



**Verified Carbon
Standard**

GREEN GOLD LORETO 1 VCS 2ND MONITORING REPORT



Project title	Green Gold Loreto 1
Project ID	2345
Monitoring period	01-August-2022 to 31-July-2024
Original date of issue	09-July-2026 is the date the monitoring report was completed following the completion of the audit.
Most recent date of issue	09-July-2026 is the date on which the document was most recently submitted
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Prepared by	Green Gold Forestry Peru S.A.

CONTENTS

1	PROJECT DETAILS.....	4
1.1	Summary Description of the Implementation Status of the Project	4
1.2	Audit History.....	5
1.3	Sectoral Scope and Project Type	5
1.4	Project Proponent	5
1.5	Other Entities Involved in the Project	6
1.6	Project Start Date	6
1.7	Project Crediting Period	6
1.8	Project Location	6
1.9	Title and Reference of Methodology	12
1.10	Double Counting and Participation under Other GHG Programs	12
1.11	Double Claiming, Other Forms of Credit, and Scope 3 Emissions.....	12
1.12	Sustainable Development Contributions	13
1.13	Commercially Sensitive Information.....	16
2	SAFEGUARDS AND STAKEHOLDER ENGAGEMENT	16
2.1	Stakeholder Engagement and Consultation.....	16
2.2	Risks to Stakeholders and the Environment.....	34
2.3	Respect for Human Rights and Equity	37
2.4	Ecosystem Health	39
3	IMPLEMENTATION STATUS	42
3.1	Implementation Status of the Project Activity	42
3.2	Deviations	45
3.3	Grouped Projects	70
3.4	Baseline Reassessment.....	70
4	DATA AND PARAMETERS.....	70
4.1	Data and Parameters Available at Validation	70
4.2	Data and Parameters Monitored.....	87
4.3	Monitoring Plan.....	97
5	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	105
5.1	Baseline Emissions	105

5.2	Project Emissions	110
5.3	Leakage Emissions	114
5.4	GHG Emission Reductions and Carbon Dioxide Removals	123
APPENDIX 1: COMMERCIALY SENSITIVE INFORMATION.....		128
APPENDIX 2: GREEN GOLD LORETO 1 ER CALCULATION SPREADSHEET Y3Y4		128
APPENDIX 3: SDG EVIDENCE_Y3Y4		128
APPENDIX 4: LEAKAGE ANALYSIS PROJECT 2345_Y3Y4.....		128
APPENDIX 5: PRA RESULTS		1288
APPENDIX 6: NPRR_Y3Y4		128

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Green Gold Forestry Peru S.A. (GGF) is a forestry company with 394,875 hectares (ha) of production forest concessions for timber purposes located in the Loreto region. With the Green Gold Loreto 1 project, GGF has taken 183,445.54 ha of its concession area out of the planned logging cycle and into management for ecosystem services. Using the VM 0010 “Methodology for Improved Forest Management: Conversion from Logged to Protected Forest, v1.3 (28 April 2016)”, validated in 2021, **the project reduced 550,133 tCO₂e and removed 91,297 tCO₂e net GHG emissions** during the monitoring period August 2022 – July 2024. In addition, the following activities were implemented:

1. Involving the neighboring communities in the project, to ensure their participation in the project
 - Active involvement of neighboring communities as stakeholders and beneficiaries.
 - Over 400 temporary jobs were created, and US\$142,276 in local procurement and over 550 individuals trained in NTFP (non-timber forest product) harvesting, conservation, and management.
 - Pilot baseline established for community impact monitoring.
 - Partnerships with 6 communities for communal enterprise development (infrastructure implemented in five communities: four (4) in Napo, one (1) in Marañón).
2. Regularly patrolling the project area with teams of forest custodians
 - Training and accreditation of 11 forest stewards (6 in 2023).
 - Seven fluvial patrols (six Marañón, one Tacsha-Curaray) and two field entries since August 2022.
 - Resource mapping implemented to identify potential concession overlaps and risk of illegal entry to GGF forest concessions.
3. Erecting signs along all fluvial access points and existing logging roads
 - Installation of 40 boundary markers (banners) at access points (19 Mazán, 21 Tacsha-Curaray).
 - Territorial boundary activities conducted with eight allied communities to reinforce land ownership.
4. Remote monitoring using drone and satellite surveys:
 - Satellite carbon mapping was developed by our remote sensing partner, Space Intelligence.
 - Implementation of a deforestation early warning system (AT-D) for monthly field surveillance.
 - Integration of drone technology with four pilot flights conducted by licensed personnel.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation	01-August-2020-31-July-2040	VCS	SCS Global	1
Validation	01-August-2020-31-July-2040	CCB	SCS Global	1
Verification	01-August-2020-31-July-2022	VCS	SCS Global	2
Verification	01-August-2020-31-July-2022	CCB	SCS Global	2
Verification	01-August-2022-31-July-2024	VCS	AENOR	2

1.3 Sectoral Scope and Project Type

Sectoral scope	Agriculture, forestry and other land use (AFOLU)
AFOLU project category ¹	Improved Forest Management (IFM)
Project activity type	Logged to Protected Forest (LtPF)

1.4 Project Proponent

Organization name	Green Gold Forestry Peru S.A.
Contact person	Gareth Hughes
Title	General Manager
Address	Jr. Cabo Pantoja 454, Iquitos, Maynas, Loreto, Peru
Telephone	(51) 995194038
Email	gareth.hughes@ggfgroup.pe stuart.clenaghan@ggfgroup.pe

¹ See Appendix 1 of the VCS Standard

1.5 Other Entities Involved in the Project

No other entities are involved in the project.

1.6 Project Start Date

Project start date	01-August-2020
Justification	This is the date on which it is assumed that logging operations would have resumed in the project area in the baseline scenario, whereas the project activity of conservation is effectively being implemented. It marks the beginning of the dry season when logging operations are feasible again after the rainy season.

1.7 Project Crediting Period

Crediting period	☐ Seven years, twice renewable ☐ Ten years, fixed ☒ Other (20 years, fixed)
Start and end date of first or fixed crediting period	01-August-2020 to 31-July-2040

1.8 Project Location

The project areas have been divided by GGF into three project regions, each comprising one or more discreet parcels of forest land. The three regions are:

1. Consolidado Tacsha – Total area 125,557.53 ha
2. Consolidado Mazán – Total area 30,619.63 ha
3. San Regis – Total area 27,268.38 ha

The locations of the project areas are shown in Figure 1, and the geodetic coordinates are presented in Table 1, 2 and 3.

Table 1: Geodetic coordinates - Consolidated 1: Tacsha

Vertices	Segments	UTM coordinates		Geodetic Coordinates	
		East	North	Latitude	Longitude
P1	P1 - P2	618560	9681411	2° 52' 54.651" S	73° 55' 59.702" W
P2	P2 - P3	618560	9700613	2° 42' 29.362" S	73° 56' 0.267" W
P3	P3 - P4	623560	9700613	2° 42' 29.216" S	73° 53' 18.355" W
P4	P4 - P5	623560	9695613	2° 45' 12.033" S	73° 53' 18.205" W

P5	P5 - P6	628560	9695613	2° 45' 11.878" S	73° 50' 36.290" W
P6	P6 -P7	628560	9700825	2° 42' 22.157" S	73° 50' 36.452" W
P7	P7 - P8	638560	9702656	2° 41' 22.210" S	73° 45' 12.703" W
P8	P8 - P9	638560	9695613	2° 45' 11.550" S	73° 45' 12.467" W
P9	P9 - P10	641061	9695613	2° 45' 11.464" S	73° 43' 51.489" W
P10	P10 - P11	641061	9694778	2° 45' 38.653" S	73° 43' 51.460" W
P11	P11 - P12	643904	9694778	2° 45' 38.553" S	73° 42' 19.400" W
P12	P12 - P31	643904	9690613	2° 47' 54.170" S	73° 42' 19.252" W
P13	P13 - P14	637904	9690613	2° 47' 54.382" S	73° 45' 33.548" W
P14	P14 - P15	637904	9685613	2° 50' 37.191" S	73° 45' 33.376" W
P15	P15 - P16	633560	9685613	2° 50' 37.340" S	73° 47' 54.054" W
P16	P16 - P17	633560	9690613	2° 47' 54.529" S	73° 47' 54.221" W
P17	P17 - P18	628560	9690613	2° 47' 54.692" S	73° 50' 36.132" W
P18	P18 - P19	628560	9677382	2° 55' 5.529" S	73° 50' 35.700" W
P19	P19 - P20	638560	9712503	2° 36' 1.596" S	73° 45' 13.023" W
P20	P20 - P21	638560	9703258	2° 41' 2.628" S	73° 45' 12.723" W
P21	P21 - P22	628560	9701399	2° 42' 3.460" S	73° 50' 36.470" W
P22	P22 - P19	628560	9714780	2° 34' 47.742" S	73° 50' 36.873" W
P23	P23 - P24	623083	9715911	2° 34' 11.081" S	73° 53' 34.240" W
P24	P24 - P25	623122	9730128	2° 26' 28.128" S	73° 53' 33.391" W
P25	P25 - P26	625275	9728651	2° 27' 16.165" S	73° 52' 23.624" W
P26	P26 - P27	625375	9728726	2° 27' 13.706" S	73° 52' 20.389" W
P27	P27 - P28	632508	9729669	2° 26' 42.790" S	73° 48' 29.506" W
P28	P28 - P29	630036	9725552	2° 28' 56.934" S	73° 49' 49.406" W
P29	P29 - P30	638560	9719263	2° 32' 21.471" S	73° 45' 13.237" W
P30	P30 - P23	638560	9714893	2° 34' 43.768" S	73° 45' 13.099" W
P31	P31 - P32	643549	9713777	2° 35' 19.934" S	73° 42' 31.539" W
P32	P32 - P33	648560	9710614	2° 37' 2.750" S	73° 39' 49.187" W
P33	P33 - P34	648560	9708514	2° 38' 11.144" S	73° 39' 49.114" W
P34	P34 - P31	643556	9706009	2° 39' 32.872" S	73° 42' 31.066" W
P35	P35 - P36	638560	9680613	2° 53' 19.977" S	73° 45' 11.947" W
P36	P36 - P37	648560	9680613	2° 53' 19.607" S	73° 39' 48.106" W
P37	P37 - P38	648560	9680886	2° 53' 10.727" S	73° 39' 48.117" W
P38	P38 - P39	653560	9680886	2° 53' 10.532" S	73° 37' 6.197" W
P39	P39 - P40	653560	9681949	2° 52' 35.912" S	73° 37' 6.239" W
P40	P40 - P41	658560	9681949	2° 52' 35.711" S	73° 34' 24.324" W
P41	P41 - P42	658560	9675613	2° 56' 2.007" S	73° 34' 24.065" W
P42	P42 - P43	653560	9675613	2° 56' 2.212" S	73° 37' 5.988" W
P43	P43 - P44	653560	9661667	3° 3' 36.278" S	73° 37' 5.417" W
P44	P44 - P35	638560	9672292	2° 57' 50.918" S	73° 45' 11.648" W
P45	P45 - P46	643560	9668149	3° 0' 5.630" S	73° 42' 29.554" W
P46	P46 - P47	652711	9659223	3° 4' 55.904" S	73° 37' 32.807" W
P47	P47 - P48	653847	9659286	3° 4' 53.806" S	73° 36' 56.022" W

P48	P48 - P49	658560	9657973	3° 5' 36.357" S	73° 34' 23.308" W
P49	P49 - P50	658560	9645613	3° 12' 18.784" S	73° 34' 22.761" W
P50	P50 - P51	668560	9645613	3° 12' 18.316" S	73° 28' 58.842" W
P51	P51 - P52	668560	9640613	3° 15' 1.105" S	73° 28' 58.600" W
P52	P52 - P53	673560	9640613	3° 15' 0.857" S	73° 26' 16.639" W
P53	P53 - P54	673560	9636720	3° 17' 7.588" S	73° 26' 16.443" W
P54	P54 - P55	658560	9636720	3° 17' 8.318" S	73° 34' 22.361" W
P55	P55 - P56	658558	9633812	3° 18' 43.028" S	73° 34' 22.287" W
P56	P56 - P57	655145	9633855	3° 18' 41.784" S	73° 36' 12.873" W
P57	P57 - P58	653291	9635004	3° 18' 4.453" S	73° 37' 12.963" W
P58	P58 - P59	652394	9633558	3° 18' 51.581" S	73° 37' 41.967" W
P59	P59 - P60	648569	9634507	3° 18' 20.824" S	73° 39' 45.918" W
P60	P60 - P61	648560	9645613	3° 12' 19.223" S	73° 39' 46.692" W
P61	P61 - P62	643560	9645613	3° 12' 19.432" S	73° 42' 28.662" W
P62	P62 - P63	643560	9650613	3° 9' 36.627" S	73° 42' 28.865" W
P63	P63 - P64	648560	9650613	3° 9' 36.421" S	73° 39' 46.902" W
P64	P64 - P65	648560	9655613	3° 6' 53.619" S	73° 39' 47.109" W
P65	P65 - P45	643560	9655613	3° 6' 53.822" S	73° 42' 29.065" W

Table 2: Geodetic coordinates - Consolidated 2: Mazan

Vertices	Segments	UTM coordinates		Geodetic Coordinates	
		East	North	Latitude	Longitude
P1	P1 - P2	588560	9695984	2° 45' 0.859" S	74° 12' 11.684" W
P2	P2 - P3	588560	9710613	2° 37' 4.448" S	74° 12' 11.992" W
P3	P3 - P4	583560	9710613	2° 37' 4.549" S	74° 14' 53.907" W
P4	P4 - P5	583560	9715613	2° 34' 21.714" S	74° 14' 54.003" W
P5	P5 - P6	590427	9715613	2° 34' 21.577" S	74° 11' 11.647" W
P6	P6 - P7	590524	9715613	2° 34' 21.575" S	74° 11' 8.520" W
P7	P7 - P8	590619	9715613	2° 34' 21.573" S	74° 11' 5.442" W
P8	P8 - P9	592056	9713827	2° 35' 19.706" S	74° 10' 18.869" W
P9	P9 - P10	592078	9713778	2° 35' 21.293" S	74° 10' 18.152" W
P10	P10 - P11	592126	9713685	2° 35' 24.319" S	74° 10' 16.580" W
P11	P11 - P12	592861	9712760	2° 35' 54.437" S	74° 9' 52.777" W
P12	P12 - P31	593466	9712025	2° 36' 18.360" S	74° 9' 33.164" W
P13	P13 - P14	593560	9712026	2° 36' 18.325" S	74° 9' 30.110" W
P14	P14 - P15	593432	9712123	2° 36' 15.169" S	74° 9' 34.278" W
P15	P15 - P16	593560	9712311	2° 36' 9.043" S	74° 9' 30.116" W
P16	P16 - P17	593560	9712124	2° 36' 15.135" S	74° 9' 30.112" W
P17	P17 - P18	593560	9705613	2° 39' 47.172" S	74° 9' 29.970" W
P18	P18 - P19	598560	9705613	2° 39' 47.058" S	74° 6' 48.053" W
P19	P19 - P20	598560	9700613	2° 42' 29.887" S	74° 6' 47.936" W
P20	P20 - P21	603560	9700613	2° 42' 29.764" S	74° 4' 6.015" W
P21	P21 - P22	603560	9695613	2° 45' 12.591" S	74° 4' 5.890" W
P22	P22 - P19	608560	9695613	2° 45' 12.460" S	74° 1' 23.965" W

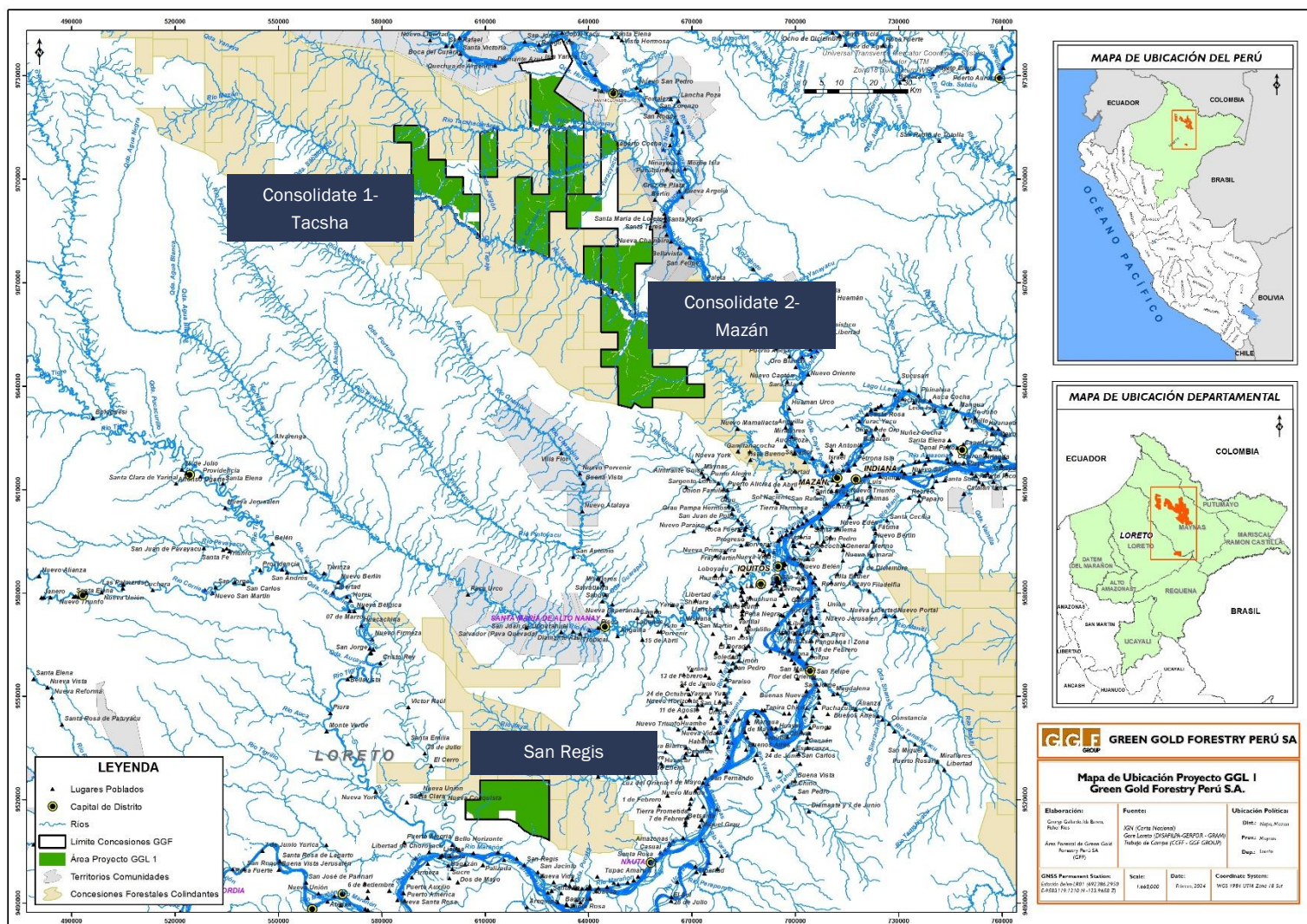
P23	P23 - P24	608560	9690371	2° 48' 3.165" S	74° 1' 23.825" W
P24	P24 - P25	603560	9690371	2° 48' 3.298" S	74° 4' 5.756" W
P25	P25 - P26	603560	9688032	2° 49' 19.459" S	74° 4' 5.696" W
P26	P26 - P27	604536	9687750	2° 49' 28.625" S	74° 3' 34.093" W
P27	P27 - P28	606565	9687750	2° 49' 28.571" S	74° 2' 28.366" W
P28	P28 - P26	606685	9686557	2° 50' 7.423" S	74° 2' 24.447" W
P29	P29 - P30	606665	9687750	2° 49' 28.569" S	74° 2' 25.127" W
P30	P30 - P31	608560	9687750	2° 49' 28.517" S	74° 1' 23.754" W
P31	P31 - P32	608560	9684377	2° 51' 18.357" S	74° 1' 23.662" W
P32	P32 - P33	608544	9684371	2° 51' 18.554" S	74° 1' 24.180" W
P33	P33 - P34	606785	9686536	2° 50' 8.109" S	74° 2' 21.208" W
P34	P34 - P35	608560	9712897	2° 35' 49.600" S	74° 1' 24.411" W
P35	P35 - P36	609950	9713147	2° 35' 41.433" S	74° 0' 39.428" W
P36	P36 - P37	610094	9713471	2° 35' 30.878" S	74° 0' 34.776" W
P37	P37 - P38	612900	9713884	2° 35' 17.357" S	73° 59' 3.905" W
P38	P38 - P39	612785	9713566	2° 35' 27.701" S	73° 59' 7.621" W
P39	P39 - P40	613560	9714040	2° 35' 12.250" S	73° 58' 42.539" W
P40	P40 - P41	613560	9700613	2° 42' 29.502" S	73° 58' 42.181" W
P41	P41 - P1	608560	9700613	2° 42' 29.636" S	74° 1' 24.097" W

Table 3: Geodetic coordinates – San Regis

Vertices	Segments	UTM coordinates		Geodetic Coordinates	
		East	North	LATITUD	LONGITUD
P1	P1 - P2	604285	9516228	4° 22' 34.180" S	74° 3' 36.482" W
P2	P2 - P3	604285	9520003	4° 20' 31.238" S	74° 3' 36.648" W
P3	P3 - P4	608560	9519999	4° 20' 31.206" S	74° 1' 17.956" W
P4	P4 - P5	608560	9525613	4° 17' 28.392" S	74° 1' 18.190" W
P5	P5 - P6	628560	9525613	4° 17' 27.483" S	73° 50' 29.451" W
P6	P6 - P7	628560	9524705	4° 17' 57.061" S	73° 50' 29.407" W
P7	P7 - P8	628294	9524833	4° 17' 52.895" S	73° 50' 38.035" W
P8	P8 - P9	627904	9524833	4° 17' 52.914" S	73° 50' 50.706" W
P9	P9 - P10	627893	9524833	4° 17' 52.915" S	73° 50' 51.072" W
P10	P10 - P11	627711	9524833	4° 17' 52.923" S	73° 50' 56.974" W
P11	P11 - P12	627407	9524553	4° 18' 2.056" S	73° 51' 6.806" W
P12	P12 - P31	628560	9524203	4° 18' 13.379" S	73° 50' 29.382" W
P13	P13 - P14	628560	9508219	4° 26' 53.862" S	73° 50' 28.582" W
P14	P14 - P15	628560	9508219	4° 26' 53.862" S	73° 50' 28.606" W
P15	P15 - P16	619703	9512450	4° 24' 36.538" S	73° 55' 16.150" W
P16	P16 - P17	619703	9512950	4° 24' 20.248" S	73° 55' 16.175" W
P17	P17 - P18	618850	9513362	4° 24' 6.864" S	73° 55' 43.850" W
P18	P18 - P1	618850	9516916	4° 22' 11.142" S	73° 55' 44.015" W
P19	P19 - P20	613995	9516916	4° 22' 11.363" S	73° 58' 21.515" W

P20	P20 - P21	613995	9514269	4° 23' 37.553" S	73° 58' 21.398" W
P21	P21 - P22	607845	9514279	4° 23' 37.491" S	74° 1' 40.921" W
P22	P22 - P19	607835	9514279	4° 23' 37.491" S	74° 1' 41.251" W
P23	P23 - P24	607076	9514281	4° 23' 37.482" S	74° 2' 5.857" W

Figure 1: Project Area Map



1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	VM0010	VM0010 Methodology for Improved Forest Management: Conversion from Logged to Protected Forest	V1.3
Tool	CDM	Tool for testing significance of GHG emissions in A/R CDM project activities	V1
Tool	VCS AFOLU Non-Permanence Risk Tool	Tool for the assessment of risk to AFOLU carbon projects.	V4.2
Tool	VT0001	VT0001 Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities	V3.0

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

Has the project proponent(s) or authorized representative posted a public statement on their website saying, "Carbon credits may be issued through the Verified Carbon Standard project [project ID] for the greenhouse gas emission reductions or removals associated with [project proponent or authorized representative organization name(s)] [name of product(s) whose emissions footprint is changed by the project activities]."

☐ Yes ☒ No

1.12 Sustainable Development Contributions

During the monitoring period, GGF implemented activities contributing to key initiatives include workshops on women's empowerment, sustainable natural resource management, environmental education, and conservation training in partner communities. To monitor and potentially evaluate GGF's impact, a tailored methodology was developed in collaboration with the Oxford SDG Lab and other specialists.

The project is reporting results for 3 SDGs:

- SDG 5: Gender Equality
- SDG 8: Decent Work and Economic Growth
- SDG 13: Climate Action

Table 4: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	5.5	Proportion of seats held by women in (a) national parliaments and (b) local governments	Implemented activities to increase	$25/77 = 0.32$ Where: - The nominator is the number of seats in community boards held by women at the end of the monitoring period. - The denominator is the number of seats in local government (community boards).	$25/77 = 0.32$ Where: - The nominator is the number of seats in community boards held by women at the end of the monitoring period - The denominator is the number of seats in local government (community boards). Since the beginning of the project,
2	8.5	Average hourly earnings of female and male employees, by occupation, age and persons with disabilities	Implemented activities to increase	Total: S/. 6.59 - Women: S/. 5.94 - Men: S/. 6.62	Total: S/. 6.59 - Women: S/. 5.94 - Men: S/. 6.62

3)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	603,353 tCO2e (Aug 2022 – Jul 2024)	901,267 tCO2e (Aug 2020 – Jul 2024)
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1.13 Commercially Sensitive Information

There is no commercially sensitive information that was excluded from the public version of the report.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Since validation, the project's stakeholder identification and engagement process has remained unchanged. The only modification during the current monitoring period is the incorporation of the Native Community of Villa Monte Alegre as a directly affected stakeholder following its formal acceptance to participate in the project. The table below summarizes the current stakeholder situation and the changes, where applicable, since validation.

Stakeholder Identification	During the current monitoring period, the Native Community of Villa Monte Alegre was incorporated as a directly affected stakeholder following its formal acceptance to participate in the project. GGF first identified Villa Monte Alegre during stakeholder mapping conducted in 2022 in the Marañón River basin, based on its proximity to the project area. Initial engagement included reconnaissance visits, meetings with community authorities, and consultations to present the project's objectives and evaluate the community's interest in participating. This process culminated in the community's formal acceptance and incorporation into the project.
Legal or customary tenure/access rights	As part of the stakeholder incorporation process, socioeconomic baseline and a Participatory Rural Appraisal (PRA) were conducted in 2023 and 2024, respectively. The assessment confirmed that Villa Monte Alegre is a titled Native Community holding collective legal rights over its communal territory in accordance with Peruvian legislation. Community members exercise customary rights over forests, fisheries, hunting areas, and agricultural lands for subsistence and cultural purposes. The project recognizes and respects these legally protected customary rights. This

	studies identified that community members traditionally collect forest resources within the project area for subsistence purposes, these activities continue to be permitted and are not restricted by project implementation, provided they remain consistent with applicable legislation and customary use.
Stakeholder diversity and changes over time	Villa Monte Alegre belongs to the Kukama-Kukamiria (Cocama-Cocamilla) ethnolinguistic group, differing from most of the other participating communities, which are predominantly Quechua. Its incorporation increased the number of participating communities from 16 to 17, representing the only change in the project's stakeholder composition since validation.
Expected changes in well-being	By joining the project, Villa Monte Alegre is expected to benefit from the same interventions implemented in the other participating communities, including support for community governance, sustainable livelihood initiatives, and capacity-building activities. During the monitoring period, GGF initiated coordination with the community for the development of an Artisans' House, intended to strengthen handicraft production based on sustainably managed forest resources and contribute to income diversification.
Location of stakeholders	Villa Monte Alegre is located in the Marañón River basin, adjacent to the project area. The community was initially identified in 2022 during preliminary field visits and territorial reconnaissance carried out by GGF in neighboring communities to identify potential stakeholders within the project's area of influence. These visits were followed by meetings with community authorities and members, ultimately resulting in the community's formal incorporation into the project during the second monitoring period.
Location of resources	The 2024 PRA and community resource mapping identified that timber for household construction is primarily obtained within the community territory and adjacent forest areas. Community members also carry out the collection of forest resources within portions of the GGL1 project area for customary subsistence use. In addition, they rely on rivers

and oxbow lakes for fishing, surrounding forests for hunting and the collection of non-timber forest products (e.g., aguaje), and agricultural areas dedicated mainly to cassava, plantain, and rice cultivation. These customary resource use areas were identified during the participatory mapping process and are recognized by the project.

