Offsetting:

‘climate neutral’ through forest protection?

An assessment of the ‘climate neutral’ claims

related to the Tambopata-area:

‘REDD project in Brazil nut concessions

in Madre de Dios, Peru‘

November 2021

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With many thanks to
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1. Summary

There is much evidence that the project under investigation is essentially a 'hot air' carbon credit scheme, i.e., one that generates carbon credits only through manipulation of carbon accounting in order to profit the project developer, rather than generating any genuine additional carbon emission reductions. The evidence for this includes:

1. From the outset, the project **lacked any real basis of additionality** (see Section 4). The project did not bring about any new legal designation or protection for the forest in the area concerned, because the ~400 Brazil nut harvesters (BNHs) on whom the project would primarily rely already had their forest harvesting concessions legally designated by the Peruvian government before the project started. Instead, the project relied on an economic claim to additionality. That is that, without the project, and the additional income it would supposedly bring, the harvesters would not have sufficient financial incentive to protect the forest and would clear it for farmland. This argument was flawed, as is explained in Sections 8.1 and 8.2, but for at least the first ten years, the project delivered very little or no income or benefits to the BNHs anyway (see Section 8.3).

2. The **deforestation baseline for the project was greatly inflated,** apparently by a factor of 8-10 (see Section 5.1). Whilst the exact basis of the project's baseline calculation is not publicly available, analysis has been carried out using datasets based on the same remote sensing images as supposedly employed by the project. This shows that the scale of the baseline inflation is so great that it could not have represented the actual or likely medium-term future rate of deforestation in the project area as a whole, or in anything other than carefully selected, small and unrepresentative parts of project area undergoing exceptionally high deforestation. This means that the supposed emissions reductions from the project were also greatly inflated.

3. It can be demonstrated that the **rate of deforestation in the project area actually more than doubled** after the project started (see Section 5.1).

4. **The project excluded certain known emissions** from the project area in the calculation of its supposed carbon reductions (see Section 5.2). Most significant was the exclusion of emissions from forest degradation due to logging within the

BNH concessions. Also, under the inflated baseline, 'negligibility' rules of the project's methodology allowed for project emissions representing less than five percent of the baseline total to be disregarded in the net carbon reductions' calculations. Under a more realistic baseline, however, these emissions would have been much greater than five percent of the total, and would have had to be deducted from the claimed reductions, thus reducing the claimed emissions reductions ('Verified Carbon Units', VCUs) still further (and substantially so).

5. Using the same methodology used to calculate the project's claimed VCUs, but using a baseline reflecting the actual rate of deforestation in the area prior to the project, it has been calculated that even the *theoretical* **amount of VCUs which the project could have generated was only around eight per cent of those which were actually claimed** to have been generated (Section 5.2).

6. In order to mask a **serious project failure** resulting in a significant increase in actual carbon emissions, a large number of Brazil nut harvesters were excised from the project for carbon accounting purposes, because they were involved in logging the forest rather than preserving it. From 2013-2016, more than half of the BNH concessionaires (207 of the 405) were so excluded (see Section 6).

7. Because of points 2-6 above, there is a strong case that **none of the VCUs generated by the project represent any real emissions reductions** (see Section 7). Using what would have been a more realistic baseline, and including the emissions which were variously excluded from the carbon calculations, it can be shown that from 2010 onwards, the project area was actually **a net emitter of greenhouse gases above what would have been a reasonable baseline.**

8. There are **structural/design reasons** why the project could probably never succeed in bringing about real emissions reductions in the defined area (see Section 8). These include that:

    i. There has been a profound misunderstanding/misrepresentation of the supposed **role of the Brazil nut harvesting concessionaires**. They have had neither the incentives nor the rights which would be required for

them to fulfil their role in protecting the forest. Many of them are in fact *causing* additional deforestation.

ii. The benefits from the project were **heavily skewed towards the project developer** (Bosques Amazonicos SAC, 'BAM'), which under the terms of the project agreement received 70% of the proceeds of the sale of carbon credits. Investment which was deemed essential to the success of the project – especially for the construction of a Brazil nut processing plant in the project area, but also other aspects of the project – never actually happened.

iii. At least up until 2014, **none of the Brazil nut concessionaires themselves had received any actual payments** and, with one known exception, there is evidence that very little or none may have happened ever since for most of the BNH concessionaires. The incentive being provided to the concessionaires to prevent deforestation was also therefore very little or nil.

iv. **All the carbon credits sold** from this project so far (including some very recently) are those **generated before the end of 2016** ('vintage 2015-16' or earlier). The huge inflation of the deforestation baseline evidently resulted in the generation of a lot of credits from 2011-16, which are still being sold – i.e, from the period when very little was actually happening, other than a significant number of concessionaires causing deforestation.

9. **After 2012, monitoring of the project by BAM, and verification** of it by the verification company, Verra, **has been very fragmented and often lagged a very long way behind** the closing of carbon verification/accounting periods (see Section 9). Other than that the project was generally not functioning, the reasons for this are not obvious. It becomes increasingly clear from the verification reports from 2014 onwards - which were not completed until 2019 or 2020 - that concerns about some of the fundamental issues as raised in the analysis below have been mounting. According to the latest of these reports, relating to 2015-2016, many serious concerns remained to be addressed by the

project developer – including concerns about the appropriateness of the baseline scenario under which all the supposed emissions reductions are calculated (see Section 5.3). Despite these growing concerns, which should have had a material impact on the issuance of VCUs, possibly even halting them altogether, the verifiers nevertheless continued to verify that the project had generated many millions of VCUs.

10. It is to be noted that the financial structuring of the **Verra verification process represents a very clear and significant conflict of interest.** In addition to the very substantial (six-figure) fees which are paid by the project developer to the verifier for each verification exercise, on top of the initial fee of US$115,000 for opening a project account, a fee of US$0.10 is also payable on each issued VCU. This means that, in the case of this project, Verra would have so far received commissions of around $1 million for issuing the VCUs under the inflated baseline, rather than very little or nothing had a realistic baseline been applied[1].

2. Confirmation of the identity of the project

The project is properly known as the 'REDD Project in Brazil Nut concessions in Madre de Dios', Peru (abbreviated henceforth as RPBNCMD), with the number/identifier of #868 on the offset project database of VERRA[2]. It has been confirmed that the ClimatePartner description of the project 'Waldschutz mit nachhaltigem Paranussanbau,', project identifier #1114[3], does in fact refer to the RPBNCMD. Key details of what ClimatePartner describes for the project (such as the number of 'families' involved in the project, its location, and the project verifier, SCS) are all identical to those in the extensive documentation available on RPBNCMD. It could not be any of the other four other carbon offset projects happening in the same province in Peru, as listed by VERRA. One batch of carbon credit purchases from one of the companies using the ClimatePartner scheme, consisting of 26,902 units, has been

[1] VCS, 2013b (p5)
[2] VERRA, undated,
[3] ClimatePartner, undated.

positively correlated with a sale of VCUs registered on the Verra VCU transaction database for the RPBNCMD project.

3. The project – background and development

The project was initiated by the private Lima-based REDD project development company Bosques Amazonicos SAC (BAM) in partnership with the Federation of Brazil nut producers of Madre de Dios, FEPROCAMD. As well as developing and running REDD projects, benefiting from the sale of carbon credits, BAM is also involved in forestry operations and the trade in timber. FEPROCAMD is the principal organization representing nut collectors in Madre de Dios. In 2009 BAM signed a partnership contract with FEPROCAMD. Under the contract, in exchange for carbon rights to 405 Brazil nut concessions operated by some of FEPROCAMD's members, BAM was to provide the participating concessionaires with technical and financial support and a share of the carbon credits generated by the project. The project was also to build a Brazil nut processing plant. This was to be an important part of the project, as it would enable the Brazil nut concessionaires to avoid the usual 'middle-men' between the collectors and processing companies, thus capturing more of the product value and increasing earnings through value-added and export.

In 2012, the project was validated under the Voluntary Carbon Standard (VCS) and in 2014 it was validated (by Scientific Certification Services Inc, SCS) under the Community, Climate and Biodiversity Standard (CCBS). For reasons which are not known, the CCBS validation expired sometime thereafter and was not renewed[4]. The validation, verification, and monitoring development of the project, as well some details of carbon credit sales from it, are recorded in the databases and registries of Verra, which "develops and administers" the VCS certification program, and "provides oversight to all operational components of the Program".[5]

Around 2012, BAM entered an agreement with Indonesia-based Centre for International Forestry Research (CIFOR) for it to conduct research in the area as the project developed[6]. Numerous reports and papers resulted from this, some of which provide accounts of the mounting problems of the project and are referred to in this analysis.

[4] Verra, undated ('Project summary' panel)
[5] Verra, undated b.
[6] VCS, 2020b (p16)

The initiative is located in the Tahuamanu and Tambopata provinces and straddles the Inter-Oceanic Highway connecting Brazil to the Pacific coast. See Figure 1.

Figure 1. Location of the project area

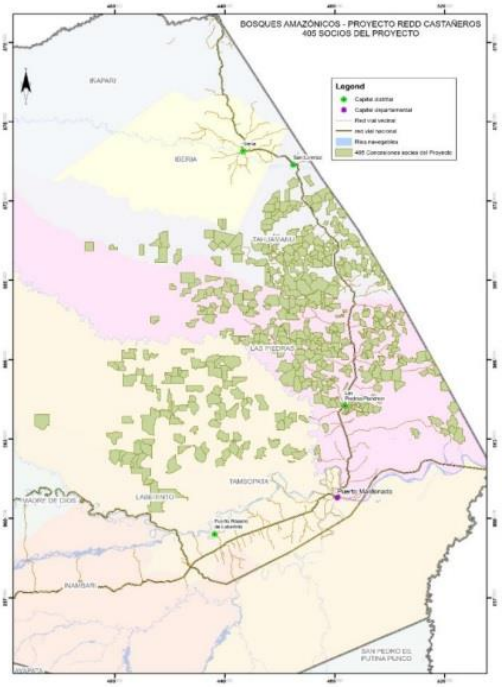
The project is based on the simple notion that Brazil nut production supports forest conservation because Brazil nuts are only produced by trees that grow in native forests with an intact forest canopy. By seeking to conserve the source of their livelihoods, Brazil nut harvesters (BNHs) thus have an interest in conserving the forest. In some cases, BNHs have indeed been a strong force for forest protection; in Brazil, they worked alongside (and sometimes doubled as) traditional tappers and collectors of natural rubber from wild rubber trees. With rubber tappers they succeeded in establishing a very large area of legally protected 'extractive reserves' across the Brazilian Amazon region – though even these areas are proving vulnerable to economic changes and pressure for economic betterment by Brazil nut harvesters[7]. (As explained below in Section 8.1, the socio-economic situation of Brazil nut collectors in the project area in Peru, and the legal framework within which they operate, is distinctly different, and hence the previous successful experiences in Brazil could not be expected to play out in a similar way.).

According to the project developers, the intervention area of the initiative originally comprised 377 Brazil nut collection concessions covering 291,566 hectares[8], though by 2013 this was increased to 405 concessions covering 308,757 hectares[9] (see Figure 2). This latter is the figure taken to refer to the project area. The concessions are located within a broader 'initiative zone' of 1,015,316 hectares that includes a 'leakage belt'. This broader zone includes more than 600 nonparticipating BNH concessions as well as adjacent agricultural land, mining areas and other forestry concessions. So only

[7] Pinto, D. 2020
[8] BAM, 2012 (p5)
[9] VCS, 2020 (p6)

around 40% of concessionaires joined the project. Even this selection was later to shrink, as it became clear that logging and deforestation was happening even within the original 405 concessions.

Map 1: location of the REDD project



Source: Self-made

Figure 2. Map of the Brazil nut concessions as presented by BAM[10]

The project formally started in September 2009, with the full carbon crediting period running from Jan 1st 2010 to the end of 2040, i.e. 31 years[11]. The monitoring and verification periods ran from Jan 1st 2010 to the end of 2012, and then supposedly every two years thereafter. But the project seems to have hit problems very early on. Construction of the processing plant was suspended in 2011, and in 2014 CIFOR described the project as '*still not fully underway*" [12]. CIFOR later reported that "*as of October 2013, BAM had still not sold any carbon credits or built the processing plant, although it had purchased the land on which the plant would be built*"[13].

[10] BAM, 2019 (p6)
[11] BAM, 2012 (p5)
[12] Garrish et al, 2014
[13] Kowler et al, 2016

In 2016, CIFOR wrote that *"At the time of writing, this project has been suspended as a result of insufficient remaining funds due to the high transaction costs involved in the project and the delay in the sale of carbon credits"*[14]. There certainly seems to have been a lack of activity after the end of the crediting period 2013-2014. Final verification reports for this period were not produced by BAM until mid-2019[15] (see Section 9 below). The verification due for the period 2017-2018 seems to have been skipped altogether, for reasons which are not clear or explained. One consequence of this is that there is little substantive documentation available relating to project activities after the end of 2016.

However, Verra's credit transaction registry shows that, by the end of 2013, BAM was already selling credits, albeit not in huge numbers. Sales stepped up significantly in 2014 and some substantial sales (in excess of 100,000 units each) were recorded already for April 2016.

Nevertheless, the main project partner, FEPROCAMD, carried on actively working with its member concessionaires[16] - though evidently with little or no support or finance from BAM. In August 2020, the project received a major boost through the sale of 1.1 million credits to BP Gas, and the announcement of a 'strategic partnership' with the company. See Figure 3 below.

Aliados estratégicos:

BP Gas Limited

En agosto de 2020, iniciamos una alianza estratégica con la empresa internacional BP, consolidando una venta record de 1'100,000 créditos de carbono que asegura la ejecución del presupuesto de REDD+ Castañeros por los siguientes dos años.

bp

Principales actividades realizadas en el mes:

Entrega de beneficios económicos a nuestros socios.

Desde el mes de diciembre venimos realizado la entrega de beneficios económicos a nuestros socios, en reconocimiento al compromiso demostrado por conservar los bosques de sus concesiones. A la fecha, **hemos realizado la entrega de S/. 1,500 soles por persona a un total de 222 socios.** Continuaremos con esta labor a lo largo del mes de febrero.

Durante las sesiones, generamos espacio para conversar sobre el proyecto, nuestra historia y planes a futuro. Asimismo, para tomar nota sobre los requerimientos y expectativas de nuestros socios a fin de dar apertura a la mejora constante.

Figure 3 BAM/FEPROCAMD announce sale of credits to and partnership with BP

This announcement claims that 222 of the concessionaires had received payments of 1,500 Peruvian soles, or around US$ 364 each. However, as Section 8.3.1 below

[14] Kowler et al, 2016.
[15] BAM, 2019
[16] See for example, FEPROCAMD's Facebook page https://www.facebook.com/david.asturimahuamantica

explores, there is evidence that there are still ongoing difficulties in the transfer of funds – and information - from BAM to FEPROCAMD.

Most recently, in February 2021, a new verification assessment of the project by VCS and CCBA was announced, for the period 2017-2020. Two 'missing' monitoring period of 2017-2018, and 2019-2020 were evidently to be carried out together. No results of this assessment seem yet to be available.

