Establishment of a Reference Level (FRL) for forest land and development of a System for Monitoring, Reporting and Verifying (MRV) carbon emission reductions from forests in FIJI
(04.2017 – 12.2018)

D4: Methodology Development for NFMS and MRV

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Version 2.0

Abbreviations

A/R	Afforestation/Reforestation
AD	Activity data
AFOLU	Agriculture, Forestry, and Other Land Use
AGB	Above-ground biomass
BGB	Below-ground biomass
BIS	Biodiversity Information System
BUR	Biennial Update Report
C	Carbon
CFMF	Carbon Fund Methodological Framework
CH_4	Methane
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalents
COP	Conference of the Parties to the UNFCCC
DBH	Diameter at breast height
DW	Dead wood
EF	Emission factor
ERRs	Emission Reductions and/or Removals
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility of the World Bank
FRA	FAO's Forest Resource Assessment
FREL/FRL	Forest Reference Emission Level/Forest Reference Level
GFOI	Global Forest Observation Initiative
GHG	Greenhouse gas
GHGI	Greenhouse gas inventory
GPG-LULUCF	Good Practice Guidance for Land Use, Land-Use Change and Forestry
ha	Hectare(s)
IPCC	Intergovernmental Panel on Climate Change
L	Litter
MODIS	Moderate-resolution Imaging Spectroradiometer
MoF	Ministry of Forests, Fiji
MRV	Measurement, Reporting, and Verification
N_2O	Nitrous oxide
NC	National Communication
NFI	National Forest Inventory
NFMS	National Forest Monitoring System
NSS	National Safeguard System
PSP	Permanent Sample Plot
QA/QC	Quality Assurance/Quality Control
R	Root to shoot ratio
REDD+	Reducing Emissions from Deforestation and Forest Degradation and the role of conservation, sustainable management of forests and enhancement of

	forest carbon stocks in developing countries
RS	Remote sensing
SESA	Strategic Environmental and Social Assessment
SIS	Safeguard Information System
SLMS	Satellite Land Monitoring System
SOC	Soil organic carbon
SPC	South Pacific Community
SPC-GEM	SPC-Geoscience, Energy and Maritime Division
SRTM	Shuttle Radar Topography Mission
TCCCA	Transparency, Consistency, Comparability, Completeness and Accuracy
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate change
WD	Wood density

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1 Background

1.1 Aim

The goal of developing a National Forest Monitoring System (NFMS) for Fiji is to establish an operational system for monitoring and measurement, reporting and verification (MRV) forest and carbon stock related aspects in a forest information system. The methodology development for the NFMS is based on existing capacities in Fiji and identifies areas where improvements are needed.

1.2 Structure of the National Forest Monitoring System

Based on the general structure for a NFMS, a separation in a monitoring and an MRV section has to be applied. According to the Terms of Reference (ToR) for this consultancy, the structure of Fiji's NFMS is defined as shown in Figure 1. The monitoring component consists of: (i) a safeguard information system, (ii) a biodiversity information system, and (3) a national database system. The MRV component includes: (1) National Forest Inventory (NFI) and (2) Greenhouse Gas Inventory (GHGI). Both components are supplemented by a Satellite Land Monitoring System (SLMS). The following explanations on Fiji's NMFS are based on the given structure and describe the individual components in more detail.

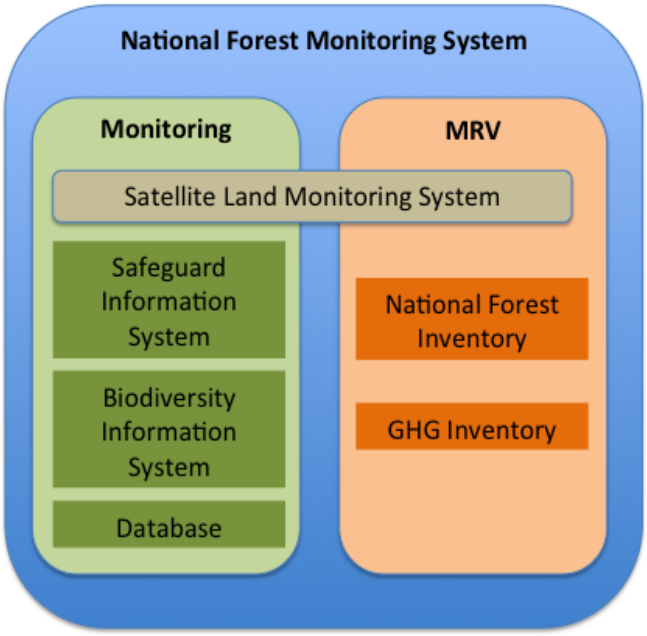

Figure 1: Structure of Fiji's National Forest Monitoring System

Methodological approach
The NFMS structure will be set up as presented in Figure 1.

