Precious Forest Foundation Project

Carbon Feasibility Checklist Implementation Final report

August 2023

1. Executive Summary

In late 2022, PFF and TBI agreed to implement a revised PFF project in 2023 focused on applying the feasibility checklist to forest concessions in Indonesia. Using guidelines published by Form International on how SFM concessions can access carbon revenue streams, the project activities from January to July 2023 focused on:

1. Conducting industry research through literature reviews and expert interviews to assess the theoretical eligibility of various concession types (inactive, non-SFM, SFM concessions) for carbon revenue streams as listed in the Feasibility Checklist.
2. Engaging with at least one concession from each type to perform a detailed execution of the feasibility checklist, providing insights on carbon revenue opportunities and identifying any barriers.
3. Consulting a Verra expert to provide perspective on Verra certifiability for each concession type.
4. Seeking continued engagement with FSC, particularly the new Indonesia team focused on carbon.
5. Proposing potential solutions or workarounds for the barriers identified.

To provide an insight in the FC's usability we implemented the FC with three distinct types of concessions:

- Inactive (awarded but unused)
- Non-SFM-certified (meets regulatory minimums)
- SFM-certified (active certification)

We are pleased to report a very positive experience, for both The Borneo Initiative and the concessions, in working with the Feasibility Checklist. The Feasibility Checklist provides an excellent framework to determine which type of carbon projects are feasible in each concession as well as the necessary Excel-based tools to gain an understanding of the opportunity.

In our experience during this pilot project, implementation of the FC does require prior experience and deep knowledge of the carbon space, both on a regulatory as well as an operational level. TBI has had to play a central and coordinating role in the implementation with each of the three concessions and would not have been able to have the concession complete the FC assessment independently.

However, this might change rapidly across the industry as forest concessions start preparations to participate in the carbon markets now that the Indonesian government is progressing with carbon legislation. concession 2 is an example of this, one of the three concessions we worked with as they started setting up an internal carbon team during the PFF project.

The results achieved from the FC, both stand-alone and when compared to the Verra analysis that we performed with our Verra expert, were in line with what TBI expected and are deemed robust and reliable enough for concessions to decide their best course of action with respect to potential carbon projects in their concessions. The results are summarised below:

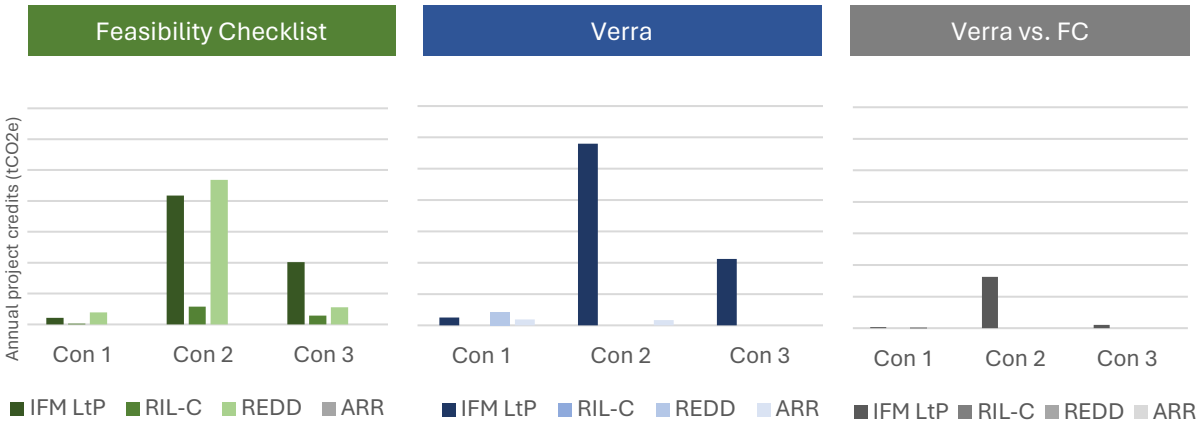

Chart 1 – Comparison between Feasibility Checklist and Verra methodology

TBI is receiving an increasing number of requests, both from forest concessions and from potential investors looking to invest in carbon projects in Indonesia. Following this pilot project, TBI is confident that it either will use the FC tool to provide an initial indication of the carbon opportunities (if hired by the concession or investor) or will recommend the concession to use the FC tool to analyse carbon opportunities.

To summarize the above:

- The FC is a very user-friendly and complete tool to assess carbon project opportunities
- The FC still requires implementation by a team with deep knowledge of carbon to yield accurate and insightful results
- The FC results, when the parameters and variables in the FC tool are properly tweaked, are in line with a more in-depth Verra VCU analysis
- TBI is confident about the robustness of the tool and will both use the tool for its own carbon projects and recommend concessions to use the tool.

During the PFF project we have also interacted with FSC, who have been working on their own tool: FLINT. Whilst we did not get to implement FLINT in one of the three concessions we implemented the Feasibility Checklist with (once we had selected a concession willing to share its data and work together with FSC, namely concession 2 FSC had already decided to move to the next phase in their project without testing the tool with an Indonesian concession), we do see a great potential for the FLINT tool to follow an initial carbon feasibility study. FLINT is an in-depth status quo carbon measurement and will therefore allow concessions and consultants to add robustness to the inputs used in the Feasibility Checklist.

2. Background

Precious Forests Foundation (PFF) aims to develop innovations through application-oriented research in tropical forests and sustainably managed areas. This optimizes and strengthens forestry practices by introducing relevant, value-creating, concrete measures. Carbon projects are often in developing tropical countries, where emission reduction opportunities abound and costs are relatively low. Besides climate mitigation, carbon projects can provide co-benefits like job creation, biodiversity conservation, and climate resilience. The goal is to generate verified carbon credits sold to offset emissions. Credits represent one tonne of CO2 or equivalent reduced or removed. The pre-feasibility stage is critical to assess viability and potential success by identifying challenges, estimating potential credits, evaluating environmental impact, and engaging stakeholders. This information enables informed decisions on whether to proceed and how to design a technically, economically, and environmentally feasible project.

PFF piloted the jointly developed pre-feasibility checklist for SFM concessions in the tropics in Indonesia. This report describes The Borneo Initiative's initial experience testing the Carbon Projects Pre-Feasibility Checklist based on Indonesia's context.

3. Carbon Markets in Indonesia and Industry Research

3.1 About carbon markets in Indonesia

Carbon presents significant green business potential as an environmental service in Indonesia. Amid declining commodity exploitation due to decreasing potential and sustainability concerns, carbon has evolved into an accepted environmental service, increasingly embraced for eco-friendly enterprises.

Carbon trading aims to reduce emissions through economic mechanisms with local, national, and global impacts. Considering the economic rationale enables a comprehensive understanding of environmental and economic benefits for stakeholders.

There are two global carbon trading systems: the Compliance Market established by policies/regulations, and the Voluntary Market involving voluntary issuance, purchase and sale of carbon credits. Both use tonnes of CO2 equivalent (tCO2e) as the unit, equalling 1 credit per tCO2e. The Kyoto Protocol's Clean Development Mechanism and Joint Implementation exemplify a Compliance Market, regulating member countries' emissions and allowing carbon credit trading to meet targets.

Other mechanisms are the Emission Trading Scheme in the EU, China, Korea and Tokyo to decrease industrial/energy emissions while encouraging clean technologies through company credit trading, and REDD+ for results-based payments to developing countries for lowering deforestation/degradation emissions.

Voluntary carbon trading involves exchanging credits/permits outside of government systems to voluntarily reduce emissions beyond mandates. This enables individuals, companies and organizations to effectively reduce emissions and offset carbon footprints. Buyers acquire credits for preferred emission reduction projects like renewable energy, methane reduction, transportation, and forestry to offset their own emissions or achieve carbon neutrality.

However, voluntary trading has reliability and quality assurance challenges. Credits must be independently verifiable and projects must demonstrate effectiveness. Ethical and transparency

issues must also be considered. Despite these challenges, voluntary trading remains crucial for achieving climate goals and sustainability.

Although not specifically mentioned in the Paris Agreement, voluntary trading can help countries meet emission targets through carbon certification programs like the Gold Standard and Verified Carbon Standard. Credits sold voluntarily on markets enable offsetting.

Indonesia's 2012 REDD+ program aims to decrease deforestation/degradation emissions and has garnered international support. After initial phases, it began Result Based Payments in 2017, receiving over USD 100 million for 2014-2016 reductions. More funds target 2019-2024 reductions in Kalimantan. Numerous AFOLU voluntary market projects also hold potential for Indonesia as a carbon trading player. However, challenges exist around policy uncertainty, business risk/assurance, technical knowledge, measurement limitations, tenure conflicts.

