



*Asia-Pacific Network for Sustainable Forest
Management and Rehabilitation*

PROJECT DOCUMENT

Promoting the Sustainable Production of Sandalwood in Fiji

[Project ID: 2021P1-FJ]

Ministry of Forestry, Fiji

Silviculture Research Division, Ministry of Forestry, Fiji

Project Duration: 3 Years, 04/2024-03/2027

Basic Information

Project title (ID)	Promoting the Sustainable production of Sandalwood in Fiji [2021P1-FJ]	
Executing agency	Ministry of Forestry, Fiji	
Implementation agency	Silviculture Research Division, Ministry of Forestry, Fiji	
Project Director: Director Forest and Research Division		
Tel: +679 3301611		
Target area(s): Navuso and Matacaucau, Viti Levu, Fiji, as shown in Annex B		
Project implementation duration: [04/2024_to 03/2027, 36 months]		
Total budget (USD)	USD \$999,400	
APFNet grant (USD)	USD \$999,400	
Counterpart contribution (USD)	USD \$0	

Project description

Sandalwood (*Santalum spp.*) has the potential to substantially increase tree cover and improve the socio-economic livelihoods of rural landholders in Fiji. However, this potential is not being achieved because of unsustainable harvesting practices, low planting rates and a lack of secure frameworks for investment and trade in sandalwood.

The goal of this project is to promote an expanded sandalwood resource that will improve the long-term rural socioeconomic development in Fiji through the promotion of efficient plantations and sustainable management of sandalwood.

The objectives are 1) to promote a substantial expansion and quality improvement of sandalwood resources through development and demonstration of efficient plantation and sustainable management of sandalwood; 2) Silviculture technologies and experiences on sandalwood are to be enhanced and knowledge extended in the Pacific region through information sharing and capacity building programs.

To fulfil the project objectives and ensure its sustainability, the expected key outcomes and outputs from the project are:

- 1) construction of a 3,500 m² (0.35 ha) nursery with a capacity of 20,000 high quality sandalwood seedlings;
- 2) 65 ha efficient sandalwood plantation and sustainable management demonstration established;
- 3) 5 ha demonstration on sandalwood plantation using different hosts since it's a semi-parasitic plant;
- 4) Training courses conducted for project stakeholders.
- 5) Best practice guidelines on the planting and management of sandalwood for landowners.

The potential beneficiaries will be landholders, local communities at the project sites.

The key activities will include: upgrading of nursery capacities in Fiji to produce high quality seedlings; establishment of demonstration sandalwood plantations; training courses for technicians and farmers.

It is expected that the outcomes from the project will be sustained. Landowners and communities will have greater support, knowledge and capacity to plant and manage their sandalwood in a manner that maximizes growth and quality (and hence value) of their trees.

Abbreviations and acronyms

APFNet	Asia-Pacific Network for Sustainable Forest Management and Rehabilitation
NGO	Non-government organization
HQ	Headquarter
USD	United States Dollar
Spp	Species
Ha	Hectare
NPK	Nitrogen, Phosphorus & Potassium
M	Meter
Cm	Centimeter
Kg	Kilogram
PS	Permanent Secretary of Forestry
CF	Conservator of Forest
EDOS	Executive Director Operation & Services
EDRD	Executive Director Research & Development
DSRD	Director Silviculture Research Division
DOCE	Director Operation Central & Eastern Division
PO	Project Officer
FG	Forest Guard
PA	Project Assistant
MRV	Measurement Recording and Verification
M&E	Monitoring & Evaluation
VTL	Viti Levu
VL	Vanua Levu

Section A-Project Relevance

1. Issues and Rationale

Sandalwood (*Santalum spp.*) has been a major trading commodity from the Pacific to international markets (primarily Asian) for hundreds of years. The demand for sandalwood continues to be very high but the supply from the Pacific has collapsed, from an estimated 3,000 tons of sandalwood per year in the 1800s to currently less than 200 tons per year. This decline is due to unsustainable practice in the past and lack of replanting. Sandalwood has the potential to substantially improve the economic livelihoods of small landholders in the Pacific. High value sandalwood can be produced in the Pacific with low investment cost and low financial risk, which gives it a significant competitive advantage over sandalwood produced within other regions.

Sandalwood is extremely well suited to the Pacific for the following reasons,

- Sandalwood grows well in the Pacific due to its adaptability to grow in a range of soil types and climatic conditions.
- It is highly suitable as a complementary crop within the existing systems of agriculture, agroforestry, row plantings and woodlots, without requiring the purchase of land or the displacement of agricultural production.
- *Santalum yasi* which is native to Fiji and Tonga produces a prized fragrant heartwood that is rich in α and β santalols which is highly sought after for traditional and religious purposes
- The rotation length is comparatively short (20 years), market prices are very high (up to USD 150,000 per tonne). And the international demand is likely to continue. The costs of growing, managing, harvesting and transporting the products are low and no special equipment is needed. The investment risk to growers is therefore very low.
- Most landholders are familiar with sandalwood and there is a high level of interest in growing more of the resource.
- Forestry Divisions in the Pacific have considerable expertise in the growing of sandalwood, including seed collection and nurseries.

However, there are currently significant constraints that prevent sandalwood from achieving its full potential, including,

- A lack of capacity and knowledge among landholders on the propagation and management of sandalwood, including host plants, pruning and thinning.
- The high value of sandalwood makes it vulnerable to theft and illegal trade, which discourages many landholders from planting it.
- the systems of family and communal land tenure in the Pacific presents challenges for encouraging individual investment in, and ownership of, sandalwood plantings.
- The absence of effective regulatory frameworks for the sandalwood trade means that landholders cannot provide evidence of sustainability and legality to international markets.

Fiji was chosen as the target economy for this project because it has identified sandalwood as a species that could significantly help to increase tree cover and provide landowners with opportunities to diversify their land use and improve their economic livelihoods. Furthermore, the population of natural stands of sandalwood (*S. yasi*) is significantly depleted within the project economy. There is a need to establish field sites that can be used as demonstration areas to encourage the planting and good management of sandalwood within the economy.

Sandalwood has the potential to substantially increase tree cover and improve the socio-economic livelihoods of rural landholders in the Pacific. This potential is not currently being achieved because of a lack of capacity for increased plantings of sandalwood.

It is pertinent to note that the relative cost of growing sandalwood in the Pacific gives it a substantial competitive advantage over other sandalwood-producing economies in the region. In the Pacific, there are no purchase or lease costs on family and communal land, and labour costs are low. Growers in the Pacific therefore enjoy low investment cost and low financial risk, which means that they are less price-sensitive to any fluctuations over time in the market price for sandalwood. In contrast, the extensive sandalwood plantations established in Australia are highly capital intensive, with establishment and management costs 5 to 10 times higher than in the Pacific. These plantations are therefore very sensitive to the global prices for heartwood and their profitability is highly dependent upon achieving their predicted high growth rates, quality and market prices. At least one major Australian sandalwood plantation company has failed in recent years and is currently in administration.

Increased plantings of sandalwood will encourage landowners to manage their land under more productive tree cover rather than leaving it as degraded forest or converting it to other uses such as intensive agriculture. Sandalwood is a proven and valued plant in the Pacific that can be readily planted into the agro-forestry land systems prevalent throughout the Pacific. It contributes to the shade and shelter needed for the agricultural crops without taking up too much space or overly competing with the crops for moisture and sunlight.

Section B - Project objectives, Outputs and Impacts

3. Goal(s) and Objectives

The goal of this project is to promote an expanded sandalwood resource that will improve the long-term rural socioeconomic development in the Pacific Island community using Fiji as a pilot site in the development of efficient plantation and sustainable management of sandalwood.

The objectives are

- 1) To promote a substantial expansion and quality improvement of sandalwood resources through development and demonstration of efficient plantation and sustainable management of sandalwood; and
- 2) To enhance Silviculture technologies and experiences with sandalwood and extend knowledge in the Pacific region through information sharing and capacity building programs;

4. Stakeholders and Beneficiaries

- The major beneficiaries for this development project are the targeted communities and resource owners respectively. Targeted communities are including interested sites, resource owners in the western, northern division and maritime islands as well.

The less obvious beneficiaries will definitely spin off in terms of transportation, processing, and marketing chain. Given the wider geographic coverage these will definitely create lot more opportunities in the rural communities.

The project will create benefits in terms of economic opportunities, sustainable production of alternative livelihood, enrichment of their degraded forest and grassland and community-based development.

