

# THE FIJI NATIONAL REDD+ PILOT SITE

# Emalu

## Navosa Province



## Fiji National REDD+ Programme National REDD+ Pilot site - Emalu

REDD+ is an effort to reduce carbon dioxide emissions and promote  
climate-resilient development in the forestry sector.

REDD+ seeks to: Strengthen national-level institutions and forest governance;  
Improve forest management and ensure forest sustainability.

The Fiji National REDD+ Programme & Land Use Planning Unit (LUP) are committed to  
achieving the national targets for the period of the plan. This plan is the national  
action plan for the plan.

**Objectives of the Plan**

- Increase the area of forest land under management
- Increase the area of forest land under protection
- Increase the area of forest land under restoration

**Key Results**

- Increase the area of forest land under management
- Increase the area of forest land under protection
- Increase the area of forest land under restoration

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**Objectives of the Plan**

REDD+ has been identified as a key strategy  
to reduce emissions from deforestation  
and forest degradation (REDD+).

**Key Results**

- 100,000 ha of forest land under management
- 100,000 ha of forest land under protection
- 100,000 ha of forest land under restoration

Approximately 100,000 ha of forest land is to be  
in managed and restored areas. A total of 100,000  
ha of forest land is to be restored.





# Establishment of Emalu REDD+ Pilot site

Emalu forest was selected as a pilot site for the National REDD+ programme in 2012. The pilot site is located South West of Viti Levu, the largest island in Fiji. The land has an area of 7,347Ha covered predominantly by pristine forest.

The Mataqali Emalu is the traditional landowner of the Emalu pilot site and their traditional residence is Draubuta Village. There are more than 30 registered members of the Mataqali and the majority is female mostly living outside Draubuta Village. Following an expression of interest from the Mataqali Emalu in 2011, a series of consultation meetings were undertaken in Draubuta village to discuss REDD+ (reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests, and carbon stock enhancement) and the requirements surrounding the development of a REDD+ project. These meetings involved other Mataqali members residing in the village and included awareness raising sessions on climate change and REDD+ and its requirements for the landowners.

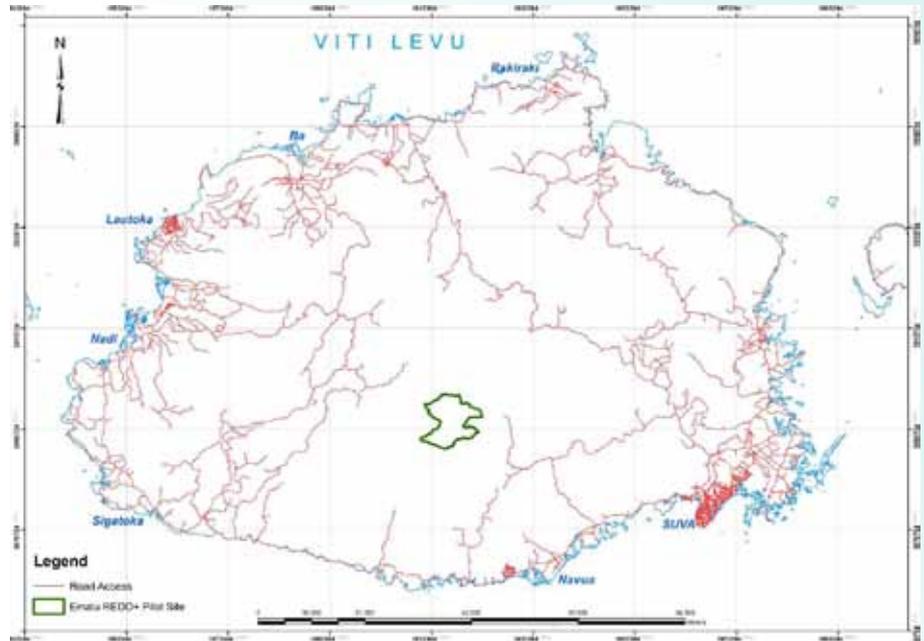


Figure 1 Location map of the Emalu pilot site

In June 2012, a consultation workshop with all members of the Emalu Mataqali was held at the Nadroga/Navosa Provincial Council office in Sigatoka to

confirm their land as the national REDD+ pilot site. The workshop resulted in a unanimous decision for the Emalu land to be established as a REDD+ pilot site.