Recent Indonesian regulations support carbon pricing, including Presidential Regulation No. 98 of 2021 on implementing carbon economic value to achieve emission targets and control emissions. This provides a framework for emission reductions and climate funding through carbon activities across sectors, driving prospective green investments.

Ministry of Environment and Forestry regulations launched voluntary and mandatory carbon pricing in forestry. While issued regulations don't guarantee smooth large-scale implementation due to needed institutional support and financing arrangements, entities can prepare under guidance. Technical guidance on implementing carbon economic value in forestry is still required for business-scale operation. A key rising challenge is regulations blocking emission reduction claims, which may inhibit foreign corporate demand and conflict with current market operation of linking investments to claimed reductions. (https://arma-law.com/media/2022/10/ARMA-Update-ESG-Update-Key-Takeaways-of-MOEF-Reg-21-of-2022-on-the-Guidelines-of-Carbon-Economic-Value-Implementation-28102022.pdf)

4. The Study

4.1 Chosen Concessions

The study was carried out in three concessions that were selected based on the type of concession management and the location within Indonesia. Based on this the following concessions were selected:

Concession name	Concession Type	Location	Dates	Status
Concession 1	Inactive	Sumatra	16-25 February	Assessment completed
Concession 2	SFM FSC	Kalimantan	27 Jan – 05 Feb	Assessment completed
Concession 3	SFM but non-FSC	Papua	21-28 May	Assessment completed

Table 1. Location of Study

4.2 Methods

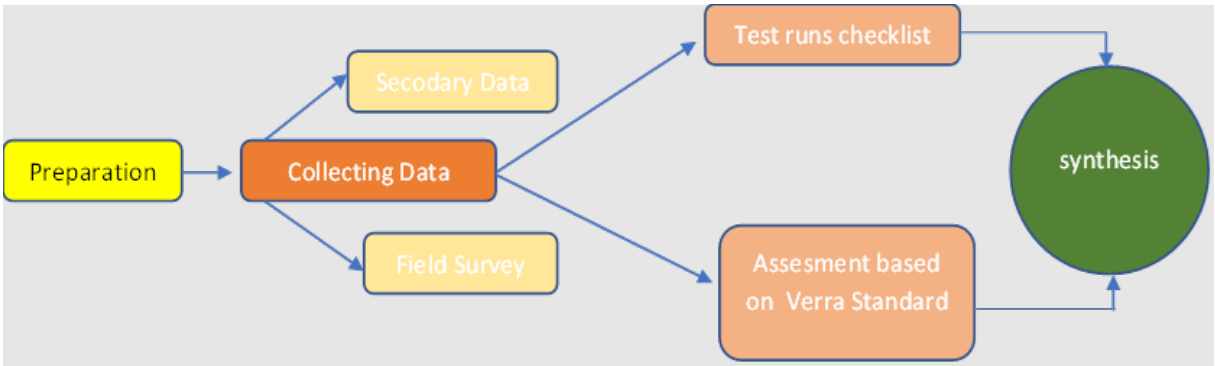

Figure 1. Flowchart Study

To compare the Feasibility Checklist and the Verra methods we compared the inputs required for each methodology, the calculation in each methodology, and the results from both.

Assessment using the Feasibility Checklist is carried out in several steps:

- Determine project type and eligibility
- Set project boundaries and scope: spatial boundaries, temporal boundaries, carbon pools and emission sources,
- Assess baseline scenario
- Determine additionality and estimate baseline emissions
- Assess project scenario and estimate project emissions
- Quantify leakage
- Quantify net emission reductions.

Model parameterization is carried out to perform calculations with the Feasibility Checklist Carbon Calculation tools:

- Ecological zone
- Continent
- Country
- Forest status

- Abbreviation
- National/regional deforestation rate (%/year)
- Average aboveground carbon (ton dry mass per hectare)
- Project crediting period (years)
- Total project area (hectare)
- Baseline rotation length (years)
- Baseline harvesting intensity (m3/ha)
- Set-aside activity area (hectares)
- RIL-C activity area (hectares)
- Average RIl-C emission reductions ton/m3
- REDD+ activity area
- Deforestation intensity
- Will the project area be logged
- Project scenario rotation length (years)
- Project scenario harvesting intensity (m3/ha)
- BCEF
- CF
- C to CO2e
- Non-permanence risk (Buffer)
- Leakage
- Uncertainty

To assess Verra certifiability we have assessed the following 3 of Verra's methodologies:

1. VM0010 Methodology for Improved Forest Management: Conversion from Logged to Protected Forest Version 1.3
2. VM0015 Methodology for Avoided Unplanned Deforestation v1.1
3. VCS VM0007 and A/R CDM methods

4.2.1 VM0010 Methodology for Improved Forest Management: Conversion from Logged to Protected Forest Version 1.3

This methodology is used in a project that aims to prevent further forest degradation by taking action to change forest management to a protected forest.

The eligibility suitability of using this method can be explained in the following table:

#	Topic	Detail
1	Forest management in the baseline scenario must be planned for timber harvest	Under the baseline scenario, the project area will be managed as a production forest which is planned to be logged.
2	Under the project scenario, forest use is limited to activities that do not result in commercial timber harvest or forest degradation	Under the project scenario, the area is fully protected and no commercial timber harvesting is carried out.
3	Planned timber harvest must be estimated using forest inventory methods that determine allowable offtake as volume of timber (m3 ha-1)	Stock The volume of wood that can be harvested (D>40 cm) per unit area has been estimated using field measurement data based on the results of forest inventories (IHMB) or RKU (General work plan) documents
4	The boundaries of the forest land must be clearly defined and documented	Project delineation of the area has been clearly defined and documented when the area is in the form of forest cover, previously the production forest area to be logged was designated as a protected forest
5	Baseline condition cannot include conversion to managed plantations	In the baseline scenario, the project area will be managed as production natural forest which will be logged according to the annual logging activity plan documented in the RKU document in which there is no conversion to plantation forest.
6	Baseline scenario, project scenario and project case cannot include wetland or peatland	This condition is fulfilled, the type of soil in the entire project area is mineral soil. There is no peat soil, water bodies, and swamps are not included in the calculation of the baseline scenario or project scenario

Table 2 – Specific conditions applicability of Methodology VM0010

In addition to the suitability provisions for the application of the method in the table above, the project area must also meet the eligibility of the method in accordance with the eligibility provisions of the VM0010 method, i.e:

1. **Legal Right to Harvest**

Legality to carry out timber harvesting activities existed before project implementation. The project area is an area that has a legal business permit for the Utilization of Timber Forest Products in a Natural Forest. Evidence and legality of the right to harvest the timber is issued by the relevant government agency, which has designated, approved, or approved the project area (or areas) for forest management, established the allocation of legal rights to forest timber resources and harvesting practices.

2. **Intent to Harvest**

Before the project intervention plan was carried out, the project initiator already had a plan to carry out timber harvesting activities through the form of evidence from the work area arrangement documents to be carried out.

4.2.2 VM0015 Methodology for Avoided Unplanned Deforestation v1.1

This methodology estimates greenhouse gas emissions from areas where unplanned deforestation is taking place and quantifies the emission reductions achieved by curbing deforestation. The methodology provides a comprehensive set of tools for analyzing both frontier and mosaic deforestation patterns to establish the baseline deforestation rate, monitor emission reductions and assess leakage. The methodology has no geographic restrictions and is applicable globally under the following conditions.

Applicability conditions

1. Baseline activities may include planned or unplanned logging for timber, fuel-wood collection, charcoal production, agricultural and grazing activities as long as the category is unplanned deforestation according to the most recent VCS AFOLU requirements.
2. Project activities may include one or a combination of the eligible categories defined in the description of the scope of the methodology (table below).
3. The project area can include different types of forest, such as, but not limited to, old-growth forest, degraded forest, secondary forests, planted forests and agro-forestry systems meeting the definition of “forest”.
4. At project commencement, the project area shall include only land qualifying as “forest” fora minimum of 10 years prior to the project start date.
5. The project area can include forested wetlands (such as bottomland forests, floodplain forests, mangrove forests) as long as they do not grow on peat. Peat shall be defined as organic soils with at least 65% organic matter and a minimum thickness of 50 cm. If the project area includes
6. Forested wetlands growing on peat (e.g. peat swamp forests), this methodology is not applicable.

