

THIS PUBLICATION
RESULTS FROM
ONGOING
COLLABORATIVE
EFFORT AMONG:



Norad



WWF

MRV AND REFERENCE LEVELS: SIX YEARS OF LEARNING THROUGH PRACTICE

May 2016

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INTRODUCTION

After the 19th Conference of the Parties (COP19) in Warsaw, the framework for the Reduction of Emissions from Deforestation, Forest Degradation REDD+ mechanism of the United Nations Framework for the Convention of Climate Change (UNFCCC) was finalized, and countries began moving forward on steps required for its implementation. Two of the elements required for the implementation of the mechanism are 1) the elaboration of a Reference Emissions Level (REL) and 2) the implementation of a Monitoring Reporting and Verification (MRV) System. The first one will serve as the benchmark against which the emissions reported by the second will be compared in order to establish whether or not a reduction has occurred, and whether or not the resulting incentives are to be rewarded to the reporting country. Countries began to deliver their reference levels to the convention in 2014, led by Brazil and followed by Colombia, Malaysia, Mexico, Ecuador, and Guyana in 2015. Other countries followed suit in early 2016 (see: <http://redd.unfccc.int/fact-sheets/forest-reference-emission-levels.html>).

In order to deliver these reference levels, countries must undergo a process of building their technical capacities with the support of international cooperation. This has been a learning by doing process in which no country (including donor countries) had prior experience of the whole process. As part of their capacities build up, countries have been exposed for the last 6+ years to a wealth of new technologies, approaches, tools and technology packages not seen before. This exposure has taken place within a context where the rules of the game were still under discussion and constant political turmoil. Experiences have not only been limited to the process under UNFCCC but also included that of bi-lateral (e.g. Guyana and Norway) as well as multilateral agreements (e.g. REDD Early Movers [REM¹], World Bank's Forest Carbon Partnership Facility [FCPF²]).

Among the entities collaborating within this process, World Wildlife Fund (WWF), supported by funding from the Norwegian Agency for Development Cooperation's (NORAD) Norwegian Forest and Climate Initiative (NICFI), has been providing technical support to countries within WWF's network since

2009 to assist them in figuring out the design, elaboration, and implementation of reference levels and MRV systems, working specifically in the Democratic Republic of the Congo (DRC), Indonesia, Peru, Colombia, and Guyana.

As the third funding cycle by NORAD was coming to an end in late 2015, WWF decided it was time to carry out a reflective exercise with country teams and government partners. The concept was to collect key messages that implementing countries could convey to their colleagues, as well as decision makers and donor countries, about the lessons they had learned through the capacity build up and delivery process. The goal was to shed light on major challenges and accomplishments, elaborate advice on good practices and identify gaps, within the context of a learning by doing experience.

¹ <https://www.giz.de/en/worldwide/33356.html>

² <https://www.forestcarbonpartnership.org/>

WWF MRV SUPPORT OVERVIEW

WWF has been working on MRV design, development, implementation, and capacity building with emphases in, but not limited to, Peru (Madre de Dios), Indonesia (Kutai Barat), and DRC (Mai Ndombe) since 2009, and in Colombia and Guyana since 2013. Support for this work has come mainly through NORAD. The work has been led by WWF's teams in each country (WWF has a presence in over 100 countries), with the support and coordination of WWF's Forest and Climate team (FCT). The FC is constituted by a small team of specialists who deliver expert support and advice to the WWF network on forest and climate matters, including REDD+ and MRV.

Activities have included:

- Work with governmental and non-governmental organizations
- Research science (including the use and testing of cutting edge technologies)
- Collaboration with other agencies (GFOI Silva Carbon³, GOF-C-GOLD⁴, UN-REDD, FAO⁵, UNEP-WCMC⁶, EDF⁷, TNC⁸, UCS⁹, etc.)

Focus has been on:

1. Finding simple yet efficient approaches to deliver MRV and RELs
2. Building capacities for the long term
3. Collecting lessons learned during the process
4. Using the lessons learned to inform each country process as well as the larger shared process

THE WORKSHOP¹⁰

The goal of the workshop was to collect the lessons of the last 6 years to deliver them to the general audience.

Expected outcomes:

1. Share good practice guidance
2. Inform other REDD+ and donor countries so they can avoid similar mistakes and capitalize on successes
3. Influence the way MRV deliverables are treated for the greater good

The approach consisted of three major moments:

1. Reconstructing the baseline: we aimed to define the conditions in terms of capacities and country circumstances in 2009 when collaborative work initiated with FC.
2. The milestones and the achievements: participants were asked to highlight major achievements and milestones along a time line. These could include country specific items or general ones (e.g. major COP decisions) that defined frameworks, context, or capacity and process leaps (forward or backwards) through December 2015.
3. Lesson highlights: participants were asked to group the highlights from moments 1 and 2 into thematic groups (e.g. monitoring, reporting, verification, reference levels, capacity building, policy, etc.) and summarize them into statements.

³ <http://www.gfoi.org/>

⁴ <http://www.fao.org/gtos/gofc-gold/>

⁵ <http://www.fao.org/home/en/>

⁶ <http://www.unep-wcmc.org/>

⁷ <https://www.edf.org/>

⁸ <http://www.nature.org/>

⁹ <http://www.ucsusa.org/>

¹⁰ Berlin, November 2015.





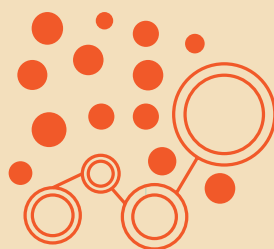
RESULTS: THE LESSONS LEARNED SO FAR

Participants delivered a very substantial list of lesson statements covering all REL/MRV related topics and areas. We attempted to package these into 6 major areas, however some of the lessons are cross cutting.

Initially we covered the elements of the MRV process following the areas covered by each of the letters in the acronym, with reference levels as a part of the reporting component (activity data, producing emissions factors, reporting, verification/validation).

Then we discussed country capacities and capacity building to address major context elements like policy, institutional arrangements, finance etc.

