Record, Report and Minutes of Technical Stakeholders Consultation (Methodological/MRV Taskforce and Selected relevant Technical Stakeholders) to consider and identify suitable option for the “Construction of the Forest Reference Emissions Level and/or Forest Reference Levels (FREL/FRLs) for Uganda’s “Policy approaches and positive incentives on issues relating to Reducing Emissions from Deforestation and Forest Degradation; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks (The National REDD+ Programme)”

Convened by the Permanent Secretary, Ministry of Water and Environment (MWE – FSSD); with Technical Support from FAO - and held at Mabira Rain Forest Lodge (Mukono – Buikwe Districts - Uganda) from 5-8 June 2016

Agenda / Programme Items (arranged in a retreat workshop format)

Day 1 Sunday 5th June		Remarks/scope		Facilitation
1400	Arrival at the hotel			
1530 - 1700	First briefing, review of the agenda and first technical interaction/working groups on specific technical issues	Sergio Innocente / REDD+ Secretariat	Familiarization of ALL staff with objective and flow of the event and possible start of technical discussion and DATA review	Sergio Innocente
Day 2 Monday 6th June				
0830-930	Ugandan context – why construct a FREL and its linkages to national policies	Xavier/Margaret	Provide context " why Uganda wishes to construct a FREL & the linkage to larger climate change policies – will help frame FREL discussion and drive options regarding the FREL construction	Sergio Innocente
0930 - 1000	Overview of FREL/FRL global debate and examples	Donna Lee	Refresh participants about overall FREL/FRL debate/technical issues and other countries approaches	Sergio Innocente
1000-1020	Coffee break			
1020-1100	Overview of the political and technical decisions reached FREL/FRL building blocks e.g. forest definition, Scale, Scope (FREL/FRL)	John Begumana	Brief participants about current status-quo of Uganda FREL/FRL	Sergio Innocente
1100-1145	Activity DATA - Deforestation	NFA (GIS/RS) Team	Overview of DATA available, sources, processing/analysis done, possible/due additional analysis	Sergio Innocente
1145-1230	Activity DATA - Conservation	NFA (GIS) and UWA Team	Overview of DATA available, sources, processing/analysis done, possible/due additional analysis	Sergio Innocente
1230 - 1400	Lunch break			
1400-1445	Activity DATA – Sustainable management	NFA (GIS) and NFA team	Overview of DATA available, sources, processing/analysis done, possible/due additional analysis	Sergio Innocente
1445-1530	Activity DATA – Degradation	NFA (GIS), UWA, MoE, Makerere Team	Overview of DATA available, sources, processing/analysis done, possible/due additional analysis	Sergio Innocente
1530 - 1600	Coffee break			
1600-1700	Emission Factors	NFA (NFI) & Lauri	Overview of DATA available, sources, processing/analysis done, possible/due additional analysis	Sergio Innocente
Day 3 Tuesday 7th June				
0830	Other data - to be	(	Overview of DATA available,	Sergio

- 0930	used for National circumstances	REDD+ John Begumana	sources, processing/analysis done, possible/due additional analysis	Innocente
0930-1100	Review of DATA - definition of FREL/FRL possible construction approach	Donna Lee and FAO team	Based on the DATA presented definition of possible options for Uganda FREL/FRL	Sergio Innocente
1100-1120	Coffee break			
1120-1300	Continue review of DATA – definition of FREL/FRL possible construction approach	Donna Lee and FAO team	Based on the DATA presented definition of possible options for Uganda FREL/FRL	Sergio Innocente
1300 - 1315	Group formulation for the preparation of materials for day 4	Group work	Development of scenarios/options for FREL/FRL	Sergio Innocente
1230 - 1400	Lunch break			
1430-1730	Group work	Groups	Development of scenarios/options for FREL/FRL	Sergio Innocente
Day 4 Wednesday 8th June (Stakeholders consultation)				
0830-930	Ugandan context – why construct a FREL and its linkages to national policies	Xavier/Margaret	Provide context behind why Uganda wishes to construct a FREL & the linkage to larger climate change policies – will help frame FREL discussion and drive options regarding the FREL construction	Sergio Innocente
0930 -1030	Overview of FREL/FRL and its components	Donna Lee	Refresh participants about overall FREL/FRL debate/technical issues and other countries approaches	Sergio Innocente
1030-1130	Overview of Uganda FREL/FRL status (including data)	REDD+ Secretariat / John Begumana	Presentation of DATA (as per above details) to the stakeholders	Sergio Innocente
1130-1150	Coffee break			
1150-1330	Combined FREL/FRL scenarios	John Begumana	Presentation of suitable options for FREL/FRL construction in Uganda.	Sergio Innocente
	Submission process FREL/FRL	Donna Lee	Presentation of the process of submission and review of the FREL/FRL	Sergio Innocente
1330 - 1430	Lunch break			

In Attendance

#	Name of participants	Title	Institution	Contacts
1.	Dr. Justine Namaalwa Jumba T: 0772 962877 E: namaalwa.justine@gmail.com	Senior Lecturer	School of Forestry, Agricultural and Environmental Sciences (CAES), Makerere University	0415 54 22 77 0414 53 16 41 tweheyo@forest.mak.ac.ug
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Abstract/Summary

This is a record and minute of Technical Stakeholders Consultation (Methodological/MRV Taskforce and Selected relevant Technical Stakeholders) to consider the "Construction of the Forest Reference Emissions Level and/or Forest Reference Levels (FREL/FRLs) for Uganda's "Policy approaches and positive incentives on issues relating to Reducing Emissions from Deforestation and Forest Degradation; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks (The National REDD+ Programme)" that was convened by the Permanent Secretary, Ministry of Water and Environment (MWE); with Technical Support from FAO - and held at Mabira Rain Forest Lodge (Mukono – Buikwe Districts - Uganda) from 5-8 June 2016.

The objectives of the FREL/FRL(s) meeting were to (1) Presentation and discussion why Uganda needs to construct a reference level for REDD+ (for national goals and as UNFCCC requirement for REDD+ participants); (2) Presentation and discussion of various approaches for the construction of reference levels and possible options for Uganda; (3) Presentation and discussion of available data sets, sources, processing /analysis so far done, additional analysis required for the construction of Uganda's reference level; (4) Evaluation of proposed scope for FREL in relation to available data and other resources and time required to submit Uganda's initial reference level; and (5) identification of suitable construction approaches for FREL/FRL Uganda, based on available data and other relevant National circumstances.

The options identified by this meeting will be analyzed (SWOT analysis) and the results will constitute the base for further consultation planned within the Uganda REDD+ institutional/coordination mechanisms. This consultation will lead to the final definition of the FREL/FRL for Uganda.

Technical support to the meeting came from FAO whose consultants guided the participants in the consideration of the possible suitable options for the "Construction of the Forest Reference Emissions Level and/or Forest Reference Levels (FREL/FRLs) and in accordance with the retreat objectives. The meeting was organized in two sessions – the first session consisted in a restricted number of experts, directly involved in the construction of FREL/FRL for Uganda (members of the Methodological/MRV Taskforce and members from institutions that comprise the "REDD+ MRV "Platform"). The second session involved a wider number of experts, consisted of all the participants in the first session and additional participants selected from the technical institutions – that comprise the "REDD+ MRV "Platform".

