

VT0004

# JNR LEAKAGE TOOL

Version 1.0

4 February 2014

Sectoral Scope 14

## TABLE OF CONTENTS

1	Sources .....	3
2	Summary Description of the Tool .....	3
3	Definitions .....	4
4	Applicability Conditions .....	5
5	Procedures.....	5
5.1	Identification of the Drivers and Agents .....	6
5.2	Identification of the Potential for Jurisdictional Leakage and Leakage Mitigation Strategies .....	6
5.3	Analysis of Leakage Categories.....	7
5.4	Determination of Overall Leakage Deduction .....	14
6	Data and Parameters.....	16
6.1	Data and Parameters Available at Validation .....	16
6.2	Data and Parameters Monitored .....	16
7	References.....	19
	Appendix 1: Document History .....	20

## 1 SOURCES

This tool uses the latest versions of the following modules:

- VMD0036 *Global Commodity Leakage Module: Effective Area Approach*
- VMD0037 *Global Commodity Leakage Module: Production Approach*

The following have informed the development of the tool:

- VCS JNR Leakage Working Group
- VCS document *AFOLU Requirements*
- VCS document *JNR Requirements*
- VCS document *Program Definitions*

## 2 SUMMARY DESCRIPTION OF THE TOOL

Jurisdictional REDD+ programs target and seek to reduce activities that result in deforestation and degradation. There is a risk that such activities may shift to cause increased GHG emissions outside the jurisdictional program boundary. These displaced, or leaked, emissions must be accounted for by the jurisdictional program and subtracted from the jurisdictional GHG emission reductions or removals achieved by the jurisdiction (ie, the difference between the GHG emissions and/or removals between the baseline and program scenarios).

By monitoring deforestation and/or degradation over large areas, jurisdictional programs will capture changes in emissions from activities that shift, yet still remain within the jurisdiction. However, certain activities, including those subject to market effects, are still at risk of shifting outside the jurisdiction and resulting in leakage. Such jurisdictional leakage needs to be assessed and accounted for.

This leakage tool provides a step-wise approach for evaluating leakage risks from a jurisdictional program and to determine the appropriate leakage deduction. It is designed to assess and account for activity shifting leakage, market leakage and deforestation to degradation leakage for jurisdictional programs. The leakage tool may be used to estimate leakage from jurisdictional program activities that reduce deforestation and/or forest degradation, including leakage associated with the following leakage categories:

- 1) Market shifts associated with global commodities,
- 2) Regional shifts associated with domestic markets and subsistence activities, and
- 3) Shifts from deforestation-causing activities to degradation-causing activities.<sup>1</sup>

---

<sup>1</sup> Note that traditionally defined “activity shifting” leakage (where agents of deforestation and/or degradation shift their carbon emitting activities to an area not being monitored and accounted for) could fall under the global

This tool does not estimate leakage occurring outside the host country (ie, international leakage), which does not need to be accounted for nor deducted from the country's domestic GHG emission reductions or removals.<sup>2</sup>

The tool also establishes leakage mitigation criteria that allow a jurisdictional program to evaluate how their jurisdictional activities address the risks of leakage. Based on the combined assessment of leakage risk and mitigation efforts, the tool produces a leakage deduction which can be applied to the jurisdictional GHG emission reductions and removals achieved by the jurisdictional program to capture expected leakage effects.

This tool was developed with a working group composed of leading practitioners and experts on jurisdictional REDD+ and has undergone peer review and public consultation, including review and testing by jurisdictional governments that are applying the VCS JNR framework.<sup>3</sup>

### 3 DEFINITIONS

For the purposes of this tool, the definitions below apply. See VCS documents *Program Definitions* and *JNR Requirements* for further specification on terms used within this document.

#### **Deforestation to Degradation Leakage**

Emissions resulting when a jurisdictional program reduces subsistence activities or production of commodities that drive deforestation and this reduction leads to increased forest degradation

#### **Domestic Market Leakage**

Emissions resulting when a jurisdictional program reduces the production of a commodity, not linked to international markets but sold to local or domestic markets, causing a change in the supply and market demand equilibrium that leads to increased commodity production elsewhere

#### **Global Commodity Leakage**

Emissions resulting when a jurisdictional program reduces the production of a commodity linked to international markets causing a change in the supply and market demand equilibrium that leads to increased commodity production elsewhere

#### **Relevant Commodity(ies)**

A commodity that drives a significant amount of deforestation (or degradation) within the jurisdiction. Collectively, these commodities are considered relevant commodities and are further classified as either relevant global commodities or relevant domestic commodities.