ACTIVITY DATA



PRODUCING EMISSIONS FACTORS



REPORTING



VERIFICATION/ VALIDATION

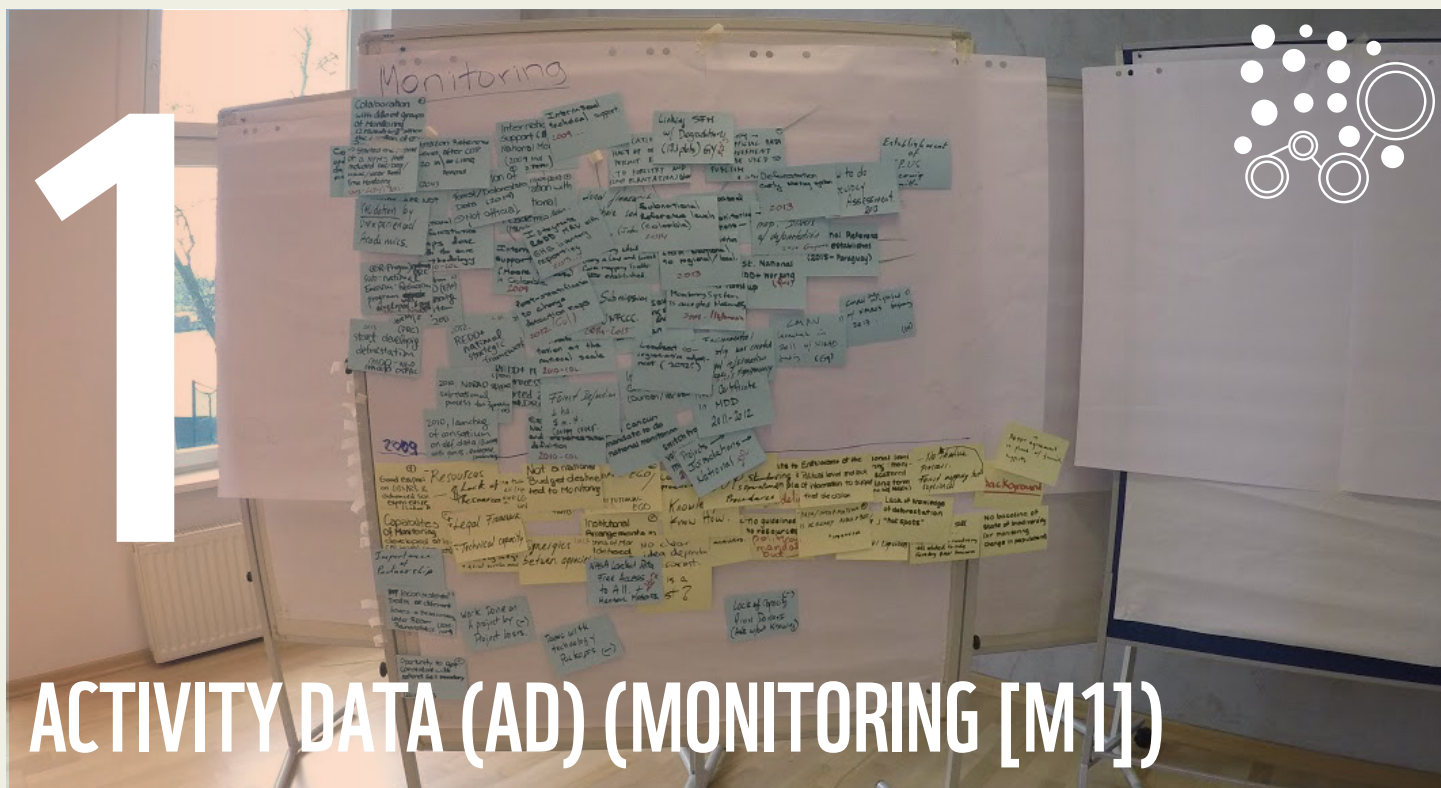


MRV CAPACITIES



OVERARCHING LESSONS





ACTIVITY DATA (AD) (MONITORING [M1])

1.1. THE CONTEXT WITHIN WHICH CHANGE IS DETECTED IS OF GREAT RELEVANCE

Lesson: Automated data analyses are a good initial first step approach towards change data production. However post-processing is always required to discern non-relevant changes from relevant ones, based on context variables that go beyond a pixel dimension.

All of the countries participating in the workshop have used remote sensing pixel based data analysis in order to identify areas where relevant forest cover changes have occurred. All countries expressed how along the way they have gone from a total confidence in their change data to the realization that change data and its relevance or meaningfulness are two separate things. The relevance of the change observed is context-based and requires moving away from the pixel dimension (to incorporate broader spatial context as e.g. the spatial dimension of the forest definition used by the country) as well as taking into account the specific management, ecological, and social context within which the change is observed. There are many reasons why forest cover shows change; many are natural and characteristic of forests and calling it deforestation, degradation, or cover gain is a judgement call prone to error and/or interpretation.

Good Practice: All participants agreed that no automatic algorithm can deal with all types of forests and that automatically generated change needs post-processing based on contextual elements of the observed change (usually done via visual assessment and using ancillary data before considering results final). Participants went even further and suggested post-processing should be done by an odd number of interpreters in order to be able to tally agreements vs disagreements and detect conflict areas in interpretation. Final classification can then defined by a majority tally.

1.2. UNCERTAINTY OF ACTIVITY DATA

Lesson: Accumulated change data has lower uncertainty than yearly data.

Recent progress on assessing uncertainties in forest cover data have highlighted the reality that we are better at mapping forest presence (the larger portion of the maps)¹¹ than at mapping forest cover change (the lesser part of the landscape). This is due to a combination of proportions with the fact that change is not always the consequence of REDD+ activities, which brings error into the change data. Accumulation of change data across larger periods of time allows us to eliminate some of the spurious changes detected (e.g. due to seasonality) and for change to represent a larger portion of the landscape, resulting in lower uncertainty estimates and in a better characterization of REDD+ activities.

Good Practice: Monitoring should be done as often as possible to allow countries to assess the impact of their mitigation actions in a dynamic way and to implement adaptive management approaches. However, in view of the requirements in place, reporting should be done using aggregated change data with lower uncertainties and perhaps with more verifiable links with intervention actions.

1.3. THE SPECIAL CASE OF FOREST DEGRADATION

Lesson: Degradation monitoring will require trial and error (research) to establish a methodology consistent with deforestation information. This means it will take time to be incorporated unless proxies are allowed and donors have an open mind about their use.

