

Terms of Reference for establishment of a Reference Level (FRL) for forest land¹ and development of a system for Monitoring, Reporting and Verifying (MRV) carbon emission reductions from forests in FIJI

1. INTRODUCTION

Fiji has a forest cover of almost 1.1 million hectares, covering about 56% of the total land mass. Almost 90% of the land is communally owned by customary groups or *mataqali*. Native forest classifications used in the last national forest inventory include - Dry Forest, Lowland Rainforest, Upland Rainforest, Cloud Forest, and Mangroves. Softwood and hardwood plantations amount to ca. 10 % of forest cover. The biodiversity includes a high number of endemic flora and fauna and is vulnerable to climate change and loss of habitat.

The Fiji National Forest Policy emphasizes sustainable forest management and improvement of the livelihoods of communities that are dependent on forests. In 2010, Fiji developed a Forest Harvesting Code of Practice (FFHCOP), which was formed into a Harvesting Regulation as part of the new Forest Bill (awaiting government endorsement). Subsistence (slash-and-burn practice) and commercial agriculture are the major drivers of deforestation. Commercial logging is the major cause for forest degradation in Fiji. The degraded areas are often taken over by invasive species (*Spathodea c.*, *Merremia sp.*) and prevent native regrowth.

After forests, the second largest land cover class is grasslands. Grasslands and degraded forest areas offer a large potential for enhancement of carbon stocks. The private sector (particularly Fiji Pine Ltd) has made efforts to harness that potential and the government has started tree planting programmes with the participation of communities. The main challenge for plantings is to combat human-induced grassland fires.

Fiji has developed a land use policy and is currently drafting land use planning guidelines. The land use planning with involvement of communities is expected to improve the sustainability of land use. A pillar for proper land use planning is the collection and organization of data on land use in order to make informed decisions.

As a major instrument for stopping the trends of deforestation and forest degradation, and at the same time helping communities to improve their livelihoods and economic development, the government of Fiji is getting ready to implement a national program for Reducing Emissions from Deforestation and Forest Degradation (REDD+). REDD+ will play an important role in Fiji's development path, as forests hold an important place in the country's culture, history, environment and economy. Fiji recognizes REDD+ as an important opportunity to contribute towards global climate change mitigation while strengthening the socio-economic situation of its forest resource owners and protect and restore its forest ecosystems.

Fiji has advanced in its national readiness process since the first multi-stakeholder national REDD+ consultations in 2009. The National REDD+ Policy endorsed in 2010 contributes to the national forestry sector goal: "*Sustainable management of Fiji's forests to maintain their natural potential and to achieve greater social, economic and environmental benefits for current and future generations*". The REDD+ Policy also emphasizes safeguards to protect and respect the knowledge and rights of indigenous peoples, to ensure the active participation of resource owners, the consideration of gender issues in all phases of decision-making and the protection of natural forests and their ecosystem services.

The implementation of activities for readiness is overseen by the National REDD+ Steering Committee (RSC). The committee is made up of twenty agencies from various sectors. The Forestry Department

¹ As defined in 2003 IPCC Good Practice Guidelines for Land Use, Land Use Change and Forestry

(FD) is the lead implementation agency for REDD+ in the country. The Government of Germany, through the German Agency for International Cooperation (GIZ), has been supporting readiness efforts in the country since 2009. In 2015, Fiji signed a Readiness grant agreement with World Bank's Forest Carbon Partnership Facility (FCPF) to receive 3.8 M USD for the implementation of REDD+ readiness in the country.

A major element of the national REDD+ Readiness process is the establishment of forest reference emissions level (FREL)/forest reference level (FRL). As described in these Terms of Reference, Fiji aims at a forest reference level (FRL). The past national forest inventories can provide data and information relevant for establishment of forest reference level.

Fiji has conducted national forest inventories in 1969, 1991 and 2006. However, the parameters for the past forest inventories were changed each time, limiting the comparability of the data. That explains the different results in forest cover analyses which were reported on different occasions limiting the comparability of carbon stock estimates and forest cover over the historical period. Based on the inventory estimates at different periods it is assessed that the emissions from degradation are more than 10 times higher than emissions from deforestation.

During 2010, a system of 100 permanent sample plots (PSP) was established to quantify the biomass growth and change of forests at periodic intervals. The PSPs are measured at two year intervals. The third round of measurements of the PSPS has been initiated in 2015.

As part of the national REDD+ Readiness programme, Fiji will establish a forest reference level for the period 2001 to 2015. Forest cover data and maps available for 2001-2007 and 2007-2012 will be used to quantify the activity data; and the biomass growth data from the permanent sample plots and the national forest inventories is expected to be used for assessing emission factor (EF)/removal factor (RF) estimates for the purpose of establishing the FRL.

