



ART
Architecture for
REDD+ Transactions

THE
REDD+
ENVIRONMENTAL
EXCELLENCE
STANDARD
(TREES)

FEBRUARY 2021

THE REDD+ ENVIRONMENTAL EXCELLENCE STANDARD (TREES), VERSION 2.0

FEBRUARY 2021

ART Secretariat
Winrock International
2451 Crystal Drive, Suite 700
Arlington, Virginia 22202 USA
Telephone: +1 703 302 6500

REDD@Winrock.org

www.ARTREDD.org

ABOUT ARCHITECTURE FOR REDD+ TRANSACTIONS (ART) PROGRAM

The Architecture for REDD+ Transactions (ART) has been developed to achieve the environmental integrity needed for REDD+ emission reductions and removals (ERRs) at national and jurisdictional scale. ART provides a credible standard and rigorous process to transparently register, verify, and issue REDD+ emission reduction and removal credits that ensure environmental and social integrity. ART aims to unlock new long-term financial flows to protect and restore forests.

© 2021 Architecture for REDD+ Transactions Program. All rights reserved. No part of this publication may be reproduced, displayed, modified, or distributed without express written permission of Winrock International. The sole permitted use of the publication is for the registration of REDD+ activities on the ART. For requests to license the publication or any part thereof for a different use, write to the Washington DC address listed above.

ACKNOWLEDGEMENTS

The ART Secretariat would like to thank the ART Interim Steering Committee members who devoted considerable time in their personal capacities to support and guide the development of the first version of *The REDD+ Environmental Excellence Standard (TREES)*: Lorenzo Bernasconi, Andreas Dahl-Jorgensen, Nat Keohane and Dan Zarin. We also appreciate the indispensable technical advice and input of members of the TREES Standards Committee, the TREES Verification Committee, the TREES Safeguards Committee, the TREES Removals Committee and the TREES HFLD Committee. Finally, the Secretariat would like to acknowledge and thank the ART Board members who all devote extensive time and expertise to the ongoing development and implementation of the ART program: Frances Seymour (chair), Carlos Nobre (vicechair), Dan Zarin, Abdon Nababan, Agnes Kalibata, Lucia Ruiz and William Bumpers.

ACRONYMS

ART	Architecture for REDD+ Transactions
COP	Conference of Parties
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CSI	Commercially Sensitive Information
ERR	Emission Reduction and Removal
ESG	Environmental, Social, and Governance
ESMF	Environmental Social Management Framework
ESMS	Environmental Social Management System
ETS	Emissions Trading Scheme
FCPF	Forest Carbon Partnership Facility
FPIC	Free, Prior, and Informed Consent
GCF	Green Climate Fund
GFOI	Global Forest Observations Initiative
GHG	Greenhouse Gas
GIS	Geographic Information System
GOFC-GOLD	Global Observation for Forest and Land Cover Dynamics
GWP	Global Warming Potential
HFLD	High Forest Cover/Low Deforestation
IAF	International Accreditation Forum
ICAO	International Civil Aviation Organization
IPCC	Intergovernmental Panel on Climate Change
NDC	Nationally Determined Contribution
NFMS	National Forest Monitoring System
NGO	Non-Governmental Organization

QA/QC	Quality Assurance/Quality Control
SIS	Safeguard Information System
SOP	Standard Operating Procedure
TREES	The REDD+ Environmental Excellence Standard
TVR	TREES Verification Report
UNFCCC	United Nations Framework Convention on Climate Change
VVB	Validation and Verification Body

Public Consultation Draft

CONTENTS

ACKNOWLEDGEMENTS	3
ACRONYMS	4
CONTENTS	6
1 INTRODUCTION	9
1.1 DESCRIPTION OF ART AND TREES	9
1.2 ART GOVERNANCE	10
1.2.1 DEVELOPMENT PROCESS FOR TREES	10
1.2.2 ADOPTION OF AND REVISIONS TO TREES.....	11
1.3 CONFLICT OF INTEREST.....	12
2 ART CYCLE	13
2.1 PROCESS FOR INITIAL REGISTRATION, VALIDATION, VERIFICATION, AND ISSUANCE.....	13
2.2 PROCESS FOR ONGOING VALIDATION, VERIFICATION, AND ISSUANCE	14
2.3 CREDITING PERIOD AND RENEWAL.....	15
2.4 DOCUMENTATION REQUIREMENTS.....	16
2.5 TIMELINE AND DEADLINES.....	16
3 ELIGIBILITY/APPLICABILITY/KEY REQUIREMENTS	18
3.1 ELIGIBLE ENTITIES	18
3.1.1 SUBNATIONAL ACCOUNTING.....	18
3.1.2 NATIONAL REPORTING REQUIREMENTS	19
3.2 ELIGIBLE ACTIVITIES.....	20
3.3 ADDITIONALITY	20
3.4 FOREST DEFINITION	20
3.5 NO EX-ANTE CREDITING.....	20
3.6 REGULATORY COMPLIANCE	21
3.7 EARLIEST CREDITING PERIOD START DATE AND VINTAGE.....	21
4 CARBON ACCOUNTING	22
4.1 ACCOUNTING REQUIREMENTS.....	22
4.1.1 ACTIVITY DATA	23
4.1.2 EMISSION FACTORS	25

4.1.3	REMOVAL FACTORS	26
4.2	STRATIFICATION.....	27
4.3	LAND-BASED VERSUS ACTIVITY-BASED ACCOUNTING	27
4.4	SCOPE OF ACTIVITIES	28
4.5	SCOPE OF POOLS AND GASES.....	29
5	CREDITING LEVEL.....	30
5.1	CALCULATING A TREES CREDITING LEVEL FOR EMISSIONS.....	30
5.2	CALCULATING A TREES CREDITING LEVEL FOR HFLD PARTICIPANTS (OPTIONAL APPROACH).....	31
5.3	CALCULATING A TREES CREDITING LEVEL FOR REMOVALS.....	32
6	MONITORING.....	34
6.1	MONITORING PLAN	34
6.2	MONITORING AND REPORTING FREQUENCY	34
7	REVERSALS AND LEAKAGE	35
7.1	REVERSALS	35
7.1.1	REVERSAL RISK ASSESSMENT	35
7.1.2	BUFFER POOL CONTRIBUTION.....	36
7.1.3	REVERSAL COMPENSATION.....	37
7.1.4	BUFFER POOL MANAGEMENT	37
7.2	LEAKAGE	37
7.2.1	LEAKAGE DEDUCTION.....	38
8	UNCERTAINTY	39
9	EMISSION REDUCTION LABELING	41
9.1	PARTICIPANT PERFORMANCE INFORMATION	41
9.2	HIGH FOREST COVER, LOW DEFORESTATION	41
10	CALCULATION OF EMISSION REDUCTIONS.....	43
11	VARIANCE	46
12	ENVIRONMENTAL, SOCIAL, AND GOVERNANCE SAFEGUARDS	47
12.1	PURPOSE	47
12.2	STRUCTURE	47
12.3	REPORTING REQUIREMENTS	48
12.4	SCOPE	48
12.5	SAFEGUARDS	49

12.5.1 CANCÚN SAFEGUARD A	49
12.5.2 CANCÚN SAFEGUARD B	50
12.5.3 CANCÚN SAFEGUARD C	52
12.5.4 CANCÚN SAFEGUARD D	53
12.5.5 CANCÚN SAFEGUARD E	54
12.5.6 CANCÚN SAFEGUARD F	55
12.5.7 CANCÚN SAFEGUARD G	56
13 AVOIDING DOUBLE COUNTING.....	57
13.1 DOUBLE ISSUANCE	57
13.2 DOUBLE USE	57
13.3 DOUBLE CLAIMING	58
14 VALIDATION AND VERIFICATION.....	59
14.1 VALIDATION AND VERIFICATION SCOPE AND FREQUENCY	59
14.2 VALIDATION AND VERIFICATION BODY ACCREDITATION	60
14.3 VALIDATION AND VERIFICATION PROCESS	60
15 REGISTRY REQUIREMENTS	61
15.1 ACCOUNT REQUIREMENTS	61
15.2 PUBLICLY AVAILABLE DOCUMENTATION	61
16 COMPLAINTS AND APPEALS	62
16.1 COMPLAINTS	62
16.2 APPEALS	62
DEFINITIONS	64
ANNEX A: TREES DOCUMENTS	72
ANNEX B: REQUIREMENTS FOR AVOIDING DOUBLE COUNTING WITH ICAO'S CARBON OFFSETTING SCHEME FOR INTERNATIONAL AVIATION (CORSIA)	77
ANNEX C: REFERENCES	84

1 INTRODUCTION

1.1 DESCRIPTION OF ART AND TREES

The purpose of the Architecture for REDD+ Transactions (ART) is to promote the environmental and social integrity and ambition of greenhouse gas (GHG) emission reductions and removals (ERRs) from the forest and land use sector to catalyze new, large-scale finance for REDD+ and to recognize forest countries that deliver high-quality REDD+ emission reductions and removals.

The ART has adopted the following statement of Immutable Principles to govern its operation:

“The ART shall...

1. Recognize countries with quantifiable ERs that result from slowing, halting, and reversing forest cover and carbon loss and maintaining forest carbon stocks;
2. Be consistent with United Nations Framework Convention on Climate Change (UNFCCC) Conference of Parties (COP) decisions including the Paris Agreement, Warsaw Framework for REDD+, and the Cancún Safeguards, which establish environmental, social, and governance principles countries are expected to uphold when undertaking REDD+ activities, in particular to ensure the recognition, respect, protection, and fulfillment of the rights of indigenous peoples and local communities.
3. Embody high environmental integrity, which includes accounting for the uncertainty of data and the risks of leakage and reversals, the avoidance of double counting, and result in issued units that are interchangeable with ER units from other sectors;
4. Promote national ambition and contribute to Paris Agreement goals including progress toward the fulfillment of Nationally Determined Contributions (NDCs);
5. Credit ERs at the national level or subnational level as a time-bound interim measure only where it represents high ambition and large scale and is recognized as a step toward national-level accounting; and
6. Set crediting baselines for deforestation and degradation that initially reflect historical emission levels and thereafter decline periodically to require higher ambition over time.”

The REDD+ Environmental Excellence Standard (TREES) sets out ART requirements for the quantification, monitoring, and reporting of GHG emissions and removals; demonstration of implementation of the Cancún Safeguards; and verification, registration, and issuance of TREES credits. TREES has been designed to ensure that all TREES credits issued are real, measured, permanent, additional, net of leakage, verified by an accredited independent third party, and are not double counted. As a result, TREES credits will represent high quality while

still allowing flexibility for implementation of REDD+ programs at a national level or subnational as an interim measure.

1.2 ART GOVERNANCE

ART will be governed by the ART Board and managed by the ART Secretariat.

The ART Board is responsible for:

- Approving TREES, TREES Validation and Verification Standard and future Standard version or revisions
- Approving issuance of TREES credits
- Making final decisions on disputes

The ART Board is comprised of members serving in their individual capacities and operates in accordance with the ART Board Charter and the ART Ethical Standards

THE ART SECRETARIAT

The ART Secretariat is responsible for:

- Drafting, maintaining, and revising Standards for ART Board approval
- Developing documentation templates and guidance documents
- Convening technical committees as deemed necessary by the ART Board
- Conducting desk reviews to assess eligibility and compliance of Participants requesting admittance into ART and approving admittance into ART
- Overseeing independent verification
- Reviewing Participants' monitoring reports and third-party verification documents
- Making recommendations to the ART Board on issuance of TREES credits
- Developing and maintaining the ART Registry and website

1.2.1 Development Process for TREES

TREES 1.0 and TREES Validation and Verification Standard were developed with support and input from three expert committees:

- The TREES Standards Committee

- The TREES Verification Committee
- The TREES Safeguards Committee

TREES 2.0 was developed with support and input from two additional expert committees:

- The TREES HFLD Committee
- The TREES Removals Committee

The Committees were composed of appointed independent experts with deep understanding and knowledge of REDD+, each serving in a personal capacity. Committee members provided expert advice and guidance for development of TREES; however, the Standard does not reflect consensus opinions of the committees or necessarily the opinions of individual committee members.

1.2.2 Adoption of and Revisions to TREES

The ART Secretariat and ART Board will conduct a review of TREES at a minimum of every three years and update the Standard if deemed necessary, including input from technical expert committees and stakeholders as well as relevant decisions of the UNFCCC.

The Secretariat will solicit broad stakeholder input to TREES and future updates and revisions to TREES through a public comment period. TREES will be posted publicly for stakeholder review and consultation for at least 60 days prior to review by the Secretariat and Board. The Board will consider stakeholder comments and make decisions on any changes prior to adoption and publication of TREES. The Secretariat will prepare responses to submitted comments and post on the ART website the comments and responses along with the Board-approved version of the Standard.

When a new version of TREES is approved by the Board, current Participants will have three options:

1. Continue to use the version of the Standard that was in place at the time of initial submittal of documentation to ART for the remainder of the crediting period. At the start of the next crediting period, the latest version of TREES must be adopted.
2. Continue to use the version of the Standard that was in place at the time of initial submittal of documentation to ART for the current crediting period *except* where the new TREES explicitly specifies where new or revised provisions may be adopted that do not affect the crediting level. Adopted provisions must be in place at the time of next reporting to ART. At the start of the next crediting period, the latest version of TREES must be fully adopted.
3. Begin a new crediting period upon publication of the new version of TREES and update to all provisions and requirements of the new version of TREES, including any changes to the crediting level.

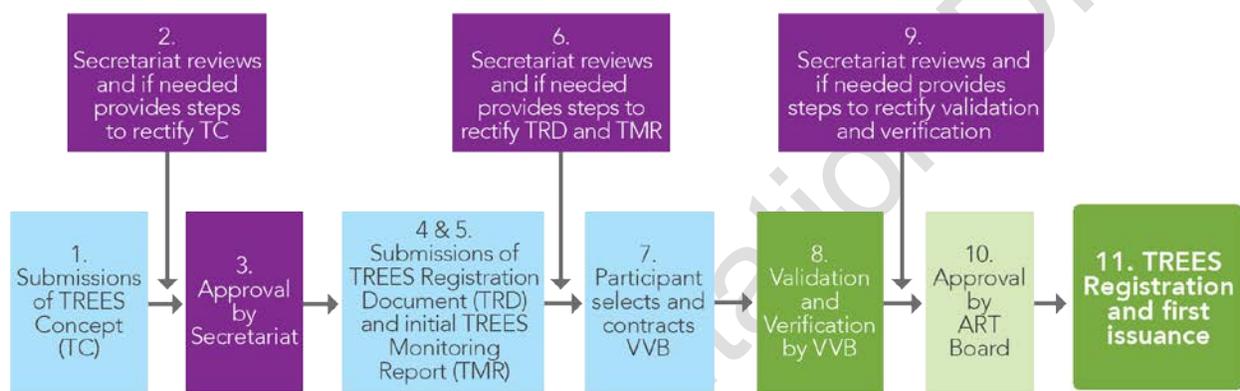
1.3 CONFLICT OF INTEREST

To ensure all ART Board members and the ART Secretariat are held to the highest standards for ethics and professional conduct and for avoidance of conflicts of interest, Board members and Secretariat staff shall be subject to the ART Ethical Standards. The Secretariat is also subject to the Conflict of Interest policy as detailed in Winrock's Code of Conduct. Each Board member and Secretariat staff member is required to regularly affirm in writing that they are in compliance with this policy, that they disclose, avoid and mitigate all Conflicts of Interest, and that they take reasonable action to avoid circumstances that create the appearance of a Conflict of Interest. Board and Secretariat members are required to notify the Winrock Chief Ethics and Compliance Officer immediately if any Conflict of Interest situations arise or come to their attention, so the conflict can be appropriately mitigated. The Officer will consider any mitigation proposed and will make a recommendation to the Board for the Board's action.

In addition to its internal Conflict of Interest policy, ART requires that all approved Validation and Verification Bodies meet Conflict of Interest requirements described in the TREES Validation and Verification Standard, and that they execute an Attestation of Validation and Verification Body, which includes detailed and comprehensive Conflict of Interest provisions. ART-approved Validation and Verification Bodies must also execute a Participant-specific TREES Validation and Verification Conflict of Interest Document for each reporting period verified, which the Secretariat reviews and approves.

