocos nucifera*** | N | 1 & 4 | Natural forest | 677.54 |
| ***Cordia subcordata*** | N | 4 | Naatural forest | 0.21 |
| ***Cumminghamii* spp** | E | 5 & 6 | Natural forest | 0.35 |
| ***Cupressus lusitanica*** | E | 6 | Agro-forestry | 0.45 |
| ***Dacrycarpus imbricatus*** | N | 1 & 6 | Natural forest | 14.63 |
| ***Dacrydium nidulum*** | N | 1 | Natural forest | 2.12 |
| ***Decaspermum fruticosum*** | N | 1 | Natural forest | 0.09 |
| ***Delumix regia*** | E | 5 & 6 | Agro-forestry | 3.73 |
| ***Dysoxylum richii*** | N | 1 & 4 | Natural forest | 1.07 |
| ***Elaeocarpus chelonimorphus*** | N | 1 | Natural forest | 1.81 |
| ***Endospermum macrophyllum*** | N | 1 & 6 | Natural forest | 5.85 |
| ***Erythrina variegata*** | N | 5 | Agro-forestry | 0.58 |
| ***Flueggea fluxuosa*** | E | 4 & 5 | Agro-forestry | 11.4 |
| ***Garcinia myrtifolia*** | N | 1 | Natural forest | 2.27 |
| ***Gnetum gnemon*** | N | 1 | Natural forest` | 0.6 |
| ***Gonystylus punctatus*** | N | 1 | Natural forest | 0.87 |
| ***Gymnostoma vitiense*** | N | 6 | Natural Forest | 2.51 |
| ***Inocarpus fagifer*** | N | 4 & 6 | Agro-forestry | 0.79 |
| ***Intsia bijuga*** | N | 1 & 3 | Natural Forest | 114.87 |
| ***Kermadecta ferruginea*** | N | 1 | Natural forest | 0.08 |
| ***Millettia pinnata*** | N | 5 & 6 | Natural forest | 1.79 |
| ***Morindao citrifolia*** | N | 4 & 5 | Agro-forestry | 0.24 |
| ***Myristica* spp** | N | 1 | Natural forest | 56.16 |
| ***Pagiantha thurstonii*** | N | 4 | Natural forest | 0.47 |
| ***Palaquium hornei*** | N | 1 | Natutal forest | 0.05 |
| ***Pandanus* spp** | N | 4 & 6 | Natural forest | 0.04 |
| ***Parinari insularum*** | N | 1 | Natural forest | 0.03 |
| ***Pinus Carribea*** | E | 1 & 2 | Plantation | 7.01 |
| ***Podocarpus affinis*** | N | 4 | Natural forest | 1.52 |
| ***Pometia pinnata*** | N | 4 | Natural forest | 4.75 |
| ***Pongamia pinnata*** | N | 3, 4 & 6 | Natural forest | 1.52 |
| ***Psidium guajava*** | E | 4 & 5 | Agro-forestry | 0.14 |
| ***Retrophyllum vitiense*** | N | 1 & 6 | Natural forest | 9.53 |
| ***Santulum yasi*** | N | 4 | Natural forest | 88.37 |
| ***Semanea semmanii*** | N | 1 & 5 | Agro-forestry | 0.42 |
| ***Serianthis melanesica*** | N | 1 & 5 | Agro-forestry | 1.05 |
| ***Splraecanthemum graeffei*** | N | 1 | Natural forest | 8.76 |
| ***Storckiella vitiensis*** | N | 4 | Agro-forestry | 7.67 |
| ***Swietenia macrophylla*** | E | 1 | Plantation | 237.13 |
| ***Syzygium decussatum*** | N | 1 & 6 | Natural fores | 1.4 |
| ***Syzygium malaccense*** | N | 4 | Natural forest | 0.83 |
| ***Tectona grandis*** | E | 1 | Plantation | 523.46 |
| ***Terminalia cattapa*** | N | 4 | Natural forest | 13.96 |
| ***Vavaea amicorum*** | N | 4 | Natural forests | 0.54 |
| **Total** | | | | **2,104.89 ha** |

**Source: COWRIE project data, Fiji Forestry Data (One Million Tree) & CI Data.** **Current use:** 1 – Solid wood products; 2 – Pulp & paper; 3 – Energy (fuel); 4 – Non wood forest products (food, fodder, medicine, etc); 5 – Used n agro-forestry system; 6 – Other (water management, windbreak, scenting)

## ANNEX 3

**Tree species of significant environmental services and social value:**

| Species (scientific name) | Native (N) or Exotic (E) | Environmental Service or Social Value (code) |
|---|---|---|
| *Acacia richii* Qumu | N | 1, 2, 3, 4 & 7 |
| *Agathis macrophylla* Dakua makadre | N | 1, 3, 4 & 7 |
| *Aleurites moluccana* Lauci | N | 1, 3, 4 & 7 |
| *Alphotonia franguloides* Doi damu | N | 1, 3 & 4 |
| *Alphotonia zizyphoides* Doi | N | 1, 3, 4 & 7 |
| *Alstonia costata* Saurua | N | 1, 3 & 4 |
| *Alstonia vitiensis* Sorua | N | 1, 3 & 4 |
| *Amaroria soulameoides* Vasa ni veikau | N | 1, 3, 4 & 7 |
| *Artocarpus altilis* Breadfruit | N | 1, 3, 4 & 7 |
| *Artocarpus integra* Uto-ni-dia | E | 1 & 7 |
| *Atuna racemosa* Makita | N | 1, 3, 4 & 7 |
| *Barringtonia asiatica* Vuturakaraka | N | 1 & 3 |
| *Barringtonia edulis* Vutu | N | 1, 3, 4 & 7 |
| *Bischofia javanica* Koka | N | 1, 3, 4 & 7 |
| *Brugulera gymnorrtiza* Dogo | N | 1, 3, 4 & 7 |
| *Buchanania attenuata* Kaukaro | N | 1 & 3 |
| *Burckella parviflora* Baumika | N | 1 & 3 |
| *Calophyllum inophyllum* Dilo | N | 1, 3, 4 & 7 |
| *Calophyllum neo-ebudicum* Damanu | N | 1, 3 & 4 |
| *Calophyllum vitiense* Damanu | N | 1, 3 & 4 |
| *Canaga odorata* Makosoi | N | 1, 3, 4 & 7 |
| *Canarium spp.* Kaunicina | N | 1, 3 & 4 |
| *Casaurina equisetifolia* Nokonoko | N | 1, 3 & 7 |
| *Cerbera manghas* Vasa | N | 1, 3 & 7 |
| *Cocos nucifera* Coconut | N | 1, 3, 4, 6 & 7 |
| *Commersonia bartramia* Sama | N | 1, 3 & 7 |
| *Cordia subcordata* Nawanawa | N | 1, 3, 4 & 7 |
| *Cordyline fruticosa* Vasili | N | 1, 3, 4 & 7 |
| *Crossostylis seemannnii* Tirivanua | N | 1, 3 & 7 |
| *Cyathea spp.* Balabala | N | 1, 3 & 7 |
| *Cynometra insularis* Moivi/Cibicibi | N | 1, 3 & 7 |
| *Dacrycarpus imbricatus* Amunu | N | 1 & 3 |
| *Decaspermum vitiense* Nuqanuqa | N | 1, 2 & 3 |
| *Decrydium nidulum* Yaka | N | 1, 2 & 3 |
| *Decussocarpus retrophyllum vitiensis* Dakua salusalu | N | 1 & 3 |
| *Degeneria vitiensis* Masiratu | N | 1 & 3 |
| *Dillenia biflora* Kuluva | N | 1, 3, 4 & 7 |
| *Dysoxylum richii* Tarawaukeirakaraka | N | 1, 3 & 7 |
| *Elaeocarpus spp.* Kabi | N | 1 & 3 |
| *Elattostachys falcata* Marasa | N | 1, 3, 4 & 7 |
| *Emmenosperma micropetalum* Tomanu | N | 1, 3, 4 & 7 |
| *Endospermum maccrophyllum* Kauvula | N | 1 & 3 |
| *Erythrina variegata* Drala | N | 1, 2 & 3 |
| *Ficus baraclayana* Losilosi | N | 1, 3 & 7 |
| *Ficus fulvo-pilosa* Ai-masi | E | 1, 3 & 7 |
| *Ficus obliqua* Baka | E | 1, 3 & 7 |
| *Ficus prolixa* Baka ni Viti | E | 1, 3 & 7 |
| *Ficus smithii* Nunu | N | 1, 3 & 7 |
| *Ficus vitiensis* Lolo | N | 1, 3 & 7 |
| *Fragraea gracillipes* Buabua | N | 1, 3, 4 & 7 |
| *Garcinia myrtifolia* Laubu | N | 1 & 3 |
| *Geissois ternata* Vure | N | 1 & 3 |
| *Glochidion seemannii* Molau | N | 1, 3 & 7 |
| *Gmelina vitiensis* Rosawa | N | 1 & 3 |
| *Gnetum gnemon* Sukau | N | 1, 3 & 7 |
| *Gonystylus punctatus* Mavota | N | 1, 3, 4 & 7 |
| *Gymnostoma vitiense* Velau | N | 1, 3 & 7 |
| *Gyrocarpus americanus* Wiriwiri | N | 1, 3 & 7 |
| *Haplolobus floribundus* Kaunigai | N | 1, 3 & 7 |
| *Hemandia olivacea* Makoloa | N | 1 & 3 |
| *Heritiera ornithocephala* Rosarosa | N | 1, 3 & 7 |
| *Hibiscus tiliaceus* Vau | N | 1, 3 & 7 |
| *Inocarpus fagifer* Ivi | N | 1, 2, 3, 4 & 7 |
| *Instia bijuya* Vesi | N | 1, 2, 3, 4 & 7 |
| *Jatropha curcas* Banidaki | N | 7 |