Figure 2 Draubuta Village



Figure 3 Emalu women with produce from the garden

## Socio-economic status of the people of Emalu and nearby villages

From 2012 to 2014 a series of socio-economic surveys were conducted in Draubuta, Vitilevu and Nakoro village in Noikoro district of the province of Navosa. Participatory rural appraisal (PRA) tools were used to assess the socioeconomic status and gather baseline information for the 3 villages. These villages are located south west of Viti Levu, the largest island in Fiji.

The Emalu pilot site land is owned by the clan of Emalu (mataqali Emalu) and their traditional village of residence is Draubuta village. Majority of the members are women with most married and living away from the village. Nakoro and Vitilevu villages were included in the assessment because of their proximity

to the Emalu pilot site. In contrast to all three villages under study, Vitilevu village is located nearest to the pilot site boundary. Most of the land clearance (for farming) comes from Vitilevu village.

The main source of food and income for all three villages is agriculture. These communities are mainly semi-subsistence farmers. The main challenges include poor road conditions and the lack of capacity and opportunities for farmers to further develop their resources. Transport is limited to carriers that service the area only on selected days. For this reason accessibility to essential services such as health care and schools is always a concern.

There are 3 primary schools that cater for nine villages in the district of Noikoro and include Draubuta, Nakoro and Vitilevu. There is no secondary school in the district and parents have to send their children in Sigatoka or outside of Sigatoka. The school is dependent on whether it provides boarding facilities or if there are relatives residing nearby where the students can be hosted. Communication is restricted to landline phones with intermittent reception and services. There is no electricity and most power is supplied through diesel generators, batteries and solar lamps. Energy sources are largely kerosene and fuel wood.

# The Emalu forest



Figure 4 Transition zone from forest to grassland



Figure 5 Inside Emalu forest – an undisturbed headwater of the Sigatoka water catchment

Emalu forest is one of the few remaining primary indigenous forests in Fiji. In terms of habitat diversity the Emalu has a diverse vegetation typing. The forest is classified as closed forest with multiple use function.

Three main strata of vegetation in Fiji are all in Emalu:

- 1 **Lowland forest:** exists within the elevation of 400m-600m. It is associated with riparian vegetation with evidence of past human occupation and communal living. Thus most of the forest areas are anthropogenic primary forest.
2. **Upland forest:** occurs within higher altitudes of 600m – 800m consisting mostly intact primary forest with higher tree species diversity and density.
3. **Cloud forest:** exists above the elevation of 800m and is restricted to mountain tops,

ridges and is almost always shrouded in clouds.

The Emalu forest transitions into a vast grassland area when moving south-west with a dry forest typology in the transition zones.

The Emalu forest is considered a very important watershed. When compared to all the headwaters of the Sigatoka

River, Emalu is the only tributary that is still undisturbed. The forest provides numerous ecosystem functions that are important for the people of Emalu and neighbouring villages. It provides - food, freshwater, wood, medicine; and regulates - microclimate, floods, diseases, water purification and has significant cultural value.