The national forest monitoring system (NFMS) that includes a robust MRV is another major priority of national REDD+ policy, which states that

“The Fiji REDD-Plus Programme will establish a forest carbon measuring, reporting and verification (MRV) capability in line with the latest international good practice guidelines and guidance arising from the Intergovernmental Panel on Climate Change under the recognition that:

- a) eligibility for participation in international carbon and climate-related financial instruments is dependent on establishing and maintaining an MRV system and capability for the forest sector at the national and sub-national scale;*
- b) such an MRV capability will provide benefits to other aspects of forest sector monitoring.”*

The MRV system is expected utilize the IPCC 2003 GPG and IPCC 2006 updates for quantification of activity data using the approach 3; and Emission Factors (EF) / Removal Factors (RF) that conform to the IPCC tier 2 / 3. The monitoring will also cover monitoring of biodiversity and socio-economic indicators in order to satisfy multiple national and international reporting requirements.

The Terms of Reference for this consultancy are prepared under the Readiness grant and it is expected to also cover the requirements of the Program for Reducing Emissions and Enhancing Livelihoods in Fiji (ERP). The work program of the consultancy is expected to:

1. Integrate local expertise as much as possible, enhancing national capacities and potential for capacity development;
2. Be carried out in close collaboration with the REDD+ Steering Committee Technical Working Group 2 (Measuring, Reporting, Verification and Pilot Site Establishment);
3. Take into account past forest inventory data, analysis reports and recommendations, as well as results from pilot activities;
4. Comply with international requirements (UNFCCC and Carbon Fund Methodological Framework);

5. Provide MRV guidelines for activities proposed to be implemented under the ERP, and their consistency with the national REDD+ policy and reporting.

2. PRINCIPLES AND OBJECTIVES OF THE CONSULTANCY

2.1 Principles

The work and deliverables required in this contract include a collection of linked activities: (i) development of a forest reference level (FRL) for greenhouse gas (GHG) emissions and removals from forests, (ii) development of a national forest monitoring system (NFMS); (iii) a corresponding database and database management system (DBMS) that includes related information on biodiversity and safeguards and facilitates the monitoring, reporting and verification (MRV) of GHG emissions and removals from forests in compliance with international standards; and (iv) guidelines for integration of REDD+ projects under the planned Emission Reductions Programme (ERP) into NFMS and FRL. All of the above has to comply with requirements of UNFCCC (IPCC 2003 Good Practice Guidelines and IPCC 2006 AFOLU Guidelines) and the Methodological Framework of the Forest Carbon Partnership Facility (FCPF). The methodology has to correspond to the national benefit sharing mechanism to ensure that the MRV system caters to the respective data needs.

A key overarching principle for this consultancy is that the outputs need to be generated in an integrated manner in tandem with the other REDD+ readiness processes. There needs to be close coordination with the National REDD+ SC and other designated stakeholders, and consultants.

The consultancy work has to make use of local expertise as much as possible, by integrating Fijian experts in the team, as well as developing the capacities of counterparts by providing training seminars and on-the-job support on all steps of the work process.

Ownership of all created products, collected data and procured equipment in the course of the consultancy lies exclusively with the government of Fiji, with at least one physical storage within the Forestry Department. The Working Group on Measuring, Reporting and Verification and Pilot site Establishment (WG MRV) of the National REDD+ SC will provide oversight and coordination in the planning of the consultancy and in quality control of the reports described below.

2.2 Objectives

This consultancy is initiated with the following objectives.

- To establish national forest reference level for the period 2001 to 2015 covering all REDD+ activities;
- To develop a robust and transparent national forest monitoring system which is compliant with international standards of reporting and accounting; and a tested MRV system, compliant with the IPCC Approach 3 for Activity Data and tier 2 for emission factors / removal factors that meet the requirements of UNFCCC reporting and the Forest Carbon Partnership Facility's Carbon Fund Methodological Framework (MF).
- To conduct a national forest inventory field test covering remote sensing imagery, field forest inventory, accuracy assessment, and present recommendations for work plan & budget for national forest inventory.
- To organize data and information related to forest inventory, reference level and national forest monitoring system information so as to facilitate traceability, reproduction, archival and storage in a comprehensive database that is easy to maintain and enable updates in future.
- To prepare standard operating procedures, protocols and documentation to ensure quality assurance and quality control of functional database, supporting documentation, comprehensive reports and SOPs.
- To prepare guidance on nesting of subnational FRL and MRV in the national FRL and MRV systems.

- To present an organizational structure and capacity development plan for effective implementation of NFMS, updates to FRL, conduct of national forest inventory, and organization of data and information to meet the national and international reporting and accounting requirements on Fiji's forest resources.

The consultancy work has to comply with national guidance on consultation and participation; the deliverables noted in the work plan below; and have to be validated in a national review.

3. WORK PROGRAM AND OUTPUTS

This section describes the tasks to be undertaken for all consulting products. The early work plan and budget preparation should cover all required products and outputs.