| | | |
|---|---|---|
| *Kingi odendron platycarpum* Moivi | N | 1 & 3 |
| *Lumnitzera littorea* Sagale | N | 1, 3 & 7 |
| *Macaranga graffeana* Gadoa | N | 1, 3 & 7 |
| *Macaranga harveyana* Gadoa | N | 1, 3 & 7 |
| *Mangifera indica* Mango | N | 7 |
| *Mastixiodendron robustum* Duvula | N | 1 & 3 |
| *Metrosideros collina* Vuga | N | 1, 3 & 7 |
| *Millettia pinnata* Vesiwai | N | 1, 2, 3 & 7 |
| *Myristica spp.* Kaudamu | N | 1 & 3 |
| *Neonauclea forsteri* Vacea | N | 7 |
| *Pagiantha thurstonii* Vuetinaitasiri | N | 1, 3, 4 & 7 |
| *Palaquim hornie* Sacau | N | 1 & 3 |
| *Palaquim porphyreum* Bauvudi | N | 1 & 3 |
| *Palaquim vitilevuensis* Bau | N | 1 & 3 |
| *Parinari insularum* Sa | N | 1, 3 & 7 |
| *Pittosporum spp.* Tuvakalou | N | 7 |
| *Planchonella vitiensis* Sarosaro | N | 1, 3 & 7 |
| *Pleiogynium timoriense* Manawi | N | 1, 3 & 7 |
| *Plerandra spp,* Sole | N | 1 & 3 |
| *Podocarpu affinis* Kuasi | N | 1 & 3 |
| *Podocarpu neriifolius* Kuasi | N | 1, 3, 4 & 7 |
| *Pometia pinnata* Dawa | N | 1, 3 & 7 |
| *Pongamia/Millettia pimmata* Vesi wai | N | 1, 2, 3 & 7 |
| *Premna serratifolia* Yaro | N | 1, 3, 4 & 7 |
| *Pterocymbium oceanicum* Ma | N | 1 & 3 |
| *Retrophyllum vitiense* Dakua salusalu | N | 1 & 3 |
| *Rhizophora mangle* Tiriwai | N | 1, 3, 4 & 7 |
| *Samanea saman* Vaivai-ni-vavalagi | N | 1, 2, 3 & 7 |
| *Santalum yasi* Yasi dina | N | 1, 3 & 7 |
| *Semecarpus vitiense* Kaukaro | N | 1 & 3 |
| *Serianthes spp.* Vaivai-ni-veikau | N | 1, 2, 3, 4 & 7 |
| *Spondias dulcis* Wi | N | 1, 3 & 7 |
| *Sterculia vitiensis* Waciwaci | N | 1, 3 & 7 |
| *Storckiella vitiensis* Marasa | N | 1, 2, 3, 4 & 7 |
| *Syzygium decussatum* Yasimoli | N | 1 & 3 |
| *Syzygium spp.* Yasiyasi | N | 1 & 3 |
| *Terminilia pterocarpa* Tivi | N | 1 & 3 |
| *Trichospermum calyculata* Makoloa | N | 1 & 3 |
| *Trichospermum richii* Mako | N | 1 & 3 |
| *Turrillia vitiensis* Kauceuti | N | 1 & 3 |

**Source: Fiji Forestry Department and USP-IAS Data**

**Service and values include:** 1 – Soil and water conservation including watershed management; 2 – Soil fertility; 3 – Bio-diversity Conservation; 4 – Cultural values; 5 – Aesthetic values; 6 – Religious values; 7 – Other (dyes, pottery glazing, ink, firewood, medicinal, food, firebreak, thatching, posts, boat making, coastal protection, carving, ornamental, living fence, hand tools, fishing rod, bio-fuel, comb making and spears)

## ANNEX 4

**Tree and other woody forest species identified as being threathened.**

| *Family* | *Species* | *Common Name* |
|---|---|---|
| ***Barringtoniceae*** | Barringtonia asiatica | Vutu |
| ***Blechnaceae*** | Boodia brackenridgei | |
| ***Botoginaceae*** | Cordia subcordata | Nawanawa |
| ***Burseraceae*** | Canarium harveyi var. 1 | Kaunicina |
| ***Caesalpiniaceae*** | Cynometra insularis | Cibicibi |
| ***Caesalpiniaceae*** | Intsia bijuga | Vesi |
| ***Casaurinaceae*** | Gymnostema vitiensis | Velau |
| ***Chrysobalanaceae*** | Parinari insularum | Sa |
| ***Clusiaceae*** | Calophyllum inophyllum | Dilo |
| ***Clusiaceae*** | Calophyllum vitiensis | Damanu |
| ***Combretaceae*** | Lumnitzera littorea | Sagali |
| ***Combretaceae*** | Terminalia capitanea | Tiviloa |
| ***Combretaceae*** | Terminalia luteola | Bausomi tivi |
| ***Combretaceae*** | Terminalia psilantha | Bausomi |
| ***Combretaceae*** | Terminalia pterocarpa | Tivi |
| ***Combretaceae*** | Terminalia simulans | |
| ***Combretaceae*** | Terminalia strigillosa | Tivi losi |
| ***Cunoniaceae*** | Acsmithia vitiensis | |
| ***Cunoniaceae*** | Geissois imthurnii | Vure |
| ***Cunoniaceae*** | Geissois stipularis | Vure |
| ***Cunoniaceae*** | Geissois superb | Vure |
| ***Cunoniaceae*** | Geissois ternate | |
| ***Cunoniaceae*** | Geissois ternate | |
| ***Cunoniaceae*** | Spiraeanthemum graeffei | Katakata, kutakuta, kutukutu |
| ***Cunoniaceae*** | Spiraeanthemum serratum | |
| ***Cunoniaceae*** | Weinmannia exigua | |
| ***Cyatheaceae*** | Cyathea mocropelidota | |
| ***Cyatheaceae*** | Cyathea plagiostegia | |
| ***Cyatheaceae*** | Cycas seemannii | |
| ***Degeneriaceae*** | Degeneria roseiflora | Karawa yaranggele |
| ***Euphorbiaceae*** | Endospermum robbieamum | Kauvula |
| ***Gramineae*** | Ischaemum byrone | Hilo Ischaemum |
| ***Guttiferae*** | Calophyllum amblyphyllum | Damanu |
| ***Guttiferae*** | Calophyllum leueocarpum | |
| ***Guttiferae*** | Gracinia adinantha | Raumba, Bulumaga |
| ***Loganiaceae*** | Geniostoma calcicola | |
| ***Loganiaceae*** | Geniostoma clavigerum | |
| ***Loganiaceae*** | Geniostoma stipulare | |
| ***Loganiaceae*** | Neuburgia macroloba | Vacea |
| ***Melastomataceae*** | Astronidium degereri | |
| ***Melastomataceae*** | Astronidium inflatum | |
| ***Melastomataceae*** | Astronidium lepidotum | |
| ***Melastomataceae*** | Astronidium palladiflorum | |
| ***Melastomataceae*** | Astronidium saulae | |
| ***Melastomataceae*** | Astronidium sessile | |
| ***Melastomataceae*** | Mediniila decora | |
| ***Melastomataceae*** | Mediniila kambikambi | Kabikabi |
| ***Melastomataceae*** | Mediniila spectabilis | |
| ***Melastomataceae*** | Mediniila waterhousei | Tagimoucia, tekiteki vuina |
| ***Motheawa*** | | |
| ***Meliaceae*** | Vavaea amicorunt | Cevua |
| ***Meliaceae*** | Zylocarpus granatum | Dabi |
| ***Mimosaeae*** | Samanea saman | Raintree |
| ***Myristicaceae*** | Myristica castaneifolia | Kaudamu |
| ***Myrtaccao*** | Cleistocalyx decusssatus | Yasimoli |
| ***Myrtacae*** | Cleistocalyx eugenioides | Yasiyasi |
| ***Palmae*** | Alsmiltia longipes | |
| ***Palmae*** | Balaka longirostris | |
| ***Palmae*** | Balaka macrocarpa | |
| ***Palmae*** | Balaka microcarpa | |
| ***Palmae*** | Balaka seemannii | |
| ***Palmae*** | Calamus vitiensis | |
| ***Palmae*** | Clincistigma exorrhizum | |
| ***Palmae*** | Cyplhosperma tangs | |
| ***Palmae*** | Cypihosperma trichospatdix | |
| ***Palmae*** | Gulubia microcarpa | |

| | | |
|---|---|---|
| ***Palmae*** | Neuveitchia storckii | |
| ***Palmae*** | Physokentia rosea | |
| ***Palmae*** | Physeikentia thrustunii | |
| ***Palmae*** | Pritchardia thurstanii | |
| ***Palmae*** | Veitchia joannis | |
| ***Palmae*** | Veichia pedionoma | |
| ***Palmae*** | Veichia petiolata | |
| ***Palmae*** | Veitchia simulans | |
| ***Podocarpaceae*** | Dacrydium nausoriense | Yaka, tagitagi |
| ***Podocarpaceae*** | Podocarpus affinis | |
| ***Rubiaceae*** | Gardenia anapetes | Tirikiloki |
| ***Rubiaceae*** | Gardenia candida | |
| ***Rubiaceae*** | Gardenia grievei | Deladrega |
| ***Rubiaceaec*** | Gardenia hillii | |
| ***Rubiaceae*** | Guetcarda speciosa | Buabua |
| ***Rhizophoraceae*** | Bruguiera gynnorhiza | Dogo |
| ***Sapindaceae*** | Pommetia pinnata | Dawa |
| ***Sapotacaee*** | Palayuium hornei | Sacau |
| ***Sapotacaee*** | Palayuium purphyreum | Bauvudi |
| ***Tiliaceaer*** | Trichospermum richii | Mako |

**Source: EPS Act 2002.**

## ANNEX 5

**Annual quantity of seed produced and current state of forest reproductive material of the main forest tree and other woody species in the country (mean of 5 years):**

| Species<br>Scientific name | Native (N) or Exotic (E) | Total quantity of seeds used (kg) |
|---|---|---|
| ***Albizia falcataria*** | E | 0.100 |
| **Bau *Palaquium vitilevuense*** | N | 0.370 |
| **Buabua *Fagraea gracilipes*** | N | 0.009 |
| **Baumuri *Flueggea flexuosa*** | E | 0.021 |
| **Cocoa *Theobroma cacao*** | E | 0.002 |
| **Dakua makadre *Agathis macrophylla*** | N | 1.632 |
| **Dakua salusalu *Decussocarpus vitiensis*** | N | 0.628 |
| **Doi *Alpitonia zizyhoides*** | N | 1.900 |
| **Dogo *Bruguiera gymnorrhiza*** | N | 2.800 |
| **Duvula *Mastixiodendron robustum*** | N | 0.800 |
| **Kabi *Elaeocarpus kambi*** | N | 13.400 |
| **Kaiceuti *Turillia vitiensis*** | N | 0.077 |
| **Kaudamu *Myristica castaneifolia*** | N | 52.700 |
| **Kauamu *Myristica chartacea*** | N | 14.400 |
| **Kaudamu *Myristica gillespieana*** | N | 9.000 |
| **Kaudamu *Myristica grandifolia*** | N | 10.400 |
| **Kaudamu *Myristica macranths*** | N | 1.300 |
| **Kautoa *Dysoxylum hornei*** | N | 0.027 |
| **Kauvula *Endospermum macrophyllum*** | N | 4.450 |
| **Koka *Bischofia javanica*** | N | 0.002 |
| **Kuasi *Podocarpus nerifolius*** | N | 0.017 |
| **Kura *Morinda citrifolia*** | N | 0.007 |
| **Mahogany *Sweitenia macraphylla*** | E | 210.400 |
| **Makosoi *Cananga odorata*** | N | 1.800 |
| **Mala *Dysoxylum quercifolium*** | N | 19.000 |
| **Manawi *Koelreuteria elegans*** | N | 2.900 |
| **Marasa *Storckiella vitiensis*** | N | 0.402 |
| **Masiratu *Degeneria vitiensis*** | N | 2.600 |
| **Mavota *Gonystylus punctatus*** | N | 5.950 |
| **Moli karokaro *Citrus lemon*** | N | 0.050 |
| ***Sandalwood Hybrid*** | E | 0.636 |
| **Yasi ni India *Santalum album*** | E | 0.360 |
| **Yasi *Santalum yasi*** | N | 2.146 |
| **Sasawira *Dysoxylum richii*** | N | 1.400 |
| **Tadalo *Pagiantha thurstonii*** | N | 0.080 |
| **Tavola *Terminalia catapa*** | N | 6.600 |
| **Teak *Tectona grandis*** | E | 1.900 |
| **Velau *Gymnostoma vitiense*** | N | 0.300 |
| **Vesi *Intsia bijuga*** | N | 0.037 |
| **Total** | | **370.603 kg** |

