



NATEWA TUNULOVA, FIJI

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REVIEWED BY:

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PURPOSE

This study was part of a Darwin Initiative project to deliver sustainable forest management for Fiji's people and wildlife. The application of TESSA was conducted at three forest sites, including Natewa Tunuloa, to identify and highlight ecological and socio-economic values of forests to encourage Fijian communities to take up sustainable forest management.

BACKGROUND & CONTEXT



Natewa Tunuloa is on a large peninsula on the south of Vanua Levu the second largest island in Fiji. The IBA is mostly lowland tropical rainforest extending along the ridges of the peninsula with steep slopes on montane forests. It contains most of the remaining tracts of native forest on the island. The land tenure includes 68 Native Lands (about 20,506 ha), two freehold lands (about 320ha), and two Crown Scheduled lands (about 246ha). The Native land is owned by 30 landowning units (mataqali) in 16 villages.



The Natewa Peninsula was assigned the status of “Key Biodiversity Area” by Conservation International in 2005. It has also been identified as a “Site of National Significance” in Fiji’s National Biodiversity Action Plan, and received the designation “Important Bird Area” in 2005 from BirdLife International. Despite this recognition of the area’s natural significance, however, the peninsula does not have official protected area status and remains vulnerable to land use change. Currently the Sisi Initiative have negotiated a community conservation area covering 7,050ha which protects the remaining forest in return for support with livelihood development. The agreement was for 15 years and will expire in 2024. Deforestation, soil erosion and water insecurity excessive logging, human-induced fires and overgrazing have historically been the main threats to the peninsula’s forests. Large areas of native forests were cleared for mahogany plantations (although this practice, for this purpose, has since ceased) and extensive and unsustainable logging continues to degrade the forests nearby. Since much of the flat land on the peninsula has been converted to coconut plantations, agriculture tends to encroach on the forest. The resulting deforestation leads to soil erosion and water insecurity, as well as threatening birds and wider biodiversity.

PRELIMINARY SCOPING APPRAISAL

The Appraisal was conducted with all 16 villages in Natewa Tunuloa as well relevant stakeholders such as the Cakaudrove Provincial Office, Department of Forestry Department of Agriculture and Land Use Section where separate discussions were conducted. The consultations helped to identify different habitats and the drivers of change. The toolkit was used to identify key threats and using the template, these were used to gather information specifically on threats, timing, scope, severity and impact.

The rapid appraisal also identified key actions in response to the threats or pressures acknowledged by the Natewa Tunuloa community.

Table 1: Summary of conservation activities implemented in Natewa Tunuloa in collaboration with different stakeholders.

| Conservation Activities (Actions at the site) | Currently occurring or likely to occur in the next 10 years? Tick all that apply | Leading stakeholder/organization |
|--|--|---|
| Education & Awareness | ✓ | Government agencies (Ministry of Health, iTaukei Affairs Board, Department of Forestry, NFMV, DOE, GEF-SGP) |
| External capacity building | ✓ | iTaukei Affairs Board through the Rewa Provincial Office, NFMV, COMDEKS |
| Land/water management | ✓ | Native Lands Commission, Ministry of Health, Ministry of Agriculture |
| Land/water | ✓ | Department of Forestry, NFMV, |



| | | |
|------------|--|---------|
| protection | | COMDEKS |
|------------|--|---------|

Table 2: Services provided by the current state, as identified by the Natewa Tunuloa community through the rapid appraisal

| Benefits | Current State |
|---------------------------|---------------|
| Global Climate regulation | ✓ |
| Harvested wild goods | ✓ |
| Water services | ✓ |
| Cultivated goods | ✓ |
| Nature based recreation | ✓ |

IDENTIFYING PLAUSIBLE ALTERNATIVE STATE

There are two separate alternative land use scenarios that were decided upon by the project team (Nature Fiji & BirdLife International).