During the first three days, the meeting reviewed the available data, its sources, further analysis required and the linkage of the FREL/FRL(s) to climate change policies. Presentations were made on emission factors of Uganda's forest strata and activity data in respect to deforestation, conservation, sustainable management, degradation. Presentations were also made about the experiences of countries that had already developed and submitted their FREL/FRL(s) including considerations and justifications for the approaches they had chosen. The meeting also received presentations

highlighting new developments at the international level and especially UNFCCC on FREL/FRLs technical assessment team reviews and recommendations which Uganda may learn from. On the third day, presentations of the first day were re-capped for the benefit of the new participants who had joined the meeting. Finally, suitable options were presented and discussed with the meeting. In addition, the second session considered the next steps with the regards to the completion and submission of Uganda's FREL/FRL(s).

Conclusively: **it was agreed that the identified suitable options for FREL/FRL construction would undergo a SWOT analysis, which will be the basis of the future consultation with the national level REDD+ institutional and coordination framework stakeholders.**

1.0 Background

Uganda is currently implementing the Readiness Phase of its National REDD+ Programme. The readiness phase is intended to deliver (a) A National REDD+ strategy and Action Plan; (b) A National Forest Baseline Scenario (Forest Reference Emission Level and/or Forest Reference Level) (FREL/FRLs); (c) a National Forest Monitoring System (NFMS); and (d) a System for providing information on how the safeguards are being addressed and respected throughout the implementation of REDD+ activities.

The bulk of the work towards the Construction of FREL/FRLs and NFMS is carried out by the Methodological Task Force also known at the Measurement Reporting and Verification or the **MRV** task Force. When and where deemed necessary, the MRV taskforce co-opts specialised groups and or individuals from other institutions and are collectively referred to as the MRV platform. The MRV taskforce reports to the National Technical committee (NTC) for technical guidance. Recommendations from the NTC are forwarded to the National Climate Change Advisory Committee, formerly the Climate Change Policy Committee (NCCAC/CCPC). NCCAC provides policy level guidance and coordination of REDD+ process for Uganda as part of its climate change policy oversight responsibility.

The main objectives of the FREL/FRL(s) meeting were:

1. Presentation and discussion of why Uganda needs to construct a reference level for REDD+ (for national goals and as UNFCCC requirement for REDD+ participants);
2. Presentation and discussion of various approaches for the construction of reference levels and possible options for Uganda;
3. Presentation and discussion of available data sets, sources, processing /analysis so far done, additional analysis required for the construction of Uganda's reference level;
4. Evaluation of proposed scope for FREL/FRLs in relation to available data and other resources and time required to submit Uganda's initial reference level;
5. Presentation, discussion and building consensus on methodological approach for Uganda's FREL.

1.1 Uganda's NCCAC endorsement of key FREL/FRLs technical elements

Construction of FREL/FRLs is premised on five elements and these are; forest definition, scale, scope, data and Methodological approach. **A consensus and endorsement of forest definition, scale, scope for the construction of Uganda's reference levels was obtained in the meeting of the NCCAC that took place in Entebbe on 10th March 2016.** With all the above elements in place, Uganda is thus in position to construct its first reference level which was the main purpose of the meeting.

Key data sets for the construction of FREL/FRL are Activity Data (land use / land use change and forestry) and Emission factors (Carbon stock coefficients). These data sets are provided by the National Forestry Authority (NFA). Key institutions with mandates and specific skills to process complimentary data sets have been mapped and herein referred to as the MRV platform (figure 1).

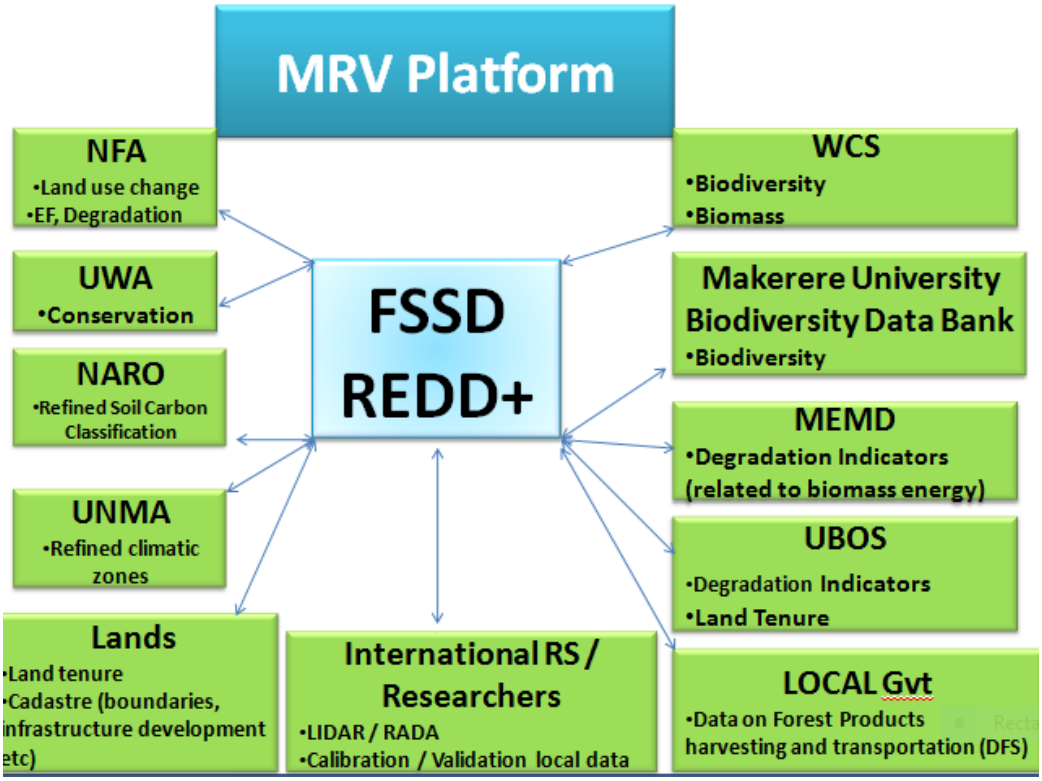

Figure 1: MRV platform (institutions data / information needed for REDD+)

1.0 Sunday 5th June 2016

Agenda/Programme Item 1: First briefing, review of the agenda and first technical interaction/working groups on specific technical issues

This agenda/programme was led by the FAO – Team in collaboration with the NFA/FSSD. It was intended to brief the meeting participants, review & agree on agenda and hold first technical interaction of working groups on specific technical issues. Familiarization of all participants and staff with objective and flow of the event and technical discussion and data review were done.

2.0 Monday 6th June 2016

On the second day, the technical meeting of the Methodological/MRV Taskforce and Selected Technical Stakeholders to consider the "Construction of the Forest Reference Emissions Level and/or Forest Reference Levels (FREL/FRLs) for Uganda's "National REDD+ Programme)" commenced with a presentation by the National Focal Point (Alternate) on Uganda's context – and how the FREL/FRLs fits in the national policy measures and programmes. This was then followed by detailed technical presentations and exchanges on: - Overview of FREL/FRL global debate and examples; Overview of the political and technical decisions reached FREL/FRL building blocks e.g. forest definition, Scale, Scope (FREL/FRL); key FREL/FRL activity Datasets aspects; and Emission Factors.