The expected benefits of the project are both short term and long term. Outlined in the table below is the result of a survey carried out by the project management with the resource owners to give an approximate figure that can be gained or earned by a successful sandalwood farmer annually;

1 hectare	10,000 m²
1 hectare	400 seedlings/ trees
Standard planting spacing	5m x 5m
Planting survival rate	65 %
Amount earned on seed sales annually (at least 1 kg per tree after 2 – 3 years of planting for \$100.00 per kilogram)	\$26,000.00
Amount earned on heartwood sales after 15 – 20 years per hectare (during harvesting for at least 30 kg per tree at \$100.00 per kilogram)	\$780,000.00

However, with capacity building and continuous technical support by the government through Ministry of Forestry, resource owners, private agencies and communities can extend their planting area every year to maintain the rotation of harvesting for a longer period. And not just a one-off cycle. This ensures sustainability over generations as well as enhanced livelihoods, poverty alleviation and overall economic returns for the country at a much higher value than could ever be realized in other commodity species. Further downstream processing of sandalwood oil from the wood can produce a gross return of twice the value from wood only.

Section C-Project Implementation

5. Activity Plan

Output 1: Construction of a 3,500 m² (0.35 ha) nursery with a capacity of 20,000 high quality sandalwood seedlings

The Ministry of Forestry will be working with the land owning units through the Itaukei Affairs Board, the provincial administrations in the setting up of the villagers/communities to set up the nurseries.

Activity 1.1: Construction of a 3,500m² nursery (PY1/Q1-3)

Participants and responsibility:

Place:

Output indicators: *i.e. established a 3500m2 nursery.*

The Ministry of Forestry will follow the procurement process outlined in both APFNet Manual for Project Identification, Implementation and Management (PIIM 2022) and the Financial Manual for the Ministry of Civil Servants advertising a tender on the specifications and the design for the construction of the Nursery that is conducive for seedling growth and the management of the nursery operations. Interested qualified companies will need to send in their expression of interest detailing the scope of work including the costing plan. This process normally takes 1 – 3 months in before awarding the contract and then proceeding with the implementation.

The Ministry Technical Evaluation committee, consisting of officers from the Silviculture and Research Division and the Restoration of Degraded Forests Unit, will conduct its assessment and background check on the companies that have submitted their expression of interest and the meritorious candidates will then be awarded the tender. The design and budget plan of both nurseries in Suva and Nadi shall be submitted to APFNet for consideration before informing the contenders.

The next aspect of the activity is the construction of a 3000m² nursery in Suva that comprises the establishment of a 500m² greenhouse and 2,500m² sunshade area. Within the shading area a 300m² seedling bed and 60m² warehouse room will be constructed.

The shading system installed in the sunshade area should have a folding and unfolding mechanism to control the intensity of sunshine and rain on the seedlings, the irrigation system should cover the entire nursery to ensure the availability of water supply throughout the year, and the total area for the light-steel warehouse and maintenance room is 200m².

The project will also entail the construction of a 500m² sunshade area with irrigation system in the seedling nursery in Nadi to cater for the Sandalwood planting program in the Western Division. No greenhouse needed in Nadi nursery.

Location	Greenhouse (m ²)	Seedling bed (m ²)	Sunshade area (m ²)	Warehouse/maintenance room (m ²)	Irrigation system (m ²)	Total size (m ²)
Suva	500	300	2,500	60	3,000	3,000
Nadi	0	0	500	0	500	500

Note: The seedling bed (300 m²) and warehouse room (60m²) are included in the Sunshade area.

Budget: The construction of the nurseries in Suva and Nadi will need a budget of \$135,360, which will be fully funded by APFNet (not including the international consultancy cost)

1) Materials cost: \$102,180

a. Greenhouse: 500m²*\$42/m²=\$21,000;

b. Shading net and its supporting materials: 3,000m²*\$8.5/m²=\$25,500;

c. irrigation system: 3,500m²*\$12/m²=\$42,000;

d. Seedling beds construction material: 300m²*\$12/m²=\$3,600;

e. Warehouse and maintenance house construction material: 60m²*\$168=\$ 10,080;

2) Working labor cost: \$33,180

a. Greenhouse construction: 500m²*\$12=\$ 6,000;

b. Shading system construction: 3,000m²*\$3=\$9,000;

c. Irrigation system construction: 3,500m²*\$3=\$10,500;

d. Seedling beds construction: 300 m²*\$5.6=\$1,680

e. Warehouse and maintenance house construction: $60\text{m}^2 \times \$100 = \$6,000$

Activity 1.2 High quality sandalwood and other seeds collected (PY1/ Q2-3, PY2)

Sandalwood seeds are available twice in a year the first fruiting season is from March to May and the second round of seeds availability is from September – November. An important factor that needs to be taken into consideration is that its fruiting calendar falls within the tropical cyclone season therefore proper planning is paramount for seed collection expeditions.

The table below captures the phenology for the *Santalum* species in Fiji

TABLE 1: SANTALUM SPECIES PHENOLOGY CALENDAR

Scientific Name	Common Name	Location	Flowering	Fruiting	Maturity	Seed Classification
Santalum Spp.	Sandalwood	Viti Levu & Vanua Levu	Jan	Feb	Mar-May	Intermediate
			July	August	Sep - Nov	

The seed collection expedition will involve the collection of 100kg or more of high quality sandalwood of which a cut test will be taken to ensure the viability of the seeds. The seeds of other native tree species will also be collected however this will be kept at a minimal of at least 2 kg for per species.

Implementation time: one or two years, PY1-PY2

Total Budget: \$20,000

Sandalwood: $\$5,000 = \$50 \times 100\text{kg}$ of sandalwood seeds, all funded by APFNet. The 3 sandalwood species will be including *Santalum yasi*, *Santalum hybrid* and *Santalum album*.

Native: $\$15,000 = \$50 \times 300\text{kg}$ of native tree species

Activity 1.3 8,000 high quality seedling produced by seeds each year (PY1Q3-PY3Q2)

The project has a joint forest management and participatory conservation component with the local communities whereby it will be sourcing or purchasing quality seeds from communities that have met the specifications for the production and supply of quality seedlings and are listed as a vendor with the Ministry of Forestry in year 1 of the project.

The project will also provide seedling cultivation technology management, that are inclusive of seed collection, production and storage techniques, seedling bed production, seed treatment before sowing, selection of containers, substrate preparation, seedling transplanting, tending management after transplanting, pest control, seedling domestication, out planting standard identification, out planting packaging, transportation, etc., cultivate quality seedlings, meet needs of the experimental demonstration plantation, and provide seedlings to promote local planted sandalwood forest industry. Apart from sandalwood, the project will also be involved in the cultivation of seedlings of associated tree species particularly its different host species and other agroforestry species, of which a list of the target species and quantity to be cultivated shall be submitted to APFNet annually during project period. The work entailed will not only focus on the seedling cultivation in every stage, however it will also involve the provision of trainings to build current capacity and increase the numbers for local seedling technicians, improve the local seedling cultivation level, and promote local planted sandalwood industrial development.

Budget: \$60,000.

APFNet will provide funds for local seedling cultivation, i.e. providing subsidiary of \$ 2.5 for every qualified seedling for afforestation, and an allocated funding for the purchase of 8,000 quality seedlings every year for 3 consecutive years, with an accumulative maximum cost of \$60,000.

The annual production target will be 8000 seedlings. But the capacity of the nursery can hold up to 20,000 seedlings. Sandalwood seeds will need to harden first before being planted and this could take an average of at least 2 years. So while hardening, the seedlings for the New Year will be collected and propagated in the same nursery. This will mean that close to 20,000 seedlings will be stored in the nursery during the first and second year.

Since we will be waiting for the nursery propagation, we will also purchase certain batch of seedlings from our local communities in the first 2 years, in order to allow us to continue meeting the target required for the area planted.

Output 2: Demonstration of sustainable management of sandalwood plantation The sandalwood demonstration component of the project is an excellent teaching tool that can benefit a variety of stakeholders as it is a cost-effective way to increase public awareness of sandalwood, promote adoption by communities and private owners, and obtain support from relevant stakeholders and industries. Demonstration plantings establish a working example of a sandalwood technology under local conditions and it will allow the Silviculture and research division to conduct silvicultural practises and research to showcase its morphological and phenological characteristics.