The first is to assume that the land use in the current Community Conservation Area would revert to a range of land use types more similar to the non-IBA area within the peninsula. This would produce a significant reduction in the extent of native forest, and an increase in the extent of logged forest, open forest, talasiga (fallow grassland) and cropped land. There is a substantial area of production plantation forestry (primarily mahogany) in the non IBA part of the peninsula. However, this land use option, to log native forest and replant with mahogany, is no longer available in Fiji due to national policy. Consequently we assumed that this land area would be logged, and left to return to forest, or to talasiga, as is the case currently in much of the non-IBA land on the Natewa peninsula.

The second scenario is based on a community suggestion – and indeed reflects the current activities of the local conservation group partner within the Satoyama Initiative. The land-use option is to convert the grassland and fallow land into plantation forests, preferably for pine, mahogany and teak. The native forest would remain protected.

Table 1. *The current state is the situation in the Sisi Initiative community conservation area (CCA). Alternative State 1 assumes that the proportion of different habitats on Natewa Tunuloa Peninsula outside the current IBA are enacted within the Conservation Area (note that we have assumed that the current law regarding no planting of plantations on previously unlogged forest is in place and so have not converted logged native forest to Plantation Forest). Alternative state 2 assumes that plantation forests will now be allowed within the areas of forest already logged, and will be used to ‘reclaim’ the talasiga grassland that is currently classed as ‘idle production land’.*



| Habitat Type | Current State | Alternative State 1 | Alternative State 2 |
|---|---------------|---------------------|---------------------|
| Tropical Moist Deciduous Forest – Unlogged | 5500 | 1396 | 5500 |
| Tropical Moist Deciduous Forest - Logged | 400 | 2800 | 400 |
| Tropical Moist Deciduous Forest – Scattered Trees | 125 | 825 | 125 |
| Grassland/Talasiga | 300 | 879 | 100 |
| Plantation Forest | | | 600 |
| Coconut Plantation | 125 | 250 | 125 |
| Cropped Land | 600 | 900 | 200 |
| TOTAL | 7050 | 7050 | 7050 |

METHODS

Global climate regulation

To estimate carbon storage (C) in above ground biomass, we collected field data separately in the logged and unlogged forests with specific transects along the ridges and slopes. We randomly located 32 sets of 5m wide x 100m length transects in the unlogged forest and 13 sets in the logged forest. Each transect was at least 200m apart accessed by trails used by the Natewa Tunuloa community. Along each transect we measured diameter at breast height (DBH) of all trees $\geq 10\text{cm}$ and estimated the height of all palms and the first tree at every 10m. Prior to conducting the field assessments, meetings and trainings were conducted with specialists from the Department of Forestry. The Department of Forestry experts provided assistance with the identification of trees.

Harvested wild goods

Based on the rapid appraisal, people in Natewa Tunuloa indicated firewood as the most important wild good. We therefore distributed questionnaires to each household to assess the quantity of firewood collected each week. In a separate exercise we also requested the villages to identify specific areas which are important for firewood collection as well as other wild goods collected by them. We also collected data on the other wild goods gathered which are mainly used for subsistence. These include wild yams, fruits, wild meat and freshwater prawns and eels.

Water provisioning

The water supply for each of the village in Natewa Tunuloa varies from spring, creek, stream and river sources. All villages however have piped water which comes directly to each



household. Since water is piped, and water shortages were not reported, the change in land cover is unlikely to have a direct impact on water provisioning at this site.

Cultivated goods

To assess the different types and the most important cultivated crops, we distributed questionnaires to the sixteen villages. We looked at those communities owning land in the logged forest, unlogged forest (CCA) and logged with some reserves set aside to compare the different types and quantity of crops cultivated and sold. To deduce the quantity of crops planted we also held village meetings to discuss this and compared the results with reports from the Cakaudrove Provincial Council as each village submits reports to the council on activities completed in each quarter.

We also collected data on other cultivated crops planted within the village vicinities such as pandanus and paper mulberry trees.