Degradation remains a loose concept, hence it is difficult to monitor. Countries have moved forward in attempting to generate activity data for degradation using several approaches. Some have sought to capitalize on how known spectral response patterns observed in forest cover correlate with a reduction in chlorophyll content and therefore in biomass that may result from activities resulting in degraded forests. Others are assessing how degradation relates to context variables that can be incorporated in the assessment of forest cover distribution like (e.g. proximity to forest edges) that have been well documented by disciplines like landscape ecology and tropical forest ecology. Proxies that have been proven to be linked with its occurrence are easier to track and should be used to generate estimates. These estimates can always be accurate as the science on which they rely is sound. However, so far countries have shied away from reporting emissions because of backlash observed with uncertainties in deforestation data. Uncertainties in degradation data are likely to be much higher than those observed in the deforestation data. Additionally, donor countries have difficulties in understanding how reporting via proxy variables could deliver adequate data.

Good Practice: Countries should acknowledge degradation but accept reporting compromises: an honest yet uncertain estimate vs no estimate at all. Right now, this is what countries are doing. This obviously has serious consequences in terms of having a clear idea of the size of the emissions contributions of forest degradation, impeding mitigation action design, and implementation. Most countries are already experimenting. The international community should recognize those efforts, have an open mind, and learn by doing as well.

1.4. FOREST DEFINITION

During the workshop, participants agreed that the forest definition used by each country is the result of a combination of ecological characteristics, reporting capabilities, and understanding the best way to implement its use, but above all of political implications. We centred our discussions on the linkage between forest definition and MRV from a technical perspective.

¹¹ See uncertainties in reporting section 3.2

Lesson: MRV of forests requires a clear integration of the forest definition components: minimum area, minimum height, and minimum % tree cover with the data used to inform forest cover condition and change

Several countries are making no use or only partial use of their country definition elements in the way they are monitoring forest cover change. This causes inconsistencies between what countries report. This also generates a poor use/understanding of the data available to monitor forest cover: e.g. in many cases tree cover is being confused with forest cover because there is no link established between the spatial resolution of the remote sensing data used to inform tree cover and the percent ratio and minimum area components in the forest definition.

Good practice: The area component of the country forest definition should define the reporting minimum mapping unit (MMU), as opposed to the spatial resolution of the remote sensing data used to track tree cover.¹²

This lesson has direct links with lessons discussed on spatial definition of reporting data:

1.5. SPATIAL RESOLUTION OF DEFORESTATION DATA IS NOT THE SAME AS THAT OF TREE COVER DATA.

Participants agreed that tree cover data and forest cover data are two different things. Tree cover data can be used as input to estimate and inform the percent tree cover data of a defined reporting unit. The higher the spatial resolution of tree cover data, the better the estimates of % tree cover of forest data allowing for more accurate MRV. Once tree cover data are aggregated into forest cover, overall accuracies improve.

Lesson: Tree cover data spatially aggregated to inform the condition of forest units allows for reductions in the uncertainty of deforestation and degradation data.

Based on a literature review, on exercises carried out by WWF, and by countries on their own, it came out that participants agreed that spatially aggregated classified data (e.g. from 30m resolution to 1ha) is more accurate. This lesson complements the previous one, regarding the linkages between forest definition and data used to inform the condition of forest units, as MMU constitute de facto tree cover data aggregation units. At the same time, tree cover data allows for simple assessment of degradation and deforestation according to thresholds defined per the country's % tree cover component of the forest definition.

Good Practice:

1. Reporting units should meet the area component of the forest definition
2. Change data should have adequate resolution to allow for informing tree cover % inside each forest minimum area or MMU
3. Activity data should result from the aggregation of tree cover data into MMUs
4. Uncertainty estimates should be produced for both tree cover data as well as aggregated forest, deforestation, and degradation data

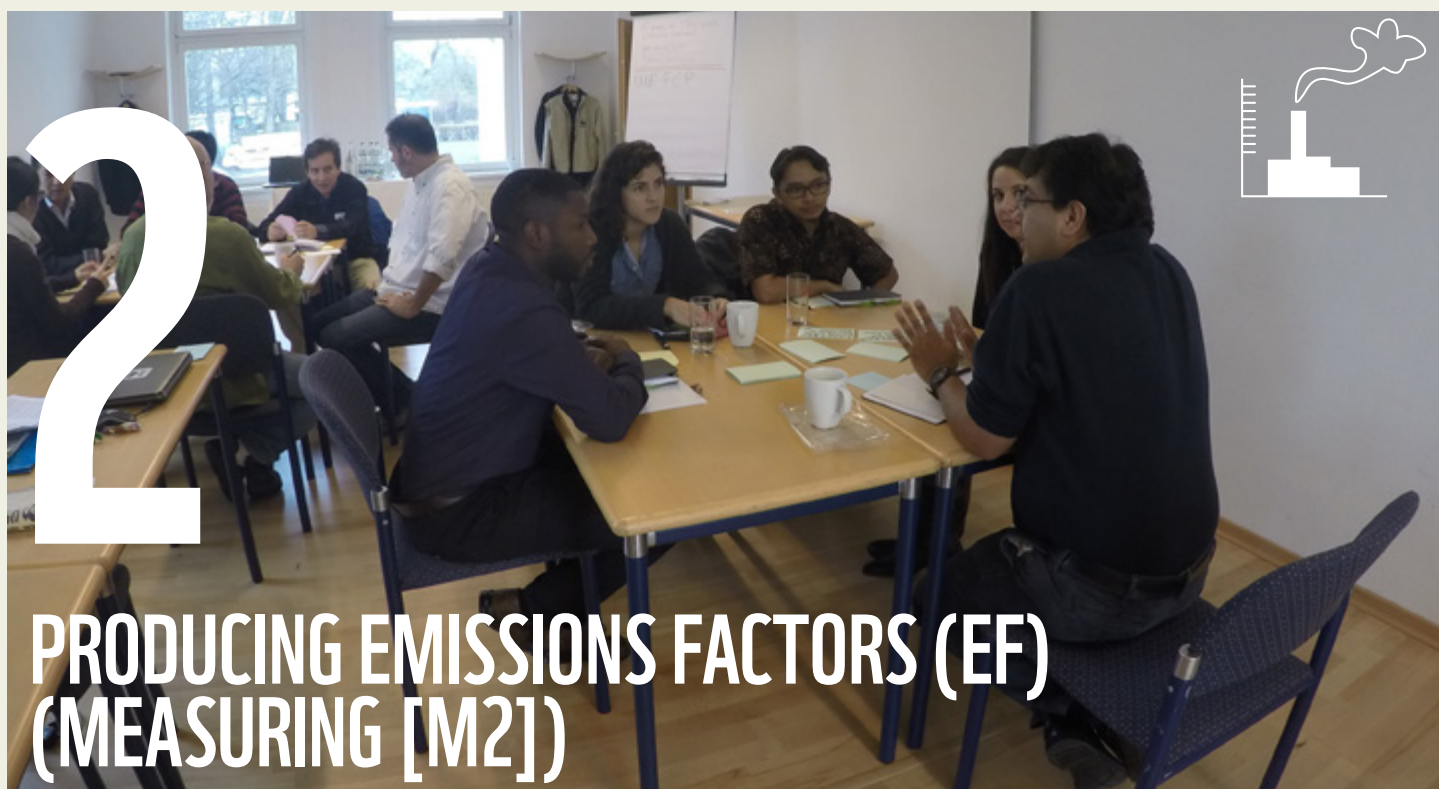
1.6. "WALL TO WALL" CHANGE DATA ARE IDEAL BUT NOT ESSENTIAL FOR REPORTING.