During the day, an overview of FREL/FRL at both regional and international levels with examples of countries that have submitted FRELs, the methodological approaches they have applied and the responses they have got from the UNFCCC technical assessment team were presented. Participants were informed that fifteen countries have submitted their Forest Reference Emissions so far of which ten considered a national scale and five considered a sub national level. Countries which considered a sub national level have considerable acreage of forest which justified their decision such as Congo.

From the International scene, presentations and discussions focused on Uganda starting with the evaluation of the available data sets. The National Forestry Authority GIS team which is responsible for activity data in the REDD+ process presented the various data processing procedures and how the processes have evolved with advancement in technology starting from 1990 up to to-date. Uganda currently has maps that represent five epochs of 1990, 2000, 2005, 2010 and 2015 which can be used to develop 4 land use / cover change points.

Complementary to the Activity data, a presentation of results on the estimation of carbon stock coefficients or forest Emission factors of various forest strata using Uganda's historical forest inventory data was made. The discussion showed that Uganda can adequately estimate EF of three out of four natural forest strata. In addition, EF of forest plantations may be estimated using growth models based on local data.

Details of the individual agenda/programme items are summarised in the following descriptions in accordance with each agenda/programme item.

Agenda/Programme Item 2: Ugandan context – why construct FREL/FRLs and its linkages to national policies

This agenda/programme item was led by Xavier Nyindo Mugumya - Alternate National Focal Point for REDD+ who made a presentation titled, "Ugandan context – why construct a FREL/FRLs and its linkages to national policies". Alternate National Focal Point informed the meeting participants that construction of the FREL/FRLs is part of the components of the REDD+ Readiness Component and a major deliverable under the UNFCCC. See full presentation in Annex I

The Alternate Focal Point informed the meeting that Uganda intends to "Develop, submit, improve the National Forest Reference Emission Levels/Forest Reference Levels (FREL/FRL) for the National REDD+ Programme: as (1) basis for receiving international "results-based payments"; (2) basis for seeking increased national investment in the forestry sector; and (3) to support the national communication under UNFCCC.

Further, the Alternate Focal Point provided a link between the National Forest Reference Emission Levels/Forest Reference Levels (FREL/FRL) and the "national circumstances" where he quoted the two national programme documents as follows:

1. Uganda Vision 2040 – Paragraph 295 - Restoration of forest cover from the "current 15" per cent of the total land area to 24 per cent
2. National Development Plan (2015/16-2020/21) (NDPII - Paragraph 524) looks at forestry as part of the ENR Sub-Sector - geared towards the following:
    i) protecting, restoring, and maintaining the integrity of degraded fragile ecosystems;
    ii) increasing sustainable use of environment and natural resources;
    iii) increasing national forest cover and economic productivity of forests;
    iv) Increasing the country's resilience to the impacts of climate change.

Agenda/Programme Item 3: Overview of FREL/FRL global debate and examples

This agenda/programme item was led by Donna Lee – FAO Consultant who made an extended presentation titled, "Status of REDD+ reference level (FREL/FRL) submissions to the UNFCCC (presented during day 1 and day 2)" - see full presentation in Annex II

In her presentation, Donna Lee informed participants that:

1. Since 2014,2015 and even in 2016 a number of countries including Brazil, Colombia, Ecuador, Guyana, Mexico, Malaysia, Chile, Costa Rica, Paraguay, Peru, Indonesia, Vietnam, Ethiopia, Rep of Congo and Zambia had submitted their country's FREL/FRL some of which had completed the technical assessments' associated with the submissions. Some of these countries have submitted other forms of REDD+ reference levels (different in some sorts from the ones submitted to the

UNFCCC) to other competent bodies such as the FCPF's carbon fund, and as part of the NDCs (formerly INDCs).

2. Some Countries have treated the technical FREL/FRLs elements (forest definition, scale, scope, data and Methodological approach) differently – depending on their national circumstances;
3. With regard to "activity data" - whereas all countries assessed deforestation using remote sensing and creating wall-to-wall forest area change maps, there was no common approach to measuring emissions from degradation or removals from forest management;
4. With regard to "Emission factors" – many countries used field inventory data from their NFIs and for degradation, several approaches were being used by different countries;
5. With regard to "Uncertainty" - Some countries have included information on uncertainty of activity data and emission factors separately, but so far no country has provided an overall quantitative uncertainty assessment of the emission/removal estimates in the FREL/FRL
6. With regard to "Construction approach" – countries also have differences and similarities for example:
    a. On "reference period" – some countries choose a range of historical data to construct their FREL/FRLs (ranging between 8-22 years so far!)
    b. On construction approach - The majority of countries (10 of 15) chose to use a **simple historical average**: but a few made "adjustments" and one country used a "hybrid approach";
7. Uganda could use the experience of the countries that have completed their FREL/FRL to consider its own options.

Agenda/Programme Item 4: Overview of the political and technical decisions reached FREL/FRL building blocks e.g. forest definition, Scale, Scope (FREL/FRL)

This agenda/programme item was led by Sergio Innocent – FAO National Technical Advisor and John Begumana – FAO MRV Expert. Both consultants provided a "Brief to the participants about current status-quo of Uganda FREL/FRL" through a presentation titled, "Status of the key elements of Uganda's FREL/FRL" which is located in annex III

In their presentation the pair mentioned the status:

1. FREL/FRL – building blocks (forest definition, data, scope, scale, and methodology)
    a. On data – forest definition including the considerations for its definition were completed
    b. On scale - A National scale is considered the most cost effective scale for the construction of Uganda's FREL/FRLs
    c. On Scope –
        i. Activities- the UNFCCC has defined 5 activities for REDD+ as the basis but the options for the activities would be further considered in this meeting
        ii. Pools; Options dependant on data availability – but above Ground Biomass is a must

iii. On gases, Options dependant on data availability – but CO2 is a must;

Agenda/Programme Item 5: Activity DATA - Deforestation

This agenda/programme item was led by Fridah Basemera and John Diisi - on behalf of National Forestry Authority- GIS Unit. They made a presentation titled, "Activity Data – Deforestation in Uganda" which is found in annex IV.

