

# THE TUMRING REDD+ PROJECT

## 1<sup>ST</sup> MONITORING REPORT (M<sub>1</sub>)



Document Prepared By Wildlife Works Carbon

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<b>Prepared By</b>	Wildlife Works Carbon LLC: Jeremy T. Freund, Simon Bird, Brian Williams.
<b>Validation/Verification Body</b>	S & A Carbon
<b>GHG Accounting/ Crediting Period</b>	01 January 2015 – 31 December 2044; 30-year total period The CCB and VCS periods are identical
<b>Monitoring Period of this Report</b>	01 January 2015 – 31 December 2019 The CCB and VCS periods are identical
<b>History of CCB Status</b>	The Project received its validation under the CCB Standard on 28 June 2018. This is the Project's first verification.
<b>Gold Level Criteria</b>	None

## **ACKNOWLEDGEMENTS**

The lead authors of the document are Simon Bird and Brian Williams. The Tumring REDD+ Project team also includes the following key people (in alphabetical order by surname): Y Chaly, Chhun Delux, Jeremy Freund, Mwangi Githiru, Nara Lee, Yuni Nunokawa, and Khorn Vantha.



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## ACRONYMS

AFOLU	Agriculture, Forestry and Other Land Use
AUDD	Avoided Unplanned Deforestation and/or Degradation
CCB	Climate, Community and Biodiversity
DNA	Designated National Authority
ER	Emissions Reductions
FA	Forestry Administration, Cambodia
FAO	Food and Agricultural Organization
FCPF	Forest Carbon Partnership Facility
FPIC	Free, Prior and Informed Consent
FRL	Forest Reference Level
GHG	Greenhouse Gas
GIS	Geographic Information System
HCV	High Conservation Value
MRV	Measuring, Reporting and Verification
MOE	Ministry of Environment
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organization
NPA	Natural Protected Area
NTFP	Non-Timber Forest Products
PA	Project Area
PAA	Project Accounting Area
PDD	Project Design Document
PMU	Project Management Unit
REDD	Reducing Emissions from Deforestation and forest Degradation
REDD+	Reducing Emissions from Deforestation and forest Degradation, plus Conservation, Sustainable management of forests, and enhancement of forest carbon stocks
RGC	Royal Government of Cambodia
R-PP	Readiness Preparation Proposal
TRP	Turning REDD+ Project
UNFCCC	United Nations Framework Convention on Climate Change VCS Verified Carbon Standard
UN REDD	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
WWC	Wildlife Works Carbon

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## 1 SUMMARY OF PROJECT BENEFITS

This section highlights some of this project's important benefits. Section 1.1 (Unique Project Benefits) should be aligned with a project's causal model and is specific to this project. Section 1.2 (Standardized Benefit Metrics) represents the same quantifiable information for all CCB projects. This section does not replace the development of a project-specific causal model or the monitoring and reporting of all associated project-specific impacts (positive and negative) in Sections 2-5 of this document.

### 1.1 Unique Project Benefits

Outcome or Impact	Achievements during the Monitoring Period	Section Reference	Achievements during the Project Lifetime
1) Development of agricultural cooperative	2	4.2	2
2) Development of agricultural demonstration plot	6	4.2	6
3) Households trained in improved agricultural methods	70	4.2	70

## 1.2 Standardized Benefit Metrics

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
GHG emission reductions & removals	Net estimated emission removals in the project area, measured against the without-project scenario	0		0
	Net estimated emission reductions in the project area, measured against the without-project scenario	645,410	3.2.4.5	645,410
Forest <sup>1</sup> cover	For REDD <sub>2</sub> projects: Number of hectares of reduced forest loss in the project area measured against the without-project scenario	1,449	3.2.1	1,449
	For ARR <sub>3</sub> projects: Number of hectares of forest cover increased in the project area measured against the without-project scenario	Not Applicable		Not Applicable
Improved land management	Number of hectares of existing production forest land in which IFM <sub>4</sub> practices have occurred as a result of the project's activities, measured against the without-project scenario	Not Applicable		Not Applicable

<sup>1</sup> Land with woody vegetation that meets an internationally accepted definition (e.g., UNFCCC, FAO or IPCC) of what constitutes a forest, which includes threshold parameters, such as minimum forest area, tree height and level of crown cover, and may include mature, secondary, degraded and wetland forests (*VCS Program Definitions*)

<sup>2</sup> Reduced emissions from deforestation and forest degradation (REDD) - Activities that reduce GHG emissions by slowing or stopping conversion of forests to non-forest land and/or reduce the degradation of forest land where forest biomass is lost (*VCS Program Definitions*)

<sup>3</sup> Afforestation, reforestation and revegetation (ARR) - Activities that increase carbon stocks in woody biomass (and in some cases soils) by establishing, increasing and/or restoring vegetative cover through the planting, sowing and/or human-assisted natural regeneration of woody vegetation (*VCS Program Definitions*)

<sup>4</sup> Improved forest management (IFM) - Activities that change forest management practices and increase carbon stock on forest lands managed for wood products such as saw timber, pulpwood and fuelwood (*VCS Program Definitions*)



Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	Number of hectares of non-forest land in which improved land management has occurred as a result of the project's activities, measured against the without-project scenario	Not Applicable	4.3.1	Not Applicable
Training	Total number of community members who have improved skills and/or knowledge resulting from training provided as part of project activities	1,087	4.3.1	1,087
	Number of female community members who have improved skills and/or knowledge resulting from training provided as part of project activities of project activities	473	4.3.1	473
Employment	Total number of people employed in of project activities, <sup>5</sup> expressed as number of full time employees <sup>6</sup>	8	4.3.1	8
	Number of women employed in project activities, expressed as number of full time employees	0	4.3.1	0

<sup>5</sup> Employed in project activities means people directly working on project activities in return for compensation (financial or otherwise), including employees, contracted workers, sub-contracted workers and community members that are paid to carry out project-related work.

<sup>6</sup> Full time equivalency is calculated as the total number of hours worked (by full-time, part-time, temporary and/or seasonal staff) divided by the average number of hours worked in full-time jobs within the country, region or economic territory (adapted from UN System of National Accounts (1993) paragraphs 17.14[15.102];[17.28])

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
Livelihoods	Total number of people with improved livelihoods <sup>7</sup> or income generated as a result of project activities	1,087	4.3.1	1,087
	Number of women with improved livelihoods or income generated as a result of project activities	473	4.3.1	473
Health	Total number of people for whom health services were improved as a result of project activities, measured against the without-project scenario	0	4.3.1	0
	Number of women for whom health services were improved as a result of project activities, measured against the without-project scenario	0		0
Education	Total number of people for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	1,087	4.3.1	1,087
	Number of women and girls for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	473	4.3.1	473
Water	Total number of people who experienced increased water quality and/or improved access to drinking	0	4.3.1	0

<sup>7</sup> Livelihoods are the capabilities, assets (including material and social resources) and activities required for a means of living (Krantz, Lasse, 2001. *The Sustainable Livelihood Approach to Poverty Reduction*. SIDA). Livelihood benefits may include benefits reported in the Employment metrics of this table.

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	water as a result of project activities, measured against the without-project scenario			
	Number of women who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	0	4.3.1	0
Well-being	Total number of community members whose well-being <sup>8</sup> was improved as a result of project activities	5,237	4.3.1	5,237
	Number of women whose well-being was improved as a result of project activities	1,898	4.3.1	1,898
Biodiversity conservation	Change in the number of hectares significantly better managed by the project for biodiversity conservation, <sup>9</sup> measured against the without-project scenario	41,196	5.1	41,196

<sup>8</sup> Well-being is people's experience of the quality of their lives. Well-being benefits may include benefits reported in other metrics of this table (e.g. Training, Employment, Health, Education, Water, etc.), but could also include other benefits such as empowerment of community groups, strengthened legal rights to resources, conservation of access to areas of cultural significance, etc.

<sup>9</sup> Biodiversity conservation in this context means areas where specific management measures are being implemented as a part of project activities with an objective of enhancing biodiversity conservation.

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	Number of globally Critically Endangered or Endangered species <sup>10</sup> benefiting from reduced threats as a result of project activities, <sup>11</sup> measured against the without-project scenario	3	5.1.4	3

<sup>10</sup> Per IUCN's Red List of Threatened Species

<sup>11</sup> In the absence of direct population or occupancy measures, measurement of reduced threats may be used as evidence of benefit

## 2 GENERAL

### 2.1 Project Description

#### 2.1.1 Implementation Description

The Tumring REDD+ Project (TRP) activity has been implemented since the Project start date of January 1st, 2015. The primary activity is the reduction of carbon emissions from the Project Area by halting deforestation and forest degradation. This is achieved through a variety of measures undertaken by the Project Proponent. Please refer to the TRP PD Section 2.1.11 for a complete list of proposed Project Activities as well as their detailed descriptions. Project Activities that have been implemented during this first monitoring period (m<sub>1</sub>) are listed below. For more detailed information on the implementation of each Project Activity, see Section 4.3.

1. Resin, wild honey enterprise, and forest conservation-based micro-finance
2. Deforestation free commodities and promotion of smallholder social forestry
3. Promoting effective forest land use planning and tenure security
4. Strengthening community organizations
5. Training on improved agricultural methods and agricultural intensification
6. Employment and motivation of a larger ranger force

The aforementioned Project Activities are focused on actions that will reduce the surrounding communities' dependence on the resources of the Project Area, either by improving agricultural methods, creating new income generating opportunities or otherwise addressing drivers of deforestation. During this monitoring period, all the TRP project activities demonstrated measurable success, with high levels of engagement from Project communities, as well as positive outcomes.

Total GHG reduction achieved by the TRP during this m<sub>1</sub> (2015-2019) monitoring period is 645,410 tCO<sub>2</sub>e. Non-permanence risk factors are monitored through the Project's climate and disturbance monitoring procedures, as described in Section 3.1.3. Potential leakage from the Project was monitored through the Project's leakage procedures; specifically activity-shifting leakage was monitored with the procedures described in Section 3.2.3.2 and potential Market leakage was determined using the procedures in Section 3.2.3.4.

#### 2.1.2 Project Category and Activity Type

The Tumring REDD+ Project (TRP) falls under the VCS sectoral scope 14: Agriculture, Forestry, and Other Land Uses (AFOLU), under the category Reduced Emissions from Deforestation and Degradation (REDD+). Specifically, the project falls under the REDD+ category Avoided Unplanned Deforestation (AUD). The project is eligible under this category by the definition provided in the VCS AFOLU Requirements version 3.6 published 21 June 2017 because it prevents emissions that would have otherwise taken place through unplanned deforestation.

The TRP is not a grouped project under the VCS standard and the CCB programmatic approach.

## 2.1.3 Project Proponent(s)

Organization name	The Royal Government of Cambodia, Forestry Administration
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### 2.1.3.1 Project Partners

Organization name	Wildlife Works Carbon
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## 2.1.4 Other Entities Involved in the Project

Organization name	Korea Forest Service
Role in the project	Donor (funding in project development phase)
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Organization name	Action for Development
Role in the project	Local NGO partner
Contact person	Mr. Som Sopheak

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Email	sopheak@afd-cambodia.org

#### **2.1.5 Project Start Date (G1.9)**

##### **MR.2 The Project Start Date**

The project start date for the TRP is January 1st, 2015. This is the date that the Tumring REDD+ Project planning and activities were first initiated.

#### **2.1.6 Project Crediting Period (G1.9)**

##### **MR.3 The project crediting period start date, end date and length.**

The TRP lifetime is 30 years, commencing on the Project start date of 01 January 2015 and ending 31 December 2044 The GHG accounting period is identical to the project lifetime.

#### **2.1.7 Project Location**

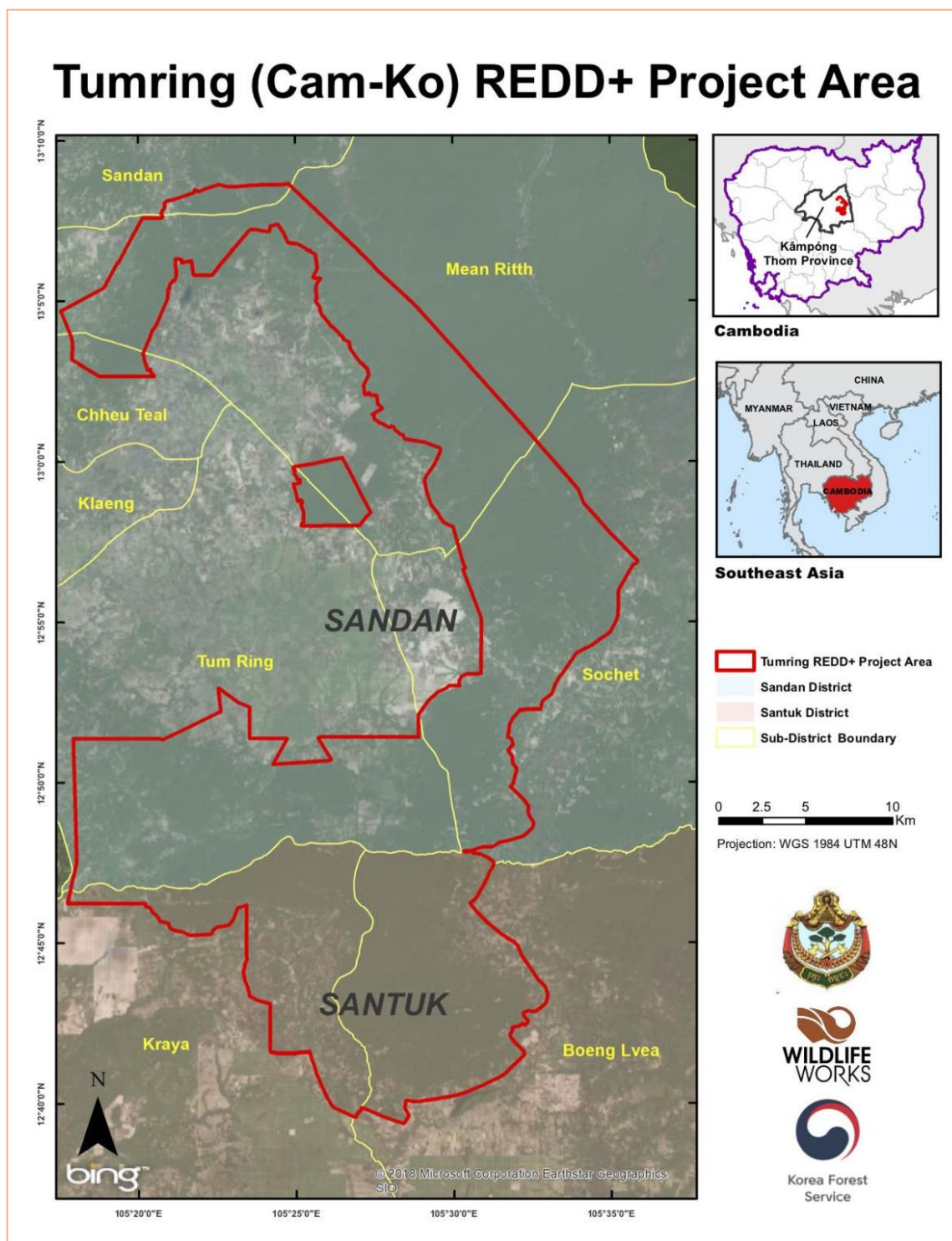


Figure 1: The Tumring REDD+ Project Area, located in Kampong Thom Province, Cambodia. Land unit administrative boundaries are also shown.



**Table 1: Project Area boundaries.**

Boundary	Location
<b>Northern Boundary</b>	
<b>Northern Extent GPS Point</b>	105° 24' 45.96" E, 13° 8' 40.50" N
<b>Eastern Boundary</b>	
<b>Eastern Extent GPS Point</b>	105° 35' 52.09" E, 12° 56' 54.14" N
<b>Southern Boundary</b>	
<b>Southern Extent GPS Point</b>	105° 28' 23.80" E, 12° 39' 23.08" N
<b>Western Boundary</b>	
<b>Western Extent GPS Point</b>	105° 17' 32.36" E, 13° 4' 41.94" N

Maps containing the VM0009 methodology Monitoring Report requirements (MRRs) listed below are provided in the following appendices to this document. Appendix A – Map of the Project Area, Appendix B – Map of Topography (DEM based), Appendix B – Map of Roads and Infrastructure, as well as major rivers and streams, and Appendix B – Map of Land use/Vegetation Cover.

The geographic or physical boundaries of the project area must be clearly delineated using, at minimum, the following:

- Name of the project area (compartment or allotment number, local name)
- Digital maps of the area, including geographic coordinates of vertices
- Total land area
- Details of ownership, including user rights and/or land tenure information
- Topography
- Roads
- Major rivers and perennial streams
- Land use/vegetation type classification

**MRR.1 A digital (GIS-based) map of the project area with at least the above minimum requirements for delineation of the geographic boundaries.**

**MRR.6 A digital (GIS-based) map of the project accounting areas with at least the above minimum requirements for delineation of the geographic boundaries.**

#### **2.1.8 Title and Reference of Methodology**

The TRP employs the VCS VM0009 Methodology for Avoided Ecosystem Conversion, version 3.0. This methodology quantifies greenhouse gas emission reductions generated from avoiding either planned or unplanned (or both) deforestation as well as protection from native grassland conversion as initiated by a variety of agents and drivers. For the assessment of additionality, the Project also uses the VCS “Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities,” VT0001 Version 3.0. The VCS “AFOLU Non-Permanence Risk Tool,” V3.3 was used to determine the Project’s non-permanence risk and project buffer withholding rate. In addition, the VCS Tool VMD 0037 Global Commodity Leakage Module: Production Approach (LM-P), V1.0 4 February 2014. This tool was utilized for the determination of market leakage resulting from the Project.

#### **2.1.9 Other Programs (G5.9)**

The TRP does not currently participate in, nor is liable to, any other emission trading program or other binding limit. However, the Project’s main activity, reduction of deforestation, is a carbon pool included in the RGC’s Nationally Determined Contribution (NDC), submitted to the UNFCCC in accordance with the Paris Agreement. To date, no internationally traded mitigation outcomes, the term for emission reductions in the Paris Agreement, have been traded or transacted in any way by the Royal Government of Cambodia. It is the intention of the project proponent to include the Project into a Cambodia wide jurisdictional / nested REDD+ initiative (JNRI) approach when one has been formalized. Currently, the Cambodian National REDD+ Taskforce secretariat, with support from the UNDP, is finalizing a study into the development of a nested REDD+ program. To date, there have been no commitments to the nested REDD+ program design or a timeframe for its creation. The Project will report in subsequent MRs the status of the national REDD+ system, the status of the Project’s nesting, and whether or not Cambodia is transacting emission reductions from reduced deforestation and/or degradation. The TRP has not, and will not in the future, seek any other form of environmental credit. The TRP is not registered with any additional GHG program, nor is it currently seeking registration with one.

#### **2.1.10 Sustainable Development**

The TRP will touch upon seven sustainable development themes that the Royal Government of Cambodia has identified and committed to (Royal Government of Cambodia – Ministry of Environment, 2012). These themes and the provisions for reporting and monitoring are listed below.

##### **Economic Growth and Development**

Project stakeholders benefit from employment in the Project and from livelihood enhancement activities. These activities improve local incomes and help create the foundation for a low-carbon economy. The Project will last 30 years and will employ local stakeholders in a variety of ways including forest protection, support of project activities, improved agricultural yield from agricultural intensification, and livelihood enhancement from improved access to markets for local products, such as resin.

##### **Poverty and Equity**

One of the goals of the RGC is to lower poverty levels in rural areas. The TRP supports poverty reduction efforts by generating employment and promoting an increase in household incomes. The TRP works with impoverished communities to provide employment and livelihood support to the neediest community members. There are small populations of the indigenous Kuy people living in within the Project Zone. The Project's equal opportunity policy ensures that they and other traditionally under-represented groups, such as women, were consulted and have been duly included in all Project activities.

### **Education**

A critical component to creating economic development and halting poverty is the improvement of education. During the SBIA, there were two types of educational support that were requested by local leaders: agricultural education and primary and secondary education. The goal of agricultural education is to support farmers in increasing their yields and conducting more sustainable farming. The TRP plans to support bursaries for local students to offset the cost of marginalized families from the loss of a potential household earner.

### **Sustainable Forest and Land Use**

The TRP supports the RGC's goal of maintaining forest cover at 60% by protecting approximately 45,000 ha of forest, improving law enforcement, as well as supporting the development and improving management of community forests that are included in the Project Area. It also promotes a concerted action to halt illegal logging and deforestation.

### **Climate Change**

REDD+ represents one the key components of RGC's climate change mitigation strategy. The TRP will reduce forest emissions by approximately 300,000 tonnes CO<sub>2</sub>e/yr. The TRP also demonstrates RGC's capacity for REDD+ implementation, as RGC is the lead proponent for the Project.

### **Agriculture and Food Security**

The RGC's focus for developing sustainable agriculture is on increased yields and providing manufacturing facilities to process products, so that local farmers can move up the supply chain. The TRP will meet the goal of increased yields by providing local farmers with training in better crop management and improved farming techniques.

The climate, community and biodiversity benefits provided by the TRP, and detailed in sections 3, 4 and 5 of this MR, contribute to achieving Cambodia's global and national sustainable development goals themes mentioned above. These contributing benefits are monitored through the TRP's climate, community and biodiversity monitoring plans and will be monitored, reported and verified through the VCS and CCB monitoring, reporting and verification system at a minimum of every 5 years.

## **2.2 Project Implementation Status**

### 2.2.1 Implementation Schedule (G1.9)

Date	Milestone(s) in the project's development and implementation
10 December 2014	Signing of MOU between FA and Korean Forest Service establishing REDD+ project.
01 January 2015	Project Start Date
01 January 2015	Implementation of project activity, protection of forest from deforestation and degradation.
April 2015	Implemented activities to strengthen Community Forest groups (CFs), provide financial support to them for forest patrols, and raise awareness of the project with them.
April 2015	Implemented increased forest protection through funding to the local FA office for Field Implementation Units (FIU) and 3 mobile enforcement units.
June 2015	Implement project activity to raise awareness of the REDD+ project and climate change through workshops, posters and training materials.
October 2015 – June 2016	Project Area carbon stock measurement
July 2016	Implemented project activity on Promoting Effective Forest Land Use Planning and Tenure Security by permanently demarcating boundaries and providing supplies to CFs to support their forest patrols, and 10 outposts.
July 2016	Proxy Area carbon stock measurement
November – December 2016	Leakage Area carbon stock assessment
June 2018	Implemented project activity on building capacity of community forest management committees
June 2018	Implemented project activities on deforestation free commodities and promote farmer production forestry
June 2018	Implemented project activities on promoting effective forest land use planning and tenure security
June 2018	Implemented the activity on Training on Agricultural Methods and Intensification by developing two agricultural cooperatives
28 June 2018	VCS and CCB Validation
July 2018	Implemented project activities on training on agricultural methods and intensification with work to improve degraded land and improved cassava varieties

July 2018	Implemented micro-finance scheme at Kbal Dontey Community Forestry.
July 2018	Implemented the project activity on creating new income generating activities by supporting Community-based resin enterprise at O' Dasco CF.
February 2019	Implemented the project activity Promoting Effective Forest Land Use Planning and Tenure Security by supporting Sandan District government in law enforcement activities within the Project Area and CFs.
April 2019	Implemented further project activities on training on agricultural methods and intensification with work to improve rice and cassava production methods
August 2019	Operationalize the project implementation plan (30 Year work plan) include the monitoring plan of climate, community and biodiversity.
01 March 2020	VCS and CCB Verification M <sub>1</sub>
01 March 2022	VCS and CCB Verification M <sub>2</sub>
01 March 2024	VCS and CCB Verification M <sub>3</sub>
01 March 2026	VCS and CCB Verification M <sub>4</sub>
01 March 2028	VCS and CCB Verification M <sub>5</sub>

## 2.2.2 Methodology Deviations

The TRP has no deviations from the VCS methodology VM0009 v3.

## 2.2.3 Minor Changes to Project Description (*Rules 3.5.6*)

In the project description the Project's end date was incorrectly stated as 31 December 2045. Based on the project start date of 1 January 2015 and the project lifetime of 30 years, the project end date should have been stated as 31 December 2044. During this monitoring period some Project procedures have been revised, including the disturbance monitoring plan, the climate monitoring plan and the social and biodiversity monitoring plan. Through the Project's adaptive management practices we are always looking for ways to improve the Project's procedures and protocols to incorporate new techniques and methods that will improve the quality of the data, reduce the potential for error and ensure repeatability.

The disturbance monitoring procedure was revised to align the schedule of remote sensing monitoring for disturbances with the schedule presented in the Project's climate monitoring plan. Additionally, a simplified method for quantifying the emission from a deforestation event was added. Whereas previously it was required that new sampling plots be added in the area of deforestation to determine the emission, in this revision the Project can now elect to delineate the area of disturbance through remote sensing or with the use of landcover data and move it to a non-forest strata and assume that all biomass has been destroyed and emitted. The climate monitoring plan was updated to align remote sensing monitoring with the disturbance monitoring plan and also to update the biomass monitoring schedule. The social and

biodiversity monitoring plan was revised to remove some social and biodiversity indicators to better align the monitoring plan with the actual monitoring activities that have been implemented to date. Please see Table 2 and Table 3 below to see each indicator that was removed and the justification for their removal. For the biodiversity monitoring plan one indicator was added. This indicator is the number of total incidents and confiscations. It was added to provide greater metrics on the Project's impacts on the protection of the forest and biodiversity.

**Table 2: A comprehensive list of the social indicators that were removed for m1 monitoring period.**

Focal Issue	Indicator	Justification
Poverty & livelihoods	Amount or yield/ha of agricultural crop increase	The data for this indicator is to be collected with a household survey. Due to the fact that there has not been any revenue from carbon credit sales the Project was unable to implement this monitoring activity at this time. It is intended that the Project will implement the household survey at a later time as funds allow. As the Project is already monitoring number of people trained in new agricultural techniques and number of workshops held we are already capturing sufficient data demonstrating progress towards this indicator.
Poverty & livelihoods	# Key assets owned by household (e.g., motorbike, phone, radio, TV)	The data for this indicator is to be collected with a household survey. Due to the fact that there has not been any revenue from carbon credit sales the Project was unable to implement this monitoring activity at this time. It is intended that the Project will implement the household survey at a later time as funds allow. This indicator, while providing important information, is superfluous to the demonstration of the Project's success.
Poverty & livelihoods	Amount of household income	The data for this indicator is to be collected with a household survey. Due to the fact that there has not been any revenue from carbon credit sales the Project was unable to implement this monitoring activity at this time. It is intended that the Project will implement the household survey at a later time as funds allow. This indicator, while providing important information, is superfluous to the demonstration of the Project's success.
Poverty & livelihoods	# Household livelihood/income sources (diversification)	The data for this indicator is to be collected with a household survey. Due to the fact that there has not been any revenue from carbon credit sales the Project was unable to implement this monitoring activity at this time. It is intended that the Project will implement the household

		survey at a later time as funds allow. This indicator, while providing important information, is superfluous to the demonstration of the Project's success.
Forest Loss and Degradation	# Tree seedlings planted and surviving beyond 3rd year	This indicator was included in the social monitoring plan in error. Initially, there were some Project Activities planned that focused on the provision of tree seedlings to the local communities. However, this project activity was removed, and therefore, this indicator should not be included in the social monitoring plan. The Project is still planning on performing reforestation and forest restoration activities, and there are remaining indicators that will provide metrics for determining the Project's impact.
Lack of awareness & knowledge	% of community members with improved understanding of forest benefits	The data for this indicator is to be collected with a household survey. Due to the fact that there has not been any revenue from carbon credit sales the Project was unable to implement this monitoring activity at this time. It is intended that the Project will implement the household survey at a later time as funds allow. This indicator, while providing important information, is superfluous to the demonstration of the Project's success.
Lack of awareness & knowledge	# Bursaries provided to students	This indicator was included in the social monitoring plan due to an oversight. Initially, there were some Project Activities planned that focused on bursaries and education, however based on community input these were removed before validation. It was determined that these project activities were not needed as the government already provides support this area. Therefore, this indicator should not have been included in the social monitoring plan.
Lack of awareness & knowledge	# Schools with improved infrastructure (buildings, desks)	This indicator was included in the social monitoring plan due to an oversight. Initially, there were some Project Activities planned that focused on bursaries and education, however based on community input these were removed before validation. It was determined that these project activities were not needed as the government already provides support this area. Therefore, this indicator should not have been included in the social monitoring plan.
Lack of awareness & knowledge	Highest level of education attained by a household member	This indicator was included in the social monitoring plan due to an oversight. Initially, there were some Project Activities planned that focused on bursaries and education, however based on community input these were removed



		before validation. It was determined that these project activities were not needed as the government already provides support this area. Therefore, this indicator should not have been included in the social monitoring plan.
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**Table 3 : A comprehensive list of the biodiversity indicators that were removed for m1 monitoring period.**

<b>Focal Issue</b>	<b>Indicator</b>	<b>Justification</b>
<b>Ecosystem improvement</b>	See SIA005: # Key assets owned by household (e.g., motorbike, phone, radio, TV)	AS documented in above, this social indicator was removed. This necessitated it also being removed as a biodiversity indicator.
<b>Ecosystem improvement</b>	# trees planted & surviving (3rd year) in Project Area	This indicator was included in the social monitoring plan in error. Initially, there were some Project Activities planned that focused on the provision of tree seedlings to the local communities. However, this project activity was removed, and therefore, this indicator should not be included in the social monitoring plan. The Project is still planning on performing reforestation and forest restoration activities, and there are remaining indicators that will provide metrics for determining the Project's impact.
<b>Biodiversity improvement</b>	# patrol distances	This indicator was removed due to the inability for the project to collect the data at this time. The patrols are performed by a large number of people, comprising both project staff and community forest members. Due to the fact that the Project has not received any revenue from carbon credit sales yet, it has not been able to obtain the equipment needed to determine patrol lengths and record and transit this data. This indicator may be reinstated at a later date when the data can be obtained reliably and accurately. Another indicator does report the number of patrols performed, providing a sufficient metric of success for this project acidity.



## 2.2.4 Project Description Deviations (Rules 3.5.7 – 3.5.10)

The TRP has no deviations from the Project Description as validated 28 June 2018.

## 2.2.5 Grouped Projects

The TRP is not a grouped project. This section is therefore not applicable.

## 2.2.6 Risks to the Project (G1.10)

### 2.2.6.1 Human induced risks

#### 1. Slash and Burn / Unsustainable Agriculture:

The greatest human-induced risk to project-based benefits is continued deforestation. As described in Section 1.2.1. and parts of Section 1.3 of the PD, the Project Zone faces significant pressure for new agricultural land from both the expanding population and ongoing immigration into the area. Therefore, slash and burn agriculture is a primary risk to the TRP's sustainability.

Mitigation of this risk is achieved through the Project Activities, mainly in the form of increased protection of the Project Area, creation of new IGAs and through the promotion of improved agricultural methods, as described in Section 2.2 of the PD. This risk is additionally mitigated through a process where members of the community forest groups can submit requests to the FA to harvest trees from their forest area for use in building homes or other buildings needed. The FA officer reviews this request against the need and the management plan for the forest area and previous requests granted to ensure that the harvest is within a sustainable cutting level. If approved the community member is granted permission to cut a specific volume of specific species of tree.

#### 2. Charcoal Production and illegal logging

Within the Project Area, there are currently wide-spread extractive activities, including the production of charcoal and illegal logging. These represent additional threats of deforestation and degradation in the TRP Project Area and pose a significant risk to the Project's climate benefits. Teams of rangers and community members patrol the Project Area permanently and attempt to halt such activities. However, these law enforcement units lack resources and have been consequently unable to effectively reduce threat. The TRP therefore provides financial, political and human capacity support by employing additional rangers, increasing ranger motivation and providing them with additional equipment, training and technology.

#### 3. Anthropogenic fires:

An additional anthropogenic threat is frequent fires; these can occur multiple times per year in the region. Many are set intentionally, with the goal of clearing trees and brush for agriculture, or at times may be the unintentional result of illegal activity, such as charcoal production. The TRP monitors the Project Area for the occurrence of fire, and works to reduce fire risk. In addition, the Project aims to reduce illegal incursion into the Project Area, thus mitigating anthropogenic fire potential. The Project Proponent monitors fire events and other potential contributions to reversals as part of its annual monitoring efforts, and reports on major carbon losses within the Project Area. Through collaboration with the communities, awareness of forest protection and

forest stewardship has been enhanced. A Project goal is to work with communities to realize the value of standing forests, and thus decreasing the willingness to destroy forest resources, as they begin to realize tangible performance benefits from the Project.

#### 2.2.6.2 Natural Risks

The Project region is not generally susceptible to severe or destructive natural events. The primary natural events that could conceivably occur are pests, disease, flooding or fire. The area is not prone to any geologic activity and such events pose little to no risk to the Project. As the Project Area is a native and biodiverse ecosystem, risk from pests or disease causing a significant emissions reversal is low. The primary mitigation for this risk is forest maintenance and verification by monitoring that the ecosystem remains healthy and intact. Minor seasonal flooding can occur due to annual monsoons. However, the species in this area are well adapted to the hydrological cycles and flooding of this type poses little risk to them. The Project Area is mostly flat, with very little topographical relief; erosion / landslide risk is low. Fire has the greatest potential to damage the forests in the Project Area. However, the risk of significant emissions reversal from fire is low, as the deciduous forest species are fire-adapted and withstand the common low intensity fires that occur. Evergreen and semi-evergreen forest types are dense, evergreen, moist forests that are not prone to forest fires. There have been no catastrophic fires in non-degraded forests of this type in the region. Therefore, natural events pose low risk to the Project's benefits.

#### 2.2.6.3 Political Risks

All countries possess a slight risk of shifting legislation or the potential for new policies that could in turn affect natural resource management and/or land tenure policy. There have been cases in Cambodia where the RGC has allowed protected forest lands to be cleared for agricultural or development purposes. That said, the likelihood of such changes occurring is extremely small, especially given that the entirety of the Project Area is under government ownership and also under a protective status (although in practice, prior to the REDD+ project, much of the area was not physically protected). Additionally, the FA has been more effective in protecting lands under their stewardship than other branches of the RGC.