2 ART CYCLE

2.1 PROCESS FOR INITIAL REGISTRATION, VALIDATION, VERIFICATION, AND ISSUANCE



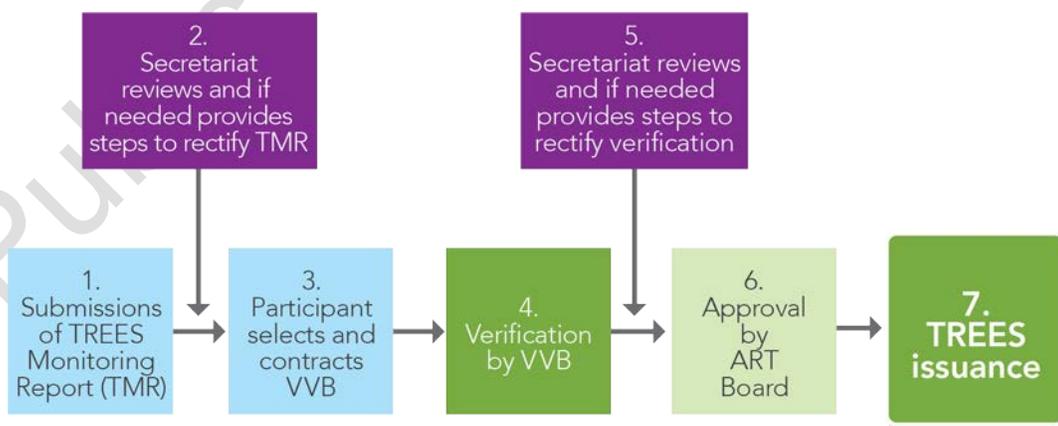
The process to enter ART using TREES requires approval of a TREES Concept, a successful initial Validation and Verification, and TREES Registration. An applicant shall be a national government entity or an eligible subnational Participant in accordance with the requirements set forth in Section 3 and will hereafter be referred to as a Participant. Each Participant shall complete the following steps prior to receiving credits.

1. The Participant submits a TREES Concept to the Secretariat for review. The TREES Concept includes information listed in Annex A.
2. The ART Secretariat reviews the TREES Concept for completeness and will request revisions as needed.
3. The Secretariat approves the inclusion of the Participant in ART.
4. Following approval, the Participant's TREES Concept is referenced in the ART Registry as Listed.
5. The Participant submits the TREES Registration Document and the initial TREES Monitoring Report covering the initial calendar year(s) to the Secretariat for a completeness check. The TREES Registration Document and the TREES Monitoring Report include information listed in Annex A.
6. The Secretariat reviews the TREES Registration Document and TREES Monitoring Report for completeness and will request revisions as needed. The Secretariat then

approves the TREES Registration Document and TREES Monitoring Report for validation and verification.

7. The Participant selects a Validation and Verification Body from the list of approved ART Validation and Verification Bodies maintained on the ART website. The Participant solicits bids and negotiates contracts directly with the selected Validation and Verification Body. The selection process will include a disclosure of conflicts of interest and mitigation measures, if conflicts are identified.
8. The Validation and Verification Body conducts the validation of the TREES Registration Document and the verification of the TREES Monitoring Report in line with the requirements of Section 14 of this Standard and the TREES Validation and Verification Standard.
9. The Validation and Verification Body submits the Validation and Verification Report and Verification Statement to the Secretariat who reviews the documents to ensure completeness. The Secretariat will request revisions as needed.
10. The Secretariat submits the Participant’s final package and a recommendation to the ART Board for approval. The Board requests additional information as appropriate and approves the credit issuance.
11. Following Board approval, the Participant’s TREES Registration Document and Monitoring Report are referenced in the ART Registry as Registered and TREES credits are issued based on the initial verification. If the Participant has demonstrated conformance with the High Forest Cover/Low Deforestation (HFLD) criteria, credits issued will be labeled as HFLD credits.

2.2 PROCESS FOR ONGOING VALIDATION, VERIFICATION, AND ISSUANCE



1. The Participant submits a TREES Monitoring Report to the ART Secretariat for review following calendar years 1, 3, and 5 of each crediting period. A TREES Monitoring

Report may optionally be submitted following calendar years 2 and 4 as outlined in Section 14. At the start of each new crediting period, an updated TREES Registration Document must also be completed and submitted by the Participant. The revised TREES Registration Document is then also included in all following steps and is validated rather than verified.

2. The Secretariat reviews the TREES Monitoring Report for completeness. The Secretariat then approves the TREES Monitoring Report for verification.
3. The Participant selects a Validation and Verification Body from the list of approved ART Validation and Verification Bodies maintained on the ART website. The Participant solicits bids and negotiates contracts directly with the selected Validation and Verification Body. The selection process will include a disclosure of conflicts of interest and mitigation measures, if conflicts are identified.
4. The Validation and Verification Body conducts the verification of the TREES Monitoring Report in line with the requirements of Section 14 of this Standard and the TREES Validation and Verification Standard. If required, the Validation and Verification Body also conducts a validation of the revised TREES Registration Document in line with the requirements of the TREES Validation and Verification Standard.
5. The Validation and Verification Body submits the Verification Report and Statement and, if required, the Validation Report to the Secretariat who reviews the documents for completeness. The Secretariat will request revisions as needed.
6. The Secretariat submits the Participant's final package and its recommendation to the ART Board for approval. The Board requests additional information as appropriate and approves the credit issuance.
7. Following Board approval, TREES credits are issued based on the verification. If the Participant has demonstrated conformance with the HFLD criteria, credits issued will be labeled as HFLD credits.

2.3 CREDITING PERIOD AND RENEWAL

The crediting period under TREES shall be five calendar years. The initial crediting period may begin up to four calendar years prior to the year the Participant submits the TREES Concept Note but may not overlap with the historical reference period used to determine the initial Crediting Level. All subsequent crediting periods shall begin on the date following the end date of the previous crediting period. The crediting period may be less than 5 years only in cases where the Participant is subnational, and must therefore terminate its crediting period on December 31, 2030, per section 3.1.1 of this Standard.

The crediting period renewal process occurs as outlined in Section 2.2. The Participant shall submit a revised TREES Registration Document for validation following the first year of a new crediting period, along with its Year 1 TREES Monitoring Report for verification. The Crediting Level shall be recalculated in accordance with Section 5.

2.4 DOCUMENTATION REQUIREMENTS

Participants shall use the latest version of the template for each of the seven documents listed below when submitting documents to ART. Revised templates will be published three months prior to the date that they are required for use and version updates will not be required once a document has been submitted to the ART Secretariat or Validation and Verification Body.

Templates of all forms are available on the ART website. All sections of the template must be completed. In some instances, an alternative form of reporting may be acceptable for certain portions of the requirements to prevent a Participant from duplicating efforts. Approved exceptions are noted in the templates and when appropriate, a reference to the alternative reporting may be included.

The TREES documents are:

1. TREES Concept
2. TREES Registration Document
3. TREES Monitoring Report
4. TREES Validation and Verification Conflict of Interest Document
5. TREES Validation Report
6. TREES Verification Report
7. TREES Variance Request Form

A summary of the information required in each is provided in Annex A. Instructions and additional information are included in each document template.

2.5 TIMELINE AND DEADLINES

Proposed Participants may submit the TREES Concept at any time. The ART Secretariat shall acknowledge receipt of the documentation. The Secretariat will then conduct a desktop review of the TREES Concept and either approve the documentation or provide a request for revision within 20 business days of receipt.

Following approval of the TREES Concept, the Participant may submit the TREES Registration Document and initial TREES Monitoring Report. The initial TREES Monitoring Report may cover multiple calendar years if the Participant submits a TREES Concept with a start date prior to the year of submission. In all cases, each TREES Monitoring Report shall document ERRs allocated to each calendar year.

Subsequent TREES Monitoring Reports shall be submitted within twelve months following calendar years 1, 3, and 5 of each crediting period and shall document one calendar year or two calendar years. TREES Monitoring Reports may optionally be submitted following calendar years 2 and 4 of the crediting period.

Upon submission of the Participant's documentation, the Secretariat will conduct a desktop review of the TREES Reporting Document or TREES Monitoring Reporting and either approve the documentation as complete or provide a request for revision within 20 business days of receipt.

The TREES Validation and/or Verification Report and TREES Verification Statement must be submitted to the ART Secretariat within 12 months of the kickoff of the validation or verification unless an extension is granted in writing. Validation and verifications will follow the process outlined in Section 14.

Upon receipt of the TREES Validation and/or Verification Report and TREES Verification Statement, the Secretariat will conduct a desktop review of the documents and either approve the documentation as complete or provide a request for revision within 40 business days.

The Secretariat will present a recommendation to the ART Board for issuance of credits to Participants. The Board will request additional information or approve the credit issuance at the next Board meeting.

Stakeholders can submit comments and feedback to ART on an ongoing basis by contacting the ART Secretariat. In addition, subscribers to the ART listserv shall receive notification of the availability of new and relevant Participant documentation as it becomes publicly available to ensure that stakeholders have ample opportunity to submit comments to ART regarding these submissions. Comments submitted within 30 days of notice will be directed to the Participants to be addressed and will also be provided to the Validation and Verification Body at the beginning of Validation and Verification.

3 ELIGIBILITY/APPLICABILITY/KEY REQUIREMENTS

3.1 ELIGIBLE ENTITIES

Participants shall be national governments (i.e., the highest level of government that exists in the country), subnational governments no more than one level down from national level, or recognized indigenous communities provided the requirements in section 3.1.1 are met. No scale thresholds apply to national participants with national accounting areas.

While ART does not directly credit projects or similar smaller-scale activities, ART recognizes that Participants will work with the private sector, communities and other stakeholders to design and implement successful programs. ART does not prescribe how such activities must be nested or incorporated into national or subnational programs in order to allow each Participant to determine the arrangement that is best for their individual needs.

3.1.1 Subnational accounting

During an interim period through December 31, 2030, subnational accounting areas may be registered under ART as a recognized step to national-level accounting. After the interim period, accounting shall be at a national level.¹ Participants registering subnational accounting areas may be a national government, a subnational government, or a recognized indigenous territory.

Where subnational accounting areas are registered either by a national government or by a subnational government:

- The boundaries of a subnational accounting area shall correspond with the entire area of one or several administrative jurisdictions no more than one level down from national level and one or several recognized indigenous territories; AND
- Participating subnational jurisdiction(s) must be comprised of a total forest area of at least 2.5 million hectares; AND
- The crediting period for subnational accounting Participants shall end on December 31, 2030 regardless of how many years have passed in the crediting period.

Where subnational accounting areas are registered by a recognized indigenous territory:

¹ National scale Participants should make efforts to include 100% of forest areas in accounting. However, national scale accounting shall be defined as $\geq 90\%$ of all areas in the country qualifying as forest under the national forest definition as described in Section 3.5. Areas excluded must be justified (i.e., they are isolated, patchy and historically not subject to deforestation rates of less than half of the national rate).

- The boundaries of a subnational accounting area shall correspond with the entire area of the territory; AND
- Participating territories must be comprised of a total area (forest and non-forest) of at least 2.5 million hectares; AND
- The crediting period for subnational accounting Participants shall end on December 31, 2030 regardless of how many years have passed in the crediting period.

Where the TREES Participant is not a national government, the national government must provide the Participant with a letter from the relevant national entity authorizing the Participant's application to and participation in ART. The letter will attest that the national government will support the Participant by aligning accounting and reporting as required under the Paris Agreement and towards NDCs, including addressing double counting provisions outlined in Section 13 of this Standard and other relevant provisions. The letter will also detail any special requirements for and exceptions to the authorization. A template for this letter will be provided on the ART website.

3.1.2 National reporting requirements

TREES Participants shall include forests in their NDCs².

In addition, Participants must demonstrate conformance with Cancún Safeguards related requirements, including:

1. Having addressed and respected the safeguards (Section 12),
2. Having submitted the most recent Summary of Information to the UNFCCC for any year where results-based payments under TREES are sought, and
3. Having either a digital or analog system for providing information on safeguards.

If a TREES Participant is a subnational government or indigenous community, the Participant must demonstrate conformance with Cancún Safeguards related requirements, including:

1. Having addressed and respected the safeguards at the scale of REDD+ implementation applicable to the Participant in consistency with national legislation and/or safeguards conformance at the national level (Section 12),
2. Having submitted a Summary of Information or safeguards report at the respective scale that is consistent with national reporting to the UNFCCC for any year where results-based payments under TREES are sought, and

² Forests must be included as part of the overall NDC target. A specific NDC target for forests is not required.

3. Demonstrating safeguards tracking and/or monitoring tools are consistent with national tracking or tools, in particular with the national system for providing information on safeguards when available.

3.2 ELIGIBLE ACTIVITIES

All REDD+ activities are eligible under TREES except enhancement from forests remaining forests.

Each TREES Participant shall submit a REDD+ implementation plan as part of the initial documentation and each subsequent TREES Monitoring Report which outlines the new and ongoing programs or activities including locations planned to achieve the ERRs. It is expected that the implementation plan will be the National REDD+ Strategies/Action Plan developed in accordance with the Warsaw Framework. If a different implementation plan is submitted under TREES, the Participant must explain any differences between the two plans. In the case when a Participant is using a subnational accounting area, the Participant must specify which REDD+ interventions from its National REDD+ Strategies/Action Plan are relevant to the subnational accounting area.

3.3 ADDITIONALITY

Additionality under TREES uses a performance-based approach in that only emissions achieved below a conservative historical crediting level and removals achieved any year above a historical crediting level will be eligible for crediting. In this way, additionality will be ensured by issuing only TREES credits that are below historical forest emissions and in excess of historical removals. Only reported emission reductions and removals that are verifiably better than the TREES Crediting Level will be eligible for receiving TREES credits.

3.4 FOREST DEFINITION

The forest definition or definitions listed in the TREES Registration Document must be consistent with the most recent definition used by the national government in reporting to the UNFCCC. The same forest definition must be used for each full TREES Crediting Period.

3.5 NO EX-ANTE CREDITING

ART will not issue TREES credits for ERRs that have not yet occurred or that have not yet been verified by an ART-approved Validation and Verification Body.

3.6 REGULATORY COMPLIANCE

In each TREES Monitoring Report, Participants must attest that REDD+ activities conducted as part of the Participant's REDD+ implementation plan to achieve ERRs are in compliance with applicable laws and regulations. Any known instances of non-compliance or violations with laws, regulations, or other legally binding mandates directly related to REDD+ activities must be disclosed in the TREES Monitoring Report along with corrective or preventive plans or actions.

3.7 EARLIEST CREDITING PERIOD START DATE AND VINTAGE

Participants may claim TREES credits for emissions reductions that occurred up to four calendar years prior to the year of submittal of the TREES Concept, provided all other requirements under TREES are met for each year of crediting.

4 CARBON ACCOUNTING

The TREES Credit is a greenhouse gas emission reduction or removal enhancement, denominated in metric tons of CO₂e, quantified and verified pursuant to TREES that is serialized and issued on the ART Registry as a TREES Credit.

TREES requires alignment with the most recent Intergovernmental Panel on Climate Change (IPCC) guidance and guidelines endorsed by the Conference of the Parties to the UNFCCC (including subsequent refinements), except where other methods are explicitly allowed under the Standard.

IPCC Guidelines are not specific to the purpose of REDD+ related estimation/reporting and may not systematically provide a necessary level of detail or specification. Therefore, other sources for best practices should be referenced.³

Participants must demonstrate that all carbon estimation and quantification approaches conform with best practices for all matters. Details of each method, including an explanation of why the method was selected for use, and descriptions of how data were interpolated or prorated by calendar year, must be provided in the TREES Registration Document, and any updates to measurements and methods must be detailed in the TREES Monitoring Report.