1.3 Scale

The Forest Reference Level (FRL) accounting area (i.e., the area for which the FRL is established) is subnational, including Fiji's three largest islands: Viti Levu, Vanua Levu and Taveuni. The accounting area

covers an area of approximately 90% of Fiji's landmass and 94% of Fiji's forest area (as mapped in 2007). A map of the FRL accounting area is shown in Figure 2.

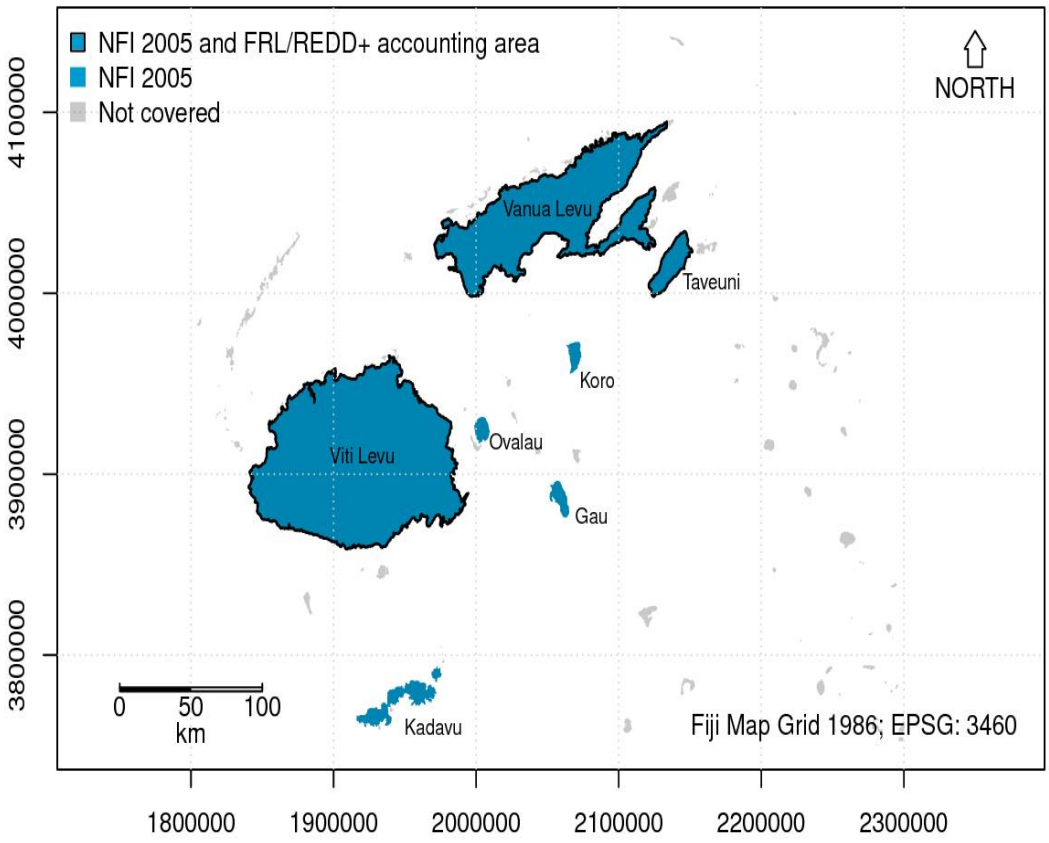

Figure 2: Map of Fiji. In blue: areas covered by the National Forest Inventory (NFI) 2006; blue with black outline: areas included for the Forest Reference Level construction and the NFI 2006.

The NFMS will contain provisions to cover the entire forest area of Fiji.

Methodological approach
Coverage of Fiji's entire forest area

1.4 Forest definition

In Fiji, the term 'forest' has not yet been formally defined. Fiji's REDD-Plus Policy document (Ministry of Primary Industries, 2011) adopted the forest definition provided in the Global Forest Resources Assessment (FRA) 'Terms and Definitions' document (FAO, 2004) of the Food and Agriculture Organization (FAO). This definition was used for the FRL and should be maintained for the NFMS.

According to a decision of the MoF, mangroves were excluded from the FRL construction. One of the motives was the intention to locate mangroves under Blue Carbon in the future. Since mangroves are a unique forest type, a decision should be made as to whether this forest type should be included in the NFI. This does not affect a decision on the extent to which emissions and removals of mangroves are taken into account in reporting, e.g. to the UNFCCC Secretariat.