			PROJECT ACTIVITY	
			Protection without logging, fuel wood collection or charcoal production	Protection with controlled logging, fuel wood collection or charcoal production
BASELINE	Deforestation	Old-growth without logging	**A**	**B**
		Old-growth with logging	**C**[1]	**D**[1]
		Degraded and still degrading	**E**[1]	**F**[1]
		Secondary growing	**G**[1]	**H**[1]
	No-deforestation[2]	Old-growth without logging	No change	Degradation
		Old-growth with logging	IFM	IFM-RIL
		Degraded and still degrading	IFM	IFM
		Secondary growing	No change	Degradation

1. Accounting for carbon stock increase in the project scenario is optional and can conservatively be omitted.
2. If the baseline is not deforestation, the change in carbon stocks is not covered in this methodology.

4.2.3 VCS VM0007 and A/R CDM methods

This methodology is used to calculate the value of the project's carbon benefits from ARR (Afforestation, Reforestation, Revegetation). Eligible ARR activities are activities that increase carbon sequestration and/or reduce GHG emissions by building, increasing, or restoring forest cover through planting, or human-assisted natural regeneration. The project area includes non-forest areas where no harvesting has been permitted in the 10 years before the project start date.

In this study we did not include the RIL-C methodology for Verra, as none of the concessions studied were located in the geographic area that covers the Verra RIL-C methodology (East and North Kalimantan).

4.3 Feasibility Checklist Preparation and cost-benefit

We prepared each of the concessions, as well as TBI internally, before the fieldwork on the ground.

Preparation for each of the three studies took approximately two weeks and started with presenting the aims and objectives of this activity to prospective concessions so that the concession clearly understood the activities to be carried out in the concession. This was followed by an MoU and distribution of rights and obligations on both sides.

After the MoU was made, we asked for the main data needed for field studies at the head office, while the data consisted of:

#	Data	Note
1	General work plan documents (RKU)	A general work plan report is usually prepared every 10 years to describe the concession management for the next 10 years
2	Periodic Comprehensive Forest Inventory report	The Periodic Comprehensive Forest Inventory (IHMB) is a mandatory activity that must be carried out by companies to determine the potential of existing stands, this document usually forms the basis for preparing RKUs and this document must also be revised every 10 years
3	LHP Document (Production Report)	This document describes how much wood is cut per year. The data requested is from at least three years back.
4	Growth increment data	This data is the result of measurements from permanent plots in the concession area. Use this data to find out the annual tree growth
4	Spatial data	Spatial data includes: • Concession boundary data • Land cover data • Protected area data • RKU data • Forest encroachment data • Accessibility Data • Forest Fire Hotspot Data

Table 3 – Secondary data

From the secondary data obtained, the next step was for TBI to analyze the data (desk study) to get an idea of how long the field survey will take and what data should be reviewed. From the results of the study deck study, we got an estimate that the average concession field visit is 8-10 working days, depending on accessibility to the area.

4.4 Tools

The tools we used for our activities consisted of:

#	Tools	Amount	Note
1	GPS Garmin 76 CSX	3 Pcs	To get coordinates and tracking points
2	Digital camera	3 Pcs	To take a picture
3	Drone Phantom 4 Pro	1 Pcs	For taking terrestrial pictures and mapping
4	Measuring tools		
	Measuring tape	2 Pcs	To measure the trees
	Rope	50 Meter	Marking
	Clino meter	1 Pcs	To measure the height of the tree
5	Binoculars	1 Pcs	To see distant objects

Table 4 – Tools used

4.5 Field Visit

After obtaining the data from the head office, we travelled to the concession site for field visit:

We started with an opening meeting with the field team. This opening meeting aims to dig deeper into the suitability of the data collected above with the current conditions and is carried out with a presentation to make it easier to explain the aims and objectives. The main activities in this meeting are:

- Build a common understanding that we will bring benefits to the company if this activity is carried out with correct and appropriate data.
- Determine the location of the site visit plan
- Collect data that cannot be provided by the head office
- Validate the data
- Seeing additionality and possible scenarios in the concession
- Explain how FC works to concessions and how to fill it out so they get an understanding of the data we really need to fill in the checklist

The point of the field visit is to see the level of existing threats and the size of the concession.

Opening meeting

Make a planning for a field visit

The parameters that are seen are:

#	Location	Note
1	Permanent Plot Plots (PUP)	To see stem and crown growth increments we visited PUP (Petak Ukur Permanen/ Permanent Plot) plots to validate their measurement results across a number of trees before we used them in carbon calculations.
2	Threat	Areas with threats of unplanned deforestation and degradation in the area. The data is usually already in the forest protection section, we will validate it randomly to see if it fits.
3	Harvesting block	The harvesting block is one of the most important locations to visit in this FC activity to get an idea of how much effort is generated from harvesting trees in the concession and whether they are implementing RIL properly and correctly.
4	Conservation area	We need this area to see the existence of protected animals
5	Village	Visits to the villages aim to see how dependent the community is on the concession both in terms of the economic, social, and natural resources that exist. In general, the community is greatly helped by the existence of the company because the company generally provides access in the form of road construction assistance so that the community's economy is better.
6	Land cover	1. Primary forest 2. Secondary forest 3. Shrub 4. Conversion to non-forest

Table 5 – Parameters

5. In-Field Execution

The execution of the Feasibility Checklist went well. Each fieldwork session took about 8 days and the data gathered during the field work was sufficient and complete to process the Feasibility Checklist.

Before we describe in detail, for each of the concessions, our experience in the implementation, the following is our approach with each concession

5.1 Field Execution Approach With Each Concession

5.1.1 Data gathering exercise

To facilitate information gathering, we clarify with the concession the data that will be collected from various staff members. We then outline the required data format and types to complete the Feasibility Checklist and calculate carbon emissions using the VCS methodology. For data collection, we engage staff across divisions to help sort and verify data accuracy, as inputs often span multiple work units.

The data that we expect from the field are:

Data type	Data format	Note
Land cover	Spasial (Shp)	Data for the past three years
Growth increment measurement	Tabulation	Average stem growth data per year
Socio-economic conditions	Narrative and documentation	• Community dependence on concessions • Forest utilization by community (NTFP) • Community income
Deforestation	Point coordinates and pictures	This data is needed to calculate the rate of deforestation
Ilegal logging	Point coordinates and pictures	This data is needed to calculate the rate of deforestation

Table 6 – Data gathering

5.1.2 Explaining Verra vs. Feasibility Checklist

The data collection process for the Feasibility Checklist and Verra standard calculations is nearly identical, but the Verra standard specifically requires assessing real-time field conditions to determine the right scenario and calculation methodology, such as AUD and ARR. These methods need more data to depict the ideal on-site situation. The FC is simpler in this regard as it utilizes more default values for expedited calculations.

5.1.3 Guiding the team to conduct data gathering

For the field teams, we provide understandings about the procedures for filling in the Feasibility Checklist in the form of tables that must be completed. The table can be seen as follows:

Parameter	Unit	Note
Land cover		
Virgin forest	Hectare	
Secondaty forest	Hectare	
Non Forest (Shrub, Mix Agriculture, etc)	Hectare	
Deforestation and Degradation	Hectare	
Project crediting period	Year	
Total project area	Hectare	
Baseline rotation length	Year	
Baseline harvesting intensity	M3/Ha	
Deforestation intensity		
High		
Medium		
Low		
Will the project area be logged?	Yes/ Now	
Mandatory protected arae	Hectare	
Effective area	Ha	
Biodiversity		
Importan / Endemic Animal	Orang utan	Direct finding / Information
	Hornbill	Direct finding / Information
	etc	
Importan / Endemic Plant	Iron wood (Protected by Government)	Direct finding / Information
	etc	

Table 7 – Feasibility Checklist table

5.2 Concession 1 in sumatra

In implementing the Feasibility Checklist for Concession 1, almost all of the required data was relatively easy to obtain. As a natural forest concession, Concession 1 must report activities in the concession to the Ministry of Environment and Forestry every year. These reports include production results, annual plans, timber potential, and threats to the concession. From these data points we were able to fill almost all of the Feasibility Checklist requirements.

We visited the Concession 1 from February 16-25, 2023, spending 8 days in the field. The Concession 1 is inactive for timber production. During our visit, there was no company to accompany us because there are no longer any employees at the location. The permit for Concession 1 itself remains active until June 29, 2056.

During our visit, we saw and mapped several threats in the Concession 1 concession to establish a basis for calculating emission baselines and threats to the area. Because Concession 1 is inactive, there is substantial illegal logging in the area, including encroachment for oil palm by the surrounding community. From the information above, this concession fits the REDD+ activity area (AUD) methodology perfectly.