In their presentation, the NFA GIS team covered the overview of data available, sources, processing/analysis done, possible/due additional analysis with emphasis on the mapping process – where they informed the participants that:

1. NFA is responsible for Activity data in Uganda's REDD+ process. The Inventory and Survey Unit and the GIS Unit are working with the REDD+ Secretariat to perform this task. The target is producing FREL/FRL for Uganda. Therefore the presentation was an overview of the mapping process;
2. With regards to data sets - datasets are from different:-Years, Data sources, Format and method of acquisition of data, and, Data Manipulation methods. The differences may be attributed to technological advancement over time
3. With regards to "processing" – several steps & stages were involved – including but not limited to data preparation, segmentation, classification, validation;
4. With regards to "analysis" – natural forests which includes tropical high forests (well stocked), degraded tropical high forest, wood land (including montane) have been analysed and their statistics prepared. The analysis also shows, among other things, Changes in Natural Forests on Private Land, Changes in Natural Forests in Protected Areas, **Rates of Forest Change and errors associated with these estimates,**
5. On the 'achievements" – the team had been able to check errors across the different change "epochs" (through change maps); and Time spent to produce a national dataset reduced greatly from 6 years (1990, 2005) to less than a year (2015, 2000), produce maps showing forest change from 1990 – 2015, other change maps
6. On "**Deforestation in Protected areas" – there is a graph showing - forest cover in forest reserves and National Parks, total forest cover, national forest cover, Total Net Forest Loss (Ha),**
7. On "looking forward, there several points including: - Cloud computing to exploit unlimited scalability of processing, Online storage/back up of critical datasets and final products

Agenda/Programme Item 6: Activity DATA - Conservation

This agenda/programme item was led by Richard Kapere - on behalf of Uganda Wildlife Authority (UWA). The made a presentation titled, "conservation and carbon stock assessment" which is found in annex V.

In his presentation, the Richard Kapere covered the overview of data available, sources, processing/analysis done, with regards to selected forests under the UWA jurisdiction – where they informed the participants that:

1. Location of national parks that are forested are distributed almost equally but with the west and south west and eastern taking the majority of the areas;

2. Conservation pressures are now visually manifest; including but not limited to: Administrative challenges-limited funding, Bush burning around the National Parks, De-forestation around the park for charcoal, and cultivation, Degradation of ecosystems river banks and rivers as they leave the national parks, Global warming-Climate Change, High levels of poverty among park adjacent communities, High population growth rate and fertility-Increasing pressure for resources, Inappropriate land use outside the parks, Over dependence on park resources, and Poor agricultural methods around the park
3. UWA obtained its “wildfires” data from “modis”;
4. On carbon enhancement - Target planting of 35,000 ha in the degraded area in the two national parks of Mt. Elgon and Kibale; In 2001 the planted area was about 10,000 ha; By 2005, 11,400ha had been planted making an addition of 1,400 ha from 2001. On “carbon stock” - before 1993; the carbon stock was at 13 Mg/ha and at 2009, Carbon above ground (188.5tons/ha);
5. On “Carbon Assessment” the objectives were to come up with estimates of tonesof carbon held within the various carbon pools in the protected areas. The exercise was also intended to develop staff capacity in carbon assessment. The scope was to cover two Forested National Parks i.e. Semuliki National Park and Kibale National Park. The assessment included carbon stocks above ground, Litter, and soil organic carbon. And the as the assessment was done in 2011; it was found that;
    a. “Carbon stock in SNP” – the carbon stock per ha in SNP – 142.93 tones /Ha (area – 22,000 Ha)
    b. “Carbon stock in KNP” – the carbon stock per ha in KNP – 188.3 tones /Ha (area – 78,900 Ha)

Agenda/Programme Item 7: Activity Data – Sustainable management

This agenda/programme item was led John Diisi - on behalf of National Forestry Authority- GIS Unit. They made a presentation titled, “Deforestation in Protected Areas” which is found in annex VI.

In his presentation, the John Diisi covered the graphics of deforestation in protected areas – where they informed the participants that:

1. Protected areas include both conservation and sustainable management of forests;
2. Trends in Forest Cover in reserves and Parks shows decline of forest cover over the time (1990-2015); so is total forest cover – but there are differences in the forest cover trends for the areas of natural forests dedicated to conservation and other areas of natural forests dedicated to sustainable management of forests;

Agenda/Programme Item 8: Activity DATA

This discussion was led by Lauri Vesa - FAO Consultant, John Begumana – FAO MRV Expert and David Elungat - NFA Inventory Team who made a presentation titled, “Historical Forest Inventory Data and Emission Factors” found in annex VII.

In their presentation, the team covered the Historical Forest Inventory Data and Emission Factors – and in particular, Overview on historical forest inventory datasets, Data processing, Allometric equations, Comparison of AG biomass models, Sample plot statistics and Mean carbon stock results (Emission factors) – where they informed the participants that:

1. Historical datasets assessed included National Biomass Study (NBS), Exploratory Inventory (EI), PSP – Natural Forest, and PSP – Plantation Forest. The biomass study sets of data covered three main habitat types (Subsistence Farmland (63%), Grassland (18%), and Woodland (13%)) while the NFI covered almost entirely the tropical high forest (77%); permanent sample plots (PSPs) were located in the tropical high forest;
2. The national NBS data contains the plot data from the following strata (i.e. land cover/land use classes):
    a. Hardwood plantations,
    b. Conifer plantations,
    c. Tropical High Forests (THF) – normally stocked,
    d. Tropical High Forests - depleted,
    e. Woodlands - trees and shrubs (aver. height > 4 m),
    f. Bushland – bush, thickets, shrub (aver. height < 4 m),
    g. Grassland,
    h. Wetlands,
    i. Subsistence farmland,
    j. Large-scale commercial farmland,
    k. Built-up area,
    l. Water (lakes, rivers and ponds),
    m. Impediments (bare rock and soils).
3. But not all the country is actually covered by the biomass plots (or even any other datasets - see map titled, “Sample plots and LC2005 map” (Slide-9) – and even many are not included in UWA protected areas
4. Based on the current historical data:-
    a. Only standing tree carbon stock can be estimated by strata
    b. PSP data is not representative for DW carbon pool estimation
5. In the EI measurements for REDD+ the fallen deadwood will be recorded
6. On “Data processing tools”,
    a. Tree and plot level results were computed using R with RStudio.
    b. Final results with combined plot data were computed using MS Excel and Pivot tool.
    c. QGIS was used for spatial analysis and visualization.
    d. The “Tree biomass and carbon computing chain” allows for application of the IPCCC guidance
7. With regards “Allometric equations - Tree height” several observations were made for example:
    a. EI data is totally missing tree heights and in PSP data, a few height sample trees were recorded per plot. Therefore tree height models are needed.
    b. NBS data was suitable for creating tree height models.

c. In NBS data only the 1st cycle plots (in case of permanent growth plots) were selected and only "normal growth" ('NG') trees were selected for analysis.
d. Three (3) height models were tested and the equation of Curtis (1967) was selected because it showed the best fit in the NBS data.
e. Crown diameter was recorded only in NBS. If the NBS biomass model is applied, this variable needs to be estimated and therefore we created a model showing relationship between *dbh* and crown diameter,

8. When "Comparison of biomass models" was made, the effect of selected above-ground biomass model to mean AGB estimate in sample plots was studied in NBS data, and with 3 different AGB equations (Chave *et al.* 2005, 2014, and NBS model 2003). In NBS the following tree variables were recorded in the field: *dbh*, tree height and crown diameter. Treeless plots were excluded from the analysis (see slide 19-21)
9. With regards to the "Plot data selection criteria by strata", the following observations were made; some data sets were not admissible; for example "*EI non-forest plots out" were not included (see slide 22 & 23)*
10. Observations and remarks on the results obtained from the consideration of the different datasets indicate that:
    a. Gaps in the historical data: plantation forests, protected areas, High altitude / montane forests and deadwood.
    b. The previous results include dead standing trees. The proportion of dead standing trees in forest land is approximately 0.2% of all standing trees (in terms of number of trees).
    c. We can compute statistically significant emission factors for THF and THF depleted.
    d. The results for non-forest strata differ slightly from the NBS Report (2003) results because we used NBS plots measured only after year 1999.