There are four phases to the Sandalwood demonstration plots:

1. Site assessment and design (Year 1)
2. Land preparation (Year 2)
3. Establishment (Year 2)
4. Monitoring and maintenance (Year 2 and 3)

Activity 2.1 Designing of Demonstration Plantation (PY1/Q3-4)

The demonstration plots will involve the acquisition of 65 ha sustainable sandalwood experimental demonstration plantation in Fiji. The first plot will be established in a 35 ha Itaukei /communal forestland belonging to the village Navuso, in the Naitasiri District, Naitasiri Province. Navuso Village is home to the high chief of the Naitasiri province whose chiefly status is referred to as “Matanikutu na Turaga na Qaranivalu” and is the head of 12 villages of the Naitasiri District. Through this approach, the sustainability and extension of this project is assured, and the best practices of demonstration activities can be disseminated to the adjoining villages. This is how it is done in our traditional communal set up – the lead village takes the lead and then the information is disseminated to the member villages.

The demonstration site is 6 km away from the Nausori International Airport, and therefore quite accessible for demo activities. The site assessment report of the planting area, including a description of land tenure, soil type, slope, existing vegetation, local precipitation and other relevant information will be submitted to APFNet before planting. The demonstration plot will adopt the mixed tree species design whereby sandalwood will be planted with associated tree species with high commercial value such as (*Dalbergia odorifera*, *aquilaria sinensis*, *Dalbergia cochinchinensis*) and cash trees (*Morinda citrifolia* trees, citrus and other tropical cash trees). The plantation will also have an agroforestry component whereby agricultural crops, such as peanuts and soybeans,

will be planted underneath the trees. The plot design will require the trees to be planted in wide and narrow lines with a planting space of sandalwood is 3mx2mx6m, and other tree species will be planted in the middle of wide lines with the planting space of 3m. With these dimensions, there is a total of 1,250 seedlings that will be needed for 1ha of land, at which the proportion of sandalwood to associated tree species will have a 4:1 ratio.

Species will be reduced from 102 native species to only 50 species. However, since project is only 3 years and preparing Sandalwood seedlings takes close to two years before planting we will need to buy seedlings from some private nurseries so because of this we will agree to reduce cost but only to \$5000 and not \$10000 as suggested

The second demonstration plot site will cover an area of 30 ha and will be located in Matacaucau Village, Namalata District, Tailevu Province. It is approximately 2km from the main Kings Highway and is therefore quite accessible for demo activities. This village is home to the Chief traditionally addressed as the “Waimarolevulevu na Turaga na Ratu” who is the head of 11 villages in the Namalata District. Just like the first plot, this approach will ensure the sustainability and, the best practices of demo activities could be disseminated to the adjoined villages. This plot will also have a mixed planting design of sandalwood and associated tree species with high commercial value, such as *Dalbergia odorifera*, *Aquilaria sinensis* and *Dalbergia cochinchinensis*. The plot design will follow a planting spacing of 3mx2mx6m in which two lines of sandalwood trees and one line of associated tree species, native and fruit species will be alternatively planted, and the proportion of sandalwood and associated tree species will follow a 2:1 ratio. Included in the 50 species of trees. As Sandalwood needs a host tree/plant in its early stages that is why we are putting the associated tree species here.

With this design, a total of 1250 seedlings will be needed for 1 ha, consisting of 834 sandalwood trees and 417 associated tree species.

Implementation time: 6 months for PY1,

Budget: 0 (International Consultant cost not included)

Activity 2.2 Land Preparation (PY2/Q1-2)

The land preparation and hole digging will be undertaken on the vacant land in the experimental demonstration plantation. The first step is to procure farm machine which will be used to comprehensively deep digging, smash and break the soil. The whole plantation will undergo soil preparation whereby it will be divided into rectangular pieces to avoid accumulation of underground water during the rainy season, which will affect seedling growth. The methodology followed will involve the excavation of the top soil till to reach a deep drainage that is 50cm in length 12m in width and 100cm in depth.. Dig the planting hole according to the designed row and line space, and the size of the planting hole is (bottom width*depth* opening width) 60cm*70cm*80cm. After the planting holes are dug, it is then exposed under the blazing sun for 1-2 months before backfilling. The first step will require backfilling of the topsoil to 1/3 depth of the hole. The next step is to thoroughly mix, 10kg mature manure and distribute it evenly in every hole. The final step is to backfill the remaining portion of the holes with soil until the soil is 5-10cm above the ground to form a dome shape.

In forestlands, the spot and whole land preparation is adopted. Firstly clearing must be undertaken where the forestland are cleared through the removal of shrubs weeds, and unnecessary trees. Land preparation is then undertaken in places with the forest gap over 16m² where cluster planting is adopted with 3-4 trees is planted in a cluster, and the hole excavation and backfilling methods are as with that on the vacant land.

Implementation time: one or two months before planting, after activity 2.1

Budget: Totally \$167,375 funded by APFNet:

Totally 81,250holes with the area of 65ha (1250 holes are needed per ha)

1) Digging and flattening of land: $65\text{ha} \times \$700/\text{ha} = \$45,500$

2) Digging planting holes: $1250\text{holes}/\text{ha} \times 65\text{ha} \times \$0.5/\text{hole} = \$40,625$;

3) Back to earth (including fertilizing): $1250\text{holes}/\text{ha} \times 65\text{ha} \times \$0.5 = \$40,625$;

4) Ground fertilizer (including purchase and transportation): $1250\text{holes}/\text{ha} \times 65\text{ha} \times \$0.5/5\text{kg} = \$40,625$

Activity 2.3 Establishment of a total of 65 ha plantation in Fiji (PY2/Q2-3)

A total of 65 hectare of sandalwood experimental demonstration plantation will be established in Fiji whereby 35 hectares will be established in the Navuso and 30 hectares will be established in Tailevu. The selection criteria of these plantations will follow the guidelines those that the site forestland is about 20km away from urban centers with a reliable transportation systems hence easing accessibility. Mixed planting of sandalwood and associated tree species with high commercial value will be adopted, such as (*Dalbergia odorifera*, *Aquilaria sinensis*, and *Dalbergia cochinchinensis*) and cash trees (*Morinda citrifolia* trees, citrus and other tropical cash trees).

Note: These associated species will need to be purchased from in large quantity both locally and internationally (The importation of seeds is possible with compliance to BAF Importation procedures i.e. sourcing of seeds from BAFs approved seed source list and payment of importation fees.).

Agroforestry mechanism will also be adopted in which crops such as peanuts and soybeans will be planted under trees, such. The plantation is large in area, so it is quite different and costly to have manual management after planting, and mechanical management should be considered. The trees will be planted in wide and narrow lines, the planting space of sandalwood is $2\text{m} \times 2\text{m} \times 6\text{m}$, and other tree species will be planted in the middle of wide lines with the planting space 3m. 1250 seedlings are needed for 1ha, and the proportion of sandalwood to the associated tree species will follow a 2:1 ratio.

Implementation time: 2-3 months, PY2, after activity 2.2.

Budget: \$ 121,875, funded by APFNet

1) Planting cost: $1250\text{ seedlings}/\text{ha} \times \$0.5/\text{seedling} \times 65\text{ha} = \$40,625$;

2) Seedling cost: $1250\text{seedlings}/\text{ha} \times \$1 \times 65\text{ha} = \$81,250$

Note: This is the associated cost for producing 1 seedling from seed to seedling. This Seedling Cost is not to purchase but the actual cost of producing a seedling from seed – seedling stage, regardless if its sandalwood or associated species the seedling will undergo a series of costly process such as; Potting Contract for Communities for mass produce of seedlings, seed Processing cost and chemicals for seed treatments.

Activity 2.4 Maintenance of Sandalwood Plantation (PY2-3)

The survival rate of the seedlings will be assessed two weeks after field planting whereby dead seedlings will be removed and replaced with new ones. Field Maintenance is conducted in the forest lands 3 times a year where weeds are removed manually from to, prevent shrubs from covering seedlings hence affecting their growth, Fence are also erected to prevent livestock from damaging seedlings. A pest and disease assessment is also carried out to control infestation and spread, furthermore, pruning is carried out in a timely manner with the objective to ensure formation of good tree forms, and the application of topdressing NPK compound fertilizer in the second year after planting, where 200g is applied per tree combined with the weeding before raining season.

Implementation time: twice in PY2-PY3, in the middle and at the end of the year.

