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COUNTRY REPORT – FIJI

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Introduction

Forest Area

Fiji is an independent State with a land area of 1,827,200 hectares comprising 300 islands of which 100 are inhabited. Total forest cover is about 852,990 hectares, constituting indigenous forests and forest plantations. Indigenous forests comprise 739,340 hectares while hardwood plantations cover 51,490 hectares and softwood (pine) 43,200 hectares.

Of the total land area, the State holds about 9.5% and 8.2% is under freehold tenure. Indigenous forests are almost entirely under private (communal) ownership. 85% of total forest cover is owned by indigenous communities or mataqalis. The other 15% of forest cover is mahogany and pine plantations which are planted on land leased from these communities.

Forests in Fiji are categorized according to their management practices or uses such as:

Multiple use natural forest	: 514,680 ha
Protection forests	: 240,650 ha
Preserved forests	: 55,000 ha

and also according to their vegetation status such as:

Dense forests	: crown density 75-100%
Medium dense forests	: crown density 45-80%
Scattered forests	: crown density 15-20%
Pine plantations	: <i>Pinus caribaea</i>
Hardwood plantations	: mahogany and other species
Coconut plantation	: 40,000 ha
Mangrove forests	: 40,000 ha

Policy and Management Objectives

Although most forested areas are communally owned, the management of forest resources is regulated by the Ministry of Fisheries and Forests, the Fijian Affairs Board and the Native Land Trust Board. Management is in accordance to rules and guidelines mentioned in the Forest Act and various Forest Regulations as well as the National Code of Logging Practice, with the Forestry Department acting as a controlling body and issuing licenses accordingly. The forest owners receive royalty

payments from the loggers via the Native Land Trust Board, based on log measurements carried out by the Forestry Department.

The national policy for the forest sector in Fiji is to establish the sector as a major contributor to the national economy with emphasis on its role as:

1. a source of employment, social development, cultural stability and income generation in the rural areas
2. a source of basic industrial wood-based materials for infrastructure, social and economic development and
3. an expanding generator of foreign exchange earnings.

Moreover, the aim of the indigenous forest sub-sector is to incorporate the sector in the economy as a permanent and sustainably managed national resource operating at its optimal capacity for timber production, conservation, environmental enhancement and social well-being.

Major Forest Health Problems

Pests and diseases of native forests and plantations have not received extensive studies in Fiji, unlike crop plants on agricultural land. There have been occasional papers written by the Forest Health staff of the Forestry Department on certain pests and diseases but none of these have been published nationally or internationally. To date, two major pests and two fungal diseases of mahogany have been objectively studied and analysis of biocontrol and silvicultural options undertaken within pilot projects.

Insects

Two major insect pests have been recorded on natural forests and mahogany plantations in Fiji.

The **ambrosia** beetles of the family **Platypodidae** and **Scolytidae** are non-selective beetles with regard to plant families. These have been recorded from 69 tree species belonging to 42 plant families in natural forests, mahogany plantations as young as 8 years, and in 2 year old potted mahogany seedlings in the nursery. At present, 5 species of platypodids and 104 species of scolytids have been identified (revised list, 21/5/97). Collections made from light traps and lab rearing in billets have been identified and stored in the insectory as well as voucher specimens identified by several entomologists.

Evidence of fresh attack by ambrosia beetles is always associated with interference or actual destruction of the vegetation matrix; more common on marginal trees of the compartment and nearly always related to some forest logging, thinning, pruning or clearing. Hurricanes and cyclones common in Fiji also leave large quantities of material suitable for breeding. Occurrences are within 1-3 weeks after disturbance and evident for up to 5 months. Saplings in the nursery were found to be highly susceptible, especially when stressed physiologically, dying or diseased.

Termites of the *Neotermes* sp. are the other pest common in mahogany plantations. Three species of termites of the genus *Neotermes* (Isoptera: Kalotermitidae) have been identified attacking mahogany (*Swietenia macrophylla* King) in Fiji – *Neotermes*

sp., *Neotermes papua* Desneux and *Neotermes samoanus* Holmgren. The mean percent incidence was 7.7 and loss in wood volume, and consequently the economic value, was 8% of the total volume/value. No correlation was observed between the sites and the nature and rate of spread of infestation and virtually nothing is known on the diversity, distribution, abundance, mode of entry and colonization in the trees and relationship between attack and site or tree condition. Occasionally, infestation occurred in combination with heart-rot caused by the fungi *Armillaria* sp. (mellea complex) or *Phellinus noxius*.