Box 1: Fiji's Forest Area Definition

Forest is land spanning more than 0.5 hectares with trees higher than five meters and a canopy cover of more than 10 per cent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agriculture or urban use. Forest is determined both by the presence of trees and the absence of other predominant land uses. Areas under reforestation that have not yet reached but are expected to reach a canopy cover of 10 per cent and a tree height of five meters are included, as are temporarily unstocked areas, resulting from human intervention or natural causes, which are expected to regenerate.

Includes: areas with bamboo and palms, provided that height and canopy cover criteria are met; forest roads, fire breaks and other small open areas; forest in national parks, nature reserves and other protected areas such as those of scientific, historical, cultural or spiritual interest; windbreaks, shelterbelts and corridors of trees with an area of more than 0.5 hectares and width of more than 20 metres; plantations primarily used for forestry or protected purposes [...]

Excludes: tree stands in agricultural production systems, for example in fruit plantations and agroforestry systems. The term also excludes trees in urban parks and gardens, Mangroves, coconut plantations.

Methodological approach

Use forest area presented in Box 1.

Make a decision on the inclusion of mangroves for the NFI.

1.5 Other basic stipulations

The NFMS should be based on a design that utilizes synergies between the different components presented in Figure 1 to a maximum extend. This results in several requirements, among which are:

- The SLMS will serve both, the MRV and the monitoring components
- NFI and GHGI (forest sector GHG assessment) will use the same sampling and plot design
- The estimation procedures for the NFI will be applied to the GHGI as well

Methodological approach

Synergies between NFI and GHGI and the other components of the NFMS will be used to a maximum extent.

2 National Forest Inventory

Information on forest resources in a defined area is generally obtained by sample surveys that utilize representative samples to draw inference for the area of interest. A sample survey consists of standardized approaches to collect information and utilizes four components (Wright and Marsden, 2010):

- Sampling: the selection of representative samples from populations, whose observed characteristics provide unbiased information of the characteristics of those populations
- Inference: the generalization of sample statistics to estimate population parameters within calculable error margins

- Assessment: strategies to collect reliable and valid information on individual members of the population
- Analysis: (multivariate) data analysis techniques for the identification of complex statistical relationships among many characteristics of the population

NFIs are tailored to the needs of each country and show clear differences in the range of information provided. These can range from simple information on forest resources to holistic information concepts that also include biodiversity or socio-economic aspects. What all NFIs have in common is that they use sample-based field surveys to gather information, which are often combined with remote sensing data in order to record forest areas and their dynamics as well as forest types cost-effectively. A link to REDD+ MRV systems is already apparent.

2.1 Sampling design

According to Decision 4/CP.15 of COP15 to the UNFCCC, RED+ MRV systems need to use a combination of remote sensing and ground based assessments for estimating GHG emissions/removals, forest carbon stocks, and area changes. Therefore, a combined inventory approach will be utilized for the NFI (and the GHGI) that can either be based on multiphase or stratified sampling designs. As remote sensing imagery generally provides a wall-to-wall cover, it is advisable to use a stratified sampling design. This design is flexible for future inclusion of innovative remote sensing technology and additional enhancements of the field plot design.

The sampling design has to allow for inventories on successive occasions. The NFI 2006 was planned and conducted as a current state inventory without precautions for repeated assessments, while the Permanent Sample Plot (PSP) assessment use a plot allocation system that does not qualify for sample based estimation. Therefore, a new sampling design has to be developed and implemented. The NFMS establishment will study possibilities to combine the current PSP with the new NFI/ GHGI design.

Methodological approach
NFI and GHGI will use the same combined Earth observation/ in-situ sampling design.

2.2 Assessment units and field plot design

While the sampling design determines how to select sample points, the “plot design” describes the activities to be undertaken at the sample point. It indicates how to include sample trees and other sample objects, and how to perform measurements and observations of the variables (FAO, 2017).

Two different plot designs are used in Fiji. Since 2010, so called Permanent Sample Plots (PSP) are recorded. The plot design is shown in Figure 3. On the large square (50 * 50 m), the diameter at beast height (DBH) [cm], total tree height [m] and species is recorded on all living trees with DBH ≥ 25 cm. On the two 20*20 m subplots, the DBH [cm], total tree height [m] and species is recorded on all living trees ≥ 5 cm and < 25 cm DBH. As The PSPs are primarily used to record the growth of individual trees, the plots are permanently marked, so that repeated recordings at successive occasions are possible. A total of 84 PSPs have been set up so far.

