SELECTED ALLOCATION OPTIONS DESCRIPTION
March 2021 – Javier Cano

INTRODUCTION

The following document details the criteria selected in coordination with the MRV Department of the Ministry of Environment (MoE) and the REDD+ Taskforce Secretariat (RTS) and the results obtained (i.e. proposed allocated baseline) from the methodology applied by the REDD+ project.

The analysis is based on the Deforestation Risk Map Methodology described in the document: "Options to Allocate the FREL Draft Report", delivered on October 31st, 2020. However, the following variations were applied.

JUSTIFICATION

A standard method applied over the whole forest.

The original methodology considers applying two different approaches to estimate the deforestation risk ratio based on the stratification between Planned and Unplanned deforestation:

- Planned was defined as the deforestation in Economic Land Concessions, Social Land Concession and Directive 001. For these concession types, the annual deforestation rate by type was estimated for 2014-2018 and then applied for the crediting period over the forest inside concessions, by concession type, at a 1 ha scale.
- For Unplanned Deforestation, a regression model based on a spatial statistical analysis was applied to project future potential deforested area by hectare.
    - The variables analyzed were: Historical Deforestation, Forest Edge, Concessions, Roads (JICA), Villages, Rivers and Population Density.
    - The best model obtained was the combination of Historical Deforestation and Forest Edge.

Base on the following justification, the current approach applied do not consider the stratification between Planned and Unplanned deforestation:

1. The National FRL does not discriminate between those types of deforestation.
2. The current available spatial datasets used to identify and delimitate the concessions area are not updated.
3. There is no evidence to demonstrate that deforestation inside this concession will happen during the crediting period at the same annual rate:
    a. Management plans or official documents to ensure that land-use change will be carried out are not available.
    b. Most of the deforestation inside concessions occurred between 2010 and 2014. After this, deforestation was reduced.
    c. Further, new concessions to develop infrastructure and agriculture projects will be probably happening in other areas of the country, which are not currently spatially identified by the MoE.

Therefore, the risk map methodology used under the current approach was applied over the country's total forest area, creating and applying a regression model[1] based on spatial statistical analysis to estimate the deforested site's future potential by a hectare of forest.

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[1] Regression model statistics are detailed in Annex 1.

Reduce the zero-risk Class.

The original methodology applies a regression model based on two statistically selected parameters (Forest Edge and Historical Deforestation) and two respective distance (500m and 2000m). Therefore, the forest outside the combination of these two parameters and distances was considered a zero-risk Class and no emissions were allocated to this forest area.

Based on the data from 2016-2018, the forest area outside the model limits corresponds to 3,8 million ha (47% of total forest), where 22.000 ha were deforested annually (8,6%).

Following the VCS JNR recommendation, a zero-risk class should be included in the risk map to allocate the FRL. Still, the recommendation is that the zero-risk class would represent 1% of deforestation in the past.

Therefore, the distance from the model boundaries where 1% of deforestation in the 2016-2018 period happens was estimated to create an updated zero-risk class. For the forest area comprised between the model boundaries and the zero-risk class, a deforestation ratio was calculated:

- The zero-risk class was identified as the area beyond 1.600m from the model boundaries. The forest area within this class was 1.688.604 ha, and the deforested area between 2016 and 2018 was 2.604 ha/year.
- The forest area within a maximum distance of 1.600m from the model boundaries comprise 2.110.020 ha, and the deforested area between 2016 and 2018 was 9.721 ha/year.
- The deforestation rate estimated from the last area was obtained by dividing the annual.

RESULTS

A deforestation risk map was developed (applying the above variations) and combined with a carbon stock map based on the National emission factors and forest stratification used in the Updated FRL submitted to the UNFCCC.

The resulting map (Figure 1) estimates annual emissions by hectare for the crediting period.
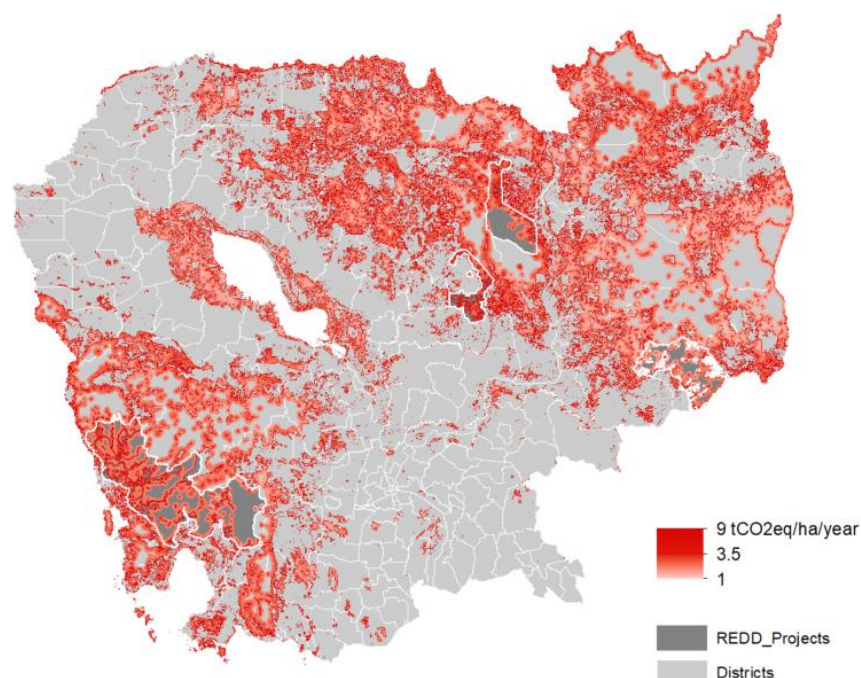

Figure 1. Deforestation risk map

In a final step, the boundaries of each REDD+ project was used to calculate the corresponding total and relative (percentage of the total emissions estimated for the whole country) emissions estimated. The relative emissions for each project were used to calculate the Updated FRL portion allocated to each one (Table 1).