As a highly visible international REDD+ project, the likelihood that the RGC would allow the TRP Project Area to be converted is low. Additionally, as the intent is to nest this Project into a future jurisdictional program, the Project's visibility and importance will increase.

#### 2.2.6.4 Policy risks

##### 1. Risk of reversal:

Risk of project reversal due to community opposition is considered minimal, as there has been open and widespread consultation via numerous outreach and information-sharing meetings throughout Project development. As a project policy, stakeholders are always able to seek further information or have grievances redressed if desired. The Project continues to engage with surrounding communities, provide education and support for community social services, and improve livelihood opportunities.

These factors build and enhance community support for the project and makes the communities viable and important stakeholders, thereby reducing the risk of opposition to the project and its goals.

## 2. Insufficient Revenues:

The majority of REDD+ credits are currently sold on the voluntary market, posing a risk to recurring, sustainable income flow. If credits are not sold, there will be no revenue, and thus no performance-based monetary support for the Project over its 30-year lifetime, save initial investment. Nevertheless, the project proponent believes that the Project will be successful in attracting buyers. The Project was developed as a cooperative effort between Cambodia and Korea, making it an attractive to buyers interested in the greater Southeast Asian region. It is also a vital forest resource for Cambodia, and represents the frontier to the Prey Lang forest ecosystem. The intention of the Project Proponent is to nest the Project into the potential future Cambodian national nested REDD+ scheme, which could, in the future, allow for the sale of larger credit volumes, on a recurring, sustainable basis to other sovereign nations and/or institutional donors. The project proponent therefore categorizes the risk of insufficient revenues to the Project's benefits as low.

### 2.2.7 Benefit Permanence (G1.11)

The TRP activities are designed to enhance CCB benefits beyond the Project's lifetime. The Project implements activities that directly address the drivers of deforestation; with a focus on education, poverty reduction and sustainable management of natural resources. These activities reduce the necessity for community members to deforest and degrade the Project Area. During the Project lifetime, this will be achieved, for example, through training farmers in sustainable agriculture, facilitating better education, creating alternative income generating activities and raising awareness of the value of the habitat and its biodiversity. These activities are outlined in more detail in section 2.2 of the TRP PD and section 2.1.1 of this document.

## 2.3 Stakeholder Engagement

### 2.3.1 Stakeholder Access to Project Documents (G3.1)

- The Project Office and Project Sub-Office (Tumring commune) maintains a complete printed version of the PD and MR in English for public viewing.
- The complete PD and MR version and the executive summary of the PD and MR in English and Khmer are available on the project website (<http://tumringredd.org/>), the FA website and an official Project Facebook page.

### 2.3.2 Dissemination of Summary Project Documents (G3.1)

The following steps were taken to ensure all stakeholders have access to the TRP monitoring report document and summary information.

- An executive summary of the monitoring report, including monitoring results, was made available in Khmer at the Project office, the project sub-offices, and at the project partners offices.
- The executive summary in Khmer was also posted to the Project's website and on the Project's Facebook page.
- The executive summary in both English and Khmer was also posted on the CCB's website.

### 2.3.3 Informational Meetings with Stakeholders (G3.1)

Information regarding the TRP was communicated through a series of community meetings that took place in a culturally appropriate setting. Meetings were conducted by members of the PMU community outreach team and were held at public locations or usual places of gathering, such as the houses of commune chiefs or village chiefs, pagodas and schools. The existing network of FA and AFD contacts across the Project Zone, particularly local government officials, was used to publicize FPIC events and ensure representative community participation. Posters were created to explain the concept of REDD+, climate change, Project activities and conflict resolutions and explain the Project's anticipated benefits, costs and risks. An open discussion and question/answer period followed, which often focused on land tenure, customary use of timber and non-timber forest products, costs / benefits and risks and community concern about Project implementation. All meetings were conducted in Khmer, ensuring that the information was communicated to, and understood by, the entire audience.

### 2.3.4 Community Costs, Risks, and Benefits (G3.2)

The TRP was designed through the engagement with communities and stakeholders, involving them in decision-making and implementation from the Project outset. Collaboration amongst the Project Partners, with the goal of initiating a carbon-crediting scheme, began in 2015. The role of the Project Partners is central to the TRP, due to their relationship with the communities. These communities are already familiar with the Project Partners and open communication channels were established prior to the start of the Project's design phase. The TRP builds on these structures, making it possible to disseminate information to the communities in a timely manner, as well as to encourage their involvement in the Project. During 2015 and 2016, the Project Partners conducted a Social and Biodiversity Impact Assessment (SBIA) and a suite of community meetings focused on Free Prior and Informed Consent (FPIC). Project costs, risks and community co-benefits were communicated in these meetings. In 2019, two additional SBIA meetings were held in the southern portion of the Project Area.

A REDD+ Project Sub-Office was established at the Tumring FA Triage office in the spring of 2016. This office serves as the administrative headquarters for the TRP and is open to all community members and stakeholders who wish to access Project information and/or record comments or grievances. The primary communication method to stakeholders and communities is through the Project Partner's existing channels of communication with the respective communities in their area. Meetings were mainly announced through phone calls or by informing the leader of a specific community group (women's groups, youth groups, etc.) in a timely fashion, who in turn communicated the pertinent information to the additional members of that group.

Project Partners have been kept up to date with regular communication and dissemination of Project documentation. Community members are encouraged to pay a visit to these headquarters in order to access to any such material. The Project Office constructed seven signboards that were installed at strategic points around the Project Area and Project Zone for Project information and notices to be posted on. The initial SBIA community meeting took place November 9 -11, 2015 in Sandan district hall, Kampong Thom province. Community FPIC meetings took place from February 2016 to December 2016 and 26 community and stakeholder meetings were held. Significant time was given between the initial SBIA stakeholder consultation and reasonable expectation for any formal decision-making. Details for the SBIA consultation and all FPIC meetings, including dates, locations and number of attendants, are provided in section 2.7.2 of the PD.

### 2.3.5 Information to Stakeholder on Verification Process (G3.3)

The VCS and CCB 30-day public comment period is November 15<sup>th</sup>, 2019 until December 15<sup>th</sup>, 2019. The following steps have been taken to ensure all stakeholders have access to the MR and are aware of and provided a means to comment on the document for the public comment period:

- A poster/notice in Khmer advertising the public comment period, and the verification field visit was posted in communities throughout the Project Zone, including specific details on providing comments.
- The Project Proponent additionally actively disseminated to community members and stakeholders at the start of the Public Comment Period the comment submission procedure and also how to access Project documentation. This was specifically accomplished by communicating the Project, Public Comment Period and Verification field visit dates to previously identified stakeholders, community leaders, leaders of faith-based communities and public officials. They in turn passed that information onto their respective communities.

### 2.3.6 Site Visit Information and Opportunities to Communicate with Auditor (G3.3)

A poster/notice in Khmer, advertising the public comment period and the validation field visit, was posted in communities throughout the Project Zone. It includes details for the field visit, details on contacting the VVB, an explanation of how to submit comments to CCB.

### 2.3.7 Stakeholder Consultation (G3.4)

Section 2.7 of the PD details the process of community and stakeholder identification and their involvement in the project design prior to validation. The primary method for community groups and stakeholders to influence Project design is through the SBIA process. Since the validation, two additional SBIA workshops have been held in communities in the southern portion of the Project Zone. Additionally, Project management visit each community in the Project every month to provide information on the REDD+ project and consult with community members and stakeholders on project implementation. As this is the first verification, and Project activity implementation is still nascent, Project design and implementation has not been altered significantly from descriptions in the PD.

### 2.3.8 Continued Consultation and Adaptive Management (G3.4)

As discussed in section 2.3.7, the primary method for continued community and stakeholder consultation is monthly visits by Project management to community leaders.

### 2.3.9 Stakeholder Consultation Channels (G3.5)

The Project has held a significant number of community meetings and workshops during the development process. Section 2.7.2 of the PD lists the community meetings and workshops that were held for all Project stakeholders before validation. Section 2.3.7 provides a list of all community meetings and SBIA workshops held since the validation. A complete report of the SBIA workshops and community meetings, including photos and meeting results, have been provided to the verifier.

### 2.3.10 Stakeholder Participation in Decision-Making and Implementation (G3.6)

To ensure effective community participation, it was important to hold meetings and workshops when stakeholders could easily attend. As such, all meetings and workshops were held during daylight hours and at times when other work did not interfere with full community participation. Invitations were extended to community leaders, leaders of the Community Forests, and commune leaders within a respectful timeframe and in such a manner that each stakeholder could readily respond. This included both written invitations and phone calls. All communication was conducted in Khmer, a language every participant speaks, thus enabling participants to fully engage. To ensure the broadest level of participation possible, women are highly encouraged to attend and participate in all meetings. To help remove any barriers from the attendance of women, meetings are held at times and locations that are convenient and open to women, children are allowed to attend and any cultural considerations needed to ensure gender sensitivity are made. This is in line with the MAFF's strategic objective number 3: to increase the equality of representation between men and women in agricultural sector (MAFF, 2016). This objective is to be achieved by increasing:

- Presence and influence of women in the ministry of agriculture, forestry and fisheries are increased.
- Presence and influence of women in decision-making processes of natural resource management and agriculture in the community is increased.
- Women are able to learn and develop skills in order to involve more in agricultural sector, including forest management.

### 2.3.11 Anti-Discrimination Assurance (G3.7)

The TRP is committed to the fair treatment of, and equal opportunity for, all Project stakeholders, community members and employees. Neither the Project, nor any agent of the Project, may discriminate against any person for any reason, including, but not limited to, gender, religion, nationality, tribe, or sexual identity. The Project has established an equal opportunity policy that ensures that the Project will not engage in, or be complicit in, any form of discrimination. The TRP is committed to providing a workplace and programs that are safe and free from all sexual harassment or unwelcome sexual advances. The Project has also created a sexual harassment policy, defining sexual harassment and describing the recourse that any employee who feels that they have suffered sexual harassment should take. Additionally, the Project has established a grievance system that provides all Project employees, stakeholders, community members and participants a recourse method if any discrimination or sexual harassment does occur (please see Section 2.7.6 of the PD).

During the current monitoring period, all Project staff members, upon their hiring, were educated on the Project's anti-discrimination policies. In addition, on November 26 2019, an awareness training was held in Kampong Thom city, the provincial capital. In total 51 people attended the meeting, including members of the Community Forest Management Committees (CFMCs) and members of the local authority. At this meeting the participants received education on the Project's anti-discrimination and equal opportunity policies and information was disseminated detailing these policies. Also, every quarter the PMU holds meetings with the CF members and the CFMCs, at which time they provide further education on and disseminate information about the Project's anti-discrimination and equal opportunity policies to them.

To date, there have been no reported discrimination cases.



### 2.3.12 Grievances (G3.8)

The Project's grievance policy is explained in Section 2.7.6 of the PD. During the verification field visit, a grievance was submitted verbally to the auditor by a community forest group (CF). In discussions with project personnel, the auditor learned that 3 other CFs had previously expressed similar concerns. The grievance stated by these 4 CFs concerned rangers from a Cambodian government entity other than the Forest Administration making incursions onto land controlled by these community forest groups, and making threats to the groups and making them feel insecure. The Project Proponent provided an official response to the CF who stated the grievance to the auditor during the field visit and the 3 CFs who had informed project staff of similar conflicts with the rangers. The letter details to the CFs that the Project is aware of the issue, and that project management will work with the relevant government officials to ensure that the rangers are aware of the CF boundaries and do not infringe on the CFs rights in the future. It also asks the CFs to inform project staff of any future additional issues that arise with the rangers. A representative of each CF signed the letter to indicate their receipt of the letter and that they have accepted this resolution. A copy of this signed letter in both the original Khmer and an English translation have been provided to the VVB with the responses to these findings.

### 2.3.13 Worker Training (G3.9)

As detailed in Section 4.2, the project has implemented a number of activities to build capacity and train the Project's workers and community members. These include demonstration gardens, training on improved agricultural methods and meetings with community forest groups. The PD details training that workers of the REDD+ project received on SBIA process in Section 2.7.2. Additionally, members of the FA have received training on methods for carbon stock calculation in September 2015, October 2016 and September 2019.

### 2.3.14 Community Employment Opportunities (G3.10)

Since the Project is still in the early stages of implementation, no local hiring has yet occurred. The Project is operated by the FA and all REDD+ Project management and operations positions are staffed by FA employees or by AFD employees on behalf of the FA. Employees for the FA are recruited and hired according to the procedures and policies of the FA and the Royal Government of Cambodia.

### 2.3.15 Relevant Laws and Regulations Related to Worker's Rights (G3.11)

The TRP meets all local, national and international laws relevant to this project:

#### **The Labor Law, 1997, amended 2007**

The Cambodian Labor Law provides regulations on the relationship between employees and employers, and the socio-legal rights and obligations resulting from a labor relationship. All people engaged in work in Cambodia, including Cambodian citizens and foreign nationals, are subject to the regulations of this law (Peng et al., 2012).

In addition to the Labor Law, there are several international legal standards that cover labor rights in Cambodia, this includes 13 International Labor Organization conventions that Cambodia has ratified (Peng et al. 2012). Also, there are many government labor regulations, including royal decrees, sub-decrees, prakas, decisions, circulars, and notices that have been issued by the Royal Government of

Cambodia, and particularly by the Ministry of Labor and Vocational Training. The Project Proponent ensures that any relevant international convention or government regulation is fully followed.

#### 2.3.16 Occupational Safety Assessment (G3.12)

The TRP abides by all relevant Cambodian worker's rights laws and regulations. Workers are informed about their rights at the point of their employment during the employee orientation. Additionally, as described in the Health and Safety plan, during the employee orientation workers are informed about the potential safety risks of their job and of methods to mitigate the risks. A hard copy of the relevant laws is kept at the Project Office and any worker is free to consult these any time during working hours. The TRP ensures that workers' health and safety are protected to the best of the Project's ability at all times and across all sites. Risks are identified, mitigation strategies produced, and appropriate measures adopted in order to minimize any risks.

Given the nature of the Project and its geographical surroundings, it is recognized that certain occupations inherently present a risk to the health and safety of workers, in particular occupations that require spending long periods walking in difficult environments. These include, though not exclusively, plot samplers and forest protection rangers, who are faced with challenging terrain as well as the risk of encountering illegal logger, illegal forest land clearer, and wildlife hunter. In addition, forest fires may also pose a safety risk if they spread rapidly and unexpectedly. The Project has created a comprehensive Health and Safety Plan that ensures that all workers' health and safety is protected, and that all workers are fully informed about workplace risks and safe practices to mitigate those risks. These include training in safe working practices, first aid training for some staff members as well as the enforcement of requirements for safe handling of equipment and other materials. This Health and Safety Plan additionally provides a comprehensive list of the measures that are taken to inform employees of their rights, to assign roles and responsibilities to supervisors and workers and provide a safe workplace culture. This document is revisited regularly and revised as needed to ensure that it contains current information and includes all job categories and potential risks. A copy of the plan has been provided to the verifier and will be kept at the Project Office and be readily available for any consultation. The TRP has a detailed orientation of newly recruited employees so that they are fully aware of their rights as well as responsibilities. All law enforcement rangers and full-time WA Project staff are provided with full health and life insurance.

### 2.4 Management Capacity

#### 2.4.1 Required Technical Skills (G4.2)

To ensure that key technical skills are maintained and enhanced within the project, staff refresher training is held periodically on REDD+ in general and the specific skills required for monitoring the climate, community and biodiversity impacts of the Project. Since validation, a refresher training for Project staff was held by WWC's Director of Forest Science Simon Bird in September of 2019. During this training, Mr. Bird worked with Project management and staff to review procedures for monitoring carbon stocks and biodiversity. In addition, community engagement procedures were reviewed, and potential improvements discussed.

The Royal Government of Cambodia's Forestry Administration (FA) is the Project Proponent and is a national agency focused on protected area management and biodiversity conservation. Its staff is trained



in Project management, the science of remote sensing, biomass sampling and conservation biology. They possess the human resources to support these areas of the TRP.

Action For Development (AFD) is an NGO based in Kampong Thom with 14 years of experience engaging with communities and working on community development projects. As a project partner, they bring expertise in implementing community-based programs. AFD has a broad range of partners and funding sources, including many large international NGOs, providing them with a diverse range of experiences and funding security beyond REDD+ funding.

Wildlife Works Carbon (WWC) is one of the leaders in REDD+ Project development. It has staff experienced in REDD+ Project design and implementation. WWC created and currently manages the first REDD+ Project under the VCS standard and provides the resources to support all REDD+ activities, including but not limited to remote sensing, biomass sampling, biodiversity sampling, project management and forest protection.

The team of the FA, AFD and WWC, possess the skills and resources to successfully implement and maintain the TRP.

#### **2.4.2 Management Team Experience (G4.2)**

##### **Mr. Chunn Delux – Deputy Director of Forest Industry and International Cooperation, Forestry Administration – TRP Project Lead**

Mr. Chunn Delux is a community forest specialist and has worked for the Forestry Administration for 10 years. He holds a master's degree in social forestry and forest governance from the Philippines. Prior to joining the Forestry Administration, he spent five years working for a multilateral development bank (ADB) and non-governmental organizations (INGOs) on the area of forest governance, forest financing, and REDD+. He has worked over 10 years in the REDD+ space, managing and implementing two Cambodian pilot projects. A seasoned natural resource project manager, Delux is one of the most experienced REDD+ project implementors in Cambodia and serves as Project Manager for the Tumring REDD+ Project.

##### **Khorn Vantha – REDD+ Specialist**

In 2013 Mr. Vantha received his bachelor's degree in forestry science from the Royal University of Agriculture in Cambodia. He has been working for the Forestry Administration since 2014. He joined the Tumring REDD+ Project in 2015, first serving as a Biomass Inventory Team Leader and Community Engagement Consultant. Mr. Vantha was promoted to REDD+ Specialist in 2018. He has attended many REDD+ associated international events, including having completed a three-month fellowship program on Sustainable Forest Management in Japan and attended a Cambodia-Korea REDD+ capacity building event in Seoul South Korea. His field expertise includes sustainable forest management, forestry conservation, community engagement in the field of REDD+ and local livelihood improvement, and methods on field monitoring and evaluation of REDD+ and project related tasks.

##### **Y Chaly – REDD+ Communication Specialist**

Mr. Chaly received his bachelor's degree in forestry science from Royal University of Agriculture in Cambodia in 2015. He received his master's degree in environmental engagement from Massey University, New Zealand in July 2019, He has been working for the Forestry Administration since 2014,

primarily focused on forest conservation, community engagement, and forestry policy reviews. He also assists the technical advisor on REDD+ related tasks, and on international cooperation on forestry.

**Keo Sochivinn – Finance and Administration Specialist**

Ms. Sochivinn holds a master's degree in finance, and a bachelor's degree in business and administration from both from the National University of Management (NUM). She has additionally successfully completed technical training certificates for the MYOB Accounting software package. She has four-years of experience working with Oxfam Australia as a Finance and Administrative Officer. She has also performed research analysis for the Advanced Bank of Asia, Ltd (ABA), and wrote a financial report for Camintel ( Tele-Com) on risk analysis. She also holds a position with the Extraordinary Chambers in the Court of Cambodia (ECCC) as a Documentation and Administrative Expert on a four-year working contract. She currently works for the Tumring REDD+ Project as Finance and Administrative Specialist.

**Chek Sovansom – Project Field Facilitator**

Mr. Sovansom received his bachelor's degree in forestry science in 2011 from Prek leap National School of Agriculture in Cambodia. He has been working for the Forestry Administration since 2014. He was mandated to work for the Office of Community Forestry. His main responsibilities are to provide technical support on CFs legalization process to all CFs in Cambodia and provide support to the development of community livelihoods programs. Prior to joining the Forestry Administration he had four years of experience with Kase Kor Thmei ( a national NGOs) as a Community Forest Officer. Currently, his role is to provide technical support and development to the community based-forest management groups and stakeholder engagement. He has worked in the Tumring REDD+ Project for approximately one year.

**Ung Keopiseth – Project Field Facilitator**

In 2014, he holds a bachelor degree in Computer Science from Royal University of Phnom Penh in Cambodia. He has been working for Forestry Administration since 2014, and he mostly works on administration, assisting technical on IT related tasks, community engagement, forest industry, and international cooperation on forestry.

**Mr. Som Sopheak – Executive Director – AFD**

Som Sopheak is currently the Executive Director of AFD. He has a master's degree of management from Angkor City Institute (ACI). He has worked with AFD for the last 10 years on natural resource management, climate change adaptation, women's economic empowerment, and REDD+ strategy. He works at the grassroots level and has vast experience in community mobilization and the empowerment of vulnerable peoples. Mr. Sopheak maintains a good relationship with communities and local authorities.

**Wildlife Works – Technical Partner****Mr. Brian Williams – Director of Asia – Wildlife Works Carbon – TRP Project Lead**

Mr. Brian Williams is an experienced conservationist that has been working in Asia since 1997. With a master's in Environmental Studies from San José State University, Mr. Williams founded Red Panda Network, an organization dedicated to protecting red panda in the wild. He transferred lessons learned from this experience into the development and management of REDD+ Projects in India, Cambodia, Indonesia, and Nepal.

In addition to these managers there is a strong Project team with a wealth of land management and carbon Project experience that will support Project management and implementation.

## **Mr. Jeremy Freund – VP Carbon Development – Wildlife Works Carbon – TRP MRV**

Mr. Freund is a global leader in REDD+ Project and program development with over 10 years' experience in international conservation. He co-wrote VCS methodology VM0009, one of the first and most widely used VCS REDD+ methodologies. He has led Wildlife Works in all validations and verifications under the VCS/CCB standards and leads TRP monitoring, reporting and verification efforts. Mr. Freund has a B.S. in Aerospace Engineering from University of Colorado at Boulder and a Masters in Geography from UC Santa Barbara where he focused on remote sensing for agriculture and food security.

## **Mr. Simon Bird – Director of Forest Science – Wildlife Works Carbon - TRP MRV**

Simon has been working in the forest ecology and environmental conservation industry for over 10 years. Simon has a B.S. in Environmental Science and a M.S. in Soil Science from the University of Vermont. Simon works in the Carbon Development department at Wildlife Works Carbon's Burlington, Vermont office. There, he assists with the development of REDD+ Projects, including validation and verification and monitoring, reporting and verification (MRV) for existing REDD+ Projects. Simon's duties include overseeing biomass sampling methods and protocols, forest modeling, and technical writing and reporting for both the VCS and CCB standards. Simon has additionally participated in the revision process of VCS REDD methodology VM0009.

### **2.4.3 Project Management Partnerships/Team Development (G4.2)**

No gaps in the Project management were identified during the validation. The Project Proponent has partnered with WWC to provide necessary REDD+ project development and management expertise. All relevant Project management experience is present in the current TRP partners as detailed in Sections 2.4.1 and 2.4.2.

### **2.4.4 Financial Health of Implementing Organization(s) (G4.3)**

The Project Proponent is the Royal Government of Cambodia Forestry Administration, which is a government supported administrative unit. The development of the Project is supported by grants from the Government of Korea, a government with a surplus annual budget. Additionally, the Forestry Administration receives an annual budget from the central government. The Project Proponent is also supported by Wildlife Works in the development of the Project. Wildlife Works is experienced at marketing and sales of REDD+ credits on the global market. It has used this applied experience to make conservative estimates for expected annual credit sales for the TRP.

Moreover, the Project Proponent and Wildlife Works' combined REDD+ project development experience (5 total successful prior VCS/CCB validated & verified projects) contributed to the creation of a detailed financial model for the development and management of the TRP. Predicted credit sales and an accurate estimated annual budget demonstrate sufficient cash flow from both predicted contracted sales and support from the Government of Korea to sustain the project through the end of the crediting period. The Project Proponent has already received grants to fund to project design and start-up costs. Documents supporting these investments can be produced to the project auditor for inspection.

#### 2.4.5 Avoidance of Corruption and Other Unethical Behavior (G4.3)

The Project Proponent provides clear assurance that no corruption of any kind will be allowed or accepted in any aspect of this Project. There are several systems in place to guard against any form of corruption that could occur in the Project. The first method is the Project's grievance policy, which enables any project community member or stakeholder to raise a grievance with a secretariat formed of the leadership of the community forests. This secretariat is therefore independent of the Project Proponent and the RGC. Additionally, the RGC has passed an anti-corruption law in 2010 and formed the Anti-Corruption Unit (ACU). Both the Project secretariat and anti-corruption law cover all members of the Project's leadership since they are government employees or local leaders. Lastly, the majority of the financing for the development of the TRP was provided by South Korea, and the Korea Forest Service is providing on-going support to the Project's management. As such they provide additional independent oversight of potential corruption in the Project.

#### 2.4.6 Commercially Sensitive Information (Rules 3.5.13 – 3.5.14)

Some information required by the VCS and/or CCB standards is confidential or sensitive in nature and cannot be released publicly by the Royal Government of Cambodia. This information has been supplied freely to the VVB as annexes to this MR document, but will not be included in the public versions of the PD. All efforts have been made by the Project Proponent to make as much information freely available to the public as conceivably possible. All necessary supporting information shall be provided to the verifier but may not be distributed publicly. This primarily pertains to Project financial information, including budgets, grants or other funding sources and projected sales, and information on contracts and agreements between project partners. This also includes detailed internal plans on project operation and implementation. Lastly, this includes information that is confidential or that utilizes proprietary technology or information, such as the carbon model.

### 2.5 Legal Status and Property Rights

#### 2.5.1 Recognition of Property Rights (G5.1)

##### ***Customary and Legal Property Rights***

Within the Project Zone there are several land use and tenure systems, which are recognized in both customary and statutory rights regimes. The customary system in place in Prey Lang centers on individual trees rather than forest area. Resin tapping is an important economic activity of the Kuy people in the region. It is used as a raw material in the manufacturing of varnish, cheap soap, leather making, and sealing wax, as well as for caulking boats and in torches for lighting houses in the village. Resin is extracted from dipterocarp trees by making a small cut in the tree, which is set alight to induce resin flow. Under the traditional Kuy system families have customary rights over individual resin trees. Other than this customary land use system the rest of the Project Zone is under statutory rights. Below is an overview of statutory property rights in Cambodia.

The Land Law of 2002 classifies the different types of property and ownership rights in Cambodia: (i) State Public Property, (ii) State Private Property, and (iii) Private property:

1. **State Public Property:** According to Articles 15 & 16 of this law, State Public Property is land held by the State which carries a public interest use. State Public Property includes properties of

a natural origin, such as the Permanent Forest Reserve. State Public Property cannot be sold or transferred to other legal entities, although it may be subject to rights of occupancy or use that are temporary in nature (such as a logging concession in the Permanent Forest Reserve).

2. **State Private Property:** Under Article 17, State Private Property is land that is owned by the State or public entities that do not have a public interest use (i.e. owned by the state or public entity but does not fit the definition of State Public Property as mentioned above). In addition, State Private Property can be described as excess or idle land that is held by the State or public entities. State Private Property may actually be sold or transferred to other legal entities, such as use for social or economic land concessions.
3. **Private Property:** Private property is property owned by natural persons or legal entities other than the State or public entities. Private property can be owned by individuals, collectives or business organizations/associations.

The Project Zone is composed of all three types of property listed above. The Project Area is state public property in the form of permanent forest reserve and includes the hydrological research area and community forests. Outside of the Project Area are both state private and private property. The state private property in the Project Zone includes social and economic land concessions. Everything outside of these areas is private property.

**Table 4:** The Customary and Legal Property Rights in the Project Area.

Forest Management Unit in the Project Area	Legal Property Right	Customary
<b>Community Forest (14 community forests)</b>	<p>Community Forest is state public property. Forestry Administration has the rights to give official recognition of the demarcation of each community forest boundary. Community Forest is the forest plantation of a Community or State forest, where the right is granted to a local Community living in or near the forest to manage and utilize the forest in a sustainable manner between the Forestry Administration and a local Community</p> <p>A Community Forest shall be managed in the economic and sustainable manner by the local community conforming to the Community Forest Management Plan, rules on Community Forestry and guidelines on Community Forestry (Article 22, Forestry Law 2002)</p> <p>Community Forest Agreements shall be in effect not more than a period of fifteen</p>	<p>Article 2 of the Forestry Law (2002) outlines the state ensures customary user rights of forest products &amp; by-products for local communities and as further provided in the provision of this Law or other relevant laws.</p> <p>For local communities living within or near the Permanent Forest Reserves, the state shall recognize and ensure their traditional user rights for the purpose of traditional customs, beliefs, religions and living as defined in this article ( Forestry Law 2002)</p>

	(15) years from the date of approval by the Forestry Administration Cantonment Chief (Article 27, CF sub-decree) .	
<b>RGC/Japan Hydrological Research Area</b>	Fall under the category of protection forest, the management purpose is for research and extension.  The Forestry Administration is the legally obligated to management area.	Local Community are allowed by the law to sustainable use of traditional resources
<b>Forest Restoration Area</b>	Fall under the category of production forest, the area managed for benefit to social, economic and environmental.  The Forestry Administration is the legally obligated to management area.	Local Community are allowed by the law to sustainable use of traditional resources
<b>Permanent Forest Reserve</b>	Potential to be converted to community forest under the support from the project	

### 2.5.2 Free, Prior and Informed Consent (G5.2)

The main evidence for right of use for the TRP is under the law for state-owned forestland.

#### State-owned Forest Land

The TRP accounting area that will generate credits at the project start date is State land, under the mandate of the Ministry of Agriculture, Forestry and Fisheries (MAFF) through the Forestry Administration (FA). It was first formally designated as Permanent Forest Estate in 1994, at which time it was implicitly classified as Production Forest. As stated in section 2.7.3 of the PD portions of the Project Accounting Area are community forest that were established between 2002 – 2008 and formally recognized by FA between 2008 – 2010. These areas are managed by Community Forest Groups but are still part of the Permanent Forest Estate and thus are State land and under the mandate of the Project Proponent FA.

### 2.5.3 Property Right Protection (G5.3)

The Project does not require involuntary removal or relocation of communities or of any activities important for their livelihood and culture.

### 2.5.4 Identification of Illegal Activity (G5.4)

The PA is Permanent Forest Reserve under the jurisdiction of the FA, and as such is protected from deforestation activities. Under the Cambodian Land Law and Forestry Law the PA forest should be protected from resource extraction or conversion to other land uses. However, illegal activities are commonly observed to occur in the PA, including but not limited to illegal logging, charcoal production, poaching for meat, and conversion of forestland, through slash and burn, to agricultural land. These



activities are all illegal under current law, and despite the FA's best efforts at controlling them to date, they are still widely and openly occurring.

All of the above listed illegal activities could have negative effects on the TRP's climate and biodiversity goals. The TRP has developed a larger ranger force, strengthened community organizations, supported agricultural intensification and microfinance, strengthened forest land use planning and secured forest land tenure. It has also supported income generating activities, such as improving the management and sales of resin as well as other deforestation-free commodities to reduce the occurrence of these illegal activities. First, TRP increased protection for the PA, and enforcement of the PA boundary against illegal incursions. Through these increased efforts, confiscations of chainsaws and other logging equipment has increased and has reduced illegal activity. Additionally, enforcement against charcoal kilns within the PA, by monitoring for their presence and quickly acting to stop them, has reduced the amount and frequency of this illegal activity. The strengthening of community forest user groups has given them the ability to protect community forests and stop the flow of migrants into the PA. By conducting training on agricultural intensification, providing micro-finance, and supporting local businesses the goal is to generate alternative income to abate illegal activities with-in the PA. The aim is that the diversification of protection and income generation activities will deter illegal activities throughout the Project life.

#### **2.5.5 Ongoing Disputes (G5.5)**

There are no ongoing or unresolved conflicts concerning customary or legal property rights in the Project Area or Project Zone.

#### **2.5.6 National and Local Laws (G5.6)**

The TRP meets all local, national and international laws that are relevant to this Project. These laws include the aforementioned Employment laws, as well the additional laws outlined below. No national or local laws that are relevant to the project or the project activities have gone into effect or been changed since the validation.

### **3 CLIMATE**

#### **3.1 Monitoring GHG Emission Reductions and Removals**

##### **3.1.1 Data and Parameters Available at Validation**

Data Unit / Parameter:	RL
Data unit:	%
Description:	The annual deforestation rate for Cambodia
Source of data:	Reference area and historic reference period
Value applied:	2.38
Justification of choice of data or description of measurement methods and procedures applied:	Time and place in which the logistic model is fit
Purpose of Data:	Determination of baseline scenario

Any comment:	Based on Cambodian national forest reference emission level (FREL) data.
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Data Unit / Parameter:	$\alpha$
Data unit:	unitless
Description:	Effect of time on the cumulative proportion of conversion over time for the Project Accounting Area
Source of data:	Reference area and historic reference period
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Time and place in which the logistic model is fit
Purpose of Data:	Determination of baseline scenario
Any comment:	Parameter not used

Data Unit / Parameter:	$\beta$
Data unit:	unitless
Description:	Effect of time on the cumulative proportion of conversion over time for the Project Accounting Area
Source of data:	Reference area and historic reference period
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Time and place in which the logistic model is fit
Purpose of Data:	Determination of baseline scenario
Any comment:	Parameter not used

Data Unit / Parameter:	$\gamma$
Data unit:	days
Description:	Time shift from beginning of historic reference period to project start date
Source of data:	Historic reference period
Value applied:	N/A N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Determination of baseline scenario



Any comment:	Parameter not used
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Data Unit / Parameter:	$\theta$
Data unit:	unitless
Description:	Effect of certain covariates on the cumulative proportion of conversion over time
Source of data:	Reference area and historic reference period
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Time and place in which the logistic model is fit
Purpose of Data:	Determination of baseline scenario
Any comment:	Parameter not used

Data Unit / Parameter:	$\lambda_{soc}$
Data unit:	proportion (unitless)
Description:	Exponential soil carbon decay parameter
Source of data:	Value from the literature. Davidson, E., and Ackerman, I. 1993. Changes in soil carbon inventories following cultivation of previously untilled soils. Biogeochemistry, 20(3), 161-193.
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Default value from VCS methodology VM0009
Purpose of Data:	Determination of baseline emissions
Any comment:	Parameter not used

Data Unit / Parameter:	$\hat{\sigma}_{EM}$
Data unit:	standard deviation (unitless)
Description:	The estimated standard deviation of the state observations used to fit the logistic function for the Project Accounting Area BEM
Source of data:	Remote sensing image interpretation
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Determination of baseline scenario

Any comment:	Parameter not used
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Data Unit / Parameter:	<b><i>B</i></b>
Data unit:	set
Description:	The set of all selected carbon pools in biomass. Is a subset of <i>C</i>
Source of data:	PD
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 and the TRP's standard operating procedures "Standard Operating Procedure Tumring - Forest Inventory" and "Standard Operating Procedure Tumring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019.
Purpose of Data:	Determination of baseline scenario
Any comment:	

Data Unit / Parameter:	<b><i>C</i></b>
Data unit:	set
Description:	The set of all selected carbon pools
Source of data:	Monitoring records
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 and the TRP's standard operating procedures "Standard Operating Procedure Tumring - Forest Inventory" and "Standard Operating Procedure Tumring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019.
Purpose of Data:	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	<b><i>J</i></b>
Data unit:	set
Description:	The set of all observations of conversion. When superscripted with a monitoring period, the conversion observations are taken for leakage analysis.
Source of data:	Remote sensing image interpretation or field observations in the leakage area.
Value applied:	N/A

Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Calculation of baseline emissions
Any comment:	Parameter not used as the BEM is not used, and leakage monitoring does not utilize remote sensing methods.