2.1.2 Stakeholder Consultation and Ongoing Communication

Effective stakeholder engagement has been a cornerstone of the GGL1 project, ensuring that community voices are incorporated into its design and implementation. Despite the significant disruptions caused by COVID-19, which limited opportunities for in-person consultations during the project design phase, GGF took proactive steps to engage with key stakeholders. An initial meeting in November 2020 in Iquitos brought together representatives from the Federation of Native Communities of the Middle Napo (FECONAMN) and the Center for Amazon Development (CEDIA) to detail the project's objectives and its emphasis on sustainable development activities, such as non-timber forest products.

As the project advanced, structured consultations resumed since 2021, strengthening communication with the 17 participating communities. Presentations of the Sustainable Management of Forest Concessions (SMFC) project, financed by USAID, ensured transparency, while surveys and baseline assessments aligned proposed actions with community priorities. Beyond these consultations, GGF has maintained continuous communication through its Community Relations (CR) team, ensuring all activities are conducted collaboratively and agreements are formalized.

Ongoing consultation

The Community Relations (CR) team conducts coordinated visits with the community population, typically organizing an assembly with the approval of the Apu (communal authority) at the beginning and end of each year. During these meetings, they present the VCS/CCB standards, outline the activities planned for the year, and share the protocols for filing complaints and resolving conflicts. Additionally, they report on the outcomes of the previous year's activities and communicate any updates made to the community's activity plan.

The Community Relations team serves as the primary representative of the company to the communities near the project area. As such, they frequently carry out unannounced visits to these communities to establish communication with key members, including leaders and individuals in significant roles. These visits also serve to gather the community's perceptions of the company and its

Date(s) of stakeholder consultation	activities. This feedback is used to adapt the company's engagement strategy to better align with the expectations of all stakeholders, as outlined in the company's Complaints and Suggestions Manual. Productive Projects: A formal evaluation process allowed communities to propose initiatives based on their interests, organizational capacity, and leadership. Through technical visits, participatory workshops, and assemblies, communities voluntarily selected products rooted in their cultural knowledge and commitment to sustainable development. Projects like <i>fariña</i> production (Santa María de Loreto), <i>ají charapita</i> processing (Chambira), <i>chambira</i> crafts (Huitotos de Fortaleza), and hen farming (Berlín) emerged directly from community input. GGF maintained ongoing support through regular meetings, technical guidance, and flexible coordination. Co-responsibility was central: communities committed land and labor, while GGF covered logistics such as transporting machinery and adapting facilities—sometimes over multi-day river journeys from Iquitos. All actions were coordinated with local leaders to ensure shared ownership. Even when challenges arose, such as with the hen project in Berlín, GGF worked with the community to evaluate outcomes and document lessons, maintaining a respectful and adaptive approach. Rather than top-down interventions, GGL1's productive projects were co-developed through open dialogue and mutual trust, with communities actively engaged from design through implementation. 1. Socialization of activities plan meeting – 2023 15-February-2023 to 17-February-2023 2. Close of activities meeting – 2023 10-December-2023 to 12-December-2023 3. Socialization of activities plan meeting – 2024 20-March-2024 to 23-March-2024 4. Close of activities meeting – 2024 28-November-2024 to 12-December-2024 Productive Projects:
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Communication of monitored results

1. Socialization of the project evaluation process – San Felipe
11-October-2023
2. Monitoring visit of the egg-laying hen project – Berlín
12-October-2023
3. Socialization of the project evaluation process – Copal Urco
14-October-2023
4. Socialization of the project evaluation process – Vencedores De Vista Alegre
13-October-2023
5. Socialization of the project evaluation process – San Luis De Tacsha Curaray
13-October-2023

The monitoring results for each year are presented during year-end meetings, which are planned from the beginning of the year. This ensures that communities remain informed about the outcomes of the activities conducted.

Additionally, timely announcements are made regarding upcoming visits from auditors.

Productive Projects

As part of the productive projects promoted by GGF, the communication of monitoring results has been a systematic and transparent practice throughout all stages of implementation. This has primarily occurred through in-person community meetings and technical feedback sessions, ensuring communities remain informed about the progress of their initiatives and any necessary adjustments for sustainability. Given the differing timelines of public funding sources and GGF's internal processes, updates have also been shared by phone with project leaders when needed.

In the communities of Santa María de Loreto and Chambira, regular meetings were held with stakeholder groups to assess progress in the installation of the fariña and ají charapita processing modules. These initiatives follow a co-

Consultation records

responsibility model, with community members actively participating not just in implementation, but also in infrastructure preparation, material management, and internal organization. Monitoring, therefore, goes beyond technical assessments—it includes continuous exchange of information between GGF and community members, both in person and remotely. This feedback loop helps resolve issues, adjust activities, and strengthen local capacities, ensuring each step of the project is community-driven.

In Huitotos de Fortaleza, monitoring visits were conducted for both the fariña and chambira handicraft initiatives. Technical reports documented the condition of equipment, performance of the productive module, and the fulfillment of community commitments. These results were shared and validated in communal assemblies, where community members also made recommendations or requested additional support.

In Berlín, the monitoring of the egg-laying hen project revealed challenges related to the management of the coop and bird feeding. These results were discussed with beneficiaries during meetings, where the reasons for the project's progressive closure were explained. A technical closure plan was agreed upon, including the sale of remaining hens. Open communication throughout this process enabled a shared understanding of the project's challenges, ensured an orderly closure, and reinforced trust between the community and GGF.

During official meetings, the Community Relations (CR) team records all questions, complaints, and suggestions raised by the communities in the designated template. If any agreements or discussions take place during a meeting, they will be documented in the meeting minutes. For simple questions or suggestions, the CR officer addresses them directly in accordance with the established protocol and community engagement guidelines. In the case of complaints, the proposed protocol is followed to provide an effective resolution for the community.

During unannounced visits, the CR team notes the community's suggestions and complaints after each

Stakeholder input

discussion. This feedback is then taken back to the office to adjust work plans as needed.

Productive Projects

GGF has established mechanisms to document community feedback during the implementation of productive projects. Inputs, suggestions, and concerns are formally recorded during technical workshops, training sessions, community assemblies, and socialization meetings using standardized templates and attendance lists.

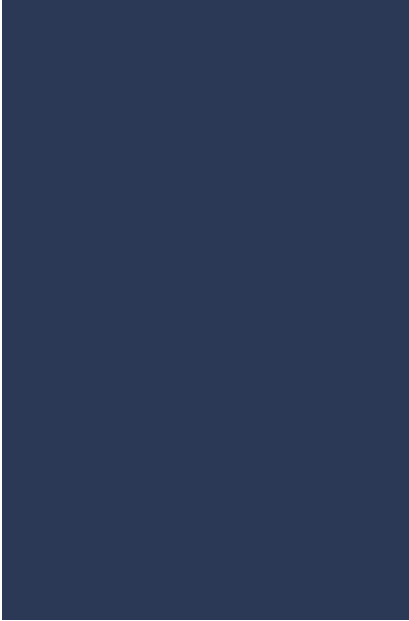
In more operational activities—such as equipment repairs or installations; attendance is not recorded, but community input is captured through internal reports or follow-up communications. These contributions are analyzed and, when relevant, incorporated into project planning or execution in coordination with the technical leads.

If a significant concern or grievance arises, the formal grievance protocol is activated to ensure a clear and traceable response.

GGF's productive projects under GGL1 are built on a participatory approach that places local knowledge and community preferences at the center of decision-making. Rather than applying a top-down model, GGF has established continuous mechanisms to gather and incorporate stakeholder input throughout all project phases.

This engagement is not just inclusive—it is technically essential. Amazonian communities possess deep traditional knowledge critical to the quality and relevance of products. For example, in Santa María de Loreto and Huitotos de Fortaleza, local preferences around the fermentation of cassava for farinã led to the co-design of a mixed product that met both local and urban market demands. This input was shared with the CITE Productivo Maynas, who validated and refined the final product.

In Santa María, the community requested a more powerful generator to support broader productive uses beyond the original scope. GGF responded by adjusting the technical plan and budget accordingly.



In Chambira, artisans helped redesign their hammocks, proposing new weaves, colors, and finishes, and requested training on market trends and innovation to boost competitiveness.

In Berlín, poultry project beneficiaries asked for additional training in animal health and locally available feed alternatives. GGF adapted the schedule and technical support to meet these needs.

Across all cases, GGF's responsiveness to community input not only improved project outcomes but also reinforced local ownership and long-term sustainability. By valuing local expertise and building projects collaboratively, GGF ensures that initiatives reflect community aspirations and capacities.

2.1.3 Free, Prior, and Informed Consent

The GGL1 project has prioritized the principles of Free, Prior, and Informed Consent (FPIC) to ensure that Indigenous Peoples (IPs), Local Communities (LCs), and customary rights holders are active participants in its development and implementation. During the project design phase, challenges posed by COVID-19 limited in-person consultations; however, foundational steps were taken, including a meeting in November 2020 with key representatives from the Federation of Native Communities of the Middle Napo (FECONAMN) and the Center for Amazon Development (CEDIA). These discussions highlighted the project's objectives and opportunities for sustainable development activities, ensuring transparency and community involvement from the outset.

As consultations resumed in 2021, a comprehensive engagement process was implemented. Community-specific meetings detailed the project's scope, benefits, and activities, while participatory baseline studies and action plans ensured alignment with community priorities. Agreements were formalized through signed minutes and letters of acceptance, reflecting informed consent and a transparent collaboration process.

To address concerns and grievances, the project established a "Protocol of Conflict Resolution" that has been continually updated in response to feedback from ongoing community engagement. This iterative process ensures that the protocol remains effective, culturally appropriate, and aligns with community expectations, fostering trust and enabling community voices to be heard and respected.

The project guarantees that no land has been encroached upon, nor have individuals been relocated without consent. There have been no instances of physical or economic displacement caused by the project. By upholding FPIC principles and fostering inclusive decision-making, GGL1 ensures that its activities support sustainable development without exacerbating unresolved conflicts or infringing upon rights.

A similar approach has been used to obtain consent from communities to participate in productive projects. First, GGF conducted an initial workshop to introduce the potential project, during which the objectives, planned activities, expected benefits, and potential risks were explained using materials tailored to the cultural and linguistic context of each community. This was followed by a communal assembly where members could discuss the proposal and decide whether to participate. All agreements were documented in the communal assembly records, ensuring transparency and mutual understanding.

Consent

At the beginning of the new operational year, GGF conducted meetings with most of the Local Communities (LC) involved in the GGL1 project, comprising 17 Native Communities. During these sessions, the Community Relations (CR) team presented the planned activities for the year and actively engaged with each community to confirm their willingness to continue participating in or renew their partnership with the GGL1 project.

The CR team ensured that consent was obtained transparently by providing comprehensive information about the project, its objectives, and its expected outcomes. This included addressing any questions or doubts raised by the communities, ensuring that all aspects of the project were fully understood. If a community expressed concerns, the CR team clarified these matters until a mutual understanding was achieved.

In cases where a community chose not to participate, the CR team respected their decision unequivocally, ceasing all project activities in their territory. This process was conducted in alignment with GGF's commitment to respecting Indigenous Peoples' (IPs) and Local Communities' (LCs) autonomy and decision-making, ensuring that all agreements were reached with free, prior, and informed consent (FPIC).

All conflicts that arose during the monitoring period were resolved within the same period (see Section 2.1.7 of this MR). There are no ongoing or unresolved conflicts.

Outcome of FPIC

Green Gold Forestry (GGF) conducted a comprehensive Free, Prior, and Informed Consent (FPIC) process to engage Indigenous Peoples (IPs), Local Communities (LCs), and customary rights holders as part of the GGL1 project. At the

beginning of each operational year, GGF organized meetings with the communities involved in the project to present the planned activities, clarify any questions, and confirm the willingness of each community to continue participating or renew their partnership. During this process, the Community Relations team provided detailed information about the project's objectives, activities, and potential impacts, ensuring full understanding among community members. If a community expressed concerns or opted not to participate, GGF fully respected their decision and ceased all activities in those areas.

Transparent agreements were established through open and respectful dialogue, ensuring that all stakeholders fully understood and agreed to the terms. For instance, in cases of land overlaps with communities such as Bellavista and San Felipe, GGF requested formal exclusions and compensation measures, which were approved by Regional Resolution No. 247-2022. Additionally, in areas with overlapping land claims, including Tacsha Curaray and Patria Nueva, GGF collaborated with organizations like CEDIA and FECONAMN to assist communities in their land titling processes and boundary clarifications, ensuring that agreements were reached with fairness and transparency.

Before establishing any agreements, GGF disclosed comprehensive and accessible information tailored to the cultural context of the communities. This included details about the project's scope, objectives, expected benefits, potential risks, and protocols for filing complaints or resolving conflicts. The company ensured that this information was shared in formats and language suitable for the communities, allowing them to make informed decisions.

GGF strictly adheres to national regulations and international standards to prevent land encroachment, forced relocations, or economic displacement. It is important to note that the risk of such occurrences is minimal to none, as there are no community territories within the project area or any of GGF's concession areas.

Land overlaps were addressed transparently through formal processes. There is case where a portion of the Bellavista and San Felipe communities overlapped the GGF concession area, due to errors in the concession contracts. This was solved by using the compensation procedure, adjusting the Bellavista and San Felipe's overlapping zones with the GGF concessions, avoiding any interference with community livelihoods. Since these areas were outside the project boundaries, their exclusion did not impact on the project's net benefits. In the case of San Luis de Tacsha, GGF ceased activities entirely upon the community leader's request, demonstrating its respect for local autonomy. Furthermore, GGF's support for land titling initiatives reinforced community rights and ensured sustainable land management. These actions reflect GGF's unwavering commitment to ethical practices, respecting the rights and well-being of all stakeholders involved in the project.

Therefore, it can be assured that the project has not encroached on land, relocated people without their free, prior, and informed consent, nor caused any form of physical or economic displacement. This is supported by GGF's extensive efforts to strengthen local governance structures and resolve land tenure issues, including boundary demarcation and titling processes for communities. These actions demonstrate the project's respect for collective territorial rights and its commitment to preventing land-related conflicts.

2.1.4 Grievance Redress Procedure

To facilitate clear and mutually agreeable resolutions between GGF and the communities in the event of potential conflicts, GGF has developed a Grievance Protocol. This protocol is designed to address and resolve issues promptly during the initial stages of any disagreement.

Below is a summary of how GGF's grievance redress mechanism aligns with the requirements of the VCS Standard.

Procedure stage (as per section 3.18.4 of VCS Standard v4.7)	GGF Procedure (as set out in section VIII of GGF's Conflict Resolution Protocol),
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The project proponent shall attempt to amicably resolve all grievances and provide a written response in a manner that is culturally appropriate.

First step: A member of the Community Relations team initiates dialogue with the representative of the community, concessionaire, or other relevant stakeholders. Once the discussion has taken place and the conflict is identified, the situation is documented using the "Conflict and Lessons Learned Socialization Form." All key points are recorded to facilitate the signing of an agreement.

If the conflict involves verification of an area under cultivation or a damaged asset, this verification must be conducted in the presence of all parties involved and completed within a maximum of 8 working days.

Any grievances that are not resolved by amicable negotiations shall be referred to mediation by a neutral third party.

Second Step: If no agreement is reached during the initial negotiation, alternative conflict resolution tools are applied. The parties must appoint a social facilitator or mediator—typically an authority from a neighboring community. This mediator must be a sworn and officially recognized lieutenant governor. If the appointed mediator is unable to continue, the role may be assumed by another recognized authority, such as an Apu, Vice Apu, or a member of the elected community boards that is registered in public records.

If an agreement is reached during mediation, both parties sign a document confirming their acceptance, and the mediator signs the minutes as a witness. This process must be completed within 11 working days.

Any grievances that are not resolved through mediation shall be referred either to a) arbitration, to the extent allowed by the laws of the relevant jurisdiction or b) competent courts in the relevant jurisdiction, without prejudice to a party's ability to submit the grievance to a competent supranational adjudicatory body, if any.

Third Step: If mediation fails, an arbitrator must be appointed to resolve the conflict, aiming for a short- or long-term agreement. The arbitrator, such as a basin authority, justice of the peace, or federation president, must act as a neutral party. Both parties are responsible for contacting the arbitrator, and no financial compensation is provided. This step should be completed within 10 working days.

Fourth Step: Once the conflict is resolved, the company shares the "Conflict Records and Lessons Learned" form with the affected community to ensure transparency and collective learning. This socialization process must occur within 15 working days.

Below is a summary of resolved and ongoing conflicts involving GGF and its stakeholders, including the actions taken to resolve them or the measures implemented to reach an agreement during the monitoring period:

Grievances received	Resolution and outcome
The communities of Pampa Caño and Villa Monte Alegre, located in the Marañón area (San Regis), initiated a process in 2021 to request the expansion of their territories, overlapping with the forest concession areas of San Regis Perú S.A., whose rights were granted by the Peruvian government in 2014 to Green Gold Forestry (GGF).	Solved: - GGF submitted an objection letter to the Directorate of Legal Physical Sanitation of Loreto (DISAFILPA), requesting that all documentation seeking territory expansion overlaps with BPP and GGF's registered property be nullified. - DISAFILPA declared the request of expansion inadmissible. - GGF continues to engage both communities in indirect project benefits through community activities.
Complaints from the Native Communities of Berlín, San Luis de Tacsha, Santa María de Loreto, and Santa Teresa about unpaid wages for individuals who provided services in previous years to LOGORSA (GGF contractor from its logging operation period). (2022)	Solved: - Over 27 individuals were registered to address pending payments. - The process concluded with payment and debt reconciliation. - An official agreement was signed, resolving this potential conflict.
The communities of Patria Nueva, Copal Urco, Huiririma, Sargento Lores, Santa María de Loreto, and Tacsha Curaray expressed concerns about potential conflicts or misunderstandings when entering GGF's project area. (2024)	Solved: - Boundaries were reviewed and verified to promote conservation and sustainable land use practices, with the approval of local authorities and GERFOR. - Signposting activities were carried out with the support of local communities and technical staff from GERFOR.
In early 2024, residents of the Sargento Lores community unintentionally entered GGF's	Solved: The situation was clarified in a meeting with Sargento Lores community members on March 9, 2024.

concession area to extract leaves from ungurahui palms.

Concerns from the Apu of the Native Community of Chambira, Ms. Julia Huamán Jipa, and the local population regarding the construction of a community facility and the perceived lack of project oversight. (2024)

Solved:

1. GGF's community relations team conducted a joint visit with stakeholders to address all concerns and clarify project-related matters.
2. The meeting reinforced the strong relationship between GGF and the Chambira community.

Apu of the Native Community of Santa María de Loreto, Carmencita Shihuango, raised concerns about their leadership and performance, involving a GGF employee who is also a community resident. (2024)

Solved:

1. A formal notice was issued to the GGF employees involved.
2. The employee was required to submit a written response.
3. Preventive measures were taken to resolve the conflict and maintain positive relations.

In June 2024, misinterpretations arose between the Apu of Santa María de Loreto and GGF staff working on productive projects.

Solved:

1. Dialogue sessions clarified the misunderstandings. Improved communication protocols were adopted to prevent future conflicts and strengthen trust between GGF staff and the community.

The forest concession No. 16-IOR-MAY/CON-MAD-2018-007, granted to Green Gold Forestry (GGF) in 2018, was found to overlap with the territories of Bellavista and San Felipe native communities. GGF requested an exclusion and compensation process to resolve the matter. (2020)

Solved:

1. GGF submitted a formal request to DISAFILPA for validation of the area overlaps.
2. DISAFILPA rejected the request in 2020 due to insufficient documentation.
3. In November 2022, Regional Resolution No. 247-2022 approved the exclusion of overlapping areas.
4. Bellavista is currently undergoing a process to rectify errors committed by the local authority in its property documentation. Since there are no more conflicts with GGF, we consider this issue as closed.

Overlaps of concession areas (outside the project area) with Patria Nueva, Copal Urco, Huiririma, Sargento Lores, Santa María de Loreto, and Tacsha Curaray communities were reported. (2023)

Solved:

1. GGF, in collaboration with allied organizations CEDIA, GERDARGRI, and FECONAMN, provided support to these communities in their land titling processes.
2. Through the collaborative efforts of GGF and its allies, all communities have successfully obtained their property

Arise of potential conflicts related to rumors about land use and privatization claims by GGF within the San Luis de Tacsha community area by some community authorities (July-2023)	titles. GGF is also actively engaged in demarcating boundaries in conjunction with community territories. Solved: 1. GGF clarified that its operations are focused on social initiatives, fully adhere to national legal frameworks, and ensure unrestricted community access to shared resources. 2. Concerns about privatization were addressed and resolved through constructive dialogue. 3. While the current communal leader has imposed a ban on GGF's activities within the community, individual members have independently decided to maintain their involvement.
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2.1.5 Public Comments

On February 9th, 2024, a public comment was received outside the designated public comment period for the project and during VERRA's verification request review of this project's first verification under VCS and validation under CCB. The following is the response provided in the previous verification report. The project has not received any further comments. Note that the public comment regarding CCB was responded in the CCB PD.

Summary of comments received	Actions taken
"The Project ID 2345 has built its baseline scenario assuming a harvest intensity of 15 M3 per hectare (validation report pages 20, 37 and 44). We are not timber experts, but we have researched OSINFOR and SERFOR databases and found that this number differs hugely from the historical harvest rate in the forest concession and the whole Loreto Region. The numbers we retrieved from SERFOR and OSINFOR, available at the web, are the following: i) The forest concession harvested 0.13 M3 per hectare in the Forest concession Unit number 10, from	The following is the response for the public comment. • It is unclear what the correspondent means by 'Forest concession Unit number 10', but we assume that the reference is confused with GGF's POA10 – this is GGF's tenth 'Plan Operacional Anual' (a detailed annual forest survey of all available trees in a designated forest plot, required by Peru's forest authorities in advance of a logging campaign). • Likewise, we do not know from where the correspondent sourced '0.13m3 per hectare' • POA10 was undertaken in 2018, in preparation for GGF's expanded business plan, and demonstrated commercially viable harvestable volumes of more than 15m3/ha (the results of POA10 are shown on pages 32-24 of the Project ID 2345 PD).

which the inventory is considered to project the baseline scenario.”

- The volumes in POA10 were inspected and authorised by Peru’s authorities, demonstrating that the POA was accurate and that the trees were available to harvest without any restrictions.
- GGF maintained Forest Stewardship Council (FSC) certification for Forest Management and Chain of Custody since 2010. The FSC audit verifies data, as well as relevant authorisation, thereby providing further assurance.
- As set out in the VCS PD (pages 30, 31-32, 47 and 54), GGF had developed a full business plan and investment memorandum to finance this expanded production in 2018 and fully exploit the timber potential of its forest concessions.
- This was the culmination of years of business development, in which GGF invested heavily in developing capacity to extract and process timber at scale. This included expanding forest holdings to 254,000ha, building a large modern sawmill at Iquitos, engaging sub-contractor plants to manufacture specialist products (such as finger-jointed timber and kiln sticks), developing market and product knowledge, constructing forest infrastructure, acquiring a fleet of forestry machinery (including skidders, bulldozers, front-end loaders, road graders, trucks, and barges), and sub-contracting logistics companies, so to create the capacity to undertake the 15m³/ha log harvest in POA10. Additionally, GGF engaged community partners, and maintained FSC certification for Forest Management and Chain of Custody. (GGF prioritised best-practice forest and operational management, and has been FSC certified since 2010).
- GGF was aligned with the goals at the time of the Loreto government and SERFOR, which made considerable efforts to increase Peru’s capacity in the timber industry in the region.
- However, following a strategic review, GGF decided to instead raise capital to enact its

conservation-focused business (i.e., Logged to Protected Forest under VCS VM0010).

- The 15m³/ha harvestable volumes are higher than average for Peru because most forestry companies selectively harvest a few, specific, high-value species.

- GGF was able to increase volumes in POA10 by including a wider range of species, including lesser-known medium- and high-density woods.

- Note that the 15m³/ha harvestable log volumes are conservative, as discussed on pages 39 and 47 of the VCS PD.

- These lesser-known species were to be utilised to manufacture FSC-certified kiln sticks, for which there is considerable demand in the US.

- GGF's 254,000ha forest concessions were acquired between 2009-19, and the due diligence process included identifying targets with high log yield potential.

- It is commercially logical that GGF focused on acquiring concessions with full stocks of available timber, rather than concessions that were depleted in available timber through previous logging campaigns, and therefore GGF focused on acquiring inactive concessions, or those with very low historic extraction yields.

ii) The forest concession historically harvested 0.43 M3 per hectare (harvest years 2008-2009 to 2019-2020).

- The correspondent has not provided a reference for the 0.43m³ per hectare extraction rate and such a low extraction rate is not commercial

- GGF undertook limited harvests over small areas of its concessions as it built capacity, expertise, market knowledge, and commercial relationships ahead of fully expanding its business (as described above) .

iii) The total volume of timber extracted in the Loreto Region is 136,366 M3 in 2022 and 249,164 M3 in 2021 (including forest

- Loreto has had historically lower logging production than Peru's main logging regions of Ucayali, and Madre de Dios.

concession and other forest producers). Using 15 M3 per hectare would mean that only the company's forest concessions will harvest 137,583 M3 per year. This is more than the 2022 harvested volume for the whole Loreto Region. The company has 183,445 hectares of forest concessions, which means around 6.6% of the total forest concessions area in the Loreto Region.

iv) The baseline scenario, based on the volume expected of 15 M3 per hectare, estimated annual timber sales of \$17,177,000. Searching at Custom numbers, the company has exports of \$401,000 in 2015, \$76,000 in 2016, \$267,000 in 2017, \$17,000 in 2018 and \$0 in 2019, the year previous to the project start. (PD page 27)

- It was for this reason GGF chose to set up in Loreto in 2008, given availability of forest concessions with potential high timber yields.
- GGF's average annual harvest would have been 137,583 m3. To put this in context, concession holders in Peru harvested more than 2million m3 in 2022 (source SERFOR).

- GGF is one of Peru's largest forest concession owners, and would have been the largest single producer in Loreto if it had not ceased logging, instead adopting a conservation-focused business model (i.e., Project ID 2345).

- GGF's planned volumes would have made it a medium- to large-sized timber company by Peru's standards, but by no means the biggest. For comparison, Madera Bozovich processed 440,336m3 of logs in 2023

- As explained above, GGF acquired forest concessions, built processing capacity, and developed market knowledge and expertise, ahead of full expansion.

- Logging volumes to 2018 were relatively modest, reflecting GGF's low-risk approach to developing its business.

- The export data that the correspondent has found is misleading as GGF sold semi-finished goods to intermediaries in Peru, who processed timber and then exported products in their own name.