---

commodity leakage, domestic market and subsistence leakage, or deforestation to degradation leakage categories in this tool and is accounted for accordingly.

<sup>2</sup> This follows the precedent established under the United Nations Framework Climate Change Convention and other GHG programs including the VCS, is practical, and avoids the political and technical challenges of assessing international leakage and determining attribution.

<sup>3</sup> VCS JNR Leakage Working Group members can be found at: <http://www.v-c-s.org/node/620>

**Relevant Domestic Commodity(ies)**

A commodity that drives a significant amount of deforestation (or degradation) within the jurisdiction and primarily serves domestic or local markets (ie, is not linked to international markets). Collectively, these commodities are considered relevant domestic commodities.

**Relevant Global Commodity(ies)**

A commodity that drives a significant amount of deforestation (or degradation) within the jurisdiction and is linked to international markets. Collectively, these commodities are considered relevant global commodities.

**Subsistence leakage**

Emissions resulting when a jurisdictional program reduces activities that would have been used to meet a household's needs or local demand for commodities

## 4 APPLICABILITY CONDITIONS

This tool is applicable under the following conditions:

- The jurisdictional program applies a Scenario 2 or Scenario 3 approach (as defined in VCS document *JNR Requirements*); and
- The jurisdictional program is subnational in scope, or the jurisdictional program is national in scope and the tool is being used to estimate and address (and/or allocate) leakage within the country.

## 5 PROCEDURES

The jurisdictional proponent may apply this tool when developing its jurisdictional program description or monitoring report. All of the descriptions and justifications required by this tool and set out in the sections below must be provided in the leakage section of the jurisdictional program description or monitoring report, unless described in other parts of the respective document (eg, descriptions of the drivers of deforestation).

This tool does not assess and account for leakage emissions from ecological leakage (ie, leakage from hydrological connectivity, see VCS document *AFOLU Requirements* for a specification of ecological leakage) or leakage to wetlands. Subnational jurisdictions that contain wetlands, create wetlands through jurisdictional program activities or may shift activities to wetlands outside the jurisdiction but in the same country must refer to VCS document *JNR Requirements* with respect to rules regulating such leakage. Alternative procedures for quantifying the leakage emissions from ecological leakage and leakage to wetlands may be developed by the jurisdictional proponent subject to approval under the JNR validation and verification process (describing such procedures within the leakage section of the jurisdictional program description), or developed in the future by VCSA.

This tool does not directly assess and account for leakage emissions from the enhancement of forest carbon stocks. Subnational jurisdictions that contain strategies, policies or measures to

enhance forest carbon stocks may adapt the framework used within this tool to assess leakage from such activities or develop alternative procedures for assessing the potential for leakage.<sup>4</sup> Where the framework within this tool and/or the jurisdictional leakage modules are adapted to assess leakage from the enhancement of forest carbon stocks, the jurisdictional proponent should consider the previous land use in areas subject to forest carbon stock enhancement and the associated commodity production on such lands instead of the drivers of deforestation or degradation. The default values used in this tool were not developed to account for potential leakage from enhancement of forest carbon stock, and the jurisdictional proponent adapting this framework must develop separate estimates for leakage from enhancement of forest carbon stocks. Alternative procedures estimating a leakage deduction from the enhancement of forest carbon stocks may be developed by the jurisdictional proponent subject to approval under the JNR validation and verification process (describing such procedures within the leakage section of the jurisdictional program description), or developed in the future by VCSA.

## 5.1 Identification of the Drivers and Agents

5.1.1 Identify the following as described within the jurisdictional program description:

- 1) The baseline drivers of both deforestation and degradation within the jurisdiction.
- 2) The agents or class of agents of both deforestation and degradation within the jurisdiction.
- 3) The strategies, policies or measures to address the main drivers, agents and underlying causes of deforestation (and degradation, where relevant)<sup>5</sup> identified in the baseline.