Data Unit / Parameter:	$\mathcal{M}$
Data unit:	set
Description:	The set of all monitoring periods
Source of data:	Monitoring records
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	$\mathcal{J}$
Data unit:	ha
Description:	The set of all species/categories of livestock
Source of data:	Monitoring records
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Determination of baseline emissions
Any comment:	Parameter not used

Data Unit / Parameter:	$A_{PAA}$
Data unit:	ha
Description:	Area of Project Accounting Area
Source of data:	GIS analysis prior to sampling
Value applied:	41,195.5
Justification of choice of data or description of	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 and the TRP's standard operating

measurement methods and procedures applied:	procedures “Standard Operating Procedure Tumring - Forest Inventory” and “Standard Operating Procedure Tumring – Proxy Area”. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019.
Purpose of Data:	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	$A_{PX}$
Data unit:	ha
Description:	Area of proxy area for the Project Accounting Area
Source of data:	GIS analysis prior to sampling
Value applied:	5,873
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 and the TRP’s standard operating procedures “Standard Operating Procedure Tumring - Forest Inventory” and “Standard Operating Procedure Tumring – Proxy Area”. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019.
Purpose of Data:	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	$A_{ASL}$
Data unit:	ha
Description:	Area of the Activity-Shifting Leakage Area
Source of data:	GIS analysis prior to sampling
Value applied:	41,195.5
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 and the TRP’s standard operating procedures “Standard Operating Procedure Tumring - Forest Inventory” and “Standard Operating Procedure Tumring – Proxy Area”. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	$c_{Lp}$
Data unit:	tCO <sub>2</sub> e/ha
Description:	Carbon stocks in project leakage area

Source of data:	Leakage area sampling
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Calculation of baseline emissions
Any comment:	Parameter not used

Data Unit / Parameter:	$f_{LSi}$
Data unit:	kg CH <sub>4</sub> head <sup>-1</sup> yr <sup>-1</sup>
Description:	Emission factor for the defined livestock population, <i>i</i>
Source of data:	IPCC default values
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Obtained directly from IPCC default values
Purpose of Data:	Determination of baseline emissions
Any comment:	Parameter not used

Data Unit / Parameter:	$m$
Data unit:	tCO <sub>2</sub> e/ha
Description:	Average carbon in merchantable trees cut each year as a result of legally-sanctioned commercial logging
Source of data:	Timber harvest plans or measurement of carbon stocks in merchantable trees in the Project Accounting Area.
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Should use the most accurate of the two data sources if both are available
Purpose of Data:	Determination of baseline emissions
Any comment:	Parameter not used

Data Unit / Parameter:	$n_d$
Data unit:	unitless
Description:	Number of spatial points in the Forest Project Accounting Area reference area
Source of data:	Remote sensing image interpretation
Value applied:	N/A

Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Determination of baseline scenario
Any comment:	Parameter not used as BEM not used.

Data Unit / Parameter:	$o_i$
Data unit:	unitless
Description:	State observation for the $i^{th}$ sample point in the Project Accounting Area reference area
Source of data:	Remote sensing image interpretation
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Calculation of baseline emissions
Any comment:	Parameter not used as BEM not used

Data Unit / Parameter:	$p_{LME}$
Data unit:	unitless
Description:	Portion of leakage related to market
Source of data:	VCS methodology VM0009 Section 8.3.3
Value applied:	0.74
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 and the TRP's standard operating procedures "Standard Operating Procedure Tumring - Forest Inventory" and "Standard Operating Procedure Tumring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	$q$
Data unit:	days
Description:	Lag between start of degradation and conversion
Source of data:	Expert knowledge, results from the PRA or reports from peer-reviewed literature
Value applied:	N/A

Justification of choice of data or description of measurement methods and procedures applied:	Commonly accepted methods in the social sciences, choice determined and justified by Project Proponent
Purpose of Data:	Determination of baseline scenario
Any comment:	Parameter not used

Data Unit / Parameter:	$r_{CFb}$
Data unit:	unitless
Description:	Carbon fraction of biomass for burned wood or herbaceous material $b$
Source of data:	Literature estimates or direct measurement
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	No burning of wood or herbaceous material in project
Purpose of Data:	Calculation of baseline emissions
Any comment:	Parameter not used

Data Unit / Parameter:	$r_{RS}$
Data unit:	unitless
Description:	Expansion factor for above-ground biomass to below-ground biomass (root/shoot ratio)
Source of data:	IPCC Guidelines for National Greenhouse Gas Inventories, 2006, Volume 4: Agriculture, Forestry and Other Land Use, Chapter 4: Forest Land, Table 4.4
Value applied:	0.37
Justification of choice of data or description of measurement methods and procedures applied:	IPCC default value for Tropical shrubland
Purpose of Data:	Calculation of Baseline Emissions
Any comment:	

Data Unit / Parameter:	$r_U$
Data unit:	unitless
Description:	Onset proportion of conversion immediately adjacent to project area
Source of data:	GIS analysis and image interpretation
Value applied:	37.27

Justification of choice of data or description of measurement methods and procedures applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 section 6.7 and the TRP's standard operating procedures. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019.
Purpose of Data:	Determination of Baseline Scenario
Any comment:	

Data Unit / Parameter:	$t$
Data unit:	days
Description:	Time since project start date
Source of data:	Monitoring records
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Determination of Baseline Scenario
Any comment:	Parameter not used

Data Unit / Parameter:	$t_i$
Data unit:	days
Description:	The point in time of the observation made at point $i$
Source of data:	Remote sensing image interpretation
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Determination of Baseline Scenario
Any comment:	Parameter not used

Data Unit / Parameter:	$t_{PA}$
Data unit:	days
Description:	Time prior to the Project Start Date when the primary agent began commercial logging in the Project Accounting Area.
Source of data:	Harvest plans prepared for the Project Accounting Area, or by public record
Value applied:	N/A



Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Determination of Baseline Scenario
Any comment:	Parameter not used

Data Unit / Parameter:	$t_m$
Data unit:	days
Description:	Length of project or logging in baseline scenario
Source of data:	PD
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Determination of Baseline Scenario
Any comment:	Parameter not used

Data Unit / Parameter:	$t_{PL}$
Data unit:	days
Description:	Length of project crediting period
Source of data:	PD
Value applied:	10,957
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 section 6 and the TRP's standard operating procedures. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019.
Purpose of Data:	Determination of Baseline Scenario
Any comment:	

Data Unit / Parameter:	$t_{PAI}$
Data unit:	days
Description:	Number of days after the project start date for the start of a project activity instance in a grouped project
Source of data:	PD
Value applied:	N/A
Justification of choice of data or description of	N/A

measurement methods and procedures applied:	
Purpose of Data:	Determination of Baseline Scenario
Any comment:	Parameter not used

Data Unit / Parameter:	$w_i$
Data unit:	unitless
Description:	weight applied to the $i^{th}$ sample point in the Project Accounting Area reference area
Source of data:	Remote sensing image interpretation
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Determination of Baseline Scenario
Any comment:	Parameter not used as BEM is not used

Data Unit / Parameter:	$x$
Data unit:	unitless
Description:	Covariate values
Source of data:	Participatory Rural Appraisal, analysis of public records, and/or expert interpretation of inventory data or remotely sensed imagery
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Should use the most accurate of the data sources if both are available
Purpose of Data:	Determination of Baseline Scenario
Any comment:	Parameter not used

Data Unit / Parameter:	$x_i$
Data unit:	geographic coordinates
Description:	Latitude of the $i^{th}$ sample point
Source of data:	Remote sensing image interpretation
Value applied:	N/A
Justification of choice of data or description of	N/A

measurement methods and procedures applied:	
Purpose of Data:	Determination of Baseline Scenario
Any comment:	Parameter not used

Data Unit / Parameter:	$x_o$
Data unit:	unitless
Description:	Covariate values as of the project start date
Source of data:	Participatory Rural Appraisal, analysis of public records, and/or expert interpretation of inventory data or remotely sensed imagery
Value applied:	
Justification of choice of data or description of measurement methods and procedures applied:	Should use the most accurate of the data sources if both are available
Purpose of Data:	Determination of baseline scenario
Any comment:	Parameter not used as the BEM is not used

Data Unit / Parameter:	$x_{SA}$
Data unit:	unitless
Description:	Covariate values as of the arrival of the secondary agents
Source of data:	Participatory Rural Appraisal, analysis of public records, and/or expert interpretation of inventory data or remotely sensed imagery
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Should use the most accurate of the data sources if both are available
Purpose of Data:	Determination of baseline scenario
Any comment:	Parameter not used as the BEM is not used

Data Unit / Parameter:	$y_i$
Data unit:	geographic coordinates
Description:	Longitude of the $i^{th}$ sample point
Source of data:	Remote sensing image interpretation
Value applied:	N/A
Justification of choice of data or description of	N/A

measurement methods and procedures applied:	
Purpose of Data:	Determination of baseline scenario
Any comment:	Parameter not used as the BEM is not used

Data Unit / Parameter:	$y_{j,t}$
Data unit:	Tonne / ha
Description:	Yield for rice
Source of data:	Literature
Value applied:	3.117
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was calculated using data from the World Bank and Royal Government of Cambodia. Wildlife Works was responsible for gathering this parameter from the literature. All measurements were made during 2017 and 2018. Accuracy level achieved is good, and is associated with the quality of the underlying data and calculations.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	$y_{j,t}$
Data unit:	Tonne / ha
Description:	Yield for Maize
Source of data:	Cambodian Agriculture in Transition: Opportunities and Risks. Economic and Sector Work, Report no 96308-KH
Value applied:	22.539
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was calculated using data from the World Bank and Royal Government of Cambodia. Wildlife Works was responsible for gathering this parameter from the literature. All measurements were made during 2017 and 2018. Accuracy level achieved is good, and is associated with the quality of the underlying data and calculations.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	$y_{j,t}$
Data unit:	Tonne / ha
Description:	Yield for Cassava
Source of data:	Cambodian Agriculture in Transition: Opportunities and Risks. Economic and Sector Work, Report no 96308-KH
Value applied:	1.693
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was calculated using data from the World Bank and Royal Government of Cambodia. Wildlife Works was responsible for gathering this parameter from the literature. All measurements were made during 2017 and 2018. Accuracy

	level achieved is good, and is associated with the quality of the underlying data and calculations.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	$y_{j,t}$
Data unit:	m <sup>3</sup> / ha
Description:	Yield for sawlogs
Source of data:	Forest Degradation in Cambodia: An Assessment of Monitoring Options in the Central Cardamom Protected Forest. Halperin and Turner (2013)
Value applied:	525
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was calculated using data from the World Bank and Royal Government of Cambodia. Wildlife Works was responsible for gathering this parameter from the literature. All measurements were made during 2017 and 2018. Accuracy level achieved is good, and is associated with the quality of the underlying data and calculations.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	$H$
Data unit:	Number
Description:	Number of historical reference years
Source of data:	Jurisdictional program description or based on data availability
Value applied:	525
Justification of choice of data or description of measurement methods and procedures applied:	The project's historical reference period is 2006-2014. The commodity yield data sources were limited to that of 2012 and 2013. Justification of the accuracy and conservativeness of this data has been provided to the auditor.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	$r_j$
Data unit:	%
Description:	Annual percent increase in yield
Source of data:	VCS VMD0037 Global Commodity Leakage Module: Production Approach
Value applied:	2.5
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was calculated using data from the World Bank and Royal Government of Cambodia. Wildlife Works was responsible for gathering this parameter from the literature. All measurements were made during 2017 and 2018. Accuracy

	level achieved is good, and is associated with the quality of the underlying data and calculations.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	<b><i>PD<sub>j</sub></i></b>
Data unit:	%
Description:	Percent of area where deforestation was avoided that would have been used for production of rice
Source of data:	Census of Agriculture in Cambodia 2013, National Institute of Statistics, Ministry of Planning in Collaboration with Ministry of Agriculture, Forestry and Fisheries
Value applied:	86.5
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was calculated using data from the World Bank and Royal Government of Cambodia. Wildlife Works was responsible for gathering this parameter from the literature. All measurements were made during 2017 and 2018. Accuracy level achieved is good, and is associated with the quality of the underlying data and calculations.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	<b><i>PD<sub>j</sub></i></b>
Data unit:	%
Description:	Percent of area where deforestation was avoided that would have been used for production of maize
Source of data:	Census of Agriculture in Cambodia 2013, National Institute of Statistics, Ministry of Planning in Collaboration with Ministry of Agriculture, Forestry and Fisheries
Value applied:	13
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was calculated using data from the World Bank and Royal Government of Cambodia. Wildlife Works was responsible for gathering this parameter from the literature. All measurements were made during 2017 and 2018. Accuracy level achieved is good, and is associated with the quality of the underlying data and calculations.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	<b><i>PD<sub>j</sub></i></b>
Data unit:	%
Description:	Percent of area where deforestation was avoided that would have been used for production of cassava

Source of data:	Census of Agriculture in Cambodia 2013, National Institute of Statistics, Ministry of Planning in Collaboration with Ministry of Agriculture, Forestry and Fisheries
Value applied:	0.5
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was calculated using data from the World Bank and Royal Government of Cambodia. Wildlife Works was responsible for gathering this parameter from the literature. All measurements were made during 2017 and 2018. Accuracy level achieved is good, and is associated with the quality of the underlying data and calculations.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	<b>IS</b>
Data unit:	%
Description:	Proportion of leakage resulting in increased supply outside of the jurisdiction
Source of data:	VCS VMD0037 Global Commodity Leakage Module: Production Approach
Value applied:	75
Justification of choice of data or description of measurement methods and procedures applied:	This parameter is the default value as required by the VCS Global Leakage module VMD0037. For background information on the default value see Appendix 2.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	<b>NL</b>
Data unit:	%
Description:	Proportion of increased supply coming from new land brought into agricultural production
Source of data:	VCS VMD0037 Global Commodity Leakage Module: Production Approach
Value applied:	40
Justification of choice of data or description of measurement methods and procedures applied:	This parameter is the default value as required by the VCS Global Leakage module VMD0037. For background information on the default value see Appendix 2.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	<b>NLD</b>
Data unit:	%



Description:	Proportion of increased supply coming from new land brought into agricultural production resulting in deforestation
Source of data:	VCS VMD0037 Global Commodity Leakage Module: Production Approach
Value applied:	100
Justification of choice of data or description of measurement methods and procedures applied:	This parameter is the default value as required by the VCS Global Leakage module VMD0037. For background information on the default value see Appendix 2.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	$d_d$
Data unit:	ha
Description:	Cambodia area of deforestation 2006-2014
Source of data:	Data source is the Royal Government of Cambodia Ministry of Environment submission to the UNFCCC technical committee (Ministry of Environment, 2016)
Value applied:	2,319,087
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was calculated using data from the Royal Government of Cambodia. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the underlying data and calculations.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	$g_d$
Data unit:	ha
Description:	Global deforestation 2006-2014
Source of data:	FAOSTAT, Food and Agriculture Organization
Value applied:	93,666,489.5
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was calculated using the FAO Stat data service. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the underlying data and calculations.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	$d_{cs}$
Data unit:	Tonnes C
Description:	Cambodia at-risk carbon stock

Source of data:	Data source is the Royal Government of Cambodia Ministry of Environment submission to the UNFCCC technical committee (Ministry of Environment, 2016)
Value applied:	193,796,061.55
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was calculated using data from the Royal Government of Cambodia. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the underlying data and calculations.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	$g_{cs}$
Data unit:	Tones C
Description:	Global at-risk carbon stock
Source of data:	FAOSTAT, Food and Agriculture Organization
Value applied:	8,273,299,406.45
Justification of choice of data or description of measurement methods and procedures applied:	This parameter was calculated using data from the FAO Stat data service. Wildlife Works was responsible for gathering this parameter from the online database. All measurements were made from the period 1961 to 2018. Accuracy level achieved is good, and is associated with the quality of the data set.
Purpose of Data:	Calculation of Leakage
Any comment:	

Data Unit / Parameter:	$R_d$
Data unit:	ha
Description:	Cambodian area in the other REDD+ Projects
Source of data:	The relevant Project Documents for each REDD+ project
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Calculation of Leakage
Any comment:	Parameter not used. Conservative default value from VMD00037 used.

Data Unit / Parameter:	$R_{cs}$
Data unit:	Tonnes C
Description:	Cambodian carbon stock in the other REDD+ Projects
Source of data:	The relevant Project Documents for each REDD+ project
Value applied:	N/A

Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Calculation of Leakage
Any comment:	Parameter not used. Conservative default value from VMD00037 used.

### 3.1.2 Data and Parameters Monitored

**MRR.85 List of parameters from Appendix H, their values and the time last measured.**

**MRR.86 Quality assurance and quality control measures employed for each.**

**MRR.87 Description of the accuracy of each.**

Data Unit / Parameter:	$w^{[m]}$
Data unit:	set
Description:	The set of all burned wood or herbaceous material
Source of data:	Monitoring records
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of Project Emissions
Calculation method:	N/A
Any comment:	Parameter not used

Data Unit / Parameter:	$A_{B \Delta PAA}^{[m]}$
Data unit:	ha
Description:	Area of avoided conversion
Source of data:	Generated from equation

Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.3.3.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of Project Emissions
Calculation method:	Equation [F.52]
Any comment:	Parameter not used

Data Unit / Parameter:	$A_{p1}^{[m=0]}$
Data unit:	ha
Description:	Area of Project Accounting Area stratum 1 prior to first verification event – Evergreen Forest
Source of data:	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 section 6.2. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the limits of Arc GIS software and quality of the shapefiles.
Frequency of monitoring/recording:	First monitoring period
Value applied:	40,541.01
Monitoring equipment:	Computer with ArcGIS software
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 and the VCS standard. This includes a review of the GIS products and visual assessments of the accuracy of the shapefiles.
Purpose of data:	Calculation of baseline emissions
Calculation method:	GIS analysis
Any comment:	

Data Unit / Parameter:	$A_{P2}^{[m=0]}$
Data unit:	ha
Description:	Area of Project Accounting Area stratum 2 prior to first verification event – Semi-Evergreen Forest
Source of data:	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 section 6.2. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the limits of Arc GIS software and quality of the shapefiles.
Frequency of monitoring/recording:	First monitoring period
Value applied:	197.71
Monitoring equipment:	Computer with ArcGIS software
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 and the VCS standard. This includes a review of the GIS products and visual assessments of the accuracy of the shapefiles.
Purpose of data:	Calculation of baseline emissions
Calculation method:	GIS analysis
Any comment:	

Data Unit / Parameter:	$A_{P3}^{[m=0]}$
Data unit:	ha
Description:	Area of Project Accounting Area stratum 3 prior to first verification event – Deciduous Forest
Source of data:	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 section 6.2. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with

	the limits of Arc GIS software and quality of the shapefiles.
Frequency of monitoring/recording:	First monitoring period
Value applied:	456.78
Monitoring equipment:	Computer with ArcGIS software
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 and the VCS standard. This includes a review of the GIS products and visual assessments of the accuracy of the shapefiles.
Purpose of data:	Calculation of baseline emissions
Calculation method:	GIS analysis
Any comment:	

Data Unit / Parameter:	$B_b^{[m]}$
Data unit:	tonnes
Description:	Biomass in burned wood or herbaceous material $b$
Source of data:	Measurements of biomass
Description of measurement methods and procedures to be applied:	Scale
Frequency of monitoring/recording:	Every monitoring period
Value applied:	
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Summation
Any comment:	Parameter not used no biomass burning in Project

Data Unit / Parameter:	$c_B^{[m]}$
Data unit:	tCO <sub>2</sub> e/ha
Description:	Baseline carbon stocks at the end of the current monitoring period for the Project Accounting Area

Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Section 6.4 and Appendix B.4 and the TRP's standard operating procedures "Standard Operating Procedure Tumring - Forest Inventory" and "Standard Operating Procedure Tumring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	5.55
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of baseline emissions
Calculation method:	Equation [B.33]
Any comment:	

Data Unit / Parameter:	$C_{B\ BGB}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Carbon not decayed in BGB at the end of the current monitoring period
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 v3 Section 8.1.7
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17



QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of baseline emissions
Calculation method:	Equation [F.32], [F.16]
Any comment:	Parameter omitted due to superseding of BEM by national FREL

Data Unit / Parameter:	$C_{B\ DW}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Carbon not decayed in DW at the end of the current monitoring period
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 v3 Section 8.1.6
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of baseline emissions
Calculation method:	Equation [F.36], [F.16]
Any comment:	Carbon pool not included

Data Unit / Parameter:	$C_{B\ SOC}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Carbon not decayed in SOC at the end of the current monitoring period
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.1.5
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A

Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of baseline emissions
Calculation method:	Subtraction
Any comment:	Carbon pool not included

Data Unit / Parameter:	$C_{BWP}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Carbon not decayed in WP at the end of the current monitoring period
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Appendix C
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [C.1], [F.16]
Any comment:	Carbon pool not included

Data Unit / Parameter:	$C_{BAGMT}^{[m]}$
Data unit:	tCO <sub>2</sub> e/ha
Description:	Baseline carbon stocks in above-ground merchantable trees at the end of the current monitoring period
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 v3 Appendix B.2.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A

Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of baseline emissions
Calculation method:	Weighted per ha average
Any comment:	Carbon pool not included

Data Unit / Parameter:	$C_{B\ BGMT}^{[m]}$
Data unit:	tCO <sub>2</sub> e/ha
Description:	Baseline carbon stocks in below-ground merchantable trees at the end of the current monitoring period
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 v3 Appendix B.2.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of baseline emissions
Calculation method:	Weighted per ha average
Any comment:	Carbon pool not included

Data Unit / Parameter:	$C_{P\ AGMT}^{[m=0]}$
Data unit:	tCO <sub>2</sub> e
Description:	Project carbon stocks in above-ground merchantable trees at project start
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 v3 Appendix B.2.1
Frequency of monitoring/recording:	At project start
Value applied:	N/A

Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of baseline emissions
Calculation method:	Summation across plots
Any comment:	Carbon pool not included

Data Unit / Parameter:	$C_{P\ BGMT}^{[m=0]}$
Data unit:	tCO <sub>2</sub> e
Description:	Project carbon stocks in below-ground merchantable trees at project start
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 v3 Appendix B.2.3
Frequency of monitoring/recording:	At project start
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of baseline emissions
Calculation method:	Summation across plots
Any comment:	Carbon pool not included

Data Unit / Parameter:	$C_{B\ b}^{[m]}$
Data unit:	tCO <sub>2</sub> e / ha
Description:	Baseline scenario average carbon stock in selected carbon pools
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.1.5 and the TRP's standard operating procedures "Standard Operating Procedure Tmring - Forest Inventory" and "Standard Operating Procedure Tmring – Proxy Area". Wildlife Works was responsible for the

	measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	5.55
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equations [B.33] and [B.34]
Any comment:	

Data Unit / Parameter:	$C_{B\ BM}^{[m]}$
Data unit:	tCO <sub>2e</sub> / ha
Description:	Baseline carbon stocks in biomass at the end of the current monitoring period for the Project Accounting Area
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.1.1.1. and Appendix B.2 and the TRP's standard operating procedures "Standard Operating Procedure Tumring - Forest Inventory" and "Standard Operating Procedure Tumring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	5.55
Monitoring equipment:	Equipment list in Annex 17

QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Turning v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.18]
Any comment:	

Data Unit / Parameter:	$c_{B\,soc}^{[m]}$
Data unit:	tCO <sub>2</sub> e/ha
Description:	Baseline soil carbon stocks at the end of the current monitoring period for the Forest Project Accounting Area
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	N/A
Purpose of data:	Calculation of baseline emissions
Calculation method:	Equation [F.32]
Any comment:	Carbon pool not included in project

Data Unit / Parameter:	$c_p^{[m]}$
Data unit:	tCO <sub>2</sub> e / ha
Description:	Project carbon stocks at the end of the current monitoring period for the Forest Project Accounting Area
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix

	B.1.5 and the TRP's standard operating procedures "Standard Operating Procedure Tmring - Forest Inventory" and "Standard Operating Procedure Tmring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	488.58
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tmring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [B.33] and [B.34]
Any comment:	

Data Unit / Parameter:	$c_p^{[m-1]}$
Data unit:	tCO <sub>2</sub> e / ha
Description:	Project carbon stocks at the beginning of the current monitoring period
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.1.5 and the TRP's standard operating procedures "Standard Operating Procedure Tmring - Forest Inventory" and "Standard Operating Procedure Tmring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.



Frequency of monitoring/recording:	Every monitoring period
Value applied:	488.58
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tunring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [B.33] and [B.34]
Any comment:	

Data Unit / Parameter:	$c_p^{[m=0]}$
Data unit:	tCO <sub>2</sub> e / ha
Description:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.1.5 and the TRP's standard operating procedures "Standard Operating Procedure Tunring - Forest Inventory" and "Standard Operating Procedure Tunring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Source of data:	Every monitoring period
Description of measurement methods and procedures to be applied:	488.58
Frequency of monitoring/recording:	Equipment list in Annex 17
Value applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tunring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.

Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Every monitoring period
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [B.33] and [B.34]
Any comment:	

Data Unit / Parameter:	$C_{P1BM}^{[m=0]}$
Data unit:	tCO <sub>2</sub> e / ha
Description:	Project carbon stocks in biomass in Project Accounting Area stratum 1 – Evergreen Forest at project start
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.2 and the TRP's standard operating procedures "Standard Operating Procedure Tmring - Forest Inventory" and "Standard Operating Procedure Tmring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	494.47
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tmring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$C_{P2BM}^{[m=0]}$
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Data unit:	tCO <sub>2</sub> e / ha
Description:	Project carbon stocks in biomass in the Project Accounting Area stratum 2 – Semi-Evergreen Forest at project start
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.2 and the TRP's standard operating procedures "Standard Operating Procedure Tmring - Forest Inventory" and "Standard Operating Procedure Tmring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	135.5
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tmring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$C_{P3BM}^{[m=0]}$
Data unit:	tCO <sub>2</sub> e / ha
Description:	Project carbon stocks in biomass in the Project Accounting Area stratum 3 – Deciduous Forest at project start –
Source of data:	Project accounting area sampling

Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.2 and the TRP's standard operating procedures "Standard Operating Procedure Tmring - Forest Inventory" and "Standard Operating Procedure Tmring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	118.64
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tmring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$C_{P\ AGMT}^{[m=0]}$
Data unit:	tCO <sub>2</sub> e / ha
Description:	Project carbon stocks in above-ground merchantable trees prior to first verification event
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	N/A

Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Average of plot measurements in a given stratum
Any comment:	Carbon pool not included

Data Unit / Parameter:	$C_{PBM}^{[m=0]}$
Data unit:	tCO <sub>2</sub> e
Description:	Project carbon stocks in biomass prior to first verification event
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.2 and the TRP's standard operating procedures "Standard Operating Procedure Tumorring - Forest Inventory" and "Standard Operating Procedure Tumorring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	20,127,383.77
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QA/QC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumorring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.17]
Any comment:	

Data Unit / Parameter:	$C_{Pb}^{[m]}$
Data unit:	tCO <sub>2</sub> e / ha

Description:	Average carbon in biomass in the project accounting area
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.2 and the TRP's standard operating procedures "Standard Operating Procedure Tumorling - Forest Inventory" and "Standard Operating Procedure Tumorling – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	488.58
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumorling v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equations [B.33] and [B.34]
Any comment:	

Data Unit / Parameter:	$c_{P\,soc}^{[m=0]}$
Data unit:	tCO <sub>2</sub> e/ha
Description:	Project soil carbon stocks prior to first verification event in the Forest Project Accounting Area
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	At Project Start

Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 11
QA/QC procedures to be applied:	N/A
Purpose of data:	Calculation of Project Emissions
Calculation method:	Average of plot measurements in a given stratum
Any comment:	Carbon pool not included in the Project

Data Unit / Parameter:	$C_{P \Delta WP}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Project carbon stocks in wood products at the end of the current monitoring period
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	N/A
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [C.2]
Any comment:	Carbon pool not included in the Project

Data Unit / Parameter:	$E_{\Delta GER}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	GERs for the current monitoring period
Source of data:	Equation [F.53]
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.4.1 and the TRP's standard operating procedures "Standard Operating Procedure Tumorling - Forest Inventory" and "Standard Operating Procedure Tumorling



	– Proxy Area”. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	473,130
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, “QA_QC Procedure Tumor v1.0” This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.53]
Any comment:	

Data Unit / Parameter:	$E_{\Delta GER}^{[i]}$
Data unit:	tCO <sub>2e</sub>
Description:	GERs for monitoring period $i$
Source of data:	Equation [F.53], measurements in the PAA and Proxy Area
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.4.1 and the TRP’s standard operating procedures “Standard Operating Procedure Tumor - Forest Inventory” and “Standard Operating Procedure Tumor – Proxy Area”. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	473,130

Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumor v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.53]
Any comment:	

Data Unit / Parameter:	$E_{\Delta NER}^{[i]}$
Data unit:	tCO <sub>2e</sub>
Description:	NERs for monitoring period $i$
Source of data:	Equation [F.55], measurements in the PAA and Proxy Area
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.4.3 and the TRP's standard operating procedures "Standard Operating Procedure Tumor - Forest Inventory" and "Standard Operating Procedure Tumor - Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	129,082
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumor v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions

Calculation method:	Equation [F.55]
Any comment:	

Data Unit / Parameter:	$E_B^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative baseline emissions at the end of the current monitoring period
Source of data:	Equation [F.16], measurements in the PAA and Proxy Area
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.1 and the TRP's standard operating procedures "Standard Operating Procedure Tumring - Forest Inventory" and "Standard Operating Procedure Tumring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	473,130
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.16]
Any comment:	

Data Unit / Parameter:	$E_B^{[m-1]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative baseline emissions at the beginning of the current monitoring period

Source of data:	Equation [F.16], measurements in the PAA and Proxy Area
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.1 and the TRP's standard operating procedures "Standard Operating Procedure Tumring - Forest Inventory" and "Standard Operating Procedure Tumring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.16]
Any comment:	

Data Unit / Parameter:	$E_{BA}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Change in baseline emissions
Source of data:	Equation [F.15], measurements in the PAA and Proxy Area
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.1 and the TRP's standard operating procedures "Standard Operating Procedure Tumring - Forest Inventory" and "Standard Operating Procedure Tumring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019.

	Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	2,365,652
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Turnring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.15]
Any comment:	

Data Unit / Parameter:	$E_{B \Delta BGB}^{[i]}$
Data unit:	tCO <sub>2</sub> e
Description:	Change in baseline emissions from below-ground biomass during monitoring period <i>i</i>
Source of data:	Monitoring the proxy area
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Already Monitored
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	N/A
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.31]
Any comment:	Parameter not used as BGB decay models are not used

Data Unit / Parameter:	$E_{B \Delta DW}^{[i]}$
Data unit:	tCO <sub>2</sub> e

Description:	Baseline emissions from dead wood in monitoring period $i$
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Already Monitored
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	N/A
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.34]
Any comment:	Parameter is not used as carbon pool is not included

Data Unit / Parameter:	$E_{B \Delta SOC}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Baseline change in emissions from soil carbon
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.26]
Any comment:	Parameter is not used as carbon pool is not included

Data Unit / Parameter:	$E_{B \Delta SOC}^{[i]}$
Data unit:	tCO <sub>2</sub> e

Description:	Baseline emissions from soil carbon in monitoring period $i$
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of data:	Calculation of baseline emissions
Calculation method:	Equation [F.26]
Any comment:	Parameter is not used as carbon pool is not included

Data Unit / Parameter:	$E_{B\ AGMT}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative baseline emissions from above-ground commercial trees at the end of the current monitoring period
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	N/A
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.37]
Any comment:	Parameter is not used as carbon pool is not included

Data Unit / Parameter:	$E_{B\ BGB}^{[m]}$
Data unit:	tCO <sub>2</sub> e

Description:	Cumulative baseline emissions from below-ground biomass at the end of the current monitoring period
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	N/A
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.30]
Any comment:	Parameter is not used as BEM is not used

Data Unit / Parameter:	$E_{B\ BGB}^{[m-1]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative baseline emissions from below-ground biomass at the beginning of the current monitoring period
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	N/A
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.30]
Any comment:	Parameter is not used as BEM is not used

Data Unit / Parameter:	$E_{B\ BM}^{[m]}$
Data unit:	tCO <sub>2</sub> e



Description:	Cumulative baseline emissions from biomass at the end of the current monitoring period
Source of data:	Equation [F.19], measurements in the PAA and proxy area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.1.1, 8.1.1.5.1 This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.1.1 and 8.1.1.5.1, and the TRP's standard operating procedures "Standard Operating Procedure Tumor - Forest Inventory" and "Standard Operating Procedure Tumor - Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	473,130
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumor v1.0" This includes a review of calculations, monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.19]
Any comment:	

Data Unit / Parameter:	$E_{B\ DW}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative baseline emissions from dead wood at the end of the current monitoring period
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A

Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.34]
Any comment:	Parameter is not used as carbon pool is not included

Data Unit / Parameter:	$E_{B\ DW}^{[m-1]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative baseline emissions from dead wood at the beginning of the current monitoring period
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.34]
Any comment:	Parameter is not used as carbon pool is not included

Data Unit / Parameter:	$E_{B\ SOC}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative baseline emissions from soil carbon at the end of the current monitoring period
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records

Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.27]
Any comment:	Parameter is not used as carbon pool is not included

Data Unit / Parameter:	$E_{B\ SOC}^{[m-1]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative baseline emissions from soil carbon at the end of the current monitoring period
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.27]
Any comment:	Parameter is not used as carbon pool is not included

Data Unit / Parameter:	$E_{BA}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative emissions allocated to the buffer account at the end of the current monitoring period
Source of data:	N/A
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.4.4 and the TRP's standard operating procedures. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period

Value applied:	72,305
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Turring v1.0" This includes a review of calculations, monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Multiplication
Any comment:	

Data Unit / Parameter:	$E_L^{[m]}$
Data unit:	tCO <sub>2e</sub>
Description:	Cumulative emissions from leakage at the end of the current monitoring period
Source of data:	Measurements in the leakage area(s)
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.3 and the TRP's standard operating procedures "Standard Operating Procedure Turring – Denrometer Forest Leakage" or the VCS tool Global Commodity Leakage Module: Production Approach VMD0037. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	5,351
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Turring v1.0" This includes a review of calculations, monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.