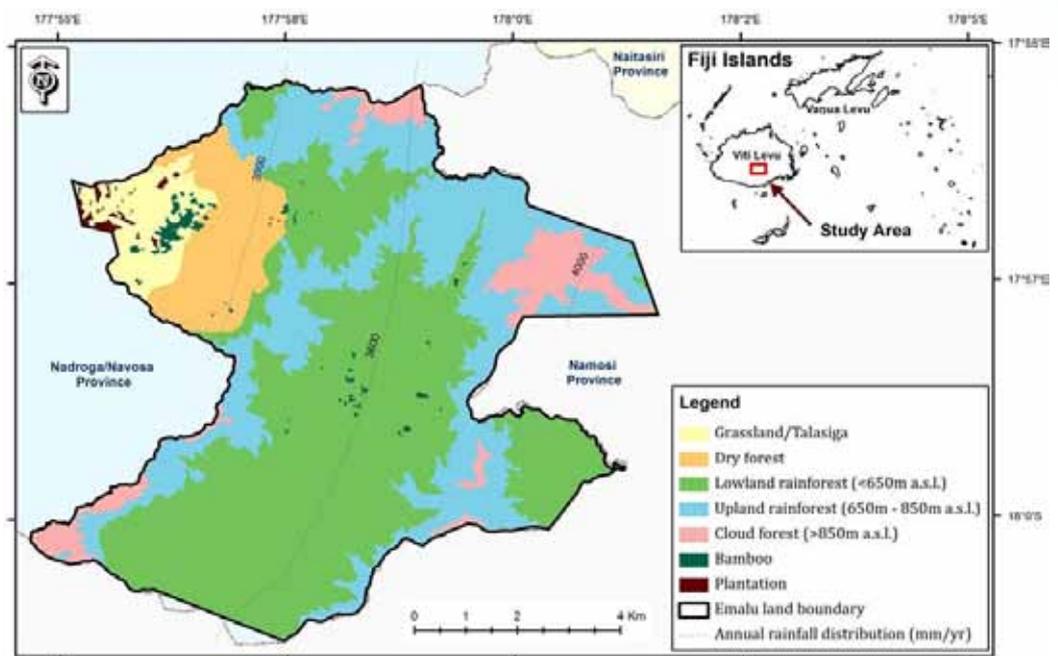


Figure 6 Vegetation types in Emalu

# Emalu – a high biodiversity hotspot

Emalu forest is a biodiversity hotspot and is unique when compared to other hotspots in Fiji. The high rate of endemism as well as the large number of species with large population is indicative of the intactness of the surrounding forest.

Biodiversity and health of the Emalu forest will be closely monitored. Local biodiversity experts have developed a table of indicator species (Table 1)



Figure 7 Biodiversity assessment of bryophytes

Table 1: Some indicator and focus species for the Emalu site

Species	Ecosystem indicator/ Characteristic
<b>Freshwater invertebrates</b>	
Chimarra sp. (caddisfly)	The abundance of caddisfly, mayfly and dipteran larvae reflects a pristine and intact catchment of tropical inland streams. Gobies indicate a clean water system.
Nesobasis spp. (damselfly)	
Pseudocloeon sp. A (mayfly)	
Fluviopupa spp. (snail)	
<b>Freshwater fish</b>	
Endemic Gobies Stiphodon spp.	The abundance of endemic genus Nesobasis (damselflies) is an excellent indicator of good water quality and intact status of the riparian systems
<b>Avifauna</b>	
Pteropus samoensis (Samoan flying fox)	Fiji's bats play an essential role as seed dispersing agents, major pollinators, and insect control agents in the rainforest and other terrestrial ecosystems. The presence of native bats augers well for the health of the forest.
<b>Insects</b>	
Nysirus spinulosus and Cotylosoma dipneusticum	Endemic and rare stick insects recognized to be associated with pristine forest systems
Taxa Coleoptera (beetle) and the Hymenopteran family Formicidae (ants)	The great diversity of the these insects are a good indication that ecosystem services such as such as soil processing, decomposition, herbivory, pollination and seed dispersal are well intact.
Hypolimnas inopinata (enedmic and rare butterfly)	Often found in or near pristine mountain areas or in semi-open areas along streams leading up to the mountains.
Raiateana knowlesi (Order Hemiptera: Family Cicadidae)	An endemic and rare cicada with a unique life cycle where adults emerge only after eight years (periodic emergence). It is the animal totem of the Emalu clan.
<b>Herpetofauna</b>	
Fiji ground frog (endemic, near threatened); Fiji tree frog (endemic, critically endangered)	Species change in terms of presence/absence and density over time will indicate the status of the forest.

Species	Ecosystem indicator/ Characteristic
Vegetation – focus species identified according to their rarity, botanical significance, very recent discovery in Fiji and IUCN Red Listing	
Acmopyle sahniana (Critically Endangered species)	In Fiji, sighting of this tree species is quite restricted. Its occurrence in Emalu is a promising indicator to a new population of A. sahniana and a range extension of its current distribution
Degeneria vitiensis (vulnerable)	The taxon is a relic to one of the oldest flowering plant families in the world and is endemic to Fiji
Equisetum ramosissimum subsp. Debile	Its occurrence is a strong indicator of an intact riparian system
Nervilia cf. punctata	Little known unifoliate herbaceous terrestrial orchid that is rare. Plant is known to only occur in Borneo, Sumatra, Java and Fiji
Cyphosperma tanga	Threatened, rare palm
Bryophytes	Good indicator of changing climatic conditions. Has water retention properties that play an important role in a cloud montane forest ecosystem

(Compiled by the Institute of Applied Sciences of the University of the South Pacific)