These termites are highly unselective and responsible for damage to economically important native forest trees as well. A total of 23 indigenous tree species belonging to 17 botanical families were found termite positive out of 48 species in 25 families. Although mean percent incidence was found to be 7%, 7 obligatory tree species were found to be more prone to severe damage: *Cleistocalyx* sp./ *Syzygium* sp. (Myrtaceae), *Calophyllum vitense* (Clusiaceae), *Terminalia luteola* (Combretaceae), *Palaquium hornei* (Sapotaceae), *Dysoxylum richii* (Meliaceae) and *Myristica castaneifolia* (Myristicaceae).

Nine species of termite have been reported from Fiji, six of which are considered as forestry pests: *Coptotermes acinaciformis*, *Prorhinotermes inopinatus*, *Cryptotermes* sp., *Cryptotermes domesticus*, *Glyptotermes taveuniensis*, *Incisitermes repandus*, *Neotermes* sp., *Neotermes papua*, *Neotermes samoanus*, *Procryptotermes* sp., *Nasutitermes olidus* and *Nasutitermes* sp.

Diseases

Brown root-rot disease caused by *Phellinus noxius* is common in mahogany but no serious attempts for silvicultural or biocontrol has been undertaken since preliminary surveys suggested less than 5% damage which can be overlooked considering the cost involved. The other common root disease is caused by *Armillaria* spp. Species infected include *Pinus caribaea*, *P. elliottii*, *Anthocephalus chinensis*, *Swietenia macrophylla*, *Cordia alliodora*, *Maesopsis eminii* and *Araucaria cunninghamii*.

Other less common diseases include those caused by *Trametes cingulata*, *Tinctoporellus epimiltinus*, *Rigidoporus microporus*, *Phellinus gilvus* and *Rigidoporus vinctus*.

A very common fungal disease in both mahogany and indigenous species trees of high commercial value is heart rot. In most cases, a central pipe from 3 cm up to 20 cm has been observed in logged-over areas and these pipes may extend all the way to the merchantable height. Another common rot observed is soft-rot but, as yet, the causal fungal agent for these rots has not been determined.

Abiotic Factors

Cyclones and hurricanes which are common in Fiji between November and April also enhance susceptibility of forest trees to insect pests and diseases.

Resources available for Forest Protection

The forest protection section of the Forestry Department in Fiji is involved only in small scale surveys of pests and diseases in second rotation mahogany plantations, exotic species trials and nursery. The two major constraints in carrying out systematic surveillance throughout forests and plantations are the lack of a forest entomologist and required budget. The Department has already in place an insect laboratory which houses a great diversity of insects (mostly identified up to family level) and rearing facilities in the insectary. The expertise necessary for identifications is lacking and so are trained field personnel. Some disease identifications have been handled by SPC staff but most insect identifications are left for visiting entomologists as funding is not available to send over specimens to the Australian National Insect Collection (ANIC).

Current Forest Health Surveillance Activities

Currently, the Research Division of the Forestry Department carries out annual pest and disease surveys in second rotation mahogany, frequent surveys in the greenhouse and nursery, and surveys in exotic species trial plots when a widespread abnormality is observed.

For port surveys in Suva and Lautoka, the Forestry Utilisation Division has one full-time trained staff member involved in inspections of timber and timber products imports and exports at the wharf. This person also visits sawmills and hardware facilities to inspect when they raise concerns regarding their products, especially imported from elsewhere and having insect or fungal damage.

Quarantine Measures

Legislation and Regulations

The Plant Quarantine Act 1982 is the principal quarantine regulation administered by the Fiji Quarantine Department on all international issues. Although geared essentially towards control of plant material imported into Fiji, provision is also made for export inspection and the issue of a formal phytosanitary certificate. Applications for import permits for timber products are handled by the Forestry Department and so is inspection and clearance based on "Timber Import Requirements for Fiji". Fumigation is carried out by Quarantine staff at port of entry. Export grading is also handled by the Forestry Department following "Export Grading Procedures".

Resources

Fiji has no diagnostic expertise for forest pests and pathogens and most insect pests and diseases encountered are referred to the Agricultural entomologist. Pests encountered in timber products are brought to the Forest Health section of the Forestry Department for identifications which are mostly done from voucher specimens.

Interceptions of serious pests and diseases

Interception of insect pests in timber products have been few and, in most cases, the pests were either already present or specific to timbers not available here. But, in all cases, fumigation was carried out and the costs borne by the importer.