The region has very high and diverse biodiversity. There are key endangered species such as tigers and elephants, according to information from the surrounding community and studies by WWF in the area.

Regarding social conditions, the local people were very open with us during site visits. They hope concrete steps will be taken so the company can become active again. The community feels the company helped considerably, both directly through building places of worship and indirectly through training programs.

5.2.1 Pictures from the field work

5.3 Concession 2 In the central Kalimantan

Implementing the Feasibility Checklist for concession 2 was relatively straightforward because concession 2 holds an active FSC certification. Therefore, extensive data is available, including production reports, annual plans, timber potential, threats to the concession, harvest damage impacts, etc. From this data we could properly fill almost all of the Feasibility Checklist requirements.

concession 2 has a strong reputation in the timber industry, beginning operations in 1988. It is a subsidiary of the Lyman Group under the Lyman Timber Division, manufacturing high quality wood products. The concession is well-managed, with many certifications like FSC, LEI, SmartWood, SVLK, PHPL, V-Legal, etc.

During our 10-day field visit, we surveyed several locations to identify the most suitable methodology for concession 2 area. We examined heavily degraded forest areas, previously logged areas, recently logged areas, pre-logging areas, community-encroached areas for shifting cultivation and rubber planting, and HCVF designated areas.

Based on the field visits, there are several plantation areas and degraded areas within concession 2 that could use the ARR scenario. Meanwhile, areas still forested could use the IFM-LtP scenario.

concession 2 area has very high biodiversity. Their HCVF document indicates potentially rare or endangered species like orangutans, proboscis monkeys, and vulnerable species such as macaques, porcupines, clouded leopards. Therefore, careful logging across the concession is required. Logging operations follow "careful logging" principles to protect endangered and vulnerable animal habitats.

Within concession 2 work area are 14 assisted villages. The company plans for these villages to become self-help, self-driven, and self-sufficient development centers in the future.

5.3.1 Pictures from the field work

5.4 Concession 3 in Papua Island

Implementing the Feasibility Checklist for Concession 2 was not very difficult. The concession has excellent field staff and maintains internal databases. As a result, extensive data is available including production reports, annual plans, timber potential, threats to the concession, and harvest damage impacts. With this data, we could accurately fill out almost all of the Feasibility Checklist.

Concession 3 is a 161,670 hectare timber company spanning the Papua and West Papua provinces. The Concession 3 was acquired by the big group timber company in 2019. The group operates an integrated upstream to downstream wood business concentrated in eastern Indonesia - Papua and West Papua. The group upstream sector focuses on sustainably cultivating forest areas which has S-PHPL, S-LK, and FSC certifications

We conducted an 8-day field visit to Concession 3 and identify suitable carbon business scenarios. We surveyed heavily degraded forest areas, 1-year post-logging areas, recently logged areas, pre-logging areas, community illegal logging areas, farming areas around the Papua causeway, and designated HCVF areas.

Based on our observations, the IFM-LtP scenario is most suitable since the estimated illegal logging area is small, around 500-1000 m3/year. The degraded area is also minimal and scattered, able to naturally regenerate into forest again.

Threats also come from the Papua causeway but the local culture prevents large-scale clearing. Unlike Kalimantan or Sumatra where an individual may clear >2 ha for rice/oil palm, the Concession 3 community generally grows bananas, chili, vegetables or other daily crops on narrow <500 m2 plots. Therefore, the REDD+ AUD method remains low scoring compared to the IFM-LtP SET-ASIDE methodology.

5.4.1 Pictures from the field work

6. Post-Field Execution & Data Analysis

After the field work, the TBI team processed the data and, in collaboration with the concession, entered the data into the Feasibility Checklist.

- Analysis of the results
- Changing of parameters in the model
- Communication of the results with the concession

We were glad to find preliminary results from the Feasibility Checklist for each concession that were in line with what the TBI team had expected on a high level. Especially after some tweaks that we made to the Feasibility Checklist Excel model, the results were in line with our expectations.

6.1 Concession 1

6.1.1 Checklist Carbon feasibility assessment

After the fieldwork, the TBI team processed the data and, in collaboration with the concession, entered the data into the Feasibility Checklist.

Step 1 - Determine project type and eligibility

Parameter	Yes/No	Explanation
Does the project area contain a forest?	Yes	
Does the project area include peatland or organic soils?	No	
Will the project activity involve conversion of forest to non-forest land use/cover?	No	
Does the country context allow for the development of VCM carbon projects?	Yes	
Will the forest be deforested in the baseline (in absence of the project activity)?	Yes	
Is the deforestation planned (in absence of the project activity)?	No	
Will the forest be degraded in the baseline?	Yes	
Is the forest degradation planned?	Yes	
Will the project activity involve timber harvesting?	Yes	
Will the project activity involve a reduction in harvest levels?	No	

Table 8 – Project Type & Eligibility Concession 1

Based on the project type and eligibility checklist above, the Feasibility Checklist decision tree concludes that the project type at Concession 1 that is likely to be developed is a REDD+ project (unplanned deforestation or degradation). Concession 1 legally obtained a permit to carry out planned logging activities (forest degradation planned), however Concession 1 is in an inactive state so that deforestation occurred a lot.

6.1.2 Carbon Calculation

The checklist recommends that the eligible project type is a REDD+ project (unplanned deforestation or degradation), even though in doing carbon calculations we try to do carbon calculations for all project activities based on the carbon calculation tools.

The model parameterization used in the calculation using the Feasibility Checklist tools is as follows:

Parameter	Value	Source
Ecological zone	Tropical forest	
Continent	Asia	
Country	Indonesia	
Forest status	Secondary > 20 years	
Abbreviation	TroAsSec>20	
National/regional deforestation rate (%/year)	0.788896316	KLHK deforestation rate 2006-2020, province level
Average aboveground carbon (ton dry mass per hectare)	104.0815	
Project crediting period (years)	30	
Total project area (hectare)	28,885	
Baseline rotation length (years)	30	
Baseline harvesting intensity (m3/ha)	17	

Table 9 – General Parameters Concession 1

Parameter	Value	Source
Set-aside activity area (hectares)	18,351	
BCEF	1.69	
CF	0.47	IPCC
C to CO2e	44/12	
Non-permanence risk (Buffer)	10	
Leakage	20	
Uncertainty	2	

Table 10 – Set-Aside Parameters Concession 1

Parameter	Value	Source
RIL-C activity area (hectares)	18,351	
Average RIL-C emission reductions ton/m3	0.29	Griscom et al. 2014; Pearson et al. 2014
Non-permanence risk (Buffer)	10	
Leakage	0	
Uncertainty	2	

Table 11 – RIL-C Parameters Concession 1

Parameter	Value	Source
REDD+ activity area	18,351	
Deforestation intensity	Low	
Will the project area be logged?	Yes	
Project scenario rotation length (years)	30	
Project scenario harvesting intensity (m3/ha)	0	
Non-permanence risk (Buffer)	10	
Leakage	20	
Uncertainty	2	

Table 12 – REDD+ Parameters Concession 1

The results of Concession 1 provisional analysis are as follows:

Feasibility checklist (Form International)		VCS By Verra	
Methodology	**VCU**	**Methodology**	**VCU**
SET-ASIDE (IFM-LtP)*	**Total VCU (tCO2e)** 641,096 **Average (tCO2e/yr)** 21,370	IFM-LtP	**Total VCU (tCO2e)** 614,019 **Average (tCO2e/yr)** 24,561
RIL-C*	**Total VCU (tCO2e)** 79,795 **Average (tCO2e/yr)** 2,660	RIL-C	
REDD+ activity area (AUD)*	**Total VCU (tCO2e)** 1.2 million **Average (tCO2e/yr)** 38,984	AUD	**Total VCU (tCO2e)** 1.2 million **Average (tCO2e/yr)** 42,404
ARR	*This tool does not include ARR Calculation*	ARR	**Total VCU (tCO2e)** 576,257 **Average (tCO2e/yr)** 19,209

Table 13 – Concession 1 FC vs. Verra results (green border the recommended activity by FC)
*Note: * Optional project activity*

SET-ASIDE (IFM-LtP), RIL-C, and REDD+ activity area (AUD) are project activity options for project developers that can be combined with ARR activities. RIL-C calculations were not included in the Verra analysis because the Verra methodology for RIL-C does not apply to the geographic area of Concession 1 . RIL-C in the Verra methodology is only applicable to East Kalimantan and North Kalimantan, and not Sumatra.

Besides this difference in result, the results for IFM-LtP and REDD+ AUD from the Feasibility Checklist and Verra analysis are similar and indicate a good feasibility for carbon project development (more detail in the cost-benefit analysis below).