Figure 8 The endemic and near threatened Fiji ground frog found in Emalu

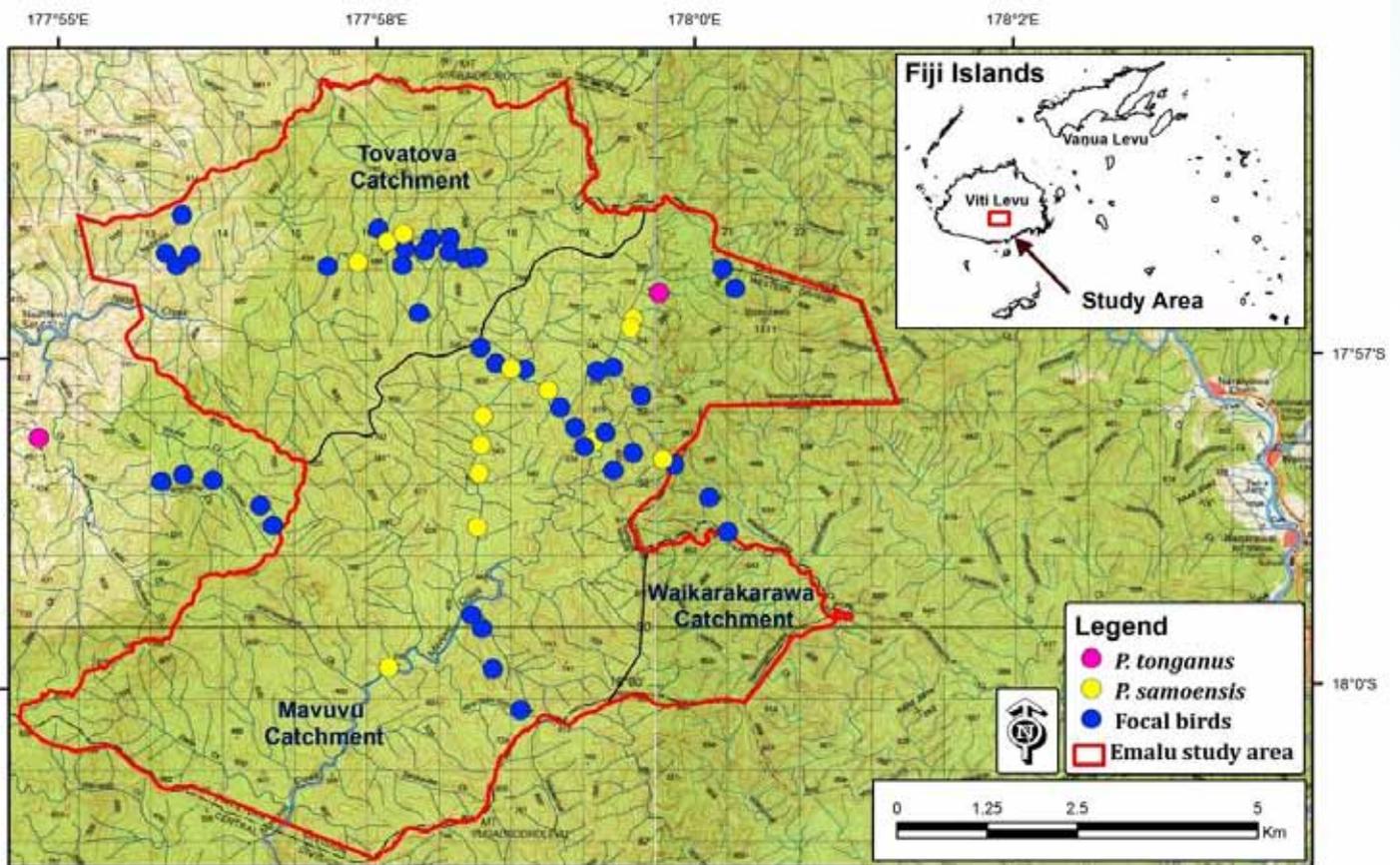


Figure 9 Sightings of bats in Emalu

# Carbon stock estimation

The forest carbon stock of the Emalu forest was calculated from biomass field measurements. This involved measurements of above ground carbon pools that included leaf litter, dead wood, and woody biomass in sample plots strategically set-up to cover each forest strata. The carbon stock measurements and calculations were carried out by the Fiji Forestry Department and supported by REDD+ technical working group members. The local communities were trained as field assistants and guides and were actively involved in field measurements and sampling.