- GGF halted its logging operations in 2019 as the company reviewed strategic options, and after a feasibility study and extensive analysis, we devoted our resources to developing the VCS VM0010 project

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

The whole GGF management team have the relevant expertise in implementing carbon projects and engaging communities, since they implemented the GGL1 carbon project since the beginning. Additionally, when needed, GGF has hired external consultants.

Position	Name	Experience
GGF Director	Stuart Clenaghan	Stuart has a background in finance and has spent the past 20 years working on conservation and climate finance. He co-founded Green Gold Forestry Peru (GGF), which runs one of the largest private forest carbon projects in Latin America. He's helped design financial tools like Sustainable Land Bonds to support countries in meeting their climate goals. Through his consulting work, he's advised governments, NGOs, and banks on how to channel private investment into forest protection.
Chief Executive Officer (CEO)	Gareth Hughes	Gareth is the CEO and co-founder of GGF, where he oversees the management and conservation of Amazon forest in Peru. His work involves combining sustainable forestry with community partnerships and carbon finance. He works closely with government institutions, NGOs, and other partners to make sure conservation efforts are grounded in both local needs and long-term financial sustainability.
Chief Operating Officer (COO)	Raúl Dance	Raúl has over 20 years of experience in forestry, with a focus on conservation, sustainable land use, and working with local communities. At GGF, he manages day-to-day operations and supports conservation efforts of GGF forest concessions. He's also worked at PROMPERU, SERFOR and PERUPETRO, leading national-level institutions related to forest governance, certification, and environmental safeguards.

2.2.2 Risk assessment

	Risk identified	Mitigation or preventative measure(s) taken
Natural and human-induced risks to stakeholders' wellbeing	- Extreme weather events (e.g., floods) may pose safety risks during activity implementation. - Encounters with illegal actors may endanger the team, particularly the forest custodians.	The project has established protocols to mitigate this risk. Measures include the use of safety equipment, insurance coverage for all staff and contractors, satellite phones for personnel entering the concessions, and a protocol for helicopter evacuation in

		the event of severe injury in remote areas. • Patrol and surveillance teams follow procedures for interacting with illegal actors in case of encounters in remote areas. The primary recommendation is to avoid direct contact. GGF is also working to ensure that a drone is always available during field monitoring to minimize the need for teams to get too close.
Risks to stakeholder participation	No risk identified	The project foment the participation of every available stakeholder to be part of the project.
Working conditions	Field personnel face several occupational risks due to the remote and challenging terrain. These include physical injuries such as sprained ankles from navigating uneven terrain ground, exposure to extreme heat that may lead to heatstroke, dehydration, and the potential risk of snake bites. Forest custodians may encounter illegal loggers, hunters, or other unauthorized actors during monitoring and surveillance activities, potentially exposing them to safety risks, intimidation, harassment, or conflict.	All personnel are hired under formal contracts that comply current Peruvian labor regulations. To ensure safety working conditions, GGF has developed an Occupational Health & Safety Manual, which identifies key workplace risks, outlines mitigation measures and establishes emergency protocols. In accordance with national regulations, GGF has also prepared a Hazard Identification and Risk Assessment Matrix (IPER: Identificación de Peligros y Evaluación de Riesgos) and formed a Health and Safety Committee to promote a culture of prevention and encourage risk mitigation actions across all operations. To ensure implementation and awareness, the company has taken the following steps:

Safety of women and girls	Risk of harassment or exclusion in mixed-gender spaces. • All new employees receive an orientation on occupational safety protocols upon joining the company. • Training sessions were conducted for field personnel covering snakebite management, hazard identification, first aid, and workplace preventive measures. • Personal protective equipment (PPE) is provided to reduce the risk of accidents during fieldwork. • For forest custodians specifically, GGF implements a Monitoring, Surveillance and Control Plan that includes mandatory training on intervention protocols, safety procedures, and incident reporting. Custodians are instructed to avoid confrontation, document observations, and immediately report incidents through established communication channels. When illegal activities are detected, interventions are coordinated with the competent authorities (e.g., ARFFS, National Police, and Public Prosecutor's Office), and security guarantees may be requested before entering affected areas. These measures are designed to prioritize the safety of project personnel while ensuring effective monitoring and protection of the project area. GGF has developed a Gender Protocol, which is required to be followed by all personnel, in their administrative offices and during
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Safety of minority and marginalized groups, including children	No risk identified	field operations, to strengthen women empowerment and participation. GGF does not hire underage as personnel. Also, all activities developed by GGF that includes kids are required to be supervised by a teacher or adult community member
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	Pollution caused by fossil fuel combustion from generator(s).	GGF has implemented solar panels in their forest camp to reduce the amount of pollution generated from generators.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified ²	Mitigation or preventative measure(s) taken
Discrimination	Discriminatory hiring practices	GGF has established anti-discrimination protocols for full-time and temporary jobs.
Sexual harassment	Risk of harassment during travel	GGF has established code of conduct for staff and a protocol in case of sexual harassment.
Gender equity in labor and work	No risk identified	GGF has established anti-discrimination protocols.
Forced labor	No risk identified	Project only engages with voluntarily participating individuals under formal agreements
Child labor	No risk identified	Project only engages with voluntarily participating

² The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

Human trafficking	No risk identified	individuals	under	formal
		agreements		
		Project only engages with voluntarily participating individuals under formal agreements		

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	The project has engaged with indigenous communities since its start, implementing activities aimed at strengthening their land tenure rights and enhancing their overall quality of life

2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified	Mitigation(s) or preventative measure taken
No risk identified	The project is actively working to empower and preserve the cultural heritage of the ethnic groups it collaborates with. For example, two of the productive initiatives focus on the ancestral practice of crafting items such as hammocks and handicrafts using chambira fiber. Also, using participatory maps (as part of the PRA methodology), the project can identify important cultural sites for the communities.

2.3.4 Property Rights

Risks identified	Mitigation or preventative measure(s) taken
Unclear boundaries between communities.	The project conducts several activities to mitigate this risk: 2. Support for community land tenure: With the support of the NGO CEDIA, the project has assisted communities that previously lacked land titles in securing legal ownership of their territories.

3. Boundary marks: The forest custodians install boundary marks around GGF forest concessions to reduce any risk of transposing.

2.3.5 Benefit Sharing

Summary of the benefit sharing plan	The communities do not participate in the direct distribution of carbon credit revenues (i.e., they do not receive funds from the sale of VCUs) because the project area does not overlap with communal territories. As a result, the benefit distribution mechanism is indirect and is reflected through job creation, capacity building, and the implementation of social, environmental, and productive projects.
Benefit sharing during the monitoring period	Not applicable.

2.4 Ecosystem Health

	Risk identified	Mitigation or preventative measure(s) taken during the monitoring period
Impacts on biodiversity and ecosystems	No risk identified.	By halting logging operations in the project area, GGF effectively maintained the vegetative cover and ecosystems that would have otherwise been degraded in a without-project scenario.
Soil degradation and soil erosion	No risk identified.	GGF's cessation of logging in the project area stopped soil degradation. Due to lack of logging, soil quality may improve. The project does not implement any reforestation or agroforestry activities within the area of the project.
Water consumption and stress	No risk identified.	GGF's cessation of logging operations within the project area reduces the use of waterways and the water contamination.

2.4.1 Rare, Threatened, and Endangered species

Species or habitat	The project area is the habitat of 7 endangered species (EN) and 22 vulnerable species (VU) (classified under the IUCN threat categories). 1. Flora 6 EN: <i>Caryocar amygdaliforme</i>, <i>Handroanthus serratifolius</i>, <i>Licania cymosa</i>, <i>Pitcairnia aequatorialis</i>, <i>Sextonia pubescens</i>, and <i>Viola surinamensis</i> 17 VU: <i>Aniba perutilis</i>, <i>Cedrela odorata</i>, <i>Endlicheria citriodora</i>, <i>Guarea trunciflora</i>, <i>Guatteria gentryi</i>, <i>Inga yasuniana</i>, <i>Klarobelia lucida</i>, <i>Mezilaurus opaca</i>, <i>Micropholis brochidodroma</i>, <i>Naucleopsis oblongifolia</i>, <i>Ocotea vasquezii</i>, <i>Pouteria krukovii</i>, <i>Pouteria pubescens</i>, <i>Sloanea gracilis</i>, <i>Sorocea guillemiana</i>, <i>Tovomita calophyllophylla</i>, and <i>Vantanea spichigeri</i>. 2. Fauna 1 EN: <i>Pteronura brasiliensis</i> 5 VU: <i>Lagothrix lagotricha</i>, <i>Chelonoides denticulata</i>, <i>Ramphastos tucanus</i>, <i>Tapirus terrestris</i>, and <i>Tayassu pecari</i> All project activities contribute to the maintaining of these habitats, such as monitoring of species and halt of logging.
Areas needed for habitat connectivity	The project has not negatively impacted critical habitat connectivity during the monitoring period. GGF has fully halted logging activities across all its forest concessions, as confirmed in Section 5.3.1 (Activity Leakage) of the Monitoring Report. This includes areas both inside and outside the project boundary. Additionally, GGF implemented a Wildlife Sighting Registration Form across project activities; such as responses to early deforestation alerts (ATD), installation and remeasurement of permanent plots (PPM), and trail clearing. The recurring presence of species like <i>Panthera onca</i>, <i>Tapirus terrestris</i>, and <i>Pteronura brasiliensis</i>; all indicators

of high ecological integrity—confirms the continued conservation value of the project area.

	Risks identified	Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	No risk identified	GGF's cessation of logging operations within the project area reduces the disturbances of habitats for rare, threatened, and endangered species.
Areas for habitat connectivity	No risk identified	GGF's cessation of logging operations within the project area maintains areas for habitat connectivity.

2.4.2 Introduction of species

The project does not have activities with planting or species introduction.

Species introduced	Classification	Justification for use	Adverse effects and mitigation
N/A	N/A	N/A	N/A

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
N/A	N/A

	Risks identified	Mitigation or preventative measure(s) taken
Invasive species	No risk identified	The project does not intend to use invasive species in any area affected by the project.

2.4.3 Ecosystem conversion

There are no risks identified.

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	N/A	The objective of the project is to maintain the original ecosystem.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

#	Activity	Implementation Status	Document
1	Involving the neighboring communities in the project, to ensure their participation in, and commitment to, forest conservation, by making them project stakeholders and beneficiaries.	During this period, 468 temporary jobs were created, and goods and services amounting to US\$142,276 were purchased. Regarding training, over 550 people were trained in topics like NTFP harvesting, conservation and management activities. GGF, in partnership with Oxford SDG Lab and an Applied Economics consultant, conducted a pilot social baseline of allied communities. This initiative aimed to monitor and evaluate the impact of GGF's activities on the proposed Social Development Goals and to develop relevant key performance indicators (KPIs). As part of its commitment to sustainable economic development, GGF has partnered with six communities to establish communal enterprises, with initial infrastructure already implemented in 5 communities being: • CN Santa María de Loreto (Napo): Fariña processing module • CN Chambira (Napo): Charapita chili processing module • CN Huitotos de Fortaleza (Napo): Fariña processing module • CN Vencedores de Vista Alegre (Napo): Chicken coop Project • CN Villa Monte Alegre (Marañon): Artisans' house	Appendix 3: SDG evidence Appendix 3: Good and services in allied communities

- | | | |
|--|--|---|
| <p>2 Regularly patrolling the project area with teams of forest rangers, who will be hired from neighboring communities and trained and equipped to deal with potential incursions adequately and safely</p> | <p>By 2023, GGF trained and accredited 6 forest stewards, bringing the total number of accredited stewards to 11 since 2022. Since August 2022, they have conducted 7 fluvial patrols (6 in Marañón and 1 in Tacsha-Curaray area) and 2 field entries. The forestry team has also collected information about resources and activities of the communities and whether there is any overlapping between those activities and GGF forest concessions through the resource mapping methodology. The information of this method showed that 2 communities (nearby the San Regis concession area - Marañón) extract timber from the GGL1 project area. The forest custodians have been using this information to plan their ground surveys and monitoring activities.</p> <p>It is important to note that the forest custodians are provided with appropriate personal protective equipment (PPE) and protocols to safely address and that all of their in-field operations are performed through observation, reporting, and coordination with the competent authorities, while avoiding direct confrontation. Patrol activities are conducted without firearms and follow the Intervention Protocol established in the Monitoring, Surveillance and Control Plan.</p> | <p>Forest reports</p> <p>PRA 2024</p> <p>Trained and certified personnel</p> <p>Monitoring, Surveillance and Control Plan</p> |
| <p>3 Erecting signs along all fluvial access points and existing logging roads to inform and warn potential intruders of the conservation status of the project area.</p> | <p>During the monitoring period, the forest custodians have installed 40 boundary markers (banners) to discourage community members and outsiders the entry to GGF's forest concession. Of these, 19 banners were placed near the Mazán access points, and 21 banners near the Tacsha-Curaray access points.</p> <p>With the support of the Community Relations team and Forestry team, territorial boundary activities were carried out with 8 communities allied to the project. These efforts reaffirm the communities' land ownership rights and minimize the risk of conflicts with neighboring communities and concession, especially when these areas are in close proximity.</p> | <p>Forest reports</p> <p>Land demarcation activities</p> <p>Engagement meetings report</p> |

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During this monitoring period, GGF, in collaboration with its technical partner Space Intelligence (SI), utilized satellite-based tools to monitor forest dynamics and biomass changes across the project area. SI produced above-ground biomass (AGB) stock maps and disturbance layers for the years 2022 and 2024 using high-resolution remote sensing data. These maps, with a 25-meter pixel resolution, were generated by integrating permanent plot data with multiple satellite sources, including GEDI LiDAR footprints, Sentinel-1, Sentinel-2, and ALOS-2/PALSAR-2.

Remote monitoring using drone and satellite surveys.

To detect forest cover loss, both natural and anthropogenic disturbance events were identified and verified using the company's satellite monitoring system and field inspections by trained forest custodians. Since late 2022, GGF has implemented an Early Deforestation Alert (ATD) system based on the Global Forest Watch integrated platform, which combines GLAD, GLAD-S2, and RADD datasets. These alerts rely on Landsat and Sentinel satellite imagery to detect disturbances at a 10x10 meter spatial resolution, enabling near-real-time identification of affected areas.

Forest reports

For the analysis of VCUs, GGF relies on SI's data due to the robust combination of optical, radar, and LiDAR imagery, which provides enhanced accuracy in detecting vegetation changes.

As part of its surveillance strategy, GGF has launched a drone monitoring pilot program. Four pilot flights were carried out by two licensed members of the Forest team to improve monitoring efficiency and precision.

Loss Event Analysis:

A loss event is defined in AFOLU projects, per the VCS Program Definitions v4.5 as “ any event or group of events that results in a cumulative loss of more than five percent of previously verified emission reductions and removals. An event qualifies as a loss when it affects carbon stocks in pools included in the project boundary and that are expected to be sequestered and/or

maintained under the project scenario. Examples include illegal logging, tillage, and fuelwood collection”

As described in section 5.1 of this MR, project emissions from disturbances were 1,631.25 tCO₂e (in which $A_{DIST_IL,i}$ is 0 ha) which is 0.55% of previous verified emissions reductions and removals. Therefore, there is no loss event to report.

3.2 Deviations

3.2.1 Methodology Deviations

The following deviations were applied during the monitoring period. It is important to note that, although a new version of the methodology became active in October 2024, the project has not reassessed its baseline and will continue to reference version 1.3 of the methodology instead of version 1.4. Nevertheless, this section, as well as section 5.1 of this document, will refer to the new version of the methodology where applicable.

Methodology deviations (MDev) applied in the baseline scenario calculations

MDev#01: Business Model Criterion for Reference Area Selection

The project proponent proposes to deviate from VM0010 on the criteria for the selection of a reference area for the development of the common practice baseline scenario. VM0010 states in Section 6.2.2 that this reference area *“must be in the same region as the project area and must match the project area in terms of forest types, climate and elevation (identical mix of forest types $\pm 20\%$; identical annual precipitation $\pm 20\%$; elevation classes (500 m classes) in the reference region shall be in the same proportion as in the project area ($\pm 20\%$))”*.

VM0010 v1.3 then also states that *“Where there is limited capacity to generate the baseline scenario using a reference site in the region of the project area, multiple reference areas may be selected to cover a country so long as the reference area criteria regarding forest types, climate and elevation are met.”*

The VCS approach of a baseline reference area is that it is representative for what would occur within the project area in the baseline scenario. There must therefore be criteria for ‘representativeness’. The wording in VM0010 on the reference area provides these criteria in terms of forest types, climate and elevation. It allows the project proponent to find a reference area outside the project region so long as these geographical criteria are met. However, the wording in VM0010 does not include any other criteria. It does not consider business model as a criterion, perhaps because VM0010 was developed with a specific project in mind, the April Salumei project in Papua New Guinea (the first validated VCS project to have applied VM0010), which does not identify a specific baseline logging agent but a hypothetical one in an area that was sanctioned for logging by the government but where there was no logging history. The methodology developers apparently did not foresee a situation where an already operational logging company would need to use a baseline reference area.

For GGF, business model is an essential criterion because its business model is not represented within the common practice of logging in Loreto or even in Peru. GGF's business model is that of an FSC-certified, vertically integrated, capital-intensive company that is able to process a wide range of tree species. These include many lesser-known species, which can be commercialized because they can be processed into non species-specific composite products and/or kiln sticks. Due to its FSC certification, its processing capacity and its production volume GGF can target international markets effectively, making a return on its capital investment.

In contrast, the majority of logging companies in Peru operate on the extraction and commercialisation of a narrower selection of higher-value species. This means the volume they extract is generally lower (see for example Goodman et al, 2019). Furthermore, there are few FSC-certified logging companies in Peru and none in Loreto. Finally, most companies in Peru, or even in the Amazon, have not invested in processing capacity and international market access, and therefore often engage with illegality to maintain profitability (EIA, 2012). We therefore argue that a reference area limited by regional or national boundaries will not provide baseline representativeness for this project. It would be more accurate to find reference companies that apply a similar business model to GGF's and to look at their extraction practices, as extracted volume per ha is the only parameter that is used for the common practice baseline in GGF's case. The use of reference companies would be allowable so long as the criteria regarding forest types, climate and elevation are met.

GGF has identified three companies that operate with a similar business model to its own within the Amazon basin (two in Brazil, one in Peru), within a similar forest type, climate and elevation (see Section 3.4.2 of GGL1 VCS PDD). GGF proposes to deviate from VM0010 by using these companies as the reference for its common practice baseline scenario of extracted timber volume per hectare.

Additional notes:

- This deviation is not impacted by the updated version of methodology VM0010.
- This deviation was approved during the validation of the project (see methodology deviation #7 in section 3.6 of the project's PDD) & the first verification (deviation #4 in section 3.2.1 of "GGL1 – VCS Monitoring Report 2022 – v4.2 v8 – July2024 VF").

MDev#02: Calculation of DBH and total height H

The project proponent must deviate from VM0010 in Section 8.1.1 *"Calculation of [baseline] carbon stocks in commercial timber volumes", which states that "Yield tables or allometric equations must be used to convert field measurements of diameter (DBH, at typically 1.3m [4.3 ft] aboveground level or above buttress where they exist), and total height H of each tree in the sample plots to merchantable volume, $V_{I,j,i,sp}$ "*.

Instead, in its forest inventory the project proponent has calculated merchantable volume from DBH and commercial height by applying Smalian's formula (utilizing a Form Factor of 0.65), which

is mandatory forestry practice in Peru (Directiva 046-2016 of SERFOR, 2016). Smalian's formula calculates the volume of a tree from its Diameter at Breast Height (DBH) and bole height as if it were a cylinder, then applying a Form Factor to simulate the conicity of the bole (in effect reducing the bole's top diameter).

The project proponent must demonstrate that this deviation results in a more conservative or more accurate estimate of baseline emissions. In order to compare the deviated method with an allometric equation we are unfortunately restricted to calculating with commercial height, not total height, as this is what has been estimated in POA10. Benitez Romero et al (2020) found six allometric equation to calculate volume from diameter and commercial height (the fact that these were all from the 1930s to 1960s demonstrates how difficult it is to find such equations in the modern literature) and tested them to harvested trees from the Brazilian Acre State, south-western Amazonia (to the south-east of Loreto). Applying Benitez Romero's best fit equation (Model MV2) to calculate the commercial volume of each tree in POA10 results in a consistently higher volume ($59,085m^3$ in 3,000ha) than estimated using the proposed deviation ($47,606m^3$).

In principle, GGF had decided in its business plan to extract no more than $15m^3/ha$. In terms of the baseline emissions being claimed by the project there is not much difference between a more or less conservative volume estimation method, since either way the emissions related to $15m^3/ha$ extracted would be claimed. However, this decision was based on a lower inventoried volume and had Model MV2 been used for the inventory (resulting in nearly $20m^3/ha$ standing extractable volume) GGF would likely have decided to take out more volume. After all, GGF's business is based on selling real products, not estimated volumes. Less trees means less income. While GGF's corporate ethos is highly geared towards sustainability it must balance this with profitability. The proposed method is therefore conservative (as well as mandatory forestry practice in Peru).

If GGF had decided to limit its extraction to $15m^3/ha$ this would have resulted in less inventoried trees being harvested. Since GGF would have prioritized the denser species (which are generally more valuable) the weighted average wood density of harvested trees would have been higher and thus claimed baseline emissions would have been higher. This is another reason the proposed method is conservative.

Additional notes:

- This deviation is not impacted by the updated version of methodology VM0010.
- This deviation was approved during the validation of the project (see methodology deviation #1 in section 3.6 of the project's PDD) & the first verification (deviation #1 in section 3.2.1 of "GGL1 – VCS Monitoring Report 2022 – v4.2 v8 – July2024 VF").

MDev#03: Calculation of carbon stock of dead wood as logging slash resulting from timber harvest

The project proponent wishes to deviate from the exact way VM0010 calculates baseline carbon stock changes in the logging slash, residual stand damage and damage from infrastructure establishment fractions of the dead wood pool and proposes an alternative that is very similar but more direct and more accurate because it can use results from peer reviewed scientific publications that are applicable to the project region and to logging operations generally. Specifically:

VM0010's Section 8.1.1 Calculation of [baseline] carbon stocks in commercial timber volumes contains the following text: *"Once the timber harvest plan is complete and $VEX_{j,i}|BSL$ as well as $VEX, INF_{j,i}|BSL$ is calculated, the Biomass Conversion and Expansion Factors (BCEF) method must be used to determine the carbon stock in harvested biomass. This method is appropriate as forest inventory data and allowable harvest must be based on volume estimates to which expansion factors can be readily applied."*

The method outlined in VM0010 uses the BCEF to calculate dead wood from logging slash in Section 8.1.2. To this is added the dead wood resulting from residual stand damage and from infrastructure establishment (the fraction that is not extracted). Residual stand damage is calculated as the extracted carbon stock multiplied by a Residual Stand Damage Factor ($F_{RSD/BSL}$).

The proposed deviation consists of applying a Logging Damage Factor (LDF in tC/m^3) (Pearson et al, 2014) which combines logging slash and residual stand damage into a single factor that is applied to extracted volume to calculate carbon content in these two dead wood fractions. Dead Wood remaining in the forest from infrastructure establishment will be calculated separately applying a Logging Infrastructure Factor (LIF, in tC/m^3) (Pearson et al, 2014), which combines biomass mortality from road construction, skid trails and log decks, camps and ports. LDF and LIF were derived from 6 studies that quantified logging impacts. While the Pearson et al (2014) paper reviews studies from the tropics of all three continents the results are consistent across sites and are of high statistical significance. Half of the sites are in the Amazon or Guiana Shield regions. Their results can therefore be considered applicable to the project area. In contrast, no species-specific BCEFs exist for the Peruvian Amazon and there are no data available for an applicable Residual Stand Damage Factor ($F_{RSD/BSL}$), which makes the method as prescribed by VM0010 less accurate than the proposed deviation.

This deviation is consistent with VM0010's requirement that *"forest inventory data and allowable harvest must be based on volume estimates to which expansion factors can be readily applied."*

The deviation renders Equations 3, 6 and 7 of VM0010 obsolete and replaces Equation (5) with the following equation:

$$\Delta C_{DWSLASH,i,p|BSL} = \sum_{j=1}^i ((V_{EX,j,i}|BSL * LDF) + (V_{EX,j,i}|BSL * LIF))$$

Where:

$\Delta C_{DWSLASH,i,p BSL}$	Change in carbon stock of dead wood as logging slash resulting from timber harvest per unit area in stratum i in land parcel p, in $tC\ ha^{-1}$.
$V_{EX,j,i BSL}$	Mean volume of extracted timber per unit area for species j in stratum i; in $m^3\ ha^{-1}$.
LDF	Logging Damage Factor, in tC/m^3
LIF	Logging Infrastructure Factor, in tC/m^3

Additional notes:

- This deviation is not impacted by the updated version of methodology VM0010.
- This deviation was approved during the validation of the project (see methodology deviation #2 in section 3.6 of the project's PDD) & the first verification (deviation #2 in section 3.2.1 of "GGL1 – VCS Monitoring Report 2022 – v4.2 v8 – July2024 VF").

MDev#04: Calculation of baseline carbon sequestered in wood products

In Section 8.1.3, VM0010 lumps the carbon stocks of extracted timber of all species together (Equation 8), then asks to portion this into wood product classes k. Then it apportions default percentages of the WW, SLF and OF fractions to each wood product class k. This approach is useful when the project proponent does not have any specific data on wood products per species and on recovery rates in the sawmill, but due to applying global default data it is not accurate. GGF does have the above-mentioned specific data, thus applying them is more accurate than using the defaults. And since GGF is the baseline agent it is appropriate to use these specific data. GGF has invested in modern sawmill equipment, so its recovery rates will be higher than that achieved by the global defaults reported in Winjum (1998), resulting in a more conservative estimate of baseline emissions. However, log recovery rates are highly product specific, with the more processed, higher-value products having lower recovery rates (more processing means more sawing, thus more waste).

The project proponent can assign one of four wood product classes to each species in its Timber Harvest Plan, based on its wood density and value. These wood product classes are: High Density – High Value, High Density – Low Value, Low Density – High Value, and Low Density – Low Value). For each of the products k in these four classes GGF has recorded and verifiable log recovery rates from its sawmill operations (see Table 11, Section 3.4.4 of GGL1 VCS PDD). Each product has been assigned to the longevity 0 years (WW and SLF) and longevity 3-100 years (OF) fractions (Table 11 – GGL1 VCS PDD).

Therefore, for each species the extracted carbon in logs can be divided into the fraction that is immediately emitted (longevity 0 years), the fraction that is emitted between years 1 and 20 (86% of the products with longevity 3-100 years – see data table p.69 of VM0010), and the fraction that remains in wood products forever (14% of the products with longevity 3-100 years).

This renders Equation 8 obsolete. The project proponent proposes to replace it with:

$$OF_j = 1 - (WW_j + SLF_j)$$

Where:

OF_j	Fraction of biomass carbon from the 'oxidized fraction' that is assumed to be emitted to the atmosphere from wood products between years 3-100 after harvest for species j, dimensionless;
WW_j	Fraction of biomass carbon from wood waste that is assumed to be emitted to the atmosphere immediately at the time of harvest for species j, dimensionless;
SLF_j	Fraction of biomass carbon from the short-lived wood product pool that is assumed to be emitted to the atmosphere immediately at the time of harvest for species j, dimensionless.

Equation 9 is modified to:

$$C_{WP0,i,t|BSL} = \sum_{j=1}^j C_{EX,i,j,t|BSL} * (WW_i + SLF_i)$$

Where:

$C_{WP0,i,t BSL}$	Carbon stock of extracted timber from stratum i that is assumed to be emitted immediately at the time of harvest t, in tC/ha.
$C_{EX,i,j,t BSL}$	Carbon stock of extracted timber from species j in stratum i at time t, in tC/ha;
WW_j	Fraction of biomass carbon from wood waste that is assumed to be emitted to the atmosphere immediately at the time of harvest for species j, dimensionless.
SLF_j	Fraction of biomass carbon from the short-lived wood product pool that is assumed to be emitted to the atmosphere immediately at the time of harvest for species j, dimensionless.