Lesson: Activity data can be generated via sampling

Countries explained how in some cases, even though they had been working on developing capacities to carry out wall to wall approaches to generate activity data, in some cases validators or proponents of competing proposals had used sample based approaches with mixed results. This allowed for understanding that the common assumption that wall to wall data are essential for generating activity data was not correct. However, it was agreed among participants that for implementation purposes, wall to wall data was ideal in order to provide a complete unbiased picture of what is going on and where, as well as to allow for better understanding of deforestation dynamics (e.g. risk modelling). Additionally, **serious concerns were raised about a lack of good practice guidance for generating unbiased sample-based estimates. This stems from the fact that in all cases reported, sample-based deforestation estimates were at least ½ and up to 6 times higher (or even 35 times, depending on the stratum) than those reporting with wall to wall data.**

Good Practice: It was agreed among participants that a sound comparison (including accuracy assessments) of estimates generated using wall to wall and sampling approaches should be carried out as to better inform the implications of the use of either method. A sensitivity analysis should be included to assess how different sampling approaches affect overall estimates. Randomized sampling should be carried out as well in order to leave out potential biases generated due to sample location.

a percent estimate in tree cover loss/gain inside each MMU, reporting change as deforestation, forest cover degradation, and forest cover gain becomes an MMU context matter.



PRODUCING EMISSIONS FACTORS (EF) (MEASURING [M2])

2.1. STRATIFICATION

The stratification used to generate the Emissions Factors (EF) needs to respond to reporting needs as well as the implementation of activities whose impacts we seek to monitor

Lesson: Keep in mind how the data will be used when planning for stratification.

- Uncertainties decrease as strata are aggregated into broader or larger classes; a lower number of strata helps in building better, easier to use emissions factors and easier accounting.
- Linkage of strata with activity data should be as straightforward as possible, especially when considering benefit sharing.

Most of the countries are elaborating their emissions factors following “traditional” approaches to stratification (in some cases resulting from the fact they are using readily available data). This means floristic or ecologic criteria have been the basis, resulting in high numbers of strata that need to be aggregated for reasons of practicality¹³ when elaborating emissions factors. This is a process that does not necessarily result in less accurate emissions factors, as some might think (see 2.3. below). One key aspect in this is the fact that **simpler stratifications can allow for better strata mapping and hence reducing the uncertainties linked with strata identification.**

Under ideal circumstances easy linkage of activity data with strata is advised:

- This is particularly the case for degradation as some countries are producing activity data as well as carbon estimates based on capacities currently being tested to assess degradation and associated emissions factors (e.g. change from close canopy to open canopy forests)
- General estimates are easier to use when considering benefit sharing. A broad, accurate, and unbiased estimate is better than detailed, “high resolution,” seamless estimates, especially when considering aspects of implementation like attribution.¹⁴

¹³ However, participants agreed that capitalizing as much as possible on readily available data was the way to go to deliver initial emissions factors estimates; before embarking on large-scale cost-intensive National Forest Inventories.

¹⁴ See point 2.2.

Good Practice: Simple and good is twice as good. Use the simplest stratification possible while delivering performance in terms of accuracy and precision. This will make it easier for the construction and assessment of emissions factors to be linked with the activity data. A purpose-built stratification is the best whenever possible, considering country circumstances.

2.2. CARBON MAPS

Even though carbon maps are relevant for understanding carbon distribution, they are not necessary for elaboration of emissions factors.

Lesson: A large enough sample size is needed to generate accurate emissions factors. Carbon maps do not guarantee this and are not really needed. More than carbon maps, sound strata maps are needed as estimates to circle back to strata.

In several countries, initial efforts included delivering a depiction of how carbon distributes itself that was closest to reality, in the hopes that only high spatial resolution estimates would allow for sound REDD+ accounting. In some cases such efforts have used different stratification approaches from those the countries ended up using. However, experience has shown countries that local estimates obtained by these means have very large uncertainties as opposed to aggregated strata or regional estimates more easily used for implementation purposes (see lesson 2.1). Carbon maps require extrapolation of plot data into non sampled areas, using covariates derived from, among others sources, different kinds of remote sensing data (e.g. images, LiDAR, radar, etc.) and do not necessarily increase the quality of that data. If you consider lesson 2.1, aggregation, rather than segmentation of the strata, is the way to go. Thus rendering high resolution carbon maps unnecessary, and even distracting, generators of potential conflict with stakeholders. Participants agreed that the use of techniques to enhance sample size is always welcome (e.g. use of LiDAR to complement plot data to increase sample size per stratum by means of pseudo-plots). However, this can only happen if sound modelling is used in a transparent way.