ART requires Participants to calculate GHG reductions based on the 100-year Global Warming Potentials (GWPs) in the IPCC Fourth Assessment Report⁴ for emission reductions that occur until December 31, 2020, and any emission reductions that occur after that date shall use the IPCC Fifth Assessment Report⁵

4.1 ACCOUNTING REQUIREMENTS

Following IPCC guidelines, GHG emissions for a given period shall be the product of activity data multiplied by emission factors, such that

$$\text{Greenhouse Gas Emissions (t CO}_2\text{e)} = \text{Activity Data (units of activity)} \times \text{Emission Factor} \left(\frac{\text{t CO}_2\text{e}}{\text{unit of activity}} \right)$$

³ For example, see [The Global Forest Observation Initiative Methods and Guidance, GOFI-GOLD REDD Sourcebook](#), and [The Sourcebook for Land Use, Land Use Change, and Forestry Projects](#).

⁴ IPCC, 2007: Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp.

⁵ IPCC, 2014: *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp..

Only anthropogenic emissions shall be considered, and IPCC guidance shall be adhered to on any exclusion of non-anthropogenic emissions.

GHG removals for a given year shall be the product of activity data multiplied by removals factor by the time elapsed since the activity began, such that

$$\text{Greenhouse Gas Removals (t CO}_2\text{e)} \\ = \text{Activity Data (units of activity)} \times \text{Removal Factor} \left(\frac{\text{t CO}_2\text{e}}{\text{unit of activity per year}} \right) \times \text{Time (years)}$$

4.1.1 Activity Data

Activity data may be derived from remote sensing data or from verifiable ground-derived data. Activity data must be reported in each TREES Monitoring Report at the intervals specified in Section 2.5.

The TREES Registration Document and TREES Monitoring Report must provide descriptions of the methods used to establish activity data, with sufficient details to enable replication by a verifier. This includes:

- Standard Operating Procedures or methodological protocols for all measurements, calculations, and sample designs
- Verifiable training procedures
- Quality Assurance/Quality Control (QA/QC) procedures for all measured data

Data collected before the Participant joined ART are not required to meet these requirements. However, data collected after the Participant joins ART must meet these requirements.

The focus under TREES is the GHG associated with land cover changes; however, for deforestation, *land use change* is the emphasis, and methods shall demonstrate that recorded deforestation is associated with land use change. Temporal dynamics of land use and land cover change must be considered to avoid the possibility of double counting, such as in cyclical systems like timber or tree crop harvest rotations, and shifting cultivation/fallow systems, so that emissions following temporary forest clearing are not counted more than one time.

Deforestation in natural forest and planted forest should be assessed and reported on separately as planted forests may not have reached its mature carbon stocks by the time of the clearing.

Any changes in approaches over time must ensure spatial and temporal consistency of activity data estimation, be documented in subsequent TREES Monitoring Reports, and be reviewed to ensure conformance with the requirements in this section at the verification event that follows the update.

Where activity data are sourced from remote sensing, area estimates and confidence intervals must be reported.

When employing remote sensing approaches to derive activity data, the following conditions apply:

Conditions for all remote sensing approaches:

1. More than one interpreter must analyze the reference data, and majority agreement must be used for the final reported data.
2. The analyses must be in accordance with forest definition thresholds applied by the Participant.

Conditions specific to stratified area estimates approach:

1. The distribution of samples per class should be as close as possible to a proportional distribution (Pagliarella et al 2017). Where this is not possible, it is recommended to construct strata that correspond directly to map classes by splitting larger strata (typically the forest stratum) into a smaller substratum that is likely to contain the omissions of the activities of interest and a larger substratum that is unlikely to contain omission errors (Olofsson et al 2020).
2. Detailed information shall be reported as follows:
 - a. the error matrix including all classes used in the analysis;
 - b. the map areas for all classes;
 - c. the user- and producer accuracy of the classes used for activity data reporting;
 - d. any additional details on the sample design, e.g. the use of a buffer.

Conditions specific to systematic or random sample approach:

1. Detailed information shall be reported as follows:
 - a. the equation used for establishing the sample size;
 - b. evidence that the sample size captures the feature of interest without bias;
 - c. when using a random sample, a description of the software or method used to determine the sample locations;
 - d. when using a systematic sample, provide a rationale for selecting the location of the initial sample unit, which determines the location of all other sample units
 - e. when sampling is intensified, a map with the strata used for intensification must be provided along with an explanation of why sampling was intensified. A table with all strata including the size of each and number of units sampled must also be provided
2. When the systematic or random sample is post-stratified, provide all details as follows:
 - a. the error matrix including all classes used in the analysis;
 - b. the map areas for all classes;
 - c. the user- and producer accuracy of the classes used for activity data reporting;
 - d. any additional details on the sample design, e.g. the use of a buffer

Conditions specific to pixel counts from wall-to-wall maps:

1. An accuracy assessment must be provided and pixel counts may only be used if the pixel count area estimate is within the confidence interval of the stratified area estimate;
2. The stratified area estimates (bias-corrected area estimates) of the map classes must be used as activity data. Detailed information shall be reported as follows:
 - a. the error matrix including all classes used in the analysis;
 - b. the map areas for all classes;
 - c. the user- and producer accuracy of the classes used for activity data reporting;
 - d. any additional details on the sample design, e.g. the use of a buffer.

Where activity data result from ground-derived data—including official industry or government records and statistics (e.g., harvested volumes)—information used is subject to verification, and a quantified estimate of uncertainty must be derived and reported.

4.1.2 Emission Factors

Emission factors are the GHG emissions per unit of activity data. Factors shall be the net carbon stocks in the post deforestation or post degradation land use (e.g. the carbon stock pre-deforestation subtracted from the carbon stock in land use observed post-deforestation).

Emission factors and components of emission factors can be derived from several data sources including on-the-ground plot measurements and inventories, peer-reviewed literature, use of models and, where allowable, use of default factors such as IPCC Tier 1. All methods used for estimating emission factors shall be justified and sufficiently detailed in the TREES Registration Document to allow traceability of information to the source during verification. Confidence intervals from sampling errors associated with the estimated emission factors shall be reported and included in uncertainty estimations.

Under TREES, IPCC Tier 1 methods and defaults may only be used for emissions accounting for secondary pools and gases (in Section 4.5), or to estimate post emission carbon stocks⁶ and to estimate emissions resulting from *minor* activities (considered to be any activity contributing an equivalent of less than 3% of reported emissions; see Section 4.4).

Models and equations may be used where justified, but shall be peer-reviewed, and demonstrated to be applicable (and where necessary, parameterized) to the specified use/geographical region, and must adhere to IPCC Tier 2 and Tier 3 methods.

Emission factors derived from existing ground-plot measurements and jurisdiction-wide forest inventory data must report:

⁶ Post deforestation and non-forest stocks may be derived from literature sources or direct measurements.

- Standard Operating Procedures or methodological protocols for all measurements, calculations, and sample designs
- Verifiable training procedures
- Quality Assurance/Quality Control (QA/QC) procedures for all measured data

Measurements taken before the Participant joined ART are not required to meet these requirements. However, measurements collected after the Participant joins ART must meet these requirements.

Post-emission event removals need not be tracked year-by-year; instead, the long-term average⁷ post-emission carbon stock can be used when establishing emission factors. In cases where the post-emission (deforestation and degradation) land use includes periodic harvest cycles (e.g., timber harvests, crop harvests, or shifting agriculture/fallow systems) the long-term average carbon stock of one full rotation shall be used. In cases where the national GHG inventory uses annualized accounting of post-deforestation carbon stock changes, the same approach shall be used under TREES. In instances where the post-deforestation land use carbon stock is higher than the pre-deforestation carbon stock, there can be no crediting for the net sequestration. Instead the emissions shall be treated as zero.

All emissions can be taken immediately at the time of the activity data for the purpose of simplified accounting except for emissions from peat soils. For peat soils a methodology for tracking emissions through time both for the crediting level and during reporting periods must be presented.

Emission factors shall be reevaluated and where necessary updated every five years in line with Crediting Level updates.

4.1.3 Removal Factors

Removal factors are the GHG removals per unit of activity data per year since the start of the reforestation / forest restoration activity.

Removal factors and components of removal factors can be derived from several data sources including on-the-ground plot measurements and inventories, peer-reviewed literature, use of models and IPCC Tier 1 default factors. IPCC Tier 1 default factors may be used in all instances for removals but must be shown to be conservative through on-the-ground measurements or country-specific peer-reviewed literature. All methods used for estimating removal factors shall be justified and sufficiently detailed in the TREES Registration Document to allow traceability of information to the source during verification. Confidence intervals from sampling errors associated with the estimated removal factors shall be reported and included in uncertainty estimations. Models and equations may be used where justified, but shall be peer-reviewed,

⁷ Typically defined as over 20 years.

and demonstrated to be applicable (and where necessary, parameterized) to the specified use/geographical region, and must adhere to IPCC Tier 2 and Tier 3 methods.

Emission factors derived from existing ground-plot measurements and jurisdiction-wide forest inventory data must report:

- Standard Operating Procedures or methodological protocols for all measurements, calculations, and sample designs
- Verifiable training procedures
- Quality Assurance/Quality Control (QA/QC) procedures for all measured data

Measurements taken before the Participant joined ART are not required to meet these requirements. However, measurements collected after the Participant joins ART must meet these requirements.

Removal factors shall be reevaluated and where necessary updated every five years in line with Crediting Level updates.

4.2 STRATIFICATION

When stratification is employed, Participants shall:

- Document the stratification criteria and procedure in the TREES Registration Document and TREES Monitoring Report
- Document the procedure for updating the stratification over time, when applicable
- Maintain records of stratification work and any changes made over time, including maps and relevant files

4.3 LAND-BASED VERSUS ACTIVITY-BASED ACCOUNTING

Both land-based and activity-based accounting are accepted under TREES.

For activity-based accounting, Participants must demonstrate that no potentially significant source of emissions has been overlooked (see Section 4.4).

For land-based accounting, Participants must be able to attribute emissions to anthropogenic sources and have in place the means to add new forest areas (specified in stratification plans) where reforestation is occurring in the country in order to capture removals and any future emissions from areas that have regenerated after initial registration.

Uncertainty analyses must be able to determine the uncertainty associated with activity data and emission factors for the selected accounting approach (i.e., land-based accounting or activity-based accounting).

4.4 SCOPE OF ACTIVITIES

TREES incorporates accounting for emissions and removals as outlined in section 3.2. Emissions across activities shall be summed.

Emissions from forests remaining forests must be included unless exclusion can be demonstrated to be conservative. This may occur where it can be demonstrated that gross annual emissions from forests remaining forests are higher in the prior five years than will occur under the current TREES crediting period. A new analysis shall be conducted at the start of each crediting period, including the first crediting period.

Emissions from forest degradation can also be excluded where emissions total $< 10\%$ of reported deforestation emissions. In cases where activity-based analysis is conducted, individual forest emission activities (e.g., timber harvest or fuel wood collection) can be excluded where considered minor, such that Tier 1 (or better) estimation of emissions are $< 3\%$ of reported deforestation emissions during the reference period as long as the sum of excluded activities remains $< 10\%$ of reported deforestation emissions. The estimates used in this justification shall be updated at the beginning of each crediting period to demonstrate leakage is not occurring. If reported emissions indicate an increase in an activity that was excluded in the initial Crediting Level, the activity must be added to the TREES Crediting Level at the next update as described in Section 5.3.

Removals may be excluded in all instances but must be excluded where the net emissions from all other activities exceeds the crediting level.

4.5 SCOPE OF POOLS AND GASES

The pools under TREES are:

PRIMARY	Aboveground live tree biomass	<i>part of IPCC - AGB</i>
	Soil organic matter (peat soils)	<i>part of IPCC – SOM</i>
SECONDARY	Belowground live tree biomass	<i>part of IPCC - BGB</i>
	Standing dead wood	<i>part of IPCC - DW</i>
	Down dead wood	<i>part of IPCC - DW</i>
	Litter/forest floor	<i>IPCC - L</i>
	Non-tree live biomass	<i>part of IPCC - AGB</i>
	Soil organic matter (mineral soils)	<i>part of IPCC - SOM</i>

IPCC carbon pool categories given for the purpose of cross-walking. AGB – above-ground biomass; BGB – below-ground biomass; DW – dead wood; L – litter; SOM – soil organic matter.

Pools not listed here are excluded, including for example harvested wood products.

The gases under TREES are:

PRIMARY	Carbon dioxide (CO ₂)
SECONDARY	Methane (CH ₄)
	Nitrous oxide (N ₂ O)

Estimates of changes/emissions from the primary pools/gas must result from IPCC Tier 2/3 methods. All other pools and gases may be excluded where conservative OR where the associated emission is equivalent to less than 3% of emissions (and the sum of emissions from excluded pools and gases does not exceed 10% of emissions). If included, secondary pools/gases may be calculated using literature or IPCC Tier 1 calculation approaches, but the approach used may not be at a lower tier than that used in the national inventory. The pools included shall remain fixed for each crediting period and once included, pools may not be excluded in future crediting periods.

5 CREDITING LEVEL

5.1 CALCULATING A TREES CREDITING LEVEL FOR EMISSIONS

For each crediting period Participants shall calculate an emissions Crediting Level from the average of emissions during a historical period.

The reference period for the Crediting Level under TREES shall be 5 calendar years. It must be demonstrated that there is no bias in the selection of data used to calculate the Crediting Level, and interpolation is permissible in cases where data does not coincide with the specified calendar years. The reference period may not overlap with the crediting period and there may be no gaps between the end of the reference period and the start of each TREES crediting period as defined in Section 2.3. The initial crediting period start date shall not be more than four calendar years prior to the year of submittal of the TREES Concept.

The TREES Crediting Level shall be updated every five calendar years starting with the first year of crediting. An updated crediting level may not be higher than the previous crediting level. If a new crediting level value is greater than the previous crediting level value, the previous crediting level must be used for the new crediting period. When a new pool or activity is added the new crediting level must be calculated with the new pool or activity included in the 5-year reference data. This represents the only circumstance in which a crediting level could rise from one crediting period to the next.

Equation 1

$$CL_n = \frac{rE_n}{5yr}$$

WHERE:

CL_n	Crediting Level for crediting period n ; t CO ₂ e/yr
rE_n	Summed emissions during period n in the historical reference period t ; CO ₂ e

5.2 CALCULATING A TREES CREDITING LEVEL FOR HFLD PARTICIPANTS (OPTIONAL APPROACH)

Participants meeting the definition of high-forest, low-deforestation (HFLD) outlined in Section 9 may optionally use the following approach to determine their crediting level.

To establish the HFLD Crediting Level, Participants must determine a linear trend line based on historical emissions that can be extrapolated over the 5-year crediting period to establish the Crediting Level. The trend line must be developed using a quantile regression based on the median, or 0.5 quantile. The trend line must be based on at least seven (7) data points obtained over no more than 15 years immediately prior to the Crediting Period. Participants may not omit data points from the reference period and the final data point used must be no more than two years prior to the start of the Crediting Period⁸.

In addition, Participants may optionally claim removals from the greenhouse gas storage that would have occurred during the crediting period in forest that would have been lost in the absence of the REDD+ program. In order to quantify these lost removals, the Participant must follow these steps:

1. Estimate the area of forest that would have been deforested during each year of the crediting period by applying a projected deforestation rate (employing the quantile regression described above) per stratum.
2. Subtract the actual area of deforestation from the projected area of forest that would have been deforested.
3. Multiply area of avoided deforestation per stratum calculated in step 2 by an applicable removal factor.
4. Sum the removals across strata to determine total foregone sequestration as a result of REDD+ program implementation.

The foregone removals rate can be derived from measurements in forests within the Participant's jurisdiction. Alternatively the Participant may use the relevant default from the IPCC (Table 2.9 of Volume 4 of the [2019 Refinement to the Guidelines for National Greenhouse Gas Inventories](#)).

⁸ A quantile regression tool will be made available on the ART website to assist Participants with determining the linear trend.

5.3 CALCULATING A TREES CREDITING LEVEL FOR REMOVALS

In order to be eligible for crediting from removals, Participants must have successfully reduced emissions from deforestation and degradation below the TREES Crediting Level (at the time of the most recently verified TREES Monitoring Report). Removals from the conversion of non-forest to forest are eligible under TREES.