	Task	Output / deliverable	Timeline
1	Situational Analysis and data revision, final work plan development	Report: Situational analysis on existing relevant forest data, gaps, and alternative options for a way forward; Final work plan for consultancy, validated and agreed by national REDD+ Steering Committee	3 weeks
2	Development of a Reference Level for forest land (FRL)	Forest reference level (FRL), integrating all REDD+ activities, for the period 2001-2015, fully documented and satisfying UNFCCC and FCPF standards.	8 months
3	Development of a national forest management system (NFMS), including monitoring, measuring, reporting and verifying (MRV) carbon emissions and removals	Develop NFMS incorporating and expanding on existing structures, including a well-documented MRV methodology for estimating REDD+ emissions and removals, capable of calculating a National FRL, and subsequently developing annual emission and removal estimates at the National level for UNFCCC reporting, and sub-national level for programme / project level reporting. Work schedule for capacity building, test inventory and SOP development	9 months
4	Forest Carbon Inventory test	Test Forest and Carbon Inventory Report Including preparations, training, mapping work / remote sensing, field work and data storage, analysis, accuracy assessment, quality assurance, recommendations for review, and tentative work plan & budget estimate for a national inventory.	6 weeks
5	Database development	Database, ready to receive input from field work, accessible to designated persons in different agencies. Mode of delivery to include training workshop with designated agencies.	6 months
6	Quality Assurance / Quality Control procedures	Set of documentation that allows reconstruction of the results of the FRL and MRV implementation, as well as repetition. Standard Operating Procedure (SOP) for quality assurance and quality control.	Ongoing, completed after 11 months
7	Guidance on the nesting of sub-national MRV and FRL within national MRV and FRL	Guidance document for sub-national REDD+ MRV, FRL and database management related to the ERP, including summary and training materials targeting landowners.	1 month
8	Capacity development	Capacity building plan for each task. Stakeholders involved in implementation of NFMS and FRL implementation know their role and are able to fulfill their tasks.	Ongoing, completed after 12 months

4. SITUATIONAL ANALYSIS

The consultants should carry out a stakeholder gap analysis to consolidate earlier stakeholder assessments and identify any relevant stakeholders that might not have been considered during the R-PP formulation phase. The analysis should include stakeholders outside the technical field, but which will significantly contribute to the success of this work. Since this is part of the early phase of the contract, it is understood that most of this analysis can be based on document review and discussions with key REDD+ SC members.

Different initiatives over the past decades and the more concerted efforts towards REDD+ Readiness preparation have produced a variety of data sets, a number of relevant assessments, reports and decisions in the area of forest measurement. Policies that affect land use and forest management in a positive or negative way have been endorsed in several sectors of government, and the recent Forest Bill includes Harvesting Regulations and other elements of more sustainable forest management practice.

The situational analysis should include, but not be limited to, chapters on the following areas:

4.1 Forest Reference Level development

The consultants review the report on construction of an REL/RL in Fiji (Trines, 2012), the forest data accuracy assessment from 2014 (SPC / GIZ), forest cover change analysis for 2001-2007 and 2007-2012 as well as aforementioned inventory data, and the land use stratification and forest cover change analysis currently being undertaken with support of UN-REDD (using Open Foris). The drivers of deforestation and forest degradation study will be undertaken in 2016. Current and planned policies that affect the land use in Fiji will be provided by the members of the REDD+ Steering Committee.

All this information is to be analyzed for its compliance with IPCC Good Practice Guidance 2003 requirements and IPCC AFOLU 2006 updates. The consultant will present a gap assessment for consultation with the REDD+ National Steering Committee of whether the data can be used to develop Approach 3 Activity Data and Tier 2 Emission Factor estimates for the three key activities of the Fiji REDD+ programme: (i) enhancement of carbon stocks, (ii) avoided deforestation through establishment of conservation areas and land use planning, and (iii) avoided forest degradation through sustainable management of forests. Where it cannot, gaps should be described and put in relation to key categories / carbon pools. The current availability and accuracy of data, as well as additional data needed to construct a historical and projected baseline for forest carbon should be outlined. The historical baseline data (2001 – 2015) will also form the reference level for the Emission Reductions Programme.

The consultant presents a list of options that need to be decided on and their implications (i.e. accuracy, approach, carbon pools, exact reference period, etc.) to the REDD+ Steering Committee.

The RSC recommendations will be captured in the final work plan for the consultancy.

4.2 National Forest Monitoring System

Different initiatives over the past decades and the more concerted efforts towards REDD+ Readiness preparation have produced a variety of data sets, a number of relevant assessments, reports and decisions on forest measurement, all of which will be provided to the consultant for review and to bring all the information into a form that allows the highest possible degree of comparability.

The accumulated data is to be analyzed for its compliance with IPCC Good Practice Guidance 2003 requirements and IPCC AFOLU 2006 updates. The consultant will present a gap assessment for consultation with the National REDD+ Steering Committee of whether the data can be used to assess activity data using IPCC Approach 3 and Tier 2 emission factor estimates for the three key activities of the Fiji REDD+ programme: (i) enhancement of carbon stocks, (ii) avoided deforestation through establishment of conservation areas and land use planning, and (iii) avoided forest degradation through sustainable management of forests. Where it cannot, gaps should be described and put in relation to key categories / carbon pools. The RSC recommendations will be captured in the final work plan for the consultancy.