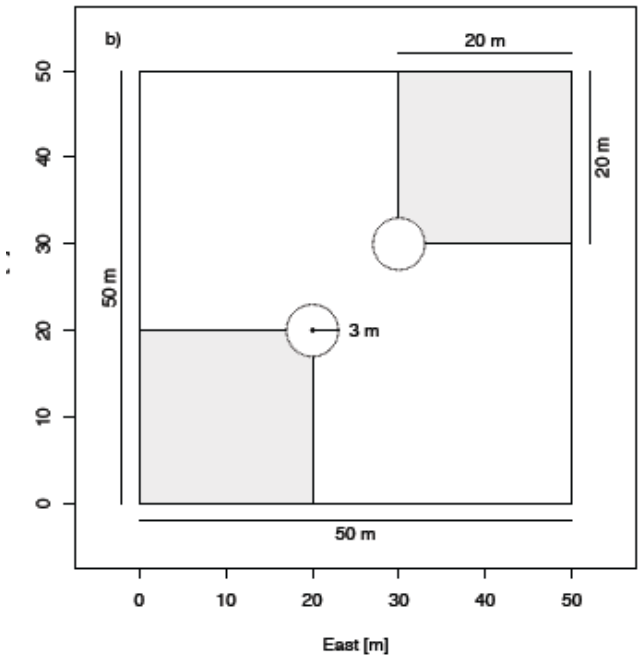

Figure 3: Permanent Sample Plot design

For the NFI 2006 a sampling unit consisting of a cluster with 5 concentric plots was used (Figure 4). The individual sample plots were not permanently marked, so that they cannot be used for repeated recordings. Thus the NFI 2006 does not allow for sampling at successive occasions. An advantage of the NFI 2006 design is the use of clusters that ensure cost-effective recording by reducing the unproductive travel time to reach the plots. In 2006 a total of 1023 clusters have been assessed.

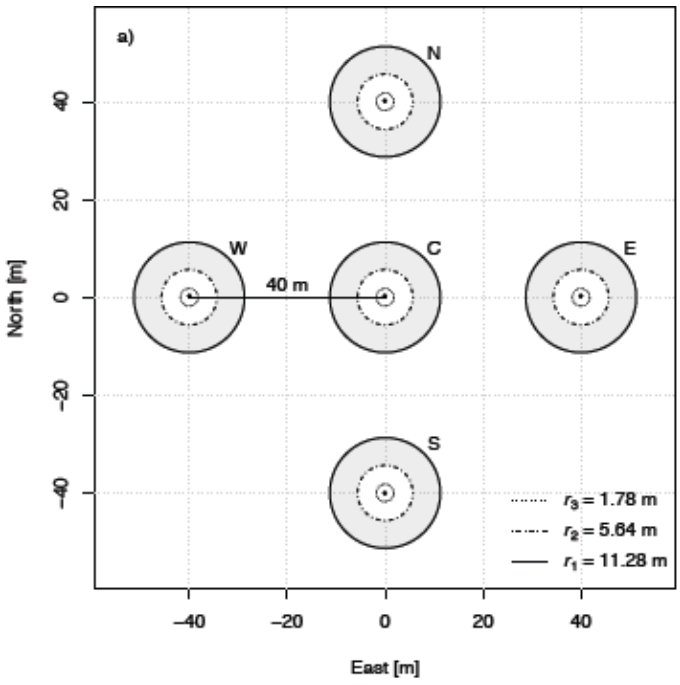

Figure 4: National Forest Inventory 2006 cluster design

Cluster designs are generally more cost-efficient than single plot designs (Köhl et al., 2006; Schreuder et al., 1992). Given the need for assessments in remote areas, a cluster design is to be preferred for future applications.

Methodological approach
For the NFMS field assessments, a design will be used that combines the advantages of clusters and concentric plots.

2.3 Allocation of sampling units

The sampling design determines among other aspects the selection of sample points (i.e. clusters). For the NFI 2006 clusters were randomly allocated within the forest area derived from satellite imagery. The PSP design uses a systematic allocation of sampling units, but applied in-situ shifts of individual sampling units, which renders statistical inference impossible.

Methodological approach
For the NFMS, an allocation of sampling units will be applied that allows for sampling at successive occasions and combines the new NFI sampling units with the PSP.

2.4 Sampling on successive occasions

The NFI must be implemented as permanent inventory. This requires that the plots will be set up in such a way that they can be unambiguously retrieved during repeated inventories.