The crediting level for removals consists of an average annual area of conversion from non-forest to forest land during the 5 calendar-year reference period. Annual areas converted from non-forest to forest during the crediting period are eligible for crediting. Annual areas of conversion of non-forest to forest land can be derived from remote sensing and/or verifiable recorded statistics, but the source of activity data must be consistent between the reference period and the crediting period. Annual areas of non-forest converted to forest land shall either be recorded or interpolated.

Stratification of areas between “types” of conversion to forest land is advised, and at a minimum stratification between commercial forest and natural forest restoration is suggested.

Commercial forest is defined as any homogeneous tree planting or forest regeneration with the purpose of timber, fiber, fruit or tree sap harvest for a commercial local, national or international market.

Natural forest restoration is defined as tree planting or natural regeneration of native species with the intention of restoring natural forest cover, without a commercial purpose.

Strata should be associated with unique removals factors (see Section 4.1.3). Where separate factors do not exist for a given stratum, strata shall be combined as needed so unique removal factors are applied to each stratum.

If stratification clearly distinguishes the areas of natural forest restoration, they can be excluded from additional crediting level analysis. All new areas of natural forest regeneration reported under ART are eligible for crediting

For strata which include commercial forest planting and restoration, the crediting level shall be established using an average of the annual area of conversion of non-forest to forest. This annual average area of non-forest to forest land conversion shall serve as the crediting level for removals crediting.

In any given year of the crediting period, areas of non-forest converted to forest land that exceed the crediting level area shall be multiplied by the removals factor for that stratum to estimate the net⁹ carbon removals eligible for crediting. This eligible area will be recorded and

⁹ Removals must be net of pre-existing vegetation prior to planting or restoration.

maintained in an ‘ongoing removals stratum’ annually to estimate the additional annual total of removals.

For each hectare of planted and restored forest (natural or commercial) that is subsequently recorded as being deforested, one hectare shall be removed from the area maintained in the ‘ongoing removals stratum’ used to calculate additional annual removals. Where possible this shall be justifiably assigned to a comparable non-forest to forest stratum. When using stratified area estimates, or systematic or random sample based remote sensing approaches to estimate activity data, it shall be conservatively assumed the loss impacts the stratum with the highest removal factor.

If an area that is being credited for removals under ART is converted back to non-forest, these emissions must be reported as deforestation emissions in next monitoring report submitted to ART.

Equation 2

Where removals are demonstrably from natural forest regeneration $RRA_{n,x} = 0$. Otherwise:

$$RRA_{n,x} = \frac{rA_{n,x}}{5yr}$$

WHERE:

$RRA_{n,x}$	Reference Removal Area for stratum x during period n in the historical reference period; ha/yr
$rA_{n,x}$	Area of conversion of non-forest to forest in stratum x during period n in the historical reference period; ha

6 MONITORING

6.1 MONITORING PLAN

Each TREES Participant shall develop a monitoring plan as part of the TREES Registration Document. The plan shall include parameters to be monitored and frequency and method of data collection including responsible parties. All data reported must have been subjected to quality control checks. Internal data quality checks and other quality control procedures shall be documented. Where appropriate, the plan may refer to other plans or documents that provide the information required.

All monitoring data shall be collected in line with the requirements of this Standard.

6.2 MONITORING AND REPORTING FREQUENCY

Following successful validation and verification of the initial TREES Registration Document and TREES Monitoring Report, Participants shall monitor and submit a TREES Monitoring Report following calendar years 1, 3, and 5 of the crediting period. A Participant may optionally submit a TREES Monitoring Report following years 2 and 4 of the crediting period as outlined in Section 14. The Participant shall use the latest approved TREES Monitoring Report template available on the ART website.

For Participants that wish to have credits deemed eligible for ICAO's Carbon Offsetting Scheme for International Aviation (CORSIA), TREES requires that the Participant agree to monitor, report and verify under TREES for a minimum of four five-year crediting periods (20 years).

Subnational Participants who shift to be included in national level reporting at the end of 2030, do not need to report separately as long as the national government continues to report under TREES. If the national government chooses not to join ART by the end of 2030 or leaves ART at any time prior to the end of the Subnational Participant's 20-years, the Subnational Participant will be required to continue monitoring, reporting and verifying under TREES for the remainder of its 20-year period.

7 REVERSALS AND LEAKAGE

7.1 REVERSALS

Under TREES, a reversal is when a Participant's annual reported emissions are higher than the Crediting Level at any time after TREES credits are issued to the Participant. Participants in ART are required to report following calendar years 1, 3 and 5 of each crediting period. Monitoring under ART is not required after a Participant exits the program.

To maintain conservativeness under TREES, reversals are reported and a volume of credits from the buffer pool equivalent to the reversed volume is retired to permanently remove the credits from circulation and negate the reversal. If a Participant exits ART, any unused buffer pool contributions are retired to account for any possible future reversals as outlined in Section 7.1.4.

7.1.1 Reversal Risk Assessment

TREES establishes a starting level of reversal risk for Participants of 25%. The starting risk level may be lowered if Participants can demonstrate that mitigating factors exist. The risk level is associated with a buffer deduction taken from the final verified TREES ERR quantity prior to each issuance.

Participants must determine the number of TREES credits that will be contributed to the buffer at each issuance. Each monitoring report must identify the buffer contribution and all justifications for the contribution for each year reported.

TREES considers three risk mitigating factors (below) that affect the success of the Participant. Each factor shall be assessed and verified for each calendar year reported. They are applied to the buffer pool contribution of a given year only when demonstrated that the mitigating factor was in place, or applicable, for the entire year.

MITIGATING FACTOR 1 (-5%): Legislation or executive decrees actively implemented and demonstrably supporting REDD+, issued by a relevant government agency, or with leadership from the Presidential or Prime Ministerial Office.

MITIGATING FACTOR 2 (-10%): Demonstrated interannual variability¹⁰ of less than 15% in annual forest emissions over the prior 10 years used in TREES Reporting.

¹⁰ This applies to emissions that increase and decrease year by year but will not apply to situations where emissions consistently decrease by over 15% a minimum of two consecutive years. The 15% is determined by taking the average of the data points over the 10 years and then comparing each individual year against that average.

MITIGATING FACTOR 3 (-5%): Demonstrated national reversal mitigation actions, plan or strategy developed in alignment with Cancun Safeguard F.

7.1.2 Buffer Pool Contribution

ART maintains a combined buffer pool that includes contributions from all Participants. Based on the results of the Risk Assessment, each Participant must contribute to the TREES Buffer Pool, which is managed by the Secretariat.

The buffer contribution % is determined as follows. This % is applied to determined BUF in Equation 3.

Buffer Contribution Assessment Tool

Fixed rate with no mitigating factors	25
Fixed rate with mitigating factor #1	20
Fixed rate with mitigating factor #2	15
Fixed rate with mitigating factor #3	20
Fixed rate with mitigating factors #1 and #2	10
Fixed rate with mitigating factors #1 and #3	15
Fixed rate with mitigating factors #2 and #3	10
Fixed rate with mitigating factors #1, #2 and #3	5

Equation 3

$$BUF_t = (GHG ER_t + GHG REMV_t) \times Buffer\%$$

WHERE:

BUF_t	TREES buffer withholding; t CO ₂ e
GHG ER_t	GHG ERs in year t; t CO ₂ e (Section 10)

GHG REMV_t	GHG removals in year t ; t CO₂e (Section 10)
Buffer%	Buffer contribution (from Table 2) potentially adjusted upwards as a result of prior reversals; %

7.1.3 Reversal Compensation

When a reversal is identified in a TREES Monitoring Report, credits shall be retired from the pooled buffer account equal to the lower of I or II:

- I. The number of emissions above the Crediting Level
- II. The total number of credits previously issued to the Participant

After each reversal is reported, a Participant must increase its buffer contribution for a period of five calendar years by 5%, added to the buffer contribution assessment scoring for those years. Further, if the number of credits retired for the reversal exceeds the number of credits contributed to the buffer to date by the Participant, this deficit must be replenished by the Participant. If the Participant does not have sufficient credits already issued into its account, future credits issued to the Participant will be placed into the buffer until the excess amount is replenished.

7.1.4 Buffer Pool Management

The TREES Buffer Pool will be managed by the ART Secretariat, with credits retired where reversals are recorded. If a Participant leaves ART at any time, all remaining buffer pool contributions are retired to compensate for any future reversals that may occur.

7.2 LEAKAGE

Where Participants submit a subnational Crediting Level, then negative leakage of emissions to outside the accounting area can occur. Participants must apply specified TREES leakage deductions.

TREES establishes three classes of leakage risk for Participants: high, medium, low. Participants must use the TREES Leakage Deduction table to determine the proportion of ERRs that must be used as “Leakage%” in Equation 4.

7.2.1 Leakage Deduction

The TREES Leakage Deduction shall consider the program boundaries. Both activity-shifting and market leakage are covered.

Leakage Deduction Assessment

HIGH	< 25% of national forest area included in TREES	20
MEDIUM	25–60% of national forest area included in TREES	10
LOW	60–90% of national forest area included in TREES	5
NO LEAKAGE	>90% of national forest area included in TREES	0

Equation 4

$$LEAK_t = (GHG ER_t + GHG REMV_t) \times Leakage\%$$

WHERE:

LEAK_t	TREES leakage deduction; t CO ₂ e
GHG ER_t	GHG ERs in year t; t CO ₂ e (Section 10)
GHG REMV_t	GHG removals in year t; t CO ₂ e (Section 10)
Leakage%	Percentage leakage deduction (from Table 3); %

8 UNCERTAINTY

TREES requires that estimates of emission reductions and removals are adjusted based on estimated uncertainty to minimize the risk of over-crediting. Participants shall endeavor to minimize all forms of uncertainty. Requirements to track uncertainty and to avoid systematic bias are given in Section 4.

Under TREES, uncertainty shall be quantified in terms of the half-width of the 90% confidence interval as a percentage of the estimated emissions. Sampling errors must be estimated and included in the uncertainty calculation.

Model and allometric errors are excluded¹¹, as such errors are considered consistent between emissions in the crediting level and crediting periods, and thus the transaction cost and capacity building needed to include far outweigh any benefit in uncertainty determination.

Uncertainty shall be assessed on both activity data and emission factors. Errors shall be propagated between sources using Approach 2 (Monte Carlo simulation). Monte Carlo simulations shall use the 90% confidence interval and a simulation n of 10,000. The simulations will form the basis for estimations both of value and uncertainty at each step, as the simulated sum of components will be more accurate than an arithmetic approach. Thus, simulated values should replace arithmetic values in Section 10.¹²

Participants must take an uncertainty deduction corresponding to the calculated risk of over-crediting for the calculated emission reductions in accordance with Equation 5.

At the end of each crediting period the Participant may calculate an uncertainty deduction based on the summed uncertainty of gross emission reductions and removals during the total period of ART participation (calculated from summed reference emissions minus summed crediting period emissions). In cases where the uncertainty contributions to date exceed this total deduction number, additional TREES credits will be issued into the Participant's registry account.

Equation 5

$$UNC_t = (GHG ER_t + GHG REMV_t) \times UF_t$$

Equation 6

$$UF_t = 0.524417 * (90\% CI_t / 1.645006)$$

¹¹ In cases where emission factors are derived from biomass maps, uncertainty of this approach must be included.

¹² Monte Carlo guidance is available on the ART website.

WHERE:

UNC_t	TREES uncertainty deduction in year t ; t CO_{2e}
UF_t	TREES uncertainty factor in year t ; %
GHG ER_t	GHG ERs in year t ; t CO_{2e} (Section 10)
GHG REMV_t	GHG removals in year t ; t CO_{2e} (Section 10)
90% CI_t	Half width of 90% confidence interval of emissions in year t ; t CO_{2e}
0.524417	t value at ART-allowable risk
1.645006	t value at 90% confidence level

Public Consultation

9 EMISSION REDUCTION LABELING

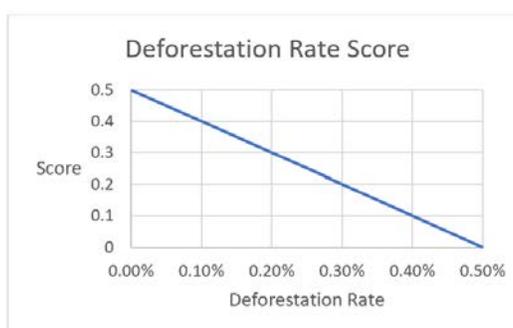
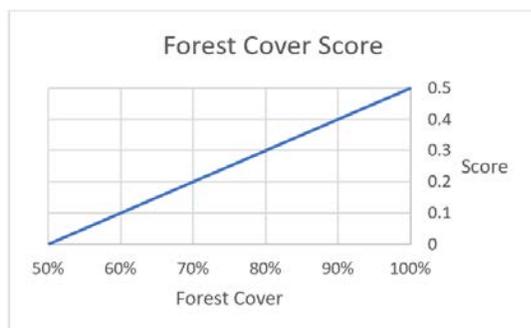
9.1 PARTICIPANT PERFORMANCE INFORMATION

Data related to the percent emission reduction achieved by a Participant at the time of TREES credit issuance will be made available on the ART Registry (i.e., the % difference between the crediting level and net emission reductions after required deductions). This will allow market stakeholders to readily identify Participants that achieve and continue to achieve high ambition.

9.2 HIGH FOREST COVER, LOW DEFORESTATION

In order to qualify for the TREES HFLD label and use the optional HFLD Crediting Level approach, national or subnational Participants must demonstrate that they meet the HFLD Score threshold throughout the historical reference period for which data is available. This must be demonstrated at the beginning of each Crediting Period and remains applicable for all five years of the Crediting Period.

Participants whose forest cover is greater than 50% and annual deforestation rate is less than 0.5% during the historical reference period for years in which data is available are eligible to calculate an HFLD Score. The HFLD Score is the sum of the Participant's Forest Cover Score and the Participant's Deforestation Rate Score as exemplified in the illustrative figures below and outlined in the following equations. Participants whose HFLD Score is 0.5 or higher meet the HFLD Score threshold.



Equation 7

$$\text{HFLD Score}_t = \text{FCS}_t + \text{DRS}_t$$

WHERE:

HFLD Score_t	HFLD Score in year t
FCS_t	Forest Cover Score in year t (Equation 8)
DRS_t	Deforestation Rate Score in year t (Equation 9)

Equation 8

$$\text{FCS}_t = (\text{FC}_t - 50\%) / 100$$

WHERE:

FCS_t	Forest Cover Score in year t
FC_t	Forest Cover in year t; %

Equation 9

$$\text{DRS}_t = 0.5\% - \text{DR}_t$$

WHERE:

DRS_t	Deforestation Rate Score in year t
DR_t	Deforestation rate in year t; % ¹³

¹³ Deforestation rate is defined as the area of forest lost in year t divided by the total area of forest present in the first year of the historical reference period.

