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**Proposal for integrating Reduced Impact Logging activities within forestry concessions into the benefit-sharing plan of the Mai-Ndombe Emission-Reduction Program**

This is a joint proposal made by WWF DRC, WWF Germany, GFA Consulting Group, FRM Ingénierie (FRMi) and SODEFOR. It is based on feasibility, baseline emission and reduced impact logging studies undertaken in Mai-Ndombe province by WWF, GFA Consulting Group, FRMi and SODEFOR (in partnership or alone) from 2013 to 2017.

Its intention is to provide a practical and readily implementable concept for integrating reduced impact logging activities of forestry concessions into the Mai-Ndombe ER-Program benefit sharing plan. It is only applicable to “reduced impact logging” (RIL) activities” and does not include “conservation concession” (avoided degradation) activities.

**Background and rationale**

There are 20 industrial logging concessions in the Mai Ndombe province, amounting to around 3,552,717 ha, which represents about 28% of the province’s total area. As such, forestry concessionaires are responsible for a very significant proportion of the ER-Program's forest area. Actively integrating forestry concessions (i.e. through activities) into the ER-Program is considered vital to ensure that emissions from the forestry sector do not exceed baseline emission but are rather reduced to contribute to ER-Program performance.

The potential of forestry concessionaires to contribute to reducing forest-related emissions has been recognized early in ER-Program development. Two feasibility studies have been undertaken to estimate the potential emission reductions from activities such as reduced impact logging and conservation concessions (Hirsh et al. 2013[[1]](#footnote-1), GFA 2014 unpublished). Both studies came to the conclusion that RIL activities would be financially viable at a carbon price of USD 5 or more.

SODEFOR, who is the major player in Mai-Ndombe province with 12 concessions totaling approx. 2.5 million ha, has expressed its interest in participating in the ER-Program and start some pilot activities as early as 2011.

In 2015, the ER-Program commissioned a study to establish concession-specific baselines under the ER-Program. The results showed that in comparison to emissions from deforestation, emissions from logging were historically very low, less than 1 million tCO2 per year during the reference period (FRMi 2015[[2]](#footnote-2)). Considering the low emissions and in order to simplify ER-Program accounting, CN-REDD decided to exclude a specific reference emission level for forestry concessions and rather include them under the overall reference emission level. Whether the performance of forestry concessions would still be measured against an internal concession-specific baseline or rather using “proxies” was left open at that time.

**Concession specific baselines vs. proxy scheme**

The forestry concession baseline study (FRMi 2015) highlighted several problems related to estimating baseline emissions for forestry concessions. One of the major problems is to correctly predict the harvested area and volume, which is key for calculating all logging-related emissions. Historical emissions are comparatively low and it was not considered appropriate to use the historical average. One reason for this is the fact that some concessions were not harvested during the reference period, but would likely be harvested during the program period. Further, volume and area to be harvested may vary significantly during the program period compared to the reference period. Effectively, the volume and thus area to be harvested depends very much on market demand, which is volatile. Another very important factor is the general "business climate" in DRC. The business climate is related to many other factors such as political stability, level of taxation, efficiency of administrative approvals, availability and quality of infrastructure, etc. This is to say that even if there is a strong market demand for tropical timber, it may not necessarily lead to an increase in harvesting in the DRC, as many other central African countries show a more favorable investment climate and would likely profit first from an increase in timber demand.

As such, accurately predicting the timber demand for the purpose of estimating baseline emissions during the ER-Program period was and still is deemed very difficult. This strongly calls into question the concept of concession-specific baselines, at least when it comes to reduced impact logging activities.

Following the report by FRMi (2015), WWF, GFA and SODEFOR have started to develop an alternative concept for integrating forestry concessions into the ER-Program. This concept is in part inspired by other work on regional forestry concession baselines in Indonesia[[3]](#footnote-3)[[4]](#footnote-4).

From August 2016 to March 2017, WWF and SODEFOR, supported by GFA and FRMi implemented a reduced impact logging pilot in Mai-Ndombe province. The pilot took place in SODEFOR concession CCF 35/11 (Madjoko) and included a control zone (765 ha) and Reduced impact logging zone (502 ha). The principal aim was to test which RIL activities are the most feasible and to estimate both the costs and emission reduction of their implementation. The results from this pilot allowed the project partners to fine-tune this concept of proxy result based scheme.