3.0 Tuesday, 7th June 2016

On the third day, the meeting continued with the consideration of the technical aspects of FREL/FRL including presentations on other data that supports the national circumstances. Specifically the meeting considered: additional auxiliary data- to be used for National circumstances such as data and information on biological diversity, soils and climate change, role and place of small holder woodlots and trees and shrubs on farmlands. The meeting also continued review of DATA- definition of FREL/FRL possible construction approach. A smaller group was formed to support preparation of a more detailed consideration of the construction approaches for FREL/FRL.

Agenda/Programme Item 9: Activity DATA –Degradation

John Begumana presented the proposed approach that Uganda intends to use for the development of indicators to be used to determine degradation, attributable to biomass demand. Participants were informed about the rate of urban growth at 6% which is in tandem with increase demand for charcoal in urban area. Especially greater Kampala has been identified as high charcoal consuming area, thus contributing to degrading

woodlands in central Uganda. The MRV platform intends to use both direct and indirect methods to derive indicators that will be used to attribute degradation of woodlands.
The proposed direct methods include biomass energy inflow and biomass consumption studies while indirect ones are repetitive forest inventories combined with RADA / LIDAR datasets and other high spatial and temporal resolution remote sensed data.

1. **On auxiliary data –the meeting was informed that:**
    a. Apart from the Activity data and Emission factor data, there are a number of parameters that may influence or directly cause land based emissions especially conversion from forest to non-forest. Some of the already identified key data sets are climatic data, soils data, population, and data on planned infrastructure development. Apart from NFA, there are a number of institutions that may provide useful information on estimation of land use change or impact of land use change. Some of these institutions are Makerere biodiversity data bank, WCS, UBOS, MAAIF, NARO and several research and academic institutions. A summary of some of these data sets are presented below.

2. ***On Soils Data participants heard that:***
    a. Until recently the available soil data was developed by the colonial government over 60 years ago. These classifications were non-standardized and naming was according to places and was at a scale of 1:250,000. National Agricultural Research Laboratories has digitized this data set under the Sustainable Land Management Project (SLM) with support from the Green Environment Facility and World Bank. In addition, mapping soils at a scale of 1:50,000 is ongoing - started in central Uganda and has systematically progressed to southwest and is now shifting to the east. It was observed that there is need to build synergies with the REDD+ process because soil productivity mapping is important for the development of options for REDD+. In addition, the land use planning maps are important for conservation planning maps. The process of development of these maps should be fast tracked through use of satellite imagery segmentation processes.

3. ***On Biodiversity Data participants heard that:***
    a. The National biodiversity Data Bank was established in the 1990s and is housed at the department of environmental management. It has historical data of plants from 1950S. It has developed a computerized checklist of species of over 190,000 records of plants and animals so far. The distribution of these species is geo referenced by use of a gazetteer. Periodic modeling is carried out to predict the occurrence of species based on environmental variables. This a valuable data for the construction of the National Forestry Monitoring System (NFMS) and one of the non-carbon benchmarks for REDD+.

4. ***On the idea of using refined climatic zones the meeting heard that:***
    a. Uganda has been having changing rainfall patterns therefore there is need to re classify the country. It was formally classified into 14 climatological zones. These have since increased to 16 following technical discussions between Uganda National Meteorological Authority (UNMA) and Directorate of Water Resources Management (DWRM). For the purposes of GHG inventory, refining the global IPCC zones for use at a local is critical for Uganda.

5. ***On Small holder Woodlots participants heard that:***
    a. One consultant who has carried out mapping and stock assessment of woodlots in the country shared with his experience and the potential of complementing work done by NFA.

6. **On FREL/FRL Approach options in light of available data: -**
    a. The FAO consultant told participants that Uganda has a wide array of choice since it had activity data that goes way back over 25 years and can be disaggregated by land tenure and management types. Giving examples of countries of approaches that have been used by other countries, the possibility of Uganda using historical average, linear projections, average between historic and global emissions was discussed. Participants were asked to brainstorm various options e.g., stratification by land tenure and management, use absolute values of forest loss or rate of annual loss and the reference period to be considered in developing FREL.

    b. Since Uganda has already decided on forest definition and scale, there was need to discuss and evaluate scope for Uganda's scope in terms of activities, carbon pools and gases. FRL construction being the core subject matter for the meeting.

    c. A special select group of technical people was tasked to evaluate several options and report its finds to general meeting and on the final day. Factors to consider were availability of data, national circumstances and the countries policies using guiding options that were provided

7. Meanwhile, details of the individual agenda/programme items are summarised in the following descriptions in accordance with each agenda/programme item.

Agenda/Programme Item 10: Other data - to be used for National circumstances
This agenda item was led by:

This agenda/programme item was led by several experts, some of whom are from the MRV Forum institutions.

1. James Lwasa - Coordinator SLM (Soil Mapping Component) - NARO-NARL - who made a presentation entitled, “Updating and improving dissemination of the national soils data” (see annex VIII.

a. In his presentation, James gave an overview and progress on the project which aims to Resurvey the soils of Uganda at a more detailed scale (1:50,000), Develop a spatial and attribute database to integrate old and new soils data, aligned to World Reference Base (2014) guidelines, Use the data and information gathered to develop new information communication products for better access. He identified what he called "key challenges/gaps": Inconsistent flow of funds, Procurement delays, Insufficient field equipment/tools/vehicles, Lack of enough pedologists on the team/country, Lack of a proficiency laboratory network (for quality assurance of soil analytical results), Technical support in Info System development, and Limited time frame of the project

2. Herbert Tushabe - Department of Environmental Management - Makerere University - who made a presentation entitled, "The National Biodiversity Data Bank (NBDB)" which is also located in annex IX.

a. In his presentation, Herbert informed the participants that the NBDB was established in 1990 to " *inventory and monitor the national biological resources and provide biodiversity information to conservationists, government agencies, land managers and others interested in the conservation and sustainable utilisation of these resources*". He talked about the database structure and content and analysis and retrieval and dissemination and sharing. He talked about some of the products including but not limited to - The Bird Atlas of Uganda (2005), The East African Bat Atlas (2009), State of Uganda's Biodiversity (2000, 2002, 2004, 2006, 2008 and so on)