Purpose of data:	Calculation of Leakage
Calculation method:	Equation [F.45]
Any comment:	

Data Unit / Parameter:	$E_L^{[m-1]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative emissions from leakage at the beginning of the current monitoring period
Source of data:	Measurements in the leakage area(s)
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.3 and the TRP's standard operating procedures "Standard Operating Procedure Turring – Densimeter Forest Leakage" or the VCS tool Global Commodity Leakage Module: Production Approach VMD0037. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Turring v1.0" This includes a review of calculations, monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Leakage
Calculation method:	Equation [F.45]
Any comment:	

Data Unit / Parameter:	$E_{L\Delta}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Change in emissions due to leakage

Source of data:	N/A
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.3 and the TRP's standard operating procedures "Standard Operating Procedure Tmring – Densimeter Forest Leakage" or the VCS tool Global Commodity Leakage Module: Production Approach VMD0037. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	5,351
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tmring v1.0" This includes a review of calculations, monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Leakage
Calculation method:	Equation [F.44]
Any comment:	

Data Unit / Parameter:	$E_{LASF}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative emissions from activity-shifting leakage at the end of the current monitoring period
Source of data:	Measurements in the activity-shifting leakage area
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.3 and the TRP's standard operating procedures "Standard Operating Procedure Tmring – Densimeter Forest Leakage" or the VCS tool Global Commodity Leakage Module: Production Approach VMD0037. Wildlife Works was responsible for the

	measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumor v1.0" This includes a review of calculations, monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Leakage
Calculation method:	Equation [F.46]
Any comment:	

Data Unit / Parameter:	$E_{LME}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative emissions from market leakage at the end of the current monitoring period
Source of data:	Global Commodity Leakage Module: Production Approach VMD0037
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.3 and the TRP's standard operating procedures "Standard Operating Procedure Tumor – Densimeter Forest Leakage" or the VCS tool Global Commodity Leakage Module: Production Approach VMD0037. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	5,351
Monitoring equipment:	Equipment list in Annex 17

QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumring v1.0" This includes a review of calculations, monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Leakage
Calculation method:	Equation [F.51]
Any comment:	

Data Unit / Parameter:	$E_{P\Delta}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Change in project emissions
Source of data:	Monitoring records for Forest Fire, Burning, logging, wood products, and natural disturbance events
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.2 and the TRP's standard operating procedures "Standard Operating Procedure Tumring – Forest Inventory" and "Standard Operating Procedure Tumring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	1,642,581
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumring v1.0" This includes a review of calculations monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Project Emissions
Calculation method:	Equation [F.41]
Any comment:	



Data Unit / Parameter:	$E_{P \Delta BRN}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative project emissions due to burning at the end of the current monitoring period
Source of data:	Monitoring plots in the project
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 section 8.2 and the TRP's standard operating procedures "Standard Operating Procedure Tumring – Forest Inventory" and "Standard Operating Procedure Tumring – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumring v1.0" This includes a review of calculations monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Project Emissions
Calculation method:	Equation [F.42]
Any comment:	

Data Unit / Parameter:	$E_{P \Delta LS}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative project emissions due to livestock grazing within the project area.
Source of data:	Monitoring in the project area

Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tunring v1.0" This includes a review of calculations monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Project Emissions
Calculation method:	Equation [F.43]
Any comment:	De minimis effect from livestock in PAA

Data Unit / Parameter:	$E_{P\Delta SF}^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative project emissions due to the use of synthetic fertilizers within the project area.
Source of data:	Monitoring in the project area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.2.5
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of Project Emissions
Calculation method:	CDM A/R methodological tool Estimation of direct and indirect (e.g. leaching and runoff) nitrous oxide emission from nitrogen fertilization
Any comment:	No synthetic fertilizer used in Project Area

Data Unit / Parameter:	$E_U^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Cumulative confidence deduction at the end of the current monitoring period
Source of data:	Equation [F.57]
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Section 8.4.1.1 and the TRP's standard operating procedures. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Turnring v1.0" This includes a review of calculations, monitoring records for errors and 5% of plots being remeasured and compared to initial sample with a t-test.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [F.57]
Any comment:	

Data Unit / Parameter:	$n_{LS i}$
Data unit:	count
Description:	The number of head of livestock species/ category $i$ in the project area
Source of data:	Monitoring in the project area

Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Use of literature or expert knowledge
Any comment:	Parameter not used

Data Unit / Parameter:	$p_{L\ DEG}^{[m]}$
Data unit:	proportion (unitless)
Description:	Portion of leakage due to degradation in forest at the end of the current monitoring period
Source of data:	Monitoring in the leakage area
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Section 8.3.2.3 and B2.9, and the TRP's standard operating procedures "Standard Operating Procedure Tumring – Densimeter Forest Leakage". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample.
Purpose of data:	Calculation of Leakage

Calculation method:	Summation across leakage plots
Any comment:	

Data Unit / Parameter:	$p_{L\ DEG}^{[m=0]}$
Data unit:	tCO <sub>2</sub> e
Description:	proportion (unitless)
Source of data:	Portion of leakage due to degradation prior to first verification event
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Section 8.3.2.3 and B2.9, and the TRP's standard operating procedures "Standard Operating Procedure Tumring – Densiometer Forest Leakage". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tumring v1.0" This includes a review of monitoring records for errors and 5% of plots being remeasured and compared to initial sample.
Purpose of data:	Calculation of Leakage
Calculation method:	Summation across leakage plots
Any comment:	

Data Unit / Parameter:	$p_{SL}^{[m]}$
Data unit:	proportion (unitless)
Description:	Proportion of AGMT that is not merchantable and goes into slash estimated from inventory
Source of data:	Estimated from inventory

Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Conservatively used volume of a cone
Any comment:	Parameter not used, no commercial logging in Project area

Data Unit / Parameter:	$t^{[i-1]}$
Data unit:	days
Description:	Time from project start date to beginning of monitoring period $i$
Source of data:	Monitoring records
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.2 and the TRP's standard operating procedures. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	N/A
Value applied:	0
Monitoring equipment:	N/A
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tunring v1.0" This includes a review of calculations, monitoring records for errors.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Subtraction
Any comment:	

Data Unit / Parameter:	$t^{[m]}$
Data unit:	days
Description:	Time from project start date to end of current monitoring period
Source of data:	Monitoring records
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.2 and the TRP's standard operating procedures. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	N/A
Value applied:	1,826
Monitoring equipment:	N/A
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Turnring v1.0" This includes a review of calculations, monitoring records for errors.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Subtraction
Any comment:	

Data Unit / Parameter:	$t^{[m-1]}$
Data unit:	days
Description:	Time from project start date to beginning of current monitoring period
Source of data:	Monitoring records
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.2 and the TRP's standard operating procedures. Wildlife Works was responsible for the

	measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	N/A
Value applied:	0
Monitoring equipment:	N/A
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Tuming v1.0" This includes a review of calculations, monitoring records for errors.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Subtraction
Any comment:	This is the first monitoring period

Data Unit / Parameter:	$U_B^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Total uncertainty in proxy area carbon stock estimate
Source of data:	Equation [B.34] and field measurements in the Proxy Area
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.1.5 and the TRP's standard operating procedures "Standard Operating Procedure Tuming - Forest Inventory" and "Standard Operating Procedure Tuming – Proxy Area". Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	4.65
Monitoring equipment:	N/A
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the



	document, "QA_QC Procedure Turning v1.0" This includes a review of calculations, monitoring records for errors.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [B.34]
Any comment:	

Data Unit / Parameter:	$U_{EM}^{[M]}$
Data unit:	tCO <sub>2</sub> e
Description:	Total uncertainty in Baseline Emissions Models for the Project Accounting Area
Source of data:	N/A
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of baseline emissions
Calculation method:	Equation [F.14]
Any comment:	Parameter not used as BEM is not used

Data Unit / Parameter:	$U_P^{[m]}$
Data unit:	tCO <sub>2</sub> e
Description:	Total uncertainty in the Project Accounting Area carbon stock estimate
Source of data:	Equation [B.34] and field measurements in the PAA
Description of measurement methods and procedures to be applied:	This parameter was measured in accordance of the VCS standard and AFOLU guidance, using the procedures outlined in the VCS methodology VM0009 v3 Appendix B.1.5 and the TRP's standard operating procedures "Standard Operating Procedure Turning - Forest Inventory" and "Standard Operating Procedure Turning – Proxy Area". Wildlife Works was responsible for the measurement. Wildlife Works was responsible

	for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the field measurements and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	20.70
Monitoring equipment:	N/A
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 section B.5 and are outlined in the document, "QA_QC Procedure Turnring v1.0" This includes a review of calculations, monitoring records for errors.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	Equation [B.34]
Any comment:	

Data Unit / Parameter:	$wC_{Pi}^{[m=0]}$
Data unit:	tCO <sub>2</sub> e
Description:	Weighted average carbon stocks for biomass or SOC in the project for the set of selected strata
Source of data:	Biomass inventory
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	N/A
Any comment:	Parameter is not used

Data Unit / Parameter:	$x^{[m]}$
Data unit:	varies

Description:	Covariate values
Source of data:	Participatory Rural Appraisal, analysis of public records, and/or expert interpretation of inventory data or remotely sensed imagery
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	N/A
Any comment:	Parameter is not used

Data Unit / Parameter:	$d_t$
Data unit:	ha
Description:	Area of avoided deforestation for monitoring period.
Source of data:	Data source is the Royal Government of Cambodia Ministry of Environment submission to the UNFCCC technical committee (Ministry of Environment, 2016)
Description of measurement methods and procedures to be applied:	This parameter was calculated using data from the Royal Government of Cambodia. Wildlife Works was responsible for the measurement. All measurements were made between 2015 and 2019. Accuracy level achieved is good, and is associated with the quality of the underlying data and calculations.
Frequency of monitoring/recording:	Every monitoring period
Value applied:	1,449
Monitoring equipment:	Computer
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 and the VCS standard. This includes a review of the calculations and data used.
Purpose of data:	Calculation of Baseline Emissions
Calculation method:	N/A
Any comment:	

Data Unit / Parameter:	<i>LM</i>
Data unit:	tonnes
Description:	Leakage mitigation achieved by the jurisdictional program in terms of production of a given commodity
Source of data:	Agricultural production data from leakage mitigation projects implemented by the jurisdictional program or data on the reduction in the production demanded as generated by the jurisdictional program.
Description of measurement methods and procedures to be applied:	A jurisdictional program should measure the volume of production through agricultural records.
Frequency of monitoring/recording:	The data may be monitored once at the end of the monitoring period but should be reported on an annual basis.
Value applied:	0
Monitoring equipment:	Computer
QA/QC procedures to be applied:	QAQC procedures are in line with the requirements of VM0009 v3 and the VCS standard. This includes a review of the calculations and data used.
Purpose of data:	Calculation of Leakage
Calculation method:	N/A
Any comment:	Leakage mitigation is conservatively excluded

### 3.1.3 Monitoring Plan

TRP's monitoring plan provides for the monitoring and reporting on the reduction in emissions from deforestation in the Project Area. The primary objective of the monitoring plan is to ensure accurate estimates of carbon stocks and carbon emission reductions from the REDD+ Project over the crediting period of the Project. The climate monitoring plan includes three primary monitoring activities that will be performed throughout the lifetime of the TRP. These activities, and their frequency are shown in Table 5.

**Table 5:** The three primary monitoring activities, the frequency that they will be performed and the method to be used.

Activity	Frequency	Method
<b>Forest Patrols and Perimeter Observation</b>	Annually	Patrol team inspects perimeter of Project area

<b>Plot Measurements</b>	Annually	Sampling teams visit a portion of plots in Project and proxy areas
<b>Identification of significant disturbance</b>	Once every 2-3 years or after major disturbance event	Periodic inspection of aerial imagery or videography, with ground inspection when necessary

Descriptions of these monitoring activities are described in Annex 3 – Climate Monitoring Plan. In addition to these three primary Project monitoring activities several additional monitoring activities will happen at informal frequencies during the Project Partners’ general operations. This includes regular forest ranger patrols through the Project Area, and outreach to adjacent communities. The additional monitoring activities will serve to identify instances of encroachment or tree harvesting that may occur in the Project Area. The monitoring plan is meant as a guide to maintain consistency during monitoring, and also includes training and internal audit procedures for quality control. It is meant as a working document to be revised as needed during the course of the Project. When revisions are necessary, they should be noted as monitoring deviations in the subsequent monitoring report prepared for a VCS and CCB verification event.

#### **MRR.88 Documentation of training for field crews.**

A primary training event for the field crews, led by Simon Bird of WWC, was held September 22<sup>nd</sup> – October 1, 2015 in the Project Area. During the training all field crew members were instructed in biomass sample plot SOP, the proper usage of all equipment, and in best practices for safe and successful field data collection. A secondary on-site training was held October 17<sup>th</sup> – 26<sup>th</sup>, 2016 by Simon Bird specifically on the leakage area data collection SOP with a review of the biomass SOP. A final, third training and review session was held by Simon Bird September 23<sup>rd</sup> – 26<sup>th</sup> 2019. In addition to these three on-site trainings, continuous support and training was provided by WWC staff by email and phone calls to answer questions and to address issues that arose by the field team.

#### **MRR.90 Documentation of data quality assessment such as a check cruise and plots of the data such as diameter distributions by strata or plot.**

Please refer to ‘Annex 09 – QA\_QC Procedure Tumring’ for the quality control standard operating procedure that the Project uses to assess data measurement quality and thoroughness. In accordance with the QC SOP, 5% of the biomass inventory plots were selected for remeasurement. These plots were selected by Simon Bird to meet the requirements of the SOP. A total of six QC plots were re-measured under the leadership of Mr. Bird with a subset of the individuals who had done the initial plot measurements. For the QA/QC measurements a different individual performed each task than from the original plot measurement. The QA/QC measurements were completed as close in time to the original plots as possible to avoid any errors due to natural regeneration/growth, although it is widely understood that some natural variation will occur between these two measurement events. The team that re-measures the plot does not have access to the data sheet from the initial plot measurement, nor should have discussed any element of the plot with the team that performed the initial measurement. Table 6 displays the results of the paired T-Test, which showed no significant difference was found.

**Table 6:** The QA/QC assessment for this monitoring (M<sub>1</sub>) period.

Paired T-Test	QC Basis	Inventory Basis
1% of Estimated Mean (tCO <sub>2e</sub> )	3.93	3.98
Estimated Mean of Paired Differences (tCO <sub>2e</sub> )	-5.06	-5.06
Standard Error of Paired Differences (tCO <sub>2e</sub> )	26.76	26.76
Difference between 1% and Paired Difference (tCO <sub>2e</sub> )	-8.99	-9.04
t Statistic	-0.34	-0.34
Degrees of Freedom	5	5
p Value (1 - alpha)	0.62	0.63
H0: No difference between 1% and Paired Difference at 90% Level	TRUE	TRUE
H1: Difference greater than or equal to 1% and Paired Difference at 90% Level	FALSE	FALSE

**MRR.91 Maps of a stratification (if any) and references to plot allocation.**

Please refer to Figure 1 for a map of the Project Accounting Area forest stratification, and to Figure 2 for a map of the biomass sample plot locations.

**MRR.92 List of plot GPS coordinates.**

Please refer to Annex 03 the Climate Monitoring Plan for a comprehensive list of all sample plots and their GPS coordinates.

**MRR. 93 Description of plot sizes and layout (such as the use of nests and their sizes) for each carbon pool.**

A permanent circular nested plot design was used for the biomass sample plots. The tree plot radius for this project is 15 meters, which is a 0.07 ha plot area. The minimum diameter for considering an individual plant as a tree for the project is 10 cm diameter at 1.3 m above the ground (DBH). All smaller woody plants are considered shrubs. The shrub plot radius for the project is 5 meters.

**Table 7:** The radii used for the Tumring REDD+ Project tree and shrub plots

Area	Plot Radius
<i>Tree Plots</i>	
All Plots	15 meters
<i>Shrub Plots</i>	
All Plots	5 meters

**MRR.94** If applicable, a detailed description of the process used to develop allometric equations, to include:

- Sample size
- Distribution (e.g. diameter) of the sample
- Model fitting procedure
- Model selection

This MRR is not applicable to the TRP. As described in Section 6, new allometric equations were not developed for the Project.

**MRR. 95** The estimated carbon stock, standard error of the total for each stock, and the sample size for each stratum in the area selected.

**Table 8:** The estimated carbon stock, error and number of plots for each forest strata in the Project Area.

Stratum	Carbon Stock (t CO <sub>2</sub> / ha)	Error (t CO <sub>2</sub> / ha)	Number of plots
<b>Evergreen Forest</b>	494.47	21.02	110
<b>Semi-Evergreen Forest</b>	135.50	81.42	8
<b>Deciduous Forest</b>	118.64	42.74	10
<b>Project Area</b>	488.58	20.70	128

**MRR. 97 Deviations from the measurement methods set out in Appendix B or the monitoring plan, per current VCS requirement.**

There were no deviations from the Methodology Appendix B or from the Project Climate Monitoring Plan in Annex 03.

**MRR.98 The frequency of monitoring for each plot for all plots – all plots should be measured for the first verification. All leakage plots should be measured every verification, and all proxy and project accounting area plots at least every five years, or after a significant event that changes stocks.**

All Project biomass, Proxy Area and Leakage Area sample plots were measured for this monitoring period. For the frequency of monitoring for all of these plots please refer to the Climate Monitoring Plan in Annex 03.

**3.1.4 Dissemination of Monitoring Plan and Results (CL4.2)**

The Climate Monitoring Plan has been established and accepted by the Project Proponent. The Plan was made available for public review at the Project Office. The full results of the climate monitoring are included in this Project monitoring report, which is made publicly available in the Project Area by having a hard copy available for review at the Project Office, and on the Project Proponents website. Additionally, a monitoring report summary has been written and provided to communities throughout the Project Area in Khmer. The monitoring report has additionally been posted to the website of the CCB for public review and comment.

**3.2 Quantification of GHG Emission Reductions and Removals**

**3.2.1 Baseline Emissions**

Table 9 below summarizes without-Project (baseline) carbon emissions and corresponding deductions for leakage and risk of reversal buffer. As the TRP opted to use Cambodia's national FREL submission to the UNFCCC, a summary of equations is provided below. A more complete justification is provided in the Royal Government of Cambodia's Initial Forest Reference Level under the UNFCCC Framework (MoE, 2016). This document also provides submission information for the reader to reproduce the reference level calculation.

**Table 9:** Baseline carbon emissions and reductions from the Tumring REDD+ Project.

Component	First monitoring period (m <sub>1</sub> )	Total to date
<b>Gross NERs (t CO<sub>2</sub>e)</b>	2,365,652	2,365,652
<b>Project Emission (t CO<sub>2</sub>e)</b>	1,642,581	1,642,581
<b>10% buffer tonnes to VCS (t CO<sub>2</sub>e)</b>	72,305	72,305



<b>Activity-Shifting Leakage deduction (t CO<sub>2</sub>e)</b>	0	0
<b>Market Leakage Deduction (t CO<sub>2</sub>e)</b>	5,351	5,351
<b>Net NERs (t CO<sub>2</sub>e)</b>	645,410	645,410

**MRR.10 Calculations of current baseline emissions  $EB_{\Delta m}$  as of the current monitoring period.**

As shown above in Table 9, baseline emissions for the current baseline emissions are calculated as a yearly allotment of total emissions pro-rated for the monitoring period length.

**MRR.11 Calculations of baseline emissions  $EB_{\Delta m-1}$  from prior monitoring periods.**

As this is the first monitoring period, there are no baseline emissions from prior monitoring periods.

**MRR.12 Calculations of cumulative baseline emissions for each selected pool ( $E_B$  BMm and  $E_B$  SOCm) and undecayed carbon ( $C_B$  BGBm,  $C_B$  DWm,  $C_B$  SOCm and  $C_B$  WPM), as of the current monitoring period.**

Cumulative baseline emissions for the TRP are calculated using equation [F.15]:

$$E_B^{[m]} = E_B^{[m]} - E_B^{[m-1]}$$

Because the current monitoring period is the first ( $m_1$ ), current baseline emissions are identical to cumulative baseline emissions ( $E_B^{[m]} = E_B^{[m]}$ ). [F.16] is employed to calculate cumulative baseline emissions:

$$E_B^{[m]} = E_B^{[m]} + E_B^{[m]} - C_B^{[m]} - C_B^{[m]} - C_B^{[m]} - C_B^{[m]} \quad [F.16]$$

where

$E_B^{[m]}$  = Cumulative baseline emissions from biomass (tCO<sub>2</sub>e)

$E_B^{[m]}$  = Cumulative emissions from soil organic carbon (tCO<sub>2</sub>e)

$C_B^{[m]}$  = Carbon not decayed in soil organic carbon (SOC) at the end of the current monitoring period (tCO<sub>2</sub>e)

$C_B^{[m]}$  = Carbon not decayed in belowground biomass (BGB) at the end of the current monitoring period (tCO<sub>2</sub>e)

$C_B^{[m]}$  = Carbon not decayed in deadwood (DW) at the end of the current monitoring period (tCO<sub>2</sub>e)

$C_B^{[m]}$  = Carbon not decayed in long-lived wood products (WP) at the end of the current monitoring period (tCO<sub>2</sub>e)

Per the communique received from Verra on 27 February 2018, WWC was instructed to omit the 10-year decay model for belowground biomass due to the fact that the national FREL does not observe this decay model. By extension, the additional decay models listed in the AFOLU requirements, including those for

soil organic carbon, deadwood and long-lived wood products are also omitted, as these models are applicable to a Project scale, and similarly not employed in Cambodia's national FREL calculation:

Variable	units	Description	Value applied	Comments
$E_{B\ BM}^{[m]}$	tCO <sub>2</sub> e	Total baseline emissions from biomass (BGB + AGB)	2,365,652	Included in RGC's national FREL. Yearly baseline emissions pro-rated for the current monitoring period ( $m_1$ )
$E_{B\ SOC}^{[m]}$	tCO <sub>2</sub> e	Baseline emissions from soil organic carbon	0	Carbon pool not included in RGC's national FREL
$C_{B\ SOC}^{[m]}$	tCO <sub>2</sub> e	Carbon <i>not decayed</i> in soil organic carbon	0	Carbon pool not included in RGC's national FREL
$C_{B\ BGB}^{[m]}$	tCO <sub>2</sub> e	Carbon <i>not decayed</i> in belowground biomass	0	VCS decay model superseded by use of national FREL, which does not employ a decay model for BGB.
$C_{B\ DW}^{[m]}$	tCO <sub>2</sub> e	Carbon <i>not decayed</i> in deadwood	0	VCS decay model superseded by use of national FREL, which does not employ a decay model for dead wood. Pool conservatively omitted from TRP.
$C_{B\ WLP}^{[m]}$	tCO <sub>2</sub> e	Carbon <i>not decayed</i> in long-lived wood products	0	VCS carbon storage for long-lived wood products model superseded by use of national FREL, which does not employ a carbon storage model for long-lived wood products.

Cumulative baseline emissions are then calculated as follows:

$$E_B^{[m]} = (2,365,652 + 0 - 0 - 0 - 0 - 0) \text{ tCO}_2\text{e} = 2,365,652 \text{ tCO}_2\text{e} \quad [\text{F.16}]$$

$$E_{B\ \Delta}^{[m]} = E_B^{[m]} = 2,365,652 \text{ tCO}_2\text{e} \quad [\text{F.15}]$$

### 3.2.1.1 Calculating Baseline Emissions from Biomass

Historical emission estimates were developed based on the national FRL activity data from 2006 to 2014. Annual CO<sub>2</sub> Emissions and Removals (tCO<sub>2</sub>e / year) are calculated by the following equation;

$$\Delta C_B = \frac{(C_{t_2} - C_{t_1})}{t_2 - t_1}$$

$$\Delta CO_2 = \Delta C_B \times \frac{44}{12}$$

where;

$\Delta C_B$  = annual change in carbon stocks in biomass (the sum of above-ground and below-ground biomass) in land remaining in the same category (e.g., Forest Land Remaining Forest Land), tonnes C yr<sup>-1</sup>

$C_{t_2}$  = total carbon in biomass for each land sub-category at time  $t_2$  in tonnes C

$C_{t_1}$  = total carbon in biomass for each land sub-category at time  $t_1$  in tonnes C

$C_{t_i}$  (Total Emission) = Activity Data (A) × Emission Factor (EF)

44/12: Molecular weight ratio of carbon dioxide to carbon (IPCC, 2006)

#### **MRR.13 Calculations of cumulative baseline emissions from biomass $E_{B\ BM}^{[m]}$ for the current monitoring period.**

Cumulative baseline emissions for the current monitoring period are calculated using the following equation from section 3.2.4.3 of the PD:

$$E_{B\ BM}^{[m]} = RL \times \left( (C_{p\ BM}^{[m]} - C_{B\ BM}^{[m]}) \times A_{PAA} \right) \times \left( \frac{t^{[m]} - t^{[m-1]}}{365} \right)$$

where

RL = The national Cambodian deforestation rate per year (%/yr)

$C_{p\ BM}^{[m]}$  = Average Project carbon stock in biomass at the end of the current monitoring period (tCO<sub>2</sub>e/ha)

$C_{B\ BM}^{[m]}$  = Average baseline carbon stock in biomass at the end of the current monitoring period (tCO<sub>2</sub>e/ha)

$A_{PAA}$  = Area of the Project Accounting Area (ha)

$t^{[m]}$  = Current monitoring period end date (days)

$t^{[m-1]}$  = Current monitoring period start date (days)

Cumulative baseline emissions for the current monitoring period are then calculated as follows:

$$E_{B\ BM}^{[m]} = 2.38\%/yr \times \left( (488.58 \frac{tCO_2e}{ha} - 5.6 \frac{tCO_2e}{ha}) \times 41,195.5 ha \right) \times (5 yrs)$$

$$E_{B\ BM}^{[m]} = 2,365,652 \text{ t CO}_2\text{e}$$

Note that cumulative baseline emissions for the current monitoring period are equal to cumulative emissions as of the current monitoring period, as calculated above for MRR.12.

**MRR.14 Calculations of cumulative baseline emissions from biomass  $E_{B\ BM}^{[m]}$  for all prior monitoring periods.**

As this is the first monitoring period this MRR is not applicable

**3.2.1.2 Calculating Baseline Emissions from SOC**

This section is not applicable as the soil carbon pool has been conservatively excluded from the project.

**3.2.1.3 Calculating Carbon Not Decayed in DW**

The TRP does not include planned forest harvesting in the baseline scenario. Therefore, the deadwood carbon pool has been conservatively excluded from project carbon accounting. The MRR.21, MRR.22, MRR.23, MRR.24 and MRR.25 are not applicable to the project.

**3.2.1.4 Calculating Carbon Not Decayed in BGB**

This section is not applicable because a jurisdictional forest reference emission level has been applied to the TRP.

**MRR.26 An estimate of carbon stored in non-decayed BGB  $C_{B\ BGB}^{[m]}$  for the current monitoring period.**

This PDR is not applicable because a jurisdictional forest reference emission level has been applied to the TRP.

**MRR.27 An estimate of cumulative baseline emissions from BGB  $E_{B\ BGB}^{[m]}$  for the current monitoring period.**

Cumulative emissions for BGB is listed in the MoE, 2016 UNFCCC document, available to the auditor upon request.

**MRR.28 Calculations of cumulative baseline emissions from BGB  $E_{B\ BGB}^{[m]}$  for all prior monitoring periods.**

As this is the first monitoring period, this MRR does not apply

**3.2.1.5 Calculating Carbon Not Decayed in SOC**

This section is not applicable as the SOC pool has been excluded from the project and was not included in the national FREL submission to the UNFCCC (MoE, 2016).

**MRR.29 An estimate of carbon stored in non-decayed SOC  $C_{B\ SOC}^{[m]}$  for the current monitoring period.**

This PDR is not applicable because the SOC pool has been excluded from the project and was not included in Cambodia's national FREL submission to the UNFCCC.

### 3.2.2 Project Emissions

#### 3.2.2.1 Calculating Emissions from Changes in Project Stocks (G1.4)

Carbon stocks have been estimated using the Verified Carbon Standard (VCS) methodology VM0009 'Methodology for Avoided Ecosystem Conversion' v3.0. This methodology was originally validated with VCS in January 2011, with version 2 validated in 2012. A third major revision was conducted to include the AFOLU (Agriculture, Forestry and Other Land Uses) category Avoided Conversion of Grasslands and Shrublands (ACoGS). Version 3.0 of VM0009 was successfully validated in June 2014 under the VCS double approval process.

According to VCS, Project plots must be re-measured at a minimum every five years. As such, 100% of the biomass plots for the TRP shall be measured every 5 years. The TRP plans to follow a monitoring plan that on average measures 20% of the biomass plots each year. Circumstantial deviations from this schedule may be deemed necessary, while still achieving 100% measurement within 5 years. The Project Proponent has not included Soil Organic Carbon (SOC) as a carbon pool for the national FREL submitted to the UNFCCC (MoE, 2016). As such, the SOC pool has been omitted in the calculation of Project stocks.

Biomass plot locations are depicted below in Figure 1. Changes in Project carbon stocks are calculated as the difference in Project stocks in each stratum in the PAA between the current and prior monitoring periods, as determined from in-situ measurement of biomass plots:

$$A_{PAA} \left( c_P^{[m-1]} - c_P^{[m]} \right)$$

Carbon stocks that are lost to burning, wood products, and leakage are accounted for using the procedures and equations listed below.

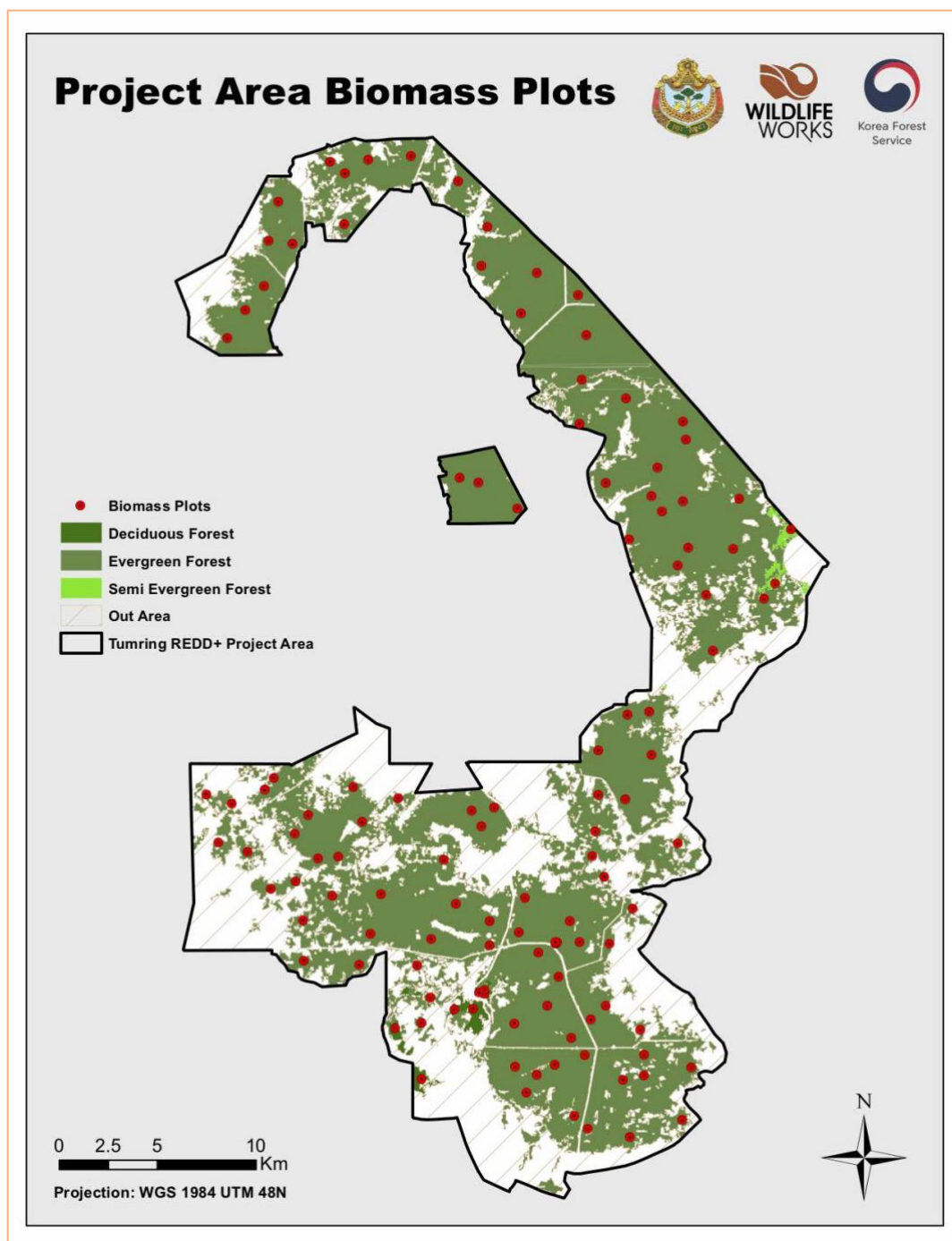


Figure 2: Biomass sample plot locations in the Tumring REDD+ Project

Table 10 depicts current measured above- and below-ground biomass carbon stocks by land cover stratum within the Project Area. Values below have been calculated using the methods of carbon accounting detailed in the VCS Methodology VM0009 and this VCS / CCB validated PD.