## 5.2 Identification of the Potential for Jurisdictional Leakage and Leakage Mitigation Strategies

5.2.1 Identify the potential for jurisdictional leakage and leakage mitigation strategies, as follows:

- 1) Undertake a qualitative assessment of the relevant leakage categories, based on the drivers and agents of deforestation (and degradation), and strategies, policies or measures to reduce deforestation (and degradation) identified in Section 5.1.1.
- 2) Identify relevant commodities associated with deforestation (and degradation) (eg, agricultural, livestock and forest products), based on the drivers of deforestation (and degradation) identified in Section 5.1.1(1).
- 3) Identify any strategies, policies or measures being implemented under the jurisdictional program to maintain commodity production, provide alternative livelihoods or mitigate jurisdictional leakage.<sup>6</sup>

---

<sup>4</sup> The financial incentives associated with agricultural production are often much greater than those associated with carbon stock enhancement, which translates to a low risk of leakage. However, where incentives from the jurisdictional program are strong enough, there may be risk of lands previously under production being converted to enhance forest carbon stocks, which could result in leakage.

<sup>5</sup> For the purposes of this tool, degradation is relevant where the jurisdictional program scope includes accounting for reducing emissions from forest degradation. All "(and degradation)" references throughout the document should be read as, "(and degradation, where relevant)".

- 5.2.2** Include in this analysis each commodity whose production drives a significant amount of deforestation (and degradation) within the jurisdiction, such commodities are referred to as a relevant commodities. The agents (or class of agents) are those associated with production of relevant commodities.
- 5.2.3** Where the jurisdictional program only includes activities that reduce emissions from deforestation, only consider relevant commodities that drive deforestation. Where the jurisdictional program includes activities that reduce emissions from deforestation and degradation, consider relevant commodities that drive both deforestation and degradation. The tool must be applied separately for leakage resulting from avoiding deforestation and for leakage resulting from avoided degradation (where relevant). This will result in one leakage deduction for deforestation and one for degradation.
- 5.2.4** Strategies to maintain production of commodities must not incentivize production of illegal commodities (eg, coca). To address deforestation resulting from the production of such commodities, strategies, policies or measures should be developed to provide alternative livelihoods to actors who produce illegal commodities. Risk mitigation may be applied where evidence is provided to demonstrate effective mitigation measures are in place.
- 5.2.5** Establish quantitative and/or qualitative objectives for the strategies, policies or measures identified in Section 5.2.1(3) and identify metrics to measure performance against these objectives. These leakage mitigation objectives combined with an assessment of the expected performance may be used to develop an ex-ante estimation of leakage in the jurisdictional program description.

### **5.3 Analysis of Leakage Categories**

- 5.3.1** The analysis of leakage categories must be conducted as follows:
- 1) Separate jurisdictional leakage into three broad categories depending on whether the drivers and agents of deforestation are associated with the following:
    - a) Global commodities,
    - b) Domestic markets and/or subsistence activities, or
    - c) Degradation caused by displaced activities from reducing deforestation.
  - 2) Each respective leakage category must be assessed in accordance with Section 5.3.2 (global commodity leakage), Section 5.3.3 (domestic market and subsistence leakage) and Section 5.3.4 (deforestation to degradation leakage), and a leakage deduction value must be assigned for each category.

---

<sup>6</sup> Strategies, policies or measures to mitigate leakage may overlap with strategies to reduce emissions or provide social and environmental safeguards. The jurisdictional program must identify the strategies that will be evaluated against the leakage mitigation criteria in the tables below.

- 3) Where applicable and where the specified leakage mitigation strategies meet the criteria specified in the tables below, reduce the leakage deduction value for the sub-category in accordance with Sections 5.3.2 to 5.3.4.
- 4) The overall leakage deduction must be determined based on the output of each leakage category in accordance with Section 5.4.

**5.3.2** Global commodity leakage must be determined using Table 2 below, noting the following:

- 1) Global commodity leakage occurs where the jurisdictional program affects the production of relevant global commodities that are linked to international markets, such as agricultural products, forest products (including timber and non-timber forest products) and livestock products. A commodity is considered linked to international markets where a significant amount of the country’s production of that commodity is traded on international commodities markets, given as more than 5 percent of the country’s total production of a given commodity being traded on international commodities markets.
- 2) Where global commodities are linked to international markets, determine the global commodity leakage value, *X*, by applying the default approach or applying a more detailed calculation approach using one of the leakage modules, as follows:
  - a) For the default approach, the global commodity leakage value, *X*, must be determined based on the country in which the jurisdictional program is located. The default approach is helpful where the global commodity leakage modules are not appropriate (eg, if historical commodity production or yield data is not available). These default values only apply for the determination of a global commodity leakage value from deforestation, and not degradation or carbon stock enhancement. The default values for global commodity leakage are provided in Table 1 below.<sup>7</sup>