Nature-based recreation

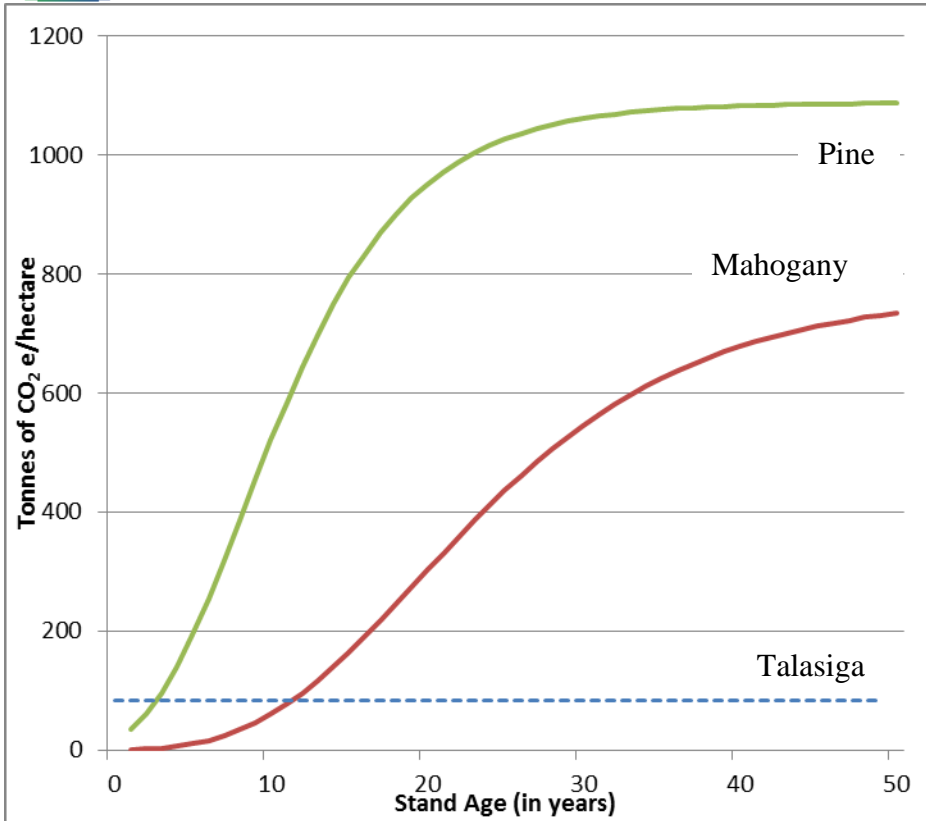
Eco tourism is not common in the two districts. We distributed questionnaires to obtain information on recreation activities within the two districts. There was only one active eco-tourism lodge which is privately owned.

ANALYSIS AND COMMUNICATION

The first alternative land use scenario results in the carbon storage at the site being reduced to just 76% of the current land use scenario. The potential conversion of native forest to logged forest and grassland will substantially reduce carbon storage at the site.

In the second of the alternative scenarios community representatives would plant areas of talasiga grassland with a production plantation, either Mahogany, Pine or possibly Teak. We used information from the literature to estimate the impact that these conversions might have on carbon storage.

Figure 3. Increase in CO₂ storage with Age of stand in Production Plantations, compared with estimated CO₂ storage in Talasiga grassland, in Fiji. Data taken from Payton and Weaver (2011) and Conservation International 2013.



Our analysis suggests that Pine Plantations would hold more CO₂ than Talasiga grassland by the time that they are 3 years of age, while Mahogany plantations would exceed Talasiga grassland when Stand Age reaches 12 years. We can assume that Teak plantations would be similar to Mahogany plantations. Pine plantations plateau at in excess of 1000 Tonnes of CO₂ per hectare – or more than 10* the CO₂ content of Talasiga grasslands. Mahogany plantations take rather more years to plateau – and CO₂ capture was still rising 50 years after planting.

The top five wild goods identified by the Natewa Tunuloa community are mainly used for sustenance. The native forest is only used on few occasions to gather fruits, wild yams, herbal medicine and pig hunters. The other important wild goods are collected mainly from agricultural areas, logged forest and mangrove forest.