One note to make is that caution is warranted when estimating AUD values. Deforestation rates have a significant impact on the results and will thus significantly impact the VCU value obtained. The feasibility checklist tools include a "Deforestation intensity" parameter where the medium category doubles the deforestation rate. This parameter is highly sensitive - at high intensity, the deforestation rate is quintupled. Additionally, the feasibility checklist tools do not account for post-deforestation carbon stocks, unlike the Verra standard. Careful parameter selection is critical for accurate AUD estimation using the feasibility checklist. Integrating findings from both the checklist and Verra tools provides a robust AUD assessment.

6.1.3 Cost Benefit tool

The purpose of this tool is to provide an initial, high-level understanding of the potential costs and benefits associated with a carbon project. Although the tool is not intended to draw definitive conclusions on financial feasibility, it helps to increase understanding of how certain parameters can influence the financial outcome of the project. Please note that taxes and inflation are not factored into the calculations.

The model parameterization used in the calculation using the cost benefit tools is as follows:

General			
Financial	**Value**	**Unit**	
EUR:USD FX rate	1.09	USD/€	*Last update April 2023*
Timeline start year	2023	year	
CCB certification	Yes	Yes/No	
	REDD+	**IFM**	**Unit**
Carbon price VCS	5		€/VCU
Carbon price VCS-CCB	8		€/VCU
Project		**Unit**	
Project size (credit eligible)	18.351	hectares	
Carbon yield	2,12	tCO2/ha/year	*Based on outcome of carbon calculation tool*
Operational start year	2024	year	
Project start date	2024	year	
# years verification dates back	1	years	
	REDD+	**IFM**	**Unit**
1) Project pre-feasibility time	1		years
2) Project development time	2		years
3) Project audit time (validation, verification (optional))	1		years
4) Project marketing time	1		years
Verification interval	2		years

Table 14 – Cost Benefit Tool General inputs Concession 1

Project development & audit cost			
General	**Value**	**Unit**	
Yearly project owner cost (staff, transport & vehicles, monitoring, management, etc.)	297.059	€/y	
Project start costs	529.412	€	*Preparatory social and environmental studies required when opting for CCB certification are likely to lead to higher start-up costs*
Yearly project owner costs start year	2024	year	
Marketing costs	5%	% of sales	
Contingency	3%	% of all costs	
Costs (consultancy & third party)	**REDD+**	**IFM**	**Unit**

Pre-feasibility studies / carbon quick scan	30.000	€
PD development	529.412	€
1st audit (validation + verification) - VCS	18.000	€
1st audit (validation + verification) - VCS CCB	21.000	€
Project TA & verification		
Monitoring & TA	20,000	€
Verification TA	40,000	€
Follow up audits (verification) - VCS	13,000	€
Follow up audits (verification) - VCS CCB	16,000	€
RIL-C (IFM only)		
Regional performance method development		€

Table 15 – Cost Benefit Tool Project Development & Audit Costs Concession 1

The results of concession 1 provisional cost benefit tool

Concession 1 , which is recommended for a REDD+ project, showed no positive gross profit from the carbon cost-benefit analysis with carbon price of US$ 8 / tCO2e. The primary reason for this is because the area is very small for carbon concessions and in mineral soils the additionality is further limited.

The gross profit calculation for the REDD+ project shows negative values until the project cycle is finished. Only with a significantly higher carbon price will this project be appealing from a financial perspective. With a VCS-CCB carbon price of US$21 / tCO2e does the IRR over a 25-year period reach 10% and with a VCS-CCB carbon price north of US$23 / tCO2e does the IRR over a 15-year period reach 10%.

Concession 1 management response to the result

From the results of the study we conducted, Concession 1 realized that the potential for carbon was limited because the concession area they owned is relatively small, around 28,885 hectares, with a carbon price of US$ 8 / tCO2e. Before we conducted the Feasibility Study, they already suspected that this could be the case, and the Feasibility Checklist was a great tool to confirm their initial expectation.

They do hope that this area can still be developed for a carbon business because Concession 1 is an important area for the habitat of the Sumatran Tiger.

6.2 Concession 2

6.2.1 Checklist Carbon feasibility assessment

After the field work, the TBI team processed the data and, in collaboration with the concession, entered the data into the Feasibility Checklist.

Step 1 - Determine project type and eligibility

Parameter	Yes/No	Explanation
Does the project area contain a forest?	Yes	
Does the project area include peatland or organic soils?	No	
Will the project activity involve conversion of forest to non-forest land use/cover?	No	
Does the country context allow for the development of VCM carbon projects?	Yes	
Will the forest be deforested in the baseline (in absence of the project activity)?	No	
Is the deforestation planned (in absence of the project activity)?	No	
Will the forest be degraded in the baseline?	Yes	
Is the forest degradation planned?	Yes	
Will the project activity involve timber harvesting?	No	
Will the project activity involve a reduction in harvest levels?	No	

Table 16 – Project Type & Eligibility FC Concession 2

Based on the project type and eligibility checklist, the likely project for Concession 2 is IFM - Logged to Protected Forest (planned degradation). Concession 2 legally obtained a permit for planned logging (planned degradation) but wants to convert the area to protection, ending logging. However, other options could accommodate government timber production obligations. IFM - Reduced Impact Logging (planned degradation) is an eligible project activity that could be applied in these conditions.

6.2.2 Carbon Calculation

The checklist recommends that the eligible project type is IFM - Logged to Protected Forest (planned degradation), even though in doing carbon calculations we try to do carbon calculations for all project activities based on the carbon calculation tool's.

The model parameterization used in the calculations in the Concession 2 project area using the Feasibility Checklist tools is as follows:

Parameter	Value	Source
Ecological zone	Tropical forest	
Continent	Asia	
Country	Indonesia	
Forest status	Secondary > 20 years	
Abbreviation	TroAsSec>20	
National/regional deforestation rate (%/year)	1.292242054	
Average aboveground carbon (ton dry mass per hectare)	100	
Project crediting period (years)	25	
Total project area (hectare)	140,077	
Baseline rotation length (years)	25	
Baseline harvesting intensity (m3/ha)	40	

Table 17 – General Parameters Concession 2

Parameter	Value	Source
Set-aside activity area (hectares)	140,077	
BCEF	1.5-1.7	IPCC
CF	0.47	IPCC
C to CO2e	44/12	
Non-permanence risk (Buffer)	10	
Leakage	20	
Uncertainty	2	

Table 18 – Set-Aside Parameters Concession 2

Parameter	Value	Source
RIL-C activity area (hectares)	140,077	
Average RIl-C emission reductions ton/m3	0.29	Griscom et al. 2014; Pearson et al. 2014
Non-permanence risk (Buffer)	10	
Leakage	0	
Uncertainty	2	

Table 19 – RIL-C Parameters Concession 2

Parameter	Value	Source
REDD+ activity area	140,077	
Deforestation intensity	Low	
Will the project area be logged?	Yes	
Project scenario rotation length (years)	25	
Project scenario harvesting intensity (m3/ha)	0	
Non-permanence risk (Buffer)	10	
Leakage	20	
Uncertainty	0	

Table 20 – REDD+ Parameters Concession 2

The results of Concession 2 provisional analysis are as follows:

Feasibility checklist (Form International)		VCS By Verra	
Methodology	**VCU**	**Methodology**	**VCU**
SET-ASIDE (IFM-LtP)*	**Total VCU (tCO2e)** 10.4 million **Average (tCO2e/yr)** 417,245	IFM-LtP	**Total VCU (tCO2e)** 14.5 million **Average (tCO2e/yr)** 579,417
RIL-C*	**Total VCU (tCO2e)** 1.4 million **Average (tCO2e/yr)** 57,326	RIL-C	-
REDD+ activity area (AUD)*	**Total VCU (tCO2e)** 11.7 million **Average (tCO2e/yr)** 468,319	AUD	-
ARR	*This tool does not include ARR Calculation*	ARR	**Total VCU (tCO2e)** 408,148 **Average (tCO2e/yr)** 16,326

Table 21 – Concession 2 FC vs. Verra results
*Note: * Optional project activity*

The Feasibility Checklist and VCS Verra results showed general agreement, though some differences emerged. The Feasibility Checklist's AUD method yielded the highest values since it calculates district-level deforestation rates. Kalimantan has relatively high deforestation, inflating the AUD results. Meanwhile, Verra's IFM-LtP and ARR scenarios better match the active timber production yet partially degraded forest cover observed on the Concession 2 .