**Table 1:** Global Commodity Leakage Values

Country	Default Global Commodity Leakage Value ( <i>X</i> )
Brazil	9
Indonesia	9
Democratic Republic of the Congo	4
All other countries	3

<sup>7</sup> These default values were determined based on an analysis using the global commodity leakage modules and data from FAO, Gibbs et al., 2007, Hansen et al., 2013 and IPCC. This analysis assumes the jurisdiction does not implement activities to maintain commodity production. Where the jurisdiction does maintain commodity production, mitigation may be applied in accordance with Table 2 to decrease this default value. A conservative threshold of three percent applies to all countries except for Brazil, Indonesia and Democratic Republic of the Congo, which are subject to higher values due to their relatively large share of international deforestation and forest carbon stocks.

- b) For the calculation approach, the global commodity leakage value,  $X$ , must be determined using VCS module *VMD0036 Global Commodity Leakage Module: Effective Area Approach* or VCS module *VMD0037 Global Commodity Leakage Module: Production Approach*, as appropriate.

The effective area approach is most applicable to a jurisdictional proponent implementing strategies, policies or measures that maintain commodity production within the jurisdiction and that has data on the amount of production for commodities relevant to deforestation (and degradation) within the jurisdiction. The production approach is most applicable to a jurisdictional proponent implementing strategies, policies or measures that maintain production or decrease demand for commodities and that is able to directly track the amount of production achieved or decrease in production demanded by such activities. The jurisdictional proponent must also be able to determine the proportion of deforestation for each driver of deforestation (and degradation) to apply the *production approach*.

These modules provide a framework for the quantification of a global commodity leakage value that takes into account strategies, policies and measures to maintain commodity production and estimates the extent to which such activities partially or fully maintain production within the jurisdiction. A jurisdictional proponent using the calculation approach is not eligible to apply the mitigation criterion in Table 2, as leakage mitigation activities are already incorporated within the calculation frameworks of the modules.

- 3) A jurisdictional proponent using the default approach may apply the leakage mitigation criterion (b) in Table 2. To qualify for this mitigation, the jurisdictional proponent must provide evidence that the production of relevant commodities is fully maintained (ie, there is no reduction in the overall production of such commodities within the jurisdiction). For example, an equivalent area of production for relevant commodities and their substitutes is being maintained within the jurisdiction (eg, through making up potentially displaced production by using intensification strategies or through use of marginal lands with low carbon stocks). The frameworks outlined in the global commodity leakage modules, or alternative approaches, may be used to demonstrate the jurisdictional program is fully maintaining production. Publicly available, peer-reviewed studies may also be used to demonstrate that the jurisdictional program is fully maintaining production. Where this mitigation criterion is met, the default value is fully subtracted (ie,  $-X$ ) resulting in a net global commodity leakage value of 0. Where the production of global commodities is partially maintained within the jurisdiction, the default leakage mitigation criterion (b) cannot not be applied. However as leakage mitigation activities are already incorporated into the calculation framework of the modules, to achieve mitigation for partially maintaining production of global commodities, the calculation approach must be applied. Note that where production is partially maintained the jurisdictional proponent may choose to waive applying mitigation criterion (b).

- 4) Where the jurisdictional baseline is developed using the historical annual average with modeled adjustments or historical trend of GHG emissions or removals (as set out in VCS document *JNR Requirements*), estimate the level of production required to maintain the existing trend of production within the jurisdiction using the historical trend in production. Where the jurisdictional baseline is developed using the historical annual average GHG emissions or removals (as set out in VCS document *JNR Requirements*), estimate the level of production required to maintain existing production within the jurisdiction using either the historical annual average amount of production or the historical trend in production. Calculate the historical annual average amount of production or historical trend in production over the same time period used to determine the jurisdictional baseline.