The exact legal status of the project is unknown, as the last known Ministry of the Environment authorization of it as a standalone project was only valid until December 31, 2020"[17].

4. Additionality

'Additionality' is an absolutely essential feature of any project claiming to generate carbon credits, or indeed anything offering any climate benefit. At its most basic, it means simply that the activities undertaken should bring about reductions in emissions that would not have happened in the absence of the activities[18]. For the purposes of a carbon trading mechanism set up under the 1998 UNFCCC Kyoto Protocol, emissions reductions had to be 'additional to any that would have occurred without the project'[19] (UN 1998). According to the Institute for Climate Economics, the concept of additionality "is central to ensuring the environmental integrity of carbon crediting"[20].

The concept is closely linked to the issue of 'baselines', which is taken to be the 'without project' or 'business as usual' scenario, against which the 'with project scenario' is assessed. Simply put, the additionality of a project would be the carbon emissions in the 'without project scenario' minus the emissions in the 'with project' scenario. If this calculation is zero or negative, then there are no emissions reductions due to the project, thus no 'additionality', and no carbon credits should be issued.

There is often thus an inherent difficulty with additionality, because it relies of the use of a 'counter-factual' projection of what *might* have happened in the future. In one explanation of this "*the difficulty of evaluating additionality is assessment of alternative hypothetical scenarios or 'baselines' to which real world observations are compared. Given*

[17] VCS, 2020b (p19)
[18] Gillenwater, M, 2012 (p4)
[19] UNEP, undated.
[20] Shishlov I and Cochran I, 2016.

that these scenarios will never materialize if a project/policy is implemented, additionality can never be established with 100% certainty – even ex-post"[21].

For projects involving forests, land use change, demographics and other factors, the future scenarios and thus baselines can be open to hugely different interpretation and manipulation[22], as is explained below in Section 5. For example, it is not always clear, beyond the *proximate agents* (i.e, those with their hands on the chainsaws) what is causing deforestation in the first place. This can be anything from land use, migration, land tenure, economic and regional development policies, infrastructure, poverty, commodity prices, weather cycles etc.

This means that the precise nature of what needs to be done to *stop* deforestation can also be very complex. Even where deforestation appears to decline in a specific area, it still might not be clear whether a project itself caused the reduction, or whether it was due to one or other of many possible exogenous factors usually at play. A clearer indicator of additionality might be, for example, that as a result of a project intervention, the legal status of a forest was changed to one that offered more protection and that this was effectively enforced, and that some form of destructive activity, such as felling of timber, was demonstrably and permanently stopped.

However, in the case of the Tambopata Brazil nut harvesting REDD+ project, the project did not bring about any actual change in the legal designation or status of the forest in the project area. All of the Brazil nut concessions already existed and were legally designated, under a law dating from 2000[23], at the time the project was started. Therefore, the only additionality which could have arisen from the project was the extent to which it enabled the concessionaires to prevent deforestation which would otherwise have occurred on their land. This would have required additional rights to be acquired, or specific added benefits to flow from the project to the concessionaires, and tangible incentives to prevent deforestation both by the BNHs themselves and by others such as migrants entering the area along the Inter-Oceanic Highway in search of land to clear for farming.

The additionality was in fact exclusively calculated on the basis of financial incentives to the BNHs[24]. To do this, the project developer BAM compared the potential revenues

[21] Shishlov I and Cochran I, 2016
[22] Piraid, R and Karsenty, A, 2009.
[23] Garrish et al, 2014
[24] BAM, 2012 (p47)

from the 'without project scenario', consisting of converting all 800 hectares of an average BNH concession to farmland and pasture, with the 'with project scenario'. In this, "*Project revenues will be generated by processing and commercializing high value-added Brazil nuts. The analysis will demonstrate the financially attractiveness of the proposed project*".[25] According to the base Project Document, the project would also "*certify the Brazil nuts concessions with organic certification, thus achieving better revenues, harvesting and processing techniques of the Brazil nuts*."

This approach contains an underlying flaw, because deforestation of entire Brazil nut concessions is neither legal under the relevant legislation, nor likely in reality. As noted below, concessionaires are allowed to clear up to two hectares of their concessions for farming. Surpassing this limit is possible, given the context of poor capacity for monitoring or enforcement by the Peruvian authorities, but clearance of much larger areas would likely attract attention, resulting in revocation of the concession. Large-scale deforestation requires very substantial inputs of time, labour and capital which the BNHs mostly lack. Therefore, the 'with project scenario' was being compared with a 'without project scenario' that was very unlikely to happen.

As importantly, however, as detailed below in Section 8, none of the processing, value-added or organic certification ever actually happened, and virtually no real benefits flowed to the BNH concessionaires. This means that the claimed additionality of greater income for the BNHs also proved to be illusory and, at least for the first nine or ten years of the project, essentially nothing material to carbon emissions was happening in the project area that would not have happened without the project. As the following section explains, the VCUs claimed to be generated by the project were thus not the result of any genuine additionality, but of essentially fraudulent carbon accounting and a highly implausible counterfactual scenario.

5. Determination of the baseline and hence purported emissions reductions

The baseline for offset projects is critically important, because it determines the level of 'without project' carbon emissions against which the 'with project' actual emissions are subsequently compared. As noted above in Section 4, with a project such as the Tambopata project does, as these are subject to multiple influences and factors, many

[25] BAM, 2012 (p48)

of them entirely exogenous to the project area. There is an inherent moral hazard in that, the higher the baseline, the more the scope to supposedly generate emissions' reductions (and thus earnings from the sale of credits/VCUs), and hence the temptation to inflate baselines above those that are realistic.

5.1 The baseline for deforestation

The generation of VCUs by the project is primarily based on a claimed reduction of deforestation that would have happened without the project, by providing additional financial support to the BNHs, who are assumed to protect the forest. Hence the baseline rate of deforestation, i.e., that which is claimed to represent what would have happened without the project, is central to any claims about how much deforestation is then 'avoided'.

According to BAM, the baseline for the RPBNCMD was determined thus:

> *"Using the Deforestation Model developed by BAM, in collaboration with Carbon Decision International and AIDER, the deforestation rate in the Madre de Dios department was estimated. This model was based on the analysis of three Landsat satellite images of (sic) from the years 2000, 2005 and 2008, which revealed different deforestation rates in the department. In the project area, approximately 1.23% of forested land will be lost per year… The estimated deforestation corresponding to the Area of the Project, according to the model of the 31 years of the crediting period, totals 100,297 hectares, which represents 34.40% of the area of the project".*[26]

No information is given about *exactly* which areas were covered by the Landsat images used by BAM, nor what the methodology was for then converting them to the baseline figure for deforestation. The 'Deforestation Model developed by BAM' is evidently a proprietary model and is not available for checking what inputs and outputs were used in order to achieve the baseline rate of deforestation of 1.23% per year.

However, for the purposes of this assessment, multiple tests were run using the global standard deforestation geo-database, the Global Forest Loss Dataset, with the analysis tool provided by the Global Forest Watch website[27], so as to derive an independent assessment of annual deforestation in the project area, both during the supposed 'baseline' years/period, and after project startup. The Global Forest Loss Dataset is

[26] BAM, 2012 (p5)
[27] Global Forest Watch, undated. Note that this technically describes 'tree loss'.

based on Landsat series images, i.e, those which the project developers claim had been used to generate their baseline.

This analysis shows a huge discrepancy between the project baseline and the actual rate of deforestation pertaining during the baseline period, in the order of a factor of 8-10. This assessment is presented below.

It should be noted that a *highly* accurate assessment of the actual tree loss which occurred in the concessions both before the project and after is technically possible, but would require access to the GIS shapefile(s) for all of the individual 405 concessions, many of which are discontinuous. This shapefile evidently exists but is not publicly available[28]. However, a shapefile covering what the project developers describe as the 'project intervention zone' - which consists of the Project Area and the 'Leakage Belt'[29] immediately surrounding the concessions - was available from the Verra website, and has been used. The 'intervention zone' defined by this shapefile covers 1.13 million hectares, the 405 Brazil nut concessions accounting for around 28% of it.[30]

The following assessments have been run:

- The annual deforestation rate in the years 2000/2001[31], 2005 and 2007
- The average deforestation rate for 2001-2010
- The average deforestation rates for 2010-2020
- The annual deforestation rate for 2020

For all the time periods, the assessment was done both for the entire 'intervention zone', using the project shapefile available, as well as another shapefile created by myself. This latter selects a smaller 'core' part of the overall 'intervention' area containing a high concentration of the Brazil nut concessions. It covers nearly 300,000 hectares, and contains approximately half of the 405 concessions, which cover about half of the area. (See Figure 4, and compare with Figure 3).

The purpose of using this selected area alongside the full intervention zone is to assess the 'noise' caused in the analysis by deforestation occurring outside of the concessions

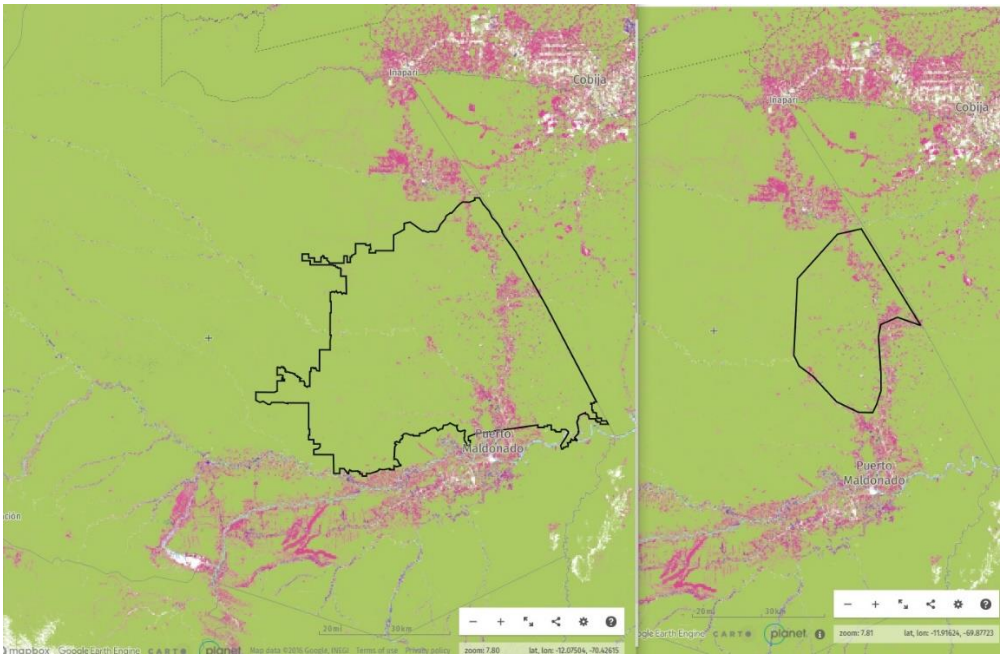
[28] VCS, 2020 (p38)
[29] SCS, 2014
[30] Note that there is a discrepancy between the size of the 'intervention zone' as described in the project documentation - 1,015,316 hectares – and the project shapefile which defines an area of 1,130,000 hectares, of which approximately 1,110,000 was forested in 2020. The overall figure as defined in the shapefile is used for all assessments.
[31] Note that data for my independent assessment is used for 2001 rather than 2000, as data for 2000 is not available.

but still inside the wider intervention area, and to gauge whether there are deforestation trends related to the Brazil nut concessions themselves. It would be expected that, if the underlying logic of the project is correct, and its implementation effective, then deforestation in the core area containing more concessions would be lower than in the whole intervention zone.

Box 1: Caution in comparing deforestation across periods using the Global Forest Loss data.

Changes in the methodology used for the analysis of deforestation by the University of Maryland (UMD), which provides the Global Forest Loss Data on which the Global Forest Watch tools are based, mean that comparisons of deforestation across the period 2000-2020 have to be treated "cautiously". The analytical model used to convert raw satellite imagery into deforestation data changed in 2011 and 2015, and the underlying data changed in 2013 with the use of new Landsat 8 data[32]. Generally, because of increased sensitivity of the methodology, post-2015 data tend to show relatively higher rates of deforestation. However, as can be noted in Figure 5, the marked uptick in tree loss in the project area commenced already in 2010-11.

Figure 4. Showing the overall 'intervention zone' (left) and the selected 'core' area (right) where Brazil nut concessions dominate.



[32] GFW, 2021

Note that green in the maps are forested areas, pink indicates deforestation from 2001-2020. The visual impact of the color scheme tends to give an exaggerated impression of the extent of deforestation

Table 1. Project baseline and independently assessed actual deforestation[33]

Period	Project baseline	Whole intervention zone – independent assessment		'Core' area - independent assessment	
	(%/year)	Actual tree loss (ha)	Tree loss rate (%/year)	Actual tree loss (ha)	Tree loss rate (%/year)
2000/2001	1.23	1,900	0.17	444	0.15
2005	1.23	3,140	0.28	698	0.23
2007	1.23	1,380	0.12	510	0.17
2001-2010	1.23	16,700	0.15	4,450	0.15
2011-2020	1.23	32,400	0.29	12,600	0.42
2020	1.23	4,700	0.42	2,030	0.68

The results of this analysis are presented in Table 1, and they show a number of important things:

1. Noting that both the areas analysed do not conform to the actual project accounting area, it is nevertheless significant that the actual tree loss in the wider intervention zone was as little as one-tenth (in 2007) of that set out in the deforestation baseline which was supposedly determined for the years 2000, 2005 and 2007.
2. On average, over the entire intervention zone, the actual tree loss of 0.15%/year during 2001-2010 was only about one-eighth of the annual deforestation rate used for the baseline.
3. The tree loss figures for the selected 'core' area containing a high percentage of Brazil nut concessions are broadly comparable with the wider area (up until

[33] See Annex 1 for records of the computations used to derive the data above

2010), and again showing an average deforestation rate of 0.15%/year for 2001-2010.

4. Between 2010 and 2020, deforestation accelerates across all areas, roughly doubling from 0.15% on average to 0.29%/year across the wider intervention zone. However, in the core project zone, it nearly trebles on average, to 0.42%/year.
5. In 2020, whilst deforestation in the wider intervention zone had more or less trebled from the 2001-2010 average, in the core project area it had more than quadrupled, to 0.69%/year (see also Figure 5).
6. Points 4 and 5 above might partly explained by the presence and proximity of the Interoceanic Highway in the selected 'core area'. Additional deforestation could have been happening outside the Brazil nut concessions, by immigrants occupying and clearing forest close to the road. However, there is evidence that the deforestation close to the road is also happening *inside* the Brazil nut concessions (see Section 6.1).