**Table 10:** A summary of current carbon stocks within the Project Accounting Area

Stratum	Area (ha)	Mean carbon stock (t CO <sub>2</sub> e / ha)	Standard error (t CO <sub>2</sub> e /ha)	Mean dbh (cm)	Average height (m)
<b>Evergreen Forest</b>	40,541.01	494.47	21.02	19.05	10.78
<b>Semi-Evergreen Forest</b>	456.78	135.50	81.42	20.69	10.75
<b>Deciduous Forest</b>	197.71	118.64	42.74	23.26	7.15

### 3.2.2.2 Calculating Emissions from Burning

No currently planned Project Activities involve the burning of biomass. Emissions from burning are therefore excluded from Project emissions calculations. If future Project Activities should include this emission type, Project emissions from burning of biomass shall be calculated using equation [F.42] of the VM0009 methodology v3.0.

**MRR. 34 A table of events when woody or herbaceous biomass was burned during the monitoring period, showing the weight of woody or herbaceous biomass in tonnes and the date consumed.**

As noted above there is no planned Project Activities that involve the burning of biomass. Therefore, this MRR is not applicable to the Project.

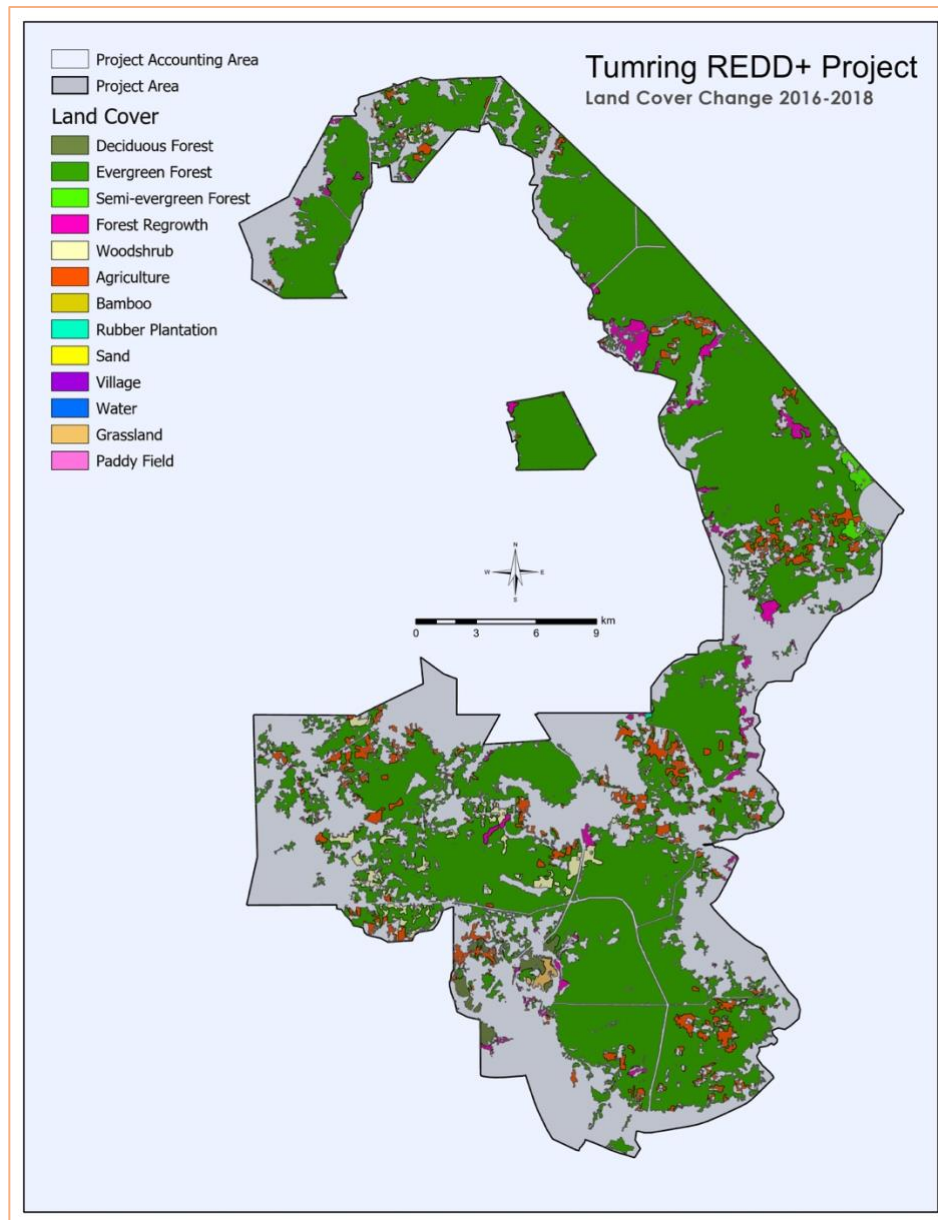
### 3.2.2.3 Calculating Emissions From Disturbances

There was an area of significant disturbance in this (M<sub>1</sub>) monitoring period. There was an area of deforestation that occurred within the Project Area where a disperse area of forest was converted to the baseline scenario, small-scale agriculture. Utilizing the Cambodian national landcover data produced by the MOE area within the Project Area that transitioned from forest to a non-forest landcover class during the monitoring period were identified and mapped. The area that transitioned from forest to non-forest was then determined for each forest strata class. An emission factor for each forest strata class was calculated by subtracting the baseline carbon stock from the carbon stock of the forest strata. The total project emission resulting from the deforestation was then calculated by multiplying the emission factor for each strata by the area of deforestation during the monitoring period within the strata, and then summing the results. The total area of deforestation was found to be 3,449 ha and the total project



emission to be 1,642,581 t CO<sub>2</sub>e. For the M<sub>2</sub> monitoring period the delineated area that was deforested during this monitoring period will become a new non-forest stratum with a carbon stock of 0 t CO<sub>2</sub>e / ha, and the 3 forest strata areas will be adjusted accordingly.

**MRR. 32 A map of the boundaries of any significant disturbance in the Project accounting areas during the monitoring period.**



**Figure 3:** The area of deforestation in the Tumring REDD+ Project during the M<sub>1</sub> monitoring period.

**MRR. 33 Evidence that plots were installed into these disturbed areas and were measured per section 9.**



The Project Proponent elected to utilize method 2 in the Project's Disturbance Monitoring Standard Operation Procedure (SOP) which relies on government landcover data to determine the area of deforestation and project and baseline carbon stock data to calculate the project emission. This MRR is not applicable to the Project during this monitoring period.

#### 3.2.2.4 Determining Carbon Stored in WP

As the TRP is utilizing the Cambodian national FREL for the Project's baseline, the carbon pool of WP is not included so as to ensure consistency between the carbon accounting of the Project and the national FREL. Therefore, MRR.30, MRR. 31, MRR.35, MRR. 36 and MRR.37 are not applicable to the Project.

#### 3.2.2.5 Calculating GHG Emissions from Livestock Grazing

There is no grazing of livestock in the Project Area. Therefore MRR.38, MRR.39 and MRR.40 are not applicable to the Project.

#### 3.2.2.6 Calculating N<sub>2</sub>O Emissions from the Use of Synthetic Fertilizers

**MRR. 41 A report of record of the quantity of synthetic fertilizer applications in the Project area.**

**MRR. 42 Emissions released due to use of synthetic fertilizer  $E_p^{[m]} \Delta SF$**

**MRR.43 Calculations to determine  $E_p^{[m]} \Delta SF$**

No inputs such as any fertilizers, chemical pesticides, biological control agents are intended to be used for the Project, or in the Project Area. These MRRs are not applicable to the Project

### 3.2.3 Leakage

#### 3.2.3.1 Leakage Mitigation Strategies (CL2.2.)

**MRR.44 A description of project activities that have been implemented since the project start date and the estimated effects of these activities on leakage mitigation**

The status of the Project Activities is described in full detail in Section 4.3. Activities were designed to mitigate deforestation and human-wildlife conflict as well as to enhance livelihoods throughout the Project Zone. They therefore by design serve to mitigate leakage and uphold Project permanence. Please see section 4.3 for the status of each Project Activity during the current monitoring period and monitored values of the effect of each activity.

**MRR.45 List of mitigation activities to reduce demand for forgone goods and services.**

**MRR.46 Quantities for the reduction or replacement of goods and services if they are used in section 8.3.3.4 of the methodology VM0009.**

**MRR.47 Methods for measuring the reduction or replacement of goods and services**

During this monitoring period no leakage mitigation activities were included that were designed to directly reduce the demand for forgone goods or services from the Project Area. These MRRs are not applicable to the Project at this time.

### 3.2.3.2 Activity-Shifting Leakage (CL2.1.)

#### 3.2.3.2.1 Change to the Activity-Shifting Leakage Area

As this is the first monitoring period and the verification is concurrent with Project validation, there were no changes to the activity-shifting leakage area as described in the PD Section 3.2.3.1.1.

Therefore MRR.50-55 are not applicable to the TRP.

#### 3.2.3.2.2 Estimating emissions from the activity-shifting leakage area.

**MRR.48 Calculated cumulative emissions from activity-shifting leakage for the current monitoring period  $E_{LAS}^{[m]}$  and supporting calculations.**

As the Project is in the first monitoring period, cumulative emissions from activity-shifting leakage are set to zero and this MRR is not applicable. See VM0009 v3.0, section 8.3.2 for details.

**MRR.49 Calculated cumulative emissions from activity-shifting leakage for the prior monitoring periods  $E_{LAS}^{[m]}$**

The Project is in the first monitoring period. This MRR is therefore not applicable

### 3.2.3.3 The Leakage Emissions Model

Activity-shifting leakage is estimated by empirical, in-situ observation of sample points in the activity shifting leakage areas for evidence of conversion and forest degradation. They are used to estimate the cumulative emissions from activity shifting leakage for each monitoring period per equations [F.46] and [F.47] from VM0009 v3.0 using the Leakage Emissions Model (LEM). The LEM is normally parameterized using equations [F.48] and [F.49], utilizing the ( $\alpha$ ,  $\beta$  and  $\theta$ ) parameters from the BEM (VM0009 section 6.8). This is done when the BEM is applied at the Project level. Because the TRP uses a nationally submitted FREL, starting at the second monitoring period.  $\alpha$ ,  $\beta$  and  $\theta$  shall be calculated with the nationally determined activity data (deforestation rate) substituted into the BEM model, thus allowing for the calculation of activity-shifting leakage for future monitoring periods.

#### 3.2.3.3.1 Sampling Conversion and Forest Degradation to Build the Leakage Model

Conversion and forest degradation are sampled in the activity shifting leakage area by empirical, in-situ observation of sample plots. The sample design utilized is a simple random sample of 38 forest leakage area plots within the activity-shifting leakage area. Please see Appendix D for maps delineating the activity-shifting leakage area. The procedures used for locating and sampling the activity shifting leakage areas are found in the document 'Standard Operating Procedure Densiometer Forest Leakage'. Plot teams visited each leakage plot a prior to confirm that each plot begins in a non-converted state and that its location is appropriate with respect to the agents and drivers in the Project baseline scenario.

#### 3.2.3.3.2 Fitting the Leakage Model

The Leakage Emissions Model is calculated by using equation [F.48]. The model estimates cumulative carbon emissions from activity-shifting leakage based on the conversion parameters  $\alpha$ , and  $\beta$  and in-situ field measurements in the leakage areas.

Where equation [F.48] is:

$$LEM_F(c_P, c_B, p_{L\ DEG}, t, x) = p_{L\ DEG}^{[m]} A_{AS}(c_P - c_B) \cdot \frac{A_{AS}(c_P - c_B)}{1 + e^{\ln\left(\frac{1}{p_{L\ DEG}^{[m=0]}} - 1\right) \cdot \beta t - \theta(x_0 - x)^T}}$$

The parameter  $p_{L\ DEG}^{[m]}$  is estimated at least once every five years from measurements taken in-situ within the PAA Leakage area. The Standard Operating Procedure (SOP) used for estimating these parameters is depicted in 'Annex 07 – Standard Operating Procedure Densiometer Forest Leakage v4\_02112016'.

**MRR.56 The estimated value  $p_{L\ DEG}^{[m]}$  for the current monitoring period and supporting calculations.**

As this is the first monitoring period,  $p_{L\ DEG}^{[m]}$  is equivalent to  $p_{L\ DEG}^{[m=0]}$ , shown below in MRR.57.

**MRR.57 The calculated value  $p_{L\ DEG}^{[m=0]}$  calculated for the first monitoring period.**

The calculated value of  $p_{L\ DEG}^{[m=0]}$  for the TRP is 0.011.

**MRR.58 The estimated value  $p_{L\ CON\ G}^{[m]}$  for the current monitoring period and supporting calculations.**

There is no ACoGS (avoided conversion of grassland & shrubland) component for the TRP. Therefore, this MRR does not apply.

**MRR.59 The calculated value  $p_{L\ CON\ G}^{[m=0]}$  calculated for the first monitoring period.**

There is no ACoGS (avoided conversion of grassland & shrubland) component for the TRP. Therefore, this MRR does not apply.

#### 3.2.3.4 Market Leakage (CL3.1.)

Market leakage can occur if a Project reduces the supply of market goods, such as timber, relative to the baseline. As described in the PD Section 2.1.11, the most likely baseline scenario is conversion of forest to agriculture. This agriculture is primarily subsistence, with little production remaining beyond household consumption. Food security is a serious issue, as discussed in the PD Section 4.1.1, throughout the Project Zone. Without the Project there would be increasing demand for land and continued low productivity of agricultural production, crop failures from droughts, fluctuation of crop price and few alternatives for income generating activities available to local communities. Given that the agents and drivers generally practice commercial farming, the Project may result in a net reduction in agricultural production.

**MRR.60 The selected approach to determining emissions from market leakage.**

The VCS Tool, VMD0037 Global Commodity Leakage Module: Production Approach (LM-P) was used to determine the market effects leakage resulting from the TRP. This tool estimates the amount of commodity production potentially impacted by the Project and calculates a global commodity leakage deduction expressed as a percentage. The tool uses the area of the Project and common crops grown in the region and the stock of harvestable timber present to estimate a potential forgone commodity

production caused by the Project Activity. The Tool achieves this by using the planted area of the primary agricultural crops in the jurisdiction in which the Project Area is located and the timber stock present in the Project Area in relation to the quantity of timber produced nationally to determine the potential of forgone production that may cause an increased supply elsewhere in the country through the deforestation of land. This tool was parameterized using a variety of data sources. This includes Project information included in this report for Project Area and carbon stocks. Public data sources were used to determine the total area of forest and agricultural land in Cambodia, primary crops in Kampong Thom province, their yield, and the total area in which these crops are planted within Kampong Thom province, and nationally. Data on the primary crops grown in Kampong Thom province, and the total area planted of these crops Kampong Thom province and nationally was obtained from The Census of Agriculture in Cambodia 2013 (NIS, 2015). The crop yield values for the primary crops grown in Kampong Thom province were obtained from the report Cambodian Agriculture in Transition: Opportunities and Risks (World Bank, 2015). The quantity of timber in the Project Area was determined from the Project's forest inventory. Values for the volume of timber harvested in Cambodia were obtained from the FAO Forest Resource Assessment for Cambodia and FAOSTAT (FAO, 2015 and FAOSTAT, 2018).

**MRR.61 Estimated cumulative emissions from market leakage for the current monitoring period  $E_{LME}^{[m]}$  and supporting calculations.**

The calculated market leakage value is **0.74%**. This rate would result in 5,351 tCO<sub>2</sub>e of estimated cumulative emissions from market leakage during the current monitoring period. The market leakage rate has been calculated in the document 'Annex 15 – Tumring\_Market Leakage Tool.xlsx' and the estimated cumulative emissions from market leakage was calculated in the document 'Annex 12 – Tumring FREL.xlsx'. Both of these documents have been provided to the auditor for review.

**MRR.62 Calculated cumulative emissions from market leakage for the prior monitoring periods  $E_{LME}^{[m]}$**

This is the first monitoring period for the TRP. Therefore, this MRR is not applicable to the Project.

**MRR.63 Provide location-by-location evidence that management plans and land-use designations of all areas under the Project proponent's control within the country have not changed as a result of the Project. For entities with a conservation mission, provide evidence of the organization's policy not to change the land use of other owned and managed lands, and evidence of compliance with such a policy.**

According to the above-mentioned laws, the mandate for FA is to manage all production and community forests as well as former economic land concessions in the country. The implementation of the TRP has not changed the land-use of other production and community forests nor economic land concessions. FA's forest protection policy has not changed since its establishment.

### 3.2.4 Net GHG Emission Reductions and Removals

#### 3.2.4.1 Determining Reversals

**MRR.72 A description of the reversal including which pools contributed to the reversal and reasons for its occurrence.**

There have been no reversals in the TRP.

### 3.2.4.2 Determining Reversals as a Result of Baseline Re-evaluation

#### **MRR.73 A description of the reversal including a summary of new data obtained in the reference area.**

There have been no reversals in the TRP. The next baseline re-evaluation period will be 10 years from the project start date (01 January 2015) in 2025.

### 3.2.4.3 Quantifying Net Emission Reductions for a PAA

#### 3.2.4.3.1 Determining Deductions for Uncertainty

#### **MRR.68 The confidence deduction $E_U^{[m]}$ and estimated standard errors used to determine the confidence deduction.**

In accordance with VM0009 v3.0, section 8.4.1.1, the confidence deduction is determined by linearly combining weighted uncertainties (standard errors) from the Project Accounting Area, Proxy Area and the Baseline Emission Model (BEM). However, because the TRP uses a nationally submitted FREL, the total uncertainty in the BEM does not exist and is therefore set to zero in equation [F.57]. Per VCS AFOLU Requirements, if the total combined error is above 15%, a deduction is applied as the difference between the calculated combined error and 15%. Otherwise, the confidence deduction is zero. The calculated uncertainties used for the determination of the confidence deduction were:

- Uncertainty in carbon stock estimates in the Project accounting area, ( $U_p^{[m_1]}$ ): 853,961 tCO<sub>2</sub>e
- Uncertainty in carbon stock estimates in the proxy area, ( $U_B^{[m_1]}$ ): 27,292 tCO<sub>2</sub>e
- Uncertainty in the baseline emissions model (BEM), ( $U_{EM}^{[m_1]}$ ): 0 KB

The calculated carbon stocks for the Project accounting area and proxy area are:

- Total measured carbon stock in the project accounting area, ( $C_p^{[m_1]}$ ): 488.58 tCO<sub>2</sub>e/ha
- Total measured carbon stock in the proxy area, ( $C_{Bp}^{[m_1]}$ ): 5.6 tCO<sub>2</sub>e/ha A

Baseline emissions for the current monitoring period are:

- Total baseline emissions, ( $E_{B\Delta}^{[m_1]}$ ): 2,365,652 tCO<sub>2</sub>e

For the current monitoring period ( $m_1$ ), the confidence deduction, as per VM0009 v3.0 equation [F.57] is:

Cumulative confidence deduction,  $E_U^{[m_1]}$  : 0 tCO<sub>2</sub>e

#### **MRR.69 Reference to calculations used to determine the confidence deduction.**

The cumulative confidence deduction,  $E_U^{[m]}$ , was calculated using VM0009 v3.0 equation [F.57]:

$$E_U^{[m]} = E_{B\Delta}^{[m]} \left[ \frac{1.64}{E_{B\Delta}^{[m]} + A_{PAA}C_P^{[m]} + A_{PXC}^{[m]}C_B^{[m]}} \sqrt{(U_{EM}^{[m]})^2 + (U_P^{[m]})^2 + (U_B^{[m]})^2} - 0.15 \right]$$

Where:

$c_P^{[m]}$  = is total measured carbon stock in the Project Accounting Area; is total proxy area carbon stock (t CO<sub>2</sub>e / ha);

$c_B^{[m]}$  = is the total proxy area carbon stock (t CO<sub>2</sub>e / ha);

$E_{B\Delta}^{[m]}$  = is total baseline emissions (t CO<sub>2</sub>e);

$U_{EM}^{[m]}$  = is the total uncertainty for the baseline emissions model (BEM) (t CO<sub>2</sub>e), set to zero; is the total uncertainty

$U_B^{[m]}$  = is the total uncertainty in the proxy area (t CO<sub>2</sub>e);

$U_P^{[m]}$  = is the total uncertainty in the project accounting area (t CO<sub>2</sub>e);

$A_{PAA}$  = is the area of the project accounting area (ha); and,

$A_{PX}$  = is the area of the proxy area (ha).

### 3.2.4.3.2 Quantifying Gross Emission Reductions for a PAA

#### **MRR.65 Quantified GERs for the current monitoring period including references to calculations.**

For complete calculations on net emission reductions please see the file in Annex 12 – “Tumring FREL.xlsx”.

Gross emission reductions are calculated for the single PAA in the TRP using equation [F.53].

$$E_{\Delta GER}^{[m]} = E_{B\Delta}^{[m]} + E_{P\Delta}^{[m]} - E_{L\Delta}^{[m]} - E_{U\Delta}^{[m]}$$

GERs for the monitoring period were then calculated as:

$$E_{\Delta GER}^{[m]} = 2,365,652 \text{ t CO}_2\text{e} + 1,642,581 \text{ t CO}_2\text{e} - 5,351 \text{ t CO}_2\text{e} - 0 \text{ t CO}_2\text{e}$$

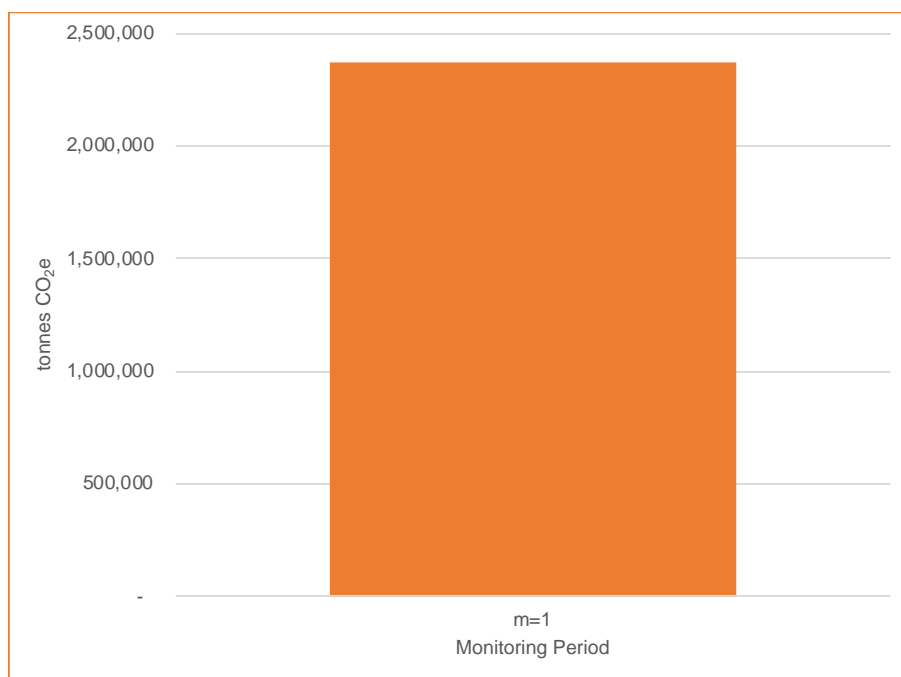
For:  $E_{\Delta GER}^{[m]} = 717,720$

#### **MRR.66 Quantified GERs for the prior monitoring period including references to calculations.**

Equation [F.54] is used to calculate the cumulative GERs to date.

$$E_{GER}^{[m]} = \sum_{i \in M} E_{\Delta GER}^{[m]}$$

As this is the Project's first monitoring, there are not quantified GERs for any prior monitoring periods.



**Figure 4:** A graph showing the total GERs for this monitoring period ( $m_1$ ). As this is the first monitoring period there are no prior monitoring periods to show.

### 3.2.4.3.3 Determining Buffer Account Allocation

#### **MRR.77 Reference to the VCS requirements used to determine the buffer account allocation.**

The buffer account allocation for the first monitoring period of the Project was calculated according to the VCS requirements as stated in the VCS Standard Version 3.4, VCS Registration and Issuance Process Version 3.4, and the VCS Non-Permanence Risk Tool Version 3.2. Please refer to Annex 16 – Non-Permanence Risk Tool for the determination of the buffer allocation amount. Please refer to Annex 12 – Turning FREL.xlsx to see the calculation of the total number of credits to be allocated to the VCS buffer pool.

#### **MRR.78 Reference to calculations used to determine the buffer account allocation.**

Calculations for the buffer account allocation can be found in 'Annex 16 – Non-permanence Risk Tool'.

### 3.2.4.3.4 Net Emission Reductions for a PAA

#### **MRR.74 Quantified NERs for the current monitoring period including references to calculations.**

Annual net emission reductions (NERs) for the Project are calculated for each PAA by subtracting the VCS buffer pool allocation from GERs using equation [F.55] from the methodology VM0009 v3.0:

$$E_{\Delta NER}^{[m]} = E_{\Delta GER}^{[m]} - E_{BA}^{[m]}$$

NERs were calculated as follows:

$$E_{\Delta NER}^{[m]} = 717,720 \text{ t CO}_2\text{e} - 72,305 \text{ t CO}_2\text{e} = 645,410 \text{ t CO}_2\text{e}$$

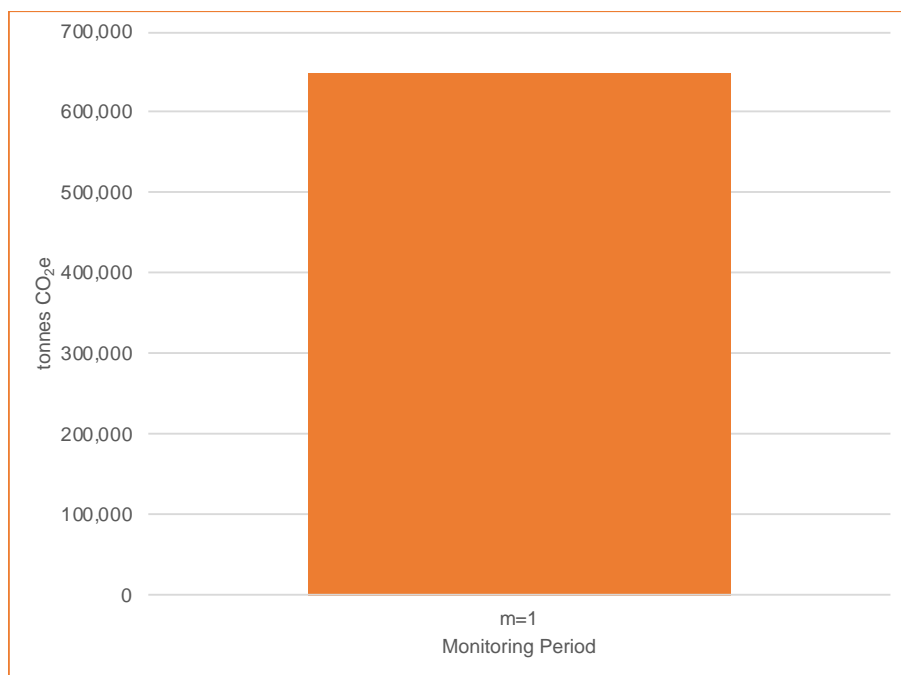
NERs for the current monitoring period ( $m_1$ ) are 645,410 tCO<sub>2</sub>e. Calculations can be found in 'Annex 12 – Turning FREL.xlsx'

**MRR.75 Quantified NERs for the prior monitoring period.**

As this is the first monitoring period, this MRR does not apply.

**MRR. 76 A graph of NERs by monitoring period for all monitoring periods to date.**

As this is the Project's first monitoring, there are not quantified GERs for any prior monitoring periods



**Figure 5:** A graph showing the total NERs for this monitoring period ( $m_1$ ). As this is the first monitoring period there are no prior monitoring periods to show.

**3.2.4.4 Quantifying Net Emission Reductions Across PAAs (CL1.1)**

**MRR.79 Quantified NERs for the current monitoring period including references to calculations.**

As there is one PAA for the TRP, this MRR does not apply.

**MRR.80 Quantified NERs for the prior monitoring period.**

As there is one PAA for the TRP, this MRR does not apply.

**MRR.81 A graph of NERs by monitoring period for all monitoring periods to date.**

As there is one PAA for the TRP, this MRR does not apply.



### 3.2.4.5 Ex-Ante Estimation of NERs (CL1.2 & 1.4)

#### **MRR.82 Quantified NERs by vintage year for the current monitoring period including references to calculations.**

The quantified NERS by vintage were calculated in an external workbook in Annex 12. This workbook was provided to the auditor during the verification. The Cambodian FREL, which the TRP is utilizing for the Project's baseline, is presented as an annual value. Therefore, there are no further calculations needed to quantify the NERs as annual vintages from a monitoring period total.

**Table 11:** The GHG reductions, Project Emissions, Leakage Emissions and Net Emission Reductions (NERs) for the monitoring period, specified by vintage. This table does not show the VCS buffer pool contribution, which is 14,461 t CO<sub>2</sub>e per year for a total contribution of 72,305 t CO<sub>2</sub>e.

Year	Baseline emissions or removals (tCO <sub>2</sub> e)	Project emissions or removals (tCO <sub>2</sub> e)	Leakage emissions (tCO <sub>2</sub> e)	Net GHG emission reductions or removals (tCO <sub>2</sub> e)
2015	473,130	328,516	1,070	129,082
2016	473,130	328,516	1,070	129,082
2017	473,130	328,516	1,070	129,082
2018	473,130	328,516	1,070	129,082
2019	473,130	328,516	1,070	129,082
<b>Total</b>	2,365,652	1,642,581	5,351	645,410

### 3.2.4.6 Evaluating Project Performance

#### **MRR.83 Comparison of NERs presented for verification relative to NERs from ex-ante estimates.**

The total NERs being presented for the verification of the first monitoring period (m<sub>1</sub>) are higher than the ex-ante estimates presented in the PD. In the PD in table 31 the ex-ante estimate for total NERs in the first monitoring period are seen to be 424,256 t CO<sub>2</sub>e. Whereas in Table 11 the actual NERs for this first monitoring period (m<sub>1</sub>) are seen to be 645,410 tCO<sub>2</sub>e.

#### **MRR.84 Description of the cause and effect of deviations from ex-ante estimates.**

As noted in MRR.83 the actual value of the NERs presented for this verification are higher than what was presented in the PD at validation. There are 4 factors causing this difference. The first is that the ex-ante estimate presented in the PD for the first monitoring period only included one year, whereas the actual monitoring period being verified is five years. This change resulted in a very significant increase in the number of NERs being presented in this monitoring period (m<sub>1</sub>) in comparison to the ex-ante estimates in the PD. Secondly, the market leakage emission calculation was refined increasing this value in comparison to the ex-ante estimate. Thirdly, there is a minor reduction in the actual baseline value in comparison to the ex-ante estimate for each year due to some corrections in the carbon model. Fourth and lastly, there was a large amount of deforestation that occurred during the monitoring period that resulted in a significant project emission that was not anticipated and therefore not included in the

estimation of the ex-ante NERs. These last three causes resulted in a significant decrease in the number of NERs calculated for each year in this monitoring period in comparison to the annual NERs in the ex-ante estimates. However, since the monitoring period is so much longer than in the ex-ante estimates there is still an increase in the actual NERs being presented in this verification in comparison to the ex-ante estimates from the PD.

### **3.3 Optional Criterion: Climate Change Adaptation Benefits**

The TRP was not validated at the Gold Level for climate change adaptation benefits. This section is not applicable to the Project.

#### **3.3.1 Demonstrate that current or anticipated climate changes are having or are likely to have an impact on the well-being of communities and/or biodiversity in the project zone (GL1.3.)**

The TRP was not validated at the Gold Level for climate change adaptation benefits. This section is not applicable to the Project.

#### **3.3.2 Describe measures needed and taken to assist Communities and/or biodiversity to adapt to the probable impacts of climate change based on the causal model that explains how the project activities will achieve the project's predicted adaptation benefits (GL1.4, V3: GL1.3.).**

The TRP was not validated at the Gold Level for climate change adaptation benefits. This section is not applicable to the Project.

#### **3.3.3 Activities and/or processes implemented for Adaptation (GL1.3)**

The TRP was not validated at the Gold Level for climate change adaptation benefits. This section is not applicable to the Project.

## **4 COMMUNITY**

### **4.1 Net Positive Community Impacts**

Based on the experience of the Project partners and from information obtained from the FPIC workshops, we developed a theory of change for each of the four key issues (Focal Issues) that we intend to address in the community component of this project. Successful mitigation of these focal issues will lead to a reduction in deforestation and forest degradation.