10 CALCULATION OF EMISSION REDUCTIONS

For GHG Emissions:

Equation 10

$$\text{GHG ER}_t = \text{CL}_n - \text{GHG}_t$$

WHERE:

GHG ER_t	GHG ERs in year t; t CO ₂ e
CL_n	TREES Crediting Level for crediting period n; t CO ₂ e/yr
GHG_t	GHG emissions in year t; t CO ₂ e

For GHG Removals:

Equation 11

$$\text{GHG REMV}_t = \sum_x \left((A_{R,b,x} \times \text{RF}_x) - (A_{R,b1,x} \times \text{CE}_x) \right)$$

Equation 12

$$A_{R,b1,x} = rA_{t,x} - \text{RRA}_{n,x}$$

$$A_{R,b,x} = \left(\sum_b (rA_{t,x} - \text{RRA}_{n,x}) \right) - \text{Def}_{R,x}$$

WHERE:

GHG REMV_t	GHG removals in year t; t CO ₂ e
A_{R,b,x}	Area of conversion of non-forest to forest in stratum x over the last b years; ha

$A_{R,b1,x}$	Area of conversion of non-forest to forest in stratum x recorded and reported for the first time ($b = 1$ years since initial conversion); ha
RF_x	Removal factor for stratum x ; t CO₂e/yr
CE_x	Conversion emissions (GHG emissions associated with pre-existing vegetation prior to forest restoration) for stratum x ; t CO₂e
$rA_{t,x}$	Area of conversion of non-forest to forest in stratum x during year t ; ha
$RRA_{n,x}$	Reference Removal Area for stratum x during period n in the historical reference period; ha/yr
$Def_{R,x}$	Summed area of deforestation for areas previously reported as transitioning from non-forest to forest in stratum x ; ha
CL_n	TREES Crediting Level for crediting period n ; t CO₂e/yr
GHG_t	GHG emission in year t ; t CO₂e

Summation:

Equation 13

$$\text{TREES ER}_t = (\text{GHG ER}_t + \text{GHG REMV}_t [+FR_t]) - \text{BUF}_t - \text{LEAK}_t - \text{UNC}_t$$

WHERE

TREES ER_t	TREES ERs in year t ; t CO₂e
BUF_t	TREES buffer withholding in year t ; t CO₂e (Section 7.1)
LEAK_t	TREES leakage deduction in year t ; t CO₂e (Section 7.2)
UNC_t	TREES uncertainty deduction in year t ; t CO₂e (Section 8)
GHG ER_t	GHG ERs in year t ; t CO₂e
GHG REMV_t	GHG removals in year t ; t CO₂e
FR_t	Foregone removals in year t ; t CO₂e [for HFLD Participants only]

At the end of each crediting period the Participant may calculate an uncertainty deduction based on the summed uncertainty of gross emission reductions and removals during the total period of ART participation (calculated from summed reference emissions minus summed crediting period emissions). In cases where the uncertainty contributions to date exceed this total deduction number, additional TREES credits will be issued into the Participant's registry account.

Public Consultation Draft

11 VARIANCE

Participants may propose variances to this Standard where they do not negatively affect the conservativeness of the ER or removal estimate or they improve the accuracy of the data used. Variances may not be proposed regarding eligibility criteria or crediting level determination and may only apply to methodological or monitoring requirements. Participants shall submit proposed variances to the ART Secretariat for review. The Secretariat will approve or reject the variance, provided that the ART Board does not object to the Secretariat's recommendation.

Variances apply to a specific Participant and will be published publicly in the Participant's TREES documentation. A full list of approved variances will not be made public as they are not modifications to the Standard and do not serve as precedent. Participants shall provide evidence that the proposed variance is conservative or represents an improvement in data accuracy.

Participants shall request a variance by using the TREES Variance Request Form template.

12 ENVIRONMENTAL, SOCIAL, AND GOVERNANCE SAFEGUARDS

12.1 PURPOSE

TREES requires Participants to demonstrate they have implemented REDD+ actions defined in the REDD+ implementation plan in consistency with Cancún Safeguards ensuring activities do no harm. It is the goal of this Standard to provide concrete guidance on how a Participant can demonstrate that it has addressed and respected all the Cancún Safeguards, while drawing on the step-wise nature of REDD+ implementation.

12.2 STRUCTURE

This section is structured as follows:

1. **Cancún Safeguards.** Each Cancún Safeguard is listed to set out the environmental, social, and governance principles Participants are expected to uphold when undertaking REDD+ actions.
2. **Themes.** Each safeguard is further broken down into thematic topics which are encompassed in Cancún Safeguards and which define the conditions that must be met in order to address and respect the Cancún Safeguards in alignment with national policies, laws and regulations. We note that as certain Cancún Safeguards encompass human rights obligations, the wording of associated themes is aligned with international human rights laws, which requires countries to “respect,” to “protect,” and to “fulfill” these obligations.
3. **Indicators.** Each indicator is meant to provide the step-wise process by which Participants can demonstrate conformance with all Cancún Safeguards while relying on progressive reporting on how the safeguards have been addressed and respected throughout REDD+ implementation. Verification will occur against the indicators only; as such, applicability, temporality, and scope conditions are included as appropriate.

There are three types of indicators:

Structure—demonstrate the relevant governance arrangements (e.g., policies, laws, and institutional arrangements) that are in place in the country and applicable jurisdiction for the case of subnational Participants under TREES and guarantee the implementation of REDD+ actions is done in consistency with Cancún Safeguards;

Process—demonstrate that relevant institutional mandates, as well as processes, procedures, and/or mechanisms that are in place and enforced in the country for the implementation of REDD+ actions in consistency with the Cancún Safeguards; and

Outcome—demonstrate implementation outcomes against the themes under which Cancún Safeguards have been unpacked, in consistency with the respect of rights and fulfillment of duties in accordance with international and national legislation and applicable jurisdictional legislation for the case of subnational Participants under TREES.

12.3 REPORTING REQUIREMENTS

Participants must always report on conformance with all Cancún Safeguards and, in accordance to the step-wise nature of REDD+ implementation, will report in a progressive manner through indicators established for each theme. At the start of the first crediting period, Participants must demonstrate conformance with Cancún Safeguards by reporting against all structure and process indicators. In addition, at the beginning of the first crediting period, Participants must either demonstrate conformance with the outcome indicators or present a plan for achieving conformance with the outcome indicators by the end of five years from the time the Participant joined ART.

Within five years of joining ART, Participants must demonstrate conformance with all structure, process and outcome indicators under all themes under each of the Cancún Safeguards.

A TREES Safeguard monitoring report template is provided for use by Participants if desired. However, Participants may utilize their Summary of Information reports prepared in the context of UNFCCC reporting or similar reports used on Cancún Safeguards outside the UNFCCC insofar all required information on required indicators is included. Participants may use Safeguard Information Systems in place as an important tool to provide data or systems information to demonstrate conformance as well. For the case of subnational Participants under TREES, reporting and monitoring tools to demonstrate conformance with safeguards shall demonstrate coherence and/or alignment with national reporting and monitoring in the context of the UNFCCC.

All indicators apply to all Participants. Where indicators reference a national program, framework or other requirement and a Participant is not a national government, the Participant must demonstrate how applicable subnational legislation is aligned and consistent with applicable national legislation.

12.4 SCOPE

TREES aims to ensure Participants are in full conformances with the Cancún Safeguards. TREES “unpacks” the safeguards into themes and indicators in line with relevant international agreements and decisions to provide a step-wise path for Participants to demonstrate progressive and on-going safeguard performance, while fostering transparent and consistent

reporting, and allowing for third-party verification of Participant conformance. This approach ensures national and subnational Participants both address (structure indicators) and respect (process and outcome indicators) Cancún Safeguards while allowing time for processes to be put in place prior to reporting on actual outcomes associated with Cancún Safeguards. It also provides flexibility for progressive reporting on all Cancún Safeguards while requiring verifiable improved performance over time. In the case of subnational Participants, demonstration of conformance environmental, social and governance safeguards shall be aligned and consistent with national procedures and/or applicable legislation for demonstration of conformance with Cancún Safeguards and related requirements under the UNFCCC.

Aiming to respect the autonomy of Participants to develop and implement procedures, policies, or programs appropriate to their unique circumstances when demonstrating conformance with environmental, social and governance safeguards under TREES, the Standard requires conformance with safeguards requirements under the UNFCCC but does not prescribe specific approaches that must be used. As a result, TREES Safeguards have been developed to assess conformance in government-led programmatic REDD+ implementation. While specific requirements for traditional project-level safeguards such as formal grievance processes or benefit sharing plans are not prescribed, the themes and indicators seek to ensure that activities are implemented in conformance with all Cancún Safeguards, including transparent implementation of activities and allocation of resources.

Participants will be able to fully draw upon the design and implementation work conducted to date to provide information on how all safeguards have been addressed and respected throughout REDD+ implementation.

12.5 SAFEGUARDS

12.5.1 Cancún Safeguard A

Actions are complementary or consistent with the objectives of national forest programs and relevant international conventions and agreements

THEME 1.1 Consistency with the objectives of national forest programs

Structural Indicator: Domestic legal framework or policy (or national REDD+ strategy or action plan) for REDD+ actions is clearly defined and designed in consistency with national and if applicable, subnational, forest policies/programs.

Process Indicator: Public institutions have made use of mandates, procedures and resources to ensure REDD+ actions are designed and implemented in consistency with the broader legal or policy framework of the forest sector, and inconsistencies are identified and resolved.

Outcome Indicator: Design and implementation of REDD+ actions have been consistent with or complemented the objectives of the national and if applicable, subnational, forest policies/programs.

THEME 1.2 Consistency with the objectives of relevant international conventions and agreements

Structural Indicator: Domestic and if applicable, subnational, legal framework or policy (or national REDD+ strategy or action plan) for REDD+ actions recognize and promote the application of ratified relevant international conventions and agreements in the context of design and implementation of REDD+ actions.

Process Indicator: Public institutions have made use of mandates, procedures, and resources to design and implement REDD+ actions that recognize and promote the application of ratified relevant international conventions and agreements.

Outcome Indicator: Design and implementation of REDD+ actions have been consistent with or has complemented the objectives of identified, ratified and relevant international conventions and agreements.

12.5.2 Cancún Safeguard B

Transparent and effective national forest governance structures, taking into account national legislation and sovereignty

THEME 2.1 Respect, protect, and fulfill the right of access to information.

Structural Indicator: Participants have in place a legal framework, policies and/or programs for accessing information related to REDD+ actions in accordance with international human rights standards, and these are anchored in relevant ratified international conventions/agreements and/or domestic and if applicable, subnational, legal framework.

Process Indicator: Public institutions have made use of mandates, procedures, and resources for accessing information related to REDD+ actions in line with relevant ratified international conventions and agreements and/or domestic and if applicable, subnational, legal framework, policies, and programs for accessing information.

Outcome Indicator: The public has been aware of and exercised the right to seek and receive official information on REDD+ actions, as well as on how safeguards have been addressed and respected.

THEME 2.2 Promote transparency and prevent corruption, including through the promotion of anti-corruption measures.

Structural Indicator: Participants have in place anti-corruption measures and measures to promote transparency reflecting the principles of rule of law, proper management of public

affairs and public property, integrity, transparency, and accountability, and these are anchored in relevant ratified international conventions/agreements and/or domestic and if applicable, subnational, legal framework.

Process Indicator: Public institutions have made use of mandates, procedures, and resources to apply anti-corruption measures and measures to promote transparency in the implementation of REDD+ actions and the distribution of REDD+ benefits, according to relevant ratified international conventions, agreements, and/or domestic and if applicable, subnational, legal frameworks; the measures should reflect principles of the rule of law, proper management of public affairs and public property, integrity, transparency, and accountability.

Outcome Indicator: The distribution of REDD+ benefits related to the implementation of the REDD+ results-based actions have been carried out in a fair, transparent, and accountable manner, as per relevant ratified international conventions, agreements, and/or domestic and if applicable, subnational, legal framework.

THEME 2.3 Respect, protect, and fulfill land tenure rights.

Structural Indicator: Participants have in place a legal framework, policies or programs for the recognition, inventorying, mapping, and security of customary and statutory land and resource tenure rights where REDD+ actions are implemented, and these are anchored in relevant ratified international conventions/agreements and/or domestic and if applicable, subnational, legal framework.

Process Indicator: Public institutions have made use of mandates, procedures, and resources to recognize, inventory, map, and secure statutory and customary rights to lands and resources relevant to the implementation of REDD+ actions in line with relevant ratified international conventions, agreements, and/or domestic and if applicable, subnational, legal framework.

Outcome Indicator: Stakeholders had access to, use of, and control over land and resources in line with relevant ratified international conventions, agreements, and/or domestic and if applicable, subnational, legal framework.

THEME 2.4 Respect, protect, and fulfill access to justice.

Structural Indicator: Participants have in place procedures for guaranteeing non-discriminatory and non-cost prohibitive access to dispute resolution mechanisms at all relevant levels, and these are anchored in relevant ratified international conventions/agreements and/or domestic and if applicable, subnational, legal framework.

Process Indicator: Public institutions have made use of mandates, procedures, and resources to facilitate access to dispute resolution mechanisms for stakeholders involved in the implementation of REDD+ actions including judicial and/or administrative procedures for legal redress, which, *inter alia*, provide access for indigenous peoples, local communities, or equivalent stakeholders with a recognized legal interest.

Outcome Indicator: Resolved disputes, competing claims, and effective recourse and remedies have been provided when there was a violation of rights, grievance, dispute or claim related to the implementation of REDD+ actions.

12.5.3 Cancún Safeguard C

Respect for the knowledge and rights of indigenous peoples and members of local communities by taking into account relevant international obligations, national circumstances and laws, and noting that the United Nations General Assembly has adopted the United Nations Declaration on the Rights of Indigenous Peoples

THEME 3.1 Identify indigenous peoples and local communities, or equivalent.

Structural Indicator: Participants have in place a legal framework, policies or procedures for the identification or self-identification of indigenous peoples, and local communities, or equivalent, and for the respect of their rights, and these are anchored in relevant ratified international conventions/agreements and/or domestic and if applicable, subnational, legal framework.

Process Indicator: Public institutions have made use of mandates, procedures, and resources to respect the rights of the indigenous peoples and local communities, or equivalent in the design and implementation of REDD+ actions, according to relevant ratified international conventions, agreements, and/or domestic and if applicable, subnational, legal framework.

Outcome Indicator: Indigenous peoples and local communities, or equivalent, have been identified and their respective rights have been respected in the design and implementation of REDD+ actions.

THEME 3.2 Respect and protect traditional knowledge.

Structural Indicator: Relevant ratified international conventions/agreements, and/or domestic and if applicable, subnational, legal framework define, and provide guidance for respecting and protecting indigenous people's knowledge and/or local communities' knowledge.

Process Indicator: Public institutions have made use of mandates, procedures, and resources to respect and protect indigenous peoples and/or local communities traditional knowledge in the implementation of REDD+ actions, in line with relevant ratified international conventions, agreements, and/or domestic and if applicable, subnational, legal framework.

Outcome Indicator: Traditional knowledge of indigenous peoples and/or local communities, or equivalent, has been respected and protected in the design and implementation of REDD+ actions where permission for its use has been granted.

THEME 3.3 Respect, protect, and fulfill rights of indigenous peoples and/or local communities, or equivalent.

Structural Indicator: Participants have in place legal framework, policies or programs to respect, protect and fulfill human rights of indigenous peoples and local communities, or equivalent, in conformity with customary law, institutions, and practices as applicable and these are anchored in relevant ratified international conventions/agreements and/or domestic and if applicable, subnational, legal framework.

Process Indicator: Public institutions have made use of mandates, procedures, and resources to respect, protect and fulfil rights of indigenous peoples local communities, or equivalent throughout the implementation of the REDD+ actions, according to relevant ratified international conventions, agreements, and/or domestic and if applicable, subnational, legal framework.

Outcome Indicator: Rights of indigenous peoples and local communities, or equivalent, have been identified and respected, protected and fulfilled in the design and implementation of REDD+ actions.

12.5.4 Cancún Safeguard D

The full and effective participation of relevant stakeholders—in particular indigenous peoples and local communities—in actions referred to in paragraphs 70 and 72 of decision 1/CP.16

THEME 4.1. Respect, protect, and fulfill the right of all relevant stakeholders to participate fully and effectively in the design and implementation of REDD+ actions.

Structural Indicator: Participants have in place legal frameworks, policies or programs to respect, protect and fulfill the right of all relevant stakeholders to participate fully and effectively, including timely access and culturally appropriate information prior to consultations, and these are anchored in relevant ratified international conventions/agreements and/or domestic and if applicable, subnational, legal framework.; access is established to recourse mechanisms to ensure the participation process is respected.

Process Indicator: Public institutions have made use of mandates, procedures, and resources to respect, protect and fulfill the right to full, effective and timely participation in the design and implementation of REDD+ actions, as indicated in relevant ratified international conventions, agreements, and/or domestic and if applicable, subnational, legal framework.

Outcome Indicator: Relevant stakeholders have participated fully, effectively and timely in the design and implementation of REDD+ actions.