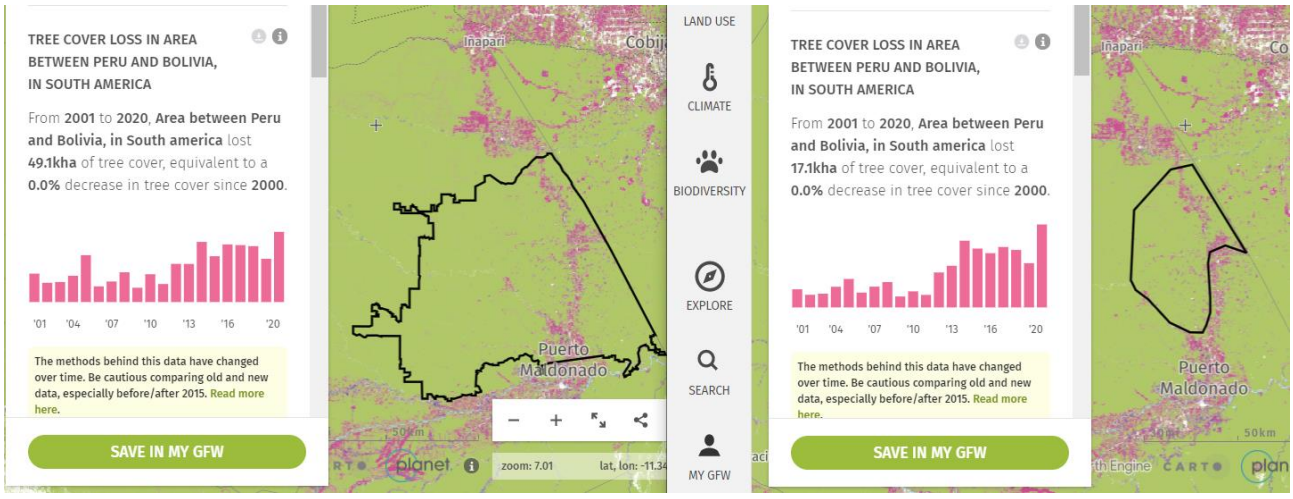


Figure 5. Deforestation rate in wider intervention area (left) and the 'core' project area, right, 2001-2020

It should also be noted that the choice of 2005 for use in the baseline calculation was choice of by far the highest rate of deforestation in the whole decade, and would have thus have skewed the baseline upward (see Figure 6).

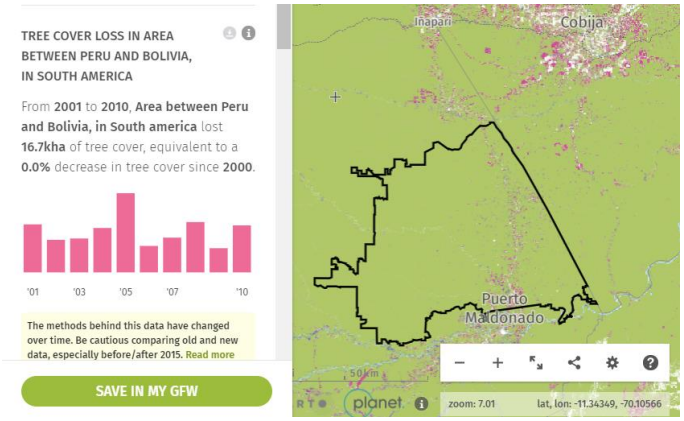


Figure 6. Tree loss in the whole intervention area, 2001-2010

The analysis thus strongly suggests that:

1. Notwithstanding that the areas analysed do not conform to the actual project accounting area, a highly inflated baseline was used for the project, thus greatly inflating the supposed emissions reductions (see below, Section 5.2). The actual tree loss in the area as whole through 2001-2010 was rather low. If the baseline figures were correct, then between 2011 and 2020, deforestation of more than 12% would have been seen across the wider intervention area (most of which is not 'Project area'), whereas in fact the total was only around 2.9%. Most likely, if the baseline figures were not simply entirely fictional, then they were created by assessing the deforestation rates in a highly selected area, such as immediately adjacent to the provincial capital, Puerto Maldonado, and were thus very unrepresentative of the region as a whole. The only other alternative explanation would be that the strict project area – that is, the 308,757 hectares containing only the 405 concessions - contained numerous concessions with very high deforestation occurring within them, which were used to construct an artificial baseline. However, this would certainly show up on the 'core area' assessment, which it does not.

2. A more representative baseline applicable to the project area for the decade before the project started would be around 0.15% deforestation per year.

3. Nothwithstanding what's noted in Box 1, the acceleration of tree loss in the wider intervention zone after 2010, when the project started, indicates that the project was ineffective at halting deforestation.

4. The *faster acceleration* of deforestation where there was a greater concentration of Brazil nut concessions, compared to the wider area, indicates that the concessions themselves were responsible for additional deforestation. This is consistent with what is reported about the project and its participants elsewhere (see Sections 5.2, 6 and 8 below)

5.2 The baseline for emissions

Under the emissions calculations used by the project – which follow a standard set of rules and methodology set by Verra/VCS - the overall deforestation baseline is then processed through a number of stages to arrive at an estimate of the carbon which would be emitted in the absence of the project. A simplified version of the main steps for obtaining this baseline level of emissions, and thence to the claimed amount of tradeable credits/VCUs, is as follows:

1. The project area is stratified, that is divided up into smaller areas of similar ecological type, (because different ecosystems, such as different types of forest, contain very different levels of carbon).
2. An assumed rate of change (mostly deforestation) is applied to each of these strata, with the total change amounting to the overall assumed baseline rate of change (in this project's case, around 1.23% deforestation per year). Each of the strata has an assessed value for above and below-ground carbon.
3. The sum of the carbon losses from the various strata provides an overall level of annual carbon loss from the project area if the project does not take place and the baseline rate of deforestation applies.
4. The amount of carbon left over in whatever replaces the forest – mostly farmland of one kind or another, but also bare ground - is also then calculated, on the basis of how much of each type of new land use replaces the original forest. This then provides a figure for the total residual amount of carbon left over in the deforested areas if the baseline amount of deforestation occurs.
5. This residual carbon is then deducted from the total estimated losses to provide a total gross figure for carbon losses under the baseline scenario.

6. From this gross figure is then deducted any emissions the project will cause or will occur in the project area for other reasons, and an amount for assumed 'leakage' of emissions from the project area to other places (such as people simply clearing forest outside the project area instead of inside of it because of any restrictions the project applies inside its area).
7. Finally, from this amount is deducted an amount of emissions reductions which are placed in a 'buffer' pool[34]. This represents the level of risk of 'reversals' (i.e., carbon emissions occurring instead of savings) assumed for the project. These buffer credits are held in an account and not traded, but can be released for trading after five years if the risk has at least not increased. If emissions are shown to have increased from the project, then a corresponding amount of the buffer pool is cancelled.
8. What remains after the buffer pool reductions is the amount of emissions reductions which can be verified and classed as VCUs for trading.
9. Normally, a projection of the project's VCUs over the first period or even all of it would be conducted, allowing for projected changes in project circumstances (such as more, or less, deforestation, emissions or leakage). However, the actual amount of VCUs issued is that which results from the project owner/developer conducting periodic monitoring, and subsequent verification by the verifier (i.e., generally VCS) sometime after each issuance/monitoring period (which usually covers 1-3 years) has been completed. These actual/verified 'emissions reductions' may differ significantly from the initial projections.

The above steps have been followed to calculate what a baseline of emissions reduction for the project, and thus its generation of VCUs, would look like if the more realistic baseline of ~0.15% annual deforestation had been used instead of the 1.23% as was actually used. The results of this, for the project year 2010 is shown in Table 2.

[34] Verra, 2019 (p29-31)

Table 2: Comparison of the project's annual emissions baseline for 2010, and a realistic baseline			
		A	B
VCS terminology		**Data as used in the project document, deforestation baseline =1.23%/yr**	**Using a realistic deforestation baseline = 0.15%/yr**
	Total C change in initial forests (t CO2e/yr)	3,060,684	382,586
	Residual carbon stock (tCO2e)	79,157	9,895
ΔCBSL,unplanned	Overall baseline (tCO2e/yr)	3,059,017	372,690
ΔCP	Project emissions	0	88,222
ΔCLK-AS,unplanned	Leakage (7.3%)	225,165	27,206
CREDD,t	ΔCBSL,unplanned minus ΔCP minus ΔCLK-AS,unplanned	2,833,852	257,262
BufferUNPLANNED	Buffer allowance (20%)	611,803	74,538
VCUs	**CREDD, t ,minus Buffer UNPLANNED**	**2,222,049**	**182,724**

Notes:

1. There seems to be some discrepancies in the project document calculation for ΔCBSL,unplanned.

2.The project emissions, ΔCP, are assumed to be the same in the 'realistic baseline' as in the actual project document. However, in the project document calculations,

these are dismissed as being 'negligible' because they represent less than 5% of the total emissions change.
3. See Excel file 'Calculations Workbook' for method of calculating the 'realistic baseline' scenario.
4. Project document data drawn from VCS, 2012 **(pp 53-77)**

This shows that, using a realistic baseline, the volume of VCUs which theoretically could have been generated by the project in its first year was only around 8% of those which the project claimed (compare column B with column A).

Using similar methods, a comparison can be made for projected VCU creation for later years of the project. This is shown in Table 3.

Table 3: Comparison of project's original VCU projection with those under a realistic baseline

Year	**VCUs projected by the project**	**VCUs theoretically created under a realistic baseline**
	A	B
2010	2,222,049	182,724
2011	2,222,670	186,976
2012	2,184,278	179,090
2013	2,344,471	197,075
2014	2,261,405	190,097
2015	2,305,004	192,072
2016	2,170,089	176,608
TOTAL	**15,709,966**	**1,304,642**

(Note that column A shows the VCUs *projected* by the project in 2010.The actual amounts claimed over the period proved to be somewhat less, as shown in Table 5 below)

The theoretical generation of credits projected at the start of the project could still be affected by circumstances in the project area, such as unexpected increases in deforestation. These should be detected in monitoring by the project developer, and reflected in how many VCUs were actually claimed, and then verified by the verifier, after each monitoring period. Changes detected by the verifier for each monitoring/ verification period (which for this project have so far been 2010-2012, 2013-2014 and 2015-2016) could also result in potentially significant alterations of the original calculation and the VCUs generated.

Such alterations in fact proved to be the case with the project, as the following sections explain. The impact of this on the overall level of emissions, and the creation of VCUs, is also then assessed.

5.3 The baseline and the verifiers

The baseline was fixed for ten years at the beginning of the project in 2009, and thus would have to be revised in 2019. Concerns about the baseline started turning up already in the VCS 2013-2014 monitoring report. This report noted as a 'Forward Action Request' that should be dealt with in a subsequent monitoring exercise, that:

> "*The verifiers consider the baseline scenario to be more complex than the one described in the project documentation. According to the [BAM], deforestation in the project area occurs mainly due to agricultural activity in situations of land invasion and lack of respect for the limits of forest concessions, that is, unplanned deforestation. Through spatial analysis, direct field observation and interviews with concessionaries, the audit team discovered that deforestation in the project area caused by a wider range of factors and situations. In addition to deforestation due to land invasions and the conversion of forests into grasslands, there is also deforestation generated by the concessionaires themselves to grown corn, cassava and other crops, which may even be considered as planned deforestation, if legally authorized. The audit team emphasizes the need to reassess the behaviour of deforestation agents and drivers of deforestation at the time the project baseline is reassessed.*"[35]

However, in the same report, despite recognising the evident problems with the baseline scenario, VCS decided to allow BAM to extend the use of the baseline a year longer, to 2020. (Identical wording to the above appeared in the 2015-2016 monitoring

[35] VCS, 2020b (p12)

report[36]). This means that, subject to verification, Verra would continue issuing credits to the project for a further six years under the existing baseline, even though it was aware that there were serious questions about the basis on which all the claimed emissions reductions were being calculated.

6. Project 'reversals'

6.1 The Brazil nut harvesters turn to logging

The key problem in terms of reversals (i.e., phenomena which increase emissions in the project area rather than decrease them) has evidently been that many of the BNH concessionaires are involved in activities that damage or destroy the forest rather than protect it. From the outset, BAM appears to have excluded a number of possible BNH concessions because of deforestation going on in them. According to BAM, "*The boundaries of the project area were defined based on the legal boundaries of each concession contract; nevertheless, some parts (especially the ones near the [Inter-Oceanic Highway -IOH] and secondary roads) were excluded because they had been deforested*." So the project focused only on those with a high carbon content and more likely not to be affected by deforestation.

As noted in the preceding section, the evidence suggests that, even with these 'high risk' concessionaires excluded, deforestation continued to accelerate in the area with more concessionaires, even further away from the Inter-Oceanic highway. The reasons why this was always likely to be the case, even in the 'with project' scenario, are explored more in Section 8. For the 2010-2012 accounting period, 84 of the concessions were quietly removed from the carbon calculations because there was logging going on in them.[37] As the verifiers for VCS noted at the time, this was not strictly permitted as "*the VCS Standard does not indicate that it is acceptable to remove project activity instances subsequent to the validation of those project activity instance*s"[38]. However, this seems to have been tolerated as the emissions were 'moved' to the Leakage Belt, though as Section 6.2.3 explains, this meant that they effectively

[36] VCS, 2020 (p12)
[37] VCS, 2013 (p20)
[38] VCS, 2013 (p32)

'disappeared'. For the 2013-2014 and 2015-2016 periods, 207 concessionaires (i.e., more than half) were removed from the calculations.[39]

In its 2015-2016 monitoring report, BAM noted that "*For this verification period, we had to exclude all the Brazil nut harvesters who did logging because of a methodological restriction.*" [40] The report noted that "*100 concessionaires were temporarily excluded of the project for this monitoring period because they were harvesting wood.*" The report included the map and explanation shown in Figure 7.

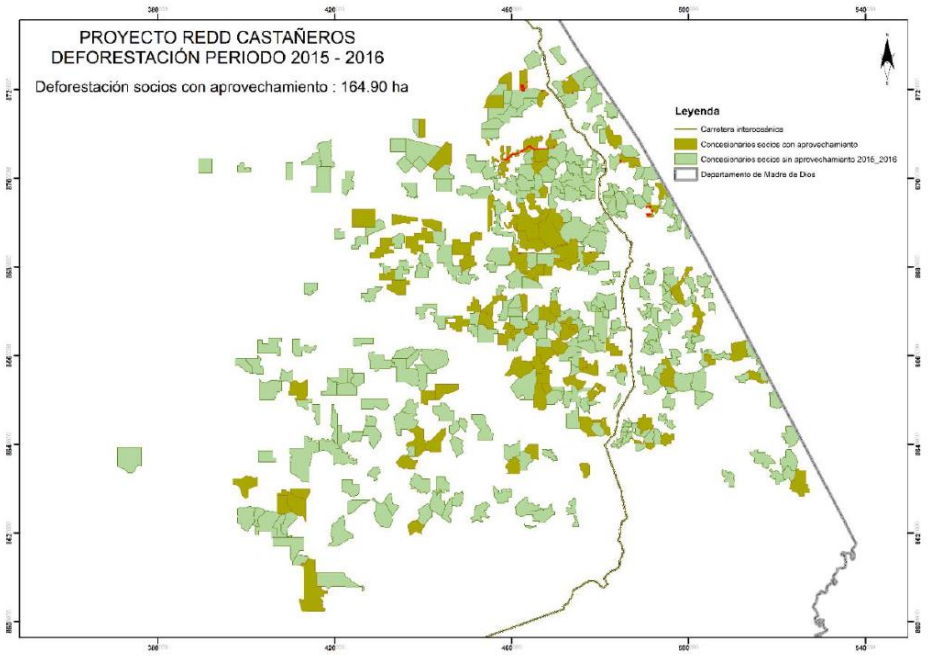


Figure 7: Exclusion of concessionaires from the carbon accounts, 2015 –2016

"Gold polygons are the project instances that are not accounted ***for the current verification period,*** *while green polygons represent the project instances that are accounted. As can be seen in the map, deforestation analysis has been done for the whole project zone, independently if the instance will be accounted or not. Deforestation in the current period may be recognized by the Basis for claimed emissions reductions... Quantitatively, deforestation in temporarily excluded areas during the current verification period was 164.90 hectares, which accounted for 129,631.47 tCO2e of gross emissions as can be seen"*[41]

[39] VCS, 2020b (p18)
[40] BAM, 2019 **(p3)**
[41] BAM, 2019 **(p46)**

BAM stated that 100 was a "high" number of concessionaires involved in logging. In fact, later verification by VSC found that "*of the 405 concessionaires belonging to the scope of the project, only 198 partners were considered in the monitored period, and these partners correspond to those who did not carry out legal logging in the project area between 2015 and 2016… the project proponent excluded 207 concessionaires from the scope of verification, which corresponded to a decrease of 186,961 ha in the project's monitoring area.*"[42] In other words, more than half of the BNH concessionaires, whose concessions represented more than 60% of the project area, were actually busy felling trees in their concessions (see Table 4). It can be noted from Figure 7 that those excluded were distributed across the entire intervention zone, and thus the forest damage underway was not particularly associated with proximity to the Inter-Oceanic Highway. The VCS monitoring report for this period challenged not only the numbers of concessionaires excluded, but also the method that BAM had used for calculating what impact this had had on the project's supposed emissions reductions[43].