The IFM-LtP SET-ASIDE calculations differ significantly between the methods. The Feasibility Checklist uses a fixed 1.53 m3/t adjusted weight/volume conversion factor averaged across calculations. In contrast, Verra's VCS approach applies a dynamic conversion factor tailored to the estimated yearly production. These differing conversion factors drive the calculation variations evident in Table 21. Overall, integrating findings from both tools provides a robust feasibility assessment for Concession 2.

6.2.3 Cost Benefit tool

The model parameterization used in the calculation in the Concession 2 project area using the cost benefit tools is as follows:

The model parameterization used in the calculation using the cost benefit tools is as follows:

General			
Financial	**Value**	**Unit**	
EUR:USD FX rate	1.09	USD/€	*Last update April 2023*
Timeline start year	2023	year	
CCB certification	Yes	Yes/No	
	REDD+	**IFM**	**Unit**
Carbon price VCS	5	5	€/VCU
Carbon price VCS-CCB	8	8	€/VCU
Project		**Unit**	
Project size (credit eligible)	140.077	hectares	
Carbon yield	2,98	tCO2/ha/year	*Based on outcome of carbon calculation tool*
Operational start year	2024	year	*If cell red, unreasonable project start year*
Project start date	2024	year	
# years verification dates back	1	years	
	REDD+	**IFM**	**Unit**
1) Project pre-feasibility time		1	years
2) Project development time		2	years
3) Project audit time (validation, verification (optional))		1	years
4) Project marketing time		1	years
Verification interval		2	years

Table 22 – Cost Benefit Tool General inputs Concession 2

Project development & audit cost			
General	**Value**	**Unit**	
Yearly project owner cost (staff, transport & vehicles, monitoring, management, etc.)	2.000.000	€/y	
Project start costs	529.412	€	*Preparatory social and environmental studies required when opting for CCB certification are likely to lead to higher start-up costs*
Yearly project owner costs start year	2024	year	
Marketing costs	5%	% of sales	
Contingency	3%	% of all costs	
Costs (consultancy & third party)	**REDD+**	**IFM**	**Unit**
Pre-feasibility studies / carbon quickscan		30.000	€
PD development		529.412	€

1st audit (validation + verification) - VCS		18.000	€
1st audit (validation + verification) - VCS CCB		21.000	€
Project TA & verification			
Monitoring & TA		10.000	€
Verification TA		20.000	€
Follow up audits (verification) - VCS		11.000	€
Follow up audits (verification) - VCS CCB		14.000	€
RIL-C (IFM only)			
Regional performance method development		0	€

Table 23 – Cost Benefit Tool Project Development & Audit Costs Concession 2

The results of Concession 2 provisional cost benefit tool

The eligible scenario for Concession 2 is IFM-LtP, because this concession is still actively logging and one of the concessions that cuts down the most trees in Kalimantan. This concession also has good biodiversity, so the possibility of getting a CCB is not difficult, which would likely result in a price higher than US$ 8 / tCO2e. However, for consistency purposes in our analysis we used US$ 8 / tCO2e.

Profitability calculations yield a positive gross profit of €16.5m over a 25-year operational period. However, cash flow is negative in the first three operational years (2024-2026) due to the initial exploitation stage and only starts generating cash in 2027, when the first credit issuance from 2026 get sold in the market. Cumulative cash flow fluctuates between negative and positive until 2034, as some years see issuance of new credits and some years only incur costs. However, from 2035 onwards the project will begin to generate significant positive cash flows.

The Internal Rate of Return (IRR) analysis shows the following:

- 5Y: 11.9%
- 15Y: 15.5%
- 25Y: 18.8%

Concession 2 management response to the result

After studying the result from the Pre-Feasibility Study conducted with the Feasibility Checklist, Concession 2 conducted a comparative analysis between the potential financial gains from converting to a carbon business and keeping the status quo as a logging business. Their conclusion was that the timber business was more profitable. In addition to this conclusion purely for the concession in which we conducted the feasibility study, Concession 2 parent company (a timber processing and manufacturing business) also relies on the Concession 2 for the supply of wood products. So their decision to continue to focus on logging is not just one made from a financial consideration, also for operational perspective.

However, Concession 2 management is truly committed to conservation and combatting climate change and are committed to try to reduce emissions from their business. Whilst Concession 2

itself may not convert to a carbon business, they are considering to acquire concessions that have a clearer carbon business case.

6.3 Concession 3

6.3.1 Checklist Carbon feasibility assessment

After the field work, the TBI team processed the data and, in collaboration with the concession, entered the data into the Feasibility Checklist.

Step 1 - Determine project type and eligibility

Parameter	Yes/No	Explanation
Does the project area contain a forest?	Yes/No	
Does the project area include peatland or organic soils?	Yes	
Will the project activity involve conversion of forest to non-forest land use/cover?	No	
Does the country context allow for the development of VCM carbon projects?	No	
Will the forest be deforested in the baseline (in absence of the project activity)?	Yes	
Is the deforestation planned (in absence of the project activity)?	No	
Will the forest be degraded in the baseline?	No	
Is the forest degradation planned?	Yes	
Will the project activity involve timber harvesting?	Yes	
Will the project activity involve a reduction in harvest levels?	No	
	No	

Table 24 - Project Type & Eligibility FC Concession 3

Based on the project type and eligibility checklist, the likely project for Concession 3 is IFM - Logged to Protected Forest (planned degradation). Concession 3 legally obtained a permit for planned logging (planned degradation). They want to know the VCU potential in their area to assess future business profitability. They want logging to continue with other options to meet government timber demand obligations. IFM - Reduced Impact Logging (planned degradation) is an eligible project activity that could be applied under these conditions.

6.3.2 Carbon Calculation

The checklist recommends that the eligible project type is IFM - Logged to Protected Forest (planned degradation), even though in doing carbon calculations we try to do carbon calculations for all project activities based on the carbon calculation tools.

The model parameterization used in the calculations in the Concession 3 project area using the Feasibility Checklist tools is as follows:

Parameter	Value	Source
Ecological zone	Tropical forest	
Continent	Asia	
Country	Indonesia	
Forest status	Secondary > 20 years	
Abbreviation	TroAsSec>20	
National/regional deforestation rate (%/year)	0.10	https://www.forestdigest.com/detail/1008/deforestasi-papua
Average aboveground carbon (ton dry mass per hectare)	180.50	
Project crediting period (years)	25	
Total project area (hectare)	161,670	
Baseline rotation length (years)	25	
Baseline harvesting intensity (m3/ha)	28	

Table 25 – General Parameters Concession 3

Parameter	Value	Source
Set-aside activity area (hectares)	118,244	
BCEF	1.5-1.7	IPCC
CF	0.47	IPCC
C to CO2e	44/12	
Non-permanence risk (Buffer)	10	
Leakage	20	
Uncertainty	2	

Table 26 – Set-Aside Parameters Concession 3

Parameter	Value	Source
RIL-C activity area (hectares)	118,244	
Average RIl-C emission reductions ton/m3	0.29	Griscom et al. 2014; Pearson et al. 2014
Non-permanence risk (Buffer)	10	
Leakage	0	
Uncertainty	2	

Table 27 – RIL-C Parameters Concession 3

Parameter	Value	Source
REDD+ activity area	118,244	
Deforestation intensity	Low	
Will the project area be logged?	No	
Project scenario rotation length (years)	25	
Project scenario harvesting intensity (m3/ha)	0	
Non-permanence risk (Buffer)	10	
Leakage	20	
Uncertainty	2	

Table 28 – REDD+ Parameters Concession 3

The results of Concession 3 provisional analysis are as follows:

Feasibility checklist (Form International)		VCS By Verra	
Methodology	**VCU**	**Methodology**	**VCU**
SET-ASIDE (IFM-LtP)*	**Total VCU (tCO2e)** 5.0 million **Average (tCO2e/yr)** 201,296	IFM-LtP	**Total VCU (tCO2e)** 6.36 million **Average (tCO2e/yr)** 212,080
RIL-C*	**Total VCU (tCO2e)** 705,704 **Average (tCO2e/yr)** 28,228	RIL-C	
REDD+ activity area (AUD)*	**Total VCU (tCO2e)** 1.4 million **Average (tCO2e/yr)** 55,188	AUD	-
ARR	*This tool does not include ARR Calculation*	ARR	-

Table 29 – Concession 3 FC vs. Verra results
*Note: * Optional project activity*

Based on the results of the FC analysis and VCS methodology by Verra, the outcomes are not significantly different. The REDD+ activity area determination (AUD) method in Papua produces small values because Papua has very low deforestation rates, unlike Kalimantan and Sumatra. Meanwhile, for the Verra methodology, we applied the IFM-LtP scenario as it is the most realistic given the active timber production in the Concession 3 we observed during our site visit. The ARR method is not applicable because there is minimal encroachment in the Concession 3 concession, with only small areas cleared for bananas and vegetables near the main road to meet basic needs. The RIL-C methodology is currently only developed for East and North Kalimantan, so it does not apply in Papua.