Table 7: Top harvested wild goods identified by the community in Natewa Tunuloa

| Land Use Type | Firewood | Fruits | Prawns | Wild yams | Traditional medicine |
|---------------|----------|--------|--------|-----------|----------------------|
| Native forest | | ✓ | ✓ | | ✓ |



| | | | | | |
|----------------------------|---|---|---|---|---|
| Logged forest | ✓ | ✓ | ✓ | ✓ | ✓ |
| Agricultural areas | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mangrove forest | ✓ | | ✓ | | ✓ |
| Coconut plantations | ✓ | | ✓ | | ✓ |
| Grassland | | | ✓ | ✓ | |

We interviewed 150 individuals from the 16 villages in Natewa Tunuloa with a minimum of 8 in a village. We found that all families in each of the 16 villages gather wild foods each week especially if it's in season. We found that all wild goods are collected only from *mataqali* land within each village and other areas are not visited unless permission is granted by landowners.

We distributed firewood questionnaires to all sixteen villages and only 39 were returned. 1 out of the 39 does not collect or use firewood but primarily depends on gas stove which is FJD \$282.00 per annum. The remaining 38 collected an average 3,026 kg firewood per annum. None of the households employ anyone to harvest firewood nor do they sell firewood either within the village or in the market. Four out of the 39 purchased kerosene which ranged from 4 litres to 16 litres per month at a total ranging from FJD\$96 to FJD\$384.00 per annum.

The villagers can find sufficient firewood in the agricultural areas, coconut plantations and grasslands close to the village thus there is no need to gather firewood from the native forest.

Hunters in four out of the sixteen villages sold wild meat (pork) either at FJ\$5.00 – FJD \$6.00 per kg in the village. These hunters either hunt wild pigs using dogs and spears or they set up traps close to plantations. Traps are set up only when there is evidence that wild pigs are present which is usually through damages to crops.

Through informal discussions with local people, traditional medicine is collected by healers and forest areas visited depends on the illness as specific plants will be gathered only in such occasions.

IMPACT

This ecosystem service assessment at the local scale we believe was the first for Fiji. We assumed that the local people use the forest to collect basic supplies such as wild food and fuel but our data proves otherwise. Natural surroundings such as grasslands and mangrove forests are equally important as they are frequented for fuelwood supply as well as other services.



At the community level, setting up forest reserves is perhaps to safeguard clean water supply as well as preventing erosion. As for the six villages in Natewa Tunuloa, the CCA is to their advantage as it has enabled the local volunteers (Local Conservation Group; Sisi Initiative) to set up an eco-tourism business in Naqaravutu village as well as other livelihood projects such as bee keeping, poultry, bakery and model farms. These are currently been implemented by the 6 villages within the CCA.

Through the assistance of the Satoyama Initiative, the remaining 9 villages have also been assisted with the establishment of livelihood projects which include initiatives such as reforestation, traditional tapa and basket weaving, sandalwood nurseries, bee keeping and the re-introduction of traditional crop varieties. Learning from the establishment of livelihood projects within the six villages, it is important to consider community participation and landowners need to drive the projects to ensure its success.

Logging of the native forest is an alternative that can be perceived but the communities with intact forests though most are preferring sustainable agriculture to utilize fallow land as well as grasslands. Establishing plantation forests is also an option for the Natewa Tunuloa communities.

CHALLENGES AND FEEDBACK

We had anticipated that information on the land use within the Natewa Tunuloa Peninsula, collected as part of the COMDECS survey would be available to us for this project. Unfortunately, this was not the case, so instead we used the 1996 forest map (courtesy of Department of Forestry) which may not be representative of the current situation on the ground. So we overlaid the location of logged areas subsequent to 1996, (courtesy of Department of Forestry) and also the boundary of the IBA and the CCA (which is from within the IBA boundary). We then used a regular 500m by 500m grid to estimate the proportion of the different land use types across the area – noting whether the land use was within or outwith the IBA, and if within the IBA whether it was within the CCA.

USEFUL ADVICE FOR NEW TESSA USERS

Ensure you have enough capacity within the team to carry out the work, including the analysis of data, which often gets overlooked when planning the project work.