3. Lawrence Aribo Godfrey R. Mujuni - Uganda National Meteorological Authority (UNMA) (Ministry of Water and Environment) - who made a presentation entitled, "Refining Homogeneous Climatic Zones of Uganda" which is also located in annex X.
    a. In his presentation, Lawrence outlined the roles of Uganda National Meteorological Authority (UNMA) whose mandate is to "carry out the tasks of establishing and maintaining weather and climate observing stations network, collection, analysis and production of weather and climate information, to support social and economic development of the country. He mentioned the products the UNMA has on offer, as Products on past climate and Prediction products
4. Fred Lali - Earth Consult (U) Ltd, a GIS, FORESTRY and ENVIRONMENT consulting firm - who made a presentation entitled, "Plantations/Woodlots Database in the Country" which is also located in annex XI.
    a. In his presentation, Fred informed the participants of the study he was working on, namely: small holder woodlots that were owned and of various species: a) NGOS - FAO supported farmers (2015-2016) (Western Region) , FSSD -Prunus conservation areas (2015), FSSD-Natural forest restoration (2012) western and Northern region, b)SPGS

(2015) (Western Region) / UTGA farmers (2014) (Mubende plantations), c)FIEFOC Project farmers(2010-2012) (The whole country), BATU woodlots, Society and Individual planters (2011) (Arua, Adjumani, Amuru, Lira, Hoima &Kanungu);

b. He informed the meeting participants that 70% of woodlots can be seem on google earth; 10,0O0 ha of small woodlots so far mapped; Majority of woodlots are fairly stocked; Majority of woodlots range 8 to 10ha and SPSGs and FSSD farmers georeferenced PSPs- need to be re-measured

5. Antonia Ortmann (Antonia.Ortmann@fao.org) – FAO Consultant - who made a presentation entitled, "Map Accuracy Assessment" which can be found in annex XII.
    a. In her presentation, Antonia informed the meeting that map accuracy assessment is necessary because all maps have errors (bias), and therefore one needs to quantify this error. To do so, the original map data is compared to reference data that needs to be of higher quality than the map data. She said that map AA is not about assessing accuracy per se, but about generating new (adjusted) area estimates, mentioning that accuracy is a relative term. She said that map and reference data together provide adjusted area estimates with confidence intervals that together account for the accuracy and precision of the map. For reporting, these adjusted area estimates should be used, and not the original map area estimates. She then proceeded to provide the steps of map AA and analysis.

Agenda / Programme Item 11: *Review of DATA - definition of FREL/FRL possible construction approach*

This agenda/Programme Item was facilitated by the FAO-REDD+ Team who made a presentation titled, "Options for Uganda's FREL)" - see full presentation in annex XIII.
Key aspects addressed in the presentation defined the area to be considered while deciding on the most appropriate approach for the Uganda FREL/FRL construction.

The key areas to be considered are: :

1. **Choice of Reference Period –**
    a. Option 1: Longer period (e.g. 25 years)
        i. Makes use of the full set of data available
    b. Option 2: Medium period (e.g. 15 years)
        i. OR
    c. Option 3: Shorter period (e.g. 10 years)
        i. Most common reference period used (i.e. 10-15 years)
        ii. Generally accepted period by donor governments
    d. Methods used for more recent years is more technically consistent

2. Stratification Options
    a. 1: Combine all forest loss into a single figure

i. Provides highest FREL, but may not be realistic

b. 2: Stratify into private vs. protected

i. More realistic to Uganda's circumstances
ii. Capture different dynamics in private (high loss) versus protected areas (lower loss)

c. 3: Stratify protected areas further by management type

i. Within protected areas, there are different forest loss rates in central/local reserves (medium loss) compared to national parks & wildlife reserves (very low loss)

The meeting then considered the above stratification options and requested a smaller technical group to analyze the feasibility of each of the suggested approaches and presents the results to the bigger group of participants. The small group left the meeting to work on:

Agenda/Programme Item 12: Group formulation for the preparation of materials for day 4

This agenda Item was composed of the core NFA team and with guidance from the facilitating FAO consultants. It worked through the possible options that Uganda could take to construct Uganda's FREL/FRL. Their findings were combined in the presentation delivered the day after by John Begumana.

4.0 DAY 3 WEDNESDAY 8TH JUNE (STAKEHOLDERS CONSULTATION)

The fourth day of the meeting of the Methodological/MRV Taskforce and Selected Technical Stakeholders to consider the "Construction of the Forest Reference Emissions Level and/or Forest Reference Levels (FREL/FRLs) for Uganda's REDD+ Programme also involved additional stakeholders. Additional stakeholders were derived from the technical institutions as well as civil society and representatives from the relevant private sector.

1) The meeting recapped to the new participants, what had been considered in the previous three days. In addition, the participants received and supported the consideration of the:
    a. A recap of the Ugandan context – why construct a FREL and its linkages to national policies
    b. A recap of an overview of FREL/FRL and its components
    c. Combined consideration of FREL/FRL scenarios and options for preparing the final FREL/FRL; and procedures for
    d. submitting a FREL to the UNFCCC

2) Day 4 started with the recap on approaches that have been used by other countries and why Uganda needs to develop FREL/FRLs. Issues discussed and emphasized were pros and cons of national and sub national FREL/FRLs. The meeting heard

that countries which considered a sub national level have considerable acreage of forest which justified their decision such as Congo.

a. On Scope of FREL/FRLs, the meeting heard that most countries considered deforestation. The meeting also heard about the difficulty (even for some advanced developing countries) of measuring degradation and additional stock was discussed.
b. On Pools - it was shown that pools considered by most countries are above ground biomass. However countries expected to state why other pools have not been measured especially if considered significant.
c. On Gases; the meeting heard that Carbon dioxide was considered in all FREL/FRLs submissions. Some countries have included CH4 from fires. The meeting also heard that countries may state when other GHG may be included.
d. Among the issues why Uganda needs to construct reference levels was to demonstrate the contribution of Uganda to global mitigation of climate change, provide information that the forestry sector may use to lobby for resources and important for REDD+ access result based payments.

3) On Methodological Approaches, the meeting was taken through:

The meeting was presented the results of the analysis of the feasible option for FREL/FRL construction in Uganda. Summarized results are also detailed below:

a. <u>Options for Choosing a reference period whereby:-</u>
   i. The reference period for choosing a reference level is dependent on the availability of data, that a country considers most appropriate presentation of the forest dynamics and a period already stated or preferred by agencies that support the REDD+ process. Most donors would love countries to consider later periods with proposals on actions that on what needs to be done to reverse the trends;

b. Based on the aforementioned and the available data, several options exist on how Uganda could choose the reference period (see figure below showing the three options)

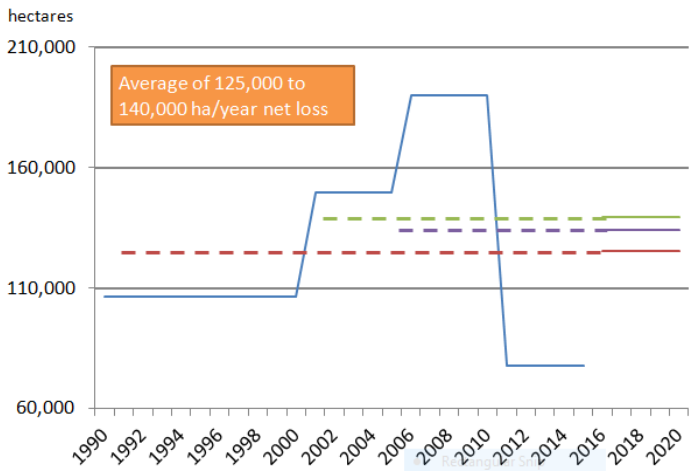

Figure 2: 25, 15 t or 10 options

c. On Levels of Forest Ownership differentiation

i. It was observed that Uganda has the choice of combining or separating forest types or forest types by ownership. However, combining of forests may not be realistic for Uganda because the rate of deforestation on private has been significantly much faster than in protected areas. Even in protected areas, the rate of deforestation has been highest in local forest reserves (under local government) followed by Central Forest reserves (under NFA) and very little or in some years no deforestation in National Parks and other areas under UWA (figure 3 below). The deforestation observed from 2000-2005 in UWA protected areas is attributable to encroachment during a transition period when some UWA areas were being demarcated.