Methodological approach
The sampling design will ensure the possibility for repeated assessments over time and contain appropriate recommendations for the plot design.

3 Greenhouse Gas Inventory

3.1 General aspects

The GHGI (forest sector) has to be planned as an integrative part of the NFI. This means that the same sampling design, field plot design and statistical estimation procedures will be used as in the NFI. This ensures transparent and consistent data assessment, data analysis and presentation of results. The same forest definition and thus the same reporting unit will also be used. The field surveys of the NFI and the GHGI will be integrated and carried out jointly.

Methodological approach
NFI and the GHGI will be integrated and will, as far as possible, apply identical approaches and methods.

3.2 Pools

IPCC (2003, 2006) identifies five carbon pools to be included in GHGI: (i) Above-ground biomass (AGB), (ii) Below-ground biomass (BGB), (iii) Dead wood (DW), (iv) Litter (L), and (v) Soil organic matter (SOC).
Of the five forest carbon pools identified by IPCC (2003, 2006), AGB and BGB have been included in Fiji's FRL construction. Excluding the remaining pools, i.e., DW, L, and SOC will underestimate emissions. Moving to higher Tier levels renders the inclusion of all of the five C-pools necessary.

Methodological approach
Inclusion of all five C-pools: AGB, BGB, DW, L, and SOC

3.3 Gases

The Agriculture, Forestry and Other Land Use (AFOLU) sector covers mainly three types of GHGs, namely carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) (IPCC, 2006). Emissions of N_2O are caused by biomass burning or by any forest management practice that increases the availability of inorganic nitrogen in soils. However, unless lands have had a heavy application of nitrogen fertilizer, forest-related emissions of N_2O do usually not represent a key category (GFOI, 2016).

Similar to N_2O, CH_4 is released to the atmosphere when biomass is burned. In Fiji, man-made and wild fires are not uncommon (Trines, 2012), but national records on the cause, extent, and intensity are currently not available. The Burned Area Product from the Moderate-resolution Imaging Spectroradiometer (MODIS) allows the retrospective assessment of burned areas.

Given the critical data situation, the NFMS will use a combination of remote sensing imagery, most likely based on the MODIS Active Fire data, and in-situ assessment of burnt areas and fire scars on plots assessed during the NFI and GHGI. NH_4 and N_2O emissions will be calculated based on combustion factors derived from estimates of burnt biomass.

Methodological approach
Inclusion of CO_2, NH_4 and N_2O for burnt areas

3.4 Sources and sinks

The following three REDD+ activities will be included in Fiji's NFMS**,** and enhance those outlined in Fiji's REDD-Plus Policy 2011 and the Emission Reductions Programme Idea Note (Ministry of Fisheries and Forests, 2015):

(a) Reducing emissions from deforestation;
(b) Reducing emissions from forest degradation; and
(c) Enhancement of forest carbon stocks.

Regardless of which future decisions Fiji makes on the inclusion of sources and sinks, the NFMS will consider all five REDD+ activities as following.

(a) Reducing emissions from deforestation;
(b) Reducing emissions from forest degradation;
(c) Conservation of forest carbon stocks;
(d) Sustainable management of forests; and
(e) Enhancement of forest carbon stocks.

Methodological approach
Develop methodology to cover sources and sinks related to all five REDD+ activities.

3.5 Land-use categories

IPCC (2006) has defined six land-use categories: (1) forest land, (2) cropland, (3) grassland, (4) wetlands, (5) settlements, and (6) other land. Each land-use category is further subdivided into land remaining in that category (e.g., forest land remaining forest land) and land converted from one category to another (e.g., forest land converted to cropland).

Under IPCC-Approach 2, total land-use area, including changes between categories has to be provided. Whereas under IPCC Approach 3, spatially-explicit land-use conversion data both the net losses and gains in the area of specific land-use categories and what these conversions represent (i.e., changes both from and to a category) have to be provided.

The land-use category "forest land" can be further divided into forest strata (sub land-use classes).

Methodological approach
Include all six IPCC land-use classes and make provisions for further subdivision of the land use class forest.

3.6 Emissions by sources and removals by sinks

Emissions and removals are calculated separately for the individual sources and sinks. The results are calculated as C stock differences between two points in time, ΔC, presented in the unit of CO_2e. Positive differences indicate carbon gains, while negative differences indicate carbon losses. If applicable, emissions are estimated using IPCC's (2006) generic equation calculating emissions as the product of

activity data and emission factors. It will be assumed that annual carbon gains and losses are balanced in unmanaged Natural Forests.