Good Practice: Stratum carbon samples sizes should be large enough to allow for the reduction of estimate uncertainties. Complementing plot data with pseudo-plots like those derived from e.g. LiDAR data is correct if done properly. Above all, sampling must reflect the stratification the country will use in the implementation process and deliver the adequate carbon estimates.

2.3. UNCERTAINTY OF EMISSIONS FACTORS

Lesson: Aggregated estimates show lower uncertainties.

One of the major areas of work countries have been involved in is the estimation for uncertainties. Identification of major sources of uncertainty, as well as the impact uncertainties have, has been part of such assessments. Several countries reported serious concerns with how most of the uncertainties stem from the allometric equations used, their choice, as well as how they are developed. Some participants pointed out how in some cases a move from general to locally developed equations does not guarantee reduction of uncertainties. It was agreed that the relevance of uncertainties shifted as estimates moved from the plot level, at which point DBH measurement and allometric error were reported as the largest sources, to strata level, at which point different stratification approaches delivered different uncertainty levels (stratification error), to National Forest Inventory Level, at which point the sampling error constitutes the largest source (see lesson 1.6. on sampling approach towards activity data production). However in all cases, countries reported decreasing accumulated uncertainties as data were aggregated into larger units.

Good Practice: Proper identification of uncertainty sources is a good practice in order to identify major sources and be able to reduce/correct impact. Aggregating estimates up to the strata level that will be used for implementation is the right choice. Full accounting of uncertainties at that level is to be done.

NOTE: Some countries reported stakeholders complaining about how aggregated estimates underestimated the carbon content in their forest areas (never the case for overestimation). Discussion among participants allowed them to identify the need for sound capacity building of stakeholders in understanding the rationale behind aggregated data use (in terms of reduction of overall uncertainties and also in terms of attribution of emission reductions). In this case it became clear how aggregation of data makes sense not only from a technical but also from a political perspective.

2.4. NATIONAL FOREST INVENTORY (NFI)

Discussions about the NFI built upon those pertaining to the uncertainty of emissions factors. A great deal turned on how expensive NFIs are, how these have been (and are being) done in most cases thanks to purpose-specific funding from foreign countries, and how difficult it would be for countries to carry out inventories themselves. Under such circumstances participants highlighted the need to look for a sound balance between use of existing data, available funding, delivery of data, data quality, clear understanding of implications in data quality (e.g. how will uncertainties impact country benefits), and maximum utility of NFI exercises.

Lesson: NFIs need to accommodate budget constraints while maximizing uncertainty reductions in carbon estimates as well as facilitate the collection of ancillary information.

Participants highlighted how country circumstances were more apparent when discussing NFIs due to how expensive and logistically challenging they are. Furthermore, lack of clarity on how uncertainty estimates will affect country's recognized emissions reductions was a clear problem. This led participants to recommend capitalizing as much as possible on already existing data while maximizing the benefits that can result from the activities and logistics involved in the execution of an NFI, when possible. Participants mentioned how, while in the field, collection of carbon data could be complemented by collection of e.g. floristic data (not needed for carbon estimates but good for e.g. biodiversity), social indicators, etc. They also pointed out that it was extremely important to keep in mind the replicability of the NFI (even if funds are being provided from abroad), as it is of great value (particularly for degradation) and because a singular experience will not be as good as something that can be streamlined as regular part of the overall MRV process.

Good Practice:

1. Capitalize on existing data.
2. Always keep replicability in mind so the country can replicate on its own. This has to do with budget, capacities, and level of accuracy needed. The NFI should be cost-effective and respond to country specific necessities in order to be sustainable.
3. Collect as much additional data as possible (maximize use of logistics of NFI for additional benefits): missing the opportunity to collect additional data (e.g. floristic composition) could be costly in the future.

NOTE on plot size: Even though in many cases countries have used smaller plot sizes or even clusters, participants agreed the best practice should be to use 1ha plots, ideally matching the area component of the country forest definition and the MMU used to report on activity data. Arguments included uncertainty levels decrease as area sampled increases, correlation with variables derived from e.g. remote sensing data, forest structural heterogeneity and other technical aspects supporting 1 ha plots. Some participants also highlighted the fact that forests constitute more than just carbon, including also the functional aspects attributed to them (a functional sample size of the forest concept as opposed to a carbon sample). This was linked with ecosystem services and how carbon is only one of the aspects that can be considered in a payment for ecosystem services program (PES).



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By the time the workshop was carried out countries had experienced REDD+ related reporting under several contexts. These included reference levels submissions to the UNFCCC (Colombia, Peru, Indonesia) as well as reporting under bilateral agreements (e.g. Guyana), multilateral agreements (REDD Early Movers –REM-[Colombia]), and Emissions Reductions Project Idea Notes (ER-PIN) to the World Bank' Forest Carbon Partnership Facility (FCPF) (Indonesia, Peru, DRC). In most cases discussions were mostly centred on the elaboration and submission of reference levels. However, the experiences from Guyana, the only participating country to have undergone full MRV processes for the previous 5 years, proved of great value especially when discussing overall lessons. Such experience allowed for identification of some good practice guidance under a learning by doing framework.

3.1. REFERENCE LEVELS

We included reference levels as part of the reporting discussions because they constitute the baseline against which MRV reporting will be compared. They also represent the very first element of the Warsaw framework that countries are actually delivering against (COP19 **decision 13** and **decision 14**). Reference levels took a good deal of the time used to share lessons on reporting. The recent or upcoming submissions of reference levels to UNFCCC as well as ongoing bilateral/multilateral agreements to the potential renewal of bilateral agreements produced many discussions on the subject.

3.1.1. REFERENCE LEVELS ARE A DATA INFORMED POLITICAL DECISION

Lesson: No matter the technical aspects of the reference level (data, scope, scale, historic, period, uncertainty etc.) reference levels are a political decision. This means several reference levels can result from the process: A historical reference level, a performance reference level, and a payment reference level.

Discussions among participants showed how once historical emissions data are delivered, the way it is used is a political choice that incorporates other datasets, assumptions, timelines and criteria that countries use to define their reference levels. Such criteria can be related to the specific intended use of the benchmark produced. A key example from Guyana was how a historic level, a reference level, and a payment level were all different despite the fact that they were all based on the historical emissions estimates. The way these levels are established will answer to country circumstances as well as political interests

Good Practice: Reference levels should answer to country circumstances. However, it was agreed among participants that it is ideal that reference levels aim towards climate integrity (compliance with UNFCCC guidelines does not guarantee a climate integrity driven REL).