**The “sectoral RIL benchmark approach"**

The sectoral RIL benchmark approach starts from the hypothesis that it is very difficult to accurately estimate the total baseline emissions from forestry concessions (see above). With the exception of conservation concession cases, it is assumed for all forestry concessions that there is no difference in the amount of timber / area harvested during the ER-Program period compared to the reference period. This makes the need to estimate the harvested volume and/or area redundant.

However, forestry concessions can influence the CO2 emissions per unit area or volume harvested. Based on our research, the parameters that a) cause most of the emissions and b) can be influenced to reduce emissions are:

1. The density of both principal and secondary roads [m/ha]
2. The width of both principal and secondary roads(the actual road strip) [m]
3. The width of solar strips [m] along principal and secondary roads
4. The density of skid trails [m/ha]
5. The width of skid trails [m]
6. The area of log landings per unit of harvested area [m²/ha]

One important "emission" parameter not included here is the residual stand damage factor (biomass loss in the remaining forest stand that is caused by tree felling). However, residual stand damage is difficult to measure and reduce. Improvements in felling techniques usually target workersafety and maintaining the merchantable quality of the tree to be felled. In particular in the tropics, where visibility in the stand can be low and tree diameters are big, the reduction of residual stand damage is a secondary objective that is very difficult to realize even under optimum felling conditions. Since the harvested volume is assumed to be the same for the baseline and project scenario, the same is assumed for residual stand damage. Further, residual stand damage is not linked to any of the above parameters (i.e. it does not increase or decrease in relation e.g. road density) and forestry companies would have no interest in increasing the residual stand damage. They are rather indifferent to it, except when it comes to avoiding damage to other merchantable trees. As such it is unlikely that residual stand damage would increase during RIL implementation.

For the above parameters, baseline data from several concessions is available to establish what we term "sectoral RIL benchmarks values".

The principal idea is that the ER-Program sets these sectoral RIL benchmark values for the duration of the ERPA. If a forestry concession company manages to reduce its logging-related emissions by staying below these set of benchmark values, then it would be rewarded accordingly.

Benchmarking is a widely used regulatory instrument to increase the performance, ranging from specific electrical appliances to entire industrial sectors. In fact, the EU Emission Trading Scheme, covering the majority of emissions from the EU industrial and energy sector, also works with (facility-specific) emission benchmarks.

Based on the research related to these parameters, including the preliminary results from the RIL study, the emission reduction effect reducing any of the above parameters can be quantified. This allows the ER-Program to link reductions related to the above parameters to CO2 emission reductions and consequently quantify the monetary benefits to be paid to performing forestry concessionaires.

**Setting of the sectoral RIL benchmark values**

When setting the sectoral benchmark values, a couple of things have to be considered.

1. All emission relevant parameters that can be influenced by a concessionaire need to be covered. Otherwise, forestry concessions may reduce one parameter and increase another, which may then not result in net emission reductions. The parameters mentioned above capture all relevant logging related emissions that are influenced by the concessionaire.
2. The parameters have to be seen as an “ensemble”, as they are to some extent connected. For example, a reduction in secondary road density usually would be compensated by an increase in skidtrail density. As such performance is not measured parameter by parameter but is rather the result of all parameters.
3. It is important to consider these parameters over the entire period of harvesting for a given unit area. The suggested area unit would be the "AAC", the annual harvesting area (Assiette annuelle de coupe). Pending approval through the forest administration, one AAC can be harvested over a period of up to 3 years after which it has to be "closed" (i.e. no further harvesting is permitted during the 25 year lease period). As such, depending on the harvesting plans and progress of the forestry company, the ER-Program ERPA term would include 1-5 AACs per participating forestry Concession Company.