For Fiji's NFMS, these five activities translate to the following sources and sinks of GHGs: a) emissions from deforestation, b) emissions from forest degradation, c) removals from afforestation and reforestation, d) emissions and removals form the management of forests, and e) removals form the conservation of carbon stocks.

Methodological approach
Provide methods to calculate emissions from sources and removals from sinks for all five REDD+ activities.

3.7 Satellite Land Monitoring System

Decision 4/CP.15 specifies that a NFMS, according to national circumstances and capabilities, should be established that uses a combination of remote sensing and ground based assessments. For the NFMS the SLMS will be designed in a flexible way. This includes the selection of satellite imagery, cost analysis, forest stratification rules, and satellite image analysis. As the SLMS will most likely be maintained by South Pacific Community- Geoscience, Energy and Maritime (SPC-GEM) division of Pacific Community Suva, provisions for the institutional setup have to be suggested.

Methodological approach
Provide approaches for the methodological and institutional setup of the SLMS

3.8 Safeguard information system

According to CoP Decision 9/CP.19, para 4, the developing countries seeking to obtain and receive results-based payments should provide the most recent summary of information on how all of the safeguards as set by the Cancun Decision (decision 1/CP.16, appendix I, paragraph 2), have been addressed and respected before they can receive results based payments UNFCCC, 2016. Likewise, COP Decision 11/CP.19, para 5 specify that national forest monitoring systems may provide, as appropriate, relevant information for national systems for the provision of information on how Cancun safeguards are addressed and respected UNFCCC, 2016. Also, Carbon Fund Methodological Framework demands an appropriate monitoring arrangement for the World Bank including social and environmental safeguards (FCPF, 2016; The World Bank, 2016).

Developing a monitoring system for safeguards is not a part of this consultancy. However, the current consultancy provides a brief chapter about safegaurds in the NFMS document. The chapter discusses:

- Elements of National Safeguards System for REDD+
- Corresponding Cancun safeguards, REDD+ Social and Environmental Standards and World Bank Policies and Procedures
- Designing Fiji's National Safeguards System (NSS)
- Institutional structure and information pathways in the NSS
- Implementing Safegrad Information System (SIS)

- Linking SIS to REDD+ MRV

This consultancy expects that the information is valuable while government of Fiji begins to develop a SIS. When the NSS/SIS is developed, it has to be integrated into the NFMS.

Methodological approach
Provide provisions for embedding the Safeguard Information System into the NFMS.

3.9 Biodiversity information system

Monitoring biodiversity is important to inform complex decisions about potential trade-offs among benefits of REDD+ and amongst different approaches to mitigating risks. Most biodiversity monitoring approaches require ecological baselines, which can be derived from long-term average data on particular aspects of biodiversity, or from assessments conducted prior to the commencement of a program. Integrating biodiversity monitoring into REDD+ facilitates compliance with the UNFCCC REDD+ safeguards requirements to exclude environmental risks.

REDD+ is likely to have variable outcomes for biodiversity, depending on how biodiversity goals are articulated, implemented, and monitored. One key element for successful biodiversity conservation is having clearly articulated, measurable and time-bound goals (Gardner, 2010; Margoluis and Salafsky, 1998).

Developing a forest biodiversity monitoring system for REDD+ is not a part of this consultancy. However, the current consultancy provides a brief chapter in the NFMS document about biodiversity monitoring system and how to link the biodiversity monitoring system to the REDD+ MRV. The chapter discusses:

- Biodiversity status in Fiji
- Major Drivers for change in forest biodiversity (direct and indirect)
- Monitoring biodiversity under REDD+ implementation
- Attributing particular changes in biodiversity to REDD+ activities
- Linking the biodiversity information system to REDD+ MRV

Finally, the chapter will present a framework to link biodiversity information system to REDD+ MRV. This consultancy expects that the information is valuable while government of Fiji begins to develop a forest biodiversity monitoring system for REDD+. When the system is developed, it has to be integrated into the NFMS.

Methodological approach
Provide provisions for embedding the Biodiversity Information System into the NFMS.

3.10 Database

The development of the database is the subject of a separate work package and is dealt with there.

4 Measurement, Reporting and Verification of removals and emissions

The measurement, reporting and verification (MRV) component comprises the SLMS, the NFI and the GHGI. MRV systems are used to estimate anthropogenic, forest-related GHG emissions by sources and removals by sinks and to report these estimates to the UNFCCC Secretariat through their Biennial Update Reports (BUR). The UNFCCC Secretariat coordinates the process of verification. However, countries are requested to perform their own verification processes following IPCC's guidance and guidelines.