Existing reports include:

- Three major forest inventories were implemented in Fiji in 1969, 1991 and 2006. The data is available. Objective was in both cases to assess the amount of merchantable timber;
- 100 permanent sample plots (PSP) were established in 2010 throughout natural forest in Fiji and include carbon measurements. The measurements are conducted at 2 year intervals. The third measurement campaign is beginning in 2016, though the event of Tropical Cyclone Winston in February 2016 might negatively affect this activity. The selected number of sample plots is not based on statistical error margin, but on budget.
- A national forest carbon stock assessment and a forest cover change assessment for the periods 1991-2001 and 2001-2007 have been carried out in 2012, currently Fiji is working on a change assessment for 2007-2012, using Landsat data.
- A reference database and validation concept for remote sensing-based forest cover change products has been proposed in a report (2014).

The consultants will review the methodologies and SOP from past activities and take the suitable elements into consideration for the design of the System. The design of the NFMS should be based on the PSP system and the NFI of 2006.

A national forest definition and stratification is under development and will be ready by third quarter of 2016, based on the stratification that was also used in the 2006 NFI.

The consultants should then draft an inception report that contains a detailed work plan and budget for the consultancy. This will be validated via a participatory consultation process with relevant stakeholders. The Consultation and Participation plan (currently under revision) will guide the consultation and participation activities for the consultancy. The consultants will work closely with the REDD+ National Steering Committee to get feedback on the Work Plan and budget and incorporate it into the final document, which will be disclosed publicly.

5. DEVELOPMENT OF A NATIONAL FOREST REFERENCE LEVEL (FRL)

The national forest reference level has to follow international guidelines and requirements (IPCC, FCPF). The FRL has to be constructed for the following activities as outlined in the National REDD+ Policy and the Emission Reductions Programme Idea Note (ERPIN):

- a) reducing emissions from deforestation via forest protection and improved forest management;
- b) reducing emissions from degradation via improved forest management (SFM) and implementation of the Fiji Forest Harvesting Regulation;
- c) afforestation / reforestation of highly degraded grasslands and forests.

The FRL has to take into account regional differences in Fiji which will be identified by the drivers study. The scale for the FRL development will be determined during the drafting period of the FRL methodology. The methodology will establish a link to potential or existing project and jurisdictional FRL, in particular under the Emission Reductions Programme (ERP). The process of methodology development and implementation has to be transparent and participative; the results have to be representative, unbiased, consistent, transparent, and verifiable.

5.1 Methodology development for a national forest reference level

- a. The result of 4.1 delivers an overview of relevant data collected in the past and of recent developments in the forestry sector, in particular regarding management. Based on this overview, the consultant will draft a document outlining options and consequences of different alternatives to approach the development of a Reference Level, taking into consideration the present forest definition and stratification, as well as the MRV methodology, and ensuring consistency with the UNFCCC and FCPF Carbon Fund Methodological Framework.

The analysis has to describe the gaps between the available data and the requirements for the FRL, as well as the options to address the data gaps. It will show how in consequence the proposed methodology options close these gaps and fulfill the international requirements;

- b. That document will be presented and discussed in a workshop involving all relevant national stakeholders. In the workshop, the participants will take the necessary decisions for progressing the FRL;
- c. Following the decisions of the workshop, the consultant will organize a consultation tour to the provinces in Fiji, assisted by the REDD+ Secretariat and local government and landowner representatives. This will serve to confirm unclear land use changes that can't be clarified by using the available data, as well as validation of future natural resource development;
- d. Based on this, a draft FRL is to be developed. It will be circulated to relevant stakeholders and for review by the FCPF Management Team for comment on compliance with international requirements. A second draft will incorporate the comments, be sent for final review to the same group, and finalized.

5.2 Forest Reference Level Construction

With assistance from the Forestry Department, the consultant will collect the data identified by the gap assessment in 4.1 and 5.1, applying the methodology to construct a national forest reference level, attributable to activity types and regional differences. For this task, staff of the REDD+ Unit and Secretariat, other government institutions, and relevant stakeholders have to be trained and integrated in the work.

5.3 Deliverables on Forest Reference Level

The deliverable is a reference level for GHG emissions and removals in the forestry sector, with option for information extraction according to locality and activity type, and fulfilling international requirements of Approach 3 for Activity Data and at tier 2 for Emission Factors.

6. DEVELOP NATIONAL FOREST MONITORING SYSTEM (NFMS), INCLUDING MEASURING, REPORTING, VERIFYING FOREST GREENHOUSE GAS EMISSIONS (MRV)

6.1 Principles and scope of the NFMS

- i. Almost 90 % of Fiji's land mass is communally owned. While some forest land and mangroves belong to government, communities have a sense of ownership over them as well. This needs to be addressed by the consultants via well-organized consultation processes throughout the country, providing information to the landowners and ensuring participation and logistical support for the planning process as well as the forest inventory.
All information has to be made publicly accessible.
- ii. The MRV System is to be developed in compliance with international standards for reporting and accounting of forest carbon emissions (IPCC 2003 LULUCF GPG, 2006 AFOLU guidance), the UNFCCC Warsaw Framework (Decisions 11-15/CP19), and informed by good practice (Verified Carbon Standard, GOFCC-GOLD Sourcebook, GFOI). The collection of information and reporting has to fulfill the principles of transparency, completeness, consistency, comparability and accuracy.
- iii. The NFMS, as also the reference level, has to supply data for GHG emission and removal estimates.
- iv. As stipulated by IPCC, a combination of remote sensing and ground-based forest carbon inventory approaches will be used.
- v. Fiji is aiming at tier 2 information for aboveground biomass, deadwood and litter. Belowground biomass data will be included, but has to be developed over time.
- vi. The documentation of the NFMS development (SOP) has to explicitly show how compliance is reached, by linking the design elements to international requirements. The database will be the

major tool to estimate and report GHG emissions and removals from forests in Fiji and has to facilitate access to the underlying information for the decisions and results.