Figure 10 Carbon stock measurement

Lowland forest	220,818 tCO <sub>2</sub> eq
Upland forest	261,526 tCO <sub>2</sub> eq
Cloud forest	33,777 tCO <sub>2</sub> eq
Total	516,121 tCO <sub>2</sub> eq

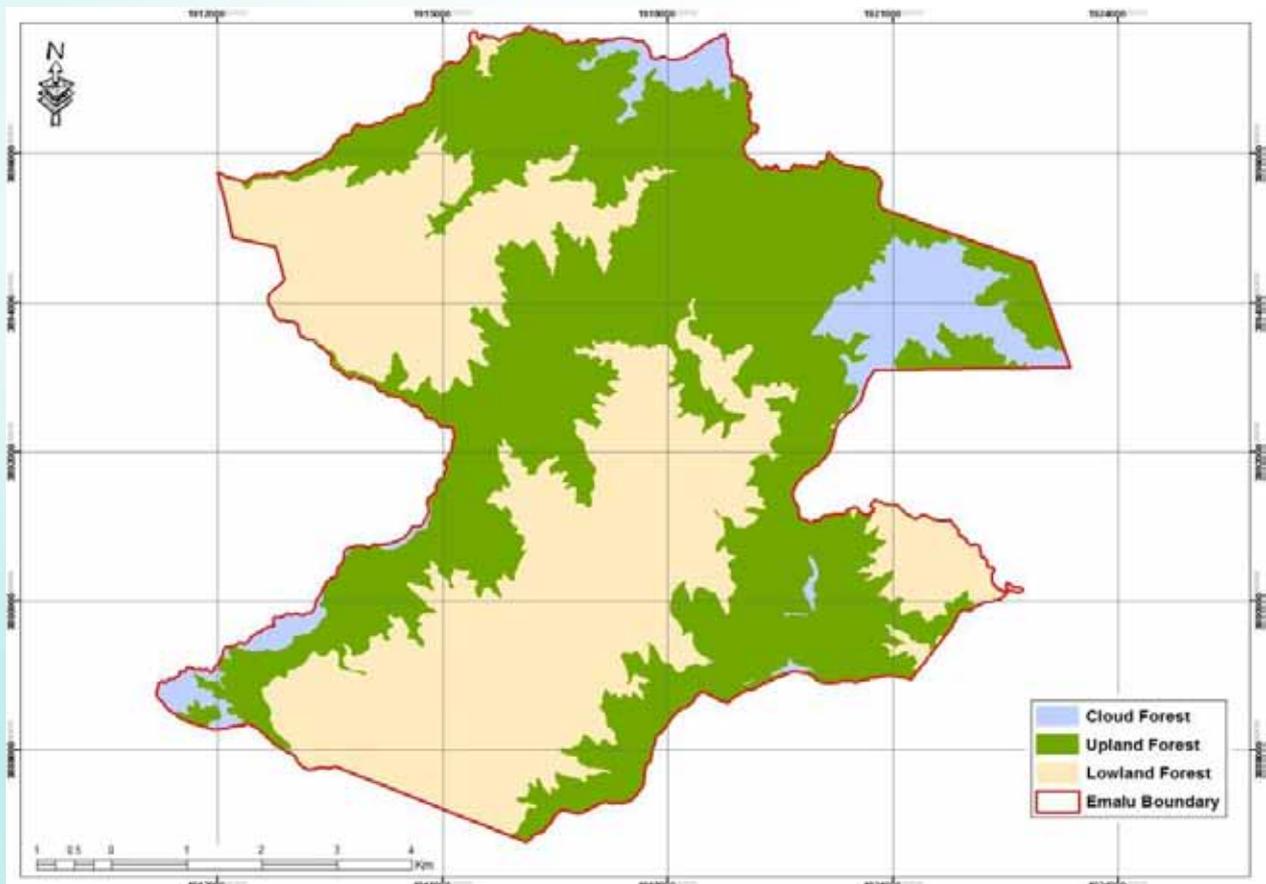


Figure 11 Emalu forest carbon stock estimation

# Culturally significant sites

The cultural and historical sites found in Emalu forest are significant to the history of the Mataqali Emalu and other surrounding Mataqalis. Taboo sites, ancient landmarks, and old village sites hold deep spiritual and cultural meaning to the people of the area. Historical features and archaeological evidence in the site reveal the ingenuity and perseverance of the Emalu ancestors that allowed them to live in such a remote, rugged, and challenging terrain. These features include old agriculture terraces; extensive channels/ditches for dalo irrigation, habitation terraces, hill fortifications, habitation platforms, scattered clay pottery, and stone alignments.