**Source: Fiji Forestry Department Data.**

## ANNEX 6

**Annual number of seedlings (or vegetative propagules) producted for the main forest tree and other woody species (mean for the last five years):**

| Species<br>Scientific name | Native (N) or Exotic (E) | Total quantity of seedlings production |
|---|---|---|
| **Amunu *Dacrycarpus imbricatus*** | N | 3 |
| **Cibicibi *Cynometra insularis*** | N | 158 |
| **Cypress** | E | 900 |
| **Dakua salusalu *Decussocarpus vitiensis*** | N | 1,681 |
| **Dakua makadre *Agathis macrophylla*** | N | 4,208 |
| ***Agathis robusta*** | E | 683 |
| **Ivi *Inocarpus fagifer*** | N | 18 |
| **Kaudamu *Myristica* spp.** | N | 4,135 |
| **Kauvula *Endospermum macrophyllum*** | N | 553 |
| **Koka *Bischofia javanica*** | N | 712 |
| **Kuasi *Podocarpus nerifolius*** | N | 28 |
| **Kura *Morinda citrifolia*** | N | 2,900 |
| **Laubu *Garcinia myrtifolia*** | N | 158 |
| **Lele *Abrus precatorius*** | N | 221 |
| **Makosoi *Conanga ordorata*** | N | 41 |
| **Marasa *Storckiella vitiensis*** | N | 683 |
| **Masiratu *Degeneria vitiensis*** | N | 115 |
| **Mavota *Gonystylus punctatus*** | N | 42 |
| **Moli *Citus* spp.** | N | 356 |
| **Pine *Pinus caribaea*** | E | 3,000,000 |
| ***Santalum album*** | N | 30 |
| ***Santalum hybrid*** | E | 672 |
| ***Santalum austro-caledonicum*** | E | 617 |
| **Yasi *Santalum yasi*** | N | 7,426 |
| **Mahogany *Sweitenia macrophylla*** | E | 248,925 |
| **Sorua *Alstonia* spp.** | N | 1 |
| **Teak *Tectona grandis*** | E | 90,000 |
| **Tadalo *Pagiantha thurstonii*** | N | 1,164 |
| **Tavola *Terminalia catapa*** | N | 1,500 |
| **Velau *Casaurina equisetifolia*** | N | 4,927 |
| **Vesi *Intsia bijuga*** | N | 1,564 |
| **Yaka *Dacrycarpus imbricartus*** | N | 53 |
| Total | | **3,374,474** |

**Source: Fiji Forestry Department Data, Future Forests Ltd, Fiji Pine Limited, Fiji Hardwood Cooperation Ltd**

## ANNEX 7

**Summary to the Flora Classification of Ferns and Seed Plants formally recorded for Fiji**

| Major Plant Groups | Plant Group | No. of family | *Family* | No. of species |
|---|---|---|---|---|
| Ferns | Fern allies | 1 | *Psilotaceae* | 3 |
| Spore producing plants | | 2 | *Equisetaceae* | 1 |
| | | 3 | *Lycopodiaceae* | 14 |
| | | 4 | *Selaginellaceae* | 7 |
| | Ferns | 5 | *Ophioglossaceae* | 7 |
| | | 6 | *Osmundaceae* | 1 |
| | | 7 | *Schizaeaceae* | 4 |
| | | 8 | *Gleicheniaceae* | 4 |
| | Tree ferns | 9 | *Cyatheaceae* | 13 |
| | | 10 | *Hymenophyllaceae* | 26 |
| | | 11 | *Dennstaedtiaceae* | 8 |
| | | 12 | *Hypolepidaceae* | 5 |
| | | 13 | *Lindsaeaceae* | 20 |
| | | 14 | *Davalliaceae* | 16 |
| | | 15 | *Vittariaceae* | 34 |
| | | 16 | *Aspleniaceae* | 17 |
| | | 17 | *Arthyriaceae* | 12 |
| | | 18 | *Thelypteridaceae* | 24 |
| | | 19 | *Aspidiaceae* | 38 |
| | | 20 | *Lomariopsidaceae* | 30 |
| | | 21 | *Polypodiaceae* | 19 |
| **Total Species of Ferns** | | | | **304** |
| **Seed Plants** | **Gymnosperms** | **No. of family** | ***Family*** | **No. of Species** |
| | | 1 | *Cycadaceae* | 1 |
| | | 2 | *Podocarpaceae* | 9 |
| | | 3 | *Araucariaceae* | 5 |
| | | 4 | *Pinaceae* | 2 |
| | | 5 | *Cupressaceae* | 2 |
| | | 6 | *Gnetaceae* | 1 |
| **Total Species of Gymnosperms** | | | | **20** |
| **Seed Plants** | **Angiosperms** | **No. of family** | ***Family*** | **No. of Species** |
| | Flowering plants | 7 | *Limnocharitaceae* | 1 |
| | Monocots | 8 | *Alismataceae* | 1 |
| | | 9 | *Hydrocharitaceae* | 3 |
| | | 10 | *Potamogetonaceae* | 1 |
| | | 11 | *Ruppiaceae* | 1 |
| | | 12 | *Cymodoceaceae* | 3 |
| | | 13 | *Triuridaceae* | 1 |
| | | 14 | *Liliaceae* | 4 |
| | | 15 | *Alliaceae* | 2 |
| | | 16 | *Agavaceae* | 8 |
| | | 17 | *Amaryllidaceae* | 5 |
| | | 18 | *Philesiaceae* | 1 |
| | | 19 | *Asparagaceae* | 1 |
| | | 20 | *Smilacaceae* | 1 |
| | | 21 | *Dioscoreaceae* | 5 |
| | | 22 | *Taccaceae* | 2 |
| | | 23 | *Pontederiaceae* | 3 |
| | | 24 | *Iridaceae* | 3 |
| | | 25 | *Strelitziaceae* | 2 |
| | | 26 | *Musaceae* | 8 |
| | | 27 | *Heliconiaceae* | 5 |
| | | 28 | *Costaceae* | 1 |
| | | 29 | *Zingiberaceae* | 17 |
| | | 30 | *Cannaceae* | 1 |
| | | 31 | *Marantaceae* | 3 |
| | | 32 | *Orchidaceae* | |
| | | 33 | *Cyperaceae* | 44 |
| | | 34 | *Bromeliaceae* | 3 |
| | | 35 | *Commelinaceae* | 6 |
| | | 36 | *Flagellariaceae* | 3 |
| | | 37 | *Joinvilleaceae* | 1 |
| | | 38 | *Poaceae* | 134 |
| | | 39 | *Arecaceae* | 49 |
| | | 40 | *Araceae* | 15 |

| | | | |
|---|---|---|---|
| | 41 | *Lemnaceae* | 1 |
| | 42 | *Pandanaceae* | 20 |
| | 43 | *Typhaceae* | 1 |
| Dicots | 44 | *Degeneriaceae* | 1 |
| | 45 | *Annonaceae* | 22 |
| | 46 | *Myristicaceae* | 6 |
| | 47 | *Aristolochiaceae* | 2 |
| | 48 | *Piperaceae* | 16 |
| | 49 | *Peperomiaceae* | 31 |
| | 50 | *Chloranthaceae* | 2 |
| | 51 | *Trimeniaceae* | 1 |
| | 52 | *Monimiaceae* | 1 |
| | 53 | *Hernandiaceae* | 3 |
| | 54 | *Lauraceae* | 37 |
| | 55 | *Cassythaceae* | 1 |
| | 56 | *Gyrocarpaceae* | 1 |
| | 57 | *Nymphaeaceae* | 2 |
| | 58 | *Ceratophyllaceae* | 1 |
| | 59 | *Menispermaceae* | 1 |
| | 60 | *Ranunculaceae* | 1 |
| | 61 | *Papaveraceae* | 1 |
| | 62 | *Ulmaceae* | 5 |
| | 63 | *Cannabaceae* | 1 |
| | 64 | *Moraceae* | 32 |
| | 65 | *Urticaceae* | 35 |
| | 66 | *Casuarinaceae* | 3 |
| | 67 | *Balanopaceae* | 1 |
| | 68 | *Phytolaccaceae* | 1 |
| | 69 | *Nyctaginaceae* | 7 |
| | 70 | *Aizoaceae* | 1 |
| | 71 | *Cactaceae* | 2 |
| | 72 | *Molluginaceae* | 1 |
| | 73 | *Caryophyllaceae* | 1 |
| | 74 | *Portulacaceae* | 7 |
| | 75 | *Basellaceae* | 1 |
| | 76 | *Amaranthaceae* | 13 |
| | 77 | *Chenopodiaceae* | 1 |
| | 78 | *Polygonaceae* | 4 |
| | 79 | *Plumbaginaceae* | 3 |
| | 80 | *Dilleniaceae* | 2 |
| | 81 | *Ochnaceae* | 1 |
| | 82 | *Theaceae* | 3 |
| | 83 | *Saurauiaceae* | 1 |
| | 84 | *Clusiaceae* | 18 |
| | 85 | *Elatinaceae* | 1 |
| | 86 | *Elaeocarpaceae* | 22 |
| | 87 | *Tiliaceae* | 12 |
| | 88 | *Sterculiaceae* | 22 |
| | 89 | *Bombacaceae* | 2 |
| | 90 | *Malvaceae* | 26 |
| | 91 | *Euphorbiaceae* | 110 |
| | 92 | *Gonystylaceae* | 1 |
| | 93 | *Thymelaeaceae* | 10 |
| | 94 | *Lecythidaceae* | 1 |
| | 95 | *Barringtoniaceae* | 4 |
| | 96 | *Rhizophoraceae* | 9 |
| | 97 | *Flacourtiaceae* | 27 |
| | 98 | *Violaceae* | 4 |
| | 99 | *Turneraceae* | 1 |
| | 100 | *Passifloraceae* | 8 |
| | 101 | *Bixaceae* | 1 |
| | 102 | *Cochlospermaceae* | 1 |
| | 103 | *Cariacaceae* | 1 |
| | 104 | *Cucurbitaceae* | 14 |
| | 105 | *Begoniaceae* | 6 |
| | 106 | *Capparaceae* | 3 |
| | 107 | *Cleomaceae* | 3 |
| | 108 | *Brassicaceae* | 11 |
| | 109 | *Moringaceae* | 1 |
| | 110 | *Salicaceae* | 1 |