The minor differences between the FC and VCS SET-ASIDE (IFM-LtP) results is because both methodologies use the same Adjusted Weight/Volume Conversion Factor of 1.50 m3/t averaged across production calculations. As seen in Table 29, this results in similar outcomes.

6.3.3 Cost Benefit tool

The model parameterization used in the calculation in the Concession 3 project area using the cost benefit tools is as follows:

The model parameterization used in the calculation using the cost benefit tools is as follows:

General			
Financial	**Value**	**Unit**	
EUR:USD FX rate	1.09	USD/€	*Last update April 2023*
Timeline start year	2020	year	
CCB certification	Yes	Yes/No	
	REDD+	**IFM**	**Unit**
Carbon price VCS		5	€/VCU
Carbon price VCS-CCB		8	€/VCU
Project		**Unit**	
Project size (credit eligible)	118.244	hectares	
Carbon yield	1,70	tCO2/ha/year	*Based on outcome of carbon calculation tool*
Operational start year	2023	year	*If cell red, unreasonable project start year*
Project start date	2023	year	
# years verification dates back	1	years	
	REDD+	**IFM**	**Unit**
1) Project pre-feasibility time		1	years
2) Project development time		2	years
3) Project audit time (validation, verification (optional))		1	years
4) Project marketing time		1	years
Verification interval		2	years

Table 30 – Cost Benefit Tool General inputs Concession 3

Project development & audit cost			
General	**Value**	**Unit**	
Yearly project owner cost (staff, transport & vehicles, monitoring, management, etc.)	1.000.000	€/y	
Project start costs	529.412	€	*Preparatory social and environmental studies required when opting for CCB certification are likely to lead to higher start-up costs*
Yearly project owner costs start year	2023	year	
Marketing costs	5%	% of sales	
Contingency	3%	% of all costs	
Costs (consultancy & third party)	**REDD+**	**IFM**	**Unit**

Pre-feasibility studies / carbon quickscan	30.000	€
PD development	529.412	€
1st audit (validation + verification) - VCS	18.000	€
1st audit (validation + verification) - VCS CCB	21.000	€
Project TA & verification		
Monitoring & TA	10.000	€
Verification TA	20.000	€
Follow up audits (verification) - VCS	11.000	€
Follow up audits (verification) - VCS CCB	14.000	€
RIL-C (IFM only)		
Regional performance method development	0	€

Table 31 – Cost Benefit Tool Project Development & Audit Costs Concession 3

The results of the Concession 3 cost benefit tool

The eligible scenario for concession 3 is IFM-LtP, because this concession is still actively logging. We have worked with a carbon price of US$ 8 / tCO2e, consistent with the rest of our analysis.

Profitability calculations yield a positive gross profit of €7.1m over a 25-year operational period. However, cash flow is negative in the first three operational years (2024-2026) due to the initial exploitation stage and only starts generating cash in 2027, when the first credit issuance from 2026 get sold in the market. Cumulative cash flow is negative until 2032 at which point cumulative cash flow becomes positive and the project will begin to generate decent positive cash flows.

The Internal Rate of Return (IRR) analysis shows the following:

- 5Y: 9.6%
- 15Y: 12.9%
- 25Y: 16.8%

Concession 3 management response to the result

Concession 3 relatively low VCU valuation indicates limited carbon business viability. They acknowledge concessions differ - Papua forests remain largely intact, restricting feasible project types unlike Kalimantan and Sumatra. Here, Avoided Planned Deforestation (APD) could offer the highest profits.

VCU value, however, is minor compared to timber revenue. Though wood prices are decreasing, vertical integration limits effects. The Concession 3 remains committed to emissions reductions. They will explore aggregated programs leveraging scale across multiple concessions to balance transaction costs.

7. Perspective on Verra Certifiability

In tandem with the implementation of the Feasibility Checklist, we conducted comprehensive carbon calculations using TBI's proprietary carbon calculation model, specifically designed to achieve Verra certification. This parallel activity aimed to compare outcomes and pinpoint differences between the results of the Feasibility Checklist and the propriety TBI model. Wahyu, our Verra expert, provided support throughout this process.

To compare the Feasibility Checklist and the Verra methods we compared the inputs required for each methodology, the calculation in each methodology, and the results from both.

7.1 Designing project activity

The Feasibility Checklist provides recommendations for eligible project activities that can be developed in a location (step 1 checklist). Even though, given the nature of the decision tree, the recommendation given is always just one project activity, a REDD project will always be an eligible project activity to be developed even when the criteria for an IFM project are also fulfilled. Meanwhile, Verra allows the development of multiple project activities within a landscape.

For example, for projects that combine agroforestry or enrichment planting with improved forest management the project shall follow an ARR methodology for planting activities and an IFM methodology for improved forest management activities. Activities that generate net reductions of GHG emissions from wetlands are eligible as WRC projects and combined category projects (such as REDD on peatland). Conservation of Intact Wetlands (CIW) may be implemented and combined with IFM, REDD, referred to as IFM+CIW or REDD+CIW, respectively. Restoring Wetland Ecosystems (RWE) may be combined with ARR, ALM, IFM, REDD activities, referred to as ARR+RWE, ALM+RWE, IFM+RWE, REDD+RWE, respectively.

The eligibility of project activity on Verra is largely determined by the legality of the status and function of the project area, so that the project meets the legal criteria that apply in a country. In addition to the biophysical and socio-economic conditions that support the project, it can be developed.

It is possible to 'mimic' this multi-methodology approach using the Feasibility Checklist, by dividing subdividing the project area into each separate carbon project approach, and running the Feasibility Checklist calculations and Cost-Benefit tools for each scenario. This will require an in-depth analysis of the concession and field study so was not done for this pilot, but we do see the opportunity to do so.

7.2 Input

Vera provides several methods, modules and tools that must be followed. The project must select the GHG sources, sinks, reservoirs, data, and methodologies appropriate to the needs of the intended user, including all relevant GHG emissions and removals and all relevant information to support the criteria and procedures chosen.

The carbon pools that are considered in the baseline and project emission calculations are adjusted to the method of the project used, there are carbon pools that are mandatory and some that are optional. Five carbon pools can be considered in a methodology:

- Aboveground biomass
- Belowground biomass
- Litter

- Deadwood
- Soil organic carbon

However, each methodology may have specific requirements with regards to which carbon pools much be included. ARR methodologies, for instance, only consider Aboveground and Belowground biomass. IFM methodologies, on the other hand, must consider dead wood and harvesting wood product in addition to Aboveground biomass.

This marks a significant difference with the Feasibility Checklist, which only considers aboveground carbon.

Likewise, in the case of gas sources being considered, the project must follow the method used whether all gas must be considered or only certain gas sources, if fire and use of fuel contribute greatly then CH4, N2O gas sources must be considered in projects other than CO2.

In a landscape that has a high degree of diversity in terms of land use and land cover, in the context of Verra, stratification must be done to minimize the diversity that occurs which will impact the accuracy of the estimation. Stratification can be done using land cover classes or in combination with other physical parameters.

In the Feasibility Checklist method, land cover is only considered as one class, even though if we look at the concessions that we have assessed there are two types of land cover, which will affect the Average aboveground carbon value (tons of dry mass per hectare) and of course it will affect also to the resulting VCU. For the AGB value in FC Version 1, by default it has been averaged for Indonesia regardless of geographical conditions, but in the latest version we are given the flexibility to change the AGB value which can be adjusted accordingly.

7.3 Calculation

Verra has a principle in calculations, to reduce bias and uncertainty as far as possible. Transparency, disclosing sufficient and appropriate GHG-related information to enable the intended users to make decisions with reasonable confidence. Estimating conservatively, using conservative assumptions, values, and procedures to ensure that net GHG emission reductions or removals are not overestimated.

In calculating emissions from deforestation activities, especially unplanned deforestation, the level of deforestation that occurs in the context of Verra is determined historically based on the project area or using a reference region which is determined based on certain criteria.

The Feasibility Checklist, however, takes a different approach by using a ‘deforestation intensity’ rate variable in the model. The deforestation rate is very sensitive and has a big influence on the final calculation results. In the second version of the Feasibility Checklist as provided by PFF, we were able to tweak the national average deforestation rate to an appropriate value applicable to each concessions. However, users with limited technical carbon knowledge may find it difficult to interpret deforestation intensity in their area.