Figure 12 Site of old garden terraces

## Sites of interest in the Emalu forest

Cultural heritage sites	Site description
Sacred pool	According to the local oral narrative, the pool is the final resting place for the endemic cicada, locally known as nanai (Raiateana knowlesi). The cicadas flock to the pool to perish, an event that occurs every eight years. The nanai is the traditional animal totem of the Mataqali Emalu.
Rock walls	The stone enclosure known as the nanaga sites is an archeological manifestation relating to certain Fijian ceremonials marking their New Year. The sites are said to be used for initiation, circumcision, pig worship and possibly preparation for warfare.
Old village sites	Extensive old village sites were recorded within the Emalu boundary. Apart from the evidence of house mounds, other cultural remains include plain potsherds found scatted in the area.
Agriculture terraces	Irrigated taro terraces were found in Emalu showing the type of skill and knowledge that went into constructing such agriculture systems.
Hill fortification	Fortified settlements were strategically constructed on hills or places of high elevation as a defense mechanism.
Scared land boundary	Rock features that indicate traditional land boundaries

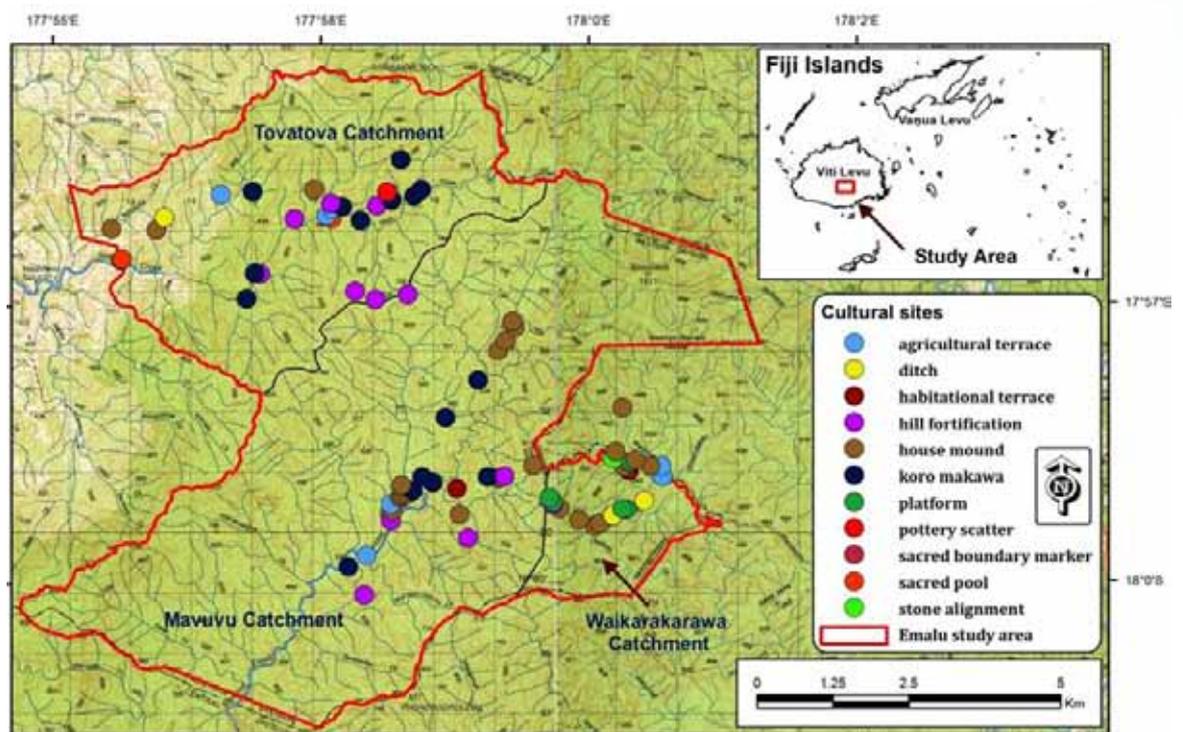


Figure 13 Location of significant known cultural sites

# Cultural mapping

Efforts have been made to record cultural aspects that are unique to these villages such as communalism, traditional skills and knowledge, totems and traditional medicine. There are aspects of oral history and traditional practices that are unique to Draubuta, Nakoro and Vitilevu village. Information gathered from the cultural mapping survey revealed significant similarities indicative of blood ties that exist between the three villages.