| | | |
|---|---|---|
| 111 | *Ericaceae* | 2 |
| 112 | *Epacridaceae* | 1 |
| 113 | *Symplocaceae* | 2 |
| 114 | *Ebenaceae* | 14 |
| 115 | *Sapotaceae* | 27 |
| 116 | *Myrsinaceae* | 29 |
| 117 | *Cunoniaceae* | 18 |
| 118 | *Davidsoniaceae* | 1 |
| 119 | *Pittosporaceae* | 6 |
| 120 | *Crassulaceae* | 1 |
| 121 | *Rosaceae* | 4 |
| 122 | *Chrysobalanaceae* | 4 |
| 123 | *Mimosaceae* | 28 |
| 124 | *Caesalpiniaceae* | 56 |
| 125 | *Fabaceae* | 123 |
| 126 | *Connaraceae* | 2 |
| 127 | *Lythraceae* | 9 |
| 128 | *Myrtaceae* | 74 |
| 129 | *Punicaceae* | 1 |
| 130 | *Onagraceae* | 4 |
| 131 | *Melastomataceae* | 32 |
| 132 | *Combretaceae* | 17 |
| 133 | *Anacardiaceae* | 13 |
| 134 | *Burseraceae* | 9 |
| 135 | *Simaroubaceae* | 1 |
| 136 | *Surianaceae* | 1 |
| 137 | *Rutaceae* | 37 |
| 138 | *Meliaceae* | 38 |
| 139 | *Zygophyllaceae* | 1 |
| 140 | *Sapindaceae* | 22 |
| 141 | *Coriariaceae* | 1 |
| 142 | *Oxalidaceae* | 6 |
| 143 | *Balsaminaceae* | 2 |
| 144 | *Araliaceae* | 22 |
| 145 | *Apiaceae* | 8 |
| 146 | *Linaceae* | 1 |
| 147 | *Celastraceae* | 3 |
| 148 | *Hippocrateaceae* | 2 |
| 149 | *Aquifoliaceae* | 1 |
| 150 | *Icacinaceae* | 2 |
| 151 | *Dichapetalaceae* | 1 |
| 152 | *Rhamnaceae* | 11 |
| 153 | *Vitaceae* | 3 |
| 154 | *Leeaceae* | 1 |
| 155 | *Malpighiaceae* | 4 |
| 156 | *Polygalaceae* | 1 |
| 157 | *Alangiaceae* | 1 |
| 158 | *Olacaceae* | 2 |
| 159 | *Santalaceae* | 2 |
| 160 | *Loranthaceae* | 1 |
| 161 | *Viscaceae* | 2 |
| 162 | *Balanophoraceae* | 1 |
| 163 | *Proteaceae* | 4 |
| 164 | *Loganiaceae* | 17 |
| 165 | *Apocynaceae* | 39 |
| 166 | *Asclepiadaceae* | 13 |
| 167 | *Oleaceae* | 10 |
| 168 | *Rubiaceae* | 191 |
| 169 | *Caprifoliaceae* | 1 |
| 170 | *Solanaceae* | 29 |
| 171 | *Convolvulaceae* | 28 |
| 172 | *Cuscutaceae* | 1 |
| 173 | *Menyanthaceae* | 1 |
| 174 | *Buddlejaceae* | 2 |
| 175 | *Scrophulariaceae* | 14 |
| 176 | *Gesneriaceae* | 41 |
| 177 | *Acanthaceae* | 25 |
| 178 | *Pedaliaceae* | 1 |
| 179 | *Bignoniaceae* | 10 |
| 180 | *Plantaginaceae* | 1 |

| | | | |
|---|---|---|---|
| | 181 | *Boraginaceae* | 10 |
| | 182 | *Verbenaceae* | 31 |
| | 183 | *Lamiaceae* | 18 |
| | 184 | *Campanulaceae* | 2 |
| | 185 | *Goodeniaceae* | 2 |
| | 186 | *Asteraceae* | 62 |
| | 32; 187 | *Orchidaceae* | 169 |
| | 188 | *Phormiaceae* | 2 |
| Total Species of Angiosperms | | | **2,317** |

**Source: South Pacific Regional Herbarium, University of the South Pacific –Institute of Applied Science.**

## ANNEX 8

**List of trees and other woody forest species considered to be threatened in all or part of their range from genetic point of view**

| Species (scientific name) | Area (ha) of species natural distribution if known | Average number of trees per hectare if known | Proportion of species natural distribution (%) | Distribution: widespread (W), rare (R) or local (L) | Type of threat | Threat category | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | High | Medium | Low |
| ***Acacia richii* Qumu** | 2.03 | 0.28 | 0.11 | | | | | |
| ***Agathis macrophylla* Dakua makadre** | 71.99 | 2.95 | 3.97 | | | | | |
| ***Aglaia elegans* Kautoa A** | 0.00 | 0.02 | 0.00 | | | | | |
| ***Alangium vitiense* Doko ni sau** | 5.07 | 0.77 | 0.28 | | | | | |
| ***Albizia saman* Vaivai ni vavalaqi** | 0.00 | 0.01 | 0.00 | | | | | |
| ***Alectryon grandifolius* Masa B** | 0.00 | 0.01 | 0.00 | | | | | |
| ***Aleurites moluccana* Lauci** | 4.06 | 0.45 | 0.22 | | | | | |
| ***Aleurites moluccana* Sikeci** | 0.00 | 0.02 | 0.00 | | | | | |
| ***Alphitonia franguloides* Doidamu** | 1.01 | 0.14 | 0.06 | | | | | |
| ***Alphitonia zizyphoides* Doi** | 5.07 | 0.7 | 0.28 | | | | | |
| ***Alstonia pacifica* Sorua lailai** | 1.01 | 0.1 | 0.06 | | | | | |
| ***Alstonia vitiensis* var 1 Sorua** | 3.04 | 0.62 | 0.17 | | | | | |
| ***Amaroria soulameoides* Vasa ni veikau** | 1.01 | 0.08 | 0.06 | | | | | |
| ***Anacolosa lutea* Kaukaumakita** | 0.00 | 0.05 | 0.00 | | | | | |
| ***Anthocephlus cadamba* Cadamba** | 0.00 | 0.03 | 0.00 | | | | | |
| ***Arthocarpus altilis* Uto** | 1.01 | 0.08 | 0.06 | | | | | |
| ***Artocarpus integra* Uto ni Idia, Jack Fruit** | 0.00 | 0.01 | 0.00 | | | | | |
| ***Arytera brackenridgei* Masa A** | 3.04 | 0.37 | 0.17 | | | | | |
| ***Astronidium confertiflorum* Dava** | 1.01 | 0.12 | 0.06 | | | | | |
| ***Atuna racemosa* Makita** | 3.04 | 0.56 | 0.17 | | | | | |
| ***Baccaurea seemannii* Midra** | 2.03 | 0.4 | 0.11 | | | | | |
| ***Barringtonia asiatica* Vutu** | 3.04 | 0.36 | 0.17 | | | | | |
| ***Barringtonia edulis* Vutu kana** | 5.07 | 0.56 | 0.28 | | | | | |
| ***Barringtonia seaturae* Vutu dina** | 1.01 | 0.07 | 0.06 | | | | | |
| ***Bischofia javanica* Koka** | 61.85 | 3.46 | 3.41 | | | | | |
| ***Buchanania attenuata* Maqo ni veikau** | 9.13 | 0.54 | 0.50 | | | | | |
| ***Buchanania vitiensis* Damanu ni yaqaqa** | 1.01 | 0.1 | 0.06 | | | | | |
| ***Burckella parviflora* Baumika** | 13.18 | 1.06 | 0.73 | | | | | |
| ***Calophyllum amblyphyllum* Damanu dilodilo** | 1.01 | 0.1 | 0.06 | | | | | |
| ***Calophyllum cerasiferum* Damanu lailai A** | 1.01 | 0.11 | 0.06 | | | | | |
| ***Calophyllum vitiense* Damanu** | 107.48 | 8.57 | 5.92 | | | | | |
| ***Canarium harveyi* var 1 Kaunicina A** | 33.46 | 2.79 | 1.84 | | | | | |
| ***Canarium vanikoroense* Kaunisiga** | 1.01 | 0.06 | 0.06 | | | | | |
| ***Casuarina equisetifolia* Nokonoko** | 2.03 | 0.11 | 0.11 | | | | | |
| ***Cerbera manghas* Vasa** | 1.01 | 0.05 | 0.06 | | | | | |
| ***Cerbera manghas* Vasarewa** | 2.03 | 0.28 | 0.11 | | | | | |
| ***Cinnamomum* spp. div. Macou** | 1.01 | 0.12 | 0.06 | | | | | |
| ***Citronella vitiensis* Nuqa** | 0.00 | 0.03 | 0.00 | | | | | |