**Table 2:** Global Commodity Leakage

Global Commodity Leakage		
a)	The jurisdictional program affects the production of relevant global commodities.	X
b)	<b>Mitigation:</b> The jurisdictional program incorporates and has implemented (or is implementing) strategies, policies or measures that fully maintain production (taking into account the historical trend in production, where relevant) of relevant global commodities within the jurisdiction.	-X
<b>Total Global Commodity Leakage [as applicable, a + b]</b>		

**5.3.3** Domestic market and subsistence leakage must be assessed using Table 3 below, noting the following:

- 1) Domestic market leakage occurs where the jurisdictional program affects the production of relevant domestic commodities that primarily serve domestic or local markets, such as artisanal mining, fuelwood gathering, production of charcoal, and production of other domestically traded forest products (ie, timber and non-timber forest products). Domestic commodities are those that primarily serve domestic or local markets and are not linked to international markets (as set out in Section 5.3.2(1)).
- 2) Subsistence leakage occurs where the jurisdictional program affects subsistence activities that are used to meet a household’s needs or local demand for a commodity, such as agricultural production for household use and smallholder cattle ranching.

Note – There may be an overlap between relevant domestic commodities and subsistence activities which is why this leakage category includes an assessment of both. The jurisdictional proponent need not distinguish between the two leakage categories where mitigation criterion (b) and (c) are not applied.

- 3) To qualify for mitigation criterion (b), provide evidence that the production of relevant domestic commodities is substantially maintained or that the jurisdictional program does not impact the production of relevant domestic commodities within the jurisdiction. For example, an equivalent area of production across relevant commodities and their substitutes is being maintained within the jurisdiction (eg, through making up potentially displaced production by using intensification strategies or through use of marginal lands with low carbon stocks). The

- jurisdictional proponent may follow the method to determine the area of production subject to leakage in accordance VCS module *VMD0036 Global Commodity Leakage Module: Effective Area Approach* or follow the method to determine the amount of production subject to leakage in accordance with VCS module *VMD0037 Global Commodity Leakage Module: Production Approach*, or justify an alternative method to demonstrate the jurisdictional program is substantially maintaining production.
- 4) To qualify for mitigation criterion (c), provide evidence that strategies, policies or measures to address subsistence drivers support and sustain alternative, non-deforesting and non-degrading livelihoods, and/or provide low-emission alternatives to agents of subsistence drivers within the jurisdiction (eg, through providing agricultural extension services to promote climate-smart farming, enhancing land tenure or security, creating new non-forest-dependent employment, or developing alternative livelihoods based on sustainably harvested non-timber forest products) or that the jurisdictional program does not impact the subsistence activities within the jurisdiction.
  - 5) To qualify for mitigation criterion (d), a comprehensive government-led, low-emission, rural development or green economy plan<sup>8</sup> must be developed with appropriate stakeholder consultation and in collaboration with all of the relevant government agencies (eg, agricultural, forestry, finance or other ministries/agencies), and must be implemented across the jurisdiction.
  - 6) To qualify for mitigation criterion (e), the consultation process for identifying and developing the jurisdictional strategy to mitigate leakage must include agents that are representative of all significant drivers of deforestation (and degradation) within the jurisdiction. Evidence must be provided demonstrating that all such agents were consulted, the rigor of the consultation process and how the consultation process has informed the jurisdictional strategy.

---

<sup>8</sup> Following commonly accepted definitions of rural development and green economy plans (eg, from United Nations Environment Programme). See "Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication". United Nations Environment Programme (UNEP), Nairobi, Kenya (2011).

**Table 3: Domestic Market and Subsistence Leakage**

Domestic Market and Subsistence Leakage		
a)	The jurisdictional program affects the production of relevant domestic commodities and/or subsistence activities.	15
b)	<b>Mitigation:</b> The jurisdictional program incorporates and has implemented (or is implementing) strategies, policies or measures that substantially maintain production of relevant domestic commodities within the jurisdiction; and/or the jurisdictional program does not affect the production of relevant domestic commodities.	-5
c)	<b>Mitigation:</b> The jurisdictional program incorporates and has implemented (or is implementing) strategies, policies or measures that address subsistence drivers of deforestation (and degradation) and support the majority of the agents associated with such subsistence activities within the jurisdiction; and/or the jurisdictional program does not affect subsistence drivers of deforestation.	-5
d)	<b>Mitigation:</b> The jurisdictional program is integrated, or is being integrated, into a comprehensive government-led, low-emission, rural development or green economy plan.	-4
e)	<b>Mitigation:</b> The jurisdictional program has developed, or is developing, its strategy to mitigate leakage in consultation with representative agents of deforestation (and degradation).	-1
<b>Total Domestic Market and Subsistence Leakage [as applicable, (a + b + c + d + e)]</b>		