And Equation 10 is modified to:

$$C_{WP20,i,t|BSL} = \sum_k C_{EX,i,j,t|BSL} * OF_j * 0.86$$

Where:

$C_{WP20,i,t BSL}$	Carbon stock of extracted timber from stratum i at time t that is assumed to be emitted between years 1 and 20, in tC/ha.
$C_{EX,i,j,t BSL}$	Carbon stock of extracted timber from species j in stratum i at time t, in tC/ha.

OF_j Fraction of biomass carbon from the ‘oxidized fraction’ that is assumed to be emitted to the atmosphere from wood products between years 3-100 after harvest for species j, dimensionless.

Additional notes:

- This deviation is not impacted by the updated version of methodology VM0010.
- This deviation was approved during the validation of the project (see methodology deviation #6 in section 3.6 of the project’s PDD) & the first verification (see methodology deviation #3 in section 3.2.1 of “GGL1 – VCS Monitoring Report 2022 – v4.2 v8 – July2024 VF”)

Methodology deviations (MDev) applied in the project scenario calculations

MDev#05: Market leakage

The project proponent, as in GGL1’s first verification,³ proposes a methodology deviation to accompany the Monitoring Report, subject to the rules in VCS Standard version 4.7 section 3.20.2, which state that ‘methodology deviations shall not negatively impact the conservativeness of the quantification of reductions or removals, except where they result in increased accuracy of such quantification.’ Specifically, we propose deviating from the procedure set out in Section 8.3.2. of the VM0010 methodology Version 1.3, which describes the calculation of market leakage.

Our proposed Methodology Deviation increases the accuracy of quantification of potential market leakage by analysis of Peru’s timber products export data to demonstrate whether other producers increased logging in the monitoring period to fill the gap in the market caused by cessation of production by GGF. To determine whether trends in Peru’s timber exports were linked to factors other than the cessation of production by GGF (i.e., that export data did not accurately reflect Peru’s timber production in the monitoring period), we consider the impact of external factors that might have caused a variation in timber exports during the monitoring period.

Current VM0010 Methodology

The VM0010 methodology states in section 8.3.2. that “*leakage due to market effects is equal to the net emissions from planned timber harvest activities in the baseline scenario multiplied by an appropriate leakage factor*”. The leakage factor is determined by considering where in the country logging will be increased because of the decreased timber supply caused by the Project. However, there are weaknesses in this approach:

The existing methodology implicitly assumes that other timber producers increase production and harvest of merchantable biomass outside the project area to fill the gap caused by cessation of timber production by the project proponent (i.e., that demand elasticity exerts equal pressure

³ See methodology deviation #6 in section 3.2.1 of “GGL1 – VCS Monitoring Report 2022 – v4.2 v8 – July2024 VF”

on other forests within the country). This could consequently lead to an overestimation of the actual market leakage attributed to the project proponent if other producers do not respond by increasing production.

It does not consider the context of the timber industry in a specific country. This is relevant in a country like Peru, that is not a leading producer or exporter of forest products (as defined by the United Nations Food and Agriculture Organization Forest product statistics (fao.org)), and which can be by-passed by international buyers who can source alternative supplies from other countries (and market leakage would not arise in Peru).

The accuracy of the current methodology can be improved through an analytical approach that quantifies potential market leakage based on an analysis of verifiable ex-post market data during the monitoring period:

Proposed Deviation

Modification of Equation 40 in VM0010 v1.3

We propose the following modification to Equation 40, which provides a more accurate measure of market leakage by quantifying ex-post market variations, which are used to assess the potential extent of increased logging elsewhere in Peru during the monitoring period.

$$GHG_{LK|LtPF,t^*} = LK_{ME} * GHG_{NET|BSL,t^*} * LP_{ME}$$

Where:

$GHG_{LK LtPF,t^*}$	Total market leakage resulting from IFM LtPF activities, in the year t* since the start of the Project activity, tCO _{2e}
LK_{ME}	Leakage factor for market-effects calculations, dimensionless
$GHG_{NET BSL,t^*}$	Net greenhouse gas emissions in the baseline scenario in the year t* since the start of the Project activity, tCO _{2e}
LP_{ME}	The percentage of log volumes that potentially could be subject to market leakage

Where, LP_{ME} is calculated as follows:

$$LP_{ME} = \frac{\sum_{x=1}^X LP_{ME_x} * Vol_{GGF_x}}{Vol_{GGF}}$$

$$LP_{ME_x} = \frac{Average(Exports_{x,t=1}, Exports_{x,t=2}) - Exports_{x,t=0}}{Revenue_{GGF_x}}$$

LK_{ME_x}	The percentage of log volumes of product 'x' that potentially could be subject to market leakage
Vol_{GGF}	The total log annual production of GGF, m ³
$Exports_{x,t^*}$	Peruvian exports of product x in year t*, USD FOB
$Revenue_{GGF_x}$	Annual GGF revenue of product 'x', USD FOB

Assumptions:

- We conservatively assume that, during the monitoring period, increases in exports of products that would have been produced by GGF were a result of increased production by other producers to satisfy buying interest that otherwise would have been fulfilled by GGF.
- We conservatively assume that all timber products that would have been produced by GGF for sale in domestic markets were replaced by production elsewhere in-country.

This approach leads to three cases:

Case 1: There is no market leakage for product 'x'

$$Average(Exports_{x,t=1}, Exports_{x,t=2}) - Exports_{x,t=0} \leq 0$$

- $LP_{ME_x} = 0\%$
- No Peruvian timber producer replaced what GGF would have produced in the baseline scenario for product 'x'

Case 2: There is potential partial leakage for product 'x'

$$0 < Average(Exports_{x,t=1}, Exports_{x,t=2}) - Exports_{x,t=0} < Revenue_{GGF_x}$$

- $0\% < LP_{ME_x} < 100\%$
- A limited portion of GGF's projected production of product 'x' was taken up by other Peruvian timber producers

Case 3: There is potential full market leakage for product 'x'

$$0 < Average(Exports_{x,t=1}, Exports_{x,t=2}) - Exports_{x,t=0} \geq Revenue_{GGF_x}$$

- $LP_{ME_x} = 100\%$
- Peruvian timber producers replaced at least as much as GGF would have produced in the baseline scenario for product 'x'

Increased accuracy of our proposed deviation

- The purpose of our proposed deviation is to increase the accuracy of the quantification of market leakage under conservative assumptions. To do this, we analyze the behavior of the market (i.e., changes in production by other Peruvian companies of timber products that GGF would have produced under the baseline scenario) to determine the extent of market leakage that is attributable to the cessation of production by GGF.
- The extent of market leakage will be assessed in each monitoring report throughout the lifetime of the Project. As there are multiple factors (that can never be definitively determined) that could impact levels of production by other producers (e.g., price changes, availability of finance, pandemic effects, strikes, etc.), we adopt the most conservative scenario, i.e., that the cessation of production by GGF is the sole cause of increases in production of like-for-like products by other producers. In this way, we never underestimate the impact on the market of GGF's cessation of production.
- We track changes in production of like-for-like products that in the baseline scenario GGF would have produced for sale in international markets. As almost all GGF's timber products were destined for export, we analyze ex-post export data of like-for-like products from other producers in Peru and compare these with what would have been produced by GGF from the project area in the baseline scenario (set out in section 3.4.4 of the PD). Where products would have been sold domestically (low-value and offcuts), we conservatively assume all would be replaced by production elsewhere in-country.
- To determine whether export data accurately reflect production during the relevant monitoring period, we assess the impact of external factors, such as the COVID-19 pandemic, disrupted exports and skewed the link between production and exports in that monitoring period.
- Conservative assumptions: We assume that all increases in export volumes of the like-for-like products resulted from increased production by other producers to satisfy buying interest that would otherwise have been fulfilled by GGF (i.e., market leakage). This is highly conservative as our default assumption is that all variations in export volumes result from the cessation of production by GGF.

Additional notes:

- Although version 1.4 removes Equation 40 from the methodology, the procedure remains the same as in version 1.3. Therefore, this deviation is not affected by the updated version of methodology VM0010.
- This deviation was approved during the first verification of the project (see methodology deviation #6 in section 3.2.1 of "GGL1 – VCS Monitoring Report 2022 – v4.2 v8 – July2024 VF").
- The deviation was updated with the information relevant for the monitoring period.

MDev#06: Project Uncertainty

The project proponent deviates from the procedure in Section 8.4.1.1 of methodology VM0010, which states that “for both the baseline and the with-project case the total uncertainty is equal to the square root of the sum of the squares of each component uncertainty (...).” For this monitoring period, Space Intelligence (SI), the project’s carbon mapping provider, applied a field-validated, spatially explicit approach to quantify changes in Above-Ground Biomass (AGB) and their associated uncertainty across the project area.

To estimate total uncertainty in AGB change for the period 2022–2024, SI implemented a direct empirical validation framework based on remeasured permanent plots and wall-to-wall biomass maps at 25 × 25 m resolution. Specifically, SI:

1. Calculated plot-level AGB differences for 28 pairs of remeasured permanent plots, obtaining 28 independent reference estimates of total AGB change;
2. Extracted the mean predicted AGB change from the 2022–2024 biomass change map for the same 28 plot polygons;
3. Computed the Root Mean Square Error (RMSE) between observed and predicted AGB change values;
4. Expressed uncertainty as a percentage by dividing the RMSE of AGB change (27.09 Mg ha⁻¹) by the mean total AGB of all plots in 2024 (298.5 Mg ha⁻¹), resulting in a total project uncertainty of 9.08%.

Regarding representativeness across the full biomass gradient, including mature and high-stock forest strata, the omission of plots SR-01 (350.6 Mg ha⁻¹) and SR-03 (426.4 Mg ha⁻¹) from the 2024 remeasurement dataset does not introduce a systematic bias nor artificially reduce the reported uncertainty. These plots were not excluded for statistical reasons but due to documented logistical and safety constraints during the 2024 field campaign. Importantly, both plots were included in the calibration of the AGB–height relationship, which was fitted using 58 plot measurements derived from 30 project plots (including SR-01 and SR-03 with their 2022 measurements) and additional external reference plots. Consequently, the upper end of the biomass spectrum is explicitly represented in the structural calibration of the model.

In addition, SI conducted a dedicated sensitivity analysis to evaluate the potential impact of omitting SR-01 and SR-03 from the 2024 remeasurement. A conservative simulation was performed by applying the mean observed AGB increment from the 28 remeasured plots (+5.761 Mg ha⁻¹ between 2022 and 2024) to both omitted plots, while keeping the height of the five tallest trees constant, as the mean height change across plots was negligible (–0.075 m). The AGB–height relationship was then refitted including these simulated values. The resulting curves showed only marginal differences, with the original relationship (excluding the simulated plots) being slightly more conservative. This demonstrates that the reported RMSE of 9.08% remains representative of the entire project area and does not underestimate uncertainty in high-biomass or mature forest strata.

With respect to the treatment of uncertainty components, the RMSE-based validation approach directly integrates the combined effects of field measurement uncertainty, allometric model uncertainty, and spatial modeling uncertainty into a single empirically derived metric. Because the RMSE is calculated from the discrepancy between observed plot-level AGB change (derived from field measurements and allometric equations) and predicted map-based AGB change, it inherently captures the propagation of all primary error sources affecting the estimation of biomass change. As such, the resulting uncertainty is functionally equivalent to a square-root-of-the-sum-of-squares (SRSS) aggregation of individual components but derived empirically rather than through the combination of assumed or literature-based error terms.

To demonstrate conservativeness relative to the original VM0010 approach, a direct comparison was performed using the same set of 28 remeasured plots. Under the traditional VM0010 sampling framework, applying a Student's t-distribution at the 95% confidence level yields an RMSE of 28.23 Mg ha⁻¹, corresponding to an uncertainty of 9.46% when normalized by the same mean 2024 biomass (298.5 Mg ha⁻¹). By contrast, the SI spatial validation approach yields a slightly lower RMSE of 27.09 Mg ha⁻¹ and an uncertainty of 9.08%. This difference is small, coherent, and scientifically justified, reflecting the greater spatial representativeness of a wall-to-wall biomass map that reduces extrapolation bias from point-based sampling, rather than an artifact of methodological manipulation. Both approaches rely on the same field dataset, and the close agreement between results confirms that the spatial model does not underestimate uncertainty.

Comparative uncertainty table (28 remeasured plots)

Approach	Methodological basis	Statistic used	RMSE (Mg/ha)	Mean biomass 2024 (Mg/ha)	Uncertainty (%)
VM0010 – traditional approach	Sampling error of physical field plots	Student's t-distribution (95% CL)	28.23	298.5	9.46%
MDev#06 – SI spatial model	Empirical map-to-plot validation (Δ AGB)	Spatial RMSE	27.09	298.5	9.08%

Overall, this deviation results in a more robust, spatially representative, and empirically grounded estimate of project uncertainty, while remaining conservative and fully consistent with the intent of the VCS Standard and methodology VM0010.

Additional notes:

- This deviation is not impacted by the updated version of methodology VM0010.
- This is a new deviation introduced in this Monitoring Report for the period August 2022 – July 2024.

MDev#07: Illegal logging Disturbances

The project proponent deviated from VM0010 in the monitoring of illegal logging impact as proposed in validation. The new approach results in higher monitoring accuracy, as it is less dependent on extrapolation of field plot data to the larger project area and instead uses a much larger set of actual data from the entire area.

Carbon stock maps for 2022 and 2024 were produced using a two-stage process: during the first stage, a 25-metre resolution per-pixel canopy height map of the area is created. This is done using machine learning methods that incorporate calibrated information from LiDAR satellite sensors, such as NASA's GEDI, which provide thousands of estimations of canopy height with a 25-metre footprint, as well as information from optical, radar and elevation sensors from continuous coverage satellites, such as Sentinel 1 and 2, ALOS-2 PALSAR-2, Landsat 8 and 9, and Copernicus DEM. In the second stage, field plot data was then used to model the local relation between canopy height and aboveground biomass, allowing to transform the height map from the first stage into an aboveground biomass map consisting of 25-metre resolution per-pixel aboveground biomass estimations of the area.

Ground plot measurements follow the Rainfor/ForestPlots.net methodology. 28 out of the 30 installed plots were remeasured installed by the project proponent within the project area. In addition, already established permanent sample plots in the same forest type and in the vicinity of the project area (i.e., covered by the satellite images) are used. Specifically, 5 permanent plots from Loubota Panzou et al. 2020 were used to compliment the information of the installed plots. The data for these are available on the Rainfor/ForestPlots.net databases.

Biomass maps were thus created for the monitoring event and then compared. This creates a ΔC map where for each pixel the changes in biomass are presented. To detect any areas of disturbance, i.e., significant reduction in carbon stocks ($>5\text{tC/ha}$), a grid of 16×16 pixels (pixel size is $25 \times 25\text{m}$, so the grid covers $160,000\text{ m}^2$) were moved over the biomass map in a Geographic Information System (GIS) and any central pixel that had more than 6 pixels that had lost more than 5 tC within its 16×16 neighbourhood was flagged as a potential ΔC indication of natural or anthropogenic disturbances.

As the above-mentioned ΔC derived from carbon stock maps comparison quantified any impact of illegal logging on carbon stocks the methodological emphasis shifts to correctly identifying an observed ΔC as resulting from illegal logging for the purpose of applying Equation 37 to calculate related fossil fuel emissions, and to take action to prevent future illegal logging.

To detect illegal selective logging an analytical function was programmed in a GIS in the following manner: a square grid of 16x16 pixels was moved over the biomass map. If within any grid more than 6 pixels show a ΔC above 5 tC (equivalent to the aboveground biomass of a large tree plus collateral damage), and it is within striking distance of an access point ($D_{DIST_IL,i}$) this may be an indication of tree mortality that exceeds the natural level, i.e., it may be an observation of illegal logging⁴. This approach no longer requires the limited field sampling when the PRA indicates there is a potential for illegal logging activities. Therefore this deviation does not impact the conservativeness of the calculations and increases accuracy.

To calculate fossil fuel emissions resulting from illegal logging, $C_{FUEL,IL}$ Equation 37 is modified to:

$$C_{FUEL,IL,t} = \frac{C_{FUEL}}{C_{EX,i|BSL}} * \frac{44}{12} * \sum_{pix}^M \Delta C_{IL,pix,t} \quad (37)$$

Where:

$C_{FUEL,IL,t}$	Fossil fuel emissions resulting from illegal logging at time t, tCO ₂ e
C_{FUEL}	Total carbon emissions associated with the combustion of fossil fuel in forestry and wood processing machinery, in tC;
$C_{EX,i BSL}$	Change in carbon stock of extracted wood products resulting from timber harvest in the baseline, in tC ha^{-1} ;
$\Delta C_{IL,pix,t}$	Change in carbon stock resulting from illegal logging in pixel pix at time t, tC
pix	number of pixels 1,2,3,... M

Note: This deviation is not impacted by the updated version of methodology VM0010

Additional notes:

- This deviation is not impacted by the updated version of methodology VM0010
- This deviation was approved in the validation (see deviation #4 in in section 3.6 of the project's PDD)

MDev#8: Natural Non-fire Disturbance

Section 8.2.2.1 Option B: Natural Disturbance – Non-Fire of the methodology states that “For non-fire natural disturbance, it is assumed that a disturbance event in the project scenario would also have occurred in the baseline scenario”. Project emissions are therefore equal to the non-fire natural disturbance to biomass absent in the baseline scenario (harvested and removed) but

⁴ The number of pixels to be detected within the grid and the detection threshold value were discussed with Prof. Ed Mitchard of the University of Edinburgh and Space Intelligence Ltd. who indicated these are realistic.

present in the project scenario.” This is the same for Option A: Natural Disturbance – Fire. However, whilst this principle is upheld in Equations 33 and 34 for fire disturbance, Equation 35 does not apply it. Instead, Equation 35 calculates project emissions from non-fire disturbance as the area affected multiplied by the total carbon stock in aboveground biomass. This is contrary to the stated principle. Therefore, this deviation does not impact the conservativeness of the calculations and increases accuracy.

The project proponent therefore proposes to modify Equation 35 to:

$$\Delta C_{DIST,t|PRJ} = \sum_{j=1}^j (A_{dist,i,t} * B_{i,t|PROJ}) * CF_j * \frac{44}{12} \quad (35)$$

Where:

$\Delta C_{DIST,t|PRJ}$ Net greenhouse gas emissions resulting from non-fire disturbance in year t, tCO₂e

$A_{dist,i,t}$ Area affected by non-fire disturbance for stratum i at time t, ha

$B_{i,t|PROJ}$ Average aboveground biomass stock present in the project scenario but absent in the baseline scenario before disturbing stratum i, time t; t d. m. ha^{-1} ; Calculated applying Equation 34.

CF_j Carbon fraction for biomass of species j; tC t.d.m⁻¹

Additional notes:

- This deviation is not impacted by the updated version of methodology VM0010
- This deviation was approved in the validation (see deviation #3 in in section 3.6 of the project’s PDD).

MDev#11: Carbon Stock Changes

The project proponent deviates from VM0010 on the monitoring of annual carbon stock changes in the project scenario. The new approach results in higher monitoring accuracy, as it is less dependent on extrapolation of field plot data to the larger project area and instead uses a much larger set of actual data from the entire area. This monitoring approach deviates from “Section 8.2: Project emissions” in the way net project emissions are then calculated.

The project proponent performs the monitoring of annual carbon stock changes in above ground biomass of trees in the project scenario through bi-annual carbon stock mapping and analysis of carbon stock changes through comparing maps from different years. Carbon stock maps are produced through a combination of samples from LiDAR satellite sensors, such as NASA’s GEDI and/or ICESAT-2, which give thousands of estimates of aboveground biomass per year in ~25m diameter plots, and operational continuous cover satellites such as Sentinel-1/2 and/or Landsat 8/9. The spaceborne LiDAR data is a measure of forest height and volume and is calibrated using field data to convert to biomass, and existing field plots from the project area and from the nearby

region have been used for this purpose. Machine learning approaches are used to find the best-fit model of a combination of the remote sensing datasets with calibrated LiDAR biomass measurements. This allows for extrapolation of measured forest properties across the landscape at a 30m spatial resolution, deriving a per-pixel biomass estimation. These maps are then compared to the field plots (which are not directly used for model extrapolation, just for forest property assessment) to provide a quantified error and bias for the maps. Once calibrated, this model is expected to produce accurate biomass maps for a period of 5-10 years, when applied to new remote sensing datasets. However, the model may be re-trained every 4 years when additional plot measurements become available if the map shows too high an error with the new measurements.

Ground plot measurements follow the Rainfor/ForestPlots.net methodology. 30 plots have been installed by the project proponent within the project area. 28 out of the 30 plots were remeasured during the monitoring period. In addition, already established permanent sample plots in the same forest type and in the vicinity of the project area (i.e., covered by the satellite images) were used. Specifically, 5 permanent plots from Loubota Panzou et al. 2020 were used to compliment the information of the remeasured 28 installed plots. The data for these are available on the Rainfor/ForestPlots.net databases.

Biomass maps are thus created for each bi-annual monitoring event and then compared. This creates a ΔC map where for each pixel the changes in biomass are presented. This ΔC map is the equivalent of the determination of $\Delta C_{AB,t|PRJ}$, applying Equation 32 of VM0010. However, Equation 32 needs to be modified as the calculation of ΔC is not done by stratum anymore, but by pixel. Hence, Equation 32 is modified to:

$$\Delta C_{AB,t|PRJ} = \sum_{basepix=1}^M \frac{(C_{AB,basepix,t2|PROJ} - C_{AB,basepix,t1|PROJ})}{T} * \frac{44}{12} \quad (32)$$

Where:

$\Delta C_{AB,t PRJ}$	Annual carbon stock change in aboveground biomass of trees in year t, tCO ₂ e/yr
$C_{AB,pix,t PRJ}$	Mean aboveground biomass carbon stock of trees in pixel <i>pix</i> at time t, tC/ha;
t_1	Year
T	Number of years between monitoring time t_1 and t_2 ($T = t_2 - t_1$); years
Basepix	1, 2, 3 ... M pixels within the area of any land parcel harvested in the baseline scenario since the start of the project activity
44/12	Ratio of molecular weights of carbon dioxide and carbon, tCO ₂ e tC ⁻¹ .

Additional notes:

- This deviation is not impacted by the updated version of methodology VM0010

- This deviation was approved in the validation (see deviation #3 in in section 3.6 of the project's PDD).

Methodology deviations (MDev) no longer applicable in future verifications

Methodology deviation #5 from “GGL1 – VCS Monitoring Report 2022 – v4.2 v8 – July 2024 VF.pdf”, related to baseline averaging, is no longer applicable for this or future monitoring periods to ensure conformance with the VM0010 Correction.

3.2.2 Project Description Deviations

During the monitoring period, 2 new project descriptions deviations were introduced (see PDev#5 & PDev#6). Additionally, deviations approved during the first verification are described (see PDev#1 – PDev#4).

Project Description Deviations (PDev) approved in previous monitoring report

PDev#1: Inclusion of parameters not considered in PD

We are describing a Project Deviation Description, to accompany the Monitoring Report, subject to the rules in the VCS Standard version 4.7 section 3.21.2 (2).

In the GGL1 VCS PD, parameters related to fossil fuel emissions were not included in sections 5.1 “Data and Parameters Available at Validation” nor 5.2 “Data and Parameters Monitored”. Baseline emissions from fuel combustion are considered insignificant (see section 4.1.5 of the PD). Parameters “EF_{Fuel}” and “FC (harvest, hauling, barging, processing)” are now added to section 4.1 “Data and parameters available at validation”. Similarly, $A_{1,i,p}$, $A_{2-10,i,p}$, $A_{11-20,i,p}$ and A_{t+} that should have been listed in the PD but were not, are now added to section 4.1 of this document.

This deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario as the changes made are required to faithfully apply the validated methodology.

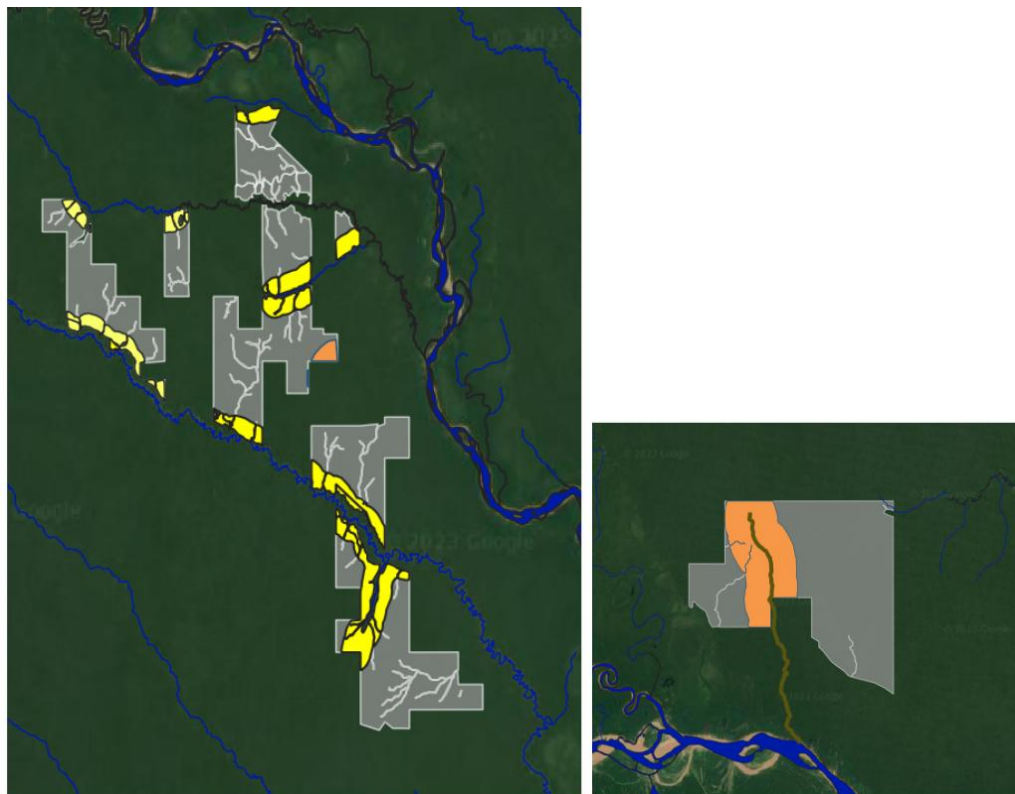
Note: This deviation was introduced during the first monitoring period August 2020 – July 2022 (see deviation #6 in section 3.2.2 of “GGL1 - VCS Monitoring Report 2022 - v4.2 v8 - July2024 VF.pdf”)

PDev#2: Installation of permanent monitoring plots

We are describing a Project Description Deviation, to accompany the Monitoring Report, subject to the rules in the VCS Standard version 4.5 section 3.21.2 (2) - ‘deviation that does not impact the applicability of the methodology...’

Space Intelligence did not have access to a height map at the point in time that the field campaign was being planned. Therefore, the following approach was undertaken, deviating from section 5.3.6 of the PD.

1. A risk assessment completed by the field team found that placing field plots more than 3 km from access points (rivers or roads) was too dangerous. Evacuation in the case of an event such as a snake bite would not have been possible without serious risk of death. All points were therefore located within 3 km of access points, with the exception of the road in Tachsa where 5 km was possible. Only 24% of the Project Area was therefore available for field sampling, see figure and table below.