| | | | |
|---|---|---|---|
| ***Citrus grandis* Moli kana** | 1.01 | 0.12 | 0.06 |
| ***Citrus reticulata* Moli Madarini** | 0.00 | 0.02 | 0.00 |
| ***Claoxylon vitiensis* Male ni via** | 0.00 | 0.01 | 0.00 |
| ***Cleistocalyx decussatus* Yasimoli** | 2.03 | 0.26 | 0.11 |
| ***Cleistocalyx eugenioides* Yasiyasi A** | 88.22 | 8.38 | 4.86 |
| ***Commersonia bartramia* Sama** | 1.01 | 0.18 | 0.06 |
| ***Cordia* spp Cordia** | 1.01 | 0.13 | 0.06 |
| ***Crossostylis seemannii* Tiri vanua** | 4.06 | 0.71 | 0.22 |
| ***Cryptocarya constricta* Diriniu** | 6.08 | 0.82 | 0.34 |
| ***Cyathocalyx insularis* Makosoi ni veikau** | 1.01 | 0.1 | 0.06 |
| ***Cynometra insularis* Cibicibi A** | 4.06 | 0.47 | 0.22 |
| ***Dacrycarpus imbricatus* Amunu** | 2.03 | 0.11 | 0.11 |
| ***Dacrydium nidulum* Yaka** | 6.08 | 0.53 | 0.34 |
| ***Decaspermum vitiense* Nuqanuqa** | 0.00 | 0.02 | 0.00 |
| ***Decussocarpus vitiensis* Dakua salusalu** | 14.20 | 0.81 | 0.78 |
| ***Degeneria vitiensis* Masiratu** | 10.14 | 0.95 | 0.56 |
| ***Dendrocnide harveyi* Salato** | 10.14 | 0.88 | 0.56 |
| ***Dillenia biflora* Kuluva** | 25.35 | 3.64 | 1.40 |
| ***Discocalyx fusca* Vutuvutu** | 0.00 | 0.03 | 0.00 |
| ***Dolicholobium latifolium* Soso ni ura** | 0.00 | 0.06 | 0.00 |
| ***Dracontomelon vitiense* Tarawau** | 3.04 | 0.14 | 0.17 |
| ***Dysoxylum hornei* Kautoa** | 11.15 | 1.19 | 0.61 |
| ***Dysoxylum lenticellare* Malamala** | 2.03 | 0.12 | 0.11 |
| ***Dysoxylum quercifolium* Mala** | 11.15 | 1.1 | 0.61 |
| ***Dysoxylum richii* Sasawira** | 64.90 | 5.01 | 3.58 |
| ***Elaeocarpus chelonimorphus* Sivia** | 1.01 | 0.01 | 0.06 |
| ***Elaeocarpus kambi* Kabi** | 3.04 | 0.33 | 0.17 |
| ***Emmenosperma micropetalum* Tomanu** | 1.01 | 0.18 | 0.06 |
| ***Endiandra elaeocarpa* Damabi A** | 15.21 | 1.4 | 0.84 |
| ***Endiandra elaeocarpa* Tabadamu A** | 2.03 | 0.21 | 0.11 |
| ***Endospermum macrophyllum* Kauvula** | 141.96 | 7.96 | 7.82 |
| ***Erythrina fusca* Drala** | 1.01 | 0.09 | 0.06 |
| ***Erythrospermum acuminatissimum* Mavida** | 0.00 | 0.01 | 0.00 |
| ***Eucalyptus* spp Gumtree** | 1.01 | 0.09 | 0.06 |
| ***Excoecaria acuminata* Mana i vanua** | 0.00 | 0.01 | 0.00 |
| ***Fagraea gracilipes* Buabua** | 2.03 | 0.23 | 0.11 |
| ***Ficus barclayana* Losilosi** | 0.00 | 0.03 | 0.00 |
| ***Ficus fulvo-pilosa* Ai masi** | 4.06 | 0.18 | 0.22 |
| ***Ficus obliqua* Baka** | 1.01 | 0.04 | 0.06 |
| ***Ficus pritchardii* Nunu** | 5.07 | 0.79 | 0.28 |
| ***Ficus smithii* Baka ni viti** | 1.01 | 0.03 | 0.06 |
| ***Ficus vitiensis* Lolo** | 0.00 | 0.04 | 0.00 |
| ***Firmiama diversifolia* Vau ceva** | 6.08 | 0.66 | 0.34 |
| ***Garcinia myrtiflora* Laubu** | 27.38 | 3.49 | 1.51 |
| ***Garcinia pseudoguttifera*** | 5.07 | 0.76 | 0.28 |

| | | | |
|---|---|---|---|
| **Bulu m. A** | | | |
| ***Garcinia sessilis* Bulu wai** | 2.03 | 0.23 | 0.11 |
| ***Garcinia vitiensis* Bulu lailai** | 0.00 | 0.04 | 0.00 |
| ***Geissois* spp. div. Vota** | 0.00 | 0.02 | 0.00 |
| ***Geissois* spp. div. Vure** | 3.04 | 0.28 | 0.17 |
| ***Geissois ternata* var 2 Vuga levu** | 5.07 | 0.22 | 0.28 |
| ***Gironniera celtidifolia* Sisisi** | 7.10 | 1.48 | 0.39 |
| ***Glochidion seemannii* Molau** | 3.04 | 0.4 | 0.17 |
| ***Gmelina vitiensis* Rosawa** | 3.04 | 0.25 | 0.17 |
| ***Gnetum gnemon* Sukau** | 1.01 | 0.13 | 0.06 |
| ***Gonystylus punctatus* Mavota** | 26.36 | 2.48 | 1.45 |
| ***Guioa rhoifolia* Drausasa A** | 5.07 | 0.64 | 0.28 |
| ***Gymnostoma vitiense* Velau** | 39.55 | 3.48 | 2.18 |
| ***Gyrocarpus americanus* Wiriwiri** | 2.03 | 0.08 | 0.11 |
| ***Haplolobus floribundus* Kaunigai** | 30.42 | 3.23 | 1.68 |
| ***Heritiera ornithocephala* Rosarosa** | 26.36 | 2.16 | 1.45 |
| ***Hernandia olivacea* Dalovoci** | 16.22 | 1.64 | 0.89 |
| ***Homalium vitiense* Molaca** | 1.01 | 0.14 | 0.06 |
| ***Inocarpus fagifer* Ivi** | 11.15 | 0.6 | 0.61 |
| ***Intsia bijuga* Vesi** | 37.52 | 1.76 | 2.07 |
| ***Kingiodendron platycarpum* Moivi** | 25.35 | 2.27 | 1.40 |
| ***Koelreuteria elegans* Manawi** | 2.03 | 0.1 | 0.11 |
| ***Litsea* spp. div. Lidi** | 2.03 | 0.34 | 0.11 |
| ***Macaranga harveyana* Gadoa** | 14.20 | 2.14 | 0.78 |
| ***Macaranga* spp. div. Mavu** | 0.00 | 0.01 | 0.00 |
| ***Maesopsis eminii* Maesopsis** | 1.01 | 0.23 | 0.06 |
| ***Maniltoa grandiflora* Moivi levu** | 0.00 | 0.03 | 0.00 |
| ***Maniltoa minor* Moivi lailai** | 1.01 | 0.11 | 0.06 |
| ***Mastixiodendron robustum* Duvula** | 4.06 | 0.37 | 0.22 |
| ***Medusanthera vitiensis* Duvu** | 0.00 | 0.01 | 0.00 |
| ***Melicope cucullata* Drautolu** | 0.00 | 0.04 | 0.00 |
| **Melochia sp. Sama loa** | 1.01 | 0.1 | 0.06 |
| ***Metrosideros* spp. Vuga** | 1.01 | 0 | 0.06 |
| ***Micromelium minutum* Sasaqilu** | 0.00 | 0.03 | 0.00 |
| ***Mimosaceae* spp. div. Vaivai** | 20.28 | 1.14 | 1.12 |
| ***Myristica castaneifolia* Kaudamu** | 174.41 | 17.27 | 9.61 |
| ***Myristica chartacea* Kaudamu lailai** | 4.06 | 0.5 | 0.22 |
| ***Myristica gillespieana* Kaudamu male** | 4.06 | 0.37 | 0.22 |
| ***Myristica grandifolia* Kaudamu levu** | 1.01 | 0.11 | 0.06 |
| ***Myristica macrantha* Male waqa** | 0.00 | 0.03 | 0.00 |
| ***Neonauclea forsteri* Vacea** | 6.08 | 0.24 | 0.34 |
| ***Neuburgia macrocarpa* Boloa** | 0.00 | 0.01 | 0.00 |
| **not included in list not listed** | 1.01 | 0.09 | 0.06 |
| ***Pagiantha thurstonii* Tadalo** | 21.29 | 2.59 | 1.17 |
| ***Palaquium hornei* Sacau** | 22.31 | 1.81 | 1.23 |
| ***Palaquium porphyreum* Bauvudi** | 35.49 | 2.51 | 1.96 |
| ***Palaquium vitilevuense* Bau** | 29.41 | 2.3 | 1.62 |
| ***Parasponia andersonii* Drou** | 0.00 | 0.06 | 0.00 |