Table 4: Number of Brazil Nut concessions excluded from the project

Date (VCS monitoring period)	**2010-2012**	**2013-2014**	**2015-2016**
Number of concessions excluded	**84**	**207**	**207**

The exclusion of a large number of concessionaires from the area as defined for carbon accounting also has the effect of undermining any claim to additionality the project might have. The areas concerned, undergoing deforestation or forest degradation, were obviously net emitters of greenhouse gases. Rather than reducing the overall claimed emissions reductions for the original project area by the emissions caused by the destructive project participants, these latter were simply removed from the carbon accounting for the period, leaving the supposed emissions reductions for the remaining area intact.

[42] VCS, 2020 (p37)
[43] VCS, 2020 (pp35-37)

Technically, the excluded BNH concessionaires were moved from the Project Area to the Leakage Belt. This ought to show in increased emissions in the Leakage Belt due to leakage from the project area (which would then have to be deducted from the overall claimed emissions reductions). However, as Section 6.2.3 below explains, because the baseline emissions for the Leakage Belt are themselves as grossly inflated as those in the project area, the project's calculations claim that, even with these clearly substantially increased emissions, there is still a net *reduction* in the Leakage Belt and therefore there is no 'penalty' to the project.

BAM claimed that the exclusion of the concessionaires removed 112,831 tCO2e of gross emissions in 2013-14[44] and 129,631.47 tCO2e of gross emissions in 2015-16[45] from the calculations[46]. It is important to note that these relate only to *outright deforestation* being caused by the excluded concessionaires; the reason they were excluded, though, was for selective logging for timber, which would be counted as *forest degradation*, which would be additional to any emissions caused by outright deforestation. As explained in Section 6.2.4, the value of these additional emissions is not included in the project's calculations. It is hard to assess independently, though given the scale of the problem, and the substantial volumes of timber being extracted, it is likely to have been significant, and probably larger than the emissions due to outright deforestation.

There are therefore reasons to think that the exclusion of many BNH concessionaires would have had a marked impact on the purported 'emissions reductions' calculations. Even the 2010-2012 exclusion of 84 concessionaires represented a reduction of 40% in the total baseline for carbon reductions[47]. It is likely that, without the exclusion in 2015-2016 of more than two hundred of the concessionaires, the project would have generated many less reductions, even against the inflated baseline. Instead, with more than half the original concessionaires excluded because they were causing emissions, the claimed emissions reductions *increased* to 3,166,622 in the 2015-2016 period, from 2,149,576 in the previous (2013-2014) period.

[44] BAMD, 2019b (p44)
[45] BAM, 2019 (p46)
[46] It is not clear from the documentation whether these emissions contributed to the reported leakage of emissions from the project to the Leakage Belt, see section 6.2.3.
[47] VCS, 2013 (p20)

6.2 Other project emissions and carbon accounting issues

As well as the problem of logging for timber, deforestation, probably both legal and illegal was also going on in the concessions to create farmland, thus increasing emissions. As noted before, concessionaires were allowed to clear up to two hectares of farmland for themselves within the concessions, and numerous reports suggest that other causes of deforestation were also frequent (see section 8.1).

6.2.1 'Negligible' emissions that aren't negligible

Several mechanisms have been deployed to minimise the calculated impact of actual emissions on the purported emissions reductions. Important amongst these is the use of a 'negligibility' clause in the project methodology. This allows project emissions constituting less than five per cent of the total baseline emissions simply to be ignored and not deducted from the claimed VCUs. The sources of such project emissions include, inter alia:

I. Non-CO2 emissions from forest burning in the Leakage Belt
II. Clearance for infrastructure, especially roads
III. Emissions from forest monitoring activities, surveillance and checkpoints
IV. Operation of the Brazil nut processing plant

As noted elsewhere, there is little evidence that III and IV above actually happened anyway. However, the impact of this '5% negligibility rule', combined with the inflated baseline, can be a dramatic added inflation of the claimed emissions' reductions. For example, in the VCU calculation shown in Table 2, 88,222 tons CO2 (tCO2e) equivalent emissions from 'Non-CO2 emissions from forest burning' (I. above) were simply ignored by the project because they constituted only around 4 per cent of the claimed baseline emissions reductions. However, if a realistic baseline had been used, these would have constituted nearly 25 percent of the baseline, and would have had to be factored in to the VCU calculation as a 'negative' emission reduction. The total 'ignored emissions' in the project for this one source alone would amount to 890,484 tCO2e over the first ten years of the project[48].

It is also important to note, as can be seen from Table 6 below, that whilst the project reported substantial emissions for the 2010-2012 period, these fell dramatically in the

[48] BAM, 2012 (p64)

two succeeding monitoring periods. This is not explained. It may partly be the effect of exclusion of the concessionaires involved in logging from the later period, as the emissions from these would no longer be deducted from the claimed reductions. However, it seems difficult to reconcile this claimed drop in emissions when the gross loss of forest in the project area was clearly increasing.

6.2.2 Inadequate buffer pools

Another source of exaggeration of the tradeable VCUs generated by the project relates to the allocation of potential VCUs to a non-tradeable 'buffer pool' of carbon credits.

For every VCS-certified offset project, a certain percentage of all supposedly generated credits is set aside in a 'buffer pool', and cannot be sold, as a kind of insurance against project reversals or failures. The percentage buffered is determined through a risk assessment process. Hence, the higher the assessed risk, the more VCUs have to be pooled as a buffer, and the less are available for sale. In the case of the RPBNCMD project, the original project document used a 20% risk and hence buffer allocation, but this was reduced by the verifiers and the risk level has been set at 11-13%. Thus for the second reporting period (2013-14), 13% VCUs was removed from the sellable total as a buffer.

It is clear from the documentation that the risk assessment by VCS was woefully inadequate. The 2012 risk assessment failed to consider the management of the project by BAM, or its finances, as any risk, whereas many problems were already known, especially in terms of failure of the project to make adequate investment on the ground, which underpinned the entire additionality of the project.[49] As noted in Section 9 below, in the later monitoring and verification reports, the observed problems were clearly mounting, including questioning of the entire baseline model and the means of accounting of emissions or reductions. These and other areas should clearly have been given a substantial risk rating, which in turn would have increased the size of the VCU buffer pool. Many of the credits which became available for trading should never have been released.

[49] VCS, 2013b

6.2.3 Inflation of the Leakage Belt baseline

The deforestation and forest degradation that is claimed would have occurred in the Leakage Belt - i.e in the larger area surrounding the 300,000 hectares or so of actual project area – was inflated on the same basis as that for the project area. This has a material impact on the legitimacy of the claimed emissions reductions from the project, for the following reasons.

The calculation of project emissions (to be deducted from claimed reductions in emissions) has to include any emissions which are caused because the reductions in emissions in the project area simply results in emissions occurring *elsewhere* – for example, because people who would have caused deforestation inside the project area are prevented from deforesting, but simply move to an adjacent area of forest and deforest that instead. This is likely to be a significant issue where the project area and non-project area (i.e. Leakage Belt) are highly heterogeneous and fragmented, that is, there are lots of small pieces of project area intermingled with non-project area, and especially so where there is lack of clarity of land and usage rights and inter-mingling of different users with different objectives/motivations.

This issue has an added significance with this project because of the exclusion of many of the BNH concessionaries from the carbon calculations. For carbon accounting purposes, this meant that these BNH concessionaires were moved from the project area to the Leakage Belt. The outright deforestation and possibly more extensive forest degradation being caused by these concessionaires, and the concomitant emissions, should therefore have been counted as a 'leakage', and deducted from the claimed VCUs. Significant leakage was reported by the project: 692,989 tCO2eq in 2013-2014[50] and 864,260 tCO2eq in 2015-2016[51].

However, because the baseline level of emissions in the Leakage Belt had been set so high (and applied over a much larger area than the project area), the *actual* leakage of emissions from the project into the Leakage Belt appear as being much less than what might theoretically have happened under the baseline, and thus these real leakage emissions are simply treated as zero additional emissions. The effect of including the leaked emissions from 2013-14 and 2015-16 on the level of VCUs (also with a realistic baseline scenario) can be seen in Table 6.

[50] BAM, 2019b (pp 60-61)
[51] BAM, 2019 (pp 60-61)

6.2.4 Exclusion of emissions from non-certified logging

There is an inexplicable anomaly in the Verra methodology for counting emissions from timber extraction or commercial logging under the kinds of circumstances applying in this project. Such logging in tropical rainforests is typically *selective*, where a limited number of trees of commercial value are extracted. Although this leaves many trees and other vegetation standing (and is thus not usually described as 'deforestation') it still has the effect of reducing the forest's carbon stock, sometimes substantially (and typically causing knock-on effects which can continue reducing carbon over time). For carbon accounting purposes, it is usually described as 'forest degradation', and is attributed specific values distinct from 'deforestation'.

Under Verra's carbon accounting rules, timber felling operations in REDD+ project areas should be certified as sustainable under the Forest Stewardship Council (FSC) scheme – or otherwise be treated as illegal logging, or excluded from the carbon calculations[52]. As noted throughout this report, many of the BNH concessionaires were involved in timber extraction on their lands. They were thus degrading the forest and reducing its carbon stock (i.e, causing emissions). However, this logging was neither FSC certified, nor illegal, as the concessionaires were allowed to log a certain amount of timber under government-approved management plans.

As described in the 2015-2016 monitoring report for VCS, "*The project proponent does not calculate GHG emissions from forest management in the project area because these activities are not certified to the Forest Stewardship Council (FSC) forest management standards, thus following the requirements of the methodology*"[53]. In other words, the emissions from this concessionaire logging were simply ignored – though clearly they should have been included as additional emissions occurring in the Leakage Belt, to which the logging concessionaires had been 're-located'. Without additional information, it is technically difficult to assess how significant these emissions might have been. However, given that the concessions involved in logging during the entire 2013-2016 period covered fully 186,961 hectares[54], it is reasonable to assume that the emissions would have been very substantial.

[52] VCS, 2012
[53] VCS, 2020b (p58)
[54] VCS, 2020b (p37)

7. Validity of the VCUs – are any real emissions reductions occurring?

In a sense, the validity of the VCUs is already nullified because the project did not and does not represent any additionality and the project's 'counter-factual' was highly implausible from the outset, as outlined above. However, even setting this aside, the evident manipulation of the baseline, and the actual deforestation and logging trends observed in the area since the project started, it is clear that any claims to have generated any real emissions reductions are highly questionable, at best.

So far, the project has generated over 10 million VCUs, as shown below in Table 5.

Table 5: VCUs generated, 2010-2016

Years	VCUs
2010-2012	4,936,277
2013-2014	2,149,576
2015-2016	3,166,622

Using the same basic methods as the project, these have been re-calculated for the three monitoring/verification periods so far, using the more realistic baseline emissions which result from using a more realistic deforestation rate, and then also including other emissions omitted by the project on various 'technical'/methodological grounds as described in section 6.2 above. These are shown below in Table 6.

Several things should be noted about this:

1. As noted already, there is an anomalous drop in the reported project emissions after the 2010-2012 period (column D), which appears partly to be related to the exclusion from the project area accounting of the BNH concessionaires involved in logging.

2. As noted above in Section 6.2., substantial actual emissions have been systematically removed from the project emissions (column D), such as under the '5% negligibility' rule.

3. The figures for leakage included in the project's calculations (column E) is also implausibly low, especially given that the known emissions from the excluded BNH concessionaires had effectively become leakage. As explained in Section 6.2.3, it results from the huge inflation of the baseline emission for the leakage belt, the same as for the Project Area, meaning that even significant increases in the actual emissions in the Leakage Belt (column K) were not counted as emissions.

4. The figures for reported emissions, both in the project area and leaked to the Leakage Belt, do *not* include the likely substantial emissions due to forest degradation caused by selective logging by many of the BNH concessionaires. As explained in Section 6.2.4, these emissions are not recorded in the project documentation and are difficult to calculate independently with the currently available information.

Table 6: Comparison of VCUs actually generated under the inflated baseline with those theoretically generated under a realistic baseline, including known emissions[55].

A	B	C	D	E	F	G	H	I	J	K	L
Period	**Original project project-ions**	**Verified baseline emissions**	**Verified project Emissions**	**Lea k-age**	**Net GHG emissions reduction s or removals**	**Buffer pool allocate-ion**	**VCUs**	**Baseline emissions with realistic baseline (See calculate-ions work-book)**	**Max VCUs with realistic baseline scenario, minus reported actual project emissions**	**Actual reported leakage to the leakage belt**	**Max VCUs with realistic baseline scenario, minus reported project emissions and actual leakage**
					(=C-D-E)		(=F-G)		(=I-D)		(= J-K)
2010-2012	6,628,997	7,755,174	1,904,717	0	5,579,828	643,550	4,936,279	1,111,280	-1,096,816	0	-1,096,816
2013-2014	4,605,876	2,741,885	132,274	75	2,488,825	339,250	2,149,575	771,252	428,425.95	692,989.05	-264,563.1
2015-2016	4,475,093	4,033,280	188,947	123	3,666,386	499,763	3,166,622	751,158	357,144.85	864,260.42	-507,115.6

[55] All actual project data drawn from the BAM and VCS monitoring reports, BAM, 2019, BAM 2019b, VCS 2013, VCS 2020 and VCS, 2020b

Nevertheless, it can be seen that, discounting the various carbon accounting tricks which serve to inflate the purported emissions reductions and VCUs, and using a realistic baseline for all the project periods, along with the actual verified emissions from the project, the period 2010-2012 would be heavily in the negative in terms of VCUs (columns J and L). In fact, the negative one million emissions reductions in this period would wipe out all the 2010-12 buffer pool and all of the credits from the 2013-2014 period. Then, for 2013-2014 and 2015-2016, deducting the known project leakage to the Leakage Belt (column K) from the gross emissions reductions under a realistic baseline (column J), a heavily negative balance is also seen for these two periods.