- vii. The NFMS database is to be maintained by the government of Fiji and to be based on existing structures as possible. The database shall be hosted within the Management Services Division of the Forestry Department and linked with other relevant databases for easy exchange of information (i.e. Ministry of Lands, Department of Environment, National Trust). Data sharing arrangements in Fiji are partially in place. The consultancy shall identify gaps in this area for the Government of Fiji to provide directions to the Forestry Department.

6.2 Contents of the National Forest Monitoring System (NFMS)

Fiji's NFMS will integrate information on the following 5 elements:

1. Measuring, reporting and Verification (MRV) processes;
 2. National Forest Reference Level;
 3. Safeguard Information System (SIS);
 4. Biodiversity Information system;
 5. A national database that organizes the information and facilitates estimation and reporting for REDD+ as well as other purposes of natural resource management.
- i. The NFMS shall provide information for different management aspects:
 - a. Forest carbon stock change in different strata, relating to the major REDD+ activities in Fiji (avoided deforestation and avoided forest degradation through sustainable management of forests, reforestation / afforestation, and implementation of land use planning and conservation areas). Carbon pool measurement shall be revised based on consultations in the stakeholder workshop. Currently, the Forestry Department measures aboveground biomass, litter and deadwood;
 - b. Forest biomass in different strata;
 - c. Impact of fire (quantify anthropogenic / natural impacts), storm, and other natural hazards on forest carbon stocks in Fiji;
 - d. Sustainable logging following the Fiji Forestry Harvesting Code of Practice (FFHCOP - data on merchantable timber, volume, occurrence, age structure, succession, etc. of economically significant species);
 - e. Vulnerability towards human interference (forest protection);
 - f. A practical approach for site descriptions, particularly to inform national reforestation efforts (soil, precipitation, exposure);
 - g. Information on non-timber forest products (NTFP);
 - ii. Underlying information has to be integrated as well, such as drivers of deforestation and forest degradation, other land use information and remote sensing information (to be made accessible as separate comprehensive database element).
 - iii. Coordination with stakeholders and agencies involved in similar tasks has to be sought (e.g. GHGI, NFI, census, etc.);
 - iv. The SIS will be developed by another consultancy. The information has to be integrated in the NFMS database.
 - v. Fiji is in the process of developing a biodiversity monitoring framework, which will lead to a national biodiversity monitoring system. Forest biodiversity information will be fed into the system and serve reporting to the UN Convention on Biodiversity (CBD) and other processes. The consultant will explore the possibility of including indicators on biodiversity in the NFMS. The database has to be linked to the national biodiversity information.

6.3 Designing the MRV System

The existing forest information compiled by the consultant serves as basis for design options for the MRV-System elements of NFMS, including remote sensing and field work, and on how the MRV System will incorporate the other elements – SIS, biodiversity, RL and database. Following that situational analysis, the consultants will draft the elements for the MRV methodology based on an IPCC GPG 2003 approach 3 for activity data and tier 2 methods for emission factors (EF)/removal factors (RF), and consistent with the requirements of the Carbon Fund Methodological Framework (MF). The methodology also has to describe how activities under the Emission Reductions Programme (ERP) will be linked to the national MRV system. The draft will be circulated for comments to the members of the RSC and the Working Group on MRV (WGMRV), as well as the FCPF Management Team, to ensure compliance with international requirements.

The consultant will then produce a full draft methodology. This will be sent for review to the RSC and stakeholders and the FCPF Management Team.

Comments and changes will be incorporated for a final draft, which will be validated by WGMRV and the FCPF Management Team.

6.4 Deliverables on NFMS

The deliverable for these activities will be a report describing the National Forest Monitoring System, including the data collection, analysis, storage, and reporting (MRV), and discussion of challenges and necessary revisions of the methodology, which is expected to be compliant with international standards, based on past inventory efforts in order to make it as comparable as possible, and accepted also by the FCPF Management Team.

7. NATIONAL FOREST INVENTORY FIELD TEST

The consultancy will plan and prepare the implementation of a national forest inventory (NFI) as designed under the National Forest Monitoring System, with support from and in collaboration with the Forestry Department Management Services Division (MSD) and other stakeholders. A test inventory will be conducted and analysed.