4.1 Measurement

Measurement is the process of estimating anthropogenic forest-related emissions by sources and removals by sinks, forest carbon stocks, and changes in forest carbon stocks and forest area resulting from the implementation of REDD+ activities.

4.2 Reporting

Reporting for REDD+ can be defined as the process used to translate information resulting from measurements or monitoring (i.e. information generated by the NFI, GHGI and SLMS) into an agreed format, such as the UNFCCC reporting framework. Emissions and removals estimates need to be reported using reporting tables, and worksheets where appropriate.

4.3 Verification

GPG-LULUCF (IPCC, 2003) describes verification as the "*purpose of verifying national GHG inventories is to establish their reliability and to check the accuracy of the reported numbers by independent means*". In addition the ´GPG-LULUCF stipulates that "*if a country undertakes internal verification of its inventory, it should ensure that:*

- *Sufficient independent expertise is available;*
- *Documentation of the verification is included in the inventory report;*
- *Uncertainty estimates and QA/QC documentation is included in the report;*
- *Other available national verification activities are described;*
- *Applied verification methods are transparent, rigorous and scientifically sound;*
- *Verification results are reasonable and well-explained; and*
- *Final calculations can be reasonably linked to underlying data and assumption.*"

The MRV setup has to provide approaches for verification of statistical estimates, field assessments, satellite remote sensing analyses and combining EF and AD.

Methodological approach

Provide approaches for measurement, reporting and verification based on available data and the methods developed for NFI, GHGI, SIS and BIS

5 Compliance with IPCC Principles (of Good Practice) and FCPF Carbon Fund Methodological Framework

5.1 Compliance with IPCC Principles

IPCC good practice guidance (2003, 2006) assists countries in producing inventories/estimates that are accurate in the sense of being neither over nor underestimated as far as can be judged, and in which uncertainties are reduced as far as practical. One of the elements that contribute to the overall improvement of the inventories is that both IPCC and UNFCCC guidelines include the principles of transparency, consistency, comparability, completeness and accuracy (TCCCA) as guiding principles in preparing and reporting inventories. These principles are applicable for the NFMS as well.

Transparency means that the assumptions and methodologies used for an inventory should be clearly explained to facilitate replication and assessment of the inventory by users of the reported information. The NFMS will transparent as all required information for its construction is given and allows for the reconstruction at any time.

Consistency means that an inventory should be internally consistent in all its elements with inventories of other years. An inventory is consistent if the same methodologies are used for the base and all subsequent years and if consistent data sets are used to estimate emissions or removals from sources or sinks. The NFMS will allow a step-wise approach. Data available at the time of its construction are consistently used. Future improvements need to take into account existing methodology.

Comparability means that estimates of emissions and removals reported by Parties in inventories should be comparable among Parties. For this purpose, Parties should use the methodologies and formats agreed by the COP for estimating and reporting inventories. The allocation of different source/sink categories should follow the split of the IPCC Guidelines, at the level of its summary and sectoral tables. The NFMS implements the methodology given by IPCC for the LULUCF and AFOLU sector. Therefore, results are comparable with those from other Parties implementing the IPCC guidance.

Completeness means that an inventory covers all sources and sinks, as well as all gases, included in the IPCC Guidelines as well as other existing relevant source/sink categories which are specific to individual Parties and, therefore, may not be included in the IPCC Guidelines. Completeness also means full geographic coverage of sources and sinks of a Party. The current FRL includes only CO_2e. Other GHG will be included in the NFMS. The accounting area covers roughly 90% of Fiji's forested area. Under a step-wise approach completeness can be assumed for the NFMS.

Accuracy is a relative measure of the exactness of an emission or removal estimate. Estimates should be accurate in the sense that they are systematically neither over nor under true emissions or removals, as far as can be judged, and that uncertainties are reduced as far as practicable. To promote accuracy in the available data and analysis procedures appropriate methodologies have been implemented, in accordance with the IPCC good practice guidance, to promote accuracy of the emission/ removal estimates.

5.2 Compliance with FCPF Carbon Fund Methodological Framework

The Forest Carbon Partnership Facility of the World Bank has published a Carbon Fund Methodological Framework (CFMF) that provides guidance to the development and selection of REDD+ Programs (FCPF, 2016). For the construction of a FRL the CFMF presents four criteria and ten indicators, which are listed and discussed below and will be implemented in the NFMS.

Criterion 10:
The development of the Reference Level is informed by the development of a Forest Reference Emission Level or Forest Reference Level for the UNFCCC.