Budget: \$ 127,725 funded by APFNet

- 1) Tending and maintenance cost: $65\text{ha} * \$185/\text{ha}/\text{time} * 3\text{times} * 2\text{years} = \$72,150$;
- 2) Fertilizer: $65\text{ha} * \$380/\text{ha}/\text{year} * 1\text{year} = \$24,700$ PY3
- 3) Pick up car: $1\text{unit} * \$30,875.00 = \$30,875.00$

Activity 2.5 Monitoring of tree growth annually (PY2-3)

Monitoring will be conducted annually, with a combination of long-term monitoring and sample monitoring. The sampling ratio for growth increment monitoring will not be lower than 1.5% of the treatment area. Within each treatment, three permanent ecological monitoring plots will be set up, the area of each plot will be 20 m × 20 m in dimensions.

Implementation time: monitor the sampling plot at the end of each year, start from year 2 (PY2-PY3)

Budget: $\$5400 = \$54/\text{day} * 10\text{day}/\text{year} * 5\text{persons} * 2\text{year}$, funded by APFNet

Output 3: Demonstration on sandalwood plantation of different hosts

Activity 3.1 Designing of plantation of different hosts (PY2/Q1)

A literature and methodology review on establishing a 5ha-plantation of different hosts in Fiji will be conducted before the adoption of the mixed plantation of sandalwoods and different associated species. Sandalwoods will be the objective species, while *Pterocarpus indicus*, *Dalbergia odorifera*, *Dalbergia cochinchinensis* and *Aquilaria sinensis* will be associated tree species. The objective tree species and associated tree species will be planted alternatively in lines, with a row of 2mx4m. The exact demonstration site is waiting for approval from landowning unit.

Implementation time: Q1, PY2.

Budget: \$ 0 (not including costs for international consultant)

Activity 3.2 Land Preparation (PY2/Q2)

A farm machine will be procured and will be used for comprehensive deep digging, smash and breaking of the soil. A 100cm deep drainage ditch will be excavated along the entire land to avoid water accumulation. The planting holes will then be dug according to the designed row and line space, and the size of the planting hole is (bottom width*depth* opening width) 50cm*50cm*60cm. After the planting holes are dug, it will then be exposed under the blazing sun for 1-2 months before backfilling. The backfilling methodology will involve filling the holes with topsoil to reach 1/3 depth. The next step is to weigh 10kg mature manure and fill it evenly in every hole, before backfilling it with the soil until the soil is 5-10cm above the ground to form a dome shape.

Implementation time: one or two months, PY2, after activity 3.1

Budget: \$ 12,875, funded by APFNet

Totally 6250 planting holes are needed for the land with the area of 5 ha (1250holes for 1ha is needed)

- 1) Clear and flating land: $5\text{ha} * \$700/\text{ha} = \$3,500$;
- 2) Digging planting holes: $1,250 \text{ seedlings}/\text{ha} * 5\text{ha} * \$0.5/\text{hole} = \$3,125$;
- 3) Back to earth (including fertilizing): $1,250 \text{ seedlings}/\text{ha} * 5\text{ha} * \$0.5 = \$3,125$;
- 4) Ground fertilizer (including purchase and transportation): $1,250 \text{ seedlings}/\text{ha} * 5\text{ha} * \$0.5/5\text{kg} = \$3,125$

Activity 3.3 Establishment of 5 ha plantation of different hosts (PY2/Q2-3)

Planting is to be conducted in the rainy season where the soil moisture over 30cm deep after two soaking training sessions. The methodology to be followed is to dig a small 15cm deep hole in the planting hole after the soil backfilling method, and then carefully select strong seedlings without pests for planting. Remove the seedling container with care, ensuring that the matrix in the root system is kept, put the seedling in the small hole in an upright position, backfill the soft soil excavated around the root system, and compact it. In the event where it doesn't rain on the planting day, water every seedling with 5-8 kg water for root taking, assessment on the soil is then made and if further watering is necessary or not according to the moisture of the soil around the seedling.

Implementation time: 2-3 months, PY2, after activity 3.2.

Budget: \$9,375, funded by APFNet

- 1) Planting cost: $1250 \text{ seedlings}/\text{ha} * \$0.5/\text{seedling} * 5\text{ha} = \$3,125$;

2) Seedling cost: $1250 \text{ seedlings/ha} * \$1 * 5 \text{ ha} = \$6,250$ (1250 seedlings in 1 ha, therefore the production for 1 seedling for the Ministry is \$1.00 per seedlings this cost is the associated cost for the production of seedling. Therefore $1250 * 1.00 = \$1,250.00$ per ha)

Note: The confusion here was the term seedling cost – This is not the purchasing of seedling but the Associated Cost of production of 1 seedlings for the Ministry.

1. Seed Purchasing
2. Seed processing (Treatments)
3. Potting in the nursery we don't have the capacity to be producing with the current staff so we may need to contract communities or organizations
4. Purchase of polythene bags
5. Purchase of Sand, soil for potting medium.

The only Purchase seedlings will be from activity 1.3 whereas for 2.3 and 3.3 they are the production costs.

Activity 3.4 Maintenance of sandalwood plantation (PY2-3)

The survival rate of the seedlings will be assessed two weeks after field planting whereby dead seedlings will be removed and replant of new ones. Field Maintenance is conducted in the forest lands 3 times a year where weeds are removed manually to prevent shrubs from covering seedlings hence and affecting their growth,

Fences are also erected to prevent livestock from damaging seedlings. A pest and disease assessment is also carried out to control infestation and spread pay attention to pest control. Furthermore, pruning is carried out in a timely manner with the e objective tree species in a timely manner to ensure formation of good tree forms, and the application of topdressing NPK compound fertilizer in the second year after planting, where 200g is applied per tree combined with the weeding before raining season. Prune objective tree species in a timely manner to form good tree forms, and apply topdressing when necessary according to the seedling growth and nutrients in the soil.

Implementation time: PY2-PY3

Budget: \$9,400, funded by APFNet

- 1) Tending and maintenance cost: $5 \text{ ha} * \$200/\text{ha} * 3 \text{ times/year} * 2 \text{ years} = \$6,000$;
- 2) Fertilizer: $5 \text{ ha} * \$340/\text{ha/year} * 2 \text{ years} = \$3,400$

Activity 3.5 Monitoring of tree growth annually (PY2-3)

Tree growth is to be conducted monitoring on an annual basis and it consists of, long-term monitoring and sample monitoring. The sampling ratio for growth increment monitoring will be not lower than 1.5% of the treatment area. Within each treatment, three permanent ecological monitoring plots will be set up, the area of each plot will be 20 m × 20 m.

Implementation time: at the end of each year, PY2-PY3

Budget: $4320 = \$54/\text{day} * 8 \text{ day/year} * 5 \text{ persons} * 2 \text{ years}$ PY2-PY3, funded by APFNet

Output 4 Capacity and awareness building for project stakeholders

Activity 4.1 Training for technicians and project officials of Fiji on integrated sandalwood plantation and management technology (20 person/ training) (PY2)

The integrated sandalwood plantation and management technology training for the project implementation will be conducted in Suva, the Capital of Fiji., The facilitators for the training will be those with rich experience in sandalwood planting theories and practice, to train 20 trainees consisting of technicians and project officials closely associated with the project implementation and is also inclusive of entrepreneurs or farmers who are interested in sandalwood planting. The training is consisted of classroom theory teaching and field practice.

Training for local technicians and managers, totally 20 persons will be trained. 2 trainers will be invited from China.

Implementation time: PY2, or training virtually in PY1

Budget: \$13,890, funded by APFNet.

- 1) Meeting room package including room, refreshment, tea break, LCD and others: \$560 for half day
- 2) Food for participants: $\$560 = \$14 / \text{day} * 2 \text{days} * 20 \text{ person time}$
- 3) Accommodation for participants: $\$800 = \$20 \text{ per day} * 2 \text{days} * 20 \text{person time}$
- 4) Training materials: $\$300 = \$15 / \text{person} * 20 \text{person times}$
- 5) Transport for participant travel and fieldtrip: $\$560 = 20 \text{ people's} * \$28 / \text{person}$
- 6) Backdrop and banner: \$ 200
- 7) costs for 2 trainers from China \$10910: international travel cost of USD6, 000=USD 3000 per person per time*2 persons; Full board accommodation cost of US\$2,380=USD 170 per person per day*2 persons*7 days; daily allowance \$1330=\$ 95 per person per day *2 persons*7 days; Allowance for training material preparation \$1200=\$100/day* 3days/training*2 trainings*2 persons

Activity 4.2 Training course for local farmers on sandalwood seedling raising planting, agroforestry, organic farming, maintenance for planting (3 training, 50 participants each) (PY1-3)

Three trainings on sandalwood seedling raising, planting, agroforestry, organic farming, and maintenance of plantation in Fiji will be conducted by training facilitators who are experienced in sandalwood planting theories and practice. The training will involve classroom theory teaching and field practice which will be delivered to, 50 trainee's particularly local farmers who are interested in sandalwood planting.