We propose to set the parameters based on baseline data collected by WWF, GFA, FRMi and SODEFOR during the years 2013-2017. We suggest to set the values as follows (see table 1)

**Table 1:** Proposed sectoral benchmark values against which the RIL performance of forestry concessions will be measured

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N° | Parameter | Unit | Benchmark value | Source of benchmark value |
| 1 | Density of principal roads | m/ha | 6 | Based on Hirsh et al. 2013 and FRMi 2015 |
| 2 | Density of secondary roads | m/ha | 6 | Based on Hirsh et al. 2013 and FRMi 2015 |
| 3 | Principal road width (the actual road strip) | m | 8 | Based on Hirsh et al. 2013, GFA 2014 (unpublished) and FRMi 2015 |
| 4 | Secondary road width (the actual road strip) | m | 8 | Based on Hirsh et al. 2013, GFA 2014 (unpublished) and FRMi 2015 |
| 5 | Width of the solar strips along principal roads (left and right side) | m | 30 | Based on Hirsh et al. 2013, GFA 2014 (unpublished), FRMi 2015, WWF/GFA/SODEFOR 2017 (unpublished) |
| 6 | Width of the solar strips (left and right side) | m | 20 | Based on Hirsh et al. 2013, GFA 2014 (unpublished), FRMi 2015, WWF/GFA/SODEFOR 2017 (unpublished) |
| 7 | Density of skid trails | m/ha | 85 | Based on Hirsh et al. 2013, FRMi 2015 and WWF/GFA/SODEFOR 2017 (unpublished) |
| 8 | Width of skid trails | m | 4 | Based on Hirsh et al. 2013, GFA 2014 (unpublished), FRMi 2015, WWF/GFA/SODEFOR 2017 (unpublished) |
| 9 | The surface of log landings per unit of harvested area | m²/ha | 60 | FRMi 2015 |

For the density of roads and skid trails, we propose to use values based on a publication from Hirsh et al. (2013). These come from measurements in SODEFOR concession CCF 39/11 (Nteno) in Mai-Ndombe. Baseline road density data for other concessions shows values up to 6.3 m/ha for principal road density and up to 15.6 m/ha for secondary road density (FRMi 2015).Other measurements for skidtrail density show up to 66 m/ha (FRMi 2015). However, this value comes from a rather selective measurement not covering an entire AAC. Skidtrail density in the control zone of the RIL study (WWF/GFA/SODEFOR 2017, unpublished) area was only30m/ha. However, harvesting here was concentrated on selected species and did only include a fraction of the merchantable volume. As such we propose to retain the value of 85 m/ha from Hirsh et al. (2013). What should also be considered is that many of the published values were measured in SODEFOR concessions, a forestry concession company that is already implementing reduced impact logging. As such some values have been slightly adjusted to account for the fact that the majority of forestry concession companies is not implementing RIL at present. Concerning road width, the benchmark value for principal roads exceeds the general value provided in the "Guides Opérationnels EFIR". We consider this appropriate though, as it better reflects current practices. The value from the "Guides Opérationnels EFIR" should be regarded more as the "target" value that should be reached by forestry companies. For the log landing value, we use a value from the FRMi (2015) baseline study.

**Calculation of performance based on the sectoral benchmark values**

As mentioned above, calculation of performance would occur on the basis of all the above listed parameters. These parameters serve to calculate the activity data. Forestry concession companies should strive to stay below each of the parameters. However, exceeding certain parameters could be tolerated, in particular as this may reflect good RIL practices. One example would be the reduction of secondary road density, which would entail an increase in skidtrail density. As skid trails have a much lower impact on biomass, exceeding the benchmark value for skid trails could thus be tolerated if it is a result of reducing (secondary) road density.

Performance in terms of emission reductions would be calculated based difference between the benchmark values and measured values. Based on previous research by Hirsh et al. (2013), GFA (2014, unpublished), FRMi (2015) and WWF/GFA/SODEFOR (2017, unpublished) as well as the national biomass map (Saatchi et al. 2016), emission factors will be provided to the ER-Program. Performance-based payments from the ER-Program to forestry concessionaires can thus be based directly on emission reductions and paid as “Payment for Environmental Service proxy” (PES proxy). See Box 1 for a calculation example. Formulas and emission factors are provided in Annex 1 to this proposal.