Table 1. Allocation options results and comparison with old baselines and adjusted old baselines.
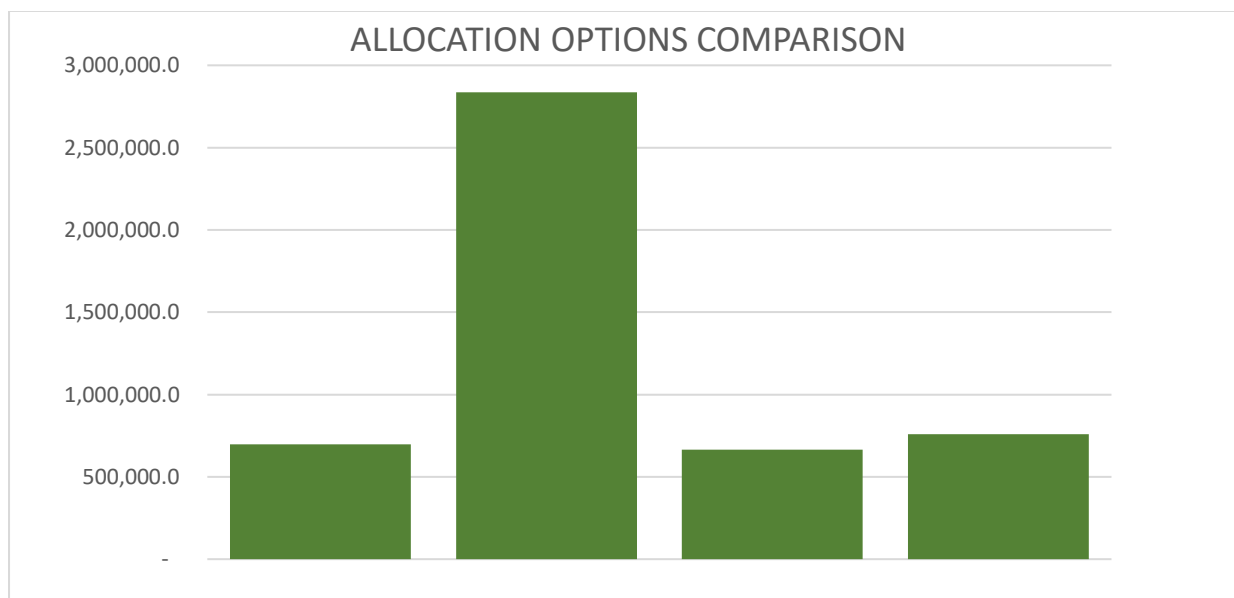
The results were compared with the original baselines used by projects and with an adjusted baseline weighted by the Updated FRL to estimate how much variation resulted from the allocation methodology and how much correspond to the Updated FRL.

The Updated FRL portion allocated is almost 5,0 million tCO2eq/year, the 8,8% of the Updated FRL, while the original baselines have estimated a volume of 8.4 million tCO2eq/year. Therefore the baselines are reduced by 41%.

However, the difference is significantly lower when comparing the proposed allocation with the weighted baselines, estimated in 6,0 million tCO2eq/year. The baselines are reduced by 17%.

Project by project, we can identify, comparing with the baselines adjusted to the Updated FRL, that:

- Tumring Project increases its baseline using the risk map allocation methodology because of the project area's location and shape, with a very high deforestation risk.
- In Southern Cardamom and Prey Lang, there are a slight reduction of the estimated baselines because there is a significant percentage of area inside the project included in the zero-risk class.
- The highest baseline reduction (the proposed baseline is 54% lower than the Updated FRL's estimated weight) happens in the Keo Seima REDD+ projects. Two significant causes were identified:
    - The emission factor used in the original baseline is around double than used in the Updated FRL (and, therefore, in the proposed allocation).
    - The project boundaries shared by CI are more detailed than the rest, including some excluded areas. Thus, the difference resolution between datasets could fail in topological issues. Therefore, it is recommended to further analysis this potential issue directly with the project technical team.

An additional potential modification to keep in mind is the one related to local or national EFs. The use of site-specific emission factors has a relevant impact on the volume of emissions allocated to the projects. In this regard:

- This option would probably be allowed or even requested by VCS JNR and by stand-alone project.
- However, the site-specific carbon stock should be revised and calculation harmonized by an independent third-party to be used shortly.

Annexe 1: Statistics for Regression models

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Call:
lm(formula = deforestationSurface ~ . + 0, data = mod3Results$regressionModel)

Residuals:
    Min      1Q  Median      3Q     Max
-494.36  -52.34  -17.45   -0.74  724.25

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
rg_def_14_16_2000    0.026393   0.006006   4.394 1.82e-05 ***
rg_non_forest_16_500 0.039399   0.012125   3.249  0.00136 **
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Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 142.5 on 195 degrees of freedom
Multiple R-squared:  0.7399,        Adjusted R-squared:  0.7373
F-statistic: 277.4 on 2 and 195 DF,  p-value: < 2.2e-16
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