The training program for this project will involve capacity building and knowledge sharing to 150 local farmers, 3trainings. And will involve the engagement of 2 guest trainers who will be invited from China and local trainers.

Implementation time: 2 days each training (1day in-door meeting and 1 day field -visit, total 3 trainings in PY 1, PY2, PY3, respectively. Training in PY1 will be conducted virtually and it will also include some transfer training where selected participants will be travelled to other selected sites for learning purposes.

Budget: \$ 25,410, funded by APFNet.

- 1) Meeting room package including room, refreshment, tea break, LCD and others: $\$1120 / \text{day} * 2 \text{days} / \text{training} * 3 \text{trainings} = \6720.00
- 2) Food for participants: $\$4200 = \$14 / \text{day} * 2 \text{days} * 50 \text{ person time} * 3 \text{trainings}$
- 3) Accommodation for participants: $\$6,000 = \$20 \text{ per day} * 2 \text{days} * 50 \text{person time} * 3 \text{ trainings}$
- 4) Training materials: $\$2,250 = \$15 / \text{person} * 50 \text{person} / \text{time} / \text{training} * 3 \text{ trainings}$

5) Transport for participant travel and fieldtrip: $\$4,200.00 = 50 \text{ persons} \times \$28 / \text{person} \times 3 \text{ trainings}$

6) Backdrop and banner: \$ 200

7) Costs for 2 trainings by local trainers \$1840: accommodation $\$640 = \$80 \text{ per day} \times 2 \text{ days} \times 2 \text{ trainers} \times 2 \text{ trainings}$; allowance: $1200\$ = \$100 \text{ per day} \times 3 \text{ days} \times 2 \text{ trainer} \times 2 \text{ trainings}$

Output 5 Best practice guidelines on the planting and management of sandalwood for landowners

The planned outcome for this output is that participants will use the information to identify potential improvements to the framework for the management of sandalwood within in Fiji and China particularly with respect to:

1. Promoting increased plantings of sandalwood to provide a substantially increased volume of high quality sandalwood for trade.
2. Strengthening the regulations to provide a more secure investment and trading environment for sandalwood growers.

Activity 5.1 Study trip to China to share and learn experience. (PY2-3/Q1-3)

An exchange programme will be funded by the project where 7 participants will be nominated by the Ministry of Forestry in agreement with the proposed Sandalwood growers association. Five (5) will be from the growers association and 2 staffs within the Ministry to accompany the participants.

Countries like China, Vanuatu and Australia will be the most preferable sites where Sandalwood is being grown and harvested at commercial or semi-commercial scale. This is an educational – awareness trip so that they come back and replicate something similar in Fiji

The Nominated farmers should be appointed on merit considering the following criteria;

- a) Sandalwood Plantation areas of 1 hectare
- b) 10-15 years Sandalwood for maturity Study exchange (3 Participants)
- c) 1-5 Years sandalwood stand for Growing and management stage (3 Participants)

The Study tour will consist the following:

- a) Farm Visit
- b) Factory visits
- c) Research lab visits
- d) Market study

*This will be fully funded by the Project (APFNet)

Budget: \$40,125

- 1) International travel: \$ 3,000/person*7 persons=\$21,000
- 2) Local transport in China (including field trip) for 10 days: \$1125/person*9 persons=\$10,125.00
- 3) Food and lodging: \$100/person*9persons*10days=\$9000.00

For the time being, the exact destination is not included as we are not sure at this stage. When the project starts we will need to confirm with the team once the plan has been finalized. Budget might be increases in the next couple of years.

Activity 5.2 Summary of the best practices on the planting and management of sandalwood based on the project findings. (P2/Q4-P3Q3)

- a) Confirm the anecdotal information regarding the actual value of Sandalwood;
- b) Validation and dissemination of findings to existing and aspiring growers to help improve the Sandalwood industry in Fiji;
- c) Improve trade links between Fiji and China regarding the revitalization of the Sandalwood industry;
- d) Support level of utilization and value adding of Sandalwood in Fiji;
- e) Technical and Scientific research exchange on breeding techniques to assist Fiji in meeting the increasing global demand of Sandalwood
- f) Given the economic value, sandalwood are vulnerable to theft and social issues; the proposed Growers association with the ministry of Forestry will need to collaborate with the Police force in developing a policing technique to safeguard the Sandalwood resources and the grower's interest's i.e. empowering the existing Forest wardens to assist in the Patrolling of the plantation.

Budget: 15,000

6. Communication and Dissemination Strategy

- An independent project communication and dissemination (C&D) strategy is attached in Annex C.
- (Activity 6.5)

Section D- Project Effectiveness

7. Monitoring and evaluation (Activity 6.4)

Measurement Recording and Verification (MRV) guideline will be used for – quarterly monitoring and verification of plantation and project activities

Forms will be designed and trailed out for further M& E activities.

- a) Progress reports will be prepared and submitted to APFNet at six monthly intervals.
- b) The Progress reports will outline activities undertaken during the period and the outputs against the indicators of achievements.
- c) The reports will include a budget report on expenditure against the work plan and an annual audit report.
- d) Forestry Operations and Services, Ministry of Forestry, Fiji will undertake regular monitoring under its internal business system where project funds will be given a special code within the system.
- e) The project team will review progress every six months to determine if any changes are needed to be made to the work program in order to ensure that the project objectives are met.

Section E- Project Management and Sustainability

8. Project Organizational Structure and Key Personnel

(1) PSC

Project Steering Committee (PSC) will include Senior Management from APFNet and Ministry of Forestry. They will oversee the overall implementation of project activities, including funds request

and approval and the monitoring process. APFNet project managers will function as an observer during the PSC meeting.

(2) Project Management Office

This will include Project Team; Project Officer and 2 other Project Assistants. They will be reporting direct to Director Forestry Research & Division.

(3) External Consultants

External consultants will be identified and approved by the PSC. They will be only engaged on any identified research component for further consultations and report compilation.

9. Consultancy support for the project implementation (Activity 6.1)

International consultants will be recruited to provide technical support for the implementation of the demonstration and training activities with a total estimate of USD 57,270, among which international consultant fee of USD21,000=USD 500 per person per day (up to 14 days each time)*1 persons*3times; consultant assistant fee of USD3,990= daily allowance USD 95 per person per day (up to 14 days each time)*1 persons*3time;international travel cost of USD18,000=USD 3000 per person per time*2 persons*3times, full board accommodation cost of USD14,280=USD 170 per person per day*2 persons*14 days*3times.

Visiting time	Consultants	Tasks	Duration
1st time in the 1st project year	1 consultant and 1 assistant from YAFG	Develop the detail design plan for demonstration sites. Provide technical support on seedling raising, including seed treatment, seeding, young seedling transplant into container with host plant.	14 days each visit in average, but could be varied depending on the actual situation. Total visiting time is up to 42 days.
2 nd time in the 2 nd project year	1 consultant and 1 assistant from YAFG	Develop the monitoring plan for demonstration sites; Conduct on-site data collection and monitoring; Give guidance at the stage of seedling transplanting into plantation field and establishment of different hosts experiments.	
3 rd time in the 3 rd project year	1 consultant and 1 assistant from YAFG	Conduct monitoring and evaluation of trees performance. Project summary and dissemination materials producing.	

Note that the Project could hire international consultants from other economies or use local consultants for consultancy works. The contracts for international consultants will be signed directly with APFNet and payment for such consultancy and related costs will be retained by APFNet and paid directly.

10. Dissemination and sustainability

The outputs of the project will be disseminated on a regular basis throughout the project by way of the consultation workshops and demonstration sites detailed under the Outputs and Strategic Activities section above.