| | | | |
|---|---|---|---|
| ***Parinari insularum*** **Sa** | 103.43 | 7.61 | 5.70 |
| ***Piper adurncum*** **Onolulu** | 0.00 | 0.02 | 0.00 |
| ***Pittosporum arborescens*** **Duva ni veikau** | 0.00 | 0.07 | 0.00 |
| ***Planchonella garberi*** **Sarosaro A** | 8.11 | 0.69 | 0.45 |
| ***Planchonella grayana*** **Bausa** | 1.01 | 0.1 | 0.06 |
| ***Planchonella pyrulifera*** **Yawe (Sarosaro)** | 2.03 | 0.07 | 0.11 |
| ***Planchonella sessilis*** **Yawe korobaba** | 4.06 | 0.4 | 0.22 |
| ***Planchonella umbonata*** **Bauloa** | 1.01 | 0.1 | 0.06 |
| ***Pleiogynium timoriense*** **Manui** | 1.01 | 0.13 | 0.06 |
| ***Podocarpus neriifolius*** **Kuasi** | 13.18 | 1.56 | 0.73 |
| ***Pommetia pinnata*** **Dawa** | 35.49 | 2.52 | 1.96 |
| ***Pongamia pinnata*** **Vesiwai** | 0.00 | 0.02 | 0.00 |
| ***Premna serratifolia*** **Yaro** | 12.17 | 1.44 | 0.67 |
| ***Psychotria amoena*** **Deqedeqe** | 0.00 | 0.06 | 0.00 |
| ***Psychotria confertiloba*** **Tabulina** | 0.00 | 0.01 | 0.00 |
| ***Pterocymbium oceanicum*** **Anita** | 0.00 | 0.01 | 0.00 |
| ***Richella monosperma*** **Makosoi B** | 10.14 | 0.97 | 0.56 |
| ***Samanea saman*** **Mocemoce (Raintree)** | 10.14 | 0.51 | 0.56 |
| ***Santalum yasi*** **Yasi dina** | 3.04 | 0.36 | 0.17 |
| ***Saurauia rubicunda*** **Mimila** | 0.00 | 0.1 | 0.00 |
| ***Schefflera seemanniana*** **Sole** | 2.03 | 0.41 | 0.11 |
| ***Semecarpus vitiensis*** **Kaukaro** | 15.21 | 1.83 | 0.84 |
| ***Serianthes melanesica*** **Vaivai ni veikau A** | 3.04 | 0.23 | 0.17 |
| ***Spathodea campanulata*** **African tulip** | 24.34 | 1.93 | 1.34 |
| ***Sterculia vitiensis*** **Waciwaci** | 6.08 | 0.28 | 0.34 |
| ***Storckiella vitiensis*** **Gadi** | 0.00 | 0.03 | 0.00 |
| ***Storckiella vitiensis*** **Marasa** | 7.10 | 0.91 | 0.39 |
| ***Storckiella vitiensis*** **Vesida** | 0.00 | 0.01 | 0.00 |
| ***Swietenia macrophylla*** **Mahogany** | 2.03 | 0.19 | 0.11 |
| ***Syzygium corynocarpum*** **Yasiyasi lailai** | 0.00 | 0.01 | 0.00 |
| ***Syzygium effusum*** **Yasidravu lailai** | 1.01 | 0.11 | 0.06 |
| ***Syzygium fijiense*** **Yasidravu** | 38.53 | 3.53 | 2.12 |
| ***Syzygium grayi*** **Yasileba** | 0.00 | 0.07 | 0.00 |
| ***Syzygium leucanthum*** **Yasikavika** | 0.00 | 0.05 | 0.00 |
| ***Syzygium malaccense*** **Kavika damu** | 0.00 | 0.03 | 0.00 |
| ***Syzygium malacense*** **Kavika** | 1.01 | 0.2 | 0.06 |
| ***Syzygium seemannianum*** **Yasiwai** | 1.01 | 0.05 | 0.06 |
| ***Syzygium*** **spp. Yasi vula** | 2.03 | 0.22 | 0.11 |
| ***Tapeinosperma ampliflorum*** **Dasia lailai** | 0.00 | 0.02 | 0.00 |
| ***Tarenna sambucina*** **Vakacare davui** | 0.00 | 0.01 | 0.00 |
| ***Terminalia catappa*** **Tavola** | 0.00 | 0.01 | 0.00 |
| ***Terminalia pterocarpa*** **Tivi A** | 6.08 | 0.4 | 0.34 |
| ***Timonius affinis*** **Dogo ni vanua** | 0.00 | 0.04 | 0.00 |
| ***Trichospermum*** **Mako** | 15.21 | 1.43 | 0.84 |

| | | | |
|---|---|---|---|
| ***Trichospermum calyculatum* Mako loa** | 12.17 | 1.42 | 0.67 |
| ***Turrillia vitiensis* Kauceuti** | 8.11 | 0.99 | 0.45 |
| ***Vavaea amicorum* Cevua** | 5.07 | 0.67 | 0.28 |
| ***Vavaea degeneri* Bua ni viqalau** | 0.00 | 0.02 | 0.00 |
| ***Viticipremna vitilevuensis* Bo** | 10.14 | 1.07 | 0.56 |
| ***Viticipremna vitilevuensis* Bosawa** | 9.13 | 0.6 | 0.50 |
| ***Weinmannia vitiensis* Unknown** | 0.00 | 0.02 | 0.00 |
| ***Xylocarpus granatum* Dabi** | 0.00 | 0.02 | 0.00 |
| ***Xylopia pacifica* Dulewa** | 12.17 | 1.6 | 0.67 |
| ***Zanthoxylum gillespieanum* Totowiwi** | 2.03 | 0.13 | 0.11 |

**Source: NFI Data, Fiji Forestry Department**

**Types of threat:** 1 – Forest cover reduction and degradation; 2- Forest ecosystem diversity reduction & degradation; 3 – Unsustainable logging; 4 – Management intensification; 5 – Competition for land use; 6 – Urbanization; 7 – Habitat fragmentation; 8 – Uncontrolled introduction of alien species; 9 – Acidification of soil and water; 10 – Pollutant emissions; 11 – Pests and diseases; 12 – Forest fires; 13 – Drought and desertification: 14 – Rising sea level:

## ANNEX 9

**Conservation of forest tree and other woody plant species in protected areas**

| FOREST RESERVES | FLORA |
|---|---|
| Colo-i-Suva | *Pullea perryana* |
| Maranisaqa | *Phaius graeffei* |
| | *Storckiella vitiensis* (Marasa) |
| Savura | *Vetchia vitiensis var. parhamioum* |
| Vago | *Crossostylis seemannii* (Tiri vanua) |
| Naboro | *Myristica castaneifolia* (Kaudamu) |
| Qoya | *Myristica gillespiana* (Kaudamu Male) |
| Suva & Namuka Harbour | *Myristica grandifolia* (Kaudamu Levu) |
| Yarawa | *Degeneria vitiensis* (Masiratu) |
| | *Gymnostoma vitiense* (Velau) |
| | *Calophyllum ampblyphyllum* (Damanu) |
| Buretolu | |
| Lololo | |
| Nadarivatu-Nadala | *Myristica castaneifolia* (Kaudamu) |
| | *Myristica gillespiana* (Kaudamu Male) |
| | *Myristica grandifolia* (Kaudamu Levu) |
| | *Degeneria vitiensis* (Masiratu) |
| Korotari | *Myristica castaneifolia* (Kaudamu) |
| | *Myristica gillespiana* (Kaudamu Male) |
| | *Myristica grandifolia* (Kaudamu Levu) |
| | *Degeneria vitiensis* (Masiratu) |
| Tavua, Ba | |
| Saru Creek | |
| Taveuni | *Medinilla waterhousei* (Tagimaucia,Tekiteki,Vunia,Moceawa) |
| | *Eugenia durifolia* |
| | *Schefflera costata* |
| | *Sukunia pentagonioides* (Nailoma ni Wase) |
| | *Veitchia simulans* |
| | *Degeneria vitiensis* (Masiratu) |
| **NATURE RESERVES** | **FLORA** |
| Nadarivatu | *Dendrobium mohilianum* |
| Tomaniivi | *Geissois superb* |
| Naqaranibuluti | *Trilocularia vitiensis* (Wailaga or Matau Masima) |
| | *Myristica castaneifolia* (Kaudamu) |
| | *Myristica gillespiana* (Kaudamu Male) |
| | *Myristica grandifolia* (Kaudamu Levu) |
| | *Degeneria vitiensis* (Masiratu) |
| Vuo Is. | *Gymnostoma vitiense* (Velau) |
| | *Rhizophra selala*(Selala) |
| | *Storckiella vitiensis* |
| Draunibota | |
| Labiko | |
| Ravilevu | *Medinilla waterhousei* (Tagimaucia,Tekiteki,Vunia,Moceawa) |
| Vunimoli | *Eugenia durifolia* |
| | *Schefflera costata* |
| | *Sukunia pentagonioides* (Nailoma ni Wase) |
| | *Veitchia simulans* |
| | *Degeneria vitiensis* (Masiratu) |

**Source: Fiji Forestry Department Data**

## ANNEX 10

**Important plants conserved and trees useful in agro-forestry systems**

| No. | Scientific name Species | Native (N) or exotic (E) species | Uses and purposes | Other relevant information |
|---|---|---|---|---|
| **1** | Acerola cherry *Malpighia punicefolia* | E | Food | |
| **2** | Bai ni cagi *Gliricidia sepium* | E | Living fence and windbreak | Nitrogen fixing |
| **3** | Baka-ni-viti *Ficus obliqua* | N | Medicinal | |
| **4** | Bilimbi *Averrhoa bilimbe* | E | Food | |
| **5** | Bovu *Musseanda raiaeensist* | N | Medicinal | |
| **6** | Bua-ni-viti*Fagraea berteroana* | N | Medicinal and scenting body oil | Flower used for making garlands |
| **7** | Bullocks heart *Annona glabra* | E | Food | Powered seeds of the fruit have been used as an insecticide to kill lice. |
| **8** | *Calliandra calothyrsus* | E | | Nitrogen fixing |
| **9** | Carambola *Averrhoa carambola* | E | Food | |
| **10** | Coconut *Cocos nucifera* | N | Food | Traditional significance |
| **11** | Dawa *Pometia pinnata* | N | Food and timber | |
| **12** | Doi *Alphitonia zizyphoides* | N | Fuel wood | Nitrogen fixing |
| **13** | Drala *Vitrex trifolin* | N | | Nitrogen fixing |
| **14** | Drala *Erythrina variegata* | N | | Nitrogen fixing |
| **15** | Ivi *Inocarpus fagifer* | N | Food | Nitrogen fixing, water and soil protection |
| **16** | Java almond *Canarium spp.* | E | Food | |
| **17** | Kalabuci damu *Acalypha wilkesiana* | N | Medicinal | |
| **18** | Kavika ni vavalagi *Syzygium jumbos* | E | Food | |
| **19** | Kavika *Syzygium malaccense* | N | Food | |
| **20** | Koka *Bischofia javanica* | N | House building | Water and soil protection |
| **21** | Kura *Noni morinda ctrifolia* | N | Medicinal | |
| **22** | Lagakali *Aglaia spp* | N | | Flower used for making garlands |
| **23** | Lemon grass *Cymbopogon coloratus* | E | Food and medicinal | |
| **24** | Losilosi *Ficus barclayana* | N | Medicinal | |
| **25** | Macadamia nut *Macadamia tetraphylla* | E | Food | |
| **26** | Macou *Aglaia spp.* | N | Scenting | |
| **27** | Makosoi *Conanga odorata* | N | Scenting body oil | Flower used for making garlands |
| **28** | Maqo *Manqifera indica* | N | Food and medicinal | |
| **29** | Marasa *Storchiella vitiensis* | N | Fuelwood | |
| **30** | Masi *Broussonetia papyrifera* | N | | Tapa/masi making |
| **31** | Mocelolo *Polyalthia spp.* | N | | Seeds used for scenting garlands |
| **32** | Moli *Citrus species* | N | Food | |
| **33** | Neem *Azaadirachta indica* | E | Medicinal | Religious significance and repellant. |
| **34** | Qiqila *Jasminum simplicifolium* | N | Medicinal | |
| **35** | Qiqila kau *Micromelum minutum* | N | Medicinal | |
| **36** | Quwawa *Psidium guajava* | N | Food | |
| **37** | Rambuttan *Nephelium iappaceum* | E | Food | |
| **38** | Se ni leba | N | | Flower used for making garlands |
| **39** | *Sesbania grandifolia* | E | | Nitrogen fixing |
| **40** | Sour sop *Annona muricata* | E | Food | |
| **41** | Star apple *Chrysophyllum cainito* | E | Food | |
| **42** | Tamarind *Tamarindus indica* | E | Food | Nitrogen fixing |
| **43** | Tarawau *Dracontomelon spp.* | N | Food | |
| **44** | Uci *Euodia evanensis* | N | Scenting body oil and medicinal | Flower used for making garlands |
| **45** | Uto *Artocarpus altilis* | N | Food | |
| **46** | Uto ni idia *Artocarpus integra* | N | Food | |
| **47** | Vasili damu *Cordyline terminalis* | N | Medicinal | |
| **48** | Vauleka *Hibiscus liliaceous* | N | Medicinal | |
| **49** | Velau *Casaurina equisetifolia* | N | Medicinal and windbreak | Soil and coastal protection |
| **50** | Vesi *Intsia bijuga* | N | House building | Nitrogen fixing |
| **51** | Vesi wai *Pongamia pinnata* | N | | Nitrogen fixing, soil and water protection |
| **52** | Vueti naitasiri *Pagiantha thrustonii* | N | Medicinal | |
| **53** | Vutu kana *Barringtonia edullis* | N | Food | |
| **54** | Wi *Spondias dulcis* | N | Food | |
| **55** | Yasi *Santalum yasi* | N | Scenting body oil | Traditional significance |
| **56** | Voivoi *Pandanus* spp. | N | | Leaves used for weaving handicrafts |