These four focal issues and their associated theories of change were:

1. Poor Community Livelihoods: If capacity of agriculture is improved, if there is an irrigation system, and if income is generated, then livelihood of the local community is improved.
2. Forest loss and degradation: If local community livelihood is improved, if the incidence of forest offences is reduced, and if law enforcement is improved, then forest resources will increase.
3. Limited knowledge and awareness, lack of understanding of forest and climate change: If extension education on improved agriculture techniques is improved, if infrastructure is enhanced

(road and school), if livelihoods are increased and if there is attention paid by involved stakeholders, then awareness and knowledge will be substantially improved.

4. **Lack of collaboration and participation in effective crackdown on forest crime:** If the community members trust in their leaders, if motivation is enhanced, and if awareness on the values of forest is gained, it will lead to increased effective participation, and better forest management.

#### 4.1.1 Community Impacts (CM2.1)

Community Group	Kbal Dontey community saving group
Impact	Community Micro-credits for 36 community members; KCRP deposited 860,040 Riels (USD 2132) and households have been borrowing from the group at 2% interest rate; by September 2018, the saving group had earned USD 158 from interest with the capital of USD 2000.
Type of Benefit/Cost/Risk	Actual and direct benefits
Change in Well-being	Most of borrowers were community members using the money for fertilizer to improve land for cassava crop plantation and cashew trees.

Community Group	Farmer groups
Impact	Improving technical capacity for farmers and degraded agricultural land: Improving degraded agricultural land in three CF villages as demonstration activities. For this, the PMU signed a fund partnership agreement with the KT-PDAFF for an initial investment of USD 20,583 in these three villages.
Type of Benefit/Cost/Risk	Actual and direct benefits
Change in Well-being	Training on improving the selected agricultural commodities such as cassava, cashew nuts and rice. Further, the PMU and KT-PDAFF handed over three drum-seeders to three CF groups, and have provided support to 14 households to establish composting sites with financial support from Tumring REDD+ Project.

Community Group	Farmer groups
Impact	Strengthening agricultural cooperatives and deforestation-free value chains: Mean Rith and Tumring Communes: meetings to

	increase community's awareness on concept of the Agricultural Cooperative (AC), rules and regulations to guide AC development, financial management.
Type of Benefit/Cost/Risk	Predicted direct plus indirect benefits
Change in Well-being	AFD (Action for Development) and provincial agricultural staff facilitate election two AC management committee in Tumring and Mean Rith Communes. Two committees were formed with 15 members each. To enable their initial functioning, the Tumring REDD+ Project provided investment capital of USD3000 to each.
Community Group	Scheat CF, Por Ro village
Impact	Promote and establish rural solar energy: Provision of charging services to 542 home-based batteries and earned USD193.
Type of Benefit/Cost/Risk	Actual and direct plus indirect benefits
Change in Well-being	KCRP supported the establishment of Solar System Charing Centre for home batteries. This Centre is already operational and serving six villages (Por Rong, An Sar, Tra Yorn, Pren, Krang and Sre Pring).
Community Group	CF members
Impact	Establishment of eight organic composting pools for eight community members (8 households).
Type of Benefit/Cost/Risk	Actual and direct benefit
Change in Well-being	Established organic compost to encourage CF members to use existing resources (litter and other kitchen disposals) to produce manure for enhancing the capacity of their degraded agricultural lands and avoid using chemical fertilizers, and to increase agricultural productivity.
Community Group	CF members

Impact	Cassava demo-site, disease-resistant cassava, high breed seedlings, and climate-resilient cassava species were introduced by the project to the three CF groups.
Type of Benefit/Cost/Risk	Actual and direct benefit
Change in Well-being	The project provided to three households a total of 3-hectare cassava plantation demonstration farm. Each CF group was given a one-hectare pilot plot. Next year, the seedlings produced from the demo-plots will be shared to 70 households. The cycle of receiving-and-sharing will continue to all participating CF group members.

#### 4.1.2 Negative Community Impact Mitigation (CM2.2)

During the monitoring period many community-wide activities were implemented to mitigate the negative community impacts resulting from the project activity of forest conservation. The primary negative community impact is the loss of income from activities within the Project Area that are no longer allowed such as logging, poaching, firewood collection, charcoal production or the clearing of new agricultural land. The activities implemented to mitigate this economic loss includes: the founding of two agricultural cooperatives to increase access to markets and prices for commodities, training on improved agricultural methods and provision of improves varieties of cassava and rice to increase farm yield, and a micro-finance scheme that provides small loans to community members to help diversify and increase family incomes. These project activities will help community members mitigate any loss of income that was previously derived from illegal activities within the Project Area that they are no longer able to perform. The level of uncertainty and risk associated with these activities to the communities is very low based on the Project Proponent and project partners combined experience and expertise in REDD+ projects, thus the precautionary principle was not explicitly applied here.

#### 4.1.3 Net Positive Community Well-Being (CM2.3, GL1.4)

Through the community consultation, a majority of community members requested support from the project for livelihood programs under the following broad objectives and strategies:

- Objective: To increase the livelihood of forest dwellers within target Korea-Cambodia Joint REDD+ implementation communities
  - Strategy: The project will improve livelihood of forest dependent communities who are living inside and adjacent the REDD+ project site by supporting agricultural intensification, supporting agricultural capacity building of stakeholders, improving access to markets, and providing micro-loans.
- Objective: To enhance the capacity of different key stakeholders including targeted communities and government stakeholders
  - Increase stakeholder participation in reducing deforestation and forest degradation in the Tumring REDD+ Project area

Implementation of these broad objectives through the strategies and actions such as founding of agricultural cooperatives to provide a better market and stable prices for agricultural products (e.g., rice, cassava and tree resins), establishment of agricultural demonstration plots and technical agricultural training including composting has directly resulted in significantly enhanced capacities and implementation of new methods, with potential for future diffusion through the communities.

#### **4.1.4 Protection of High Conservation Values (CM2.4)**

As shown under Section 4.1.1, the Project activities undertaken during the reporting period have all been designed to and focused on reducing pressure on the forest by diversifying livelihoods away from direct natural resource exploitation and enhancing forest protection. This inherently provides positive effects on the two high conservation values identified – water catchment protection and fisheries regulation; no negative effects are anticipated because of the Project activities.

### **4.2 Other Stakeholder Impacts**

#### **4.2.1 Mitigation of Negative Impacts on Other Stakeholders (CM3.2)**

No offsite negative impacts have been experienced or are expected from implementation of the ongoing and planned project activities.

#### **4.2.2 Net Impacts on Other Stakeholders (CM3.3)**

The activities undertaken during the reporting period provided crucial groundwork for the long-term protection of the Prey Lang forest. As the TRP project area is located on the frontier of the Prey Lang forest, by ensuring its protection it will provide significant protection to this vital forest area. The Prey Lang forest covers important aspects of the Mekong river and Tonle Sap lake watersheds, providing essential ecosystem services such as water regulation and sediment reduction. Millions of Cambodians are dependent on Tonle Sap lake for water and food. The project activities are focused on the protection of the forest through improved livelihoods and diversification of income sources. These activities do not have any negative affects to any other stakeholders.

### **4.3 Community Impact Monitoring**

#### **4.3.1 Community Monitoring Plan (CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5)**

##### **4.3.1.1 Project Activity Implementation Status**

The TRP Project activity has been implemented since the Project start date, January 1st, 2015. The primary activity is the reduction of carbon emissions from the Project Area by halting deforestation and forest degradation. This is achieved through a variety of measures undertaken by the Project Proponent. Please refer to the TRP PD Section 2.2 for a complete list of proposed Project Activities as well as their detailed descriptions. Since this is the first verification, the project proponent is still in the process of implementing these activities, some activities have started while others have not yet been started. The implementation status for each individual project activity in this first monitoring period (m<sub>1</sub>) is detailed as follows:

1. Resin, Wild Honey Enterprise, and Forest Conservation based Micro-Finance



- One community forest group is collecting tree resin and one of the agricultural cooperatives is purchasing the supply. AFD has worked with the community forest group to improve the quality of the resin. Another community forest group also does tree resin tapping using traditional methods, but they have not received any training as of yet from AFD. The agricultural cooperative will also purchase their supply of tree resin once they have been trained.
- One community forest group collects wild honey. AFD will be providing training on safe honey collection methods. More assistance and training is planned for the future.
- The Project provided technical support to two community forest groups to operationalize their management plan. The project proponent has additionally provided capital to the community forest groups to be lent out as micro-finance in addition to member contributions. This micro-finance will be provided to community forest group members to improve agriculture techniques and tools. In the future it is planned to scale to 7 community forest group by 2020. This is included in the AFD annual plan.

## 2. Deforestation Free Commodities and Promote farmer production forestry

- The agricultural cooperative has contracted with 70 households, in the contracts the households agreed to not expand their existing agricultural lands and the agricultural cooperative has committed to buying their full harvest. It is planned to have this expanded to 130 more households by the beginning of 2020.
- Two agricultural cooperatives have been established in the project zone. These cooperatives buy the agricultural commodities at market prices, providing the local communities with access to markets and greater scale with which to compete. These cooperatives are operational and will begin buying the 2019 harvest.





**Figure 6:** The two agricultural cooperatives established by the project.

3. Promote farmer production forestry means to put in plantations of fast growing on degraded farmland.
  - This activity has not been implemented yet. It will be implemented in the future.
4. Promoting Effective Forest Land Use Planning and Tenure Security

The Project Proponent is working with provincial and local authorities to create stronger land tenure and land-use planning in the project zone. During the monitoring period planning for 2019 land tenure and commune land planning was undertaken with the Kampong Thom Province Land Management Department and AFD. The goal is to create an overall land use plan for the communes, village, conservation, and agriculture land. This is funded by the project. It will map all of the land uses present in the project zone, including but not limited to ELCs and social land concessions. The province will then have a map of all land ownership within the Project Area.

5. Strengthening Community Organizations
  - Community organizations are being strengthened through the development of agricultural cooperatives. The cooperatives are composed of members of the community forest user groups and supports the development of community organizations.
6. Training on Agricultural Methods and Intensification
  - This project activity is being performed through the collaboration of the Kampong Thom Province Office of Agronomy and AFD. To date six agricultural demonstration gardens have been established, three for cassava and three for rice. In the gardens, members of the community forest groups and the communities can see new crop varieties better suited to the local climate



and pathogens. Also, fertilizer and compost use are demonstrated along with other methods to increase yield and crop quality.



**Figure 7:** A cassava demonstration garden in the Project Zone.



**Figure 8:** A rice demonstration garden in the Project Zone.

7. Employment and Motivation of a Larger Ranger Force

- There are currently three FA rangers patrolling the Project Area. Additionally, there are 14 military police in the area providing law enforcement. There are four at Tum Ring, four at Sandan and six at the southern FA station.

8. Establish Micro-financing schemes

- Two of the community forest groups have implemented micro-finance within their groups. There are plans to continue implementing this activity in additional groups.

9. Improve Health Facilities and Care

- Health facilities support has not been implemented yet. It is planned for the future.

4.3.1.2 Community Impact Indicators

**Table 12: The TRP Community impact monitoring plan**

Focal Issue	Indicator Number	Activity area	Indicator	Data: 2015- 2019	Notes
Poor community livelihoods	SIA01	Increased farm productivity	# agriculture extension workshops held	44 agricultural extension workshops	Assessment recommended provision of technical support and agricultural equipment to CF members, setting demonstration plots for best agricultural practices
	SIA02		# community members trained	1,220 members of the CFs trained	
	SIA03		# households applying new agriculture techniques	20 households	3 with drum-seeders, 14 with composting sites and 3 cassava demonstration plots
	SIA04		# Local jobs created by project	0	

<b>Forest Loss and Degradation</b>	SIA05	Reduced forest clearance for agriculture & settlement	# rangers and community scouts' employed & trained	45 CF members trained and provided GPS'	
	SIA06		# rangers and community scouts' outposts or equipment supplied	GPS units provided	
	SIA07		# workshops educating community on forestry laws and regulations	128 community (and CF) meetings	
	SIA08		# patrols done by the rangers and community scouts	436	83 in 2015, 75 2016, 58 2017, 120 2018 and 100 oct-2019
	SIA09		# illegal forest clearing and logging incidents	339 clearing and logging incidents.	Top three being Chainsaws (141), Axes (35) and Timber (28)
	SIA10		# People arrested for illegal logging or clearing	1	Most offenders receive official warning letters.
	SIA11		# charcoal kilns/bags recorded	44	
	SIA12		# ha of forest cleared or trees cut (m³)	443 trees confiscated 3,449 ha forest cleared	Different sizes of timber pieces recorded and confiscated

	SIA13		# of ha of forest restored	0	None during monitoring period, a number of areas have been identified for restoration.
<b>Lack of awareness &amp; knowledge</b>	SIA014	Greater awareness and appreciation of forests	# forest extension workshops or meetings conducted	221 meetings	Including interviews, elections, FPIC and general meetings
	SIA015		# awareness raising materials developed and distributed	300 units	200 posters on benefits from REDD+ implementation, and 100 leaflets on the overview information of the project
<b>Lack of collaboration in combating forest crimes</b>	SIA016	Greater willingness of community to safeguard forests	# of CF Management Plans approved by FA and operationalized	63 plots of agricultural land demarcated in four CFs (Socheat, Choam Smach, Naktala, and O's Thmor)	TRP facilitates mapping of agricultural land inholdings within CF
	SIA017		# CF institutions established to deal with forest matters	17	14 CFMCs and 3 Agricultural Cooperatives
	SIA018		# local-level rules and by-laws established and enforced in CF	17	14 CFMCs and 3 Agricultural Cooperatives

	SIA019		# Ha of new CF established and protected	0	No new CF's have been added during the monitoring period
	SIA20		# CF members trained in forest management issues	45	Trained on: How to fill patrol form; preparation for CF patrol planning and financial expense reports; Coordination with other CF to expand patrol area across the landscape
	SIA21		# CF members actively participating in forest management	45	

#### 4.3.2 Monitoring Plan Dissemination (CM4.3)

The results from monitoring plan implementation have been disseminated to the communities through community meetings during various stakeholder engagement processes. Additionally, routine project quarterly reports are used to produce the Tumring REDD+ Project Quarterly Newsletter that is also disseminated to the communities through the same process. This monitoring report includes all community monitoring data and it and the Khmer language summary are available on the Project's website and Facebook page and in hard copy at the project's offices. Lastly, the monitoring report and Khmer language summary have been disseminated through the CCB website.

#### 4.4 Optional Criterion: Exceptional Community Benefits

This section is not applicable, the Project was not validated at the Gold Level for exceptional community benefits.

##### 4.4.1 Short-term and Long-term Community Benefits (GL2.2)

This section is not applicable, the Project was not validated at the Gold Level for exceptional community benefits.



#### **4.4.2 Marginalized and/or Vulnerable Community Groups (GL2.4)**

This section is not applicable, the Project was not validated at the Gold Level for exceptional community benefits.

#### **4.4.3 Net Impacts on Women (GL2.5)**

This section is not applicable, the Project was not validated at the Gold Level for exceptional community benefits.

#### **4.4.4 Benefit Sharing Mechanisms (GL2.6)**

This section is not applicable, the Project was not validated at the Gold Level for exceptional community benefits.

#### **4.4.5 Governance and Implementation Structures (GL2.8)**

This section is not applicable, the Project was not validated at the Gold Level for exceptional community benefits.

#### **4.4.6 Smallholders/Community Members Capacity Development (GL2.9)**

This section is not applicable, the Project was not validated at the Gold Level for exceptional community benefits.

### **5 BIODIVERSITY**

#### **5.1 Net Positive Biodiversity Impacts**

Based on the project partners' experience and surveys, community meetings and key informant interviews, and desk research, the following two issues were identified as critical for improvement of biodiversity in the project area:

1. Ecosystem enhancement: If there is sustainable agricultural intensification, if there is sustained reforestation across the landscape, if there is less dependence on extractive activities, and if there is more effective enforcement, then there will be ecosystem improvement.
2. Stable or increasing levels of biodiversity: If there is improved enforcement including community patrols, if there is reduced wildlife mortality from poaching, and if wildlife movements are maintained through protection of critical habitats, then there will be improvement in wildlife status in the project area.

##### **5.1.1 Biodiversity Changes (B2.1)**

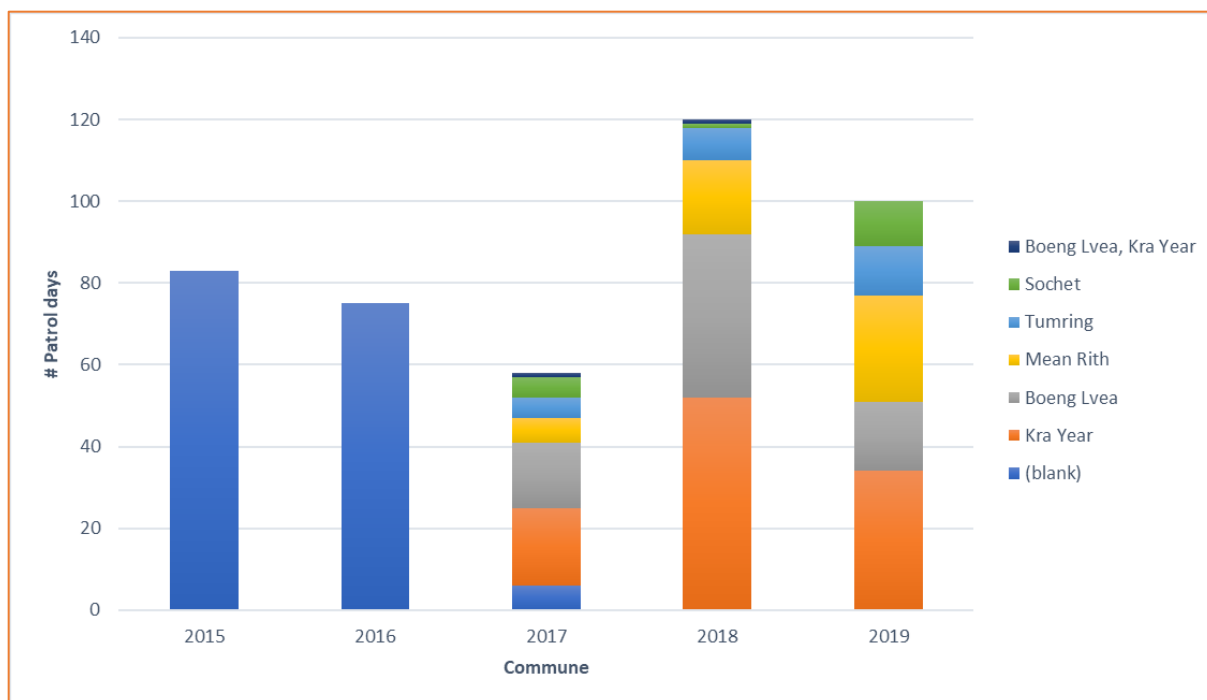
The primary Project Activity of the TRP is protection of the forest from deforestation and degradation. Other activities are focused on reducing poaching activities and other actions that are having negative impacts on the forest and biodiversity. Using a pressure-state-response framework, with forest protection as a response to pressures of illegal logging and poaching, these project activities did not result in any negative impacts on the biodiversity in the Project Area.

Change in Biodiversity	Ecosystem protection
Monitored Change	Minimal habitat destruction as demonstrated by the sustained status of the biomass monitoring plots
Justification of Change	Improved enforcement and working with communities including community forests to improve awareness and encourage alternative livelihood support projects

Change in Biodiversity	Biodiversity improvement
Monitored Change	Presence of high diversity in wildlife across the project area, including highly endangered and threatened species of high conservation value (HCVs)
Justification of Change	As predicted from the project's theory of change, improved protection of habitats and reduced pressures and threats (see patrol data below) have led to maintained biodiversity in the ecosystem

#### Enforcement and protection: Patrol effort

During the reporting period, the patrol effort grew from low and variable (83, 75 and 58 days/year for 2015, 2016 and 2017, respectively) to more consistent and higher effort of at least ten patrol-days per month (120 and 100, for 2018 and 2019 through October); the number of days patrolled in different Communes within the project area varied between the Communes with Kra Year, Boeng Lvea and Mean Rith having most days (Figure 9).

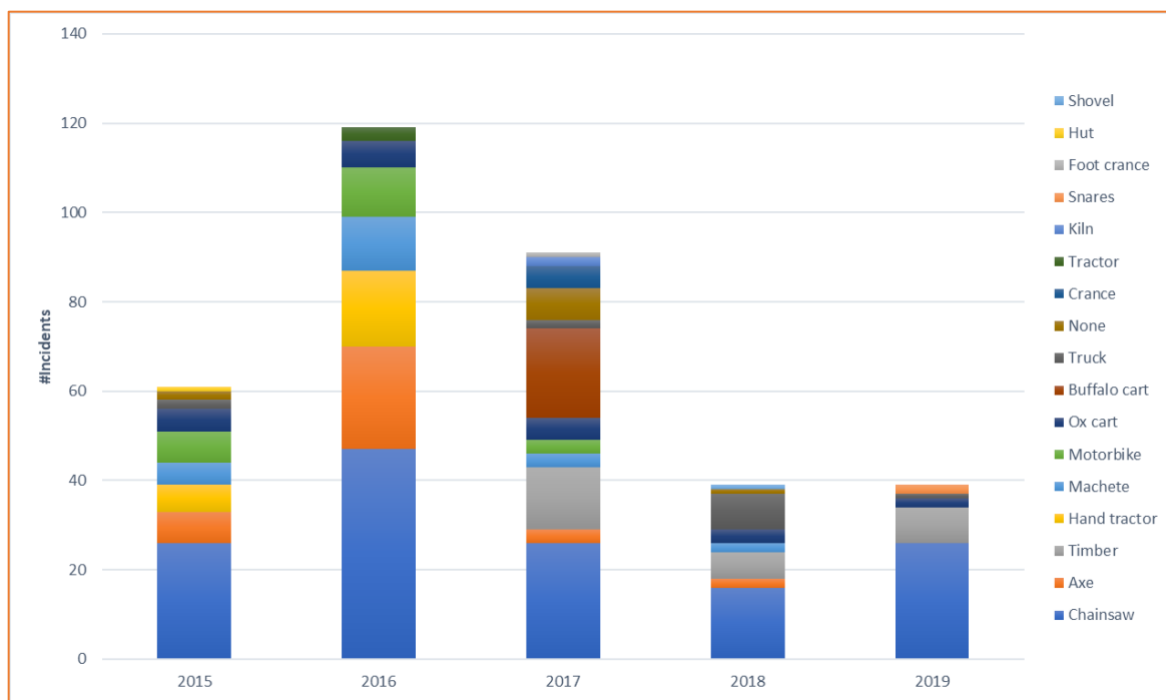


**Figure 9:** Total number of patrol-days completed in each Commune during the reporting period (NB: 2015 and 2016 data did not specify the Commune the patrols were undertaken).

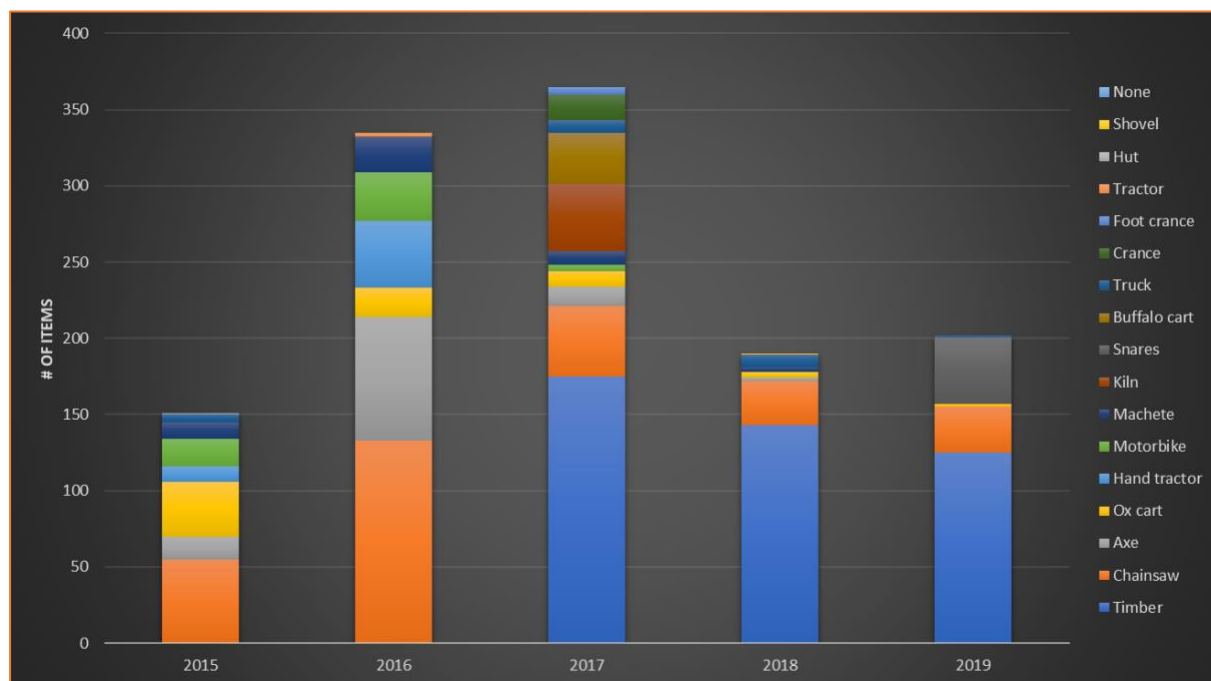
### Enforcement and protection: Patrol outcomes

For incidents recorded during the patrols, while chainsaws have remained the most common illegal encounter (ranging from a low of 16 in 2018 and high of 47 in 2016), other incidents that were previously common have become less common in the past two years, especially artisanal logging equipment like axes, hand tractors, machetes and motorbikes (confiscated woods were not recorded during the initial years) (Figure 10). A similar picture was revealed when looking at the total number of units confiscated for each incident category, whereby chainsaws remained important throughout, timber was heavily reported since 2017 but with a declining trend, while axes, ox carts and hand tractors showed a decline (Figure 11).





**Figure 10:** Number of encounters of the different illegal activities during the patrols within the project area.



**Figure 11:** Total number of units encountered across all the incidents during the patrols within the project area.

### 5.1.2 Mitigation Actions (B2.3)

Our theory of change rationale in the Result Chain diagrams identifies the likely negative impacts and implementation risks to biodiversity resulting from the Project. The primary activity of the project, the protection of the forest, ensures that native habitats are preserved and that species territories are not fragmented, providing significant positive impacts on the biodiversity in the project zone in comparison to the “without-project” scenario. The results of the climate monitoring (based on the biomass plots) demonstrate that the forest remained largely intact during the reporting period and continued to provide important habitat. Based on a pressure-state-response framework, with forest protection as a response to pressures of illegal logging and poaching, this project activity will not result in any negative impacts on the biodiversity in the Project Area. The primary mitigation actions in case there are unintended negative impacts include increased forest patrols by FA rangers and community forest members to detect and detour any illegal activity, such as logging, charcoal production or animal poaching. Additionally, there are small areas of forest restoration outside of the Project Area on lands that were illegally cleared, with future plans to expand this activity. For the maintenance of the HCV attributes of the Project Area, no measures beyond the Project Activities described in section 4.3.1.1 above are needed. The level of uncertainty and risk associated with these activities is very low based on the extensive data on the effects of forest conservation in tropical forests on biodiversity, thus the precautionary principle was not explicitly applied here.

### 5.1.3 Net Positive Biodiversity Impacts (B2.2, GL1.4)

The biomass plots monitored during this reporting period demonstrated minimal change in vegetation composition and structure, indicating that the habitat was protected for wildlife during this period, against the BAU scenario where habitat loss would have occurred. As such, this project – through protection and maintenance of this critical Prey Lang habitat – has had a positive net impact on the wildlife that depend on it. Indeed, a total of 91 different species were recorded from our transects run during the reporting period, comprising of 64 bird species, 25 mammal species and a reptile (Land monitor) and fish (Black lancer catfish).

### 5.1.4 High Conservation Values Protected (B2.4)

Of the 91 species recorded (see preceding section), at least eleven of these are classified under one of IUCN’s Red List categories, including the Critically Endangered Sunda Pangolin (Table 13).

**Table 13:** IUCN Red Listed species recorded during the transects conducted in the project area during the reporting period.

Species category	Common name	IUCN Red List category
Bird	Great hornbill	Vulnerable
Bird	Asian golden weaver	Near Threatened
Mammal	Black giant squirrel	Near Threatened
Mammal	Fishing cat	Vulnerable
Mammal	Indochinese lutung	Endangered
Mammal	Owston's palm civet	Endangered
Mammal	Pileated gibbon	Endangered

<b>Mammal</b>	Sambar deer	Vulnerable
<b>Mammal</b>	Silvery lutung	Near Threatened
<b>Mammal</b>	Sun bear	Vulnerable
<b>Mammal</b>	Sunda pangolin	Critically Endangered

#### 5.1.5 Invasive Species (B2.5)

No non-native species will be used in the Project Accounting Area. Any Project Activities that include any planting or reforestation within the Project Area utilize native tree species that are grown in nurseries on site. All farms in the Project Zone have been excised from the Project Accounting Area a priori.

#### 5.1.6 Impacts of Non-native Species (B2.6)

This section is not applicable as no non-native species are planted or used in the project zone.

#### 5.1.7 GMO Exclusion (B2.7)

No GMOs will be used to generate GHG reductions or removals.

#### 5.1.8 Inputs Justification (B2.8)

No inputs were used in the Project.

### 5.2 Offsite Biodiversity Impacts

#### 5.2.1 Negative Offsite Biodiversity Impacts (B3.1) and Mitigation Actions (B3.2)

There was little chance of having significant negative biodiversity impacts outside the Project Zone since most of the sources of threat to biodiversity were local and they are unlikely to be transferred outside the Project Zone (e.g. fuel wood collection and subsistence poaching). Additionally, commercial poaching threats, which could be transferred further, are unlikely to occur because of the national drive and commitment to reducing poaching and should show an overall decrease.

#### 5.2.2 Net Offsite Biodiversity Benefits (B3.3)

As there are no anticipated negative offsite impacts to biodiversity, evaluation of unmitigated offsite impacts is not applicable.

### 5.3 Biodiversity Impact Monitoring

#### 5.3.1 Biodiversity Monitoring Plan (B4.1, B4.2, GL1.4, GL3.4)

**Table 14:** The TRP Biodiversity monitoring plan.

Focal Issue	Indicator Number	Activity area	Indicator	Data: 2015 - 2019	Notes
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<b>Ecosystem improvement</b>	BIA01	Sustainable agricultural intensification	# agriculture extension workshops held	44 agricultural extension workshops	Assessment recommended provision of technical support and agricultural equipment to CF members, setting demonstration plots for best agricultural practices. (Same as SIA01)
	BIA02	Reduced Forest Clearing for Agriculture and Settlement	# rangers and community scouts' employed & trained	45 CF members trained and provided GPS'	(Same as SIA05)
	BIA03	Greater Willingness to Safeguard Forests	# of CF Management Plans approved by FA and operationalized	63 plots of agricultural land demarcated in four CFs (Socheat, Choam Smach, Naktala, and O's Thmor)	TRP facilitates mapping of agricultural land inholdings within CF. (Same as SIA16)
	BIA04	Improved wildlife habitats		# degraded sites identified for inclusion into a restoration programme (document}	21
	BIA05	Habitat protection	Abundance and diversity of trees and shrubs	4,601 standing trees; the two dominant tree species were <i>Vatica odorata</i> (1257 individuals,	128-forest biomass plots

				27%) and <i>Eugenia</i> spp. (520 individuals, 11%)	
	BIA06	Forest protection: community forest patrolling	Training on forest patrol	45 members	Training Community Forest Management Committee (CFMC) on patrols, GPS use and how to fill patrol form
	BIA07		# active outposts	14 Community Forestry Groups (CFG), and Forest Implementation Unit (FIU)	The two units conduct regular forest patrol and forest law enforcement
<b>Biodiversity improvement</b>	BIA08	Forest and wildlife protection	# patrols	436 patrols between 2015 and October 2019	Patrols undertaken by CFGs and the FIU: 2015 (83 patrols), 2016 (75), 2017 (58), 2018 (120), and 2019 (100)
	BIA09	Threats to habitat and wildlife	# snares recovered	479	
	BIA10		# bushmeat poachers arrested	0	Data was not collected during this monitoring period. This indicator will be recorded in future monitoring periods.
	BIA11		# animals injured or killed (carcasses)	0	Data was not collected during this monitoring period. This indicator will be recorded in

					future monitoring periods.
	BIA12		# recoveries	339 incidents were encountered during the patrols, that involved confiscation of 1,243 items	Incidents; 2,015 (59), 2016 (119), 2017 (84), 2018 (38), and 2019 (39)
	BIA13	Status of wildlife in the project area	Presence of HCV species	91 species recorded in transects and patrols, of which 11 were under threat based on IUCN's Red List	<ol style="list-style-type: none"> <li>1. Great hornbill</li> <li>2. Asian golden weaver</li> <li>3. Black giant squirrel</li> <li>4. Fishing cat</li> <li>5. Indochinese lutung</li> <li>6. Owston's palm civet</li> <li>7. Pileated gibbon</li> <li>8. Sambar deer</li> <li>9. Silvery lutung</li> <li>10. Sun bear</li> <li>11. Sunda pangolin</li> </ol>
	BIA14		Wildlife distribution & evidence of movement between National Parks & Project ranches		Data was not collected during this monitoring period. This indicator will be recorded in future monitoring periods.

### 5.3.2 Biodiversity Monitoring Plan Dissemination (B4.3)

The results from the monitoring plan's implementation have been disseminated to the communities through community meetings during various stakeholder engagement processes. Additionally, routine project quarterly reports are used to produce the Tumring REDD+ Project Quarterly Newsletter that is also disseminated to the communities through the same process. This monitoring report includes all biodiversity monitoring data and it and the Khmer language summary are available on the Project's website and Facebook page and in hard copy at the project's offices. Lastly, the monitoring report and Khmer language summary have been disseminated through the CCB website.