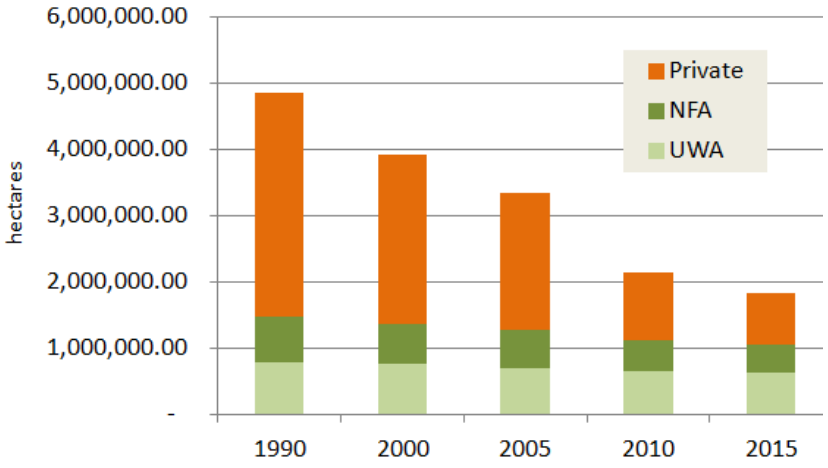

Figure 3: Forest area in private vs. protected land (further subdividing protected into UWA - NFA)

ii. Once more, the meeting heard that based on the aforementioned and the available data, it was observed that combining all forest loss into a single figure provides highest FREL/FRLs, but may not be realistic for Uganda. Stratifying into private versus protected is more realistic to Uganda's circumstances and captures different dynamics in private (high loss) versus protected areas (lower loss) while stratifying protected areas further by management type within protected areas, brings the differences in forest loss rates in central/local reserves compared to national parks & wildlife reserves (where there is very low loss)(see figure 4 below);

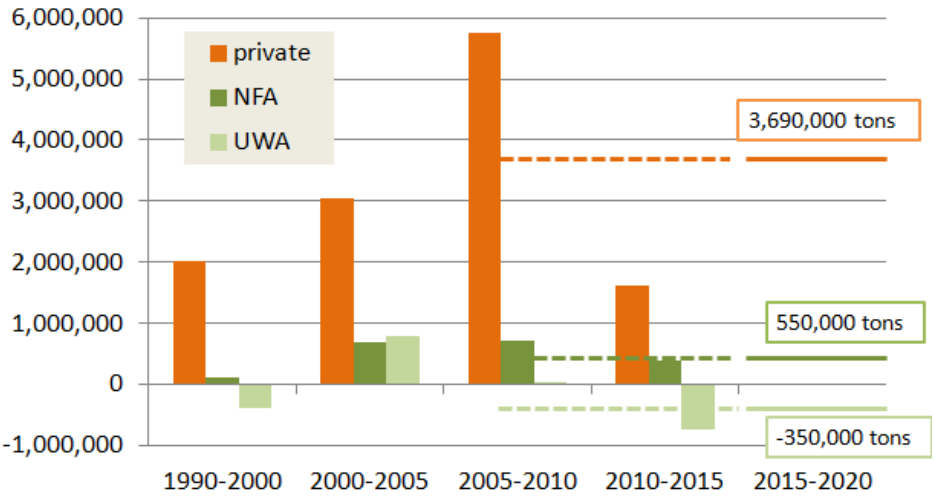

Figure 4: Forest emissions/removals in private vs. protected land (subdividing protected into UWA – NFA)

d. On FREL/FRLs Technical Assessment and submission process the meeting heard that:

i. Countries are invited to voluntarily submit a FREL/FRLs to the UNFCCC to be technically assessed for two main objectives;
   1. To assess whether the submission in accordance with UNFCCC guidelines
   2. To build country capacity to improve future FRELs through an exchange with technical experts

ii. The assessment uses a stepwise approach where a country may justify simplified approach (e.g. considering deforestation only) but identifies "next steps" for improvement in future FREL/FRLs. Justification of omission of pools or activities considered significant should also be provided.

iii. In addition to the five elements of constructing a FREL/FRLs, the technical assessments in summary look at:
   1. Consistency with Green House Gas Emissions (GHG).

2. Justification given for the activities both considered and left out.
3. Historical data
4. Proposed areas for improvement.
5. What is required improve the FREL/FRLs

iv. It was observed that many countries' FRELs are not consistent with past GHG inventories. In such instances a justification should be provided. Differences with past inventories could for instance be due to more recent data and/or IPCC guidance used in the FREL.

v. It was also noted that the assessment team cannot make any policy adjustments to the FREL. The technical assessment team validates country specific data sets in comparison with regional and Global data sets. Where big variations are observes, countries will be required to explain the reasons / causes of the variations.

vi. On General TA recommendations

1. The technical assessment may require a clear documentation on how Measurement, Reporting and Verification (MRV) tenancies of per IPCC guidance have been followed. For example provision of the following;
2. Evidence Transparency and Reproducibility: Include examples of calculations; if appropriate, allow access to original information.
3. Accuracy: Provide accuracy assessments, and to the extent possible uncertainty analysis
4. Validation and verification process; Provide examples of verification activities, e.g. comparison with independent estimates

vii. Technical Assessment Process (time frame)

1. The technical Assessment happens once a year in Bonn, Germany. The whole process takes a about one year (table 2).

4) Meanwhile, details of the individual agenda/programme items are summarised in the following descriptions in accordance with each agenda/programme item.

Agenda/Programme Item 13: Ugandan context – why construct a FREL and its linkages to national policies

This agenda/programme item was led by Margaret - National Focal Point for REDD+ who made a presentation titled, "Ugandan context – why construct a FREL/FRLs and its linkages to national policies" – also found in annex XIV.

The National Focal Point informed the meeting participants that construction of the FREL/FRLs is part of the components of the REDD+ Readiness Component and a major deliverable under the UNFCC where in the context of the REDD+ Readiness Package itself with the following deliverables:

1. FREL/ FEL established & published as basis for determining Uganda's forests contribution to the global mitigation of climate change. - basis for scrutinizing

quality of national program by the international community and reference to arrive at the amount of results-based benefits that countries can expect to receive for their efforts.
2. A REDD+ Strategy or Action Plan.
3. A Robust & functional National Forest Monitoring System (NFMS) established and operational - for the monitoring and reporting of the [REDD+] activities
4. A System for providing information on key social and environment risks and potential impacts of REDD+ strategy options

The Focal Point informed the meeting that Uganda intends to "Develop, submit, improve the National Forest Reference Emission Levels/Forest Reference Levels (FREL/FRL) for the National REDD+ Programme: as to **Why Should Uganda Construct a FREL/FRL -** Basis for lobbying / mobilizing resources for the forestry sector; benchmark for assessing country's performance in implementing REDD+ activities; assess progress on the outcomes of the policies and measures taken to mitigate climate change in the forestry sector.