Communal living is an important part of iTaukei rural communities that involves everyone working together in the village. This can involve farming, fishing, any form of community development work and any other task that would need the contribution and assistance of everyone in the village. Traditional skills and knowledge are passed down orally and "learn by doing" from generation to generation. Mat weaving, traditional fish trap weaving and bamboo weaving for building traditional Fijian houses are some traditional skills that are still being practiced in these villages. Given the inaccessibility of these villages, they rely on their natural surroundings for traditional remedies. Knowledge on trees, herbs, shrubs and their healing properties is unique and important to these communities. In addition to this iTaukei communities have traditional totems that are linked to their natural environment. These totems can vary in each village, clan or land owning unit. Totems are a form of cultural identity which can be a specific bird, plant, fish species and even staple food varieties.

However, there are risks to the potential loss of these traditional skills and knowledge. The underlying threat is the lack of knowledge transference from the village elders coupled with the lack of interest by the younger generation. This was evident in the very few people that possess this knowledge.



Figure 14 Vitilevu woman using traditional clay pots for cooking

# Land use

Agriculture is the main source of income for the villagers that live in the vicinity of Emalu forest. The pilot site is not only accessible to the Emalu landowners but also to the villages that reside near Emalu forest.

The predominant farming system practiced in Emalu is mixed cropping with yaqona as the dominant and main cash crop. Given the remoteness of these villages, farmers find it easier to cultivate and sell yaqona because it is light to cart, non-perishable and is rarely affected by market prices. Other farming systems occurring in the pilot site include; planting of root crops (dominated by taro and cassava), vegetables which include a variety of green leafy vegetables and seasonal crops and varieties of fruit trees. Due to a lack of awareness on more sustainable agriculture practices which include sloping agriculture land technologies (like contour planting) and optimum crop diversification.

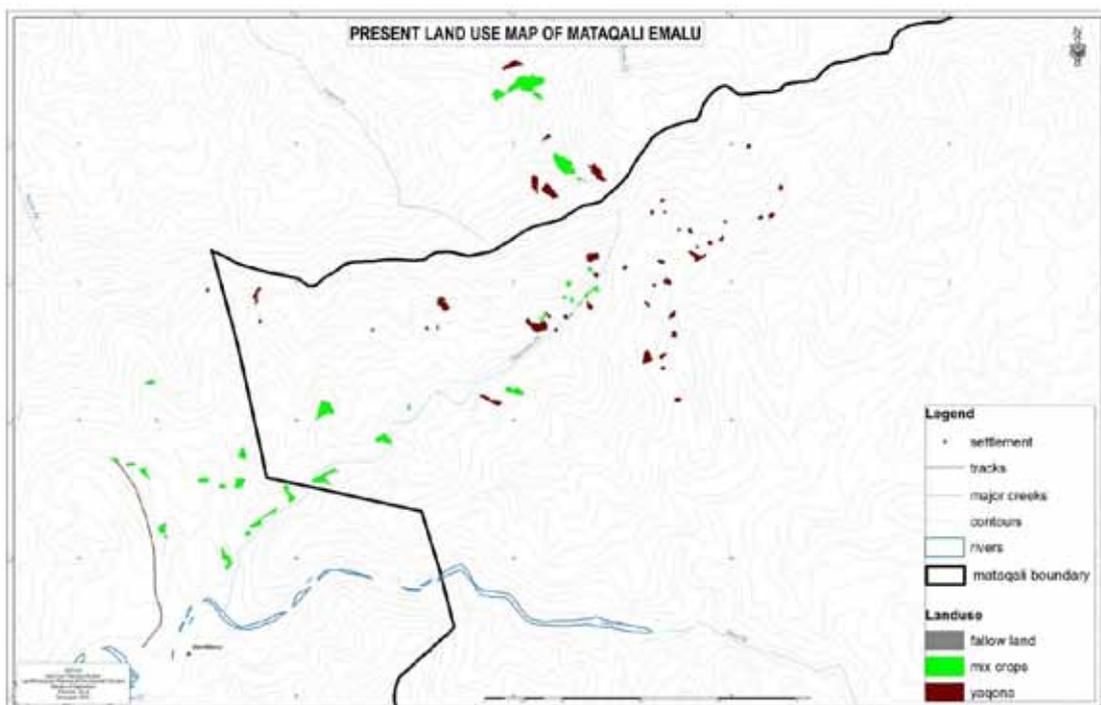
The underlying threat to Emalu forest is agriculture clearance with more than 60 farming sites existing within the Emalu boundary. Approximately 70% of these farms are owned by farmers from