Areas accessible for the location of the plots. In yellow, 3km buffer from rivers. In orange 3 km buffer from roads (*a 5km buffer was applied in the road near Tachsa after discussions with the field team). Left is Tachsa and Mazan, on the right in San Regis.

	Area AOI (ha)	Area buffer 3km rivers (ha)	Area buffer 3km* roads (ha)	Total accessible area (ha)	% Accessible
Mazan	30,619.63	6,739.93		6,739.93	22.01
Tachsa	125,557.53	25,833.42	1,288.70	27,122.13	21.60
Regis	27,268.38	1,173.87	6,536.78	7,710.66	28.28
Total	183445.54				23.96

2. Plot locations were stratified to be located in two different vegetation types, 'Bosque de colina baja' and 'bosque de terraza alta', according to their proportions in each of the three regions, based on a vegetation map used in the preparation of the PD (Vegetation Cover Map (MINAM, 2015) (R. M. N.° 059-2015-MINAM).
3. GEDI LiDAR footprints are distributed across the Project Area. We attempted to place field plots under these footprints, which would have enabled direct regression between LiDAR and field-measured tree height. Ultimately it was found that the geolocation of field plots under the tall forest canopy was too poor for their placement exactly under GEDI footprints, but when placing them points were placed under the footprints.

The resulting plot locations were randomly generated using QGIS given the requirements as above, and given to the field team, who placed plots as near as possible to these points given field constraints. The number of plots in each vegetation type and area are given here:

Number of sample plots within the AOI per land cover class

Land cover class	Consolidado Tacsha (ha) / number of plots	Consolidado Mazan (ha) / number of plots	San Regis (ha) / number of plots	Total number of plots
Bosque de colina baja	116565 / 13 plots	30050 / 4 plots	27268 / 5 plots	22
Bosque de terraza alta	9030 / 7 plots	586 / 1 plot	0 / 0 plots	8
Total	125595 / 20 plots	30636 / 5 plots	27268 / 5 plots	30

It should be noted that this corresponds well to the equivalent table in the SOP, as created before the fieldwork started:

	San Regis		Consolidado Mazan		Consolidado Tacsha		
	AREA (HA)	PLOTS	AREA (HA)	PLOTS	AREA (HA)	PLOTS	TOTAL
Bosque de colina baja	27280.71 (98.32%)	7 (5)	30797.59 (90.56%)	6	119667.32 (87.34%)	20	33
Bosque de terraza baja	48.58 (0.18%)		2619.97 (7.70%)		4548.21 (3.32%)		0
Bosque de terraza alta			589.83 (1.73%)	1	12794.67 (9.34%)	3	4
TOTAL	27746.41	7 (5)	34007.39	7 (5)	137010.19	23 (20)	37 (30)

Overall, Space Intelligence still believes the plots represent the range of forest types and locations in the study area and are unlikely to be biased. And as the total biomass of the area is based not on the field plots, but on remote sensing-based observations of every 0.0625 ha pixel (25m x 25m), biases in the field data set are less of an issue.

Note: This deviation was introduced during the first monitoring period August 2020 – July 2022 (see deviation #3 in section 3.2.2 of “GGL1 - VCS Monitoring Report 2022 - v4.2 v8 - July2024 VF.pdf”)

PDev#3: Resolution land cover map

A 25 x 25 m resolution land cover map has been used for the disturbance analysis. This is different to that indicated in the PD in sections 3.6 (specifically deviation #3 and #4) and 5.3.7 of the PD. This was done because the higher resolution was thought likely to reduce uncertainty (most likely), and at worst do not increase uncertainty, and thus is a conservative change. Thus, this deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario.

Note: This deviation was introduced for the from the first monitoring period August 2020 – July 2022 (see deviation #1 in section 3.2.2 of “GGL1 - VCS Monitoring Report 2022 - v4.2 v8 - July2024 VF.pdf”)

PDev#4: Disturbance

To detect any areas of disturbance, i.e., significant reduction in carbon stocks (>5tC/ha), a grid of 16x16 pixels (pixel size is 25x25m, so the grid covers 160,000 m²) were moved over the biomass map in a Geographic Information System (GIS) and any central pixel that has more than 6 pixels having lost more than 5 tC within its 16 X 16 neighborhood is flagged as an indication of disturbances. This differs from what was stated in the PD in sections 3.6 (specifically deviation #3 and #4) and 5.3.7 of the PD. The 3 x 3 window itself does not add any additional information over simply viewing the change map at the native resolution. Thus, this deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario. The results of the application of this deviation can be found in section 4.3.5.

Note: This deviation was introduced during the first monitoring period August 2020 – July 2022 (see deviation #2 in section 3.2.2 of “GGL1 - VCS Monitoring Report 2022 - v4.2 v8 - July2024 VF.pdf”)

New Project Description Deviations (PDev)

PDev#5: Remeasurement of permanent plots

We are describing a Project Deviation Description, to accompany the Monitoring Report, subject to the rules in the VCS Standard version 4.7 section 3.21.2 (2).

During the 2022–2024 monitoring period, two permanent monitoring plots (SR-01 and SR-03) could not be remeasured during the 2024 field campaign. This was due to logistical access

constraints documented in the field reports associated with unusually dry climatic conditions in the San Regis sector, which limited operational access to these plots.

As a result, 28 out of the 30 permanent plots were successfully remeasured and used for the empirical validation of biomass change and the estimation of project uncertainty. This represents a deviation from what was originally described in the Project Description, specifically in Sections 3.6 and 5.2, where the remeasurement of all 30 plots was expected.

This deviation does not affect the applicability of the methodology, as it does not introduce any changes to the nature of the project activity or to the applicability conditions set out in VM0010, v1.3.

It also does not affect the demonstration of additionality, as it does not modify the initial conditions or assumptions underpinning the without-project scenario.

Finally, it does not affect the appropriateness of the baseline scenario, as the deviation only impacts the calculation of project emissions and does not alter baseline assumptions, baseline behavior, or baseline emission estimates.

Moreover, to explicitly assess the potential effect of excluding plots SR-01 and SR-03—both of which fall within the upper range of the project’s biomass gradient—Space Intelligence (SI) conducted a dedicated sensitivity analysis. This analysis is documented in Appendix 2 – “Analysis of the impacts of field plot omissions in 2024 data (SR-01 and SR-03)” of the report “GGF Peru 2024 Report v1.3.”

The sensitivity analysis conservatively simulated 2024 biomass values for SR-01 and SR-03 by applying the mean biomass increment observed across the 28 remeasured plots, while maintaining the heights of the tallest trees unchanged, given that the mean height change between measurement periods was negligible. The biomass–height relationship was then refitted including the simulated plots and compared against the original calibration.

The results show that including SR-01 and SR-03 does not improve model fit nor reduce error, and that differences between the biomass–height relationships with and without these plots are negligible. The original calibration excluding the non-remeasured plots is slightly more conservative, confirming that the omission of SR-01 and SR-03 does not result in an underestimation of model error or uncertainty.

Accordingly, the use of the 28 remeasured plots provides a technically sound and conservative basis for model validation and uncertainty estimation, and the exclusion of SR-01 and SR-03 has been explicitly evaluated and addressed through a documented sensitivity analysis.

PDev#6: Recalculation of baseline

We are describing a Project Deviation Description, to accompany the Monitoring Report, subject to the rules in the VCS Standard version 4.7 section 3.21.2 (2).

The project is recalculating the net GHG emissions in the baseline scenario (and thus, the estimated leakage emission and estimated net GHG emissions reductions or removals) to correct calculation inconsistencies identified in the validated Project Description (PD) and to ensure full alignment with the “Correction to VM0010, v1.2–v1.4” issued on September 18, 2025.

1. Project area: The baseline calculations presented in Section 4 of the PD were conducted using a total area of 183,445.00 ha, instead of the precise project total area of 183,445.54 ha.
2. Harvesting Area in the Baseline Scenario: The validated baseline was calculated using the average annual area loggable rather than the specific areas defined in the validated timber harvesting plan (see PD Section 3.3). This approach did not comply with Box 1 of the methodology (“The description of harvesting in the form of a timber harvest plan forms the basis of the baseline scenario for greenhouse gas accounting”).
3. Correction and Clarifications for VM0010 v1.3:
 - a. On July 10, 2024, VERRA issued the document “Corrections and Clarifications for VM0010: Improved Forest Management – Conversion from Logged to Protected Forest, v1.3,” which became effective on the date of issuance. As shown in the supporting document “Corrections & Clarifications Analysis”, only corrections to the nomenclature of the equations were made.
 - b. In compliance with the “Correction to VM0010, v1.2–v1.4” (September 18, 2025), the project is updating the baseline calculation of net GHG emissions from an average-based approach to a year-by-year approach, consistent with the revised methodological procedures for determining baseline emissions and associated VCUs.

It is important to note that during the first verification, an update to the estimation of net GHG emissions in the baseline was already made to address points (1) and (2) above (see deviation #4 in section 3.2.2 of “GGL1 - VCS Monitoring Report 2022 - v4.2 v8 - July2024 VF.pdf”)

This deviation does not alter the project’s eligibility under the methodology, its additionality, or the validity of the baseline scenario. Rather, it ensures that the baseline is calculated in a manner fully consistent with the validated methodology and the latest methodological corrections.

The result from this deviation is below and replaces the information on section 1.10 and section 4.4 (specifically table 12) from the PD. Given the calculations of the baseline since validation (See Section 4.1 of GGL1 PDD & Section 5.1 of the “GGL1 - VCS Monitoring Report 2022 - v4.2 v8 - July2024 VF.pdf”), no related data or parameters need to be changed or updated.

The correction removed a paragraph in Section 8.1 of VM0010, versions 1.2, 1.3, and 1.4, that allowed projects to calculate baseline emissions using an averaging approach. This update was introduced to resolve the inconsistency between the summary description and Equations 11–15 in VM0010 v1.2.

As described in Section 5.4 of this Monitoring Report, the calculation of GHG credits associated with the implementation of IFM activities is based on the actual net GHG emissions in the baseline scenario for each year, rather than on the average net GHG emissions in the baseline scenario (as outlined in Section 4.4 of the PDD and Section 5.4 of “GGL1 - VCS Monitoring Report 2022 - v4.2 v8 - July 2024 VF.pdf”).

Year	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
1	124,428	-13,689	9,954	128,162
2	204,255	-30,558	16,340	218,473
3	259,091	-46,558	20,727	284,922
4	291,042	-59,526	23,283	327,285
5	340,818	-72,665	27,265	386,217
6	388,803	-85,706	31,104	443,404
7	442,140	-99,279	35,371	506,048
8	491,931	-112,776	39,355	565,353
9	541,037	-126,153	43,283	623,907
10	539,412	-133,878	43,153	630,137
11	544,164	-147,996	43,533	648,627
12	503,297	-162,972	40,264	626,005
13	465,841	-178,255	37,267	606,829
14	440,778	-193,085	35,262	598,601
15	403,157	-206,375	32,253	577,280
16	371,970	-219,402	29,758	561,614

17	338,962	-232,422	27,117	544,266
18	300,712	-244,812	24,057	521,467
19	256,726	-256,119	20,538	492,306
20	267,251	-269,053	21,380	514,924
Total	7,515,815	-2,891,277	601,265	9,805,827
			Average annual ERs	490,291

It is important to note that, although the VCUs issued during the project's first verification period were consistent with the version of the methodology in effect at that time, the subsequent correction and clarification issued by Verra required a downward revision of the total quantified emission reductions and removals (ERRs), as shown in the following tables⁵.

The difference between the two estimations amounts to 402,309 VCUs. To address this, a VCU replacement plan has been established that upholds methodological integrity while ensuring a practical pathway for the project's implementation. Under this plan, GGF will request Verra to issue and immediately cancel VCUs equivalent to 50% of the excess issuance (as calculated by GGF and validated by a VVB through a Project Description deviation in this monitoring report and the corresponding verification report, respectively). Verra will also cancel the remaining excess credits from the AFOLU pooled buffer account.

Upon completion, Verra will publish a VM0010 C&C Conformance Letter detailing the actions taken, including the list of cancelled VCUs (quantities and serial numbers).

All VCUs were issued in accordance with the methodology version in effect at the time, and the implementation of the replacement plan ensures full conformance with the VM0010 Correction and Clarification. Therefore, all previously issued VCUs remain valid.

Net GHG Emission Reductions and Removals 1st Monitoring Period⁶

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)	Buffer pool allocation ⁷ (tCO ₂ e)	VCUs eligible for issuance (tCO ₂ e)
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⁵ Note that all rest of calculations that were not related to the implementation of the C&C remain unchanged

⁶ The BCEFR value has been updated from 0.607 to 0.614 t dm m⁻³ following a review of species wood density classifications. This correction does not result in a material impact on project calculations.

⁷ The overall non-permanence risk for this period is 0.14.

ERR estimations - 1st Monitoring Period (Pre C&C)						
Year 1 (01-August-2020–31-July-2021)	382,383	-	35,796	112,780	17,420	95,360
Year 2 (01-August-2021–31-July-2022)	471,244	-	44,115	185,134	28,596	156,538
Total	853,626	-	79,911	773,715	119,508	654,207
Updated ERR estimations - 1st Monitoring Period (Post C&C)						
Year 1 (01-August-2020–31-July-2021)	124,428	-	11,648	112,780	17,420	95,360
Year 2 (01-August-2021–31-July-2022)	204,255	-	19,121	185,134	28,596	156,538
Total	328,683	-	30,769	297,913	46,016	251,898

Net GHG Emission Reductions and Removals by Calendar Year 1st Monitoring Period

Year	Baseline emissions or removals (<i>tCO₂e</i>)	Project emissions or removals (<i>tCO₂e</i>)	Leakage emissions (<i>tCO₂e</i>)	Net GHG emission reductions or removals (<i>tCO₂e</i>)	Buffer pool allocation ⁸ (<i>tCO₂e</i>)	VCUs eligible for issuance (<i>tCO₂e</i>)
ERR estimations - 1st Monitoring Period (Pre C&C)						
2020	160,286	-	15,005	145,281	22,440	122,841

⁸ The overall non-permanence risk for this period is 0.14.

2021	419,631	-	39,283	380,348	58,748	321,600
2022	273,709	-	25,623	248,086	38,319	209,766
Total	853,626	-	79,911	773,715	119,508	654,207
Updated ERR estimations - 1st Monitoring Period (Post C&C)						
2020	52,157	-	4,883	47,275	7,302	39,973
2021	157,890	-	14,781	143,109	22,105	121,004
2022	118,636	-	11,106	107,530	16,609	90,921
Total	328,683	-	30,769	297,913	46,016	251,898

All calculations are in Appendix 2 – Green Gold Loreto 1 ER Calculations Spreadsheet Y3Y4_V3.

Project description deviations (PDev) no longer applicable in future verifications

Project description deviation #1 from “GGL1 – VCS Monitoring Report 2022 – v4.2 v8 – July 2024 VF.pdf”, related to the recalculation of baseline, is no longer applicable for this or future monitoring periods to ensure conformance with the VM0010 Correction.

3.3 Grouped Projects

This is not a grouped project.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$V_{EX,j,i BSL}$
Data unit	$m^3 ha^{-1}$
Description	Mean volume of timber extracted for wood processing per unit area for species j in stratum i

Source of data	Forest inventory records of the project proponent
Value applied	15 m^3/ha
Justification of choice of data or description of measurement methods and procedures applied	All infrastructure areas are initially part of the area from which timber is extracted. This means that the commercial volume of 15 m^3/ha will be extracted from all areas that will subsequently be converted into roads, skid trails, log landings (decks) and port areas. Log volumes have been calculated for each harvestable tree on an area of 3000ha, using DBH and commercial stem height and applying Smalian's formula with a Form Factor of 0.65 (see Section 3.2.1: <i>Methodology deviation #1</i>)
Purpose of Data	Calculation of baseline emissions: calculation of carbon stocks in harvested timber.
Comments	No comments

Data / Parameter	$V_{EX,INF,j,i BSL}$
Data unit	$m^3 ha^{-1}$
Description	Mean volume of timber extracted for wood processing during the process of forestry infrastructure establishment per unit area for species j in stratum i
Source of data	Forest inventory records of the project proponent
Value applied	15 m^3/ha
Justification of choice of data or description of measurement methods and procedures applied	All infrastructure areas are initially part of the area from which timber is extracted. This means that the commercial volume of 15 m^3/ha will be extracted from all areas that will subsequently be converted into roads, skid trails, log landings (decks) and port areas. Log volumes have been calculated for each harvestable tree on an area of 3000ha, using DBH and commercial stem height and

	applying Smalian's formula with a Form Factor of 0.65 (see Section 3.2.1: <i>Methodology deviation #2</i>)
Purpose of Data	Calculation of baseline emissions: calculation of carbon stocks in harvested timber.
Comments	No comments

Data / Parameter	D_j
Data unit	$t \cdot dm \cdot m^{-3}$
Description	Basic wood density of species j
Source of data	Species specific wood densities from Peruvian data tables and literature (see Table 9, Section 3.4.4. of the PD).
Value applied	0.614 (volume-weighted average for all species inventoried in POA10)
Justification of choice of data or description of measurement methods and procedures applied	This is the most accurate and realistic approach to establishing the wood density of extracted timber Species-specific wood densities are presented in Table 9, Section 3.4.4. of the PD
Purpose of Data	Calculation of baseline emissions: calculation of carbon stocks in harvested timber.
Comments	No comments

Data / Parameter	CF_j
Data unit	$tC \cdot td \cdot m. -1$
Description	Carbon fraction of dry matter for species j
Source of data	IPCC default

Value applied	0.5
Justification of choice of data or description of measurement methods and procedures applied	No species-specific values could be found in literature. The large variety of species to be harvested in the baseline justifies the use of a default value.
Purpose of Data	• Calculation of baseline emissions • Calculation of project emissions
Comments	No comments

Data / Parameter	Logging Damage Factor (LDF)
Data unit	tC/m^3 extracted timber
Description	This factor determines the addition to the Dead Wood pool in the forest in m^3 for each m^3 of timber extracted, caused by harvesting. It combines dead wood from logging slash (stumps and crowns of harvested trees) and residual stand damage (biomass not in harvested trees killed by tree felling).
Source of data	Pearson et al (2014)
Value applied	1.134 tC/m^3
Justification of choice of data or description of measurement methods and procedures applied	Pearson et al (2014) introduce a complete accounting method for estimating emission factors from selective timber harvesting, which accounts separately for emissions from the extracted log, from incidental damage to the surrounding forest, and from logging infrastructure. Emissions are expressed as units of carbon per cubic meter of timber extracted to allow for simple application to timber harvesting statistics. They applied the method in six tropical countries (Belize, Bolivia, Brazil, Guyana, Indonesia, and Republic of Congo). Their results include statistically significant relationships between LDF and total aboveground biomass carbon stock (regression equation $y = -0.0039x + 1.7817$, $R_2 = 0.86$), and between LDF

	and extracted log length (regression equation $y = -0.0569x + 1.8388$, $R^2 = 0.98$). <i>LDF and total aboveground biomass carbon stock</i> Application of aboveground biomass carbon stock in Bosque de Colina Baja ACS_{0,i} (140tC/ha – see the data table below) to the regression equation results in an LDF of 1.236 <i>LDF and extracted log length</i> POA10 estimated the commercial height of over 15,000 standing trees to be harvested (i.e., excluding seed trees), which is the closest we can get to log length. The average commercial height was 14.17m. Application of this figure to the regression equation results in an LDF of 1.033 We have calculated the LDF to be applied in this project as the average of the two regression equation results, resulting in an LDF of 1.134
Purpose of Data	Calculation of baseline emissions: calculation of carbon stocks in the dead wood pool.
Comments	No comments

Data / Parameter	Logging Infrastructure Factor (LIF)
Data unit	tC/m^3 extracted timber
Description	This factor determines the addition to the Dead Wood pool in the forest in m^3 for each m^3 of timber extracted, caused by infrastructure establishment. It combines dead wood from road construction, skid trails, logging decks and ports. As all these areas will first have their commercial harvest extracted the LIF applies to the remaining biomass after logging.
Source of data	Pearson et al (2014)
Value applied	Calculated

Justification of choice of data or description of measurement methods and procedures applied

Pearson et al (2014) – see discussion above for LDF – also calculated LIFs for three sites, of which the site in Guyana is the most comparable with the project in terms of extracted timber volume ($13 \text{ m}^3/\text{ha}$ in Guyana compared to $15 \text{ m}^3/\text{ha}$ in the Green Gold Loreto 1 Project) and mean log length (16m in Guyana compared to 14.2m in this project). However, the Guyana site had a total aboveground forest carbon stock of 244tC/ha, compared with 140tC/ha for the project site (see above in LDF discussion).

The LIF is composed of a factor for skidding damage (SF), a factor for road construction damage (RF) and a damage factor for log deck areas (DF – this also includes camps and port areas). RF and DF quantify a complete removal of biomass, whereas SF quantifies damage from skid trails, which are often less destructive because they try to go around obstructing trees where possible.

For SF the damage level is likely to be more determined by extraction rate and size of the extracted logs than by forest carbon stocks. Since the former two factors are similar in the site we consider it justified to apply the SF of $0.17 \text{ tC}/\text{m}^3$ from Guyana to the project.

For the quantification of RF and DF we do not consider it justified to use the Guyana factor due to the difference in forest carbon stocks. So, we will add up all areas of road construction, log landings (decks), permanent camps and ports in the project area (A_{RF+DF}). We will then calculate the remaining forest carbon stock after extraction as follows:

$$C_{non-HARV,i} = ACS_{0,i} - C_{HARV,i|BSL} \quad (BL1)$$

Where:

$C_{non-HARV,i}$ = forest carbon stock not killed by harvesting in stratum i, in tC/ha

$ACS_{0,i}$ = forest carbon stock of unlogged forest in stratum i, in tC/ha

$C_{HARV,i|BSL}$ = carbon stock in biomass killed by harvesting in stratum i, in tC/ha

$C_{HARV,i|BSL}$ is calculated as follows:

$$C_{HARV,i|BSL} = V_{EX,i|BSL} * (LDF + SF)$$

(BL2)

Where:

$C_{HARV,i|BSL}$ = carbon stock in biomass killed by harvesting in stratum i, in tC/ha

$V_{EX,i|BSL}$ = Volume of extracted timber in stratum i, in m^3/ha

LDF = Logging Damage Factor, in tC/m^3 extracted

SF = Skidding Factor, in tC/m^3 extracted

$C_{non-HARV,i}$ is assumed to be completely killed. We then calculate a combined (RF+DF) as follows:

$$(RF + DF) = (A_{RF+DF} * C_{non-EX,i}) / (A_{EXpr} * V_{EX,I|BSL})$$

(BL3)

Where:

$(RF + DF)_i$ = Combined Road Factor and Deck Factor in stratum tC/m^3 , in tC/m^3 extracted timber

$A_{RF+DF,i}$ = Sum of areas of road construction, log landings (decks), permanent camps and ports in the project area, in stratum i, in ha.

$C_{non-HARV,i}$ = forest carbon stock not harvested in stratum i, in tC/ha

A_{EXpr} = Area of all land within the project area where timber extraction will take place, in ha

$V_{EX,I|BSL}$ = Volume of extracted timber in stratum i, in m^3/ha

The Logging Impact Factor is then calculated as:

$$LIF = SF + (RF + DF)_i$$

(BL4)

Where:

LIF = Logging Impact Factor, in tC/m^3 extracted

	SF = Skidding Factor, in tC/m^3 extracted $(RF + DF)_i$ = Combined Road Factor and Deck Factor in stratum tC/m^3, in tC/m^3 extracted timber The LIF is applied in Equation 5 (see Section 3.2.1 <i>Methodology deviations</i> – MDev#3)
Purpose of Data	Calculation of baseline emissions: calculation of carbon stocks in the dead wood pool.
Comments	No comments

Data / Parameter	$ACS_{0,i}$
Data unit	tC/ha
Description	Aboveground carbon stock in undisturbed forest in stratum i
Source of data	Literature
Value applied	140tC/ha for Bosque de Colina Baja/Bosque de Terraza Alta
Justification of choice of data or description of measurement methods and procedures applied	del Aguila-Pasquel et al (2013) measured 147tC/ha AGB (all sizes trees) in a 1-ha plot in the vicinity of the project area and on the same soil type. Asner et al (2014)'s Carbon density map for Peru indicates values between 120-150tC/ha for the project region. Here we will use 140tC/ha as a reasonable average (and conservative for the purpose of determining the LDF).
Purpose of Data	Calculation of baseline emissions: calculation of carbon stocks in the dead wood pool.
Comments	No comments

Data / Parameter	OF, PF, SLF, WW
Data unit	$Kg\ kg^{-1}$

Description	<i>OF</i> = Fraction of wood products that will be emitted to the atmosphere between 3 and 100 years after production; <i>PF</i> = Fraction of wood products that will store carbon permanently <i>SLF</i> = Fraction of wood products that would decay within 3 years of production, but that will be assumed to be emitted to the atmosphere immediately upon production; and <i>WW</i> = Fraction of extracted biomass effectively emitted to the atmosphere during production
Source of data	<i>OF</i>, <i>SLF</i> and <i>WW</i>: Project proponent's historical wood processing data <i>PF</i>: Winjum et al (1998)
Value applied	$OF * 0.86 = 45.86\%$ (86% of <i>OF</i> – Winjum et al (1998)) $PF * 0.14 = 7.47\%$ (14% of <i>OF</i> – Winjum et al (1998)) <i>SLF</i>: 0% <i>WW</i>: 46.67%
Justification of choice of data or description of measurement methods and procedures applied	These fractions apply the historical waste and recovery rates of the project proponent's wood processing practices.
Purpose of Data	Calculation of baseline emissions: calculation of carbon stocks sequestered in the wood products pool.
Comments	No comments

Data / Parameter	RGR_i
Data unit	$tC.ha^{-1}.yr^{-1}$
Description	Forest regrowth rate post timber harvest for stratum <i>i</i>
Source of data	Rutishauser et al (2015)

Value applied	1.02
Justification of choice of data or description of measurement methods and procedures applied	Rutishauser et al (2015) give the best (and only, to our knowledge) data on post-harvest tree carbon stock recovery for managed Amazonian forests. Comparing sites from the southwestern central and eastern Amazon they concluded that % loss of pre-harvest carbon stocks was a much better predictor of post-harvest recovery rate than geographic, climatic or edaphic variables, presenting the regression equation $t_{REC} = (100 * ACS_{loss}/ACS_0)^{1.106} (R^2 = 0.994)$ Where: t_{REC} = post-harvest recovery time of above-ground carbon stocks (trees with DBH>20 cm) ACS_{loss} = above-ground carbon stock lost through harvesting ACS_0 = pre-harvest above-ground carbon stock which we used to calculate a t_{REC} of 27.9 years from 28.4tC/ha ACS_{loss} and ACS_0 of 140tC/ha. This results in a RGR_i of $28.4/27.9 = 1.02tC/ha/yr$ Note that this conservatively assumes that areas of infrastructure (roads, log decks, etc) will regrow at the same rate as logged forest. This is not realistic, as these areas will have been completely cleared and their soils denuded, scraped and compacted. A significant portion of the infrastructure area will also be in use for a longer period than their year of establishment, e.g., primary roads and ports.
Purpose of Data	Calculation of baseline emissions: Change in carbon stocks due to forest regrowth after harvest
Comments	No comments

Data / Parameter	Ggi
Data unit	$g\ kg^{-1}$ dry matter burnt

Description	Emission factor for stratum i for gas g
Source of data	Defaults can be found in Volume 4, Chapter 2, of the IPCC 2006 Inventory Guidelines in table 2.5
Value applied	Default values
Justification of choice of data or description of measurement methods and procedures applied	Default values
Purpose of Data	Calculation of project emissions
Comments	Default values shall be updated whenever new guidelines are produced by the IPCC Fire disturbance has been unknown in this part of the Peruvian Amazon, due to the long rainy season and high annual precipitation. Even in a changing global climate this is not expected to change within the foreseeable future. Should any fire disturbance be monitored the project proponent can look up the most updated default value for this parameter.