Thus, for all the periods, the data strongly suggest that, using a realistic baseline, and including a number of real known emissions which are excluded in the project's calculations, the overall negative emissions was greater than the total buffer pool. The project was a net emitter of greenhouse gases above the realistic baseline, and should not have been credited with any sellable VCUs. If the emissions due to forest degradation from selective logging by the BNH concessionaires were included, the project area would be an even greater net emitter of greenhouse gases.

8. Structural/design problems with the project

It is important to consider this, as there are reasons to believe the project could probably *never* achieve the kind of emissions savings claimed, because the intervention logic of it was fundamentally flawed. The failures are so basic that it points to lack of sincerity on the part of the project developer, and enormous incompetence or negligence on the part of the verification bodies.

8.1 'Brazil nut harvesters' or colonists, farmers and loggers?

As noted earlier, the underlying premise of the project was that supporting Brazil nut collectors would ensure better protection of the forest – because, extrapolating experience from Brazil, the nut collectors would have an interest in protecting the intact forest where Brazil nut trees thrive. This section considers how this premise was over-simplified to the point of being fundamentally flawed.

In the project area, as throughout Peru, the collection of non-timber forest products (NTFPs) (along with timber) is regulated under the Wildlife Law of 2000 (No. 27308), which establishes 40-year concessions for timber and NTFPs. Concessions can be of 25–4,000 hectare units. As CIFOR explains, "*although intended primarily for Brazil nut production, concessionaires can present complementary plans for other forest uses. A 2004 decree allowed timber harvests up to 5 m3/ha in Brazil nut concessions, but was rescinded in 2007. Timber extraction continues, however, and in 2009 and 2010 the volume of wood from Brazil nut concessions exceeded that from timber concessions in the [Madre de Dios] region*".[56] According to CIFOR, timber can in fact be removed from Brazil nut concessions, so long as it is conducted under a government-approved management plan.[57]

In addition, Brazil nut collectors are allowed to clear up to 2 hectares of their concessions for farming[58]. According to the CIFOR 2014 study, "*Concessionaires generally did not deforest more than 0.5–1.0 ha in a two-year period, with clearing generally associated with cropping or pasture creation. Nevertheless, when asked whether forest cover within the concessions had changed in the past two years, participants in every community survey indicated that forest cover had decreased*."[59] Nearly one-half of the concessionaires surveyed by CIFOR reported clearing land for crops.

Moreover, whilst a key deforestation threat is immigration and colonisation along the recently constructed Interoceanic Highway, which runs north-south down the eastern edge of the intervention zone and connects western Brazil with the Pacific Coast, some concessionaires were actively cooperating with the incomers. As CIFOR reported in 2014: *"Participants typically associated forest cover loss with increased immigration (three communities) or small-scale forestry (two communities). Some nut concessionaires, particularly those located near the 'Interoceanic Highway and with natural irrigation sources, sell parcels of land within their concession for agricultural uses. Although this practice is illegal, the government does not have the capacity to control it."*[60]

In addition, as noted already, 207 of the BNH concessionaires (51% of the total concessionaires in the project) were excluded from the carbon calculations by BAM because they were involved in logging. However, the 2014 CIFOR study found in a

[56] Garrish et al, 2014
[57] Evans, K, 2013
[58] Kowler et al., 2016
[59] Garrish et al, 2014
[60] Garrish et al, 2014

sample of nearly a third of the Brazil nut concessionaires in the project area that *60%* of them had been felling trees in their concessions for commercial sale. A VCS verification audit in 2019 found worse:

> *"Of the 24 areas visited (concessions) [during the 25th, 26th and 27th of November, 2019], 16 areas (66.6%) presented indications and evidence that there was logging, such as stumps, logs, trails and the own testimonials from the concessionaires.*
>
> *It is the audit team understanding that the extraction of trees for illegal timber or fuelwood and charcoal is a major driver for forest degradation in the project area. The proponent failed to explain the reason for the proposed methodological deviation and to demonstrate that the gap in participatory diagnosis does not affect the conservatism of GHG emission reduction calculations....This non-compliance report remains open."*[61]

Brazil nut collecting is a highly seasonal activity, running for only 2-3 months per year, so concessionaires were complementing their incomes through logging. The project was supposed to have provided "permanent advice" on how to conduct 'Reduced Impact Logging' (RIL), as well as training and management to help the concessionaires "manage their concessions better"[62], but there is no evidence that any of this ever happened.

According to my calculations, the reported average amount of timber felled in each concession is around 666 cubic metres, a substantial amount, though the environmental impact of which would depend on how the felling was distributed through the concession. As explored below in Section 8.3, there has been clear and serious failures of the project to make payments to concessionaires; the income from logging, however, averaged around $6,200 per concessionaire, or between one-quarter and one-half of reported concessionaire incomes[63]. Brazil nut trees can in fact tolerate a certain amount of forest felling around them, therefore it is wrong to think that nut collectors have an interest in keeping their concessions in pristine condition.[64]

Yet another cause of deforestation in the area is illegal small-scale mining, mostly for gold[65]. Whilst there is only a small (c2%) overlap between the intervention zone and

[61] VCS, 2020 (p31)
[62] BAM, 2019
[63] Garrish et al, 2014
[64] Evans, K. 2013
[65] See for example, REDD-Monitor,

mining, some concessionaires were again involved in this activity. As CIFOR noted from their surveys in 2014, "*respondents anecdotally remarked that nut concessionaires often illegally invite miners into their concessions for a percentage of their profit.*"[66]

Finally, whereas Brazil-nut collectors in other parts of the Amazon might have long associations with the land and could be described as 'traditional' forest communities, in the Madre de Dios they are much more recent arrivals. As CIFOR noted, "*nearly three-quarters of the Brazil nut concessionaires interviewed were not born in their respective community*".[67] In fact, most of them are from the Andean highlands, all live in nearby towns and villages and none of them on their concessions[68], and are essentially agricultural colonists.

8.2 Land tenure – insecure and problematic

Another major difference between the situation of the nut collectors in Brazil and those in Peru, is that the former were able to secure permanent rights to the land containing their trees through the designation of Extractive Reserves. In Peru, as noted above, nut collectors operate on the basis of concessions, which are essentially 40-year exploitation agreements on land which remains owned by the State. 40 years is not a short period, but it also does not confer a strong incentive to invest in sustainability, nor to consider it as an asset to pass on to future generations. The Brazil nut concession agreements include provisions allowing deforestation as well as to exploit Brazil nuts.

A further problem is that, as in many places in the Global South, the tenure context is complex and contradictory, with potentially many other users having a claim to the same land. As CIFOR noted, "*One of the greatest challenges facing the initiative is unclear land tenure rights and chaotic zoning, resulting in overlapping land rights in the initiative zone…Resolution of the problems of imprecise boundaries and overlapping claims, and the success of REDD+ in Madre de Dios, will hinge upon cooperation between the ministries to eliminate multiuse land zoning".*[69] As the project focused only on the Brazil nut concessions with a high carbon content, and most collector concessionaires did not join the project anyway, a patchwork pattern of concessionaires within the 'intervention zone' was created (as per Figure 2), with overlaps and gaps between them that could

[66] Garrish et al, 2014
[67] Garrish et al, 2014
[68] VCS, 2020 (p69)
[69] Garrish et al, 2014

be exploited by immigrants (or concessionaires themselves) to convert the land to farmland. The resulting distribution of project members makes little sense in terms of changing any overall deforestation trends affecting the area as a whole.

Unfortunately, whilst help with clarification of land rights was one of the promises of the project, little or nothing in this regard seems to have been achieved (or even attempted).

Thus the people upon whom the success of the project rests, the BNH concessionaires, have limited rights, do not have a particularly strong association with the forest, have opportunities to gain more income from other activities involving damage to the forest, have ethnic and socio-economic associations with incomers also doing so, or are embattled with tenure problems which they are unable to solve. The collectors do not own the land or the trees they are collecting from, therefore supporting them economically does not necessarily provide any additional protections to the forest. All in all, this would never have been a propitious context on which to project high expectations that the collectors would somehow become effective 'guardians of the forest'. The 2014 CIFOR study showed that nearly two-fifths of concessionaires surveyed were not even aware they were part of a REDD project.[70]

The difficulties which have subsequently arisen, including accelerating deforestation, bear testimony to these underlying design flaws. These problems *should* have been foreseen by the project developers, and they certainly should have been identified and challenged by the verifiers.

On top of all this, there also seems to have been structural and circumstantial reasons why the problems were worsened by lack of constant financial support to the BNH concessionaires by the project developers.

8.3 Project finances – a money pump for Lima businessmen?

8.3.1 Follow the money...

As already noted in Section 4, the distribution of benefits from the project to the Brazil nut concessionaires is crucial, because it underpinned its entire claim to additionality.

[70] Garrish et al, 2014

But the financial structure and subsequent operation of it strongly mitigated against this basis of additionality ever being achieved.

As has already been noted, under the terms of the REDD project, the developer would capture fully 70% of the value of sale of carbon credits, with the remaining 30% going to FEPROCAMD and its members. There is evidence that this bled essential investment from the project on the ground, diminishing further any likelihood of success.

The Verra carbon credit sales registry for the project shows that in total 9,339,294 credits have been sold until 12th of November 2021.[71]

Nearly 500,000 credits had been sold by the end of the 2014. During 2015 and 2016, another 750,000 were sold[71]. The actual value of any of these sales is not reported or known, but at prevailing prices for VCS credits of around $4-$6/tonne CO2e[72], a rough figure of US$5m-US$7.5m in credit sales can be estimated. During 2017-2018, another nearly 1.5 million credits were sold, even though the project was not being independently monitored and appeared to be, in effect, 'suspended'. Sales of credits increased dramatically after 2018. All of these credits, indeed all those sold right up until the latest sale of 1,616 credits on 23rd September 2021, were of 'vintage 2015-2016' or earlier.

However, according to CIFOR, up until its study in 2014, all the carbon credit income from the project had gone to cover project costs: *"Once the initiative was VCS-validated in 2012, approximately 1.5 million verified carbon units (VCUs) were sold to four clients (the majority negotiated with BioCarbon Group Pte Limited for 1,116,504 VCUs) but the sale has covered costs and no direct payments have yet been received by concessionaires."*[73] (Note that the Verra registry does not show records of such large sales this early on, though it was reported in 2013 that *"Approximately 1.5 million VCUs have been forward sold to four clients. The project expects to sell additional 400,000 VCUs in the second semester of 2013, after the project has received verification, at an average price of US$4"*)[74].

The VCS Monitoring Report for 2013-2014 noted that:

[71] Verra, undated c.
[72] Stanley, MP, 2012
[73] Garrish V, et al. 2014
[74] VCS, 2013b, (p4)

> *"The audit team understands that no clear economic or financial incentives to the concessionaries have been generated due to the project implementation during the monitoring period covered by this verification. This conclusion was supported by interviews conducted with the concessionaries in the field and corroborated by evidence taken from the project complaint box, which demonstrates the concessionaries' dissatisfaction with the project benefit-sharing. According to the project documents and contracts signed among the parties, the concessionaries have the right to benefit from 30% of the net carbon credits generated by the project verification."*[75]

Little seems to have changed as a result of this admonishment. BAM's 2019 report for the 2015-2016 period contains a number of similar complaints received from the concessionaires about the failure of BAM to meet its financial commitments (see below, Figure 10)[76]. Somewhat contemptuously, no attempt was made by BAM to address these complaints. Although Verra auditors received directly complaints about the lack of transparency and the degree of implementation of the project activities during their 2019 field audit mission, these were dismissed as "*typical opinions expressed in a REDD + project implemented in a complex reality*"[77].

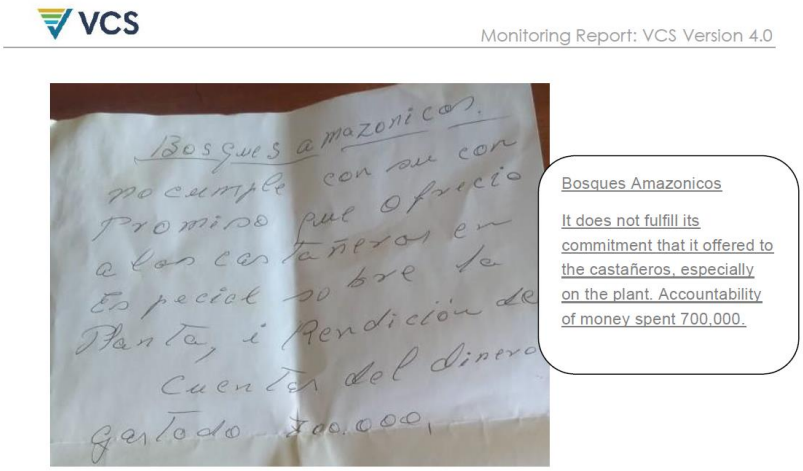


Figure 10 - example of complaint received by BAM about failure to meet its commitments.

According to the 2016 CIFOR study, "*Many of the concessionaires were unaware of any contractual recourse; in other words, what would happen if any of the participating actors*

[75] VCS, 2020b (p12)
[76] BAM, 2019 (p14-16)
[77] VCS, 2020b (p20)

did not meet their obligations"[78] Moreover, FEPROCAMD and the concessionaires "*were not clear about the amount of carbon to be captured, or on how much might be earned through carbon sales*". [79]

With rapidly increasing credit sales, potentially running to many millions of dollars up until the present time, substantial payments or transfers of credits should have been due to FEPROCAMD and its member Brazil nut harvesters. However, in February 2021, in two letters sent on the same day to BAM, FEPROCAMD set out a number of wide-ranging grievances and requests[80]. Amongst these are a request that a bank account should be set up. It is not impossible that any fund transfers had earlier been conducted in cash, but it seems astonishing that more than ten years after the project had started, FEPROCAMD did not even have a proper account for receipt of any payments.

Hinting at wider concerns about BAM's financial transparency and probity, it also asked for "*all the negotiation documents on the sale of advance carbon bonds with the companies BP Gas and BAM*", "*the closing of expenses of the REDD project corresponding to the years 2018-2019*", "*a detailed report of monthly expenditures executed in the REDD Project*" and a written "*commitment to enter into the renegotiation of the profit percentage of 50%*"[81]. It is clear from one of the letters that multiple requests for such information had been made previously, without any response from BAM. It is not known what, if any, response was received.