The consultant team will conduct targeted trainings with the implementing personnel. A training plan has to consider all positions in various agencies that contribute to implementation:

- a. Remote sensing section of Management Services Division, Agriculture, Lands, in cooperation with SPC;
- b. Forest inventory teams (including current inventory staff, para-taxonomists, members of Drawa and Nakavu communities, biodiversity survey attachments and others to be trained in methodology and use of equipment);
- c. MRV Specialist and other staff that has to implement inventories in future have to be trained on MRV system development and implementation, as well as reference level development;
- d. Trainings have to be prepared on inventory plot establishment and measurement activities for community members in the provinces who will accompany the inventory teams and later serve as coordinators in the provinces for the organization of monitoring-related project activities;

The inventory work has to be prepared in order to guarantee undisturbed smooth implementation. This includes distribution of sample plots, defining amount and location of test plots, informing the local authorities about the inventory and receiving access to the identified sample plots, planning the sequence of plots to be measured by each team, organizing the necessary vehicles, equipment, field manuals and guides for the inventory teams, field forms and maps on handheld devices, preparing the budget and the per diem payments, etc. This work has to run in parallel to the earlier tasks and should be completed at the same time as the trainings. The overall sample plot distribution should be based on the plots that were established for the PSP and the NFI 2006.

The consultants will accompany the inventory teams to ensure smooth operation and train the team members on the job. This way, the experts can solve systematic and logistical problems quickly. The

work schedule for the inventory has to be revised regularly for time management purposes. Preliminary data analysis with the staff of MSD and the WGMRV will serve to build capacities in that area and allow Fiji to take over running the full data collection themselves.

During and after the inventory, the field manual has to be revised as necessary. A third party will conduct the QA/QC for the test, following the documentation.

Necessary equipment for all these tasks will be procured by the Readiness Grant implementation on coordination with the consultants and implementing agencies. Due to the procurement processes and the chance that equipment will have to be ordered from overseas, the consultant and the REDD+ Unit will discuss this immediately after the contract has been approved.

Information processing

The consultant will perform the following tasks, each including training workshops and on-the-job training of staff of the implementing agencies:

- a. Analysis of collected data;
- b. Draft report on forest emission factors and activity data, as well as uncertainty assessment and QA / QC report, in compliance with UNFCCC and FCPF requirements;
- c. Review process of draft report to involve national stakeholders, UNFCCC Secretariat and FCPF Management Team;

7.1 Deliverables on National Forest Inventory Field Test

The consultant will submit a report that details the preparation, implementation and analysis of the forest inventory. The challenges encountered in the field and in using the database (see section 8) have to be described. Recommended solutions will inform the revision of the methodology, the database, and the capacity development plan.

8. DATABASE DEVELOPMENT

Develop a database that can fulfill all requirements for a National Forest Monitoring System, including

- a. Automatic transfer of collected data from electronic devices into the database, via cloud server, with physical backup on servers at forestry department and its partners;
- b. Easy extraction of collected data for different purposes (carbon, biomass, merchantable timber, biodiversity, social safeguards information, etc.);
- c. Provide all necessary data and information for international validation of REDD+ operations in Fiji by a third party;
- d. Based on open source programmes;
- e. Explore options to link database to other national systems (Ministry of Lands, Department of Environment, Ministry of Agriculture, etc.) and the University of the South Pacific (USP) and the Pacific Community (SPC). This would also inform the decision on software and maintenance of database;
- f. Training for staff within forestry department and Ministry of Communication / ITC section, USP and SPC to run the database independently after consultancy ends;
- g. Data collection, storage and sharing have to comply with national laws, policies and regulations.

Database development has to be in close collaboration with WGMRV, Management Services Division of the Forest Department and other sector departments (agriculture, lands, iTaukei Affairs, and environment).

A database for storage of all data and information processed and all results produced has to be created. This database will include the following information:

1. Documentation of the processes leading to development of methodologies relevant for REDD+ (NFMS & MRV, FRL, biodiversity surveys, SIS, SESA, drivers of deforestation and forest degradation analysis, etc.);

2. The final methodologies, with justifications for selected design options;
3. The raw data acquired from the above activities and used in the implementation of the methodologies;
4. Maps and map layers;
5. Standard Operating Procedures (SOP);
6. Field forms and guidelines;
7. The processed and analysed data and information which is used for reporting purposes.

8.1 Identification of database specifications

The consultant has to elaborate if an existing database can be used to integrate the data relevant to REDD+. Such a database must grant administrator rights to the forestry department regarding the provided contents. It has to be accessible from the servers of the forestry department and be able to link to the cloud programme in use by the department. The decision on database integration should be taken in consultation with Ministry of Lands, Department of Environment, Ministry of Agriculture, Ministry of Strategic Planning and the Prime Minister's Office.

A decision for a standalone solution has to be justified by detailing the reasons for the decision. In that case, a new database has to be developed and located on the server of the Management Services Division in Forestry Department, as well as on a cloud service that will be provided by the Forestry Department.

Further specifications have to be informed by a national stakeholder workshop and international reporting requirements, and compiled by the consultant.

8.2 Database development

The consultant will develop a database based on the identified specifications in 8.1. The draft has to be presented to relevant stakeholders and experts for discussion and revision.