Indicator 10.1: The Reference Level is expressed in tonnes of carbon dioxide equivalent per year.

- Fullfilled for Fiji's NFMS. The FRL will be expressed in tonnes of CO_2e.

Indicator 10.2: The ER Program explains how the development of the Reference Level can inform or is informed by the development of a national FREL or FRL, and explains the relationship between the Reference Level and any intended submission of a FREL or FRL to the UNFCCC.

- A national FRL will be constructed, which includes roughly 90% of the total forest area of Fiji. The same FRL will be used by the ER-Program and implemented in the NFMS.

Indicator 10.3: The ER Program explains what steps are intended in order for the Reference Level to achieve consistency with the country's existing or emerging greenhouse gas inventory.

- Consistency is maintained as the same forest area definition is used.

Criterion 11: A Reference Period is defined.

- The reference period will be defined.

Criterion 12: The forest definition used for the ER Program follows available guidance from UNFCCC decision 12/CP.17.

Indicator 12.1: The definition of forest used in the construction of the Reference Level is specified. If there is a difference between the definition of forest used in the national GHGI or in reporting to other international organizations (including an FREL or FRL to the UNFCCC) and the definition used in the construction of the Reference Level, then the ER Program explains how and why the forest definition used in the Reference Level was chosen.

- The forest area definition is specified. The construction of the FRL and the NFMS use the same forest definition as it was used in the Second National Communication to the UNFCCC, 2013 submitted by the Republic of Fiji.

6 Capacity development

Capacity gap is defined as the difference between what is required for REDD+ NFMS (focusing more on MRV) in accordance with the national circumstances and existing monitoring capacity of Fiji (Figure 5). Based on the current capacities available in Fiji the future capacities needed and the resulting activities for capacity building will be presented for the different components of the NFMS.

- An assessment of Fiji's existing capacities for establishing a national monitoring system for estimating emissions and removals from forests will be conducted.
- The assessment provides the basis for defining the capacity-development needs for an operational NFMS for the country.
- The capacity-gap assessment will be based on four selected indicators: (i) SLMS, (ii) NFI, (iii) GHGI, and NFMS database system (Romijn et al., 2012; Romijn et al., 2015);
- The capacity-gap assessment considers the several components of the three phase of the REDD+ NFMS: (i) planning and design, (ii) monitoring, and (iii) analysis and reporting (GOFC-GOLD, 2016).
- A 'Capacity Development Plan' will be is proposed to bridge the capacity gaps and focus on capacity building for the key action areas.

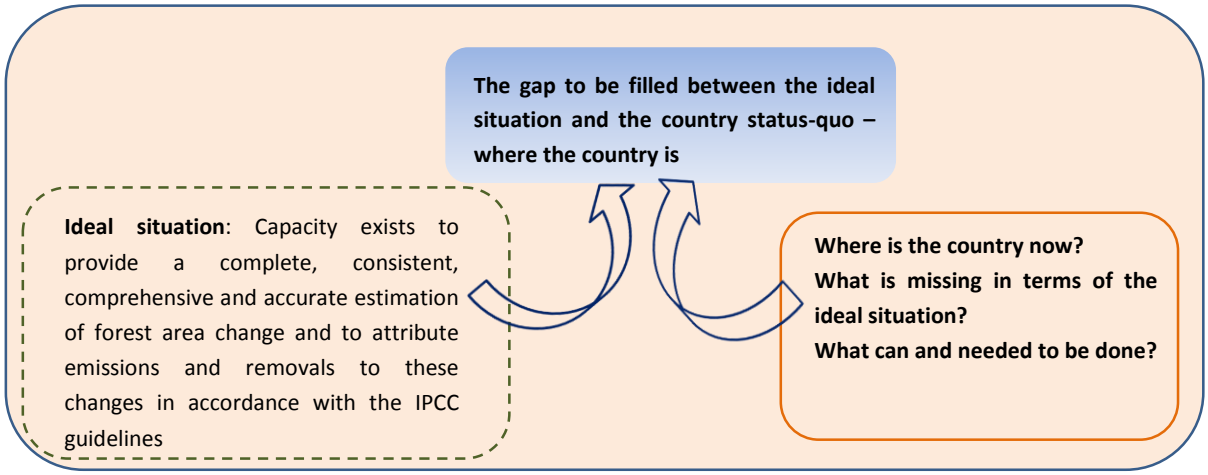

Figure 5: Capacity gap analysis approach

The development of Capacity Development Strategy is a separate Deliverables of the consultancy. The NFMS documents will provide the summary.

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