3.1.2. SCALE FOR THE REFERENCE LEVEL

The scale at which reference levels should be elaborated was another topic that drew lengthy discussions. With countries elaborating subnational reference levels, dealing with project reference levels validated under other mechanisms (e.g. VCS projects), or having operated under national scale reference levels, plenty of lessons had been learned.

Lesson: The reference needs to be built at significant scale for national impact.

While some participants considered aggregation of subnational reference levels possible, others disagreed. For some, reference levels needed to be linked with area-specific circumstances, dynamics, or contexts, so it made sense to elaborate separate reference levels that would ultimately be used to assess the performance of mitigation actions tailored to respond to those contexts. Others explained how after years trying to accommodate e.g. project reference levels, it became apparent that aggregations were ill advised, as methodologies were not always compatible. They explained how the context changes dramatically as the scale moves upwards and leakage risk becomes apparent. Discussions produced a consensus that aggregation of piecemeal RELs is not advised when inconsistencies among partial REL methodologies exist and lack strategic relevance to the national scale. The bigger picture allows for better strategic approaches. This resulted in participants agreeing to a top-bottom approach being the best alternative, with subnational reference levels assigned only if they make sense from the national perspective (as opposed to a bottom-up flow).

Good Practice: Assessment of historic emissions at the national scale should be the first step. Once the national context is clear, providing a big picture framework of emissions dynamics, countries can decide whether or not to elaborate partial reference levels that can be aggregated into the national one. This should be done only if it makes strategic sense from a REDD+ implementation strategy that will actually be capable of delivering emissions reductions.

3.2. LEARNING TO LIVE WITH UNCERTAINTIES

Up to this point discussion had covered matters pertaining to the estimation of uncertainties of activity and emissions factors data. Then came the issue of focusing in depth on the matters related to reporting and use of uncertainty estimates to deliver e.g. palatable reference levels and use of MRV data in legitimate ways. Several lessons and messages were collected. However, in general terms, participants agreed that uncertainties require us to learn how to live with them in ways we all agree upon, rather than eliminating them, which is simply impossible. Uncertainties will always be larger than we would like them to be because of a series of factors. Learning to live with them and make intelligent use of them is the way forward: “While we try to reduce uncertainty, we must be comfortable with the fact that it will always be present and large.”

3.2.1. CHANGE DATA WILL ALWAYS SHOW HIGH UNCERTAINTY

Lesson: Being the smallest part of the landscape, change data will always have relatively high uncertainties.

Participants shared their experiences in assessing change and no-change data, reporting high levels of uncertainty in change data vs low levels for non-change data. Based on this, some participants suggested that instead of reporting emissions from largely uncertain change data, countries should report less uncertain differences observed in overall stocks as a pragmatic approach towards assessing the same phenomena from a less uncertain perspective. However, linkage of stock changes with implementation actions proved to be a heated discussion which resulted in minimal clarity. This is clearly an area for scientific improvement.

Good Practice: It was agreed that a potentially good approach would be for countries to report on the results obtained using both approaches (e.g. for their reference levels). In theory, results should complement each other and the report on stock change should contribute to reduce the “uneasiness” some donors are having with the uncertainty level estimates observed in the change data.

3.2.2. WE NEED CRITERIA FOR LEGITIMATE USE OF UNCERTAINTIES (IN BOTH DIRECTIONS: DONORS AND PRODUCERS)

It is pretty clear that the uncertainty issue is related to the issue of legitimate reference levels and reported Emissions Reductions. However participants agreed that low uncertainty does not guarantee legitimate use of the estimates nor that high uncertainties are equivalent with non-legitimate use of the estimates: **Should we worry about the uncertainty or should we be aware of the uses and misuses of the levels of uncertainty?**

Lesson: It’s more about transparency than about uncertainty. Transparency about uncertainty allows for sound use of data.

Participants agreed that work on reducing uncertainties had, or has had, the possibility of backfiring. Some participants described how all the noise about uncertainties resulted, in some cases, in it actually becoming a perverse incentive for making numbers seem more than what they are. This is especially true when uncertainties are estimated and in some cases are done so using non-transparent approaches, resulting in a cat and mouse iterative game fed by the fear of uncertainties expressed by donor countries.

Good Practice: REDD+ countries should be transparent about their uncertainties as well as about the approaches used to estimate them (which is clearly a field for improvement from the scientific perspective). At the same time, donor countries need to recognize this and be open to developing sound approaches to assess the correct use of the uncertainty estimates.¹⁵ The point here is that uncertainties alone will not define whether or not data are being well used.

NOTE: Implications of uncertainty need to be clear: A lot was said about a lack of clarity on how uncertainties are to be used under the REDD+ mechanism. Some suggested it would be ideal to have a framework similar to the one used by CDM, picked up by the FCPF in which discount factors are applied to reference level and reported estimates depending on where uncertainties fall in a range system. This will definitely help countries figure out the rate of return vs investment (particularly when discussing National Forest Inventories).

¹⁵ This point pertains both to REDD+ and donor countries as participants reported that in some instances donors had also made for a poor use of uncertainty estimates.



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The Verification/Validation process was cause for very heated discussions among participants. This may be because even though, at the time of the workshop, not many experiences of verification were available, they were diverse among a context within which not much guidance exists and the use and purpose of the validation/verification process is still open to interpretation.

4.1. LEARNING BY DOING

REDD+ countries, validators, and verifiers are learning how to implement REDD+ related “V” on the go. Even though previous experience can come from work e.g. on CDM, validators find themselves in new territory when assessing reported RELs or MRV ERs under REDD+. This makes for an area of work from which many lessons can be collected in the hopes of making “V” better and easier, and requires a learning by doing attitude towards the process and for the engagement among countries

Lesson: The validation/verification process is a learning experience for both validators and validated.