THEME 4.2. Promote adequate participatory procedures for the meaningful participation of indigenous peoples and local communities, or equivalent.

Structural Indicator: Relevant ratified international conventions, agreements, and/or domestic legal framework recognizes, respects, and protects the respective rights to participation of indigenous peoples, local communities, or equivalent, through their respective decision-

making structures and processes,¹⁴ which requires appropriate procedures take place in a climate of mutual trust.

Process Indicator: Public institutions have made use of mandates, procedures, and resources to promote the meaningful participation of indigenous peoples and local communities, or equivalent in the design, implementation and periodic assessments of REDD+ actions, according to their respective rights and decision-making structures and processes and to the relevant ratified international conventions, agreements, and/or domestic and if applicable, subnational, legal framework.

Outcome Indicator: Design, implementation, and periodic assessments of REDD+ actions were, where relevant, undertaken with the participation of indigenous peoples and/or local communities, or equivalent, including if applicable through FPIC, in accordance with relevant international and/or domestic and if applicable, subnational, legal framework, and in accordance with their respective rights and decision-making structures and processes.

12.5.5 Cancún Safeguard E

That actions are consistent with the conservation of natural forests and biological diversity, ensuring that the actions referred to in paragraph 70 of decision 1/CP.16 are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits

THEME 5.1 Non-conversion of natural forests.

Structural Indicator: Relevant domestic legal framework, policies and programs consistently define the term natural forests, distinguishing them from plantations, describe the process for mapping the spatial distribution of natural forests, and policies or procedures are in place prohibiting the conversion of natural forests as part of REDD+ actions.

Process Indicator: Public institutions have made use of mandates, procedures, and resources to ensure the design and implementation of REDD+ actions considers information of spatial distribution of natural forests and avoids the conversion of these forests, in line with relevant ratified international conventions, agreements, and/or domestic and if applicable, subnational, legal framework, policies and programs.

Outcome Indicator: REDD+ actions were designed and implemented avoiding the conversion of natural forests to plantations or other land uses.

¹⁴ If the institutions consulted are not considered representative by the people they claim to represent, the consultation may have no legitimacy. "If an appropriate consultation process is not developed with the indigenous and tribal institutions or organizations that are truly representative of the communities affected, the resulting consultations will not comply with the requirements of the Convention" (ILO Governing Body, 282nd session, 2001, GB.282/14/2).

THEME 5.2 Protect natural forests, biological diversity, and ecosystem services.

Structural Indicator: Relevant ratified international conventions, agreements, and/or domestic legal framework or policies identify priorities for the protection and conservation of natural forest areas, biodiversity, and ecosystem services, to which REDD+ actions could contribute.

Process Indicator: Public institutions have made use of mandates, procedures, and resources to protect and avoid adverse impacts on natural forest areas, biodiversity, and ecosystem services in the design and implementation of REDD+ actions, according to relevant ratified international conventions, agreements, and/or domestic legal frameworks, policies and programs.

Outcome Indicator: REDD+ actions have promoted the protection of natural forest areas, biodiversity and ecosystem services.

THEME 5.3 Enhancement of social and environmental benefits.

Structural Indicator: Relevant ratified international conventions, agreements, and/or domestic legal framework, policies and programs regulate the assessment of potential social and environmental benefits of REDD+ actions.

Process Indicator: Public institutions have made use of mandates, procedures, and resources to assess social and environmental benefits of REDD+ actions and to promote the enhancement of these benefits in the implementation of these actions, according to relevant ratified international conventions, agreements, and/or domestic and if applicable, subnational, legal frameworks, policies and programs.

Outcome Indicator: REDD+ actions have contributed to enhancing social and environmental benefits.

12.5.6 Cancún Safeguard F

Actions to address the risks of reversals

THEME 6.1 The risk of reversals is integrated in the design, prioritization, implementation, and periodic assessments of REDD+ policies and measures.¹⁵

Process Indicator: Public institutions have identified and integrated measures to address the risk of reversals in the design, prioritization, implementation, and periodic assessments of REDD+ actions.

¹⁵ In accordance and/or complementarity to technical measures and procedures to address reversals included in Section 7 of the Standard.

No structure or outcome indicators have been developed for Safeguard F as these issues are broadly addressed by requirements in other sections of the Standard.

12.5.7 Cancún Safeguard G

Actions to reduce displacement of emissions

THEME 7.1 The risk of displacement of emissions is integrated in the design, prioritization, implementation, and periodic assessments of REDD+ policies and measures.

Process Indicator: Public institutions have identified and integrated measures to address the risk of displacement of emissions in the design, prioritization, implementation, and periodic assessments of REDD+ actions.

No structure or outcome indicators have been developed for Safeguard G as these issues are broadly addressed by requirements in other sections of the Standard.

13 AVOIDING DOUBLE COUNTING

In the context of climate change mitigation, the term double counting describes situations where a single GHG ERR or removal is used towards more than one mitigation target, pledge, obligation or other mitigation commitment or effort. Double counting must be avoided when ERRs are used to meet compliance mitigation obligations, targets, pledges, commitments or efforts. Double counting can occur in a number of different ways, including double issuance, double use/double selling, and double claiming, as described below. The risks can be mitigated through operational processes, transparent registry infrastructure and oversight by crediting programs. TREES will incorporate by reference relevant future decisions and guidance on accounting and reporting in the UNFCCC for the Paris Agreement and, as applicable, the International Civil Aviation Organization (ICAO) for its Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).

13.1 DOUBLE ISSUANCE

Double issuance occurs when more than one unique unit is issued for a single ERR, within the same program/registry or when more than one program/registry issues unique units for a single ERR. To mitigate the risk of double issuance, TREES requires the disclosure of any verified or issued emission reductions in the same accounting area, including credits from projects, which will be deducted from TREES issuance volume, checks of duplicate registration under other programs (including offset programs) and requirements for disclosure of other registrations, as well as for cancellation of the units on one registry prior to re-issuance on another.

13.2 DOUBLE USE

Double use occurs when a unique unit is used twice, for example if it is 1) sold to more than one entity at a given time (also referred to as double selling) due to double issuance or fraudulent sales practices, 2) used by the same owner toward more than one obligation / target, or 3) paid for as a results-based payment and then also transferred or sold to another entity. Double use can also occur if the use of a unique issued unit is reported, such as towards NDC achievement or a CORSIA obligation, but the unit is not retired or cancelled.

To prevent double use, TREES requires clear proof of ownership upon registration and tracking of ownership of credits within the registry by serial number and account. In addition, double selling will be prohibited through rules in the legal Terms of Use agreement to be executed by all ART Registry account holders, which will expressly prohibit double use of credits and prohibit the transfer of ownership of credits off-registry.

13.3 DOUBLE CLAIMING

Double claiming occurs when the same ERR is reported by two or more Parties or entities (e.g. buyers and sellers) to meet climate change mitigation obligations, targets, pledges, commitments or efforts, including international transfers under the Paris Agreement towards achievement of Nationally Determined Contributions and transfers for use by aeroplane operators under the ICAO CORSIA, or when voluntary market transfers are counted toward both corporate buyer pledges and supplier country NDCs. ART Participants may authorize transfers of TREES Credits for compliance purposes to buyers outside of the Participant's country by submitting a Host Country Letter of Authorization to ART¹⁶ and subsequently applying an accounting adjustment in biennial transparency reports to the UNFCCC.¹⁷ At present, voluntary market transactions do not require corresponding adjustments.

Where accounting for international transfers may be required or preferred, the ART Registry facilitates this process for all transactions by providing the infrastructure to publish Host Country Letters of Authorization for transfer of TREES Credits, to label TREES Credits associated with a Letter of Authorization, as well as to label TREES Credits for which a corresponding adjustment has been applied. All TREES Credit retirements and cancellations will be transparently recorded in public reports on the ART Registry. In addition, all transfers of TREES Credits for use under CORSIA must follow the procedures and requirements outlined in Annex B.

¹⁶ See example Host Country Authorization letter as Exhibit 1 to Appendix B.

¹⁷ As referred to in paragraph 77, subparagraph (d) of the Annex to decision 18/CMA.1.

14 VALIDATION AND VERIFICATION

14.1 VALIDATION AND VERIFICATION SCOPE AND FREQUENCY

Validation and Verification is required following calendar year 1 of each crediting period. Verification is required after calendar years 3 and 5 of each crediting period. Participants may elect to have verifications following calendar years 2 and 4 of the crediting period. If these optional verifications are conducted and a positive verification conclusion is reached, a Participant may be able to issue credits annually. If the optional verifications are not conducted, a Participant will only be able to issue credits following calendar years 1, 3, and 5, as no credits will be issued without verification.

If in the initial crediting period, a Participant elects to use a crediting period start date up to four years prior to the year of the TREES Concept submittal, the initial verification shall cover all years included in the initial monitoring report.

Verification Cycle

End of Year 1	All sections of the TREES Registration Document and TREES Monitoring Report, including eligibility criteria and Crediting Level data and calculations, monitoring data, ERR calculations for calendar year 1; and conformance with social/environmental safeguards
End of Year 2 OPTIONAL	All sections of the TREES Monitoring Report including monitoring data and ERR calculations for the ERRs achieved in calendar year 2, and conformance with social/environmental safeguards
End of Year 3	All sections of the TREES Monitoring Report including monitoring data and ERR calculations for the ERRs achieved in either calendar year 3 only or calendar years 2 and 3 (if the optional verification was not performed), and conformance with social/environmental safeguards

End of Year 4 OPTIONAL	All sections of the TREES Monitoring Report including monitoring data and ERR calculations for the ERRs achieved in calendar year 4, and conformance with social/environmental safeguards
End of Year 5	All portions of the TREES Monitoring Report, including monitoring data and ERR calculations for the ERRs achieved in either calendar year 5 only or calendar years 4 and 5 (if the optional verification was not performed), and conformance with social/environmental safeguards

14.2 VALIDATION AND VERIFICATION BODY ACCREDITATION

Validation and Verification Bodies shall be accredited for validation and verification by an accreditation body that is a member of the International Accreditation Forum (IAF) as outlined in the TREES Validation and Verification Standard.

Validation and Verification Bodies shall also complete an application and an Attestation of Validation and Verification Body to be an approved ART Validation and Verification Body. This process serves to ensure the Validation and Verification Body has the technical capabilities, qualifications, and resources to successfully complete a TREES validation and verification. Additional detail regarding the process and required capabilities, qualifications, and resources are provided in the TREES Validation and Verification Standard.

The Validation and Verification Body application documents and a list of approved ART Validation and Verification Bodies shall be maintained by the ART Secretariat on the ART website.

14.3 VALIDATION AND VERIFICATION PROCESS

TREES Validations and Verifications shall be conducted in accordance with the TREES Validation and Verification Standard. The Validation and Verification Body shall submit a TREES Validation Report following completion of the validation and a TREES Verification Report and Statement to the Secretariat following completion of the verification. Reports and Verification Statements shall follow the latest templates available on the ART website.

15 REGISTRY REQUIREMENTS

15.1 ACCOUNT REQUIREMENTS

All Participants will have an account in the ART Registry, managed by the ART Secretariat. The ART Registry will contain Participant information, program documentation, Validation and Verification Reports, records of serialized credit issuance, and credit cancellation, transfer, and retirement data. The Secretariat will also manage a pooled reversals buffer account in the ART Registry which will be publicly available.

15.2 PUBLICLY AVAILABLE DOCUMENTATION

All approved and final TREES documents listed in Section 2.4 shall be publicly available through the ART Registry. Participants may designate certain parts of the documentation as Commercially Sensitive Information (CSI). In these cases, redacted versions of TREES documentation can be made publicly available. However, this information—as well as any requested supporting documentation—must be available for review by the Secretariat and Board and the Validation and Verification Body (VVB).

For the sake of transparency, the Secretariat shall presume Participant information is available for public scrutiny, and demonstration to the contrary shall be incumbent on the Participant. The VVB shall check that any information requested as “commercially sensitive” meets the TREES definition of CSI. Subscribers to the ART listserv shall receive notification of the availability of new and relevant Participant documentation as it becomes publicly available to ensure that stakeholders have ample opportunity to submit comments to ART regarding these submissions. Comments submitted within 30 days of notice will be directed to the Participants to be addressed and will also be provided to the VVB at the beginning of Validation and Verification.

16 COMPLAINTS AND APPEALS

16.1 COMPLAINTS

All complaints relating to validation and verification should be directed to and resolved through the Validation and Verification Body's complaints and appeals procedure.

When a Participant or stakeholder objects to a decision made by ART representatives or the application of the ART program requirements, the following confidential complaint procedure shall be followed:

- I. The Participant or stakeholder sends a written complaint via email to *redd@winrock.org*. The complaint must detail the following:
 - A. Description of the complaint with specific reference to TREES requirements, as applicable;
 - B. Supporting documentation provided for consideration by ART in the complaint resolution process; and
 - C. Complainant name, contact details, and organization.
- II. The ART Secretariat shall assign a representative to research and further investigate the complaint. The representative assigned to handle the complaint shall not have been involved with the issue that is the subject of the formal complaint.
- III. The Secretariat will provide a written response via email to the complainant detailing the Secretariat's decision on the matter.

16.2 APPEALS

If a complaint remains unresolved after the conclusion of the complaint procedure, a Participant or stakeholder may appeal any such decision or outcome reached. The following confidential appeals procedure shall be followed:

- I. The Participant or stakeholder sends a written appeal via email to *redd@winrock.org*. The appeal must detail the following:
 - A. Description of the appeal with specific reference to TREES requirements, as applicable;
 - B. Supporting documentation provided for consideration by ART in the appeal resolution process, including previous communication on the complaint and all relevant details of the previously implemented complaint procedure; and
 - C. Appellant name, contact details, and organization.

- II. The Secretariat will convene a committee of representatives to review and discuss the matter. The committee will include a member of Winrock Senior Management or Board, a member of the ART Board of Directors, and one external expert selected by the appellant and approved by the Secretariat, all of whom will have equal votes. The committee may also include additional technical and/or subject matter expert or experts as necessary, who will not be able to vote. The committee members selected will depend on the subject matter and nature of the appeal. The appellant will be contacted if any additional information is needed or clarification is required.
- III. The decision reached by the committee shall be communicated via written response to the Participant or stakeholder. Any decision reached by the committee shall be final.

DEFINITIONS

Access to Information	Access to information relates to the public's right to access information held by authorities that is relevant to forest-related processes.
Accountability	<p>There are two principle dimensions of accountability considered by safeguard B: vertical and horizontal accountability.</p> <p>Vertical accountability refers to the methods by which the State is (or is not) held to account by non-State agents through the relationship between citizens and their political representatives.</p> <p>Horizontal accountability refers to the intra-governmental control mechanisms that exist between the legislature, the executive branch, and the judiciary, and between different sub-entities of the executive branch, including the Cabinet, line ministries, and lower-level administrative departments and agencies.</p>
Activity Data	This is the magnitude of a given human-led activity that results in emissions or removals in a specified time period.
Additionality	Additionality ensures that the implemented activity reduces emissions or increases sequestration more than would have occurred in the absence of the intervention.
Addressing Safeguards	<p>This entails identifying and providing information on what a country has in place, in terms of its governance arrangements, which would seek to guarantee the implementation of the safeguards.</p> <p>Addressing safeguards are linked to "structural" indicators under TREES ESG indicators.</p>
Biological Diversity	In alignment with international law, the term biological diversity refers to the variability among living organisms from all sources including, inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.
Buffer Pool	This is an account managed by the ART Secretariat as a reversal risk mitigation mechanism into which Participants contribute a determined

quantify of ERRs to replace unforeseen losses in carbon stocks. The Buffer Contribution is a percentage of the Participant's ERRs determined through a Participant-specific reversal risk assessment.

Cancel or Cancellation

The permanent removal of an ART credit from the ART Registry so that it cannot be transferred, transacted, retired or applied towards any emission reduction targets. The exception to this is for airplane operators who cancel units to surrender them towards their CORSIA compliance obligations.

Cancún Safeguards

The term "Cancún Safeguards" refers to the safeguards developed under the UNFCCC in paragraph 2 of Appendix I to decision 1/CP.16 (the Cancún Agreement).