Data / Parameter	$COMF_i$
Data unit	dimensionless
Description	Combustion factor for stratum i
Source of data	Defaults can be found in Volume 4, Chapter 2, of the IPCC 2006 Inventory Guidelines in table 2.6
Value applied	Default values
Justification of choice of data or description of measurement methods and procedures applied	Default values

Purpose of Data	Calculation of project emissions
Comments	Default values shall be updated whenever new guidelines are produced by the IPCC Fire disturbance has been unknown in this part of the Peruvian Amazon, due to the long rainy season and high annual precipitation. Even in a changing global climate this is not expected to change within the foreseeable future. Should any fire disturbance be monitored the project proponent can look up the most updated default value for this parameter.

Data / Parameter	$BCEF_R$
Data unit	$t.dm.m^{-3}$ (tonnes of dry matter per cubic meter)
Description	Biomass conversion and expansion factor applicable to volume of wood removals in the project area
Source of data	N/A
Value applied	0.614
Justification of choice of data or description of measurement methods and procedures applied	$BCEF_R$ is used for the purpose of calculating project emissions resulting from fire disturbance in Equation 34. VM0010 states that fire emissions attributable to the project are limited to the burning of the biomass portion that would have been removed in the baseline scenario, i.e., only the logs. It logically follows that $BCEF_R$ is used to calculate extracted log biomass from its volume. Thus, $BCEF_R$ is equivalent to wood density D.
Purpose of Data	Calculation of project emissions
Comments	No comments

Data / Parameter	$BCEF$
Data unit	tC/m^3 (tonnes of dry matter per cubic meter)

Description	Biomass carbon conversion and expansion factor applicable to volume of all trees > 10 cm DBH in carbon stock permanent sampling plots
Source of data	Goodman et al (2019)
Value applied	0.986
Justification of choice of data or description of measurement methods and procedures applied	BCEF is used for the purpose of calculating sample plot tree carbon stocks in Equation 29, together with the calculation of tree stem volume using Smalian's formula and a Form Factor of 0.65 (SERFOR, 2016). This replaces the allometric equation $fj(X, Y \dots)$. The result of this calculation will be used to recalibrate the model used to produce the carbon stock maps from remotely-sensed data if the map shows too high an error with the new plot measurements. Goodman et al (2019) report as one of their results that the relative portions of crop tree residuals and log carbon stocks are 65:40. This ratio can be used to calculate the carbon stock of crop tree residuals from the per-hectare carbon stock in extracted logs. When this is divided by the extracted volume per ha this gives the crop tree residual carbon stocks per m^3 harvested. The total crop tree (or measured tree in sample plots) carbon stock per m^3, i.e., the BCEF, can then be calculated by adding the wood density. While the above calculation method is specific to larger crop trees, and not to all trees to be measured, we consider it to be conservative, because larger trees will have a lower BCEF than smaller trees. It will therefore result in an underestimation of biomass carbon accumulation in the project scenario.
Purpose of Data	Calculation of project emissions
Comments	No comments

Data / Parameter	PML_{FT}
Data unit	%

Description	mean merchantable biomass as a proportion of total aboveground tree biomass for each forest type
Source of data	Merchantable biomass: 9.2 t/ha; source: 15 m^3 extraction rate multiplied by the weighted average wood density (see also data table for WD in PD). Total aboveground tree biomass: 280 t/ha; source: assumption based on Peruvian carbon map (Asner et al, 2014) – see also data table for $ACS_{0,i}$
Value applied	0.033
Justification of choice of data or description of measurement methods and procedures applied	The project has a single stratum, consisting of Bosque de Colina Baja/Bosque de Terraza Alta (these two forest types are indistinguishable in terms of tree species composition and biomass and are lumped together in the GGF forest inventory).
Purpose of Data	Calculation of project emissions
Comments	No comments

Data / Parameter	<i>FC (harvest,hauling,barging,processing)</i>
Data unit	L/m ³
Description	Fuel Consumption (each for harvesting operations, haulage to port, barging to the sawmill in Iquitos and generating electricity for the sawmill)
Source of data	GGF company records
Value applied	$FC_{Harvest} = 7.0 \text{ L/m}^3$ $FC_{Roads} = 2.4 \text{ L/m}^3$ $FC_{Hauling} = 5.3 \text{ L/m}^3$ $FC_{Barging} = 8.5 \text{ L/m}^3$ $FC_{Processing} = 7.4 \text{ L/m}^3$
Justification of choice of data or description of	These fuel consumption data are highly project specific and verifiable.

measurement methods and procedures applied	
Purpose of Data	Calculation of baseline emissions: Calculation of baseline emissions from the combustion of fossil fuels in forestry and wood processing
Comments	FC_{Roads} is the fuel consumption for road establishment and maintenance (this includes log landings). GGF has been keeping records for this category and we will include this in the harvesting fuel consumption as this is part of forestry operations. The project will also monitor fuel consumption for any road maintenance in the project scenario. FC_{Hauling} and FC_{Barging} replace the calculations of fuel consumption from log transport in Equations 16, 17 and 18, because these offer an indirect way of calculating fuel consumption, whereas this information is available directly. Also, for FC_{Barging} these equations are not applicable because log transport is done by river barges and fuel consumption and thus emissions are variable depending on river water level (if it is low the trip becomes considerably longer!). FC_{Processing} is the fuel consumption recorded for the diesel generator in GGF's sawmill. This is the sole source of power to the sawmill.

Data / Parameter	EF _{Fuel}
Data unit	gCO ₂ e/l
Description	Emission Factor for diesel
Source of data	IPCC, 2006, Volume 2, Chapter 3, Section 3.3.1, Table 3.3.1, p. 3.36
Value applied	2,660.56
Justification of choice of data or description of	VM0010 stipulates that the IPCC default factor must be used.

measurement methods and procedures applied	
Purpose of Data	Calculation of baseline emissions: Calculation of baseline emissions from the combustion of fossil fuels in forestry and wood processing
Comments	No comment.

Data / Parameter	$A_{1,i,p}$
Data unit	Ha
Description	The area of stratum i in land parcel p that was harvested 1 year ago
Source of data	Geodetic coordinates, GIS Files or legal parcel records
Value applied	Calculated in the project's calculation workbook (Appendix 2)
Justification of choice of data or description of measurement methods and procedures applied	The data is provided by planned forestry infrastructure for baseline forest management, which provides the areas that would have been logged based on a 20-year rotation and that divides each project region into 20 land parcels of similar size. See section 3.3 of the PD and the Appendix 2 of this Monitoring Report.
Purpose of data	Calculation of baseline emissions
Comments	No comments

Data / Parameter	$A_{2-10,i,p}$
Data unit	Ha
Description	The area of stratum i in land parcel p that was harvested between 2 and 10 years ago
Source of data	Geodetic coordinates, GIS Files or legal parcel records
Value applied	Calculated in the project's calculation workbook (Appendix 2)

Justification of choice of data or description of measurement methods and procedures applied	The data is provided by planned forestry infrastructure for baseline forest management, which provides the areas that would have been logged based on a 20-year rotation and that divides each project region into 20 land parcels of similar size. See section 3.3 of the PD and the Appendix 2 of this Monitoring Report.
Purpose of data	Calculation of baseline emissions
Comments	No comments

Data / Parameter	$A_{11-20,i,p}$
Data unit	Ha
Description	The area of stratum i in land parcel p that was harvested between 11 and 20 years ago
Source of data	Geodetic coordinates, GIS Files or legal parcel records
Value applied	Calculated in the project's calculation workbook (Appendix 2)
Justification of choice of data or description of measurement methods and procedures applied	The data is provided by planned forestry infrastructure for baseline forest management, which provides the areas that would have been logged based on a 20-year rotation and that divides each project region into 20 land parcels of similar size. See section 3.3 of the PD and the Appendix 2 of this Monitoring Report.
Purpose of data	Calculation of baseline emissions
Comments	No comments

Data / Parameter	$A_{t+,i}$
Data unit	Ha
Description	Cumulative area harvested until in the stratum I at time t*
Source of data	Geodetic coordinates, GIS Files or legal parcel records
Value applied	Calculated in the project's calculation workbook (Appendix 2)
Justification of choice of data or description of measurement methods and procedures applied	The data is provided by planned forestry infrastructure for baseline forest management, which provides the areas that would have been logged based on a 20-year rotation and that divides each

	project region into 20 land parcels of similar size. See section 3.3 of the PD and the Appendix 2 of this Monitoring Report.
Purpose of data	Calculation of baseline emissions
Comments	No comments

4.2 Data and Parameters Monitored

Data / Parameter	$\Delta C_{AB,t PRJ-Gross}$
Data unit	tCO_2e/yr
Description	Sum of carbon stock changes observed by comparing the carbon stock values of all pixels within the project boundary on the carbon stock map from one monitoring campaign with their equivalent pixels on the carbon stock map from the previous monitoring campaign.
Source of data	Carbon stock maps from remote sensing data.
Description of measurement methods and procedures to be applied	To estimate above-ground biomass (AGB) across the Green Gold Forestry (GGF) Peru Project Area of Interest (AOI), a multi-step remote sensing approach was applied using both satellite and field data. First, a canopy height map dated 31 July 2022 was generated using thousands of LiDAR footprints from NASA's GEDI (Global Ecosystem Dynamics Investigation) sensor. GEDI, hosted on the International Space Station, provides globally distributed, high-resolution laser ranging observations that offer a strong correlation between tree height and biomass in tropical forests. Due to the spatial sparsity of GEDI observations, a predictive model was developed by correlating GEDI-derived canopy height data with wall-to-wall mosaics created from multiple satellite sensors. These included Sentinel-1 C-band Synthetic Aperture Radar (SAR), ALOS-2 PALSAR-2 L-band SAR, and Sentinel-2 optical imagery. This integration enabled the creation of a per-pixel forest canopy height map at 25 m x 25 m resolution across the entire AOI. The canopy height map was then converted into a wall-to-wall AGB map using a field-derived allometric model (Equation 4), which relates canopy height to biomass. For 2024, a new AGB map was produced by updating the 2022 height map. As GEDI data was unavailable during most of the intervening period—due to the sensor being offline from March 2023 to June

	2024—the updated map incorporated field plot remeasurements from 2024 alongside Sentinel-1 SAR data collected between August 2022 and July 2024. The SAR data, captured every 12 days, was used to detect changes in canopy height and structure, allowing the 2022 canopy height map to be adjusted accordingly to reflect forest growth or loss. The updated canopy height data for 2024 was then processed using the same height-to-biomass model to produce the 2024 AGB map. Finally, statistical analysis was conducted to compute total AGB stock, mean AGB density, and changes in these metrics between 2022 and 2024 for each of the three project sites. To ensure consistency with forest definitions under Peruvian environmental standards, only pixels with canopy heights greater than 5 meters were included in the calculations. The masked areas used for the calculations differ slightly between years due to pixels crossing the height threshold over time.
Frequency of monitoring/recording	Every 2 years after the project start date
Value monitored	See Section 5.2
Monitoring equipment	Satellite imagery, GIS
QA/QC procedures to be applied	Quality control / quality assurance (QA/QC) procedures for image processing and data handling will be applied in SOPs.
Purpose of data	Calculation of project emissions
Calculation method	$\Delta C_{AB,t PRJ-Gross} = \sum (\Delta C_{AB,pixel1} + \Delta C_{AB,pixel2} + \Delta C_{AB,pixel3} + \dots)$
Comments	No comment.
Data / Parameter	Illegal Logging PRA Results
Data unit	Dimensionless

Description	Assessment of whether illegal logging is a risk within the project boundary and whether an on-the-ground survey must be triggered
Source of data	PRA
Description of measurement methods and procedures to be applied	See Appendix 5 (PRA results)
Frequency of monitoring/recording	Every two years
Value applied	9.47% of those interviewed reported using timber from the project area. According to the data in the 'Illegal Logging PRA Results' table in section 9.2 of the methodology, if “<i>≥10% of those interviewed/surveyed believe that illegal logging may be occurring within the project boundary, then the limited on-the-ground illegal logging survey must be triggered</i>”. As the percentage of those interviewed that actually use timber from inside the project area is below that threshold, then the PRA concludes that there is no potential pressure for anthropogenic activities within the area of the project and illegal logging can be assumed to be zero and no monitoring is needed.
Monitoring equipment	Community surveys in the communities
QA/QC procedures to be applied	PRA results will be kept in paper (if relevant) and digital format in the project office for the duration of the project and will be available at verification events.
Purpose of data	Calculation of project emissions
Calculation method	Interviews and participatory maps
Comments	No comments

Data / Parameter	$A_{burn,i,t}$
Data unit	Hectare
Description	Area burnt in stratum i at time t
Source of data	GPS coordinates and Remote Sensing data
Description of measurement methods and procedures to be applied	Disturbance will be observed by comparing biomass maps between monitoring events and delineating areas of at minimum one hectare where a biomass reduction above 5tC is observed since the last monitoring event. Sites of disturbance observed on satellite imagery or during field patrols will be visited, the nature of the disturbance will be determined, and the boundaries of the burnt area will be verified by GPS. See Section 5.3: <i>Monitoring Plan</i> for more detail. When there is disturbed area within the buffer created by PRA results that is unsurveyed, they will be conservatively classed as $A_{burn,i,t}$ as stated in section 5.3.7 of the PD.
Frequency of monitoring/recording	Areas disturbed will be monitored in accordance with the monitoring and reporting schedule.
Value applied	2,246.69 ha.
Monitoring equipment	Satellite imagery and GPS
QA/QC procedures to be applied	Quality control / quality assurance (<i>QA/QC</i>) procedures for image processing and data handling, as well as for field verification visits will be set out in SOPs.
Purpose of data	Calculation of project emissions
Calculation method	N/A
Comments	No comment

Data / Parameter	$A_{dist,i,t}$
Data unit	Hectare
Description	Area disturbed (non-fire) in stratum i at time t
Source of data	GPS coordinates and/or Remote Sensing data
Description of measurement methods and procedures to be applied	Disturbance will be observed by comparing biomass maps between monitoring events and delineating areas of at minimum one hectare where a biomass reduction above 5tC is observed since the last monitoring event. Sites of disturbance observed on satellite imagery or during field patrols will be visited, the nature of the disturbance will be determined, and the boundaries of the area will be verified by GPS.
Frequency of monitoring/recording	Areas disturbed will be monitored in accordance with the monitoring and reporting schedule.
Value applied	41.79 ha
Monitoring equipment	Satellite imagery and GPS
QA/QC procedures to be applied	Quality control / quality assurance (<i>QA/QC</i>) procedures for image processing and data handling, as well as for field verification visits will be set out in SOPs.
Purpose of data	Calculation of project emissions
Calculation method	N/A
Comments	No comment.

Data / Parameter	$A_{DIST_IL,i}$
Data unit	Hectare

Description	Area potentially impacted by illegal logging in stratum i
Source of data	GPS coordinates and/or Remote Sensing data
Description of measurement methods and procedures to be applied	The PRA concludes that there is no potential pressure for illegal logging within the area of the project as only 9.47% of people interviewed use timber from the project area. This is below the 10% threshold stated in the table of the parameter "Illegal Logging PRA Results" in section 9.2 of the methodology.
Frequency of monitoring/recording	Areas disturbed by illegal logging will be monitored in accordance with the monitoring and reporting schedule.
Value applied	0 ha
Monitoring equipment	Satellite imagery and GPS
QA/QC procedures to be applied	Quality control / quality assurance (<i>QA/QC</i>) procedures for image processing and data handling, as well as for field verification visits will be set out in SOPs.
Purpose of data	This parameter is not used for the calculation of project emissions, as these are directly observed in the ΔC from comparing carbon stock maps. GGF knows the location and size of areas affected in order to formulate appropriate response strategies.
Calculation method	N/A
Comments	No comment.

Data / Parameter	A_{plot}
Data unit	Hectare
Description	Total area of carbon stock sample plots
Source of data	Ground measurement

Description of measurement methods and procedures to be applied	Around 30 0.5 ha permanent sample plots have been established at project start and remeasured in Year 2 after project start, according to the RAINFOR/ForestPlot.net methodology (Phillips et al, 2018). The number of 30 plots is recommended by Space Intelligence Ltd. as being sufficient to calibrate their model to produce carbon stock maps, considering the homogenous vegetation type covering the project area. They are randomly spaced throughout the project area, but within 1 km of a road or navigable river for accessibility.
Frequency of monitoring/recording	Plots were established at project start and remeasured in Year 2. After that the measuring frequency will be every 4 years.
Value applied	N/A
Monitoring equipment	Field measurement equipment (e.g., measuring tapes) to be specified in field measurement SOP.
QA/QC procedures to be applied	Standard quality control / quality assurance (QA/QC) procedures for forest inventory including field data collection and data management shall be applied. Use or adaptation of QA/QCs already applied in national forest monitoring, or available from published handbooks, or from the IPCC GPG LULUCF 2003, is recommended.
Purpose of data	Calculation of project emissions
Calculation method	According to the RAINFOR/ForestPlot.net methodology (Phillips et al, 2018).
Comments	28 out of the 30 installed permanent monitoring plots were remeasured and were used to calibrate the carbon stocks maps.

Data / Parameter	<i>DBH</i>
Data unit	Cm
Description	Diameter at Breast Height

Source of data	Field measurement in sample plots
Description of measurement methods and procedures to be applied	According to the RAINFOR/ForestPlot.net methodology (Phillips et al, 2018). DBH is used for the purpose of calculating sample plot tree carbon stocks using local or regional allometric equations which relate stem biomass to stem diameter and height. The result of this calculation is used to recalibrate the model used to produce the carbon stock maps from remotely sensed data if the map shows too high an error with the new plot measurements.
Frequency of monitoring/recording	Plots were established at project start and remeasured in Year 2. After that the measuring frequency will be every 4 years.
Value applied	N/A
Monitoring equipment	Field measurement equipment (e.g., measuring tapes) to be specified in field measurement SOP.
QA/QC procedures to be applied	Standard quality control / quality assurance (QA/QC) procedures for forest inventory including field data collection and data management shall be applied. Use or adaptation of QA/QCs already applied in national forest monitoring, or available from published handbooks, or from the IPCC GPG LULUCF 2003, is recommended.
Purpose of data	Calculation of project emissions
Calculation method	According to the RAINFOR/ForestPlot.net methodology (Phillips et al, 2018).
Comments	
Data / Parameter	H_{Stem}
Data unit	M

Description	Stem Height of tree stems >10cm DBH in carbon stock permanent sample plots
Source of data	Ground measurement/estimation
Description of measurement methods and procedures to be applied	According to the RAINFOR/ForestPlot.net methodology (Phillips et al, 2018). H_{stem} is used for the purpose of calculating sample plot tree carbon stocks using local or regional allometric equations which relate stem biomass to stem diameter and height. The result of this calculation is used to recalibrate the model used to produce the carbon stock maps from remotely sensed data if the map shows too high an error with the new plot measurements.
Frequency of monitoring/recording	Plots were established at project start and remeasured in Year 2. After that the measuring frequency will be every 4 years.
Value applied	N/A
Monitoring equipment	Field measurement equipment (e.g., measuring tapes) to be specified in field measurement SOP.
QA/QC procedures to be applied	Standard quality control / quality assurance (QA/QC) procedures for forest inventory including field data collection and data management shall be applied. Use or adaptation of QA/QCs already applied in national forest monitoring, or available from published handbooks, or from the IPCC GPG LULUCF 2003, is recommended.
Purpose of data	Calculation of project emissions
Calculation method	According to the RAINFOR/ForestPlot.net methodology (Phillips et al, 2018).
Comments	

Data / Parameter	PMP_i
Data unit	%
Description	Merchantable biomass as a proportion of total aboveground tree biomass for stratum i within the project boundaries
Source of data	Census data from GGF forest concessions, Biomass maps
Description of measurement methods and procedures to be applied	The project has a single stratum, consisting of Bosque de Colina Baja/Bosque de Terraza Alta (these two forest types are indistinguishable in terms of tree species composition and biomass and are lumped together in the GGF forest inventory)
Frequency of monitoring/recording	Every 2 years
Value applied	Merchantable biomass: 9.2 t/ha; source: 15 m3 extraction rate multiplied by the weighted average wood density which is 0.614 (see also data table for WD in PDD). Total aboveground tree biomass: 299 t/ha; source: data from carbon maps elaborated by Space Intelligence. It is the average of ABG biomass of the permanent plots remeasured during the monitoring period Final value: $9.2/299=0.031$
Monitoring equipment	Field equipment to collect census data (GPS, tape diameter, others), satellite images
QA/QC procedures to be applied	Standard quality control / quality assurance (QA/QC) procedures for forest inventory including field data collection and data management shall be applied. Use or adaptation of QA/QCs already applied in national forest monitoring, or available from published handbooks, or from the IPCC GPG LULUCF 2003, is recommended.
Purpose of data	Calculation of project emissions
Calculation method	Given that the project is accounting for the option sequestration due to ongoing growth in the project scenario, the total aboveground tree biomass was calculated from carbon stock maps, which use the measured aboveground tree carbon stock in sample plots directly as input for that model. For additional details

	regarding the carbon stock maps, please refer to section 4.3.4.5 in this document.
Comments	No comment.

4.3 Monitoring Plan

4.3.1 Overview of the monitoring process:

Monitoring campaigns were organized and overseen by GGF's COO and Monitoring Specialist. Remote sensing work was carried out by Space Intelligence Ltd. (www.space-intelligence.com), based in Edinburgh, UK. Ground surveys were conducted by forest custodians with the help of supporting staff and community surveys were conducted by the community relationships team with the support of the forest custodians

Field plot re-measurements were conducted by trained forest engineers and/or ecologists.

The process starts with the community surveys, which help assess the risk of illegal logging and other illegal incursions into the project area, and community feedback on the implementation of project activities with the communities and/or in communal areas. The next component is remote sensing, which may detect areas of natural and/or anthropogenic disturbance that may require a field survey. Following on from that are the field surveys that confirm disturbances observed by remote sensing or informed by the community surveys.

In between monitoring campaigns data was gathered from regular and irregular patrols, access point lookouts, field surveys, observations by visiting scientists, community visits and drone flights. This information is also used in the monitoring campaigns to assess areas of natural or anthropogenic disturbance.

4.3.2 Scope:

Monitoring is required to:

- Confirm project activity; and
- Determine changes in forest carbon stocks and greenhouse gas emissions from disturbances.

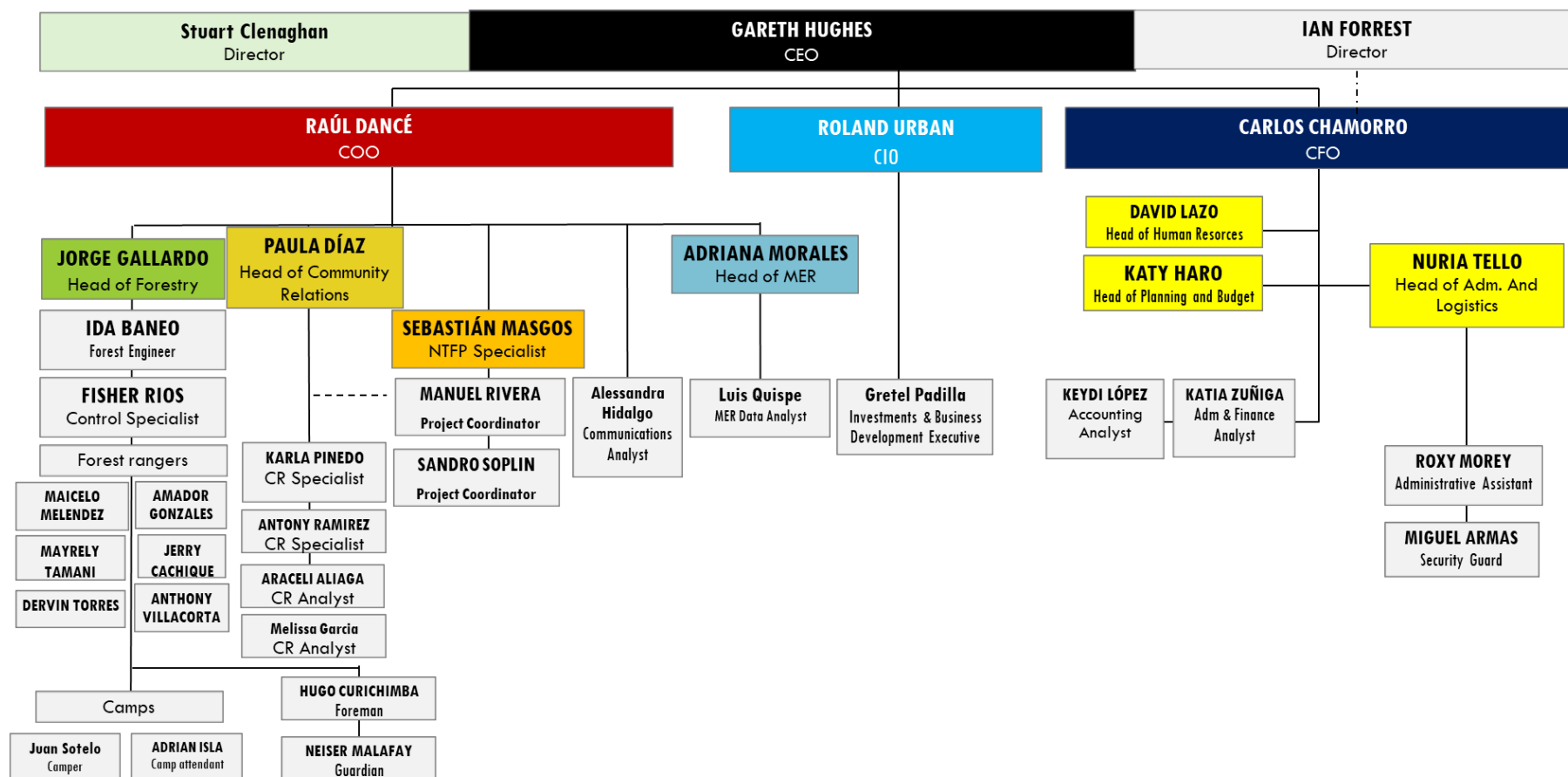
4.3.3 Organizational structure:

Position	Area	Responsibilities and competencies in relation to the monitoring activities
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Chief Executive Officer Management (CEO)		Supervise the implementation of monitoring activities in accordance with the project design.
		Coordinate with Space Intelligence on the progress of satellite monitoring and the data to be monitored.
Chief Operating Officer Management (COO)		Supervise the implementation of monitoring activities in accordance with the project design.
		Coordinate with Space Intelligence on the progress of satellite monitoring and the data to be monitored.
Head of Forestry Area	Forestry Area	Supervise the implementation of monitoring activities in accordance with the project design.
Head of Monitoring, Evaluation and Report	Monitoring, Evaluation, Report and Institutional Image	Report the activities carried out by the forestry and community relations areas to the corresponding institutions.
		Coordinate with Space Intelligence on the progress of satellite monitoring and the data to be monitored.
Head of Community Relations	Community Relations Area	Support the forestry area with the coordination and integration of the beneficiary communities to the project's activity
Forestry specialist	Forestry Area	Support the forest custodians' monitoring activities
Community Relations specialist	Community Relations Area	Support the forestry area with the coordination and integration of the beneficiary communities to the project's activity
Forest custodians	Forestry Area	- Implement monitoring activities such as forest monitoring, territory delimitation and communication with communities.