**5.3.4** Deforestation to degradation leakage risk must be assessed using Table 4 below, noting the following:

- 1) Where a jurisdictional program accounts for activities that reduce emissions from degradation, there is no risk of deforestation to degradation leakage and a leakage deduction of 0 should be applied for deforestation to degradation leakage in Table 5.
- 2) Deforestation to degradation leakage may occur where drivers of deforestation shift to become drivers of (unaccounted for) forest degradation as a result of the implementation of the jurisdictional program. Deforestation to degradation leakage may result in degradation on lands both within and outside the jurisdiction, however only deforestation to degradation leakage within the jurisdiction must be considered.<sup>9</sup> Activities associated with such leakage may be linked to commercial drivers of deforestation or subsistence drivers of deforestation, as follows:

<sup>9</sup> Agents of deforestation within the jurisdiction have numerous responses to activities implemented by jurisdictional programs to tackle deforestation. Such agents could continue to deforest the land, which would be accounted for by jurisdictional accounting and monitoring of deforestation within the jurisdiction. Such agents could shift their activities outside of the jurisdiction, which is addressed by the previous sections of this tool. This tool conservatively assumes such agents of deforestation leaving the jurisdiction will maintain activities that lead to deforestation outside the jurisdiction even though such agents could leave the jurisdiction and shift to degrading activities (with relatively lower emissions than comparable deforesting activities). Agents of deforestation could also shift to activities that lead to degradation within the jurisdiction, which this section addresses.

- a) Subsistence drivers of deforestation at risk of shifting to degradation include activities where the production model for meeting a household's needs or providing a livelihood may shift from driving deforestation to driving degradation, or agents may shift from livelihoods that drive deforestation to livelihoods that drive degradation (eg, slash-and-burn farmers that drive deforestation shift to activities that degrade forests, such as fuelwood collection, charcoal production or small-scale timber production).
  - b) Commercial drivers of deforestation at risk of shifting to degradation include activities where the production model for relevant global or domestic commodities may shift from driving deforestation to driving degradation, or agents may shift from producing commodities that drive deforestation to commodities that drive degradation (eg, agricultural businesses (formerly driving deforestation) switch to forest degrading activities, such as timber harvesting).
- 3) The jurisdictional proponent may demonstrate that shifts from deforestation to degradation caused by the jurisdictional program are insignificant. Demonstrate that such shifts are insignificant by providing justification that there is a low risk that the jurisdictional program would cause agents associated with the significant drivers of deforestation to shift to the following:
- a) A new production model that results in degradation rather than deforestation (eg, where cattle ranching is a significant driver of deforestation, the analysis must demonstrate that such ranching activities have a low risk of transitioning to a livestock production model that only degrades (and does not deforest) forest lands); and
  - b) Other activities or livelihoods resulting in degradation (eg, where slash-and-burn agriculture is a significant driver of deforestation, the analysis must demonstrate that there is a low risk that the associated farmers will shift to a livelihood that drives degradation, such as fuelwood gathering).

Where shifts from deforestation to degradation can be demonstrated to be insignificant for subsistence drivers of deforestation, the leakage deduction in criterion (a) of Table 4 does not apply. Where shifts from deforestation to degradation can be demonstrated to be insignificant for commercial drivers of deforestation, the leakage deduction in criterion (b) of Table 4 does not apply.

- 4) To qualify for mitigation criterion (c), strategies, policies or measures to address the risk of subsistence drivers must support and sustain alternative, non-deforesting and non-degrading livelihoods, and/or provide low-emission alternatives to agents of subsistence drivers within the jurisdiction (eg, through providing agricultural extension services to promote climate-smart farming, enhancing land tenure or security, creating new non-forest-dependent employment, or developing alternative livelihoods based on sustainably harvested non-timber forest products).
- 5) Leakage mitigation criterion (c) may only be applied in combination with criterion (a) (ie, to zero out the leakage deduction associated with subsistence-related shifts from deforestation to degradation). Similarly, leakage mitigation criteria (d) may only be applied in combination

with criterion (b) (ie, to reduce the leakage deduction associated with commercially driven shifts from deforestation to degradation).