**Source: Trees, Trees, Trees Booklet, Medicinal Plants Trial, Recommended Tree species in Agro-forestry**

## ANNEX 11

**Institutions involved with conservation and use of forest genetic resources**

| Name of institution | Type of institution | Activities or programs | Contact information |
|---|---|---|---|
| **Ministry of Finance** | Government | Formulating and implementing fiscal, financial and monetary policies. Responsible for the evaluation and review of the governmental programs and associated expenditures. | P. O. Box 2212<br>Government Buidlings<br>Suva<br>Fiji<br>Phone No: +679 330 7011 |
| **Ministry of Foreign Affairs International Cooperation Bureau** | Government | Responsible for handling Fiji's external relations. The ministry objective is "the provision of policy advice to the Government [of Fiji] regarding the formulation and implementation of its foreign policies," and it maintains the country's various diplomatic missions based domestically in Suva, those attributed to Fiji in Canberra, Australia and Wellington, New Zealand, as well as those based internationally. | P. O. Box 2220<br>Government Buildings<br>Suva<br>Fiji<br>Phone No: +679 330 9645 |
| **Ministry of iTaukei Affairs** | Government | Safeguard and promote the iTaukei language and culture. Program aimed at establishing a National Inventory on iTaukei Traditional Knowledge and Expression of Culture. It includes research, data documentation and storage of both tangible and intangible iTaukei Cultural Heritage. Resource center that is widely used by both local and international researchers in the area of iTaukei anthropology, ethno history, language, culture and iTaukei artistic expression. | P. O. Box 2100<br>Government Buildings<br>Suva<br>Fiji<br>Phone No: +679 310 0909 |
| **Ministry of Industry and Trade** | Government | Formulate and implement policies and strategies that promote investment, commence, small business development, consumer protection and fair trade in the domestic market. The Ministry aims to create a supportive business and commercial environment that is stable, secure, transparent and free of lengthy processes for all investors, be they from industry, commence, cooperatives, small business or micro-business. The Ministry has responsibility for two statutory bodies: the Fiji Islands Trade and Investment Bureau and the Consumer Council of Fiji. | P. O. Box 2118<br>Government Buildings<br>Suva<br>Fiji |
| **Ministry of Strategic Planning** | Government | Formulate the economic and social policies and strategies. Also include the analysis of economic and demographic trends and their implications for the labor force and social services, including those associated with the forestry sector. | P. O. Box 2351<br>Government Buildings<br>Suva<br>Fiji |
| **Ministry of Tourism** | Government | The Ministry has a policy and strategy to sustainably develpop ecotourism and village-based tourism. Promote environmental awareness and conservation throughout the tourism industry | P. O Box 2278<br>Government Buildings<br>Suva<br>Fiji |
| **Department of Culture & Heritage** | Government | Environment monitoring, Integrated Pest Management (IPM), boxing/storing objects, remedial conservation, storeroom management, condition reporting of the collection, showcase management, exhibitions, media relations, private conservation work, cultural heritage protection, cultural heritage management and tourism, cultural heritage management projects projects in Fiji, national site register, consultancy work, ntional fieldwork program, archaeology laboratory project and collecting oral tradition, | P. O. Box 2100<br>Government Buildings<br>Suva<br>Fiji |
| **Department of Agriculture -** | Government | Regulatory body for the agricultural sector, | **agrihelp@govnet.gov.fj** |

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| **Landuse Division** | | agricultural related activities, program on watershed and landuse. | |
| **Department of Environment** | Government | Regulatory body of the environment. Focal point for Multilateral Environment Agreements | **info@environment.gov.fj** |
| **Department of Forests** | Government | The roles and responsibilities of the Forestry Department are the formulation and implementation of policy initiatives and the administration of the regulatory framework to facilitate Sustainable Forest Management (SFM) in all types of forests. Its responsibilities include research and developments, facilitating the development of infrastructure, coordinating the activities of stakeholders and stakeholders' agencies, monitoring and the implementation of forestry development programs, promoting training and skill development, promoting the conservation and protection of forest resources and encourage local participation and entrepreneurship in value-adding and down-streaming processing for local and export markets. | P. O. Box 2218<br>Government Buildings<br>Suva<br>Fiji |
| **Lands & Mineral Resources Department** | Government | Monitoring and implementation of programs in the areas governing state land administration, mineral sector and Fiji's groundwater resource. | P. O. Box 2222<br>Government Buildings<br>Suva<br>Fiji |
| **Fiji Development Bank** | Statutory body | Funded by the Government of Fiji and provides loans for agriculture and small and medium enterprises (SME) loans. | **info@fijidevelopment.com.fj**<br>Phone No: +679 331 4866 |
| **Fiji Trade and Investment Bureau** | Statutory body | Marketing arm of the Government of Fiji. | |
| **National Trust of Fiji (NTF)** | Statutory body | Protecting archeological sites and conservation activities. | 3 Ma'afu Street<br>Domain<br>Suva<br>Fiji<br>Phone No: +679 330 1807 |
| **Taukei Land Trust Board** | Statutory body | Native Land administration | +679 330 4200 |
| **Water Authority of Fiji** | Statutory body | Environmentally responsible for performance of all activities, assist in protecting, managing and conserving water resources, assist in the formulation and implementation of national policies or urban and rural land use planning relating to the use and control of water bodies and resources.Management of its forestered water catchments and supply of water to municipalities. The WAF leases the water catchments from indigenous landowners and also provides some compensation for the use of their resource. | P. O. Box 1272<br>Suva<br>Fiji<br>Phone No: +679 334 3251 |
| **Fiji Hardwood Corporation Limited** | Fiji Government owned forest companies | Focuses on managing mahogany plantations. Activities include road-making, harvesting, replanting, plantation maintenance, and forest protection, including native forest, in its leased areas. | Private Mail Bag<br>Suva<br>Fiji<br>Pone No: +679 337 2663 |
| **The Fiji Pine Group (Fiji Pine Limited and Tropic Woods Industries)** | Fiji Government owned forest companies | Softwood plantation company involved in the management of pine plantations and processing and marketing of softwood timber and wood-based products. The company is involved in plantation establishment (planting), Maintenance (e.g. weeding), harvesting (felling) and log transportation to Tropik Wood Industries. The sudsidiary companies of Tropik Wood Industries Limited and Tropik Wood Products Limited are its processing and marketing arms. | P. O. Box 521<br>Lautoka<br>Fiji<br>Phone No: +679 666 1388 |
| **International Union for Conservation of Nature and Natural Resources (IUCN) – IUCN Oceania Regional Office** | International organisation | Oceania Programmes:<br>- Species<br>- Water and Wetlands<br>- Marine<br>- Energy | **oceania@iucn.org** |

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| **Japan International Cooperation Agency (JICA)** | International organization | The Japan International Cooperation Agency is advancing its activities around the pillars of a field-oriented approach, human security, and enhanced effectiveness, efficiency, and speed. Thematic issues include promotion of integrated water resource management, rural water supply, flood control and environmental and social considerations. | Private Mail Bag<br>Suva<br>Fiji<br>Phone No: +679 330 2522 |
| **Organization for Industrial, Spiritual and Cultural Advancement (OISCA)** | International organization | Fiji agro-forestry development projects, Fiji mangrove rehabilitation projects, coral reef restoration in Fiji and children's forest program | oisca@oisca.org |
| **United Nations Development Programme (UNDP)** | International organization | The UNDP Fiji Multi-Country Office strives to support the Pacific by coordinating the United Nations activities at the country-level and through direct policy advice in four key areas:<br>• Poverty Reduction Save<br>• Democratic Governance<br>• Environment and Energy<br>• Crisis Prevention and Recovery | UNDP Fiji Multi Country Office<br>Private Mail Bag<br>Suva, Fiji<br>Phone No: +679 331 2500 |
| **Secretariat of Pacific Communities** | Regional organization | Forest and trees programs – provides technical and policy advice and assistance to its Pacific Island members. | Deputy Director General<br>Secretariat of the Pacific Community<br>Private Mail Bag<br>Suva<br>Phone No: +679 334 9500<br>www.sprep.org |
| **Secretariat of the Pacific Regional Educational Programme (SPREP)** | Regional organization | Manages two programs, the Island Ecosystems program and the Pacific Futures program. The **Island Ecosystems** program focuses on developing the capacities in the Pacific Island countries to sustainably manage and conserve terrestrial, coastal and marine ecosystems. The program also focuses efforts to protect priority threatened species, and to protect the islands' biodiversity from invasive alien species and living modified organisms (LMOs). The **Pacific Futures** program aims to secure a healthy environment for future generations on the Pacific Islands, through promotion of good governance. Medium term threats and pressures that are central in the program are climate change, climate variability, sea-level rise, pollution, waste, and other land-based sources of pollution. Program activities include building institutional capacity on the islands for assessment and priority setting, for planning responses, for monitoring and for anticipating the impact of pressures and emerging threats. | |
| **SPC/GIZ – CCCPIR** | Regional organization | Program aims to build and strengthen the capacities of Pacific member countries and regional organizations, to adapt to, and climate change, as a fundamental element for the sustainable management of land-based resources. | Phone No: +679 3305 983 |
| **Birdlife International** | NGO | Conserve bird species, sites and habitats. Conservation activities in important bird areas. Conservation of pristine forest ecosystems. | 10 McGregor Road<br>Ma'afu Street<br>Suva<br>Fiji<br>Phone No: +679 331 3492 |
| **Conservation International (CI)** | NGO | Establishment of conservation areas (e.g. Sovi Basin & Wabu), reforestation and afforestation for the conservation of bio-diversity and the improvement of community livelihoods. | G. P. O. Box 13779<br>Suva<br>Fiji<br>Phone No: +679 331 4593 |
| **Live & Learn Environmental Education** | NGO | Environmental education, establishment of conservation areas and improvement of | 87 Gordon Street<br>Suva |