- Upon notification of a change in forest cover and/or detection of an anomaly, verify and analyze whether an illegal activity has taken place.

GGF organisation chart



4.3.4 Monitoring activities:

4.3.4.1. Remote sensing:

Remote sensing and satellite imagery are the primary tools used to assess changes in forest carbon, and this was conducted primarily by Space Intelligence. Additionally, it is used to identify areas of disturbance and illegal logging, using the biomass and deforestation reports.

As part of an ongoing improvement of GGFs monitoring activities, a Early Detection Alert (EDA) protocol was elaborated and implemented. The team use this tool to analyse loss of forest cover due to natural and anthropogenic to complement the analysis made by SI and to guide the interventions and activities done in the field.

4.3.4.2. Ground Surveys and Observations:

Additional GGF forest custodians were recruited and certified in July 2023. Since then, the forest custodians have made 9 entries to the GGF concessions and beneficiary communities, of which 7 have carried out fluvial and 2 field monitoring activities. In addition, since the last quarter of 2022, the Forestry team adopted early deforestation warnings (AD-T in Spanish) as another source for detecting deforestation within the project zone.

- Identification of access-points: Using georeferenced data and the information from the PRA, the team identified different access points to the concessions. With that information, the forest custodians visited the routes and evaluated their state.
- Routine fluvial monitoring: GGF forest custodians conducted routine fluvial monitoring to monitor the state of the concession. In each of these trips, using GPS to track the routes, the team logged any observations (location, description, pictures) of disturbances. Also, GGF custodians placed banners to indicate where the concession area starts to outsiders.
- Routine field monitoring: This type of monitoring was made using identified field access routes like existing roads. The team also used fluvial routes to monitor areas deep in the forest.

4.3.4.3. Community surveys:

At second semester of 2024, the forest custodians collected information from communities through the resource mapping methodology. By doing so, GGF identified the communities' use of land, the allocation of their resources and some land overlapping with the concessions. The results and a more in-depth description of the methodology used is explained in section 5 and in Appendix 4 of this MR.

4.3.4.4. Field Plot Measurements:

Using a protocol made by Space Intelligence based on the RAINFOR/ForestPlot.net methodology and following what was explained in section 5.3.6. of GGF VCS PD, the recalculation of the measurements of the installed Permanent Monitoring Plots (PMP) was conducted.

The reassessment was carried out in 28 of the 30 initially planned. In 2 plots in the San Regis sector, it was not possible to carry out the reassessments due to climatic factors and the dry season in the sector,

in addition to not having found sources of water suitable for human consumption, because the streams and rivulets were dry or not suitable for consumption.

The information collected was used to calibrate the carbon stocks maps that were used for GHG calculation and disturbance analysis.

4.3.4.1 Determining changes in forest carbon stocks and greenhouse gas emissions from disturbance measurements:

Step 0. During the second semester of 2024, GGF conducted the Participatory Rural Approach (PRA) in 17 partner communities, utilizing resource mapping and surveys. Resource mapping involved leaders and members from each community identifying fields, ravines, and locations where they gather fruits, hunt, or extract timber on white and black maps. It's worth noting that the maps intentionally did not specify the project area's boundaries to prevent potential bias in reporting activities within the project area. The results revealed that out of the 17 communities, only 2 reported timber extraction within the project area.

Regarding the surveys, a total of 243 families were interviewed across 17 communities. The sampling method employed was probabilistic, entailing the random selection of respondents within each community and population center. The sample size varied depending on the number of families residing in each area. The survey results indicated that 65% of the surveyed families engaged in timber extraction. However, there was no specific question about the exact location of this extraction. Consequently, data from both tools were combined.

According to the "Illegal Logging PRA Results" parameter in section 9.2 of the methodology, if 10% or fewer of the interviews suggest timber extraction within the project area, the PRA may conclude that there is minimal potential pressure for illegal logging, and the incidence of illegal logging can be assumed to be negligible, thus requiring no further monitoring. The PRA results demonstrated that out of the 156 individuals involved in timber extraction, only 23 were from the community identified in the resource mapping as conducting this activity within the project area. This accounts for 9.47% of the total survey respondents. Therefore, illegal logging is assumed to be 0. Please also refer to Appendix 5: PRA Results for additional details.

Where timber extraction happens?	# Surveys	% Surveys
Within GGL1	23	9.47%
Within the concession but outside of GGL1	46	18.93%
Within community territory	87	35.8%
No extraction	87	35.8%
Grand Total	243	100.00%

Step 1. Space Intelligence Ltd. produced a carbon stock map of the project area using space- borne LiDAR samples (25m diameter circles, 0.05 ha) collected during the 24 months of monitoring period. The LiDAR footprints were run through a model that has been trained (using machine learning approaches) using other satellite imagery and field plots from within and outside the project area to create a canopy height map, which is then converted to a carbon stock map using an allometric equation.

Step 2. Run a pixel-by-pixel comparison to determine ΔC between the new carbon stock map and the one from the previous monitoring campaign (2 years previous). In this first monitoring campaign (2020 - 2022) two carbon stock maps were made using the same model: one using imagery from the start date of the project activity (2020) and one using imagery from the monitoring date (2022). Using the timber harvest plan, the areas that would have been harvested in the baseline scenario up until the monitoring date were delineated.

Step 3. Within the parcels p that would have been harvested in the baseline scenario up until the monitoring date, areas where more than 6 25x25m pixels in any grid of 16x16 pixels have lost the equivalent of 5tC/ha or more were detected. These were areas where either a natural (fire, windfall) or anthropogenic disturbance may have occurred (intense felling, conversion). In other words, there were areas where a significant reduction in carbon stocks (>5tC/ha) can be observed. To detect such areas, the 16x16 pixel moving grid was used (pixel size is 25x25m, so the grid covers 160.000 m²).

Step 4. Detect areas within the entire project area that are within $D_{DIST_IL,i}$ distance from access routes (roads and navigable rivers) and where within any grid of 16x16 pixels more than 6 pixels show a negative ΔC greater than 5tC.

Using the results from the PRA, it was found that only 9.47% of interviewees use timber from the project area. They do not sell it but use it for their own consumption (like to fix their boats or houses). Therefore, the PRA concludes that no potential pressure for these activities and illegal logging ($\Delta CDIST_IL,i,t|PRJ$) can be assumed to be zero and no monitoring is needed

By combining remote sensing data with on-field monitoring results, the project was able to analyze disturbances within the project area. This analysis confirmed that no significant disturbances occurred during the monitoring period (see Section 5.2 of the Project Description).

4.3.5 Monitoring of project activity implementation:

Theme	Activity (PD)	Implementation Status
Conservation	Patrolling of the project area by boat and on land (e.g., on already established logging roads) to prevent and detect illegal incursions	The forest custodians conducted 9 entries to the GGF concessions and beneficiary communities.

	Patrolling of the project area using drones to detect illegal incursions	GGF is in the process of incorporating drones to their surveillance protocols.
	Permanent observation points at key access points to detect and record any entries and exits from the project area	Using the results of the resource mapping, the forest custodians have undertaken entry point reconnaissance.
	Establishment of informative boundary boards at key access points to prevent illegal incursions	40 Boundary markers were installed in buffer zones between the forest concessions and community
	Visits to potential incursion sites to request the trespassers' departure	Since the forest custodians began their activities at the beginning of 2022, no trespassers were reported.
Community outreach activities	Fruit growing and fruit collection enterprises	During the monitoring period, GGF has been working on strengthen community's governance. This fundamental to stablish community enterprises that grow in an institutionalized environment. The approach is that by strengthening governance in the communities, community enterprises will have a solid foundation and will be able, over time, to grow and sustain themselves.
	Other community-based projects the VCS project may support	By the end of the monitoring period, GGF has developed the initial infrastructure for 6 productive projects in 5 allied native communities.
	Regular meetings to discuss project activities; the importance of conservation, biodiversity, and ecosystem services; potential grievances and conflicts and how these will be addressed	GGF is constantly communicating its activities to the communities whether that is through participating in local reunions or talking directly to their local authority, the Apu. Additionally, GGF has been implementing environmental education workshops, primarily to the children of the communities. Finally, when potential grievances and conflicts have arisen, meetings were held in Iquitos and in their communities.

Eco-scientific tourism and research	Field excursions	During the monitoring period, GGF have received multiple visits. Among the visitors are Conservation International and Oxford SDG Lab
	Hospitality services to visitors	During the visits, boat rental services were taken as well as the purchase of local products.

4.3.6 Data archiving:

All data collected as part of monitoring is being archived electronically and will be kept at least for 2 years after the end of the project crediting period. All measurements are being conducted according to relevant standards. Data archiving will take both electronic and paper forms.

The archives include:

- Copies of all original field measurement data, laboratory data, data analysis spreadsheets.
- Estimates of the carbon stock changes in all pools and non – CO₂ GHG and corresponding calculation spreadsheets.
- GIS products; and
- Copies of the measuring and monitoring reports.

4.3.7 Data archiving:

Monitoring related QA/QC requirements are being documented in a series of Standard Operating Procedures (SOPs) which are mostly summarized in section 4.2 Data and Parameters Monitored. It is important to add that the forest custodians' patrols have been conducted following required QA/QC. These SOPs will be available at the first Project Verification.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The baseline emissions calculated in this MR include:

1. Emissions from wood product conversion
2. Decomposition of deadwood from harvested trees
3. Emissions from wood product retirement

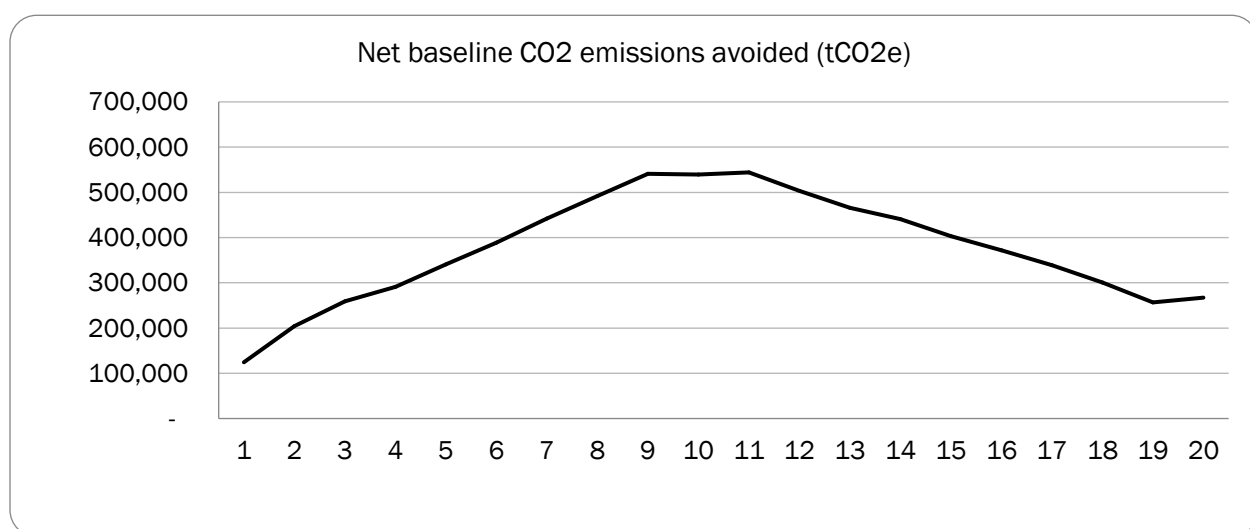
4. Stock change due to regrowth following timber harvest
5. Decomposition of trees incidentally killed during tree felling
6. Decomposition of trees killed through skid trail creation
7. Decomposition of trees killed through road construction

As per VM0010, the following baseline emissions have been conservatively excluded from calculations:

1. Emissions through subsequent forest re-entry

The project is following the common practice data pathway, as concluded in Section 3.4 of GGF VCS PD.

The total of baseline CO_2 emissions avoided are the following. It is important to note that during the second monitoring period, the baseline had to be recalculated (see project description deviation #7 of this MR and/or Appendix 2 to see the results).



5.1.1 Calculation of carbon stocks in commercial timber volumes⁹

For the calculation of carbon stock in commercial timber volumes GGF has established a Timber Harvesting Schedule as per VM0010 and based on its own logging practices. The Timber Harvesting Schedule allows for the calculation of:

- 1) The mean extracted volume of extracted merchantable timber per unit area by species in each stratum in each year ($V_{EX,j,i|BSL}$ – Equation 4 of VM0010).

⁹ See also GGF VCS PD.

There is no legal maximum extraction rate in Peru, but there is a legal minimum DBH established for the main commercial tree species. However, GGF has internally mandated its own minimum DBH for these species, which is on average 18% higher than the legal minimum (see Table 10,

Based on POA10, its most complete forest inventory in terms of species included¹⁰, which applies its internal minimum DBH list, GGF could take out a volume of $16.3m^3/ha$ ¹¹. In its business plan and investment memorandum for the expansion and optimisation of its logging business in its ambition to make it profitable while maintaining sustainability the company aimed for an average extraction rate of $15m^3/ha$, which is what will be used for baseline modelling. Note this is a conservative extraction rate relative to the legally allowed extraction volume. This extraction rate is in line with the common practise for logging companies with a similar business model in the Amazon basin.

- 2) All infrastructure areas are initially part of the area from which timber is extracted. This means that the commercial volume of $15m^3/ha$ will be extracted from all areas that will subsequently be converted into roads, skid trails, log landings (decks) and port areas. In Equation 4, $V_{EX,j,i|BSL}$ thus includes $V_{EX,INF,j,i|BSL}$.

After commercial harvest, all remaining above ground biomass on areas of infrastructure establishment will be converted into dead wood. However, this addition to the dead wood pool in the forest is calculated as a Logging Impact Factor per cubic meter of timber extracted.

Calculation of the carbon stock of timber harvested

Calculation of the carbon stock of timber harvested is done in the GGF Loreto 1 baseline emissions calculation spreadsheet, applying Equation 4 of VM0010.

$$C_{EX,i,j|BSL} = V_{EX,j,i|BSL} * D_j * CF_j \quad (4)$$

The parameters used in this equation are:

- Mean volume of extracted timber per unit area for species j in stratum i , $m^3 \cdot ha^{-1}$ ($V_{EX,j,i|BSL}$) – Value applied: $15 m^3 \cdot ha^{-1}$ (independent of species)
- Wood Density (D_j , biomass per m^3) – $0.614 t/m^3$ (volume weighted average of harvested species, see Table 9)
- Carbon Fraction (CF) – 0.5 (IPCC default)

¹⁰ POA10 was conducted in 2017 and does therefore not require a field validation, as it is less than 10 years old (VM0010, p18). Note also that there are many more species included in POA10 than in previous POAs, as a result of GGF's intended change of business model to produce and export non-species-specific products (composite wood products, kiln sticks, etc).

The values applied are discussed in the data tables in Section 4.1.

5.1.2 Calculation of dead wood (logging slash) generated in the process of timber harvest

Calculation of the carbon stock changes in the forest dead wood pool is done in the GGF Loreto 1 baseline and project emissions calculation spreadsheet, applying Equation 5.

$$C_{DWSLASH,i,p|BSL} = \sum_{j=1}^j \left((V_{EX,j,i|BSL} + LDF) + (V_{EX,j,i|BSL} + LIF) \right) \quad (5)$$

Where: $\Delta C_{DWSLASH,i,p|BSL}$ = Change in carbon stock of dead wood as logging slash resulting from timber harvest per unit area in stratum i in land parcel p, in $tC \cdot ha^{-1}$;

$V_{EX,j,i|BSL}$ = Mean volume of extracted timber per unit area for species j in stratum i; in $m^3 \cdot ha^{-1}$;

LDF = Logging Damage Factor, in tC / m^3

LIF = Logging Infrastructure Factor, in tC / m^3

The parameters used are:

- Mean volume of extracted timber per unit area for species j in stratum i, $m^3 \cdot ha^{-1}$ ($V_{EX,j,i|BSL}$) - Value applied: $15 m^3 \cdot ha^{-1}$ (independent of species)
- Logging Damage Factor (tC / m^3 extracted) - Value applied: 1.134 Logging Infrastructure Factor (tC / m^3 extracted) - Value applied: 0.458 The values applied are discussed in the data tables in Section 5.1.

5.1.3 Calculation of baseline carbon sequestered in wood products

Calculation of the carbon stock changes in the Wood Products pool is done in the GGF Loreto 1 baseline and project emissions calculation spreadsheet, applying Equations 8, 9, 10 and Equation 11 of VM0010.

$$OF_j = 1 - (WW_j + SLF_j) \quad (8)$$

Where:

OF_j = Fraction of biomass carbon from the 'oxidised fraction' that is assumed to be emitted to the atmosphere from wood products between years 3-100 after harvest for species j, dimensionless;

WW_j = Fraction of biomass carbon from wood waste that is assumed to be emitted to the atmosphere immediately at the time of harvest for species j, dimensionless;

SLF_j = Fraction of biomass carbon from the short-lived wood product pool that is assumed to be emitted to the atmosphere immediately at the time of harvest for species j, dimensionless

$$CWP_{0,i,t|BSL} = \sum_j C_{EX,i,j,t|BSL} * (WW_i + SLF_i) \quad (9)$$

Where:

$CWP_{0,i,t|BSL}$ = Carbon stock of extracted timber from stratum i that is assumed to be emitted immediately at the time of harvest t, in $tC \cdot ha^{-1}$;

$C_{EX,i,j,t|BSL}$ = Carbon stock of extracted timber from species j in stratum i at time t, in $tC \cdot ha^{-1}$;

WW_j = Fraction of biomass carbon from wood waste that is assumed to be emitted to the atmosphere immediately at the time of harvest for species j, dimensionless;

SLF_j = Fraction of biomass carbon from the short-lived wood product pool that is assumed to be emitted to the atmosphere immediately at the time of harvest for species j, dimensionless

$$CWP_{20,i|BSL} = \sum^j C_{EX,i,t|BSL} * OF_j * 0.86 \quad (10)$$

Where:

$CWP_{20,i|BSL}$ = Carbon stock of extracted timber from stratum i at time t that is assumed to be emitted between years 1 and 20, in $tC \cdot ha^{-1}$;

$C_{EX,i,j,k|BSL}$ = Carbon stock of extracted timber from species j in stratum i at time t, in $tC \cdot ha^{-1}$;

OF_j = Fraction of biomass carbon from the 'oxidised fraction' that is assumed to be emitted to the atmosphere from wood products between years 3-100 after harvest for species j, dimensionless;

The parameters used in these equations are:

- Wood Waste and Short-Lived Wood Products, that are assumed to be emitted immediately into the atmosphere: 46.7%
- Long-lived Wood Products, that are assumed to be emitted over a 20-year linear decay function: 45.9%
- Wood Products that are assumed to permanently store carbon: 7.5% (14% of the Long-lived Wood Products (as per Winjum et al, 1998)).

The values applied are discussed in the data tables in Section 4.1.

$$CWP_{100,i,p|BSL} = CWP_{i|BSL} * OF_k$$

$CWP_{100,i,p|BSL}$ = Carbon stored in wood products that are assumed to be retired between 3 - 100 years after harvest from stratum i in land parcel p, in $tC \cdot ha^{-1}$;

$CWP_{i|BSL}$ = Carbon stock of extracted timber from stratum i that is assumed to enter the wood products pool that is not immediately emitted at the time of harvest, in $tC \cdot ha^{-1}$;

OF_k = Fraction of biomass carbon from the 'oxidised fraction' that is assumed to be emitted to the atmosphere from wood products between years 3 and 100 of timber harvest, dimensionless;

i 1,2,3,..., M strata

p 1,2,3,... P land parcels

5.1.4 Change in carbon stocks due to forest regrowth after harvest

Calculation of the carbon stock changes in the Wood Products pool is done in the GGF Loreto 1 baseline and project emissions calculation spreadsheet, applying Equation 12 of VM0010.

$$C_{RG,i,p|BSL} = RGR_i * t$$

The parameters used in this equation are:

- RGR_i , Regrowth rate of forest post timber harvest post forestry infrastructure establishment for stratum i, $tCha^{-1}yr^{-1}$ – Value applied: $1.02tCha^{-1}yr^{-1}$

The values applied are discussed in the data tables in Section 4.1.

5.1.5 Calculation of baseline emissions from the combustion of fossil fuels in forestry and wood processing machinery

Baseline emissions from fuel combustion are considered insignificant as per application of the CDM Tool for testing significance of GHG emissions in A/R CDM project activities, version 1.

5.1.6 Calculation of baseline scenario of greenhouse gas emissions from change in carbon stocks

In this section Equations 23-28 of VM0010 are applied to calculate $GHGNET|BSL$, the net greenhouse gas emissions in the baseline scenario, in tCO_2e . Except for the area A logged each year (according to section 3.3 of the PD), all parameters are calculated. The calculations are performed in the GGF Loreto 1 baseline and project emissions calculation spreadsheet. Results are presented in section 3.2 of the MR and in Appendix 2

5.2 Project Emissions

The project emissions are calculated using carbon maps provided by Space Intelligence.

To estimate above-ground biomass (AGB) across the Project Area of Interest (AOI), a multi-step remote sensing approach was applied using both satellite and field data.

First, a canopy height map dated 31 July 2022 was generated using thousands of LiDAR footprints from NASA's GEDI (Global Ecosystem Dynamics Investigation) sensor. GEDI, hosted on the International Space Station, provides globally distributed, high-resolution laser ranging observations that offer a strong correlation between tree height and biomass in tropical forests.

Due to the spatial sparsity of GEDI observations, a predictive model was developed by correlating GEDI-derived canopy height data with wall-to-wall mosaics created from multiple satellite sensors. These included Sentinel-1 C-band Synthetic Aperture Radar (SAR), ALOS-2 PALSAR-2 L-band SAR, and Sentinel-2 optical imagery. This integration enabled the creation of a per-pixel

forest canopy height map at 25 m x 25 m resolution across the entire AOI. The canopy height map was then converted into a wall-to-wall AGB map using a field-derived allometric model which relates canopy height to biomass.

For 2024, a new AGB map was produced by updating the 2022 height map. As GEDI data was unavailable during most of the intervening period—due to the sensor being offline from March 2023 to June 2024—the updated map incorporated field plot remeasurements from 2024 alongside Sentinel-1 SAR data collected between August 2022 and July 2024. The SAR data, captured every 12 days, was used to detect changes in canopy height and structure, allowing the 2022 canopy height map to be adjusted accordingly to reflect forest growth or loss.

The updated canopy height data for 2024 was then processed using the same height-to-biomass model to produce the 2024 AGB map.

Finally, statistical analysis was conducted to compute total AGB stock, mean AGB density, and changes in these metrics between 2022 and 2024 for each of the three project sites. To ensure consistency with forest definitions under Peruvian environmental standards, only pixels with canopy heights greater than 5 meters were included in the calculations. The masked areas used for the calculations differ slightly between years due to pixels crossing the height threshold over time.

The results of the AGB density in the AOI are presented below:

Year	PC	Mean AGB (2022)	Mean AGB (2024)	Difference Mg AGB ha-1	Difference Mg AGB ha-1 annual	Annual C sequestration (tC/ha/yr)
1	PC_01	374.5	372.5	-2.0	-1.0	-0.5
2	PC_02	374.3	375.6	1.3	0.7	0.3
3	PC_03	370.4	372.5	2.1	1.1	0.5
4	PC_04	372.0	374.7	2.7	1.3	0.7

Where the negative growth in PC_01 is considered 0 for calculations due to it being from natural disturbances which are part of the analysis below.

Disturbance analysis

Space Intelligence (SI) generated two types of disturbance layers to assess biomass loss across the project area: a significant disturbance layer and a light disturbance layer. Both are binary mask layers that indicate the presence or absence of disturbance, derived through spatial analysis of biomass change data.

- The significant disturbance layer identifies areas where, within a 16 × 16 pixel window, more than six individual pixels exhibit biomass loss exceeding 5 megagrams of carbon (Mg C), and are located within 1,250 meters of a river, road, or established community.
- The light disturbance layer highlights areas where, within a 4 × 4 pixel window, the total biomass loss exceeds 10 Mg C.

For the disturbance analysis, only the results from the significant disturbance layer were considered. These results were cross-referenced with findings from field monitoring activities conducted during the same monitoring period. Based on this comparison, the disturbance areas were analyzed as follows:

PC	Checked by on-field monitoring	Causes	ha	Comment
PC_01	No	Natural fire	1,653.4	It is assumed as natural fire as that is the conservative approach.
PC_02	Yes	Natural non-fire	4.3	
PC_02	No	Natural fire	528.9	It is assumed as natural fire as that is the conservative approach.
PC_03	Yes	Natural non -fire	26.9	
PC_03	No	Natural fire	64.3	It is assumed as natural fire as that is the conservative approach.
PC_04	Yes	Natural non -fire	10.6	
PC_04	No	Natural fire	0.1	It is assumed as natural fire as that is the conservative approach.
Rest of area	Yes	Illegal Logging	31.6	It should be considered 0 as the PRA concluded that there is no a significant pressure for illegal logging.
Rest of area	No	Illegal Logging	44.1	It should be considered 0 as the PRA concluded that there is no a significant pressure for illegal logging.
Rest of area	Yes	Natural non – fire	186.0	It is assumed 0 as the disturbance would have happened with or without project
Rest of area	No	Natural fire	899.7	It is assumed 0 as the disturbance would have happened with or without project.
TOTAL			2,364.1	

Project emissions from natural forest disturbances – Fire

During the monitoring period, 2,246.69 ha were identified as disturbed due to natural causes. As these areas were not directly surveyed, and in line within section 5.3.7 of the PD, they were conservatively classed as $A_{burn,i,t}$.

Using equations 33 and 34 of the methodology, the emissions associated with these disturbances were 934.14 tCO₂e.

$$\Delta C_{DIST-FR|PRJ} = \sum_{i=1}^M A_{burn,i,t} * B_{i,t|PRJ} * COMF_i * G_{g,i} * 10^{-3} * GWP_{CH4} \quad (33)$$

$$B_{i,t|PRJ} = \sum_{j=1}^J \{V_{EX,i,j|BSL} * BCEF_R\} \quad (34)$$

Results from these equations are shown in Appendix 2.

Project emissions from natural forest disturbances – Non – Fire

During the monitoring period, 41.79 ha were identified as disturbed and on-field monitoring showed the causes were natural (strong winds). Therefore $A_{dist,i,t} = 41.79$

Using the modified equation 35 (see section 3.2.1, methodology deviation #8), the emissions associated with these disturbances was 697.11 tCO₂e

Project emissions from illegal logging

During the second semester of 2024, GGF conducted a Participatory Rural Approach (PRA) in their 17 partner communities, utilizing resource mapping and surveys. Resource mapping involved leaders and members from each community identifying fields, ravines, and locations where they gather fruits, hunt, or extract timber on white and black maps. It's worth noting that the maps intentionally do not specify the project area's boundaries to prevent potential bias in reporting activities within the project area. The results revealed that out of the 17 communities, only 2 reported timber extraction within the project area.

Regarding the surveys, a total of 243 individuals were interviewed across the 17 communities. The sampling method employed was probabilistic, entailing the random selection of respondents within each community and village. The sample size varied depending on the number of families residing in each area. The survey results indicated that 156 people engage in timber extraction. However, there was no specific question about the exact location of this extraction. Consequently, data from both tools were combined.

According to the "Illegal Logging PRA Results" parameter in section 9.2 of the methodology, if 10% or fewer of the interviews suggest timber extraction within the project area, the PRA may conclude that there is minimal potential pressure for illegal logging, and the incidence of illegal logging can be assumed to be negligible, thus requiring no further monitoring. The PRA results demonstrated that out of the 156 individuals involved in timber extraction, only 23 were from the community identified in the resource mapping as conducting this activity within the project area. This accounts for 9.47% of the total survey respondents.