Figure 15 Gardens close to Emalu forest

Vitilevu village who are not *Mataqali* Emalu landowners. The villagers are currently farming in the pilot site where forest areas are cleared mainly for the main cash crop – *yaqona*. This farming is to meet the cash needs of the

community (like the construction of a village community hall) and of individual households. Other threats include fires (common during the dry season), free roaming livestock and invasive species.



# Threats, challenges and responses

Threats and challenges	Strategies
1. Agriculture clearance	<ul style="list-style-type: none"> <li>• Land Use Planning</li> <li>• Crop diversification</li> </ul>
2. Increase in free roaming livestock	<ul style="list-style-type: none"> <li>• Land Use Planning</li> <li>• Livestock managements and village bylaws</li> </ul>
3. Introduction of invasive species	<ul style="list-style-type: none"> <li>• Land Use Planning</li> <li>• Education</li> <li>• Strengthen protection of vulnerable forests sites</li> <li>• Village bylaws and monitoring to prevent introduction of invasive plants, fish and animals</li> </ul>
4. Pressure from loggers	<ul style="list-style-type: none"> <li>• Awareness</li> <li>• Traditional agreements</li> <li>• Monitoring by Forestry Department</li> </ul>
5. Competing Government incentives	<ul style="list-style-type: none"> <li>• Consultation with other government agencies—alignment of sectoral plans, collaboration and joint planning</li> </ul>
6. Mineral exploration tenement	<ul style="list-style-type: none"> <li>• Consultation with other government agencies—alignment of sectoral plans, collaboration and joint planning</li> </ul>
7. Non-mataqali members are main forest users and have no sense of responsibility	<ul style="list-style-type: none"> <li>• Regular consultation and information sharing</li> <li>• Regular awareness-raising programmes</li> <li>• Develop traditional agreements between Mataqalis</li> </ul>
8. Lack of commitment from pilot site LOs and communities	<ul style="list-style-type: none"> <li>• Actively involve landowners and villages in decision making processes, project planning and implementation</li> <li>• Regular consultations and information sharing</li> </ul>
9. Emalu LOs have moved to other part of Fiji and majority do not reside in Draubuta village	<ul style="list-style-type: none"> <li>• Conduct biannual LO consultation meetings</li> <li>• Establish a Mataqali committee to facilitate communication</li> </ul>
10. Conflicting work programs of implementing partners	<ul style="list-style-type: none"> <li>• Alignment of work programs at the District and Provincial Level</li> </ul>
11. Difficulty and lack of market access	<ul style="list-style-type: none"> <li>• Regular visitations by agriculture officers to inform farmers of market trends</li> <li>• Road development for the area</li> </ul>
12. Lack of knowledge and skills in the community	<ul style="list-style-type: none"> <li>• Provide appropriate trainings for upscaling existing skills and knowledge</li> </ul>
13. Traditional obligation takes precedence over project activities	<ul style="list-style-type: none"> <li>• Alignment of project activities and traditional obligations</li> </ul>
14. Inappropriate advice from extension officers	<ul style="list-style-type: none"> <li>• Integrated trainings and capacity building initiatives – all sectors plan together (agriculture, forestry, livestock, land use, environment, etc.)</li> <li>• Training for farmers to allow them to make informed decisions</li> </ul>
15. Unclear traditional decision making structures	<ul style="list-style-type: none"> <li>• Clear identification of communication and decision making channels</li> <li>• Governance training to be carried out by iTaukei Affairs Board</li> </ul>



**Figure 16 Forest clearance for agriculture - the main threat to the Emalu forest**



**Figure 17 The village track to reach vehicular access**



**Figure 18 Burning - a common practice in the area causing ongoing degradation to the landscape**





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The Emalu pilot site is implemented in partnership with the  
SPC/GIZ programme - Coping with Climate Change in the Pacific Island Region



**SPC**  
Secretariat  
of the Pacific  
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**giz** Deutsche Gesellschaft  
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