**Table 4:** Deforestation to Degradation Leakage

Deforestation to Degradation Leakage		
a)	The jurisdictional program affects subsistence drivers of deforestation and there is a risk that such agents of deforestation will shift to forest degrading activities.	2
b)	The jurisdictional program affects commercial drivers of deforestation and there is a risk that such agents of deforestation will shift to forest degrading activities.	2
c)	<b>Mitigation:</b> The jurisdictional program incorporates and has implemented (or is implementing) strategies, policies or measures that address the risk of subsistence drivers of deforestation shifting to forest degradation activities and support the majority of the agents associated with such subsistence activities within the jurisdiction. <sup>10</sup>	-2
d)	<b>Mitigation:</b> The annual total volume of timber extracted within the jurisdiction does not increase.	-2
<b>Total Deforestation to Degradation Leakage [as applicable, ((a + b + c + d))]</b>		

#### 5.4 Determination of Overall Leakage Deduction

**5.4.1** The overall leakage deduction must be determined for each year included in the monitoring period using Table 5.

**Table 5:** Leakage Category

Leakage Category		Leakage Deduction
a)	Global Commodity Leakage (from Table 2)	
b)	Domestic Market and Subsistence Leakage (from Table 3)	
c)	Deforestation to Degradation Leakage (from Table 4)	
<b>Overall leakage deduction (a + b + c)</b>		

**5.4.2** To determine the leakage deduction for the jurisdictional program, the overall leakage deduction must be converted to a percentage (eg, an overall leakage deduction of 10 converts to 10 percent). The overall leakage deduction percentage must be multiplied by the jurisdictional GHG emission reductions or removals achieved by the jurisdictional program for the relevant activity (ie, reducing deforestation or reducing degradation) to determine leakage for the jurisdictional program. The overall leakage deduction percentage must be calculated for each year in the monitoring period and applied to the GHG emission reductions and removals in the relevant year.

<sup>10</sup> The strategies, policies or measures implemented may be the same as those used to mitigate subsistence leakage. Therefore the same evidence used to satisfy leakage mitigation criterion (c) in Table 3 may also be used to satisfy this (Table 4 (c)) leakage mitigation criterion.

Where the jurisdictional program only accounts for activities that reduce emissions from deforestation, the leakage deduction is multiplied by the difference between jurisdictional baseline and program emissions as set out in equation 1.

$$L = (JBE_{def} - JPE_{def}) * LD_{def} \quad (1)$$

Where:

$L$  = Leakage (tCO<sub>2</sub>e)

$JBE_{def}$  = Jurisdictional baseline emissions and/or removals from deforestation (tCO<sub>2</sub>e)

$JPE_{def}$  = Jurisdictional program emissions and/or removals from deforestation (tCO<sub>2</sub>e)

$LD_{def}$  = Leakage deduction for deforestation (percent)

Where a jurisdictional program accounts for activities that reduce emissions from both deforestation and degradation, a separate leakage deduction should be determined for each deforestation and degradation. The leakage deduction for deforestation must be multiplied by the difference between jurisdictional baseline and program emissions from deforestation, and the leakage deduction for degradation must be multiplied by the difference between jurisdictional baseline and program emissions from degradation.

$$L = (JBE_{def} - JPE_{def}) * LD_{def} + (JBE_{deg} - JPE_{deg}) * LD_{deg} \quad (2)$$

Where:

$L$  = Leakage (tCO<sub>2</sub>e)

$JBE_{def}$  = Jurisdictional baseline emissions and/or removals from deforestation (tCO<sub>2</sub>e)

$JPE_{def}$  = Jurisdictional program emissions and/or removals from deforestation (tCO<sub>2</sub>e)

$LD_{def}$  = Leakage deduction for activities reducing deforestation (percent)

$JBE_{deg}$  = Jurisdictional baseline emissions and/or removals from degradation (tCO<sub>2</sub>e)

$JPE_{deg}$  = Jurisdictional program emissions and/or removals from degradation (tCO<sub>2</sub>e)

$LD_{deg}$  = Leakage deduction for activities reducing degradation (percent)

Leakage must be subtracted from the jurisdictional GHG emission reductions or removals achieved by the jurisdictional program for each year during the monitoring period, in accordance with VCS document *JNR Requirements*.