### 5.4 Optional Criterion: Exceptional Biodiversity Benefits

This section is not applicable, the Project was not validated at the Gold Level for exceptional biodiversity benefits.

#### 5.4.1 Trigger Species Population Trends (GL3.3)

This section is not applicable, the Project was not validated at the Gold Level for exceptional biodiversity benefits.

## 6 ADDITIONAL PROJECT IMPLEMENTATION INFORMATION

### Development of Allometry: Tumring REDD+ Project

VM0009, version 3, section 9.3.3.1 specifies how to validate allometric equations used to estimate biomass for the Project. The methodology has several requirements with respect to validation of allometric equations.

#### **MRR.99 A list of all selected allometric equations used to estimate biomass for trees and non-trees**

The TRP uses a single allometric equation to estimate the biomass of all trees in the Project area. The selected biomass equation is model II.2, from Chave et al. (2005):

$$AGB = EXP[-1.602 + (2.266 \times LN(DBH)) + (0.136 \times LN(DBH)^2) + (-0.0206 \times LN(DBH)^3) + (0.809 \times LN(sg))]$$

where:

AGB = aboveground biomass in kg;

DBH = diameter at breast height in cm; and,

sg = wood density in g/cm<sup>3</sup>

standing dead and lying dead biomass are not included as a carbon pool in the TRP.

#### **MRR.100 For each selected allometric equation, a list of species to which it is being applied and the proportion of the total carbon stocks predicted by the equation.**

As documented in MRR.99, the TRP uses a single allometric model for all trees in the Project Area. Therefore, the Chave et al. (2005) model II.2 listed above is applied to all tree species included in the inventory. The Chave et al. (2005) equation is applied to 100% of the carbon stock. 'Annex 10 - Tumring

REDD Carbon Inventory\_revised PA v11.xlsm,' tab 'Parameters' in the table 'Tree Species Information' contains a list of all species for which the allometry was applied.

**MRR.101 For each selected allometric equation, indication of when it was first employed to estimate carbon stocks in the Project Area (monitoring period number and year of monitoring event).**

As this is the Project's first monitoring event ( $m_1$ ), this is the period where the selected allometric equation has been first applied. As discussed in the MRR.100 and MRR.101, the Project uses a single allometric equation for all species in the biomass inventory. This equation is being applied for the first time in the current  $m_1$  monitoring period, covering the dates of 2015 to 2019.

**MRR.102 For each selected allometric equation, indication of whether it was validated per section 9.3.3.1 or 9.3.3.2.**

The methodology states that if the allometric equation, or equations used were not developed in an area similar to the Project area or are from a biome-wide database, then it/they must be verified utilizing field measurements from the Project area, or an area similar to it. The selected model was previously developed in existing peer-reviewed literature and is therefore validated under section 9.3.3.1 of the methodology VM0009 v3.

**MR.103 Documentation of the source of each selected allometric equation and justification for their applicability to the project area considering climatic, edaphic, geographical and taxonomic similarities between the project location and the location in which the equation was derived.**

Model II.2 from Chave et al. 2005 was selected for application to 100% of the trees for the TRP forest inventory. This model was specifically developed to be used in tropical forests. The appropriateness of this model to be used in Cambodia is demonstrated by the fact that the Chave et al. 2005 models have become common and generally accepted for use in Cambodia throughout the scientific and forestry community. The Government of Cambodia is proposing to use these models to estimate above-ground biomass for the national forest inventory, ultimately contributing to the calculation of the Cambodian national FREL (RGC, 2017). Additionally, the VCS Keo-Siema REDD+ Project, located in eastern-Cambodia in a similar evergreen forest type, applied allometric equations from the Chave et al. (2005). Lastly, FAO performed a study on best methods with which to estimate biomass in Cambodia (Sola et al. 2014). They identified Chave et al. (2005) as the best fit and most conservative approach for the estimation of above-ground biomass in Cambodia, utilizing data from several Cambodian field sites.

Through validation and a corresponding derivative test required in VM0009 section 9.3.3.1, the selected model was deemed accurate to the TRP Project Area. The selected equation, Chave Model II.2, was found to predict biomass at -9% of the measured biomass using the ratio of sums method from section 9.3.3.1, which falls within +/-15% specified requirement. Cumulative measured biomass is greater than the total biomass predicted by the allometric equation. However, because the largest tree in the destructive harvest sample is 6.4 cm smaller at DBH than the largest tree in the inventory (133.2 cm vs 140 cm), the methodology requires demonstration of additional criteria. In Table 16, we note that the measured biomass for the largest tree in the destructive sample (DBH 133.2 cm) is higher than the predicted biomass by the selected equation Chave model II.2. As required by VM0009 Section 9.3.3.1, a calculation of the derivative of the model was performed. Derivative values for the largest tree in the sample and the largest tree in the inventory were then determined and compared. The derivative for the largest tree in the inventory was 5% higher than the derivative for the largest tree in the sample (318.2



kg/cm vs. 303.5 kg/cm). We therefore elected to conservatively cap DBH for the carbon inventory at the value of the largest tree in the validation sample set (133.2 cm). It should be noted that only 2 trees from the inventory had a DBH larger than the largest tree in the validation sample set, so those 2 tree's DBH (134 cm and 140 cm) were conservatively changed to 133.2 cm. The allometry validation worksheet containing the abovementioned calculations have been provided to the auditor.

**MR.104 A list of allometric equations validated by destructive sampling.**

Model II.2 from Chave et al.2005 was validated by use of destructive sample data from existing literature.

**MR.105 For each, the number of trees (or non-trees) destructively sampled and the location where the measurement were made relative to the Project area.**

For the single allometric model applied to the Project, two separate published studies employing destructive harvesting of trees in Cambodia were used for the validation, with a total sample size of 46 trees. The majority of the destructive harvest data (34 trees) was from a site in southern Cambodia approximately 314 km from the Project Area but of very similar forest type and climatic conditions as the Project Area (Chave et al. 2014). The UTM coordinates of the site are 325147.51 m E, 1208702.52 m N. The second set of destructive harvest data (12 trees) came from a site approximately 165 km from the Project Area. The coordinates of the site are 699326 m E, 1366949 m N. The forest type and species composition at this site are very similar to that of the Project Area. This study site has a slightly wetter climate than the Project area, with a reported average rainfall of 2200 - 3000 mm/yr compared to 1462 mm/yr for the TRP. However, the range of elevations in this study site (60 - 750 m) are very similar to the Project Area, (60 - 110 m), and the general topography of the study site and the Project Area, being comprised of a combination of mountainous slopes, valleys and plateaus, show good similarity.

**MR.106 A field protocol used to measure destructively sampled trees (or non-trees).**

Two destructive harvest studies from literature were utilized, including a destructive harvest dataset from Hozumi et al. (1969) (per Chave et al. 2014) and from the Keo-Seima REDD+ Project. The Keo-Seima REDD+ Project included the report that the destructive harvest field protocol from Walker et al. (2009) was followed. Hozumi et al (1969) describes the field protocol starting on page 11 in the section "Methods of Field Survey" used to measure biomass in the Cheko, Cambodia dataset and the manuscript has been provided to the auditors for reference. Therefore, the quality of the data is demonstrated.

**MR.107 Justification that the field protocol for the destructive measurement method conservatively estimates biomass.**

The two literature sources used to complete the destructive harvest are well known and have undergone independent assessments. The Keo-Seima REDD+ Project utilized a generally accepted destructive harvest method (Walker *et al.* 2009) and underwent independent validation and verification as part of that Project's VCS certification. The Cheko study, performed by Hozumi *et al.* in 1969 and referenced by Chave *et al.* (2014) shows good correlation between total biomass in the Cheko region and similar forests in Kao Chong and moist tropical forest in Ghana, indicating that the protocol accurately estimates biomass.

**MR.108 For each allometric equation in the list, a figure showing all the destructive measurements of biomass compared to predicted values from its selected allometric equation.**

**Table 15:** The destructive biomass measurements from the Cheko study and the Keo-Seima REDD+ Project are shown compared to the predicted biomass values from the 3 different forms of the Chave *et al.* (2005) allometric models. The Chave model II. Was shown to be the best fit and was selected for use in the TRP.

Study	Species	Specific Gravity (g/cm <sup>2</sup> )	DBH (cm)	Height (m)	Measured Biomass (kg)	Chave II (kg)	Chave No Height (kg)	Chave With Height (kg)
<b>Cheko</b>	Unknown	0.74	5	8.2	8.58	7.907	7.973	7.722
<b>Cheko</b>	Unknown	0.56	5.2	7.7	5.84	6.974	6.681	5.935
<b>Cheko</b>	Unknown	0.77	5.2	6.3	5.28	9.023	9.186	6.677
<b>Cheko</b>	Unknown	0.47	5.3	8.3	7.8	6.353	5.892	5.578
<b>Cheko</b>	Unknown	0.74	5.5	8.9	8.98	10.080	10.217	10.141
<b>Cheko</b>	Unknown	0.54	5.5	8.3	5.22	7.812	7.456	6.901
<b>Cheko</b>	Unknown	0.56	5.7	9.3	9.31	8.813	8.488	8.613
<b>Cheko</b>	Unknown	0.54	5.7	6.9	6.58	8.557	8.184	6.162
<b>Cheko</b>	Unknown	0.54	5.8	7.3	7.5	8.946	8.565	6.750
<b>Cheko</b>	Unknown	0.54	5.9	10.3	7.83	9.345	8.957	9.855
<b>Cheko</b>	Unknown	0.54	5.9	10.2	9.23	9.345	8.957	9.759
<b>Cheko</b>	Unknown	0.54	6	11.5	10.69	9.755	9.360	11.379
<b>Cheko</b>	Unknown	0.54	6.3	8	10.61	11.050	10.637	8.727
<b>Cheko</b>	Unknown	0.56	6.4	10.9	12.13	11.848	11.497	12.726
<b>Cheko</b>	Unknown	0.54	6.5	6.1	8.72	11.970	11.547	7.084
<b>Cheko</b>	Unknown	0.74	6.6	9.3	17.17	16.061	16.471	15.259
<b>Cheko</b>	Unknown	0.74	6.7	8.8	14.54	16.691	17.136	14.879

<b>Cheko</b>	Unknown	0.68	6.8	10.3	15.31	16.190	16.372	16.485
<b>Cheko</b>	Unknown	0.56	7.2	12.7	16.53	16.018	15.674	18.766
<b>Cheko</b>	Unknown	0.68	7.5	10.3	20.77	20.809	21.197	20.053
<b>Cheko</b>	Unknown	0.56	7.6	12.7	19.07	18.399	18.078	20.909
<b>Cheko</b>	Unknown	0.77	7.6	8.3	19.25	23.805	24.857	18.789
<b>Cheko</b>	Unknown	0.56	8.2	8.4	15.97	22.356	22.100	16.100
<b>Cheko</b>	Unknown	0.68	8.7	7.2	19.32	30.448	31.388	18.862
<b>Cheko</b>	Unknown	0.56	9.2	11.3	28.88	30.033	29.975	27.262
<b>Cheko</b>	Unknown	0.54	9.4	11.3	26.63	30.816	30.601	27.444
<b>Cheko</b>	Unknown	0.56	9.9	11.9	40.62	36.248	36.412	33.245
<b>Cheko</b>	Unknown	0.56	11.8	15.4	68.09	56.848	58.040	61.121
<b>Cheko</b>	Unknown	0.74	11.8	11.5	57.43	71.226	76.696	60.313
<b>Seima</b>	Chhlik/Terminalia alata Roth	0.75	13	10.7	63	92.255	100.534	69.032
<b>Seima</b>	Trach/Dipterocarpus intricatus Dyer	0.64	14	10.65	81	98.064	104.439	67.999
<b>Cheko</b>	Unknown	0.48	16.6	17.2	115.57	119.936	123.019	115.799
<b>Seima</b>	Onsoy/[unidentified species]	0.65	19	9.13	98	215.899	237.979	109.046
<b>Seima</b>	Rang Phnom/Shorea siamensis Miq.	0.86	22	14.75	220	392.021	462.958	312.503
<b>Seima</b>	Troseak/Peltoporum sp.	0.55	22	12.8	257	274.261	297.692	174.381

<b>Seima</b>	Pchek/Shorea obtusa Wall.	0.85	24	16.6	390	483.170	574.604	413.683
<b>Cheko</b>	Unknown	0.55	25.5	25.5	373.7	395.405	435.503	464.196
<b>Seima</b>	Koki/Hopea sp.	0.69	34	25	986	971.403	1152.085	1017.939
<b>Cheko</b>	Unknown	0.46	37	24	660.66	858.778	950.266	769.290
<b>Cheko</b>	Unknown	0.55	41.3	24.7	1214.57	1296.622	1501.006	1179.445
<b>Seima</b>	Sokrom/Xylia dolabriformis Benth.	0.68	44	19.12	1865	1793.981	2176.119	1281.209
<b>Seima</b>	Chambok/Irvingia malayana Oliver ex A. Benn.	0.88	49	18.85	1396	2869.216	3696.268	2034.145
<b>Seima</b>	Khlong/Dipterocarpus tuberculatus Roxb.	0.66	52	23.8	3489	2615.191	3205.380	2165.224
<b>Seima</b>	Sralao/Lagerstroemia calyculata Kurz	0.72	89	34.25	9765	9707.061	12624.950	9942.392
<b>Seima</b>	Chheuteal/Dipterocarpus alatus Roxb.	0.60	93	44	14016	9228.405	11620.970	11602.810
<b>Cheko</b>	Unknown	0.56	133.2	44.2	20578.48	19089.104	24172.270	22353.037
	<b>Total Biomass</b>				<b>56072.86</b>	<b>51044.49</b>	<b>63984.63</b>	<b>54565.62</b>

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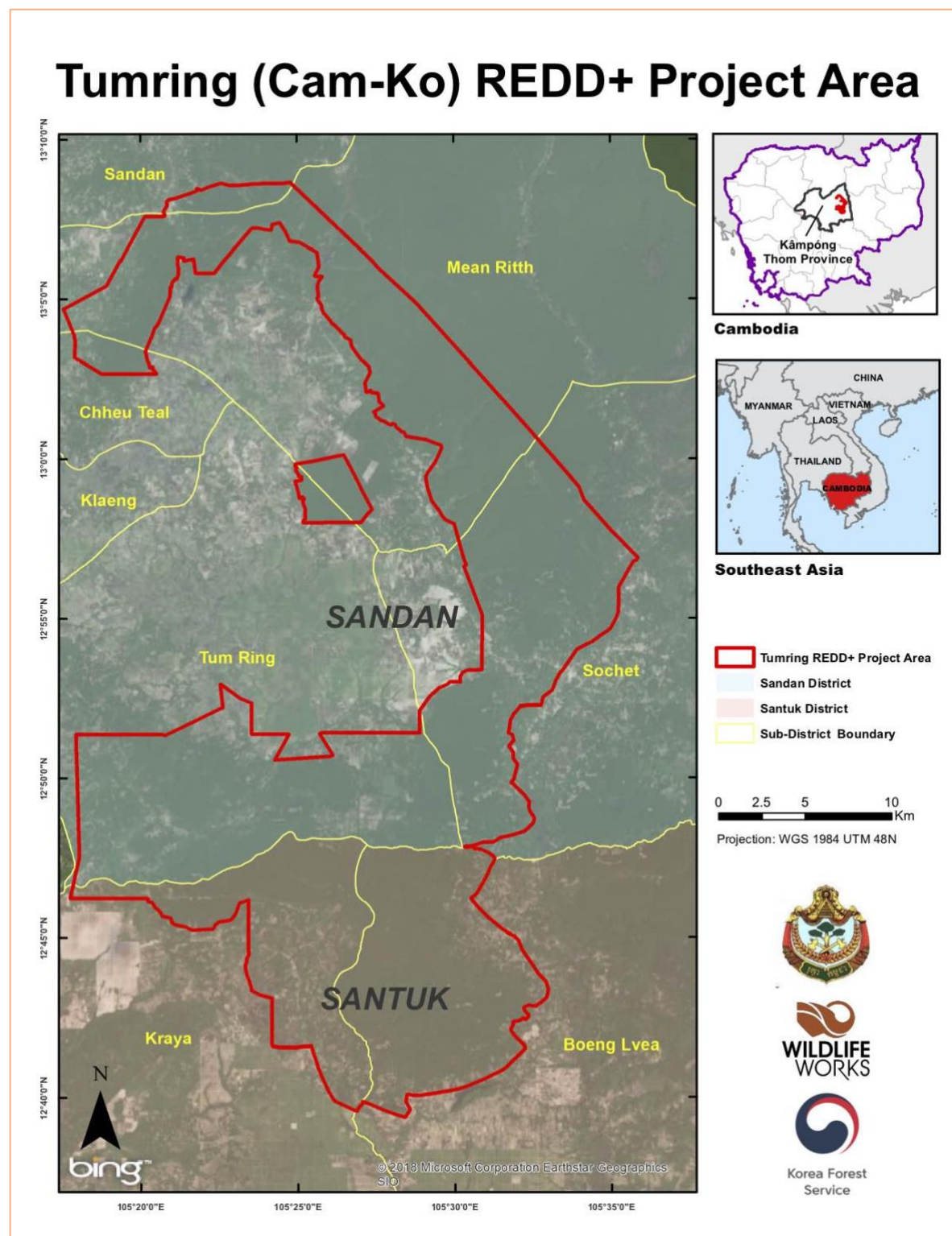
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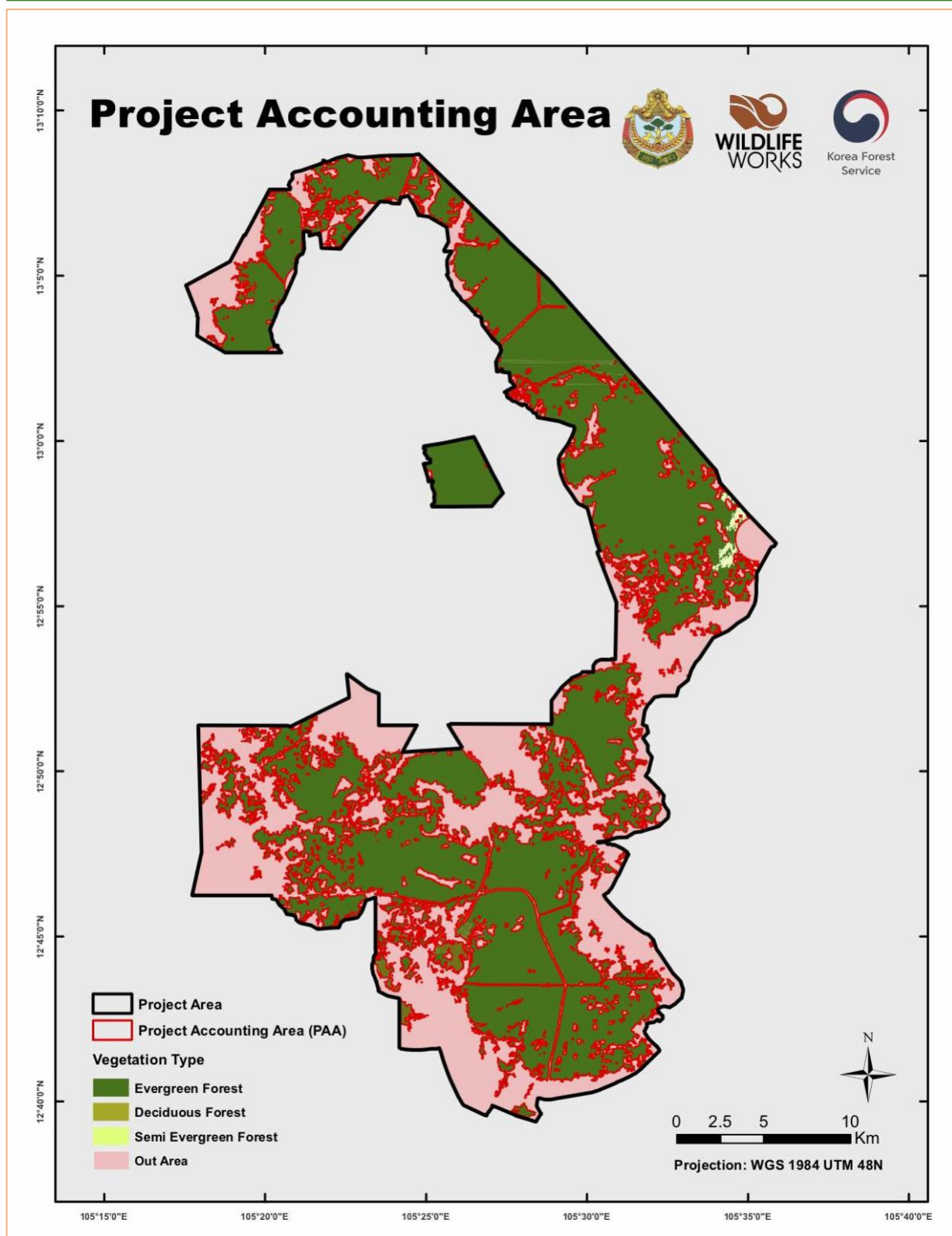


## 8 APPENDICES

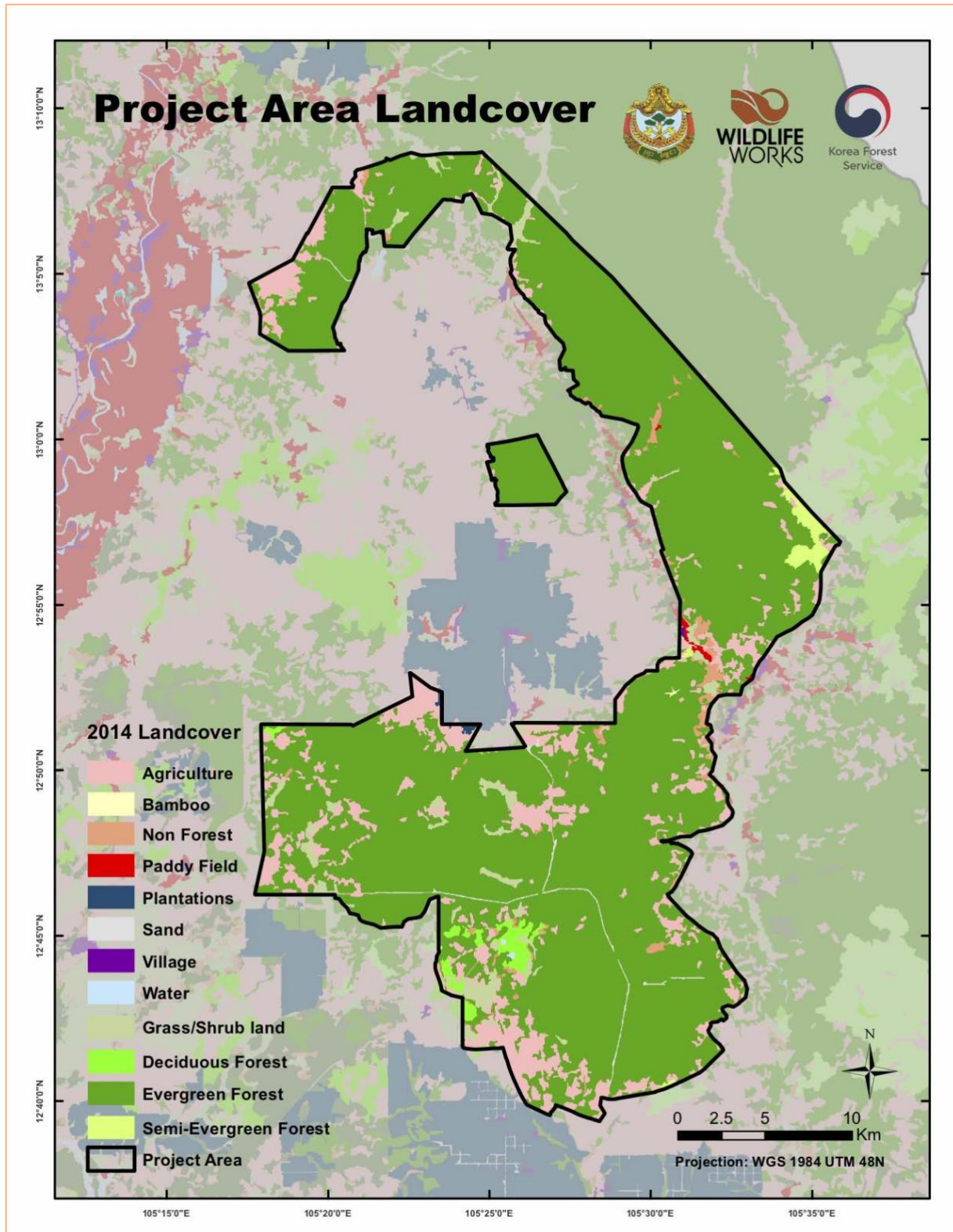
### APPENDIX A. THE PROJECT AREA AND PROJECT ACCOUNTING AREA







**APPENDIX B. PROJECT AREA VEGETATION, RIVERS AND STREAMS, BIOMASS PLOTS, SOIL TYPES, INFRASTRUCTURE, COMMUNITIES AND LANDSCAPE CONFIGURATION.**





## Tumring REDD+ Project Land Use

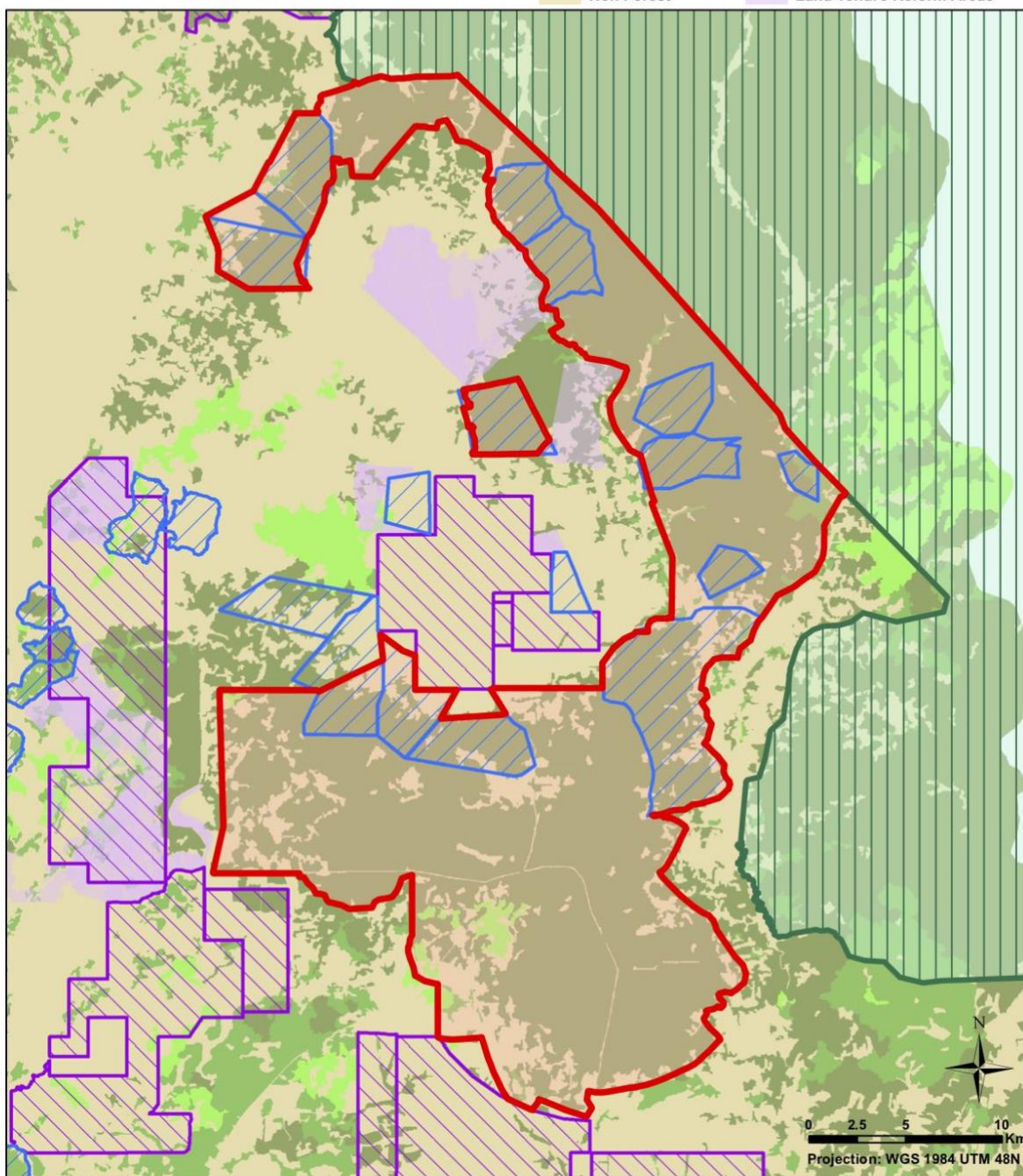


### Land Cover

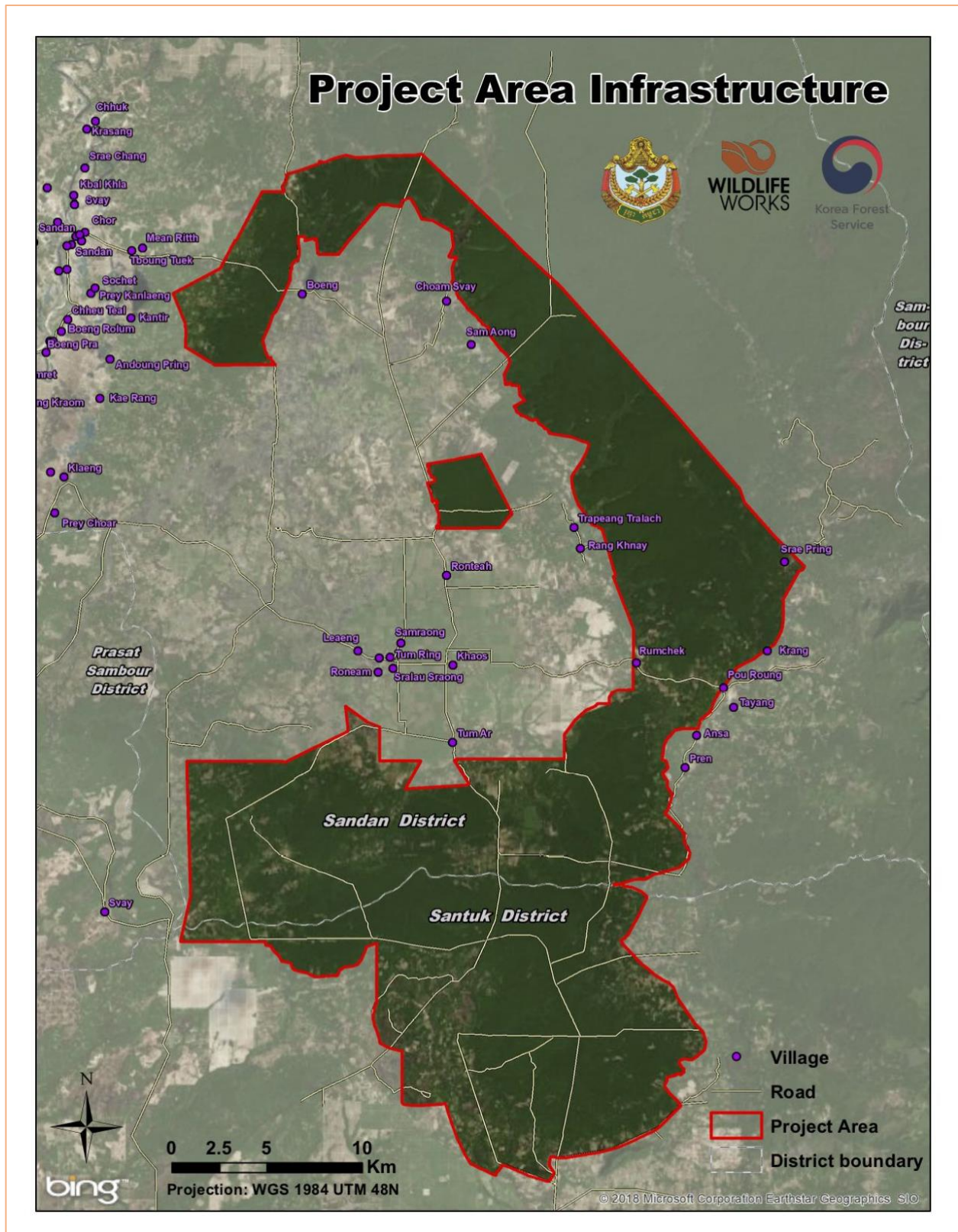
- Evergreen forest
- Deciduous forest
- Other forest
- Non Forest