11. Risks and Assumptions

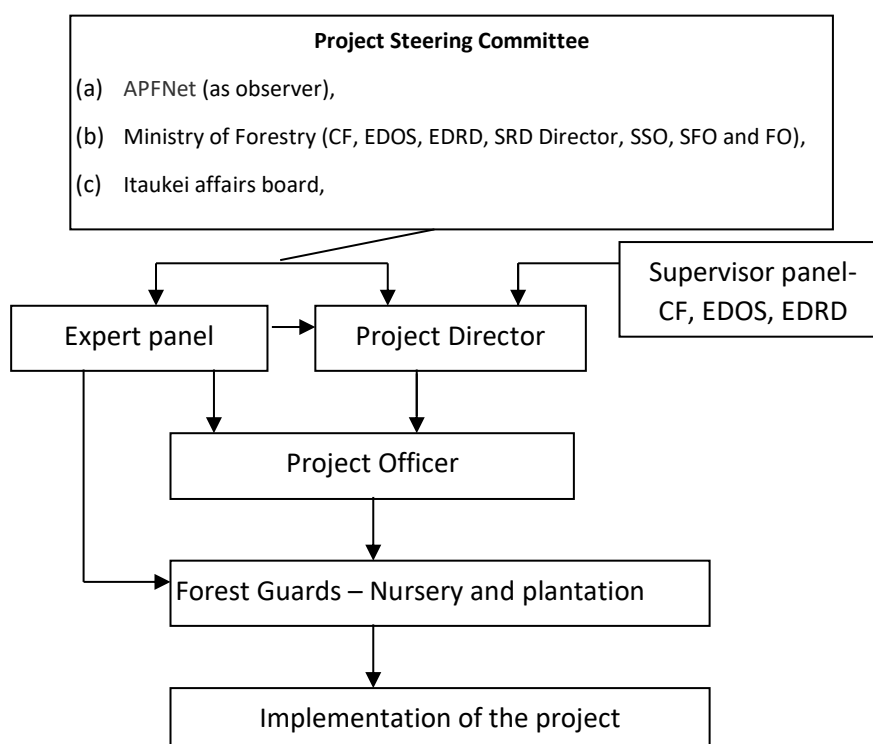
Risks:

- Political instability – this mainly affect the availability of funds locally due to economic instability.
- Climate variability – this will affect the growth of the established plantations, and even the implementation process.
- Economic climate (change in economic impacts can result in budget adjustment).

Potential:

- Provide Employment – employment opportunities for our local communities.
- Provide economic activity – contribute to our economic growth.
- Climate change mitigation – supporting the tree planting initiatives.
- Local and International market opportunities – broaden and improve our market and networking system on sandalwood products.
- Potential research opportunities for Fiji – exchange ideas and knowledge with other experts.
- Benefit sharing of lessons learnt from project

12. Institutional Management and Communication



Project Steering Committee

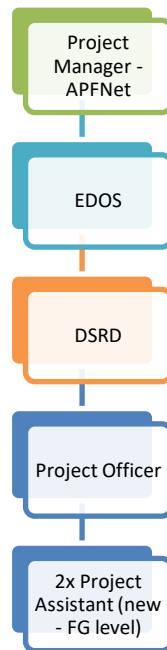
A Project Steering Committee (PSC) is composed of forestry managers from the Pacific Community (SPC) and the Ministry of Forestry. The PSC will inspect annual work plan and activity report, carry out necessary inspection and assessment of project process, research and guide the important issues during the project implementation.

Designation	Name
Acting Permanent Secretary of Forestry	Atelaite Rokosuka
Conservator of Forest	Sanjana Lal
Executive Director Operation Services	Tevita Bulai
Executive Director Research and Development	Deborah Sue
Director Research and Development	Alivereti Naikatini
Senior Scientific Officer	Iliesa Koro
Senior Forestry Officer	Maika Lesubula
Forest Officer- Tree Improvement	Waisea Bolatolu
Yunnan Academy of Forestry and Grassland, China	Zhang Jinfeng
Project Officer	Vacant
Project Assistant	Vacant
Land Owning unit	Vacant

If there are any changes or additions to the PSC, APFNet is to receive an updated list immediately.

Project Team

The main project body will harbor under the Ministry of Forests, Fiji with the coordination of the project team. The Director Silviculture and Research division will be the Project Director and responsible for the overall project coordination and implementation in Fiji. The Project Coordinator/officer will involve in project daily communication, coordination, and implementation. The Project Coordinator will provide all project plans and initiate all the project activities in order to meet the required outputs. Two project assistants will be recruited to assist the Project Director and Project coordinator. Also, the Project Coordinator will monitor all the implementation done by the Project Assistant at divisional and district level. The two (2) Project Assistant will have to provide report and update on the project implementation status on a regular basis. Since most of the implementation will be done in communities within districts and provinces, Provincial Offices will be our main doors, also hands and feet during implementation phases.



Expert Panel

Experts from Yunnan Academy of Forestry and Grassland, China and Ministry of Forestry, Fiji will establish the expert panel. The team will engage the views and advice of those experts consisting of international and local Sandalwood specialist as or when the need arises.

13. Material Resources

Majority of the material used in this project will be sourced locally such as planting materials, construction materials and human materials.

Within the 3 years of implementation, awareness, planting and silviculture management will involve and requires a lot of materials in order to deliver the project successfully. These will include training materials, land preparation tools and machinery and other required techniques requires during planting management to ensure healthy growth of sandalwood plantation.

In the long run, more materials will be required in terms of identifying matured trees, oil production and value adding machines to boost our local production.

7. 14. Dissemination

All the project findings will be captured and documented in the form of publication such as brochures or pamphlets and will be presented in the Ministry's website to be readily available for other sandalwood development. Raw data will be kept at the ministry of Forestry archives and the plantation data will be recorded in the national sandalwood data base

8. 15. Duplicability and sustainability

In this partnership program the long-term management of the project will be done by the community itself. The initial working committee that is formed will be involved in the preparatory work as well as the

implementation phase and subsequently transferring the full management of the work to the community committee as the project phases off.

Consultation with landowners directly has been an on-going event for the past years but with limited districts. With the implementation of this project, the initial phase right up to completion will be undertaken with consultation and collaboration with iTaukei Land Trust Board (TLTB), iTaukei Affairs Board (ITAB), District Commissioners, Provincial Council Offices, landowning units (Mataqali), lands department and any other relevant stakeholders.

Currently, the project is managed by one Project Officer with the guidance of Principal Silviculturist, Research Division and assistance from DFOs, provincial offices and communities for the implementation. However the Division will have continuous in-house training for all staff to render them competent in case of staff turn-over.

Section F-Project Finances

16. Budget

This project will be fully funded by the APFNet and the Ministry of Forestry will provide additional support and assistance in kind through project implementation, monitoring and reporting process. These includes project staffs, office space, other staffs who will assist in field works, vehicles and etc.

Total budget (USD)	USD \$999,400
APFNet grant (USD)	USD \$999,400
Counterpart contribution (USD)	USD 0

17. Project resources and financial management

The project will provide fully fund its activities and funds will be regulated by the Ministry of Forestry Finance Section to ensure that all utilization of budgets follow the ministry of Forestry Financial Manual and data are well documented in the FMIS system and physical filing systems.

The financial report and independent audit report should be submitted to APFNet on annual basis. The project will be monitored on a quarterly and annual basis where audit queries will be addressed.

18. Auditing (Activity 6.2)

Normally, our Finance team within the ministry, with the assistance from the Ministry of Finance will ensure their audit and monitoring are done in usual manner in order to maintain the sustainability of project implementation with the funds availability. This is a project which will be administered by the Ministry of Forestry. For all government registered projects, an external audit (not government) will be hired to review and audit the project expenses.