Commercially Sensitive Information

CSI comprises trade secrets, financial, commercial, scientific, technical, or other information whose disclosure could result in a material financial loss or gain, prejudice the outcome of contractual or other negotiations, or otherwise damage or enrich the person or entity to which the information relates.

Conflict Resolution Mechanisms

This is the formal and informal means of settling (through negotiation, mediation, or arbitration) complaints or disputes of groups and individuals whose rights may be affected through the implementation of REDD+ activities.

Crediting Level

The TREES Crediting Level is the performance benchmark that is established under TREES. Only net emissions and removals that outperform the Crediting Level are eligible for TREES crediting. The TREES Crediting Level is based on five years of historical emissions or removals data (noting that this may not apply to HFLD Participants). The Crediting Level is valid for one crediting period after which it must be recalculated and validated.

Crediting Period

This is the finite length of time for which a Crediting Level is valid, and during which a Participant can generate ERRs against the Crediting Level. The Crediting Level must be re-calculated and re-evaluated to renew the crediting period. The ART crediting period is five years.

Customary Law

Traditional or customary land laws are the set of legal rules that constitute the traditions of a community or population. Customary law

currently coexists with statutory law; in most Latin American countries it is subordinate to statutory law.

Double Counting

In the context of climate change mitigation, double counting consists of situations where a single GHG ER, removal, avoidance, or other mitigation outcome is used more than once to demonstrate achievement of mitigation targets or pledges. Double counting can occur in different ways, including double issuance, double use, and double claiming.

Ecosystem Services

These are *provisioning services* such as food, water, timber, fiber, and genetic resources; *regulating services* such as the regulation of climate, floods, disease, and water quality as well as waste treatment; *cultural services* such as recreation, aesthetic enjoyment, and spiritual fulfillment; and *supporting services* such as soil formation, pollination, and nutrient cycling.

Emission/Removal Factor

This is an average emission or removal rate for a given source relative to units of activity data.

Indigenous Peoples

In alignment with international law, the term indigenous peoples refer to peoples in independent countries who are regarded or self-determined as indigenous on account of their descent from the populations which inhabited the country, or a geographical region to which the country belongs at the time of conquest or colonization, or the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural, and political institutions. Specific application of the definition will vary according to each Participant's ratified international legal frameworks and agreements and national legislation regarding Indigenous Peoples, or equivalent.

Institutional Framework

Institutional framework of a country refers to the institutions and institutional arrangements mandated with a responsibility for overseeing the implementation of the legal framework.

Issue or Issuance

The creation of serialized TREES Credits equivalent to the number of verified GHG reductions or GHG removal enhancements for an approved REDD+ program over a specified period of time denominated in metric tons of CO₂ equivalent. Issued TREES Credits are delivered in the ART Registry Account Holder's Account for transfer, retirement, surrender or cancelation.

Land Cover Change	Land cover reflects how much of a given area is covered by forests or by forests of specific types. This contrasts with land use which shows how people use the landscape. As an example, an area may change from unmanaged forest to forest managed for timber but there is no measurable land cover change. Different types of land cover can be managed or used differently.
Land Tenure Rights or System	The land tenure system in a given jurisdiction comprises the set of possible bases under which land may be used. It may include: a) Formal or statutory land tenure system. This refers to the legislation and state institutions that govern rights to land and natural resources within the borders of a State. b) Customary land tenure system. A series of rules established by custom which define the rights of access for persons in a specific social group to particular natural resources.
Land Use Change	Land use reflects how people use a landscape—for example, conservation, forest management, settlement, and agriculture. This contrasts with land cover which details whether an area does or does not have forest cover, or the cover of a specific type of forest. Different types of land cover can be managed or used differently.
Leakage	Leakage refers to the displacement of anthropogenic emissions from within a Participant’s registered subnational accounting area to an alternative area within the country not monitored under ART.
Legal Framework (Domestic)	This is comprised primarily of national policies, laws, and regulations (PLRs) relevant to the implementation of the safeguards. Programs and plans contribute to the implementation of the safeguards but rely on the recognition and compliance of the PLRs.
Local Communities	In alignment with international law, this term refers to communities that have a long association with, and depend on, the lands and waters that they have traditionally lived on or used; this also includes “forest dependent communities.” Sometimes these communities are also referred to as “traditional communities.” Specific application of the definition will vary according to each Participant’s ratified international legal frameworks and agreements and national legislation regarding local communities, or equivalent.

National Forest Programs	National forest programs include forest (and forest-related) policies; forest (and forest-related) legislation and strategies, programs, and/or action plans for implementation of the forest policy; and the institutional framework for implementation.
Natural Forests	Natural forests are naturally regenerated by native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
National Level Accounting	A TREES Submittal by a national government, that includes accounting of greater or equal to 90% of a country's forest area (defined as $\geq 90\%$ of all areas in the country qualifying as forest under the national forest definition). Areas of forest that are excluded must be justified (i.e., they are isolated, patchy and historically not subject to deforestation rates of less than half of the national rate).
Participant	A Participant is a national government or government, or a subnational government no more than one level down from national or a recognized indigenous peoples community responsible for an accounting area that meets the requirements of section 3.1.1 of this Standard.
REDD+ Actions	The term "REDD+ actions" are the measures through which REDD+ activities are implemented. This can be divided into direct and enabling. These can have a national and/or subnational application. Direct actions are specific, often local activities which result in a direct change in the carbon stock (e.g., reforestation, protected area strategies, and agricultural intensification to reduce pressure on forests). Enabling actions are aimed at facilitating the implementation of direct interventions (e.g., improved law enforcement against illegal logging and land tenure regulation).
REDD+ Activities	The term REDD+ activities refers to those included in paragraph 70 of decision 1/CP.16 and Decision 1/CP.16, paragraph 73 as follows: <ul style="list-style-type: none">● Reducing emissions from deforestation● Reducing emissions from forest degradation● Enhancement of forest carbon stocks● Conservation of carbon stocks● Sustainable management of forest

REDD+ Countries	There is no official list of REDD+ countries. The term REDD+ country is used to refer to countries that could be eligible, and/or are working toward participation in REDD+ under the UNFCCC.
Reference Period	This is the period of time for which the mean historical emissions are included to determine the TREES Crediting Level. In this Standard the reference period is 5 years unless the optional HFLD crediting level approach is used.
Remote Sensing	Remote sensing is the science of obtaining information about objects or areas from a distance, typically from aircraft or satellites.
Removals	The process in which carbon dioxide gas (CO ₂) is removed from the atmosphere and sequestered for long periods of time in forests.
Reporting Period	The period of 12 months, corresponding to a calendar year, for which TREES Monitoring Reports must be submitted to ART.
Respecting Safeguards	<p>This includes identifying and providing information on how a country has implemented its governance arrangements, and what were the implementation outcomes of the country's safeguards framework.</p> <p>Respecting safeguards are linked to "process" and "outcome" indicators under TREES ESG indicators.</p>
Retire or Retirement	The permanent removal of an ART credit from circulation as a transactable unit so that it represents a permanent reduction or removal of CO ₂ e from the atmosphere. A retired credit may be applied toward the emission reduction target of the ART Account Holder (towards its NDC achievement) or on behalf of a third party towards an emission reduction target (including NDC achievement).
Reversal	Under TREES, a reversal occurs where a Participant's emissions in a given crediting period exceed the Crediting Level.
Safeguard Information System	SIS is generally understood to be a domestic institutional arrangement responsible for providing information as to how the country-specific safeguards are being addressed and respected in the context of the implementation of the proposed REDD+ actions.

Start Date	The start date is when the initial TREES crediting period begins. This date shall be no earlier than four years prior to submittal of a TREES Concept Note.
Sustainable Livelihoods	Sustainable livelihoods are defined as the capabilities, assets (including both material and social resources), and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.
Traditional Knowledge	In alignment with international law, the term traditional knowledge refers to cultural heritage, traditional knowledge, and traditional cultural expressions, and can be defined as manifestations of indigenous peoples' sciences, technologies, and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games, and visual and performing arts.
TREES Credit	The ART unit of exchange is a greenhouse gas emission reduction or removal enhancement, denominated in metric tons of CO ₂ e, quantified and verified pursuant to ART Standards, including TREES, that is serialized and issued on the ART Registry as a TREES Emission Reduction or Removal (ERR).
Uncertainty	Uncertainty is an expression of the degree to which a value is unknown. Under TREES, uncertainty should be expressed quantitatively.
Validation	Validation is the systematic, independent, and documented process for the evaluation of a TREES Registration Document against applicable requirements of TREES.
Validation/Verification Body	The Validation and Verification Body is a competent and independent firm responsible for performing the validation and/or verification process. A Validation and Verification Body must be ART-approved to conduct validations and verifications.
Verification	Verification is the systematic, independent, and documented assessment by a qualified and impartial third party of the ERR assertion for a specific reporting period. The verification process is intended to assess the degree to which an ART program complies

with TREES and has correctly quantified net GHG reductions.
Verification must be conducted by an independent third-party verifier.

Public Consultation Draft

ANNEX A: TREES DOCUMENTS

A summary of the information required in each TREES Document is provided below. Instructions and additional information are included in each document template available on the ART website.

1. TREES Concept

The TREES Concept includes preliminary information about the proposed Participant and demonstrates how the proposed Participant meets the eligibility criteria. Information contained in the TREES Concept is based on information and preliminary estimates available at the time of submission and will likely change during development of the TREES Registration Document (TRD) as more detailed analyses and calculations are conducted. The ART Secretariat will review the TC for completeness and general eligibility screening, but approval of the TC does not constitute formal ART registration or formal verification of the submitted information.

1. Participant Contact Information

Identify the country or jurisdiction(s) and primary ART contact, including all contact information. Describe the legal authority of this entity to represent the country/jurisdiction.

2. Program Partners

A summary of any other organizations and individuals who have or will assist in preparing the TREES documentation, if any, including additional government agencies, non-governmental organizations (NGOs), and/or additional technical consultants.

3. Crediting period dates and reference period dates

Anticipated dates for the initial crediting period and the 5-year historical reference period (or HFLD reference period, if applicable).

4. Accounting area

Please provide a description of the proposed accounting area, including georeferenced geographic information system (GIS) shape files of the accounting area (subnational or national) boundaries and percentage of forests covered by the accounting area.

5. Eligibility Criteria

Describe how the Participant meets each of the eligibility criteria outlined in Section 3 of TREES. If the Participant is a subnational jurisdiction, the letter of approval from the national government does not need to be submitted with the TC but must be included with the TREES Registration Document by the end of the verification process.

6. Description of ownership rights to ERRs to be issued by ART

Provide a brief summary of the Participant's rights to the ERR's generated from the accounting area (regulatory frameworks, laws or administrative orders) or a description of how rights will be obtained in accordance with domestic law including where agreements have been made providing such rights. Please describe any agreements in place or that will be in place for the

transfer of ERR rights or benefit allocation arrangements with landowners / resource rights holders that exist between the Participant and project owners and/or landowners.

7. Safeguards Overview

For each indicator in Section 12, Environmental, Social, and Governance Safeguards, identify whether the Participant will be demonstrating conformance or will be providing a plan to achieve conformance during the first crediting period.

8. Participation in other REDD+ crediting or payment-for-performance programs and/or REDD+ Project(s) within the proposed area

Disclose any existing REDD+ programs or projects under which some or all of the accounting area may generate credits or payment for performance.

9. Double Counting

Provide a preliminary description of the plan and procedures to ensure double counting is avoided per Section 13. Also please indicate the intended use for TREES credits, if known. For example, indicate if they will be used for compliance against NDC targets, for transfer to another entity for use, or a combination of both.

2. TREES Registration Document

The TREES Registration Document and attachments provide a full description of how the Participant meets and plans to meet the requirements of TREES. This includes:

1. Contact information including country or jurisdiction and primary TREES contact
2. Partners in preparing the documentation, if any, including additional government agencies, NGOs, and/or additional technical consultants and a description of their roles
3. Crediting period dates and reference period dates
4. Accounting area including georeferenced GIS shape files of the accounting area (subnational or national) boundaries and percentage of national forest area covered by the accounting area
5. Description of how the Participant meets the eligibility criteria outlined in Section 3 of this Standard
6. Description of ownership rights to ERRs to be issued by ART
7. Disclosures about participation in other REDD+ crediting or payment-for-performance programs and/or REDD+ Project(s) within the proposed area regardless of credit ownership
8. Plan and procedures to ensure double counting is avoided
9. Crediting Level calculation for the crediting period including a detailed description/justification of the calculated crediting level value along with quantification approach methods, data-sources, and procedures used for data collection and quantification for both activity data and emission factors
10. Standard Operating Procedures (SOPs) or methodological procedures for data collection (e.g., field-based, remote- sensing, QA/QC, and other)

11. Stratification map, description, rules, and procedure for updating
12. Description of included pools and gases, and/or justifications for exclusions where applicable
13. Data sources, if from literature or defaults
14. Description of emission or removal factors derived
15. Data storage and sharing plan
16. Uncertainty calculations
17. Emission reduction calculation (description and supporting workbook) and if applicable, removals calculation
18. Description of monitoring plan
19. Description of how the Participant meets the requirements of the Cancún Safeguards
20. Description of the REDD+ activity's contribution to sustainable development
21. Description of the country's REDD+ implementation plan strategy (this may be a single document or a collection of documents as appropriate)

3. TREES Monitoring Report

The TREES Monitoring Report is submitted to the ART Registry prior to each verification. Each report must cover a minimum of 12 months representing one calendar year and is required to be submitted within twelve months following the end of calendar years 1, 3, and 5 of each crediting period. A TREES Monitoring Report may be optionally submitted following the end of calendar years 2 and 4. The TREES Monitoring Report outlines the ongoing performance of the Participant including a summary of activities conducted and the data collected and quantified for the ERRs over the reporting period. These include:

1. Crediting period start and end date
2. Reporting period start and end date
3. Summary of REDD+ activities
4. Description of on-going conformance with the Cancún Safeguards
5. Emissions from deforestation and degradation (if applicable) for the reporting period, including any changes in methodology, stratification, and including a description of the quantification and data collection since the most recently submitted report, and descriptions of how data were interpolated and prorated by calendar year
6. If applicable, removals data and calculations including any changes in methodology, stratification, and including a description of the quantification and data collection since the most recently submitted report, and descriptions of how data were interpolated and prorated by calendar year
7. Data storage and sharing plans
8. Reversal and leakage risk assessment results
9. Report of reversal (if any)

10. Uncertainty calculations
11. ERR calculation description and supporting workbook

4. TREES Validation and Verification Conflict of Interest Document

This form identifies any potential conflict of interest and appropriate mitigation actions if required to ensure an independent validation or verification is conducted. It must be submitted to the ART Registry for review and approval prior to commencing validation or verification services for a given reporting period.

1. List of validation and verification team members
2. List of all validation and verification work conducted for Participant under any program in the past five years
3. List of any additional professional, familial or personal relationships between anyone on the validation and verification team and the Participant or its partners in preparing the documentation as listed in the TREES Concept Note

5. TREES Validation Report

The TREES Validation Report provides a summary of the validation process used to evaluate the Participant's assertions and its results in the TREES Registration Document. Validation is only required following Year 1 of each crediting period. The report includes:

1. List of validation team members
2. Overview of validation activities including sampling approaches employed
3. Summary of Participant REDD+ program's conformance to TREES
4. List of nonconformances identified and how each was addressed by the Participant
5. Validation conclusion

6. TREES Verification Report

The TREES Verification Report provides a summary of the verification process used to evaluate the Participant's assertions to a reasonable level of assurance and its results. The report includes:

1. List of verification team members
2. Overview of verification activities including sampling approaches employed
3. Summary of Participant REDD+ program's conformance to TREES
4. List of nonconformances identified and how each was addressed by the Participant
5. Verification conclusion including identification of verified emission ERRs available for crediting, if applicable

The TREES Verification Statement includes the final verified ERR quantity, whether the ERRs qualify for labeling as HFLD, and a short summary of the verification conclusion.