Complaints about the transparency and transfer of funds were evidently lodged with VERRA, which requested BAM to explain what had happened. In response to this, VERRA reported in November 2020 that "*the project proponent made available to the audit team contracts that show the donation of VCUs from BAM to FEPROCAMD and supporting documents that show other types of expenses associated with the project activities*".[82] In fact BAM stated that "*BAM has transferred to FEPROCAMD 1,039,507 VCUs in 2018, which is equivalent to 29% of the credits sold. Additionally, according to the 2016 agreement, BAM and FEPROCAMD recognize that the investment made in the project for the benefit of the castañeros, amounts to 2,120,463. All this amounts to 3,159,970 VCUs, which represents 87% of the credits sold and 64% of the credits*

[78] Kowler et al, 2016.
[79] Kowler et al, 2016
[80] FEPROCAMD, 2021a and FEPROCAMD, 2021b
[81] FEPROCAMD, 2021b
[82] VERRA, 2020 (p3)

available for sale, which far exceeds the percentage agreed in the Framework Agreement."[83]. This still fails to confirm that any cash payments were made, rather transfers of VCUs (which may be of little value to FEPRACMD if they cannot sell them) and payments for project expenses. As VCS noted, "*the VCU transaction does not necessarily correspond to the generation of benefits to the concessionaires.*"[84] Evidently, project expenses were counted by BAM as a 'benefit' to the concessionaires. VCS noted that "*the amounts reported as project expenses in these different categories, it is not clear to the audit team whether it represents or could be considered as proof of direct benefit to the concessionaires*".

8.3.2. A mythical processing plant?

According to BAM's original project document, "*our approach is to focus on the increase of our partners' incomes by improving forest management (adding value through processing and exporting, reforestation and certification, among others)*" and that "*the Brazil nut processing plant is the main action strategy of the project to seek profitability and value added to the Brazil nuts of the Concessionaires.*"[85] The project was to be completed and running by 2014.

However, according to CIFOR in 2014, "*the exact manner in which concessionaires will receive income from the nut processing plant has yet to be determined*"[86]. In 2016, CIFOR reported that, by October 2013, BAM "*had still not built the processing plant, although it had purchased the land on which the plant would be built and the equipment to begin construction*".[87] According to BAM in 2019, money for the processing plant was 'loaned' to the concessionaires and to be returned from the sale of nuts[88]. This report does not confirm that the plant actually exists.

Indeed, no evidence at all can be found that the processing plant has been built. There are no pictures nor any record of it presented anywhere in the documentation, including in likely places such as FEPROCAMD's Facebook feed, or through a Google search. Indeed, in the February 2021 correspondence from FEPROCAMD to BAM referred to above, the association notes that "*BAM has not yet complied with the formal*

[83] VCS, 2020 (p91)
[84] VCS, 2020 (p76)
[85] BAM, 2012 (P16)
[86] Garrish V, et al, 2014
[87] Kowler et al, 2016
[88] BAM, 2019 (p18)

and documentary transfer of the assets (land and plant machinery) that belong to the partners of the REDD + Project".[89]

What implicitly purports to be video footage of the plant in ClimatePartner's promotion video for the project appears to have been falsified or used in error. As can be seen below in Figure 11, the video includes footage produced by or for the company Agriforest SAC, not FEPROCAMD.

Figure 11: Whose Brazil nut processing plant?

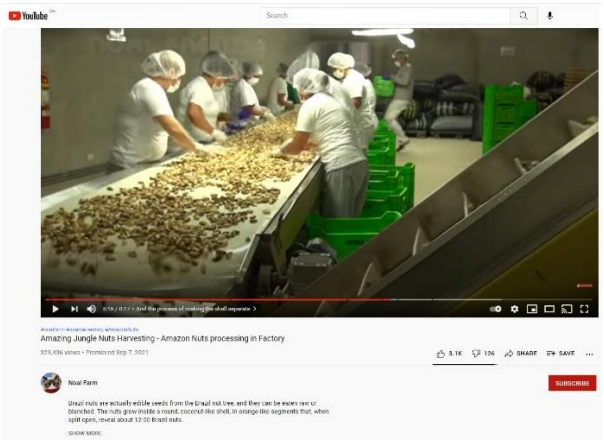
1. ClimatePartner's project promotion video implies that the processing plant exists and is benefiting the project's Brazil nut collectors.[90]

2. However, the logo clearly seen on the packer's overalls in the ClimatePartner video is that of the company Agriforest SAC.

AGRIFOREST S.A.C.

Psje. José Boterín 197
Santa Catalina, La Victoria, Lima-Perú

3. Agriforest SAC is a Lima-based company with substantial operations in nut and other forest product processing.[91]



4. Some of the same footage used in the ClimatePartner video can be seen in a video available on YouTube made in conjunction with Agriforest SAC.[92]

[89] In the original, "BAM aun no ha cumplido con la transferencia formal y documental de los bienes (terrenos y macquinarias de planta) que pertenecen a los socios del Poyecto REDD+", FEPROCAMD, 2021b
[90] ClimatePartner, 2020.
[91] Agriforest, undated.
[92] Noal Farm, 2021

Taken together, these financial issues point to a project that was principally intended to generate maximum profits for its developer, whilst reinvesting little back into ensuring its success. Basic mechanisms for ensuring payments to the supposed beneficiaries and implementers have been lacking throughout. It is possible that, aside from the reported payments from the BP Gas 'partnership', neither FEPROCAM nor any of its members have ever received any significant financial or other benefit from the project. In this case, it is hardly surprising that the project appears to have had little or no impact on the ground in reducing deforestation or carbon emissions.

9. Project monitoring

The sequencing and timing of monitoring of the project points to a chaotic situation where key processes were not conducted in a timely manner, if at all. The existing reports are numerous, but the dating and content of these paints a picture of neglect or abandonment of serious monitoring and verification. After 2012, BAM's own monitoring reports only appeared years after the monitoring period concerned. For example, the monitoring report for the 2015-2016 monitoring period only appeared in its final form in June 2019.

No doubt because of this, the monitoring verification reports carried out for Verra also lagged many years behind. For example, the monitoring verification report for the 2013-2014 period is dated October 13th 2020 – nearly six years after the monitoring period had ended - and that for the 2015-2016 period appears to have been issued a month later, on 16th November 2020, on the basis of audit undertaken only in late 2019[93]. As well as general laxity in the monitoring and verification mechanisms, this is also indicative of serious problems having been identified, requiring lengthy resolution with the project developer, BAM.

Indeed, it is clear from the documentation that it has become increasingly challenging for Verra to resolve the problems it has identified. Serious problems with the project, with a likely material impact on the validity and volume of VCUs issued, started turning up in the VCS 2013-2014 monitoring report. These included that:

[93] VCS, 2020

- The baseline scenario used by the project appeared not to be a true reflection of what was happening on the ground, and needed revision. As became clear later on, the BNH concessionaires were themselves evidently closely implicated in deforestation.
- That monitoring of forest degradation by BAM supposed to have been undertaken in 2014 and 2016 had been 'postponed' until 2018.
- The absence of any actual benefits to the supposed beneficiaries.
- The lack of evidence that many activities which were promised in the original project documentation had ever been undertaken.

It is not clear how any of the above were followed up or acted upon by the verifiers.

The latest VCS report, covering 2015-2016, identified numerous 'non-conformities', some of them serious and many of which apparently remain unresolved. Key amongst these relate to the exclusion of concessions undergoing logging, as noted above in Section 6. Despite these outstanding problems, VCS nevertheless concluded that the project's claims to have generated 3,166,622 tCO2e in emissions reductions during the period was justified. Sales of credits from the 2015-2016 period had already started anyway, and number more than 11,000 VCUs to the present time.

Because of the very long lag in monitoring, there has of course been no verification for 2017-18. It is understood that two monitoring periods, 2017-2018 and 2019-2020 would be grouped together in an audit due to take place in 2021 (see Figure 12) below. There is no record of what has occurred as a result of this audit, or indeed whether it actually took place, especially in the light of the severity of the Covid-19 epidemic in Peru this year.

Proceso de verificación período 2017 - 2020 bajo el estándar VCS + re-validación del estándar CCB.

Iniciamos el proceso de verificación del proyecto bajo el estándar VCS (Verified Carbon Standard) para el periodo comprendido entre los años 2017 y 2020. Actualmente, el equipo técnico se encuentra realizando el Reporte de Monitoreo correspondiente.

Asimismo, iniciamos el proceso de re-validación del proyecto bajo el estándar CCB (Climate, Community and Biodiversity). El equipo técnico se encuentra realizando la definición de la línea base (comunidad + biodiversidad) y los análisis para el desarrollo del Documento de Proyecto CCB.

VCS VERIFIED CARBON STANDARD A Global Benchmark for Carbon

CCB Standards The Climate, Community & Biodiversity Alliance

Equipo REDD+ Castañeros

Personal dedicado a la administración y gestión del proyecto

Eduardo Galindo (BAM)	Director regional BAM
Ronald Rojas (BAM)	Jefe de proyecto BAM
David Asturima Huamantica	Coordinador social del proyecto
Raúl Andy Huanaco Huanca	Asesor legal
Walter Flores Casanova	Asesor técnico
Ronal Cisneros Castro	Asesor técnico
Elmer Racua Quispe	Comunicador social
Daisy Chávez Puma	Asistente administrativo y contable
Fabiola Villanueva Paredes	Apoyo administrativo y limpieza
Douglas Vergara	Seguridad (L-V)
Luis Salas	Seguridad (S-D)
Soporte BAM	
Jorge Torres	Director Carbono
Carlos Gameros	Desarrollador técnico
María Alejandra Cantuarias	Marketing
Alvaro Guerrero	Planeamiento financiero

Figure 12 – Announcement of verification of the project for 2017-2020, posted February 2021

Clearly, the outcome of this verification would be extremely helpful in understanding the current status of the project but, judging from the previous record, it seems unlikely there will be a report of it for some time. In the meantime, millions of VCUs from the project are still available for purchase and being sold, even from the project periods when monitoring showed there to be serious known anomalies and inconsistencies.

Acronyms used in the text

BAM	Bosques Amazónicos SAC
BNH	Brazil nut harvester
BPG	BP Gas
CCBA	Community, Climate and Biodiversity Alliance
CCBS	Climate, Community & Biodiversity Standard
CIFOR	Centre for International Forestry Research
FSC	Forest Stewardship Council
GFW	Global Forest Watch (of World Resources Institute)
IOH	Inter-Oceanic Highway
NTFPs	Non-timber forest products
REDD	Reducing Emissions from Deforestation and Degradation
FEPROCAMD	Federación de Productores de Castaña de Madre de Dios
RPBNCMD	REDD Project in Brazil Nut concessions in Madre de Dios
SCS	Scientific Certification Systems Inc
tCO2e	Tons of carbon dioxide equivalent
UMD	University of Maryland
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCU	Verified Carbon Unit

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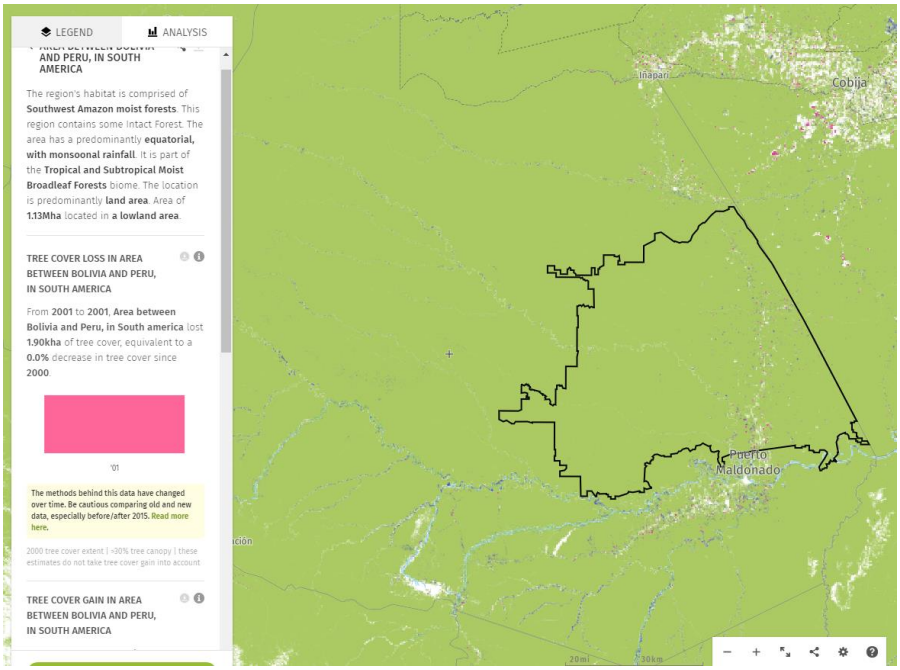
ANNEX 1

Computations used to derive the data for Table 1, showing actual tree loss in the whole intervention zone and 'core area'

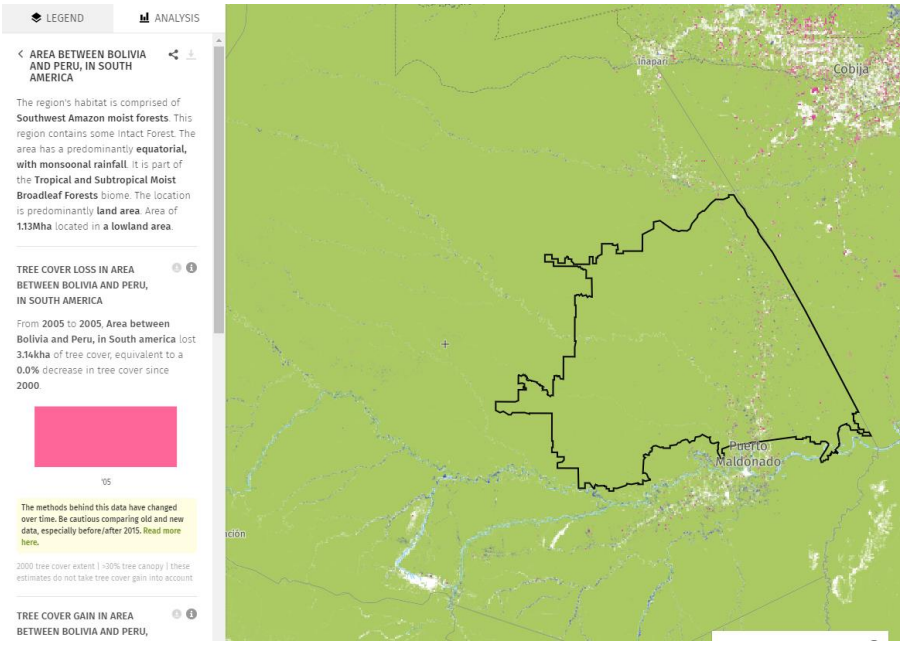
(All showing the results of importation of the relevant shapefile into the Global Forest Watch analytical tool. For the different years/periods, as shown in the panel on the left of the map)