**Box 1: A calculation example under PES proxy**

|  |
| --- |
| A forestry company enters into a contract with the ER-Program to carry out RIL activities. The contract is valid for the duration of the ERPA (5 years) and the ER-Program and the company agree on a price of 5 USD per avoided ton of CO2. During the 5 years of the ERPA, the company harvests 10,000 ha across several AACs, all of which are officially closed during the ERPA period. On average, the company achieves the following performance:* Density of principal roads: 3 m/ha (reduction of 50%)
* Density of secondary roads: 3 m/ha (reduction of 50%)
* Principal road width: 5.5 m (reduction of 2.5 m)
* Secondary road width: 5 (reduction of 3 m)
* Width of solar strips along principal roads: 20 m (reduction of 10 m)
* Width of solar strips along secondary roads: 12m (reduction of 8 m)
* Density of skid trails: 85 m/ha (reduction of 30%)
* Area of log landings: 30m²/ha (reduction of 50%)

Based on these values, the following activity data is calculated for the entire harvesting area (10,000 ha). Values in brackets show the benchmark activity data.* Area principal roads: 17 ha (48)
* Area solar strip principal roads: 60 ha (180)
* Area of secondary roads: 15 ha (48)
* Area solar strip secondary roads: 36 ha (120)
* Area skidtrails: 240 ha (340)
* Area log landings: 30 ha (60)

To arrive at emission estimates, this activity data is multiplied with the following emission factors:* For principal and secondary roads and log landings: Total AGB+BGB loss based on the national biomass map. Either an AAC or concession based mean value.
* For solar strips: Based on biomass inventories from Hirsh et al. (2013) and WWF/GFA/SODEFOR 2017 (unpublished)
* For skid trails: Based on biomass inventories from Hirsh et al. (2013), GFA 2014 (unpublished) and WWF/GFA/SODEFOR 2017 (unpublished)

These emission factors are provided in Annex 1 to this proposal. General emission factors for roads and log landings do not exist as they would be calculated for each concession or AAC separately.Then, deducting Program emissions from benchmark emissions, the emission reductions are calculated. Since the harvesting area has been closed and RIL does not entail a reduction in harvested volume, no deductions for leakage and non-permanence are foreseen.Based on the proposed benchmark values and preliminary results from RIL pilot implementation in Mai-Ndombe, we estimate the emission reduction potential at approx. 10 tCO2 per ha of exploited area. In this example, this would result in 100,000 tCO2 of emission reductions during the period of the ERPA, which would mean a gross revenue for the company of USD 500,000, paid on result as “PES proxy”. |

**Participation requirements**

As stipulated in the ERPD (Annex 7), any forestry concession company that wishes to engage with the ER-Program need to demonstrate compliance with national forestry law and regulations as well as with the ER-Program.

*[Excerpt from Annex 7 in the ER-PD]*

To this end, a "**REDD+ compliance standard"** for logging concessions has been elaborated by the ER program technical Secretariat, in cooperation with logging companies and with technical support from the European Forest Institute (EFI) and the consultancy FRMi. The standard was elaborated through cross-referencing DRC’s legal framework with REDD+ objectives. This standard provides a **simple and non-exhaustive** framework aimed at informing about the state of play of concessions’ compliance with selected legal provisions most relevant for REDD+, i.e. provisions which have a direct impact on :

1) GHG emissions and the environmental integrity of the reference scenario, and

2) Compliance with REDD+ environmental and social safeguards.

The REDD+ compliance standard is based on **3 principles**:

* Principle 1: forest concessionaires engaged in REDD+ projects or initiatives must be legally established in the DRC and hold the rights of access to the forest resources they value.
* Principle 2: forest concessionaires engaged in REDD+ projects or initiatives must demonstrate their commitment to sustainable forest management, promote environmental services, including through limiting the impact of logging operations on forest cover and enhance the preservation of biodiversity.
* Principle 3: forest concessionaires engaged in REDD+ projects or initiatives must ensure that the rights of local communities and workers are respected.

These 3 principles are divided into 11 indicators and 23 verifiers. The majority of verifiers are documentary, in order to allow for a yearly monitoring with limited resources. A simple scoring system enables to assess the global performance of a concession with regard to the standard.