7. TREES Variance Request Form

The TREES Variance Request form allows Participants to seek permission on a case-by-case basis to diverge from the requirements of TREES as outlined in Section 11. The form includes:

1. Participant information
2. Standard requirement as written
3. Proposed change
4. Justification for the change along with supporting evidence, as appropriate

ANNEX B: REQUIREMENTS FOR AVOIDING DOUBLE COUNTING WITH ICAO'S CARBON OFFSETTING SCHEME FOR INTERNATIONAL AVIATION (CORSA)

PURPOSE

Greenhouse gas (GHG) emissions from international civil aviation are typically not included in countries' climate change mitigation targets under the United Nations Framework Convention on Climate Change (UNFCCC), its Kyoto Protocol and its Paris Agreement. Article 2.2 of the Kyoto Protocol mandated countries to work through the International Civil Aviation Organization (ICAO) to address these emissions.

In 2010, ICAO adopted an aspirational goal of carbon-neutral growth, meaning that global net carbon dioxide (CO₂) emissions from international aviation should be frozen at their 2020 levels. ICAO pursues a basket of measures to achieve this goal, including improved aircraft technologies, operational improvements, and sustainable aviation fuels. To address any remaining emissions above 2020 levels, in 2016 ICAO adopted an offsetting scheme – the Carbon Offsetting and Reduction Scheme for International Aviation (CORSA).

CORSA requires aeroplane operators to offset any increase of CO₂ emissions from international flights between participating countries above a 2020 baseline, through the purchase and cancellation of eligible emissions units.

For emissions units to be eligible under CORSA, they must comply with eligibility criteria, referred to as the CORSA Emissions Unit Eligibility Criteria (EUC), and, accordingly, carbon offset-crediting programs that wish to provide offset credits under CORSA must demonstrate that the offset credits meet the CORSA Emissions Unit Eligibility Criteria. Carbon offset-crediting programs that are approved by ICAO as eligible under CORSA will be included on a published list of CORSA Eligible Emissions Unit Programs. Likewise, emissions units approved by ICAO as eligible under CORSA are published list of [CORSA Eligible Emissions Units](#).

A key requirement under the CORSA Emissions Unit Eligibility Criteria is that carbon offset-crediting programs have in place rules and procedures to avoid the double counting of emission

reductions. The Paris Agreement likewise requires countries to avoid double counting. Avoiding double counting is essential for environmental integrity, because if double counting occurs, actual global GHG emissions will be higher than the sum of what individual countries or entities report their emissions to be.

This Appendix B to TREES details requirements to avoid double counting in the CORSIA.

B.1 CORSIA REQUIREMENTS FOR AVOIDING DOUBLE COUNTING

The CORSIA Emissions Unit Eligibility Criteria, as adopted by the ICAO Council in March 2019, requires programs to put measures in place to avoid all three forms of double counting: double issuance, double use, and double claiming.

Avoidance of Double Counting, Issuance and Claiming

Carbon offset credit integrity assessment criteria

Eligibility Criterion: Programs should deliver credits that represent emissions reductions, avoidance, or sequestration that are only counted once towards a mitigation obligation. Measures must be in place to avoid:

- a) Double issuance (which occurs if more than one unit is issued for the same emissions or emissions reduction).
- b) Double use (which occurs when the same issued unit is used twice, for example, if a unit is duplicated in registries).
- c) Double claiming (which occurs if the same emissions reduction is counted twice by both the buyer and the seller (i.e., counted towards the climate change mitigation effort of both an airline and the host country of the emissions reduction activity). In order to prevent double claiming, eligible programs should require and demonstrate that host countries of emissions reduction activities agree to account for any offset units issued as a result of those activities such that double claiming does not occur between the airline and the host country of the emissions reduction activity.

B.2 FUNCTIONALITY OF THE ART REGISTRY

A key element to avoid double counting in all of its forms is a robust and transparent registry platform, including a program database, that is publicly accessible, transparent and easily searchable, and provides relevant information needed to avoid double counting under CORSIA.

The robust registry and database platform must support program registration including providing a unique identifier for each program that can be cross-referenced with offset credits issued in a offset credit registry, so that program information can be identified for every offset credit issued within the registry. ART's registry platform is operational with all functionality and transparency needed to avoid double counting for CORSIA including:

1. Securely and transparently effectuating the issuance, transfer, retirement and cancellation of offset credits;
2. Serialization and labeling of issuances so that each offset credit is clearly associated with a specific REDD+ program, country, issuance block and vintage and so that information for avoiding double counting can be assigned to each offset credit. Program information includes:
 - a. A description of the REDD+ Program;
 - b. The emission sources, sinks, and greenhouse gases included in the calculation of the emission reductions or removals;
 - c. The Host Country and geographical location where the program is implemented;
 - d. The Host Country Program Proponent (Participant);
 - e. The year(s) in which the emission reduction or removal occurred (vintage);
 - f. Any other information needed for the program to be unambiguously identified, and distinguished from other programs that may occur in the same location;
 - g. A Letter of Assurance and Authorization from the Host Country, which will be posted on the registry once obtained;
 - h. Designation of the credits as Qualified for CORSIA once the Host Country Letter of Assurance and Authorization has been obtained; and
 - i. Notice that the Host Country has applied an adjustment, once evidence obtained.
3. Public, downloadable, sortable reports on all offset credits including programs, issuances, retirements and cancellations; and
4. Retirement and cancellation procedures that ensure the removal of the unit is clearly indicated, irreversible, and unambiguously designated for an intended purpose. For cancellations of units for the CORSIA, the cancellation information will specify the aeroplane operator for which the offset credits were cancelled and the calendar year for which an offsetting requirement is fulfilled through the cancellation.

B.3 ART REQUIREMENTS FOR AVOIDING DOUBLE COUNTING IN CORSIA

ART requirements for avoiding double counting in all of its forms are detailed in Chapter 13 of TREES. Procedures are in place to avoid double issuance, double use and double claims of credits issued under TREES. To avoid double claiming with progress towards mitigation targets pledged by countries in their Paris Agreement Nationally Determined Contributions (NDCs) and emission reduction and removal units used for the CORSIA, TREES requires in 13.3 II that countries authorize the use of offset credits by aeroplane operators under the CORSIA and provide a letter of assurance and authorization that they will report the use to the UNFCCC in the structured summary of its biennial transparency reports and make corresponding accounting adjustments.

ART will only qualify offset credits for CORSIA once such a letter is received, only to any limit established in the letter, and as long as all other ART and CORSIA requirements are met including the presentation of an ART-approved mechanism to mitigate the risk of or compensate for double claims for post 2020 units, as further described below.

1. **The Host Country Letter of Assurance and Authorization.** The letter will be obtained from the country's UNFCCC National Focal Point or designee to qualify post 2020 TREES Credits for CORSIA. ART will make all Letters of Assurance and Authorization publicly available by posting on the registry. A sample Letter of Assurance and Authorization is included as Exhibit 1 to this Annex B.

The Letter of Assurance and Authorization should explicitly:

- Identify the specific REDD+ activity to reduce emissions or enhance removals in the country;
- Acknowledge that ART has issued, or intends to issue, offset credits for [a stated volume in CO₂-e] emission reductions or removals that occur within the country¹⁸;
- Authorize the use of the REDD+ emission reductions or removals, issued as TREES Credits, by aeroplane operators in order to meet offsetting requirements under CORSIA, including providing a limit for the maximum number of emission reductions or removals that the country authorizes for use, including any limits on the time period over which the country provides such authorization;
- Declare that the country will not use the associated REDD+ emission reductions or removals to track progress towards, or for demonstrating achievement of, its NDC and will account for their use by aeroplane operators under CORSIA by applying relevant

¹⁸ To ensure consistency in UNFCCC reporting and assurance of adjustments for CORSIA units issued, if the Global Warming Potential (GWP) value used by a country in its NDC reporting (in particular in its first NDC report) is different than the value used by ART to calculate the volume of offset credits issued, ART will convert the offset credit volume to the volume that should be adjusted using the same GWP values the country uses in its NDC reporting and provide that number to the country.

adjustments in the structured summary of the country's biennial transparency reports, as referred to in paragraph 77, sub-paragraph (d), of the Annex to decision 18/CMA.1, and consistent with relevant future decisions by The Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA); and

- Declare that the country will report on the authorization and use of the REDD+ emission reductions for the CORSIA [or by other countries] in a transparent manner in the country's biennial transparency report submitted under Article 13 of the Paris Agreement.

2. **ART Double Claiming Compensation Mechanism.** Before qualifying post 2020 units for CORSIA, ART also requires that the Participant present, in a form acceptable to ART, a mechanism to mitigate the risk of or compensate for double claims of emission reductions units between aeroplane operators for the CORSIA and host countries towards NDC achievement. Compensation is required in the event that the adjustment has not been made or credible evidence cannot be obtained by ART within a year after the adjustment was due to be reported to the UNFCCC by the Host Country.

Options include:

- i. Evidence of the application of the adjustment, as detailed in the Host Country Letter of Assurance and Authorization, in country reports to the UNFCCC, in the Article 6 database or by other means (e.g. an irrevocable electronic certificate) from the Host Country indicating that the required adjustments have been applied within the relevant accounting system), before the unit could be cancelled for use by an aeroplane operator for CORSIA. The option of allowing an irrevocable electronic certificate will apply only in cases in between UNFCCC reporting periods and only when a Host Country has a robust GHG accounting system with functionality, such as a distributed ledger registry technology, to enable reporting of this type of real-time, transparent, immutable, irrevocable transaction information. When adjustments are demonstrated by an entry in the Article 6 database or via an irrevocable electronic certificate, ART requires that the information on the adjustment also be recorded in country reports to the UNFCCC in the next reporting period.
- ii. A guarantee, in a form acceptable to ART¹⁹, that any double-claimed units (those for which an adjustment has not been made) will be replaced with a volume of ICAO-eligible credits corresponding to the number of units that were double claimed by the Host Country ("Replacement Contribution"). These units must be ART units (or comparable units as approved by ART) that have not been sold or otherwise committed. ART will cancel the associated Replacement Contribution to mitigate the Host Country's double claim of emission reductions. This guarantee could be from a reputable third-party, an entity such as the Multilateral Investment Guarantee Agency (MIGA) or an ART approved insurance mechanism.

¹⁹Any guarantee must be legally secure and binding, offered by a highly reputable third-party (i.e. a sovereign or corporate with a high grade or prime rating by Moody's, S&P and/or Fitch) and include sufficient remedies to cover ART's costs for replacement units in the event of a default.

- iii. A guarantee, in a form acceptable to ART²⁰, that the guarantor will fully financially compensate ART for the procurement of a Replacement Contribution for the double-claimed units. The Replacement units must be ART units (or comparable ICAO-eligible units as approved by ART) that have not been sold or otherwise committed. ART will cancel the associated Replacement Contribution to mitigate the Host Country's double claim of emission reductions. This guarantee could be from a reputable third-party, an entity such as the Multilateral Investment Guarantee Agency (MIGA) or an ART-approved insurance mechanism.
3. **ART Annual Reporting on the qualification and use of Units for CORSIA.** ART will publish annual reports that provide aggregated information related to the issuance, CORSIA qualification and cancellation of offset credits. ART will publish these reports within six months after the end of a calendar year and will transmit the reports to ICAO and to all countries in which the emission reductions or removals associated with issued and CORSIA qualified offset credits occurred. Reported information will include: (i) Quantity of CORSIA qualified offset credits issued by country, calendar year, cancelled for CORSIA and cancelled for other purposes. (ii) Quantity of CORSIA qualified offset credits cancelled by aeroplane operator for each CORSIA compliance period (iii) The maximum number of emission reductions or removals from ART programs authorized by countries for use by other countries or entities, by country and calendar year.
4. **Obtaining evidence of the application of adjustments.** ART will take action to obtain evidence of the host country reporting the use of the emission reduction / removal units for CORSIA and the application of required adjustments in its reporting to the UNFCCC. Evidence could, for example, be in the country's biennial transparency reports to the UNFCCC or provided in the form of a letter or irrevocable electronic certificate from the Host Country indicating that the required adjustments have been applied within the relevant accounting system. Any evidence should clearly reference the offset credits (e.g., using unique identifiers or serial numbers) for which the country has applied the adjustments. Once evidence has been obtained, ART will post such evidence on the registry and indicate that the adjustment has been made.
5. **Remedy for CORSIA Double Claim.** In the event that the adjustment has not been made or credible evidence cannot be obtained within a year after the adjustment was due to be reported to the UNFCCC by the Host Country, compensation is required for the double claimed volume following its selected compensation mechanism. ART will inform the UNFCCC and ICAO accordingly and will evaluate whether to cease qualifying offset credits from the respective country for CORSIA.

²⁰ Ibid.

EXHIBIT 1: EXAMPLE HOST COUNTRY LETTER OF ASSURANCE AND AUTHORIZATION

DATE:

TO: Architecture for REDD+ Transactions (ART), Secretariat at Winrock International

FROM: UNFCCC Focal Point, Government of Country X

RE: Letter of assurance and authorization related to REDD+ program X

With regard to REDD+ program X, as described in the documentation attached to this letter, we hereby acknowledge that the program may reduce greenhouse gas emissions and enhance removals in country Y and that the Architecture for REDD+ Transactions (ART) has issued, or intends to issue, offset credits for these emission reductions / removals.

We hereby authorize that the REDD+ program's emission reductions / removals, issued as offset credits by ART, may be used by aeroplane operators to meet offsetting requirements under CORSIA [optional: *or by other countries towards achieving their NDC,*] subject to the following restrictions:

- We authorize only the use of the program's emission reductions / removals, for which ART has issued or will issue offset credits, that occur in the period from [DATE] to [DATE]; and
- We authorize only the use of a maximum of [#] tCO₂e of the program's emission reductions / removals, issued as offset credits by ART, for each calendar year.

We hereby request ART to submit annual reports to us, no later than by 31 March of each year, on the use of the offset credit's associated emission reductions / removals by other countries or entities, including volumes canceled for use by each country and entity.

We hereby declare that country X will not use the programs's emission reductions to track progress towards, or for demonstrating achievement of, its NDC and that country X will account for the use of the program's GHG emission reductions by aeroplane operators under CORSIA or by other countries through adjustments in the structured summary of country X's biennial transparency reports, as referred to in paragraph 77, sub-paragraph (d), of the Annex to decision 18/CMA.1, and consistent with relevant future decisions by the CMA.

We hereby also declare that country Y will report on the authorization and use of the program's emission reductions / removals by other countries or entities in a transparent manner in the country's biennial transparency report submitted under Article 13 of the Paris Agreement.

ANNEX C: REFERENCES

- Federici, S., D. Lee, and M. Herold. 2017. *Forest mitigation: A permanent contribution to the Paris Agreement?* Working Paper for CLUA and NICFI, http://www.climateandlandusealliance.org/wp-content/uploads/2017/10/Forest_Mitigation_A_Permanent_Contribution_to_Paris_Agreement.pdf.
- Global Observation for Forest and Land Cover Dynamics (GOFC-GOLD) REDD Sourcebook: *The Sourcebook for Land Use, Land Use Change, and Forestry Projects*.
- GFOI 2016, Integration of remote-sensing and ground-based observations for estimation of emissions and removals of greenhouse gases in forests. In *Methods and Guidance from the Global Forest Observations Initiative*, Edition 2.0, Food and Agriculture Organization, Rome.
- Olofsson, P. et al. 2014. Good practices for assessing accuracy and estimating area of land change. *Remote Sensing of Environment*, 148. http://reddcr.go.cr/sites/default/files/centro-de-documentacion/olofsson_et_al_2014_-_good_practices_for_estimating_area_and_assessing_accuracy_of_land_change.pdf.
- Pearson, TRH, S. L. Brown, and R. A. Birdsey. 2007. Measurement guidelines for the sequestration of forest carbon, 42. Prepared by Gen. Tech. Rep. NRS-18. Newtown Square, PA: United States Department of Agriculture, Forest Service, Northern Research Station.
- Pearson, T., S. Walker, and S. Brown. 2005. Sourcebook for Land Use, Land-Use Change and Forestry Projects. Prepared for BioCarbon Fund of World Bank.