1. Whole intervention area

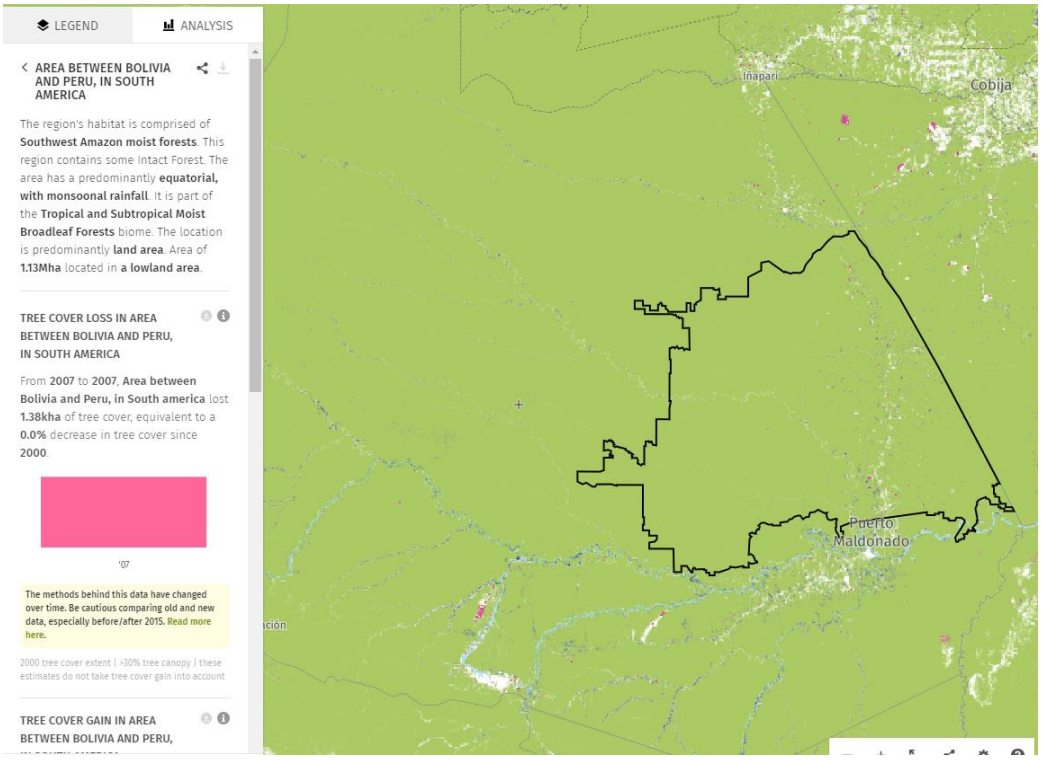
2001



2005


LEGEND
ANALYSIS
AREA BETWEEN BOLIVIA AND PERU, IN SOUTH AMERICA
The region's habitat is comprised of Southwest Amazon moist forests. This region contains some Intact Forest. The area has a predominantly equatorial, with monsoonal rainfall. It is part of the Tropical and Subtropical Moist Broadleaf Forests biome. The location is predominantly land area. Area of 1.13Mha located in a lowland area.
TREE COVER LOSS IN AREA BETWEEN BOLIVIA AND PERU, IN SOUTH AMERICA
From 2005 to 2005, Area between Bolivia and Peru, in South america lost 3.14kha of tree cover, equivalent to a 0.0% decrease in tree cover since 2000.
'05
The methods behind this data have changed over time. Be cautious comparing old and new data, especially before/after 2015. Read more here.
2000 tree cover extent | >30% tree canopy | these estimates do not take tree cover gain into account
TREE COVER GAIN IN AREA BETWEEN BOLIVIA AND PERU,
Cobija
Puerto Maldonado

2007


LEGEND
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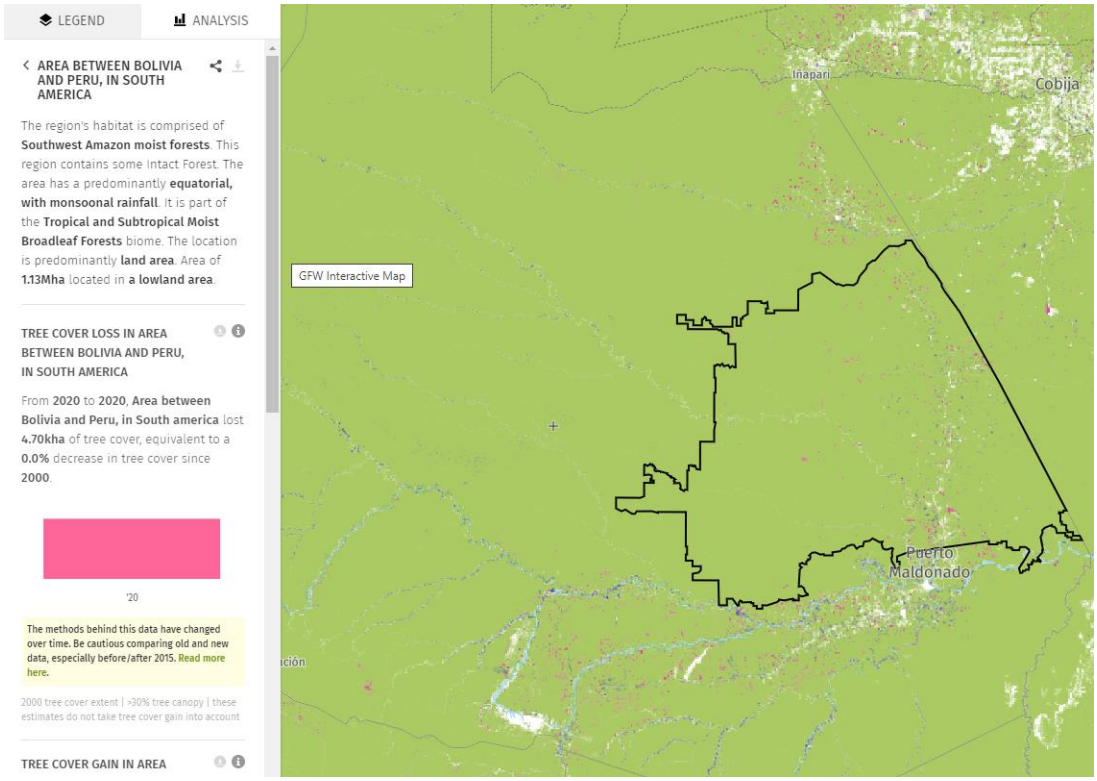
TREE COVER LOSS IN AREA BETWEEN BOLIVIA AND PERU, IN SOUTH AMERICA
From 2007 to 2007, Area between Bolivia and Peru, in South america lost 1.38kha of tree cover, equivalent to a 0.0% decrease in tree cover since 2000.
'07
The methods behind this data have changed over time. Be cautious comparing old and new data, especially before/after 2015. Read more here.
2000 tree cover extent | >30% tree canopy | these estimates do not take tree cover gain into account
TREE COVER GAIN IN AREA BETWEEN BOLIVIA AND PERU,
Cobija
Puerto Maldonado

2020


LEGEND
ANALYSIS
AREA BETWEEN BOLIVIA AND PERU, IN SOUTH AMERICA
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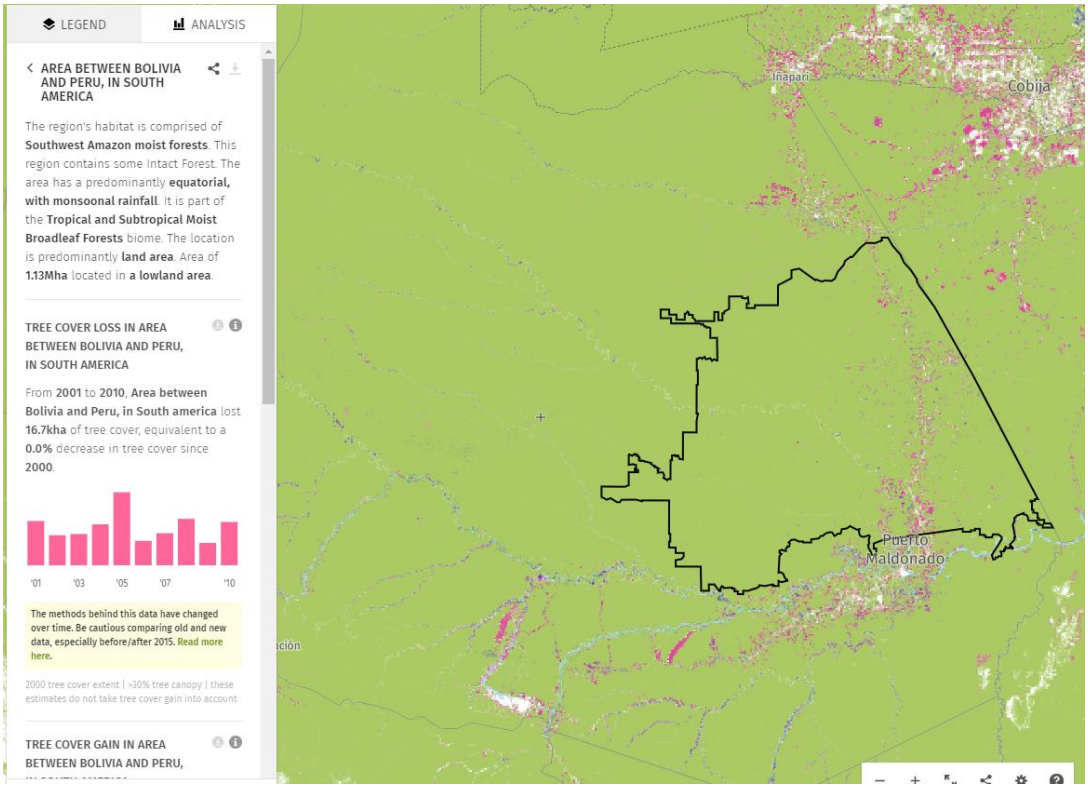
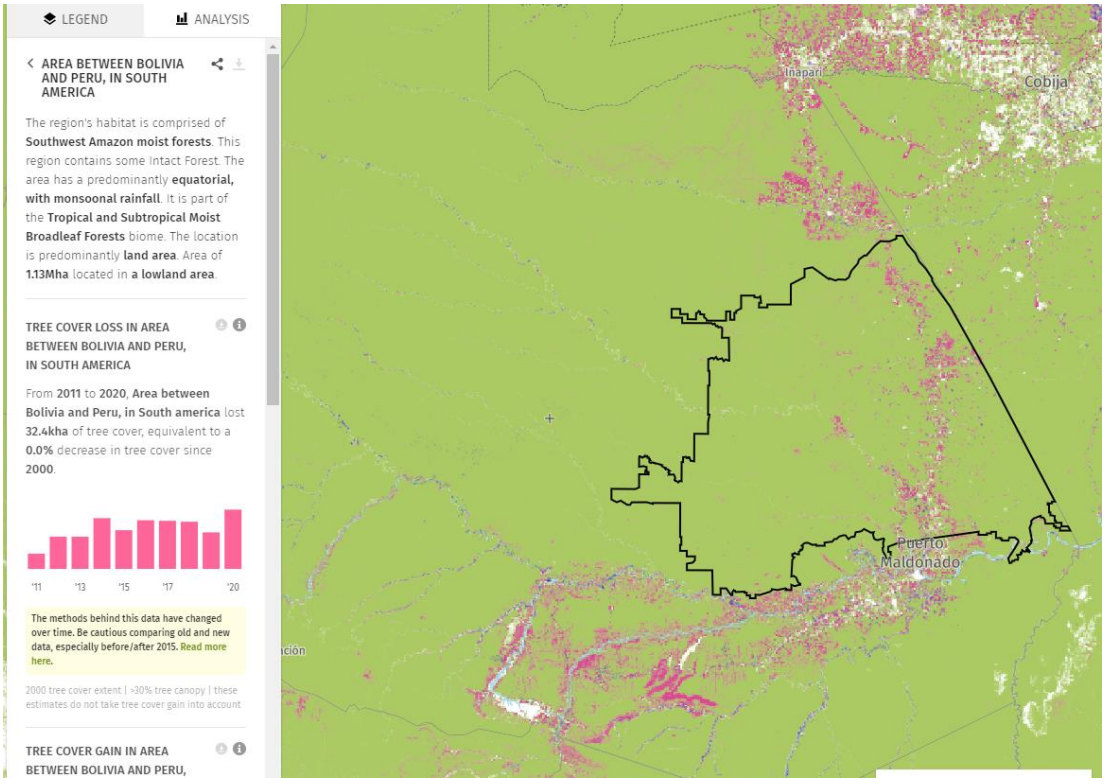
TREE COVER LOSS IN AREA BETWEEN BOLIVIA AND PERU, IN SOUTH AMERICA
From 2020 to 2020, Area between Bolivia and Peru, in South america lost 4.70kha of tree cover, equivalent to a 0.0% decrease in tree cover since 2000.
'20
The methods behind this data have changed over time. Be cautious comparing old and new data, especially before/after 2015. Read more here.
2000 tree cover extent | >30% tree canopy | these estimates do not take tree cover gain into account
TREE COVER GAIN IN AREA
GFW Interactive Map
Inapari
Cobija
Puerto Maldonado

2001-2010


LEGEND
ANALYSIS
AREA BETWEEN BOLIVIA AND PERU, IN SOUTH AMERICA
The region's habitat is comprised of Southwest Amazon moist forests. This region contains some Intact Forest. The area has a predominantly equatorial, with monsoonal rainfall. It is part of the Tropical and Subtropical Moist Broadleaf Forests biome. The location is predominantly land area. Area of 1.13Mha located in a lowland area.
TREE COVER LOSS IN AREA BETWEEN BOLIVIA AND PERU, IN SOUTH AMERICA
From 2001 to 2010, Area between Bolivia and Peru, in South america lost 16.7kha of tree cover, equivalent to a 0.0% decrease in tree cover since 2000.
'01
'03
'05
'07
'10
The methods behind this data have changed over time. Be cautious comparing old and new data, especially before/after 2015. Read more here.
2000 tree cover extent | >30% tree canopy | these estimates do not take tree cover gain into account
TREE COVER GAIN IN AREA BETWEEN BOLIVIA AND PERU,
Inapari
Cobija
Puerto Maldonado

2011-2020


LEGEND
ANALYSIS
AREA BETWEEN BOLIVIA AND PERU, IN SOUTH AMERICA
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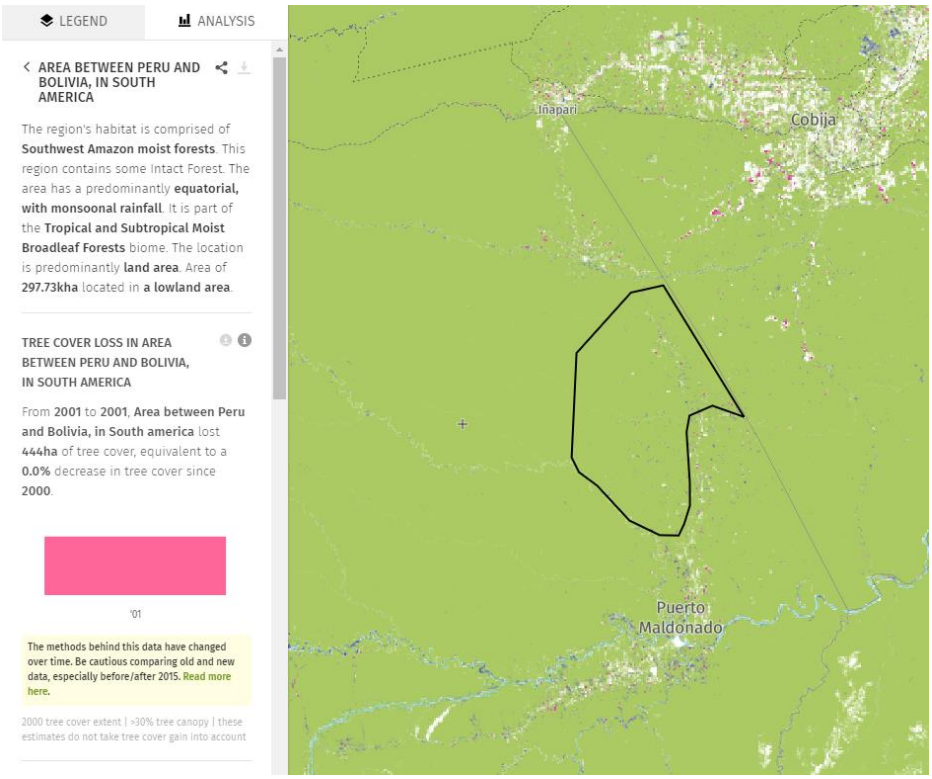
TREE COVER LOSS IN AREA BETWEEN BOLIVIA AND PERU, IN SOUTH AMERICA
From 2011 to 2020, Area between Bolivia and Peru, in South america lost 32.4kha of tree cover, equivalent to a 0.0% decrease in tree cover since 2000.
'11
'13
'15
'17
'20
The methods behind this data have changed over time. Be cautious comparing old and new data, especially before/after 2015. Read more here.
2000 tree cover extent | >30% tree canopy | these estimates do not take tree cover gain into account
TREE COVER GAIN IN AREA BETWEEN BOLIVIA AND PERU,
Inapari
Cobija
Puerto Maldonado