After incorporating the comments, the second draft database has to be presented to the stakeholders for validation. If a third revision is necessary, the stakeholders decide if the changes are significant and have to be presented again or if the REDD+ Secretariat can validate the final design of the database.

8.3 Database establishment

The database has to be established according to the agreed design and following the latest security protocols. Once it is functional, the stakeholders and consultants test the database. Requested changes have to be integrated.

8.4 Documentation & training

Just like for the other items in the database, the process of developing the design and the explanation of the decisions along the process have to be documented. For future work on the database, a Standard Operating Procedure has to be produced. All stakeholders have to be trained before decision-making, the designated staff of the different agencies has to receive training on all elements of maintenance, use and changing of the database, including the applied open source programmes.

8.5 Deliverables on database development

The deliverable for this task is a functional database that complies with national and international requirements and relevant documentation, and fully trained staff in the relevant positions for database maintenance.

9. QUALITY CONTROL / QUALITY ASSURANCE

Quality Assurance / Quality Control procedures have to be integrated in all standard operation procedures (SOP). These SOP are required for all above work steps, including field inventory for different carbon pools, remote sensing, data collection, sample checks, data formats, storage, archiving, and procedures of data access. Every relevant work step that led to the methodology development, every step in planning, preparation, implementation and analysis of the methodologies, as well as justification of methods and documentation has to be documented in a structured form that facilitates transparency, completeness, consistency, comparability and accuracy of the whole system. Experts and verifiers that were not involved in the consultancy have to be able to trace back all steps of the system. The SOP have to be developed along and in parallel with work steps 1-5, undergo review by stakeholders and be stored in the national database and on the national REDD+ website for linking it to the UNFCCC Web Portal.

The consultants will document and justify the decision-making during the design of the different methodologies, describe the methodologies, provide guidance in using the methodologies and document the implementation. Every activity leading to an outcome will have separate SOP. For example, under NFI, there will be SOPs for the methodology, for preparation of field work, for community engagement, for measurement, for data analysis, for reporting, etc. The SOP for the FRL will have to be broken down to each FRL (per activity and locale).

After a task is complete, the SOP will be drafted and sent for revision by relevant stakeholders. The final draft will be validated by the WGMRV.

9.1 Deliverables on quality assurance and quality control

The deliverable is a complete set of Standard Operating Procedures, including quality assurance and quality control measures, to inform future activities and allow validation of the NFMS.

10. GUIDANCE ON THE NESTING OF SUB-NATIONAL MRV AND FRL WITHIN NATIONAL MRV AND FRL

The average landowner unit in Fiji is small, and so are the potential project areas for REDD+. It is important to provide landowners with as much support as possible. The consultant has to integrate reporting for the Emission Reductions Programme activities in the implementation of NFMS, MRV, FRL and data management for REDD+ projects and the nesting of the subnational MRV and FRL with the national MRV and FRL. The consultant will provide draft text for compliance with all relevant criteria and indicators of the Carbon Fund Methodological Framework.

10.1 Deliverables on nesting of subnational MRV and FRL with national MRV and FRL

Deliverable for this task is the draft text for the chapters on carbon accounting and programme design / implementation of the Emission Reductions Programme Document, following the indicators given in the Carbon Fund Methodological Framework.

11. CAPACITY DEVELOPMENT

Throughout the assignment the consultants will assess the capacities of relevant national stakeholders (REDD+ Unit and Secretariat, Forestry Department, REDD+ Steering Committee members and their institutions, landowner, academia, CSOs, private sector, etc.) to use, maintain, repeat, assess and revise the tasks and products in this consultancy by themselves.

In a comprehensive capacity building strategy the consultants identify existing capacity gaps as well as trainings and other capacity building activities required to overcome them in a systematic manner.

11.1 Deliverables on capacity development

The output of this task is a comprehensive capacity development plan aiming at enabling Fiji nationals to take over their national REDD+ programme tasks in future.

12. SCHEDULE AND DELIVERABLES

The overall timeframe for the NFMS consultancy (from signing of contract) will be 12 months. The table below summarizes the deliverables and schedule for the consultancy.

Task	Deliverable	Schedule
1. Situational analysis, data revision and final work plan development	Situational analysis report (incl. FRL and NFMS chapters), final consultancy work plan Validated and disclosed	Within 3 weeks from contract signing
FRL		
2. Methodology Development for FRL	Methodology, validated by RSC and FCPF	Within 12 weeks from contract signing
3. FRL construction	FRL for the different REDD+ activities, with sub-national relevance	Within 8 months from contract signing
NFMS		
4. Methodology development for NFMS and MRV	Methodology, validated by RSC and FCPF	Within 12 weeks from contract signing
5. Implementation of a test inventory	Forest inventory report from selected plots, incl. capacity assessment, trainings conducted, description of preparation activities and revised methodology Validated nationally and internationally	Within 8 months from contract signing
6. NFMS establishment	Documentation and chart for the established NFMS, including SIS, biodiversity, FRL, MRV	Within 9 months of contract signing
National Forest Inventory Field Test		
7. Collection of emission factor / field data to test all practical elements of the system.	Report on preparation, implementation and analysis of the forest inventory, incl. recommendations for revision of methodology, database, and capacity development plan.	6 weeks within the time window between methodology draft and finalisation
Database development		
8. Identification of database specifications and location	Draft design for database Based on stakeholder consultations	Within 3 weeks from contract signing
9. Database development and establishment	Database functional and in use, in compliance with national and international requirements	Within 6 months from contract signing
Quality assessment / quality control		
10. Documentation of all work steps, decision-making, implementation, and analysis	Set of SOPs that cover all work aspects of the consultancy and include the QA / QC measures Validated and disclosed	Completed within 11 months after contract signing
Capacity Development		
11. Capacity assessment for relevant stakeholders involved in each task, capacity building plan, and conduction of trainings	Capacity development strategy for MRV, including immediate trainings done in the consultancy implementation, as well as a future development plan	First draft within 5 months of contract signing, final version 12 months after contract signing