Where timber extraction happens?

Surveys

% Surveys

Within GGL1	23	9.47%
Within the concession but outside of GGL1	46	18.93%
Within community territory	87	35.8%
No extraction	87	35.8%
Grand Total	243	100.00%

Therefore, the PRA concluded that there is no potential pressure for anthropogenic activities within the area of the project. Therefore, $A_{DIST_IL,i}$ is 0 ha.

Total project emissions

In total, emissions from disturbances during the monitoring period were 2,201.2 tCO₂e which is non-significant (less than 5% after applying the significance tool). Therefore, no discounts were made to the calculations.

5.3 Leakage Emissions

5.3.1 Activity shifting leakage

Section 8.3.1 of the VM0010 methodology v1.3 states that “Where the project proponent controls multiple parcels of land within the country the project proponent must demonstrate that the management plans and/or land-use designations of other lands they control have not materially changed as a result of the planned project (...) because such changes could lead to reductions in carbon stocks or increases in GHG emissions”.

During the monitoring period, GGF expanded its production forest concessions to a total of 394,875 ha, distributed as follows:

- 236,236 ha of production forest concessions, delineated across 3 consolidates: Consolidate 1 – Tacsha; Consolidate 2 – Mazán and San Regis.
- Of this total, 183,445.54 ha were allocated for the GGL1 carbon project, GGL1 (see section 1.7 of this document for the geodetic coordinates). The remaining concessions are designated for either timber harvesting, sustainable non-timber forest product (NTFP) extraction (without logging), or preservation activities beyond GGL1’s scope. These activities predate the project and align with GGF’s obligations as a concession holder under Peruvian regulations.
- 158,660 ha of additional production forest concessions were acquired during 2023–2024. Of these:
 - o 16,718 ha were allocated to GGF by authorities as compensation for excluded areas (see Section 2.1.4, Grievance Redress Procedure) and are part of the new carbon project GGF is developing.
 - o The remaining areas were newly acquired and are part of the new carbon project GGF is developing.

Since the beginning of the project, no timber harvesting has occurred since the beginning of the project¹² in the previously owned areas or newly acquired areas. Therefore, this type of leakage maintains 0.

5.3.2 Market leakage

In this monitoring report, to calculate the market leakage the project is applying a modification of equation 40 from version 1.3 of the methodology (see methodology deviation #5 in section 3.2 of this MR), which is the following.

$$GHG_{LK|LtPF,t*} = LK_{ME} * GHG_{NET|BSL,t*} * LP_{ME}$$

Where:

$GHG_{LK LtPF,t*}$	Total market leakage resulting from IFM LtPF activities, in the year t* since the start of the project activity, tCO ₂ e
LK_{ME}	Leakage factor for market-effects calculations, dimensionless
$GHG_{NET BSL,t*}$	Net greenhouse gas emissions in the baseline scenario in the year t* since the start of the project activity, tCO ₂ e
LP_{ME}	The percentage of log volumes that potentially could be subject to market leakage

Leakage factor (LK_{ME})

VM0010 requires that the ratio of merchantable biomass to total biomass is compared between the project forest (consisting of a single stratum) and the displacement forest. Both forests are Bosque de Colina Baja in Loreto, near Iquitos.

$PMP_i = 9.2/299 = 0.031$ for the project forest, and $PMLFT = 9.2/281 = 0.033$ for the displacement forest.

Where:

PMP_i = merchantable biomass as a proportion of total aboveground tree biomass for stratum i within the project boundaries, %; and

$PMLFT$ = mean merchantable biomass as a proportion of total aboveground tree biomass for each forest type, %.

For PMP_i , the merchantable biomass value is derived from the product of the timber extraction volume (15 m³) and the weighted average wood density (WD : 0.614 t/m³), both obtained as outcomes from the POA10, presented at validation. The value applied for total aboveground tree

¹² in 2020, only timber harvested in 2019 was mobilized (see section 5.4.1 of the “GGL1 - VCS Monitoring Report 2022 - v4.2 v8 - July2024 VF” in the VERRA Registry).

biomass is 299 and is derived from analysis made by Space Intelligence. . It is the average of the ABG biomass from the permanent plots remeasured during the monitoring period. Both are discussed in 4.2 of this document.

For PML_{FT} , the merchantable biomass value is derived from the product of the timber extraction volume (15 m^3) and the weighted average wood density ($WD: 0.614 \text{ t/m}^3$), both obtained as outcomes from the POA10, presented at validation. The value applied for total aboveground tree biomass is based on Asner et al (2014). Both are discussed in the data tables in Section 4.1 of this document.

The variance between these two ratios stands at 6%, falling within the range of $\pm 15\%$, pointing to a deduction factor of 0.4 (VM0010, Box 2).

Market Leakage Analysis (LP_{ME})

Through the analysis derived from MDev#5, we show whether other producers increased production to fill the shortfall in supply created by the cessation of production by GGF and demonstrate the market variability exclusively attributable to GGF's VM0010 project. As established in our analysis below, we demonstrate no market leakage of some timber product categories (e.g., sleepers, Smooth-four-sides timber, decking and deck tiles) and potential full market leakage for some other products (e.g., rough sawn lumber).

Overall, we conclude that a market leakage factor (calculated according to Box 2 in the methodology) should be applied to 17.30% of GGF's projected log harvest volume.

Financial stability of the Project

Although Peru's timber industry has experienced a declining trend since 2014, it is possible that future production might increase if other producers take up the export opportunities that GGF identified. In this scenario, the Project remains financially secure as the maximum discount due to market leakage would be capped by applying the calculated leakage factor as per Box 2 of the methodology across all GGF's projected production (i.e., $LP_{ME} = 100\%$). The financial stability of the Project has been stress-tested under various scenarios, including reduced VCU yields and sustained low carbon prices. All operational costs, including payroll, administration costs, fees, and financing costs, can be adequately covered in these instances (see Non-Permanence Risk Report). Furthermore, GGF will generate additional non-VCU revenues from late 2026 onwards, when its new fruit-oil processing facility at Santa Clothilde is expected to become operational, which further ensures long-term financial resilience.

Market Leakage Analysis

1. Our starting point is to set out what GGF's log harvest and timber production would have been under a business-as-usual scenario – i.e., in the absence of the carbon project
 - i. GGF's logging operations in the Project area terminated before the Project start-date of August 1st 2020

- ii. Under a business-as-usual scenario, the 183,445ha of forest concessions would have been logged over a 20-year period, yielding an average of 15m³ per hectare of logs
- iii. Unlike most forest operations in Peru, which target selected high-value species, GGF planned to extract a wide mix of species and produce a range of products
- iv. GGF's concessions were (and remained until December 31st, 2024) FSC-certified for forest management. Additionally, GGF also maintained FSC certification for chain-of-custody (i.e., production and logistics)
- v. 95.2% of GGF's baseline production would have been exported, with only low-value products and off-cuts sold to local markets
- vi. GGF's timber buyers sought certified timber – this is especially the case in US and EU markets
- vii. GGF based its timber production schedule using log harvest data in POA10 – a complete inventory of harvestable trees in 3,000ha undertaken in 2018
- viii. GGF established four broad categories of timber, based on density and market recognition: high-density high-value (HDHV); high-density low-value (HDLV); low-density high-value (LDHV); low-density low-value (LDLV). The allocation of each species is shown in the 'POA 10 by timber category' tab of Appendix 4.
- ix. A detailed production plan was developed to maximize the commercial value of this log harvest, with a mix of products including decking, S4S (Smooth-four-Sides), sleepers, kiln sticks (also known as 'fillers'), RSAD (rough-sawn air-dried) and RSKD (rough-sawn kiln-dried), shorts, etc.
- x. The plan takes account of expected recovery rates (based on GGF's experience of sawing and processing timber products) and market prices, to optimize the commercial value of each species of tree (see NIR20 in Validation audit, and 'GGF margin analysis including kiln sticks.xls')
- xi. By categorizing each species in POA 10, the expected volume of each marketable product can be calculated, together with the volumes of logs used for each product (see 'POA 10 Production analysis' tab of Appendix 4).
- xii. The mix of products derived from each species is based on expected recovery rates and market prices – the objective being to maximize commercial value
 - HDHV species are processed into decking, S4S, decking tiles, sleepers, kiln sticks, and others
 - HDLV are processed into sleepers, kiln sticks ('fillers'), and others
 - LDHV are processed into various grades of RSKD

- LDLV are processed into RSAD and RSAD shorts
 - xiii. The processing of these products was to be undertaken at GGF's own sawmill, and sub-contracted to two specialist plants in Iquitos (under GGF's FSC chain of custody certification)
 - xiv. To derive GGF's timber production under a business-as-usual scenario, the volumes derived from POA 10 must be multiplied by a factor of 3.058 (to scale up to the average 9,173ha harvested each year – i.e., 1/20th of 183,455ha) – the result of this is shown in the 'Baseline Timber Production' tab of Appendix 4.
 - xv. The same tab calculates the market value of these products (note that prices are quoted FOB Iquitos – i.e., excluding onward transport costs to Lima or other port). Prices are conservative estimates, based on GGF's trade prior to 2019
 - xvi. The total value of timber products is around \$31million
 - xvii. Excepting products categorize as 'Other' (low-value timber and off-cuts), all GGF's production was scheduled to be sold in export markets
2. To assess potential market leakage resulting from the carbon project, we have analyzed:
- Peru's overall timber production and exports in 2019-24
 - Peru's export timber trade in 2019-24
3. Analysis of trends in Peru's overall timber production and exports
- i. In the absence of the carbon project, GGF would have been one of Peru's major timber exporters (around \$31million annually)
 - ii. From 2014 to 2024, Peru's sawn wood production showed a pattern of fluctuations, but with an underlying downwards trend. A regional analysis reveals a significant decline across most regions, including Loreto, from 2019. Ucayali and Madre de Dios were exceptions, demonstrating a moderate increased production. The observed trend, as detailed in the 'Peru Timber Industry' tab of Appendix 4, suggests that the cessation of GGF's operations likely intensified the production downturn in Loreto region.
 - iii. The absence of GGF's production has not on the whole been offset by increased production by other timber companies in Peru. Overall, Peru's exports of timber products have declined against a 2019 baseline, as indicated by export data (Source: Veritrade – Appendix 4, tab 'Peru Timber Exports').
 - iv. The decline in Peru's overall timber production is corroborated by a 6% drop in active forest concessions, falling from 10.14 million to 9.55 million hectares between 2021 and 2023. This reduction reinforces the conclusion that no other Peruvian producers compensated for the supply deficit caused by GGF's carbon project.

<https://repositorio.serfor.gob.pe/bitstream/SERFOR/894/1/Anuario%20Forestal%20y%20de%20Fauna%20Silvestre%202019.pdf>;

<https://repositorio.serfor.gob.pe/bitstream/SERFOR/969/1/SERFOR%202024%20-%20Anuario%202023.pdf>

- v. All GGF's timber production would have been FSC-certified, and GGF's clients required certified timber. Any potential supply gap resulting from GGF's carbon project would therefore have had to derive from other certified forests. However, excluding GGF's 175,560 hectares, the total area of FSC-certified forest in Peru decreased from 1,004,411 hectares to 887,758 hectares between August 1st, 2022, and July 31st, 2024. <https://connect.fsc.org/es/impacto/datos-y-cifras>
 - vi. GGF's production could not be replaced by illegally harvested timber, as international buyers require proof of legality and, in most cases, certification. In any case, Peru has made substantial progress in recent years in implementing policies and enforcement to eliminate illegal logging, e.g., <https://www.gob.pe/institucion/osinfor/noticias/904247-osinfor-y-prevenir-de-usaid-unen-esfuerzos-para-contribuir-a-una-gestion-forestal-sostenible> and <https://www.gob.pe/institucion/osinfor/noticias/889618-profesionales-supervisores-fortalecen-knowledges-para-realizar-labores-de-fiscalizacion-forestal-con-el-osinfor>
4. As a next step, we examine the mix of Peru's export timber trade in 2022-24, and ask whether, against a general trend of decline in exports, there was an increase in certain products that GGF would have produced in the absence of the carbon project (i.e., market leakage)
- i. We have used data from Veritrade and Peru's tax authority (SUNAT) to analyze Peru's timber exports from 2019-24. World trade databases on global imports and exports Veritrade (veritrade.com), undertakes global trade analysis, classifying products using unique codes, tracking exporters and counterparts for international trade across a broad range of products.
 - ii. The tab 'Peru's Timber Exports' of Appendix 4 shows the US dollar value of each product category in the years 2019 through 2024.
 - iii. US dollar prices are a good proxy for timber volumes, and conservatively we have assumed no price change in the period 2019-24, as seen in the ITTO biweekly reports. [Back issues | ITTO | The International Tropical Timber Organization](#)
 - iv. We have used 2019 as a baseline, given the economic disruption caused by the COVID-19 pandemic in 2020
 - v. GGF's own production would have taken four or five months to complete a cycle of production from harvest to export – therefore, as the Project monitoring period was

1st August 2022 to 31st July 2024, the relevant export years for the purposes of market leakage analysis are 2023 and 2024

- vi. We consider external factors that might have skewed Peru's export data during the monitoring period to give assurance that exports are a reliable proxy for production in the relevant period
5. To assess potential market leakage, we compare Peru's 2023-2024 exports with those in the baseline of 2019:
- i. With respect to the specific products and quantities that GGF would have produced in the absence of the Project, our analysis provides the following conclusions:
 - Decking export sales in 2024 were 62% lower than in 2019. Our conclusion is that there is no market leakage for decking (GGF's annual production would have been valued at \$3.5million)
 - S4S export sales fell by 85% between 2019 and 2024. Our conclusion is that there is no market leakage of S4S (GGF's annual production would have been valued at \$1.4million)
 - Deck tiles export sales decreased by 67% between 2019 and 2024. Our conclusion is that there is no market leakage of deck tiles (GGF's annual production would have been valued at \$75,000)
 - Kiln stick exports rose from \$111,000 in 2019 to \$209,600 in 2023 and \$219,000 in 2024. GGF's production would have produced additional annual export sales of \$14.16million. We conclude that there is a possibility that a small part of GGF's production could have leaked.
 - Sleepers were not exported in 2023-2024 (last exports were in 2015) – our conclusion is that there is no market leakage of sleepers as a result of the project (GGF's annual production would have been valued at \$3.35million).
 - RSKD exports (including shorts) were lower in 2023 (US\$ 13.8 million) and 2024 (US\$ 10.6 million), compared with export sales in 2019 (US\$ 21.4 million) – our conclusion is that there is no market leakage of RSKD and RSKD shorts (GGF's annual production would have been valued at \$6.8million)
 - RSAD exports (including shorts) were \$4.6million in 2019, \$16.4 million in 2023 and \$10.7million in 2024; exhibiting an increase compared to year 2019 (\$10.6 million). We conclude that there is a possibility GGF's production could have leaked (GGF's annual production would have been valued at US\$ 1.526 million).

- Other products produced by GGF would have been waste by-products (such as off-cuts) and would have been sold in local markets, with the possibility of leakage (annual value \$258,000)
6. To determine whether export data accurately reflect production in the relevant monitoring period, we reviewed social and economic events in the relevant period and assessed these to determine whether external factors disrupted exports and skewed the link between production and exports in that monitoring period.
- i. In December 2022, the impeachment and arrest of President Pedro Castillo sparked protests throughout Peru, especially in the Andes and parts of the Amazon. People took to the streets demanding new elections and Castillo's release, leading to roadblocks, airport closures, and disruptions in some transportation routes. These events likely caused temporary delays in timber transportation. However, it is reasonable to assume that the timber harvested during the 2022–2023 period was eventually exported later in 2023 once transport routes normalized and therefore showed up in export data.
 - ii. Export embargos – from time to time, the harvest of certain species is restricted through the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In November 2022, the Convention added Cumaru (*Dipteryx* spp.) and Ipe (*Tabebuia* spp.) to CITES Appendix II, meaning that international trade must be covered by an export permit or re-export certificate. The Convention permits 24 months to implement these measures. As this restriction came into force in Peru at the end of the monitoring period (i.e., on November 25th 2024) it does not impact Peru's export data in the time-period, and is therefore not an influence in estimating leakage factors (<https://www.atibt.org/en/news/13248/cites-towards-an-appendix-ii-listing-for-cumaru-ipe-african-mahogany-padouk-and-doussiequestion>)

7. Market Leakage Conclusions

- i. This analysis, using conservative assumptions, shows that, at most, other producers in Peru could have replaced only a small fraction of GGF's projected share of production for export markets during the monitoring period
- ii. Of GGF's projected \$31million production value, the majority was not picked up by other producers
 - The data shows zero market leakage of S4S, Sleepers, Decking, Deck tiles, and RSKD (including shorts).
 - In 2023 and 2024 Peru exported a total of \$428,000 value of kiln sticks, or an annual average of \$214,000, above 2019 levels. This represents 3% of GGF's projected production. We conclude that it is possible that a small part of GGF's baseline production of kiln sticks was taken up by other producers (i.e., partial market leakage)

- Peru's exports of RSAD increased from \$4.6 million in 2019 and averaged \$13.6 million in 2023 and 2024. GGF's production would have been an annual \$1.525million, and it is possible that other producers in Peru took this up (i.e., market leakage)
 - All GGF's products categorized as 'Other' would have been sold in local markets, and possibly other producers stepped in to supply this (i.e., market leakage)
- iii. To calculate market leakage, we have applied a leakage factor of 0.4 (see section 5.3 of the MR) to that part of GGF's production that could have been taken up by other producers (i.e., market leakage)
- iv. The results are shown in 'GGF Leakage calculation.xls' in Appendix 4
- 0% Decking, S4S, Deck tiles, Sleepers, & RSKD (including shorts); 3% kiln sticks & 100% RSAD (including shorts) & Other
 - Leakage factor 0.4 per the procedure stated in Box 2 of the methodology
 - Leakage factor applies to 17.30% of log volume

Results

Full harvest baseline (9,173ha)			Results from leakage analysis	
Production	m ³	Logs input (logs m ³)	Market Leakage (%)	Log volume leakage m ³ (Logs input * market leakage)
Decking	4,324	9,609	0%	-
S4S	2,820	6,266	0%	-
Deck tiles	940	2,089	0%	-
Sleepers	6,263	9,489	0%	-
Kiln sticks	23,607	40,800	3%	1,250
RSKD	25,346	38,994	0%	-
RSKD shorts	5,069	7,799	0%	-
RSAD	11,058	13,322	100%	13,322
RSAD shorts	2,212	2,664	100%	2,664
Other	4,298	6,573	100%	6,573
Total		137,605		23,810

$$LP_{ME} = \frac{\text{Total log volumen leakage}}{\text{Total log input}} = \frac{23,810}{137,605} = 17.30\%$$

Therefore, after applying the equation 40, the total market leakage is:

Leakage Y3:

$$GHG_{LK|LTPF,3} = LK_{ME} * GHG_{NET|BSL,3} * LP_{ME}$$

$$GHG_{LK|LTPF,3} = 0.4 * 259,091 * 0.173$$

$$GHG_{LK|LTPF,3} = 17,932$$

Leakage Y4:

$$GHG_{LK|LTPF,4} = LK_{ME} * GHG_{NET|BSL,4} * LP_{ME}$$

$$GHG_{LK|LTPF,4} = 0.4 * 291,042 * 0.173$$

$$GHG_{LK|LTPF,4} = 20,144$$

Year	Baseline emissions or removals (tCO ₂ e) (20 years)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)
3	259,091	34,706	17,932
4	291,042	56,590	20,144
Total	550,133	91,297	38,076

5.4 GHG Emission Reductions and Carbon Dioxide Removals

State the non-permanence risk rating (%)	18%
Has the non-permanence risk report been attached as either an appendix or a separate document?	☒ Yes ☐ No
For ARR and IFM projects with harvesting, state, in tCO ₂ e, the Long-term Average (LTA). Has the LTA been updated based on monitored data, if applicable?	Not applicable. This is an IFM project without harvesting. ☐ Yes ☐ No Not applicable. This is an IFM project without harvesting.

State, in tCO ₂ e, the expected total GHG benefit to date.	603,353
If a loss occurred (including a loss event or reversal), state the amount of tCO ₂ e lost:	No loss occurred.

Uncertainty Analysis

As per the methodology (VM0010, v1.3), uncertainty is expressed as a variance greater than $\pm 15\%$ of the mean at the 95% confidence interval. For the monitoring period August 2020 to July 2022, the variance estimated at validation for the baseline scenario does not change as the parameters that were checked were validated and contained either historic or secondary information. Regarding the project scenario uncertainty, this is calculated using RSME (see Methodology Deviation #6 & Project Description Deviation #6).

A. Baseline Scenario

The following is a recount of the analysis and estimation of the variance of the following relevant input parameters in the baseline scenario:

- **Project area:** no variance
- **Harvestable volume inventory data:** no variance. All trees were inventoried on 3,000ha, in effect a single data point. Measurement errors were not quantified. Diameter measurements generally have uncertainties of no more than a few percent, which will be normally distributed and cancel each other out in such a large dataset. Tree height estimates tend to have higher uncertainty attached to them; however, no quantitative data exist for this within GGF, and any bias would be strongly person-dependent so that in a large inventory team the errors would probably cancel each other out. The method to calculate volume from DBH and commercial height (Smalian's equation, see Methodology Deviation #2) has uncertainty attached to it. However, as has been demonstrated in comparison with an allometric equation method, this method results in an under-estimation of volume (this method to estimate commercial standing volume was designed to deliver an *at least* estimate, so that foresters can build a low-risk business case on it). In addition, the baseline extraction rate is 5.5% lower than the inventoried average volume per ha, which likely cancels out a significant part of the uncertainty due to measuring and estimation error. In view of the above, no uncertainty will be propagated for extracted volume.
- **Above ground C content:** This is an estimated average without variance. However, the Asner et al (2014) map of above ground carbon density for Peru shows a relatively homogenous carbon density for the project areas. In the paper's supplementary information, a map of estimated relative uncertainty (as a % of the mean C density) is published (Fig 9), showing the uncertainty for the project areas to be <5%.
- **Forest regrowth:** the regression equation that calculates recovery time from % loss of aboveground carbon content from logging presented by Rutishauser et al (2015) gives a

standard error of 0.022 on the value of 1.106 for the variable θ , which equals an uncertainty of 1.99%.

- **Wood densities:** no variance data available. However, with the use of species-specific wood densities and with a low number of species without known wood density the assumption is that of low uncertainty for this input parameter.
- **Logging Damage Factor (LDF):** this is based on the average value of two linear regression equations in Pearson et al (2014), one relating LDF (tC/m³ extracted) with the standing biomass carbon stock, the other with log length. The first equation has a coefficient of determination R² of 0.98, meaning that 98% of the variance of the dependent variable (LDF) has been accounted for by the regression equation, i.e., 2% uncertainty. The second equation has an R² of 0.86, i.e., 14% uncertainty. The average uncertainty is thus 8%.
- **Skidding Factor (SF):** no variance data available (Pearson et al, 2014).
- **Wood product class percentages:** full set of GGF historical data, not based on sampling so no variance.

Thus, the uncertainty propagation in the baseline will be done using the uncertainties of forest regrowth and LDF. This is calculated as the square root of the sum of the squares of the two parameters (see Equation 42 below, applied mutatis mutandis).

Baseline uncertainty is therefore: $UBSL = \text{SQRT}(0.0199^2 + 0.08^2) = 0.0824$ (8.24%). If a 5% uncertainty were to be added for the aboveground C content estimate (this would not be quite correct because this is the uncertainty in the map, not around the estimate), this would result in a baseline uncertainty of 9.64%.

B. Project Uncertainty

To estimate the total uncertainty in AGB change from 2022 to 2024, Space Intelligence calculated the difference in AGB for each of the 28 resurveyed plots, producing 28 individual estimates of total AGB change—one per plot. These values serve as the reference (or target) measurements of AGB change.

Next, data was extracted from the 2022–2024 AGB change map for each of the 28 field plot polygons, and the mean of the sampled pixel values was computed to derive a predicted AGB change per plot. Using these 28 pairs of reference and predicted AGB change values, the root mean square error (RMSE) of AGB change was then calculated.

To express this uncertainty as a percentage, the RMSE of AGB change was divided by the mean total AGB of all plots in 2024. The RMSE value obtained from these 28 pairs is 27.09 Mg ha⁻¹, while the average AGB density per plot in 2024 is 298.50 Mg ha⁻¹. By dividing the RMSE by this average 2024 plot density, the resulting uncertainty is 9.08%.

Total Uncertainty

The total uncertainty is calculated as the square root of the sum of the squares of the baseline and project uncertainty, through propagating the error in the baseline stocks and the error in the project stocks by applying Equation 42 of VM0010 v1.3.

The total uncertainty is:

$$\sqrt{0.09075^2 + 0.0964^2} = 13.24\%$$

$$U_{TOTAL|LtPF} = \sqrt{U^2_{PRJ} + U^2_{BSL}} \quad (42)$$

Where:

$U_{total LtPF}$	Total uncertainty for LtPF Project, dimensionless;
U_{PRJ}	Total uncertainty for the improved forest management activities in the project scenario, dimensionless; and
U_{BSL}	Total uncertainty for the baseline scenario, dimensionless.

Net GHG emission reductions and removals

The achieved net GHG emission reductions/removals for each year of the project monitoring period are presented in the table below. These figures are derived from the Green Gold Loreto 1 Calculation Spreadsheet, which applies Equations 41–44 from version 1.4 of the VM0010 methodology.

As the uncertainty levels remain below 15%, no additional deductions are applied. The reported values have been adjusted for the buffer deduction, resulting in the number of Verified Carbon Units (VCUs).

To determine the number of buffer credits to be deposited into the AFOLU pooled buffer account, the project's overall risk rating was converted into a percentage using the AFOLU Non-Permanence Risk Tool. This percentage, 18%, was then multiplied by both the net GHG emission removals and the net GHG emission reductions. The figure shown below represents the sum of these two values.

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Buffer pool allocation (tCO ₂ e)	Reductions VCUs (tCO ₂ e)	Removals VCUs (tCO ₂ e)	Total VCU issuance (tCO ₂ e)
01-Aug-2022 to 31-Dec-2022	108,605	14,548	7,517	22,168	93,469	-	93,469

01-Jan-2023 to 31-Dec-2023	272,484	43,880	18,859	56,945	240,559	-	240,559
01-Jan-2024 to 31-Jul-2024	169,043	32,869	11,700	36,344	153,868	-	153,868
Total	550,133	91,297	38,076	115,457	487,896	-	487,896

The reasons behind the differences between the achieved reductions/removals and the ex-ante estimations is explained in the table below.

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
01-Aug-2022 to 31-Dec-2022	119,433	115,637	-3.18%	Although annual carbon sequestration achieved was, on average, 27% higher than estimated, the overall GHG emissions reductions/removals were slightly lower than ex-ante projection. This is because the biomass change in PC_01 was excluded from the calculations as explained in Section 5.2, and leakage was slightly higher during the monitoring period.
01-Jan-2023 to 31-Dec-2023	302,679	297,504	-1.71%	
01-Jan-2024 to 31-Jul-2024	190,094	190,212	0.06%	
Total	612,207	603,353	-1.45%	

APPENDIX 1: COMMERCIALY SENSITIVE INFORMATION

There is no commercially sensitive information included in the monitoring report that was excluded in the public version.

APPENDIX 2: GREEN GOLD LORETO 1 ER CALCULATION SPREADSHEET Y3Y4_V4

APPENDIX 3: SDG EVIDENCE_Y3Y4

APPENDIX 4: LEAKAGE ANALYSIS PROJECT 2345_Y3Y4_CORR

APPENDIX 5: PRA RESULTS

APPENDIX 6: NPRR_Y3Y4_V2