**Contractual issues**

It is assumed that the ER-Program and any forestry concession company undertaking RIL activities would enter into a contractual relationship. Important issues to be considered in the contract would be:

* All necessary documentation as well as all concession areas must be made accessible upon request by the ER-Program to allow for the validation of the participation requirements
* Areas for which payments for RIL are claimed must be made fully accessible to the ER-Program for verification of monitoring results.
* Payments for RIL can only be made for AAC which are officially "closed" to ensure that emissions won't increase through additional harvesting in the area after monitoring.
* Forestry concessions, as other private sector participants, do take a financial risk when participating in the ER-Program. In the case where a forestry company makes an upfront investment into reduced impact logging and succeeds in reducing emissions, but the ER-Program does not perform, the company would not receive any benefits despite its performance. As such it is proposed to share this risk between the ER-Program and the forestry concessionaire by guaranteeing a payment equivalent to the costs of implementing RIL. These costs would need to be budgeted under the fixed costs of the ER-Program
* In addition, the contract should foresee an exit clause that allows the concession to step back from the contract if despite individual performance the ER-Program was not able to make a payment because of overall non-performance of the ER-Program.

**Monitoring, reporting & verification**

Monitoring and reporting of the above listed proxy indicators would be the responsibility of the forestry concession company. As such, all monitoring and reporting costs would be borne by the concessionaire.

The measurements are relatively simple and WWF, GFA and SODEFOR have developed 'easy-to-use'field protocols that can be used as a starting pointby the ER-Program. To ensure the quality of monitoring data, it would make sense for the ER-Program to offer training courses in measuring and reporting of the data to forestry companies.Table 2 shows the suggested monitoring parameters and methods as well as reporting requirements and verification methods.

**Table 2: Monitoring parameters**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Monitoring parameter | Unit | Monitoring method | Reporting requirement | Verification methods |
| Harvesting area (AAC) | ha | Localization of AAC limits in the forest area using GPS;  | Printed map and shape file of the AAC  | Field audit and Landsat imagery |
| Length of principal and secondary roads and skid trails | mm | Measurement of all road and skidtrail segments using a GPS unit. Divide length by AAC area to arrive at road and skid trail density [m/ha] | Printed map and shape file of the road network, including a table of all road segments and presentation of the total road length | Landsat imagery for roads; field audit for skidtrails |
| Width of principal and secondary roads, solar strips and skid trails | m | Measurement of width at frequent intervals using a measuring tape. Measurement interval depends on road type (see measurement protocols) | Printed map and shapefile with all measurement points. Table with all width measurements and calculated mean values. | Field audit |
| Area of log landings | m² | GPS or measuring tape | Printed map and shape file of all log landings | Landsat imagery |

For reporting, the so-called 'quarterly declaration' (déclaration trimestrielle) is proposed plus a final report upon closure of the AAC. In these quarterly declarations, forestry concession companies report every 3 months the timber volume harvested, the associated harvesting area and the length of roads opened. Altering the reporting template for the purpose of the ER-Program to include in addition the above parameters should not be problem. Quarterly reporting does also make sense from the point of view of taking the measurements. While in theory it would be most efficient to wait with the measurements until harvesting has been completed and the AAC has been closed, the vigorous regrowth on e.g. skid trails and solar strips would make measurements here very difficult and time consuming already 6-12 months after harvesting.

For parameters which provide an average value (width of road strip and solar strip), measurements should be continuous but would not need to be reported on a quarterly basis. All measurements should be compiled in a final report and submitted to the ER-Program upon closure of the AAC.

The ER-Program would then make a desk-review of the report and undertake a field audit of the AAC including control measurements (either through its technical staff our though a commissioned third party). These verification costs would be borne by the ER-Program.

Following a positive verification result, the ER-Program would transact the payment to the forestry concession company (achieved ER x agreed price).

1. Hirsh, F., Jourget, J.-G., Feintrenie, L., Bayol, N. and Atyi, R.E. 2013. Projetpilote REDD+ de la Lukénie. Working Paper 111. CIFOR, Bogor, Indonesia. [↑](#footnote-ref-1)
2. FRMi (2015) Assessment of the Reference Emission Level (REL) For Planned Degradation for the Maï-Ndombe Emission Reductions Program.FRMi, Monpellier, France. [↑](#footnote-ref-2)
3. Griscom, B.; Ellis, P.; Putz, E.F. (2014) Carbon emissions performance of commercial logging inEast Kalimantan, Indonesia. Global Change Biology (2014) 20, , 923–937 [↑](#footnote-ref-3)
4. http://database.v-c-s.org/methodologies/methodology-improved-forest-management-through-reduced-impact-logging-v10 [↑](#footnote-ref-4)