We do see the benefits of the Feasibility Checklist using a deforestation rate instead of manually calculating the deforestation rate for each project area. It makes the Feasibility Checklist more user-friendly and easier to reach a result.

In calculating emissions for IFM project activities, the Verra VM0010 methodology accounts for emissions and removals resulting from changes in carbon stock of deadwood, changes in carbon stock of wood products, and forest regrowth. By contrast, the feasibility checklist calculation

tools estimate emissions based solely on the volume harvesting intensity (m3/ha). For IFM or ARR projects involving timber harvesting, the Verra requirements mandate quantifying and deducting the carbon losses from harvesting when determining overall project emissions reductions. This is an important difference from the feasibility checklist approach.

Specifically, Verra methodologies require subtracting the carbon removed in harvested wood from the project's total quantified emissions reductions. This aligns with Verra's conservative approach and ensures credited emissions reductions represent permanent reductions. Without adjusting for harvesting leakage, projects could claim credits higher than their true long-term climate benefit. Properly accounting for harvesting losses ensures the GHG credits available to IFM and ARR projects do not exceed the long-term sequestration from forest regrowth and storage in wood products.

Overall, the Verra tools provide a more comprehensive and rigorous approach to assessing IFM and ARR project impacts than the feasibility checklist estimates based solely on harvesting volumes. Adopting the Verra approach could improve the accuracy and credibility of project analysis, providing assurance the quantified climate benefits are permanent and additional. Aligning feasibility checklist procedures with Verra would enable projects to transition smoothly from initial rapid analysis to full standard development.

8. Results, Comparability, Recommendations and Next Steps

8.1 Results

We based our study on three different concession types: Inactive, Active with SFM and Active without SFM.

The first category, represented by Concession 1 in our study, is most suitable for the REDD (AUD) scenario given that inactivity leads to increased encroachment by external actors seeking access to unused lands within company boundaries. In our specific sample we had a relatively small inactive concession area which was not large enough to lead to a profitable project. However, a larger inactive concession would be expected to produce higher VCU values under the REDD (AUD) scenario and thus better profitability profile.

The second category, represented by Concession 2 in our study, that shows significant potential for carbon business is the concessions that have FSC certification and plan a carbon project under the IFM-LtP scenario. FSC certified concessions conduct extensive logging as there is higher demand for certified wood products and a broader geographic market.

The third category, represented by Concession 3 in our study, covers active concessions without FSC certification. In our sample, which is largely representative for active concession without FSC certification, the concession has low logging rates and is located in the Papua region. Concessions such as these concessions offer less added value for carbon business (given the lack of FSC certification limits their markets and the distinct conditions in Papua result in lower production, illegal logging, and encroachment compared to other Indonesian regions) but still represents a decent potential for carbon projects. Whilst there is reduced additionality for carbon projects, with the right carbon price it is still possible to achieve profitable projects.

8.2 Comparability

In the context of FOLU, Verra provides four robust project activities: REDD+ (AUD/Avoid Unplanned Deforestation, APD/Avoid Planned Deforestation, Planned Degradation), ARR, IFM, and WRC. Each activity has clear tools and modules for projects to follow.

The Feasibility Checklist, developed by Form International, is a rapid assessment tool to be used before more comprehensive Verra standard evaluations. The checklist, when used by people who have a good understanding of carbon theory, produces outcomes that do not significantly differ from the Verra methodology.

The only instance where the Feasibility Checklist produced a significantly different result is with Concession 2 in a theoretical IFM LtP carbon project. Our Verra calculations showed an annual carbon credit value of 579,000 tCO2e whereas the Feasibility Checklist result was 417,000 tCO2e annually, a difference of 28%. However, as described in the results section for Concession 2, this difference is due to the adjusted weight/volume conversion factor. In the Feasibility Checklist this value is set to 1,53m3/t whereas in the Verra methodology this figures is calculated dynamically based on the year's projected logging activity. We are therefore confident that, despite this difference, the comparability between the Feasibility Checklist and Verra methodology is not compromised. It does, however, highlight again the need for a carbon expert to be using the tool as only minor tweaks in variables and inputs can drastically change the results (e.g. when changing the adjusted weight/volume conversion factor to 2,1 in the Feasibility Checklist, the annual volume of carbon credits increases to 572,000 tCO2e, in line with the Verra methodology).

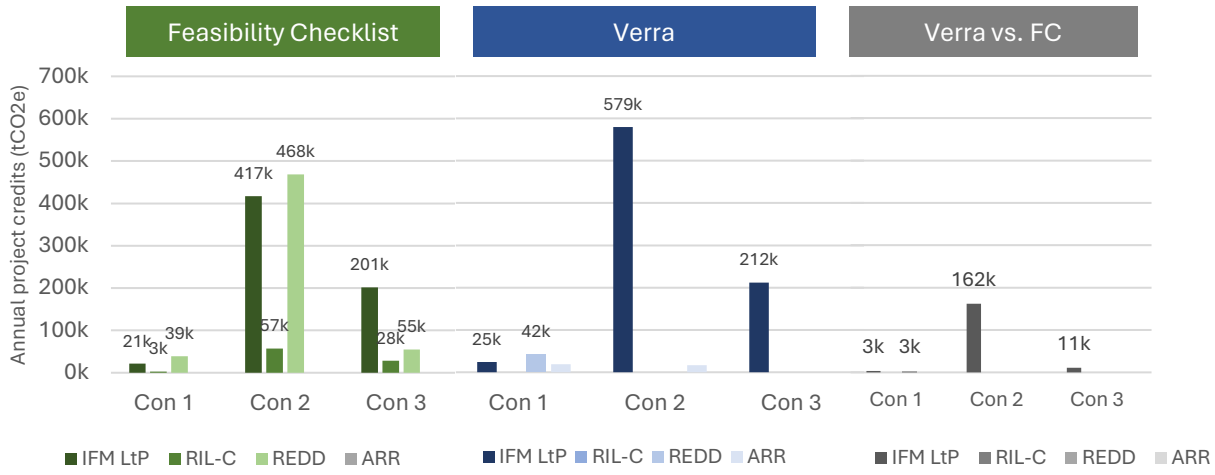

Chart 2 – Comparison between Feasibility Checklist and Verra methodology

Overall, we conclude that the checklist provides an excellent initial benchmark aligned with Verra standards for project developers. Consequently, the rapid assessment results should serve as a preliminary reference adhering to Verra standards. This information can then be used to refine the checklist and improve the calculation model's parameterization.

8.3 Recommendations

8.3.1 Feasibility Checklist

Since our interim reporting and feedback on the Feasibility Checklist we have no major recommendations to the workings of the tool. We believe that the tool at the moment strikes the right balance between usability, user-friendliness and insight.

With regards to the insights generated, we would recommend the following:

- Add a sensitivity analysis, perhaps in one a new sheet. This would allow the user to see what impact slight variations in variables has on the final results
- Add a dashboard page that shows a summary of results, also in chart format, that easily communicates the results

8.3.2 Carbon Cost-Benefit Tool

The carbon cost-benefit analysis tool is a very valuable addition to the Feasibility Checklist and our project greatly benefitted from including this tool in our analysis in the second part of the project. It provides a robust and reusable framework to determine the profitability of a carbon project.

To use the Cost-Benefit Tool, a basic knowledge of financial analysis in addition to carbon is required. If this knowledge is present, we believe the tool will pose no significant challenges in using and we have no significant changes to recommend. However, as with the Feasibility Checklist, we would recommend the following:

- Add a sensitivity analysis, perhaps in one a new sheet. This would allow the user to see what impact slight variations in variables has on the final results
- Add a dashboard page that shows a summary of results, also in chart format, that easily communicates the results

8.4 Next steps

Following the successful implementation of the Feasibility Checklist and Cost-Benefit Tool across three concessions, we would like to see how TBI can help spread awareness about the availability of this tool in Indonesia.

- TBI will continue to use the tool to get a quick understanding of carbon opportunities when engaging with potential investors and concessions
- TBI could promote the tool in a LinkedIn post, recommending forest concessions to use the tool to get an initial understanding of the carbon potential in their concessions

We could also explore, possibly in collaboration with Form International, the following:

- Organise an event in Jakarta for forest concessions, in collaboration with the Indonesian association of concession holders (APHI), to inform concessions of the recent developments in the carbon markets where the Feasibility Checklist and Cost-Benefit tools are promoted