Annex A-1 Map of location of Fiji

FIJI PROPOSED SANDALWOOD PROJECT NURSERY SITES



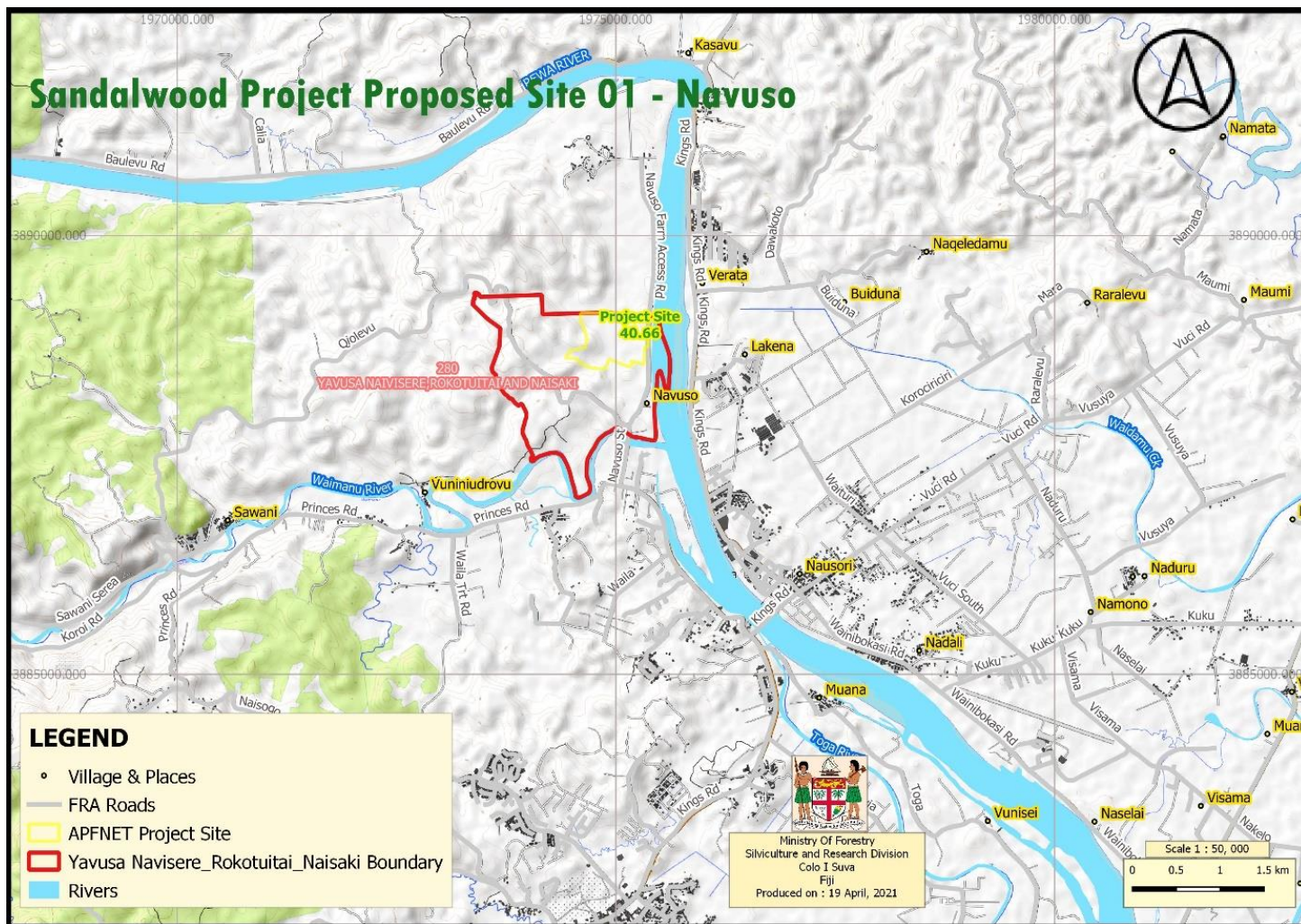
The Republic of Fiji is located in Melanesia in the South Pacific Ocean about 2,000 km northeast of New Zealand's North Island. It comprises an archipelago of more than 332 islands, of which 110 are permanently inhabited, and more than 500 islets, amounting to a total land area of 18,300 km². The two major islands, Viti Levu and Vanua Levu, account for 87% of the population of almost 860,000. The capital and largest city, Suva, is on Viti Levu. About three-quarters of Fijians live on Viti Levu's coasts, either in Suva or in smaller urban centres like Nadi (tourism) or Lautoka (sugar cane industry). Viti Levu's interior is sparsely inhabited due to its terrain.

The climate in Fiji is tropical marine and warm year round with minimal extremes. The warm season is from November to April and the cooler season lasts from May to October. Temperature in the cool season still averages 22 °C. Rainfall is variable, with the warm season experiencing heavier rainfall, especially inland. Winds are moderate, though cyclones occur about once a year (10–12 times per decade).

Politics in Fiji normally take place in the framework of a parliamentary representative democratic republic wherein the Prime Minister of Fiji is the head of government and the President the Head of State, and of a multi-party system. Executive power is exercised by the government, legislative power is vested in both the government and the Parliament of Fiji, and the judiciary is independent of the executive and the legislature. Fiji has one of the most developed economies in the Pacific island realm due to an abundance of forest, mineral, and fish resources. Fiji has about 1 million ha of forest (56% of its land mass), comprising natural forest and about 180,000 ha of plantations of species such as mahogany and pine. Today, the main sources of foreign exchange are its tourist industry and sugar exports.

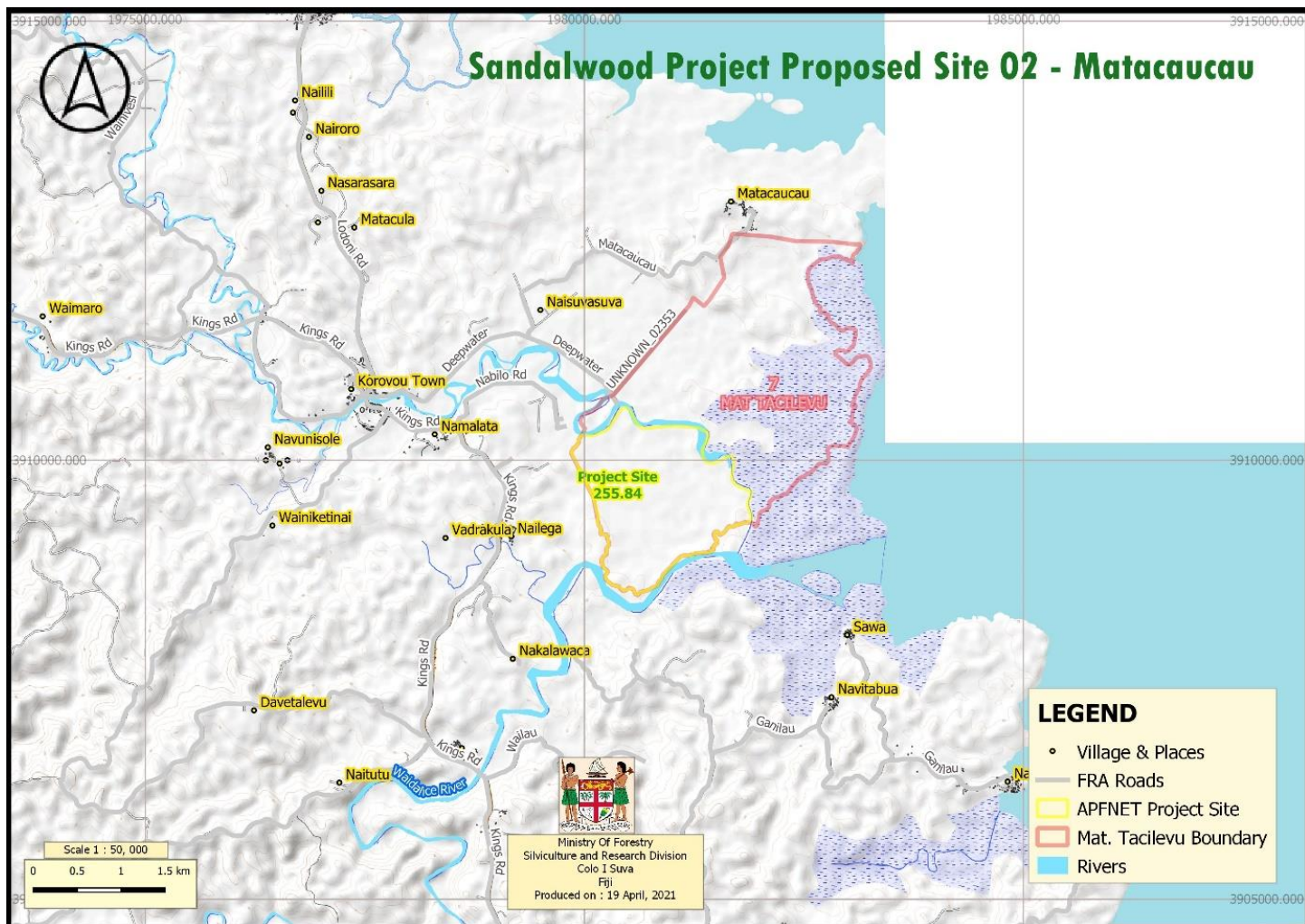
Annex A-2: Project sites map and relevant information

Site # 1: Navuso



Annex A-2: Project sites map and relevant information

Site # 2: Matacaucau



Annex B Project Monitoring and Evaluation Framework

Items		Objectively verifiable indicators of achievement ⁵	Sources of information and means of verification ⁶	Assumptions ⁷
Goal(s) ¹	The goal of this project is to promote an expanded sandalwood resource that will improve the long-term rural socioeconomic development in the Pacific Island community through development of efficient plantation and sustainable management of sandalwood.	<ul style="list-style-type: none"> To promote a substantial expansion and quality improvement of sandalwood resources through development and demonstration of efficient plantation and sustainable management of sandalwood; and To enhance Silviculture technologies and experiences with sandalwood and extend knowledge in the Pacific region through information sharing and capacity building programs 	<ul style="list-style-type: none"> Status reports Media Press release Research findings published 	<ul style="list-style-type: none"> Political instability Tropical cyclones
Output 2	Establishment of a nursery with high quality sandalwood seedlings			