2. Core area only

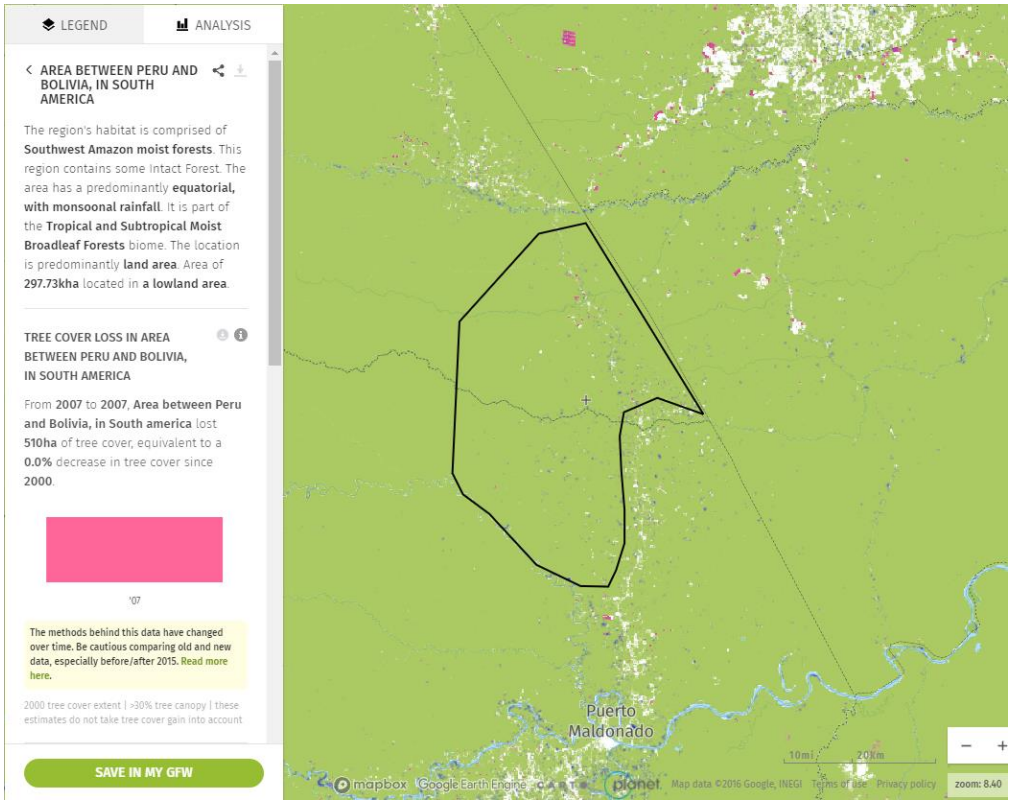
2001



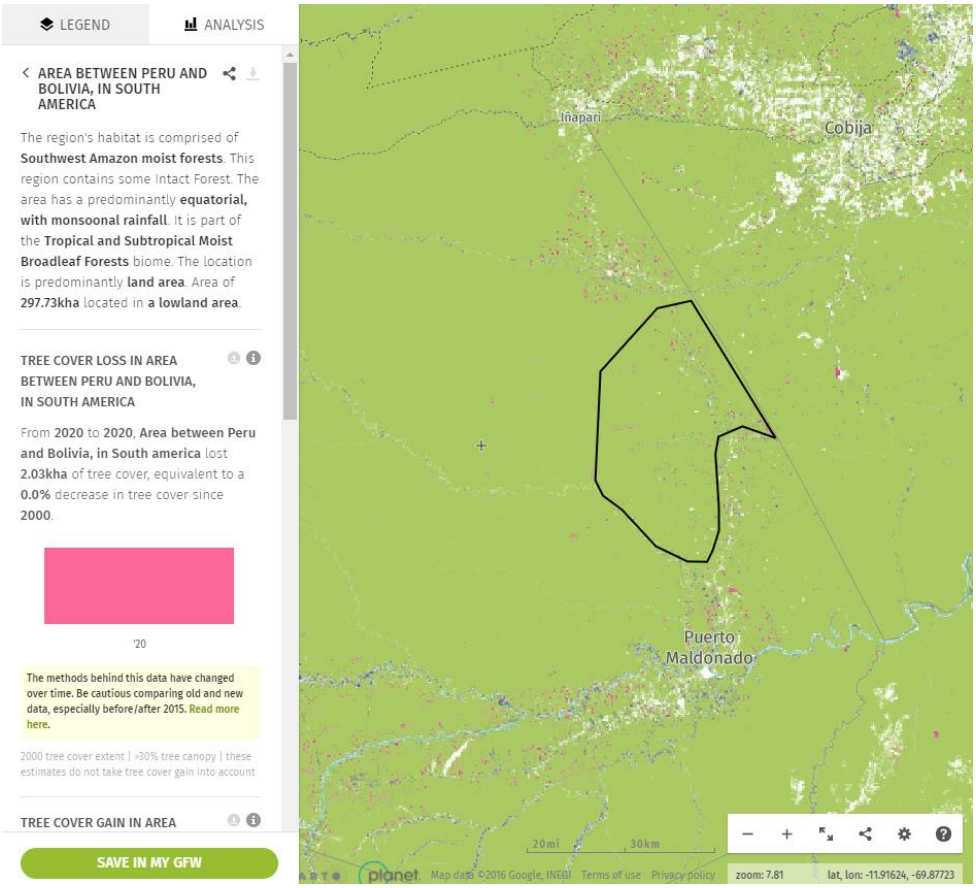
2005

LEGEND
ANALYSIS
AREA BETWEEN PERU AND BOLIVIA, IN SOUTH AMERICA
The region's habitat is comprised of Southwest Amazon moist forests. This region contains some Intact Forest. The area has a predominantly equatorial, with monsoonal rainfall. It is part of the Tropical and Subtropical Moist Broadleaf Forests biome. The location is predominantly land area. Area of 297.73kha located in a lowland area.
TREE COVER LOSS IN AREA BETWEEN PERU AND BOLIVIA, IN SOUTH AMERICA
From 2005 to 2005, Area between Peru and Bolivia, in South america lost 698ha of tree cover, equivalent to a 0.0% decrease in tree cover since 2000.
'05
The methods behind this data have changed over time. Be cautious comparing old and new data, especially before/after 2015. Read more here.
Iñapari
Cobija
Puerto Maldonado

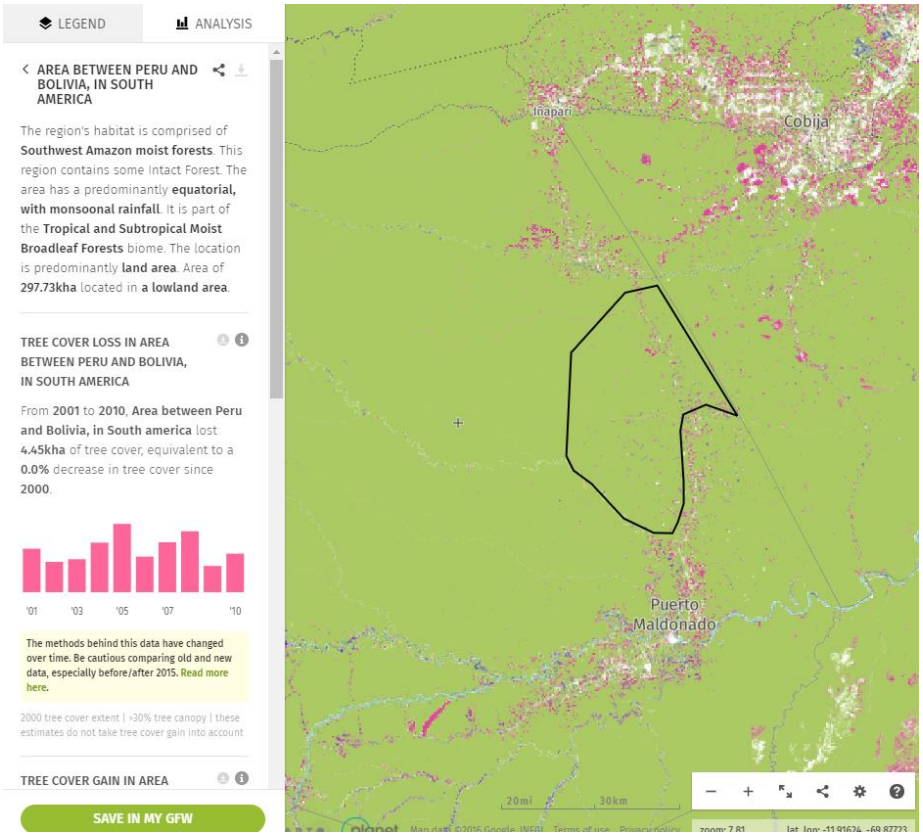
2007


LEGEND
ANALYSIS
AREA BETWEEN PERU AND BOLIVIA, IN SOUTH AMERICA
The region's habitat is comprised of Southwest Amazon moist forests. This region contains some Intact Forest. The area has a predominantly equatorial, with monsoonal rainfall. It is part of the Tropical and Subtropical Moist Broadleaf Forests biome. The location is predominantly land area. Area of 297.73kha located in a lowland area.
TREE COVER LOSS IN AREA BETWEEN PERU AND BOLIVIA, IN SOUTH AMERICA
From 2007 to 2007, Area between Peru and Bolivia, in South america lost 510ha of tree cover, equivalent to a 0.0% decrease in tree cover since 2000.
'07
The methods behind this data have changed over time. Be cautious comparing old and new data, especially before/after 2015. Read more here.
2000 tree cover extent | >30% tree canopy | these estimates do not take tree cover gain into account
SAVE IN MY GFW
Puerto Maldonado
10mi
20km
mapbox
Google Earth Engine
planet
Map data ©2016 Google, INEGI
Terms of use
Privacy policy
zoom: 8.40

2020



2001-2010


LEGEND
ANALYSIS
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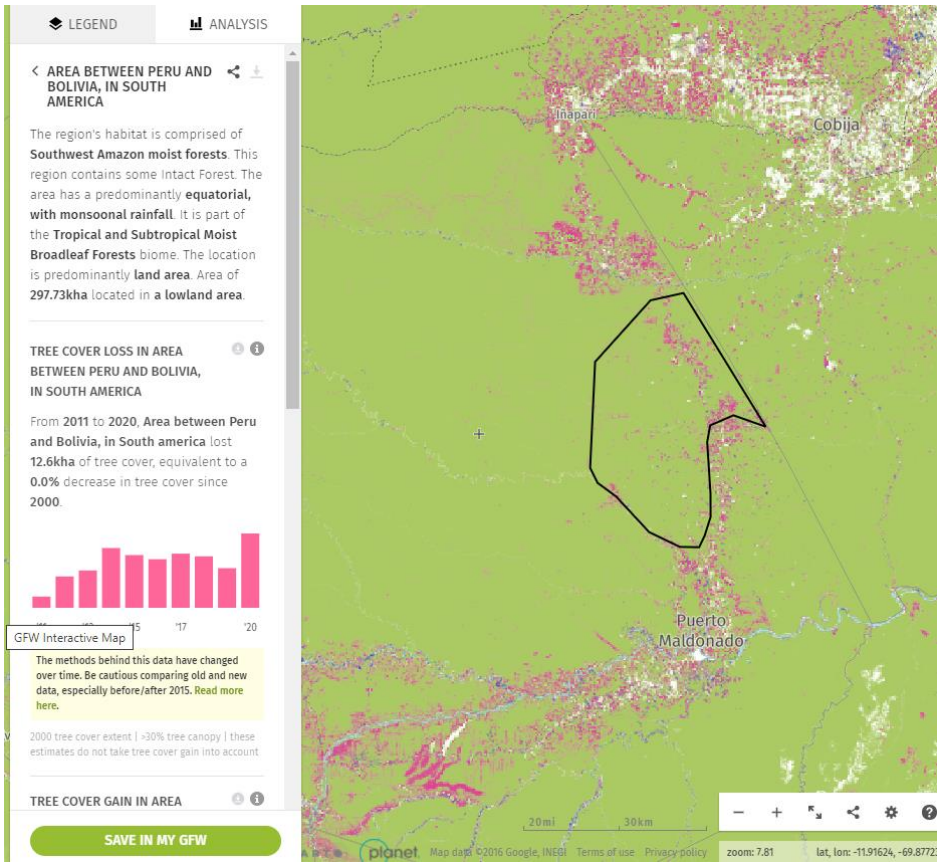
TREE COVER LOSS IN AREA BETWEEN PERU AND BOLIVIA, IN SOUTH AMERICA
From 2001 to 2010, Area between Peru and Bolivia, in South america lost 4.45kha of tree cover, equivalent to a 0.0% decrease in tree cover since 2000.
'01
'03
'05
'07
'10
The methods behind this data have changed over time. Be cautious comparing old and new data, especially before/after 2015. Read more here.
2000 tree cover extent | >30% tree canopy | these estimates do not take tree cover gain into account
TREE COVER GAIN IN AREA
SAVE IN MY GFW
Inapari
Cobija
Puerto Maldonado
20mi
30km

2011-2020


LEGEND
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TREE COVER LOSS IN AREA BETWEEN PERU AND BOLIVIA, IN SOUTH AMERICA
From 2011 to 2020, Area between Peru and Bolivia, in South america lost 12.6kha of tree cover, equivalent to a 0.0% decrease in tree cover since 2000.
'15
'17
'20
GFW Interactive Map
The methods behind this data have changed over time. Be cautious comparing old and new data, especially before/after 2015. Read more here.
2000 tree cover extent | >30% tree canopy | these estimates do not take tree cover gain into account
TREE COVER GAIN IN AREA
SAVE IN MY GFW
Inapari
Cobija
Puerto Maldonado
20mi
30km
Map data ©2016 Google, INEGI
Terms of use
Privacy policy
zoom: 7.81