We are all learning how to do verification. It is still a learning process for all involved stakeholders (verifiers, countries, etc.), so it is important to incorporate an iterative process for improvement. As a novel area, participants agreed validators need to allow themselves to learn from REDD+ countries at the same time as they provide positive constructive feedback and suggestions to deal with issues in need of fixing. Use of results generated using competing approaches for assessing the validity of the results reported by countries violates comparability principles (e.g. assumptions are not always comparable); in some cases, personnel with little experience have been used to replicate/implement competing methodologies to validate the work of teams that have been working for several years. This is particularly the case when the same standards for compliance are not applied to those competing approaches. Participants agreed the validation/verification process should also be subject to the same five REDD+ principles, particularly that of transparency. With full transparency, anyone can verify. Full transparency and open participation ensures replicability (in data, maps, methodologies, and processes), understanding, and approval.

Good Practice: The validation/verification process should concern the soundness of the methods used and their implementation. It needs to assess the work countries are doing. Feedback should be delivered in a constructive way. Verification/Validation is about whether countries are doing honest and adequate work.

Discussions pertaining to the link between the practice of full transparency and how that would enable a more legitimate validation/verification process allowed participants to identify how the validation/verification process can be a pillar in the development of participatory approaches to the MRV process. Successful implementation of validation/verification processes at the national level could enhance stakeholder engagement in the overall REDD+ implementation process. **Building capacities for participation in validation/verification inside the countries was identified as good investment and a good opportunity for countries to lead the assessment from donors by example.**

NOTE: Several countries reported how on occasion, validators had centred their efforts on the uncertainty estimates observed in the data that countries were delivering. Participants agreed that even though uncertainty is one of the elements allowed to assess the quality of the data and the reports being made by countries, it alone cannot provide a complete picture and be analogous to the verification of its quality. Verification/Validation should not be centred exclusively on the accuracy assessment results, especially since uncertainty estimates will unavoidably be higher than donor countries comfort.



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MRV CAPACITIES

A lot of effort has been made in the REDD+ countries in order to build the capacities to be able to carry out the MRV process. The support to build such capacities has come in different ways. Some have been successful, others have not or have been partially so, even though in many cases countries have results to show.

5.1. ESTABLISHED WELL KNOWN APPROACHES VS STATE OF THE ART/CUTTING EDGE METHODS

Exposure to state of the art, cutting edge technologies that are still under research and development is part of the support countries have been receiving. Even though a lot of results have been generated from this work, participants were quick to highlight how, for the most part, countries have resorted back to the use of well-known and established methods to do their MRV. Among the reasons for this they mentioned:

1. The excessive cost involved in the use of some of those technologies, only enabled by the provision of project specific subsidies by donors.
2. In many cases, the details of the technology have not been unveiled to the countries due the fact that some of the developers have put in limitations that hinder sharing (particularly the case of academic institutions involved in research and development). These so called “black box” technologies impede compliance with transparency standards and therefore sound validation/verification of the data.
3. As such, those technologies are not guaranteed for sustainable use, which raises concerns over the consistency of the data (particularly the base when used for reference levels setting but not available for MRV).
4. The number of available providers is very limited, which in itself demonstrates how difficult the implementation of the methods are.

However, it was agreed among participants that testing and experiencing new technologies and approaches that may be incorporated for reporting needs to be part of routine activities carried by countries MRV teams in order to gain the necessary experience and know-how to incorporate them as their strengths and weaknesses have been well understood, thus allowing for a sound use of the data generated.

Lesson: Use the tools and methods that are well known and whose limitations and strengths are well understood.

MRV should use “user friendly,” well known, and understood technologies and methodologies (preferably open source) in order to have a monitoring system that is sustainable in time and in budget. Only by knowing and acknowledging the strengths and weaknesses of methods and data, can a transparent MRV be created. In many cases, those providing the capacity training have failed to inform countries about the strengths and weaknesses of their methods, generating confusion among decision makers and leaving country MRV practitioners with the need to explain those themselves.

Good practice: Use well-known methods or technologies for reporting while at the same time evaluating state of the art or new technologies. Incorporating new approaches needs to be gradual. The state of the art has often been poorly tested and is still under development. If method know-how is still in its early stages, the methods in question should not be used for reporting (e.g. no country that has presented its REL has used state of the art methodologies). Once strengths, weaknesses, and pertinence have been assessed within the country’s context, use can be implemented but by no means earlier than that.

5.2. OWNERSHIP OF THE MRV PROCESS

Even though a lot has been invested in generating and enhancing the MRV capacities of REDD+ countries, these have not always resulted in the ownership and involvement of government in MRV. In some cases this has the consequence of the use of emergent technologies not suitable for country implementation. However in other cases, participants report that countries themselves have not been proactive in appropriating the process, leaving it to consultants or supporting agencies to do it for them. This of course does not result in sustainable approaches to MRV, thus questioning the legitimacy of efforts like MRV as a national responsibility. If capacities are lacking, it is the responsibility of the country and the donors to build them, but not to do it for the country. Ensure government takes responsibility and ownership for MRV processes, rather than depend on third parties pushing the process.

Lesson: Capacity building needs to aim towards sustainability (as opposed to delivery of results or products). Countries must have internal capacity building programs in place.

Discussions among participants established that the best capacity building strategies are those that are long term oriented, are designed in-house, and seek to strengthen the internal knowledge management procedures, methodologies, and processes. Such strategy should combine different approaches:

- a. Capacity building is a long term process that requires continuity
- b. Initially it should aim at “hands on” approaches and problem solving capacity building – one to one problem solving, specialized workshops and short courses, and certificate courses of different level.
- c. Collect and incorporate the lessons as part of an overall M&E framework
- d. Work with academic institutions for large group trainings for broad base capacities (e.g. MRV certificate with Universidad of Madre de Dios, in Peru, helped maintain capacities in regional government through several government changes)

Good practice:

1. Institutionalize the MRV process: MRV cannot be a project funded activity. It needs to be part of the national workload and budget.
2. Design and implement an in-house capacity building strategy.
3. Train a large spectrum of people: build the capacities of as large and diverse a number of other stakeholders as possible. This has proven to help with maintaining capacities under periods of transition as well as enhancing stakeholders’ buy-in to the MRV system.
4. Donor support is usually short term: it needs to fit into the capacity strategy (otherwise it may become a distraction: particularly in the case of technology packages)

Participants reported how in many cases the MRV process has not yet been institutionalized in their countries. In some cases this is because no legal framework exists, and there is therefore no assigned institutional budget, which can result in MRV activities being carried out by contractors financed with funds from foreign cooperation agencies or other organizations. This generates instability for the MRV teams as long term contracts are not possible, rendering the maintenance of institutional capacity very difficult (participants reported that in many cases those individuals who had acquired the necessary skills were hired by those consulting firms providing the services and therefore represented a loss of investment).