Further, the Focal Point provided a link between the National Forest Reference Emission Levels/Forest Reference Levels (FREL/FRL) and the "national circumstances" where he quoted the two national programme documents as follows:

1. Uganda Vision 2040 – Paragraph 295 - Restoration of forest cover from the "current 15" per cent of the total land area to 24 per cent
2. National Development Plan (2015/16-2020/21) (NDPII - Paragraph 524) looks at forestry as part of the ENR Sub-Sector - geared towards the following:
    i) protecting, restoring, and maintaining the integrity of degraded fragile ecosystems;
    ii) increasing sustainable use of environment and natural resources;
    iii) increasing national forest cover and economic productivity of forests;
    iv) …
    v) Increasing the country's resilience to the impacts of climate change.

The Focal Point provided and re-iterated the reasons **why Uganda should construct a** FREL/FRL **which she said was:**

1. Access results-based payments.
2. Assess performance in contributing to mitigation of CC through actions related to forests.
3. To contribute to international mitigation through REDD+ actions under the UNFCCC.
4. Support to national communication under UNFCCC

Agenda/Programme Item 14: Overview of FREL/FRL and its components

Agenda/Programme Item 15: Overview of Uganda FREL/FRL status (including data)
This agenda/programme item was led by Xavier Nyindo Mugumya - Alternate National Focal Point for REDD+ who made a presentation titled, "Status of the key elements of

Uganda's FREL/FRL". Alternate National Focal Point informed the meeting participants that the presentation was modified from the one presented on Monday by John Begumana – the FAO MRV Expert.

See full presentation in annex III. :

Agenda/Programme Item 16a: FREL/FRL scenarios

This agenda item was preceded by an introduction made by Donna Lee – FAO expert, who introduced the meeting to the status of FREL/FRL submissions (global dimension). This presentation titled, "Status of REDD+ reference level (FREL/FRL) submissions to the UNFCCC" - see full presentation in annex XV.

In her presentation, she made a re-cap of what was discussed on Monday about the examples of how other countries had handled their FREL/FRL and how these lessons could be useful for Uganda.

Following the above presentation John Begumana presented to the team the results of the group work, which provided the meeting with feasible options for Uganda Reference Scenario construction. see full presentation in annex XIII.

The different options were/are articulated taking into consideration different stratification possibilities and reference periods:

1) Forest change has been derived from maps 1990, 2000, 2005, 2010, 2015. The country will have to decide **the most suitable reference period** for the projection of future scenario e.g. option 1. 25 years; option 2. 15 years or option 3. 10 years.
General consideration:

- Most common reference period used (i.e. 10-15 years)
- Generally accepted period by donor governments
- Methods used for more recent years is more technically consistent

2) Stratification options:
- Combine all forest loss into a single figure: Provides highest FREL, but may not be realistic for Uganda
- Stratify into private vs. protected:

- More realistic to Uganda's circumstances
- Capture different dynamics in private (high loss) versus protected areas (lower loss)

- Stratify protected areas further by management type: Within protected areas, there are different forest loss rates in central/local reserves (medium loss) compared to national parks & wildlife reserves (very low loss)

Agenda/Programme Item 16b: Submitting a FREL to the UNFCCC

This agenda/Programme Item was led by Donna Lee – FAO Consultant who made a presentation using a previous but updated presentation titled, "Submitting a FREL/FRL to the UNFCCC" - see full presentation in annex XVI.

In her presentation, Donna Lee informed the meeting that "Countries are invited to voluntarily submit a FREL/FRL to the UNFCCC to be technically assessed". And then she outlined the steps required as follows:

1. Countries who submit their FREL/FRL to the UNFCCC, also have to participate in the assessment of these FREL/FRL;
2. Technical Assessment (TA) are intended:
    a. To assess whether the submission in accordance with UNFCCC guidelines
    b. To build country capacity to improve future FRELs through an exchange with technical experts
3. Scope of the Assessment – is intended to find out the extent to which information provided was transparent, complete (allowing reconstruction), consistent and accurate; including for areas for technical improvement may be identified
4. There are procedures for submission, assessment and process including procedures for assessment team composition and timing of the assessment. One example "Indicative timeframe for 2017 submissions"

Table 1: Indicative timeframe for 2017 submissions

By January 4 2016	• Reference level submission
March 14-19	• Assessment session in Bonn, Germany
March 21-28	• AT may seek additional clarifications
March 29 – May 23	• Country provides clarifications
May 23 – June 20	• AT considered modified FREL (if applicable)
By July 11	• AT to prepare draft report
By October 3	• Country to respond to TA draft report
By October 31	• AT prepares final report
By November 11	• Final report published – TA completed

5. Countries can modify their submission in response to initial feedback from the Assessment team (AT);
6. The assessment report has an agreed format on
    a. I. Introduction and Summary
    b. II. Data, methodologies and procedures: and
    c. III. Conclusions
7. There are Few Useful Tidbits that Uganda should be aware of – for example:
    a. The stepwise approach is accepted practice – for example:
        i. Subnational
        ii. Degradation
        iii. Regrowth

b. Justification should be provided on omission of pools or activities
c. Many countries' FRELs are not consistent with past GHG inventories
d. The AT may look at global data sets and compare them to data used in the proposed FREL
e. Document in a clear way how IPCC Guidance has been followed
f. The next step…results reporting - Results are reported in a Technical Annex to the Biennial Update Report;

WAY FORWARD

Tasks	Responsible	Timeframe	Remarks / Comments
Elaborate on the identified options and prepare a SWAT paper for each of the option	MRV Team	By 22nd July	This will be the basis (background documentation) to guide the discussion of the NTC
Convey an NTC to endorse the process and agree on the recommended (to NCCAC) approach for Uganda RS	REDD+ Secretariat and MRV Team	NTC planned on 26-27 July	NTC objective is to analyze and recommend most suitable contraction approach for RS in Uganda starting from the analyze submitted by the MRV TF
Building on the recommendation from the NTC finalized submission to the NCCAC	MRV Team / REDD+ Secretariat	By 15th of August	
Convey NCCAC for endorsement of the recommended RS	REDD+ Secretariat	Planned on 6-7th of September	
Finalize draft 0 of the RS write up	REDD+ Secretariat, MRV team and FAO team	1st of October	
Conduct consultation on Draft 0 (both National and International)	REDD+ Secretariat, MRV team and FAO team	End of November	National consultation will move within the established institutional arrangements, plus an overall stakeholders consultation. International consultation will be done informally, using FAO network of expert
Using inputs from the consultation process finalize RS write up	REDD+ Secretariat, MRV team and FAO team	End of December	
Submit RS for Uganda	REDD+ Secretariat, MRV team and FAO team	January 2016	