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|---|---|---|---|
| | | community livelihood. | Fiji<br>Phone No: +679 331 5868 |
| **NatureFiji – MareqetiViti (NFMV)** | NGO | Raising awareness on the 2007 Fiji Forest Policy to priority forest communities, focusing on the concept of the permanent forest estate. Researching endangered forest species, targeting youths in awareness and training in forest bio-diversity conservation, and assisting communities in establishing nurseries so that they may raise native seedlings to undertake reforestation. | 14 Hamilton-Beattie Road<br>Domain<br>Suva<br>Phone No: +679 310 0270 |
| **Partners in Community Development Fiji (PCDF)** | NGO | Promote good governance and gender balance, protect the environment, increase self-reliance in detached rural communities by building capacities and promote healthy living and reduce the stigma attached to mental health issues. | 8 Denison Road<br>Suva<br>Fiji<br>Phone No: +679 330 0392 |
| **Viti Land and Resources Owners Association and Other Landowners** | NGO | An association of indigenous resource owners that have stewardship of native forests/plantations/conservation areas. They Partake in all aspects of forest activities whenever possible. The main interests of the Association include agroforestry, sustainable forest management, carbon trading and biodiversity conservation. | |
| **Wildlife Conservation Society** | NGO | Conservation activities - works with communities and the Fiji Government to protect biodiversity and natural resources through sound management. | Phone NO: +679 331 5174 |
| **World Wildlife Fund** | NGO | Conservation activities – tree replanting programme and conservation efforts | 4 Ma'afu Street<br>Suva<br>Fiji<br>Phone No; +679 331 5533 |
| **Future Forests Fiji Limited** | Private | Managing Teak plantation on freehold land, leased land from indigenous Fijians | G. P. O Box 704<br>Suva<br>Fiji<br>Phone No: +679 336 4201 |
| **RiversFiji** | Private | Activities primarily include ecotourism operations in Fiji from rafting, and river/mangrove forest/ocean kayaking. They are the world renowned for their Upper Navua Conservation Area, which emcompasses a river portion with a 200-meter buffer zone ia a designated RAMSAR[7] site leased from the landowners. | Phone No: +679 345 0147 |
| **University of the South Pacific – Institute of Applied Science** | University | Floral and fauna surveys, environmental impact assessments, forest certification auditing, and specialized training commissioned by organizations, like Conservation International, GIZ, SPC, etc. | Phone No: +679 323 1000 |

## ANNEX 12

**Tree and other woody species that is important for food security and livelihoods:**

| Species | | Use for food security | Use for poverty reduction |
|---|---|---|---|
| **Scientific name** | **Native (N) or exotic (E)** | | |
| *Acacia richii* Qumu | N | | √ |
| *Agathis macrophylla* Dakua makadre | N | | √ |
| *Aleurites moluccana* Lauci | N | | √ |
| *Alphotonia franguloides* Doi damu | N | | √ |
| *Alphotonia zizyphoides* Doi | N | | √ |
| *Alstonia costata* Saurua | N | | |
| *Alstonia vitiensis* Sorua | N | | √ |
| *Amaroria soulameoides* Vasa ni veikau | N | √ | √ |
| *Artocarpus altilis* Breadfruit | N | | √ |
| *Artocarpus integra* Uto-ni-dia | N | | |
| *Atuna racemosa* Makita | N | | √ |
| *Barringtonia asiatica* Vuturakaraka | N | | |
| *Barringtonia edulis* Vutu | N | | |
| *Bischofia javanica* Koka | N | | √ |
| *Brugulera gymnorrtiza* Dogo | N | | |
| *Buchanania attenuata* Kaukaro | N | | √ |
| *Burckella parviflora* Baumika | N | | |
| *Calophyllum inophyllum* Dilo | N | | √ |
| *Calophyllum neo-ebudicum* Damanu | N | | √ |
| *Calophyllum vitiense* Damanu | N | | |
| *Canaga odorata* Makosoi | N | | |
| *Canarium spp.* Kaunicina | N | | √ |
| *Casaurina equisetifolia* Nokonoko | N | | |
| *Cerbera manghas* Vasa | N | | |
| *Cocos nucifera* Coconut | N | | |
| *Commersonia bartramia* Sama | N | | √ |
| *Cordia subcordata* Nawanawa | N | | |
| *Cordyline fruticosa* Vasili | N | | √ |
| *Crossostylis seemannnii* Tirivanua | N | | |
| *Cyathea spp.* Balabala | N | | √ |
| *Cynometra insularis* Moivi/Cibicibi | N | | |
| *Dacrycarpus imbricatus* Amunu | N | | |
| *Decaspermum vitiense* Nuqanuqa | N | | √ |
| *Decrydium nidulum* Yaka | N | | |
| *Decussocarpus retrophyllum vitiensis* Dakua salusalu | N | | |
| *Degeneria vitiensis* Masiratu | N | | √ |
| *Dillenia biflora* Kuluva | N | | |
| *Dysoxylum richii* Tarawaukeirakaraka | N | √ | |
| *Elaeocarpus spp.* Kabi | N | | |
| *Elattostachys falcata* Marasa | N | | √ |
| *Emmenosperma micropetalum* Tomanu | N | | |
| *Endospermum maccrophyllum* Kauvula | N | √ | |
| *Erythrina variegata* Drala | N | | √ |
| *Ficus baraclayana* Losilosi | N | √ | √ |
| *Ficus fulvo-pilosa* Ai-masi | N | | √ |
| *Ficus obliqua* Baka | N | | |
| *Ficus prolixa* Baka ni Viti | N | | √ |
| *Ficus smithii* Nunu | N | | √ |
| *Ficus vitiensis* Lolo | N | | √ |
| *Fragraea gracillipes* Buabua | N | | |
| *Garcinia myrtifolia* Laubu | N | | √ |
| *Geissois ternata* Vure | N | | √ |
| *Glochidion seemannii* Molau | N | | |
| *Gmelina vitiensis* Rosawa | N | | √ |
| *Gnetum gnemon* Sukau | N | | √ |
| *Gonystylus punctatus* Mavota | N | | |
| *Gymnostoma vitiense* Velau | N | | |
| *Gyrocarpus americanus* Wiriwiri | N | | |
| *Haplolobus floribundus* Kaunigai | N | | √ |
| *Hemandia olivacea* Makoloa | N | | √ |
| *Heritiera ornithocephala* Rosarosa | N | | |
| *Hibiscus tiliaceus* Vau | N | | |
| *Inocarpus fagifer* Ivi | N | | √ |
| *Instia bijuya* Vesi | N | | √ |

| | | | |
|---|---|---|---|
| *Jatropha curcas* Banidaki | N | | √ |
| *Kingi odendron platycarpum* Moivi | N | | |
| *Lumnitzera littorea* Sagale | N | | √ |
| *Macaranga graffeana* Gadoa | N | | √ |
| *Macaranga harveyana* Gadoa | N | | |
| *Mangifera indica* Mango | N | | √ |
| *Mastixiodendron robustum* Duvula | N | √ | √ |
| *Metrosideros collina* Vuga | N | √ | |
| *Millettia pinnata* Vesiwai | N | | √ |
| *Myristica spp.* Kaudamu | N | | |
| *Neonauclea forsteri* Vacea | N | | |
| *Pagiantha thurstonii* Vuetinaitasiri | N | | √ |
| *Palaquim hornie* Sacau | N | | √ |
| *Palaquim porphyreum* Bauvudi | N | | √ |
| *Palaquim vitilevuensis* Bau | N | | |
| *Parinari insularum* Sa | N | | √ |
| *Pittosporum spp.* Tuvakalou | N | | √ |
| *Planchonella vitiensis* Sarosaro | N | | √ |
| *Pleiogynium timoriense* Manawi | N | | √ |
| *Plerandra spp,* Sole | N | | √ |
| *Podocarpu affinis* Kuasi | N | | √ |
| *Podocarpu neriifolius* Kuasi | N | | √ |
| *Pometia pinnata* Dawa | N | √ | |
| *Pongamia/Millettia pimmata* Vesi wai | N | | √ |
| *Premna serratifolia* Yaro | N | | √ |
| *Pterocymbium oceanicum* Ma | | | |
| *Retrophyllum vitiense* Dakua salusalu | N | | √ |
| *Rhizophora mangle* Tiriwai | N | | √ |
| *Samanea saman* Vaivai-ni-vavalagi | E | | √ |
| *Santalum yasi* Yasi dina | E | | √ |
| *Semecarpus vitiense* Kaukaro | E | | √ |
| *Serianthes spp.* Vaivai-ni-veikau | N | | √ |
| *Spondias dulcis* Wi | N | √ | |
| *Sterculia vitiensis* Waciwaci | N | | √ |
| *Storckiella vitiensis* Marasa | N | | √ |
| *Syzygium decussatum* Yasimoli | N | | √ |
| *Syzygium spp.* Yasiyasi | N | | √ |
| *Terminilia pterocarpa* Tivi | N | | √ |
| *Trichospermum calyculata* Makoloa | N | | √ |
| *Trichospermum richii* Mako | N | | √ |
| *Turrillia vitiensis* Kauceuti | N | | √ |

**List of Stakeholders:**

**List of stakeholders that contributed towards the compilation of the Fiji Country Report on SOW FGR include the following institutions:**

1. **Birdlife International**
2. **Conservation International**
3. **Department of Environment, Fiji**
4. **Environmental Consultant – Dick Watling**
5. **Fiji Forestry Department**
6. **Fiji Hardwood Cooperation Limited**
7. **Fiji Pine Limited**
8. **Future Forests Limited**
9. **Ministry of iTaukei Affairs**
10. **IUCN**
11. **Live & Learn**
12. **National Trust of Fiji**
13. **Nature Fiji**
14. **Secretariat of Pacific Communities**
15. **University of the South Pacific – Institute of Applied Science**
16. **Wildlife Conservation Society**
17. **World Wildlife Fund**

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