Lesson: The MRV process needs to be institutionalized.

In order to maintain capacities, the MRV team needs to be given stability. This means a sufficient yearly budget needs to be assigned. This budget needs to be large enough to allow for the MRV team to run its basic core functions. This budget can then be complemented by projects funded by foreign cooperation and partners, e.g. for research and development. However, participants reported that doing so may render the MRV process itself too politicized, resulting in a loss of efficiency as countries no longer are held accountable by donors.

Good practice: Assign a yearly sufficient budget to run MRV activities according to country capacities. Match budget with technical requirements.

5.3. PARTICIPATION IN THE MRV PROCESS

Several countries reported experiences in which they experimented with participatory/community MRV, supported by a surge of available technologies for doing so including Wiki Maps, Web based social network linked mapping, and the use of smart phone enabled apps. In most cases, such effort have been done with the participation of indigenous communities and have incorporated not only carbon/activity related data collection but also additional data allowing for a better interpretation of the carbon/activity data (e.g. context wise) and data specifically relevant for the communities involved. However, most of these efforts have either been led by a foreign agent, have been done within the confines of a project, have targeted a very small segment of the population, or have had very limited impact due to logistical constraints (e.g. lack of internet, cell phone or even power access). Participants were quick to highlight the relevance of such exercises to enhance transparency and sustainability of the MRV process as well as compliance with e.g. social safeguards but were also quick to raise concerns about the development of parallel, competing MRV systems that would undermine rather than legitimize and strengthen the national effort.

Lesson: Full national participatory MRV vs National or Community MRV

Even though the surge in Community MRV projects is good, these need to be used not as the goals but as the learning stages towards developing fully inclusive, participatory approaches to the MRV process. Participants were quick to explain how the MRV process is a national endeavour that, in order to comply with safeguards requirements and deliver data that are closely linked to the realities on the ground, should be made up of participatory approaches, with a clear leadership structure and a framework that aims for complementarities as opposed to competition. Participants highlighted several examples of organizations producing their own datasets and using them as a competing dataset as opposed to complementing the national ones. Of course an independent view is always welcome as a means to deter data manipulation, but a sound participation framework should help to deal with this risk.

Good practice: Countries should aim to generate broader approaches for all types of citizens to participate in the MRV process and its components. For this a broad base of capacities needs to be established as well as the necessary technology and political context

5.4. THE NEED FOR INFORMED DECISION MAKERS: A COMMUNICATIONS STRATEGY

Participants in the workshops had mostly technical profiles. However, they highlighted several ways that MRV links with policy and argued that decision makers were determining factors of quality and use of MRV final deliverables as well as of the management and administration of the MRV process, context, and ultimately of its sustainability. This facilitated participants' agreement that decision makers need at least a basic level of knowledge about MRV, its purpose, and the right way of using and administering the process in sustainable manner. This does not only include in-country managers but also those who manage donor programs and projects.

Lesson: Educate decision makers so they support the MRV process.

Because the learning process has been, is, and will be, a collection of lessons learned, dissemination needs to include decision makers among those targeted. Only by including politicians and decision makers will they be better able to support the MRV process, the capacity building strategies, and the national products. Importantly, only with adequate political support can the MRV process be institutionalized and assured a budget.

Good practice: Develop a communications strategy. This should be part of the MRV workload. A sound communication strategy will help keep the general audience well informed, including decision makers that can affect the overall MRV work.



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OVERARCHING LESSONS

Participants identified two main, or overarching, messages as a result of their discussions: aspects related to transparency and MRV being a national information process. On that basis we have elaborated 3 main lessons:

6.1. IT'S ALL ABOUT TRANSPARENCY

Participants identified transparency as the cornerstone of the MRV process: no matter what the uncertainty levels, methods used, or proposed approaches, full transparency is essential for honest deals to be brokered. Transparency is the only way honest and constructive assessment is possible for parties to come to reasonable agreements. Only through transparency will social safeguards be upheld. As one participant put it, “you can have the best quality data in the world and not be transparent about it and propose illegitimate ways of using it to define reference levels, reporting emissions reductions or benefit sharing whereas another country with very basic data with high uncertainty levels can still propose sound use approaches that result in legitimate proposals.” **Too much emphasis on accuracy has produced, in some cases, a perverse incentive that has resulted in lack of transparency** on, among other aspects, how uncertainties have been or are being estimated.

6.2. MRV IS A NATIONAL ENDEAVOUR

Participants highlighted how ongoing initiatives in CMRV carried the risk of compartmentalizing the MRV process and generating a scenario in which incompatibilities among datasets and processes could be cause for major disputes. Based on experiences in reference levels aggregation (from projects to jurisdictions) and on the realization that transparency was quintessential, participants agreed that the MRV process was a national endeavour (requiring the inclusion of all citizens) that when done transparently should enable the participation of those willing and capable of doing so. **Ideally, a unique National MRV system with frameworks that allow for the participation of the national community (independent of ethnicity or type) will be established.** It was agreed upon by the participants that sound strategies aimed at building a critical mass of enabled MRV users was essential to accomplish such a goal.

6.3. THE READINESS PHASE CONTINUES AND NOW REQUIRES DONORS TO GET READY

Even though, on paper, the REDD+ readiness phase is coming to an end, in practice, as countries are just beginning to tackle the R of MRV via the delivery of reference levels, donors are just getting their first experiences of the V process. Participants agreed that as a learning by doing process, the readiness phase actually continues. Countries have made a good deal of progress on Measuring and Monitoring but are just now Reporting and being Verified. Countries should recognize this, including donors, who need to embrace the fact they have low experience and capacity for doing validation/verification and perhaps need to learn from REDD+ countries experience so far in order to be able to meet the standards they have set up themselves.

Annex 1:

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