## 6 DATA AND PARAMETERS

### 6.1 Data and Parameters Available at Validation

Data / Parameter:	$JBE_{def}$
Data unit	tCO <sub>2</sub> e
Description	Jurisdictional baseline emissions and/or removals from deforestation
Equations	1 and 2
Source of data	Jurisdictional program description or monitoring report
Value applied	
Justification of choice of data or description of measurement methods and procedures applied	Baseline emissions from deforestation for each year included in the baseline period, as reported in the jurisdictional program description or monitoring report.
Purpose of Data	Calculation of leakage
Comments	

Data / Parameter:	$JBE_{deg}$
Data unit	tCO <sub>2</sub> e
Description	Jurisdictional baseline emissions and/or removals from degradation
Equations	2
Source of data	Jurisdictional program description or monitoring report
Value applied	
Justification of choice of data or description of measurement methods and procedures applied	Baseline emissions from degradation for each year included in the baseline period, as reported in the jurisdictional program description or monitoring report.
Purpose of Data	Calculation of leakage
Comments	

### 6.2 Data and Parameters Monitored

Data / Parameter:	X
Data unit	Percent
Description	Global Commodity Leakage Value
Equations	Table 2

Source of data	Default value provided in Table 1 or calculated value using VCS module <i>VMD0036 Global Commodity Leakage Module: Effective Area Approach</i> or VCS module <i>VMD0037 Global Commodity Leakage Module: Production Approach</i> .
Description of measurement methods and procedures to be applied	Apply the default approach or apply a more detailed calculation approach using one of the global commodity leakage modules.
Frequency of monitoring/recording	Where applying the default approach, determine the value once at the end of the monitoring period and apply the same value to each year included within the monitoring period.  Where applying the calculation approach, determine the value at the frequency specified within the global commodity leakage module.
QA/QC procedures to be applied	
Purpose of Data	Calculation of leakage
Comments	

Data / Parameter	$JPE_{def}$
Data unit	tCO <sub>2</sub> e
Description	Jurisdictional program emissions and/or removals from deforestation
Equations	1 and 2
Source of data	Jurisdictional program description or monitoring report
Description of measurement methods and procedures to be applied	Deforestation emissions, as reported in the jurisdictional program description or monitoring report.
Frequency of monitoring/recording	As specified within the jurisdictional program description or monitoring report
QA/QC procedures to be applied	
Purpose of data	Calculation of leakage
Comments	

Data / Parameter	$LD_{def}$
Data unit	Percent
Description	Leakage deduction for activities reducing deforestation

Equations	1 and 2
Source of data	Table 5
Description of measurement methods and procedures to be applied	As calculated using the procedures in Section 5 relevant to the agents and drivers of deforestation.
Frequency of monitoring/recording	Calculate the value for each year included within the monitoring period.
QA/QC procedures to be applied	
Purpose of data	Calculation of leakage
Comments	

Data / Parameter	$JPE_{deg}$
Data unit	tCO <sub>2</sub> e
Description	Jurisdictional program emissions and/or removals from degradation
Equations	2
Source of data	Jurisdictional program description or monitoring report
Description of measurement methods and procedures to be applied	Deforestation emissions, as reported in the jurisdictional program description or monitoring report.
Frequency of monitoring/recording	As specified within the jurisdictional program description or monitoring report
QA/QC procedures to be applied	
Purpose of data	Calculation of leakage
Comments	

Data / Parameter	$LD_{deg}$
Data unit	Percent
Description	Leakage deduction for activities reducing degradation
Equations	2
Source of data	Table 5

Description of measurement methods and procedures to be applied	As calculated using the procedures in Section 5 relevant to the agents and drivers of degradation.
Frequency of monitoring/recording	Calculate the value for each year included within the monitoring period.
QA/QC procedures to be applied	
Purpose of data	Calculation of leakage
Comments	

## 7 REFERENCES

FAO, 2010. *Global Forest Resources Assessment 2010*. FAO Forestry Paper 163.

Gibbs, H. et al., 2007. *Monitoring and Estimating Tropical Forest Carbon Stocks: Making REDD a Reality*. Environmental Research Letters. 2:4 1-13.

Hansen, M.C. et al., 2013. *High-Resolution Global Maps of 21<sup>st</sup>-Century Forest Cover Change*. Science 342: 850-853.

IPCC, 2006. *Guidelines for National Greenhouse Gas Inventories*. National Greenhouse Gas Inventories Programme and Japan: Institute for Global Environmental Strategies.

## APPENDIX 1: DOCUMENT HISTORY

Version	Date	Comment
v1.0	4 Feb 2014	Initial version released.