Annex B Project Monitoring and Evaluation Framework

Activities⁴	Activity 2.1 Construction of a 3,500m ² Nurseries.	<ul style="list-style-type: none"> • Specification of Nursery report • Advertisement of expression of interests • Evaluation report <p>Awarding of Tender</p>	<ul style="list-style-type: none"> • Quarterly Progress report • Annual report 	Delay in funding procedure
	Activity 2.2 High quality sandalwood and other seed collection	<ul style="list-style-type: none"> • Submission of Species List • Seed collection <p>Seed collection and treatment</p>	<ul style="list-style-type: none"> • Submission of species list from DSRD to seed collection team (Email evidence and Documentation) • 100kg • Quarterly seed treatment report <p>Quarterly viability test report</p>	<ul style="list-style-type: none"> • Tropical cyclone • Logistics (Transportation) <p>Fruiting season variability</p>
	Activity 2.3 Seedlings propagation in the nursery - 8,000 high quality seedling produced by seeds each year	<ul style="list-style-type: none"> • Soil collection and treatment • Potting • Seed Germination % at the nursery. • Survival rate after transplanting 	<ul style="list-style-type: none"> • Quarterly report of number of pots produced • Quarterly Seedling stocks 	<ul style="list-style-type: none"> • Tropical cyclones
Output 3	Demonstration of sustainable management of sandalwood plantation			

Annex B Project Monitoring and Evaluation Framework

	Activity 3.1 Designing of Demonstration Plantation	<ul style="list-style-type: none"> • Consultation with land owners • Drone survey <p>Demonstration plot design and land use planning</p>	<ul style="list-style-type: none"> • Consultation report/ agreement <p>Production of plantation layout 1 per site</p>	<ul style="list-style-type: none"> • Land dispute • Unfavorable weather condition <p>Tropical cyclone</p>
	Activity 3.2 Land Preparation - clearing and mounting of the sites	<ul style="list-style-type: none"> • Funding of farming machines • Clearing and mounting of the sites • Drainage • Poling 	1 Report	<ul style="list-style-type: none"> • Unfavorable weather condition <p>Delay of machine availability</p>
	Activity 3.3 Establishment of a total of 65 ha plantation in Fiji	<ul style="list-style-type: none"> • Planting of sandalwood seedlings 	1 Establishment report for each site	<ul style="list-style-type: none"> • Unfavorable weather condition
	Activity 3.4 Maintenance of Sandalwood Plantation	<ul style="list-style-type: none"> • Plantation Assessment – 1st round • Beat up (Replacing dead plants) 	Quarterly Monitoring Report	<ul style="list-style-type: none"> • Unfavorable weather condition
	Activity 3.5 Monitoring of tree growth annually	<ul style="list-style-type: none"> • Biannual measurement and verification of plantation 	3 Annual performance report for each sites	<ul style="list-style-type: none"> • Funds availability.

Annex B Project Monitoring and Evaluation Framework

Output 4	Demonstration on sandalwood plantation of different hosts			
	Activity 4.1 Designing of plantation of different hosts	<ul style="list-style-type: none"> • Selection of Host species Listed • Propagation and purchasing of host plants 	Submission of agreed design	<ul style="list-style-type: none"> • Funds availability.
	Activity 4.2 Land preparation	<ul style="list-style-type: none"> • Funding of farming machines • Clearing and mounting of the sites • Drainage • Poling 	1 Report	<ul style="list-style-type: none"> • Unfavorable weather condition • Delay of machine availability
	Activity 4.3 Establishment of 5 ha plantation of different hosts	<ul style="list-style-type: none"> • Planting of selected host 	1 Establishment Report	<ul style="list-style-type: none"> • Funds availability
	Activity 4.4 Maintenance of sandalwood plantation	<ul style="list-style-type: none"> • Plantation Assessment – 1st round • Beat up (Replacing dead plants) 	Quarterly Monitoring Report	<ul style="list-style-type: none"> • Funds availability
	Activity 4.5 Monitoring of tree growth annually	<ul style="list-style-type: none"> • Biannual measurement and verification of plantation 	3 Annual performance report for each sites	<ul style="list-style-type: none"> • Funds availability
Output 5	Capacity and awareness building for project stakeholders			

Annex B Project Monitoring and Evaluation Framework

	Activity 5.1 Training for technicians and project officials of Fiji on integrated sandalwood plantation and management technology (20 person/ training)	<ul style="list-style-type: none"> • Development of Training materials • Training Logistics and preparation • Training Budget 	1 training report per community	<ul style="list-style-type: none"> • Community engagement • Funds availability
	Activity 5.2 Training course for local farmers on sandalwood seedling raising planting, agroforestry, organic farming, maintenance for planting (3 training, 50 participants)	<ul style="list-style-type: none"> • Development of Training materials • Training Logistics and preparation • Training Budget 	1 training report for local farmers	<ul style="list-style-type: none"> • Community engagement • Funds availability
Output 6	Exchange and summary of best practice on the planting and management of sandalwood			
	Activity 6.1 Study trip to China to share and learn experience for Fijian	<ul style="list-style-type: none"> • Selection of successful growers • Trip logistics and preparation • Consolidation of country report 	<ul style="list-style-type: none"> • 1 study tour report <p>Learning experience review from growers (press release)</p>	<ul style="list-style-type: none"> • Funds availability

Annex B Project Monitoring and Evaluation Framework

	Activity 6.2 Summary of the best practices on the planting and management of sandalwood based on the project findings.	<ul style="list-style-type: none">• Final plantation assessment in terms of best Silviculture practices and growth of species• Adoption of innovative planting methods• Promote sandalwood investment	Project impact report	<ul style="list-style-type: none">• Funds availability
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Annex C Project Communication and Dissemination Strategy

C&D Objectives	Target Audience	Key Message	Monitoring Indicator	Work plan and budget				
				Activities (what)	C&D tools (how)	Time/location (when/where)	Responsible person (who)	Estimated budget (USD)
Quarterly Project Performance Report (QPPR) – Standard Excel format	APFNet, PSC, Project Team	Quarterly achievement Quarterly commitment – utilized budget Pending activities Challenges & Way forward	Quarterly achievement & budget utilization	Achieve vs. pending activities	Printing and sending e copies	Quarterly basis	Project Officer	\$200
Monthly PSC meeting Report – Standard format	APFNet, PSC, Project Team	Progress of the project Burning issues Way forward	Progress report & weekly report	Weekly activities & achievement (monthly)	Printing and sending e copies	Monthly basis	Project Officer	\$200
Monthly Work Group meeting	PSC, Project Team and LOU	Progress of the project Burning issues Way forward	Progress report & weekly report	Weekly activities & achievement (monthly)	Printing and sending e copies	Monthly basis	Project Officer	\$200
Project brochure/leaflet/others	APFNet, Project Team, Farms	A brief of the APFNet project and its benefits	Project implementation stories, benefits, achievements, impacts	APFNet project summary information	Printing and sending e copies	One-off, unless more is required	Project Officer	\$6900
							Subtotal	\$7500
Project kick-off meeting leaflet	APFNet, PSC, Project Team	A brief of the APFNet project and its benefits	Project awareness at Kick-off meeting (at least 200 brochures)	APFNet project summary information	Printing and sending e copies	After the Project kick-off meeting	Project Officer	\$ 2500
News Articles	APFNet, members of the public, farmers	Project progress report, lessons learnt, benefits to	Number of articles published, comments and	Project stories, progress, lessons	Printing in local a local newspaper and e copies	1-2 news article/yr	Project Officer	\$0 (Ministry will cover this)

Annex C Project Communication and Dissemination Strategy

		the public, research findings	enquiries from people	learnt, public or farmers views				
Project Documentary film	APFNet, members of the general public globally, farmers, local government officials in Fiji	lessons learnt, benefits to the public, research findings	A finalized documentary film	Project stories, progress, lessons learnt, public or farmers views	Disseminating on the Ministry social media platforms, APFNet social media platforms, others	Project Year 3	Project Officer + film making company	\$5000
							Sum	\$15,000

Annex E Project Budget by Category

Refer to the Excel