13. BUDGET AND PAYMENTS

The consultancy for FRL and MRV products includes all consultancy fees, subsistence allowances, travel, accommodation and necessary incidentals.

Workshop and meetings costs for national level consultations will be separately covered by the REDD+ National Program and the FD.

Output	Payment (%)
Upon signing of contract	10%
Report on situational analysis and work plan	10%
Draft NFMS description and MRV methodology	15%
Final FRL	15%
Functional database	10%
Complete validated set of Standard Operating Procedures	15%
Final NFMS	15%
Capacity Development Plan	10%

14. CONSULTANT QUALIFICATIONS AND EXPECTED LEVEL OF EFFORT

The NFMS / FRL consultancy will be conducted by a multidisciplinary team of experts in collaboration with relevant governmental and non-governmental institutions. Consultant teams are encouraged to make use of local partners, since in case of equal qualifications, there will be a preference for local and regional consultants to encourage greater ownership by Government whilst closing capacity gaps. The consultant team hired to conduct this work will work closely with the REDD+ MRV working group of the National REDD+ SC, the REDD+ Secretariat, the REDD+ Unit and other relevant agencies. The tasks described are considered an important capacity building process where consultants are expected to work closely with local agencies and officers to transfer skills and knowledge.

The consultants for these tasks have to be well-qualified to advise, plan and carry out the listed tasks of the assignment. The experts should demonstrate the ability to facilitate multi-stakeholder consultation processes surrounding these issues and be knowledgeable of Fiji's social structures and environmental issues, especially on the forest sector.

The Team Leader should demonstrate sufficient experience in development of forest carbon monitoring methodologies based on existing information, international requirements, and development of perpetual forest inventory systems, as well as application of GIS programs and statistical analysis. He/She is expected to possess an excellent knowledge of the Carbon Fund Methodological Framework, IPCC 2006 Guidelines and methodology standards on the voluntary market with experience in developing an inclusive, comprehensive MRV System that benefits also other processes.

The following fields of technical expertise and working experiences are required and will form the basis for selection:

Expertise of team has to cover:	Minimum qualification	Required experience and skills of proposed team:	Other desired skills
<p>1. Forest Mensuration, Carbon Monitoring and Accounting</p> <p>2. Remote sensing / GIS and computer modelling</p> <p>3. Database design and application</p> <p>4. Statistical analysis</p>	<p>Team members should hold degrees in fields relevant to the tasks. The team leader is expected to have a Master's degree at minimum. Qualifications should include forestry, geo-sciences, IT / database design, statistics or similar areas.</p> <p>All team members should have a minimum of 7 years (team leader 15 years) working experience in the forestry sector and relevant to the assignment.</p>	<ol style="list-style-type: none"> 1. Working knowledge of the requirements for National Forest Monitoring Systems, REDD+ MRV systems and reference level under UNFCCC/IPCC, Carbon Fund Methodological Framework, and voluntary project standards. 2. Strong background in statistical analysis and forest carbon inventory. 3. Proven experience in leading project and national REDD+ MRV system development (team leader). 4. Experience in leading and managing multi-disciplinary teams from other cultural backgrounds (team leader). 5. Minimum of 5 years working experience in Pacific Island countries (team leader) 6. At least 10 years of experience in land use and land use change mapping. 7. Familiar with international standards for forest monitoring and reference level development. 8. Familiar with utilization of different optical bands, radar, and data from sources with different resolution. 9. Skilled in creating computer-generated models for future predictions, based on quantitative and qualitative data. 10. At least 10 years of working experience in designing databases, 5 years in regards to forest resource inventories. 11. Proven expertise in utilization of open source programmes 12. Experience in capacity building for institutions and counterparts. 13. Familiar with international requirements for information provision / reporting and transparency for REDD+ 14. Excellent communication and proven reporting skills in English 	<ul style="list-style-type: none"> • Experience in tropical countries with high forest degradation of advantage • Familiar with IT capacities and existing databases on natural resources in the Pacific • Knowledge of Fiji is of advantage • Facilitation skills

CONTACT

For further information about the Fiji FCPF Readiness Preparation Activities and on these terms of reference please contact:

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