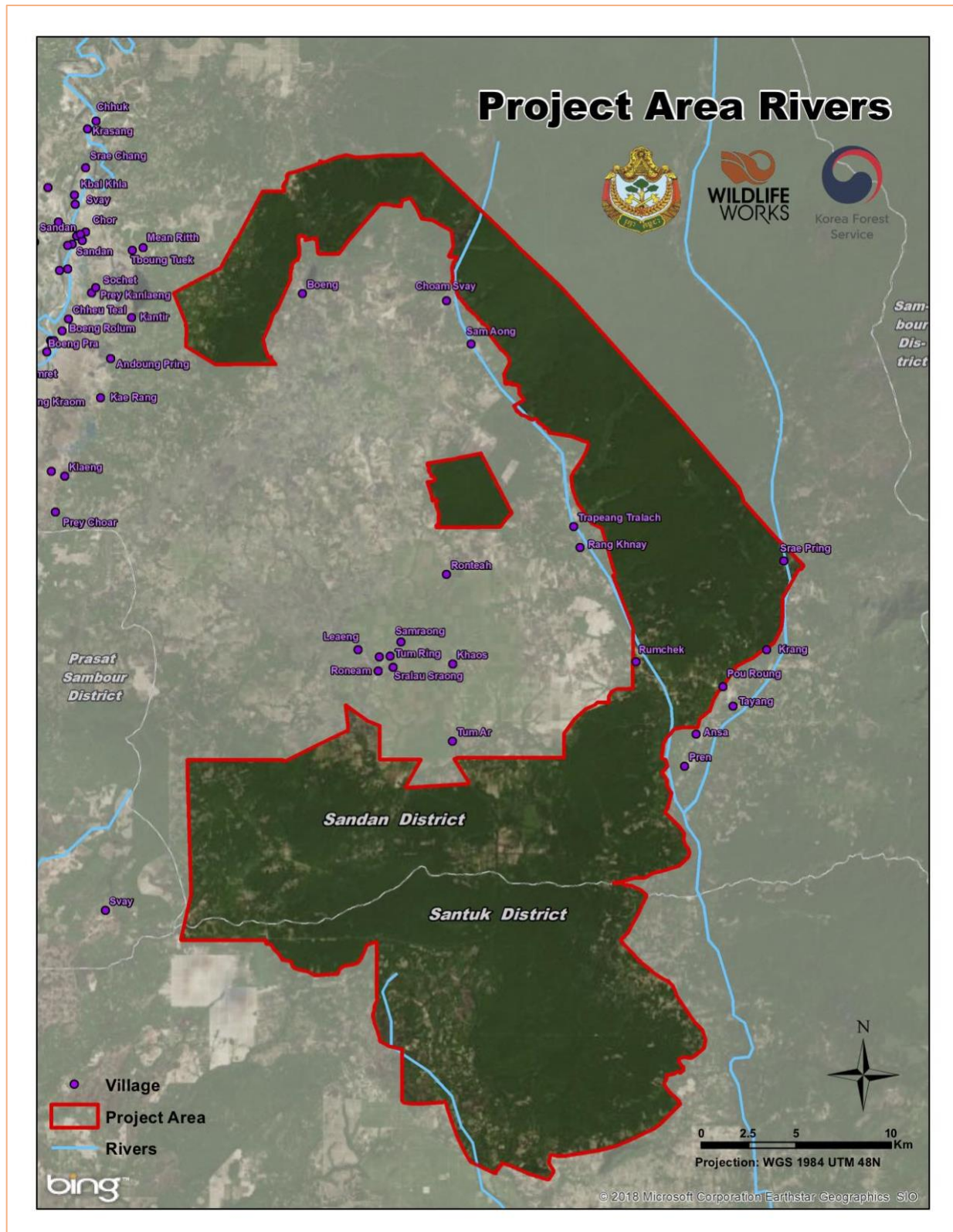
### Land Use

- Prey Lang Wildlife Sanctuary / Permanent Forest Reserve
- Tumring REDD+ Project Area/ Permanent Forest Reserve
- Community Forest
- Economic Landconcession
- Land Tenure Reform Areas

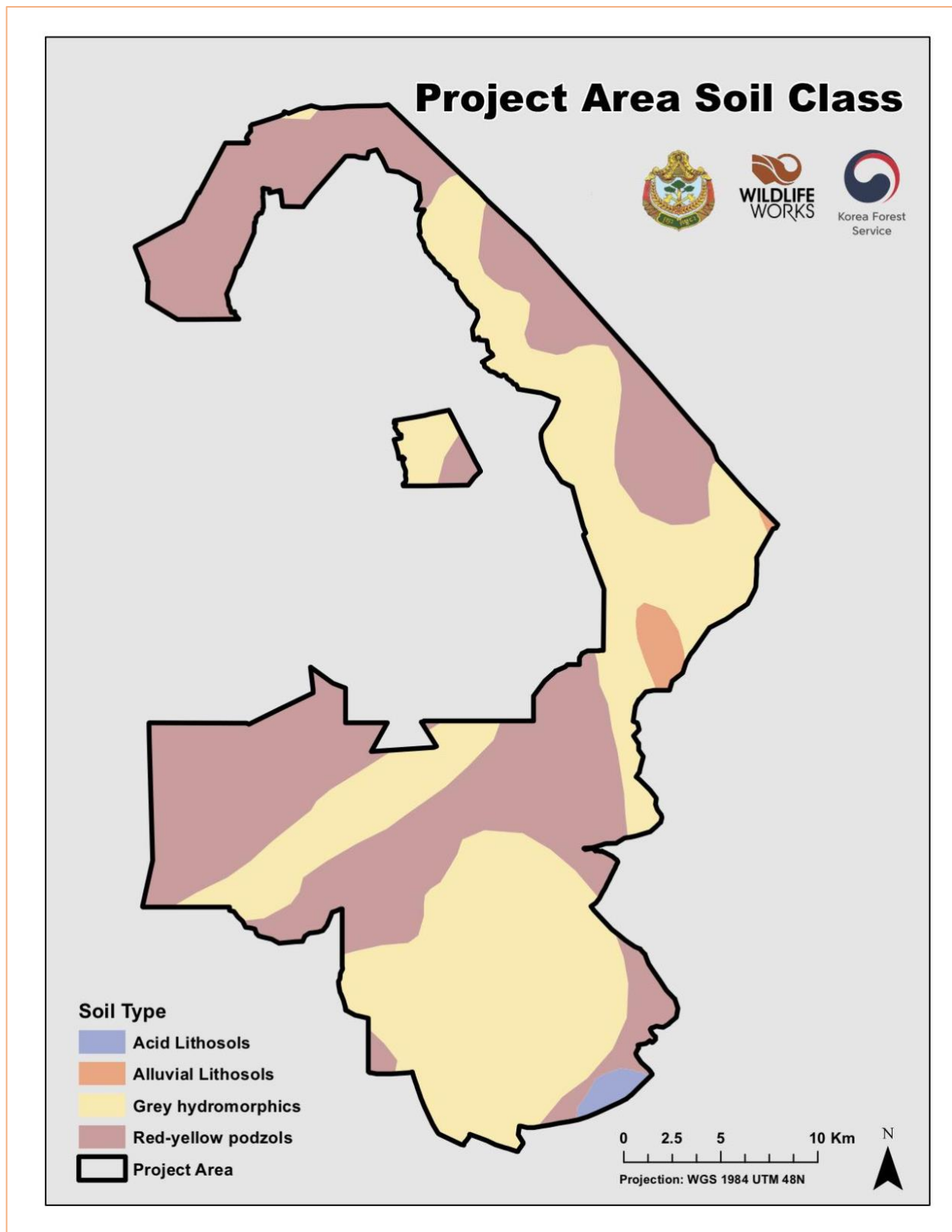


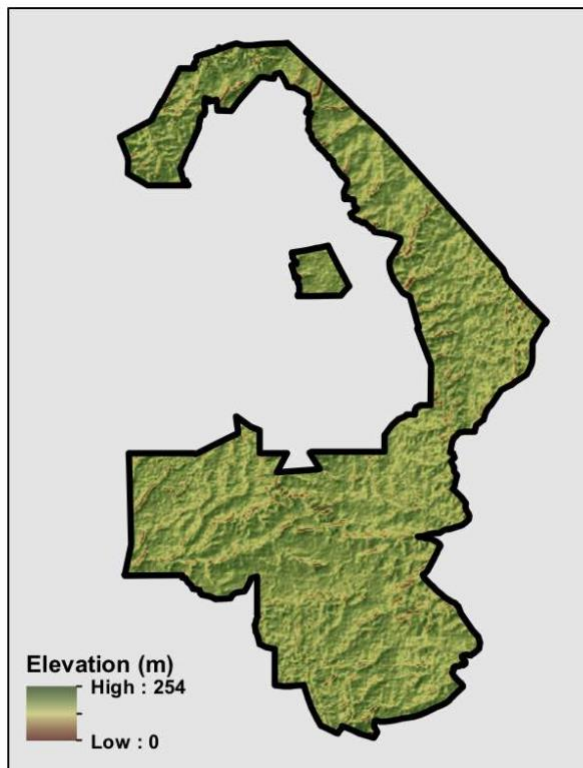












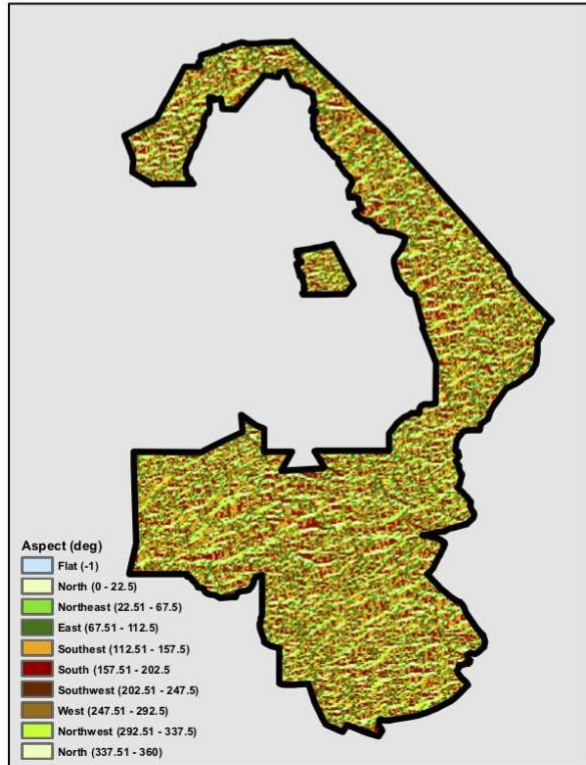
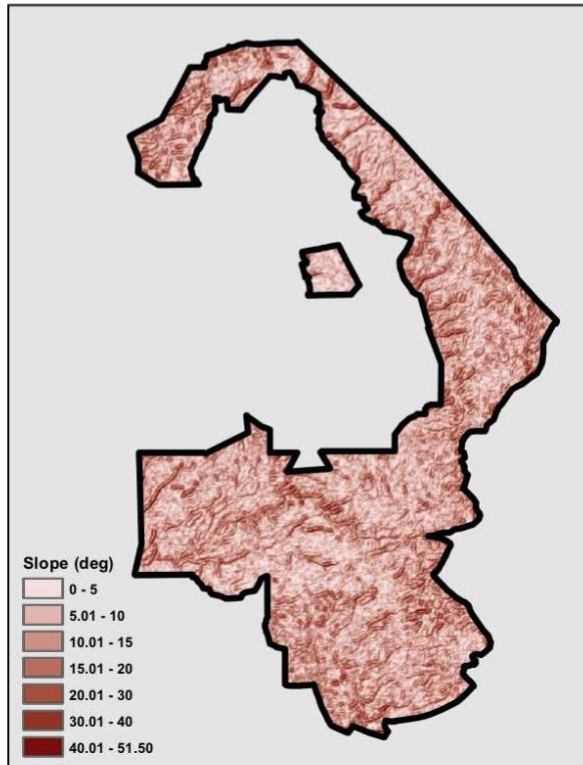
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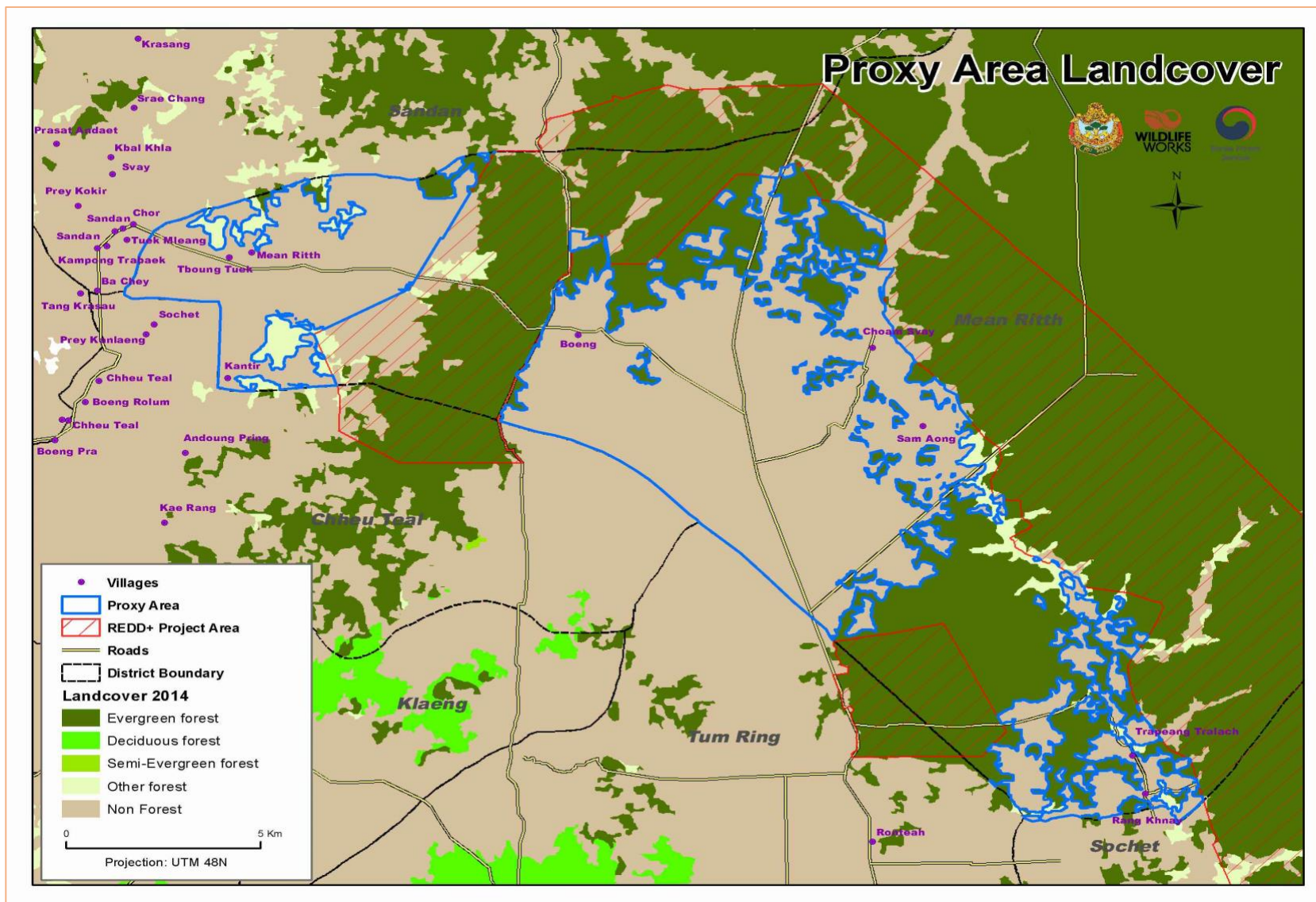


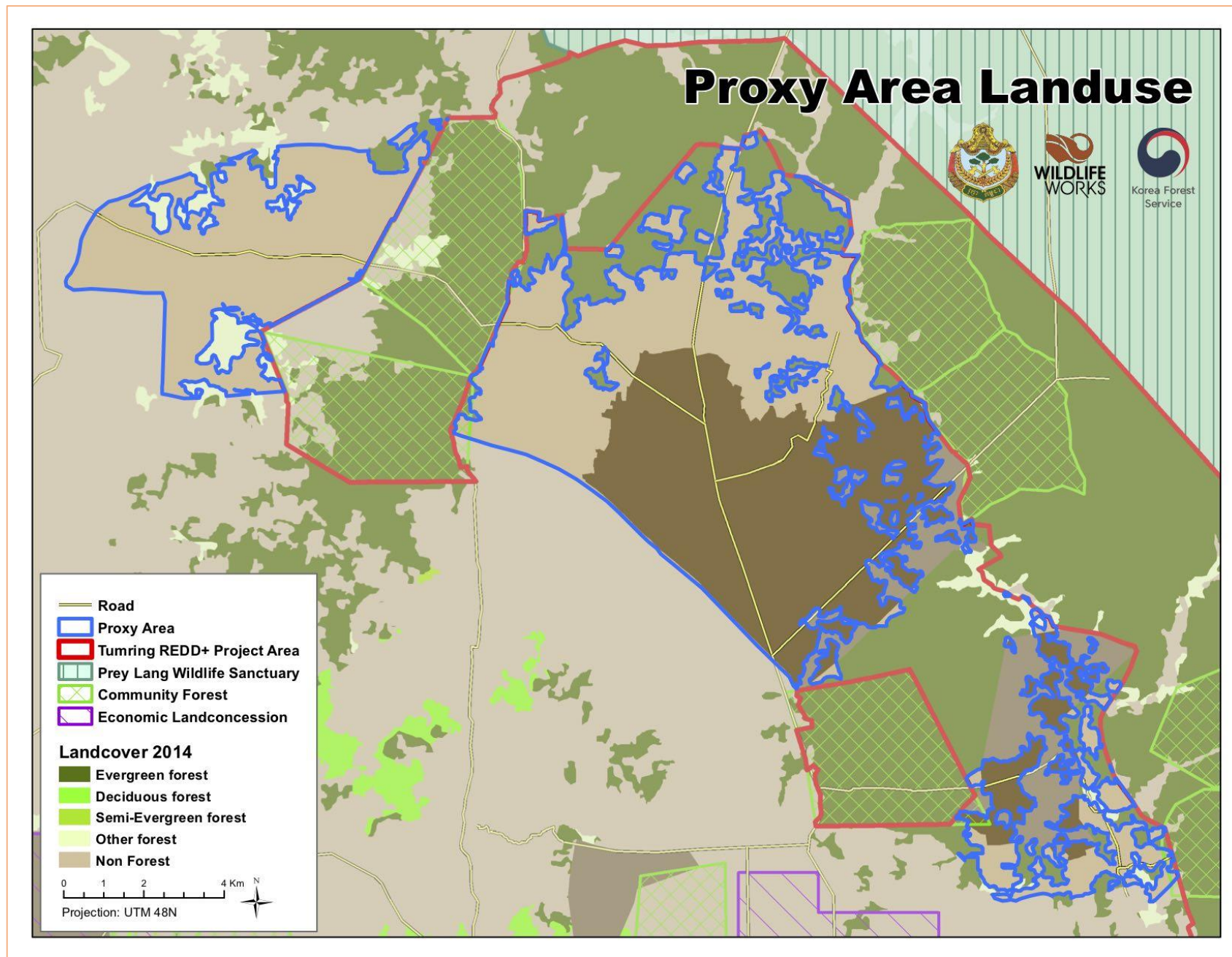
 Tumring REDD+ Project Area



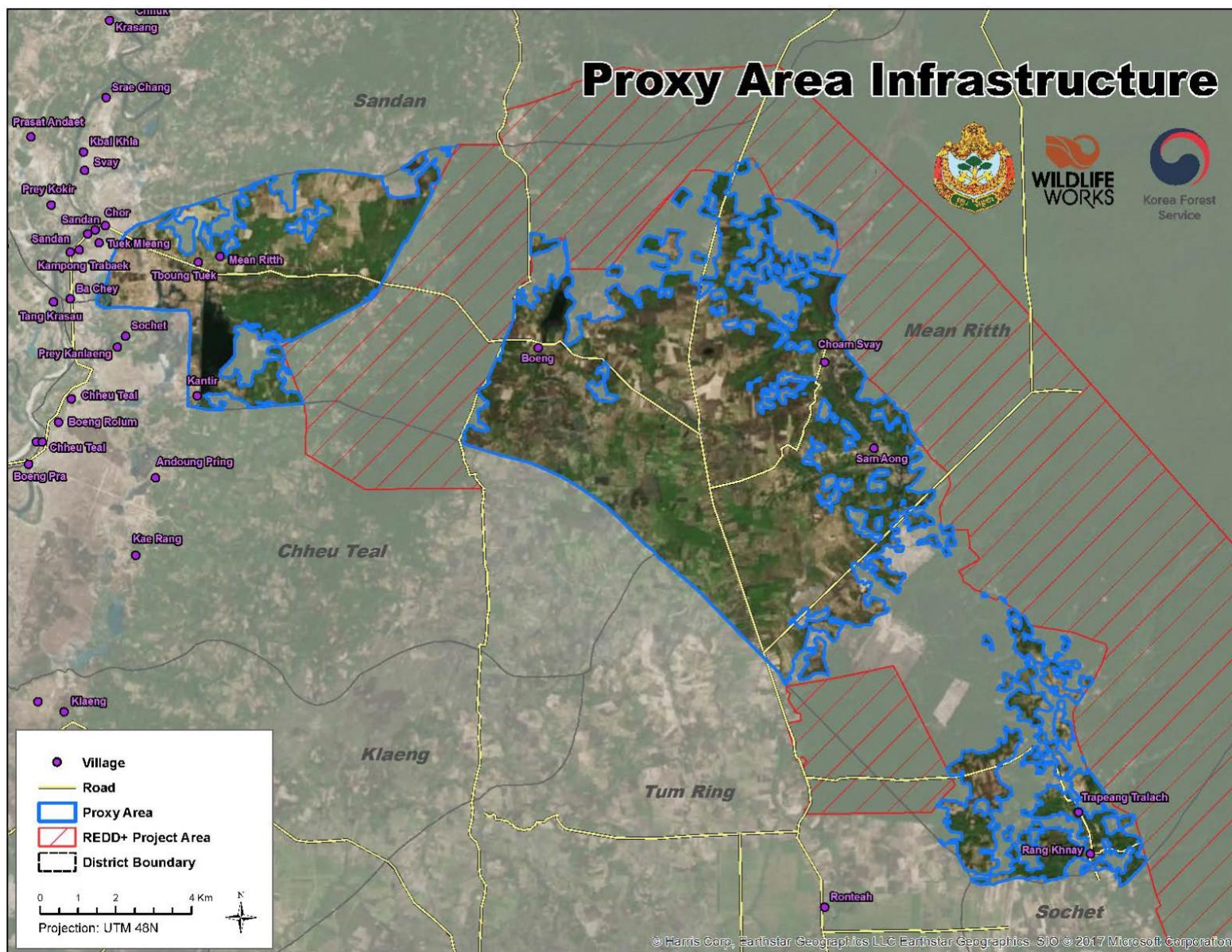


**APPENDIX C. DOCUMENTATION REQUIRED FOR THE PROXY AREA SELECTION CRITERIA**

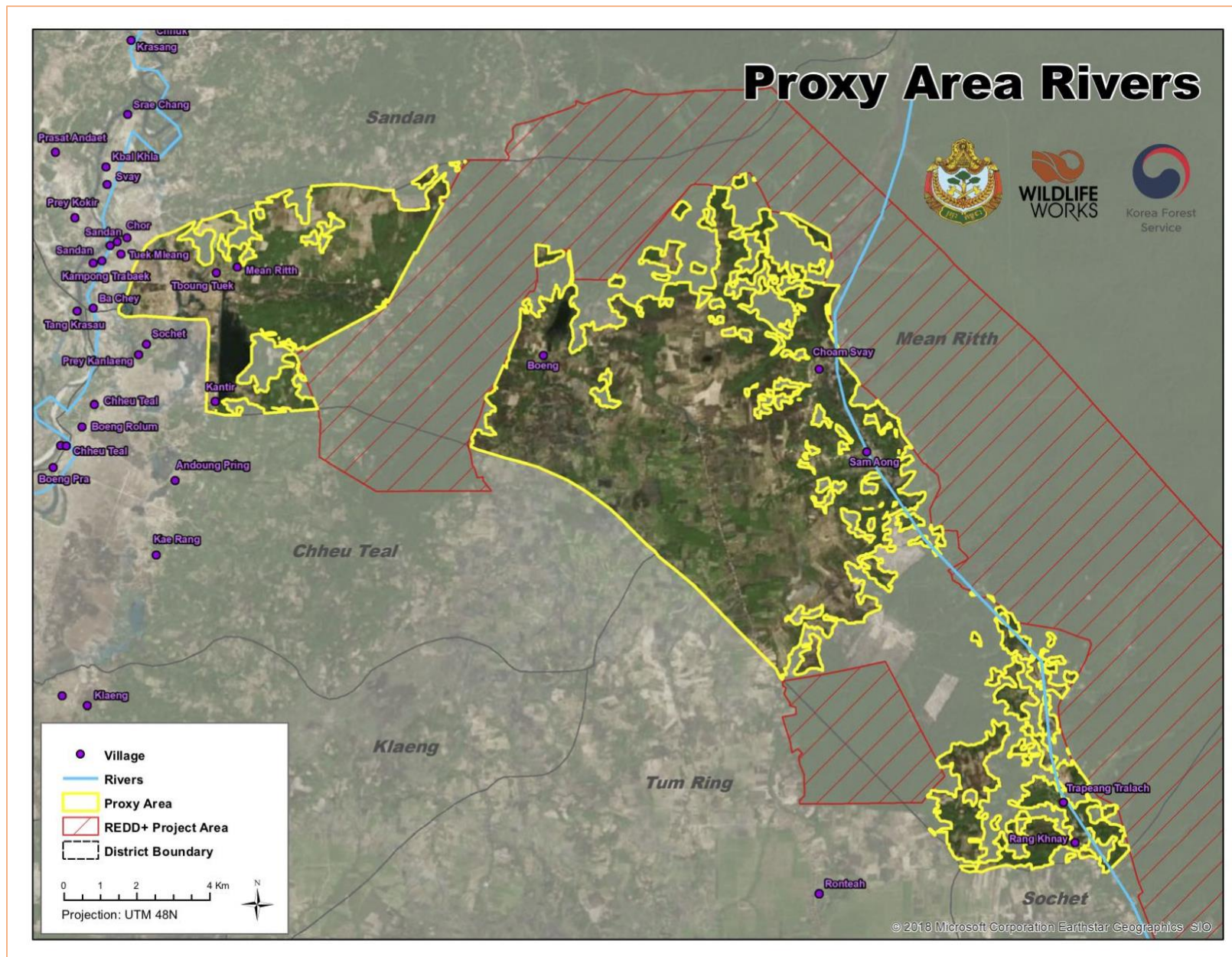


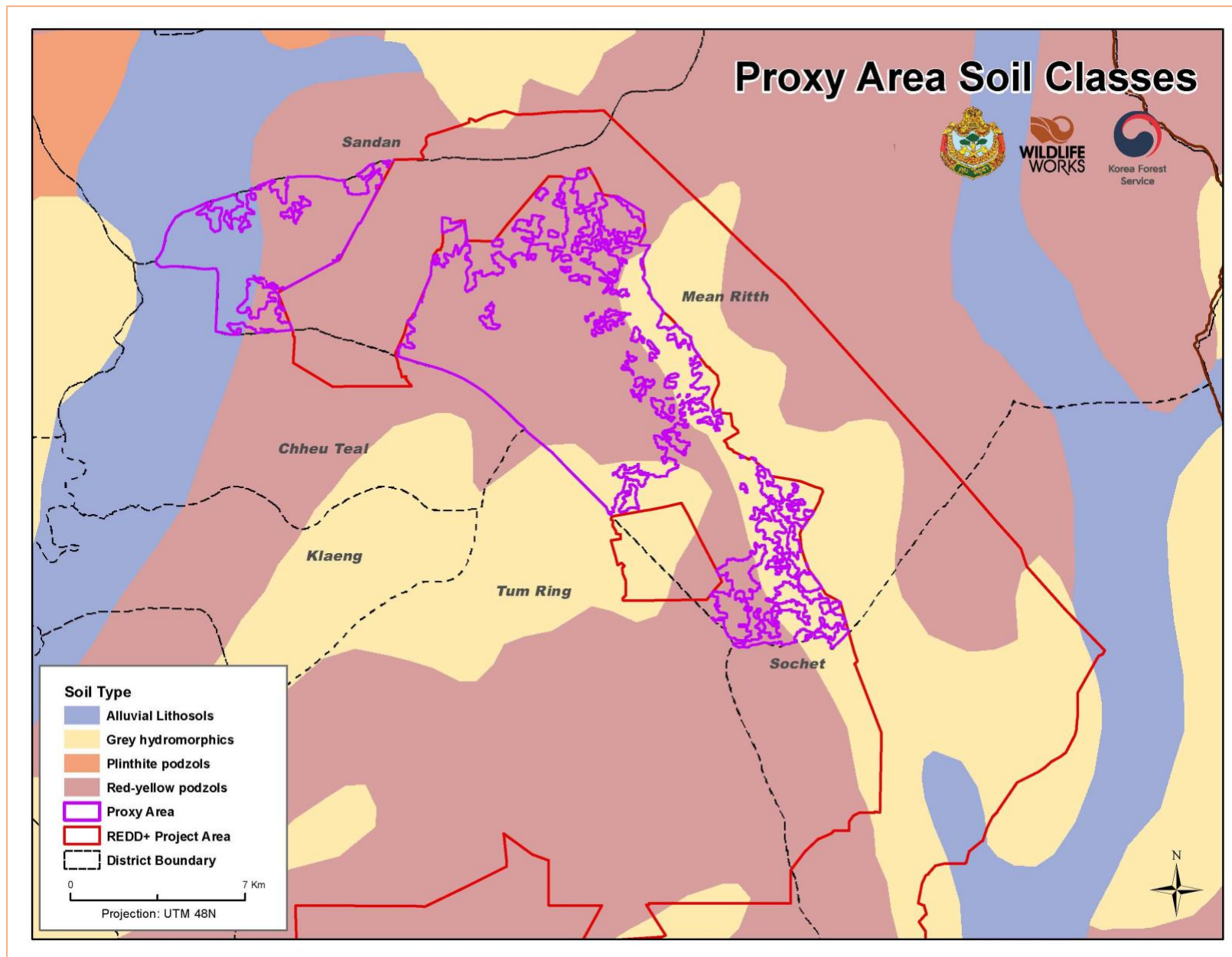




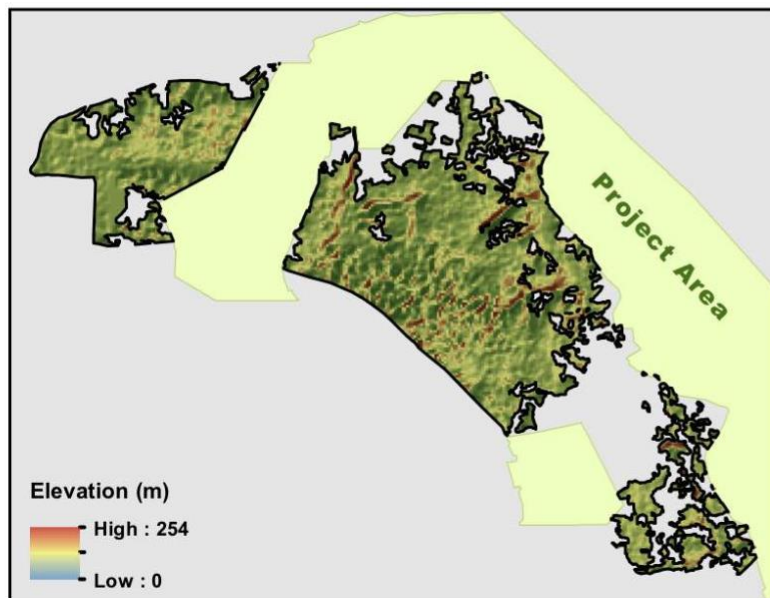










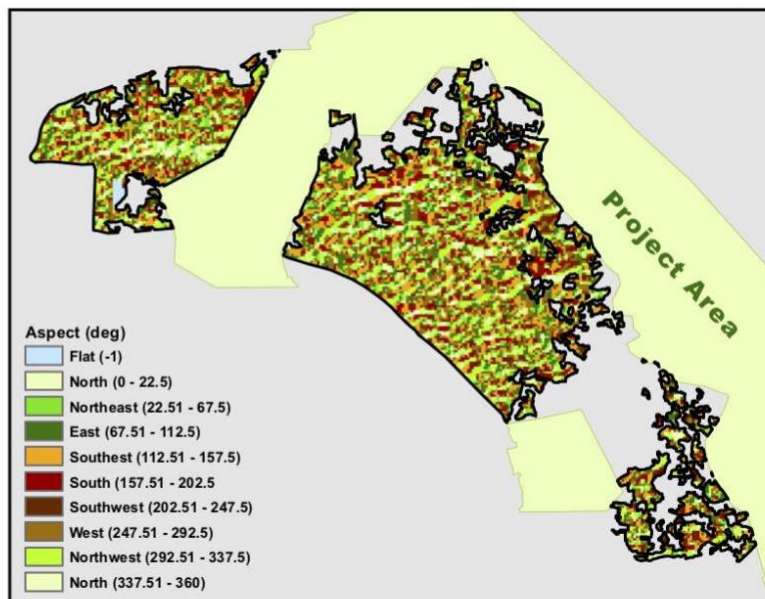
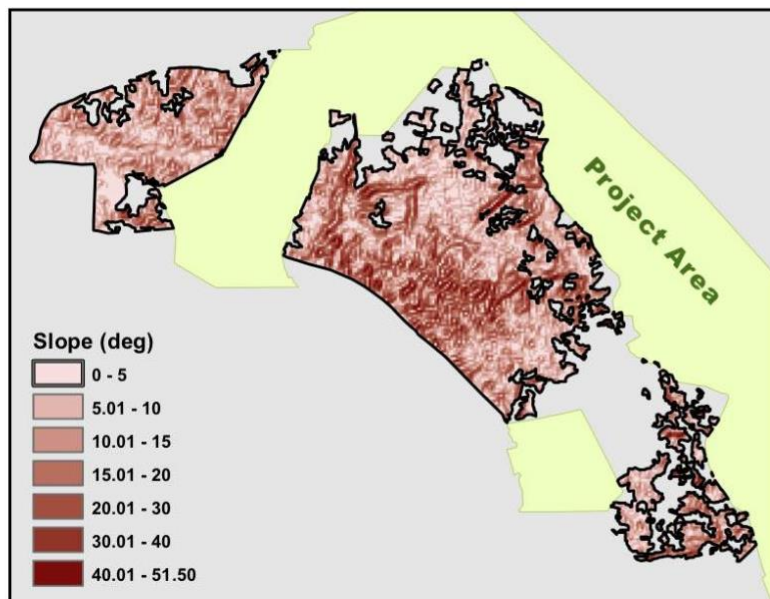


## Proxy Area Topographic Maps

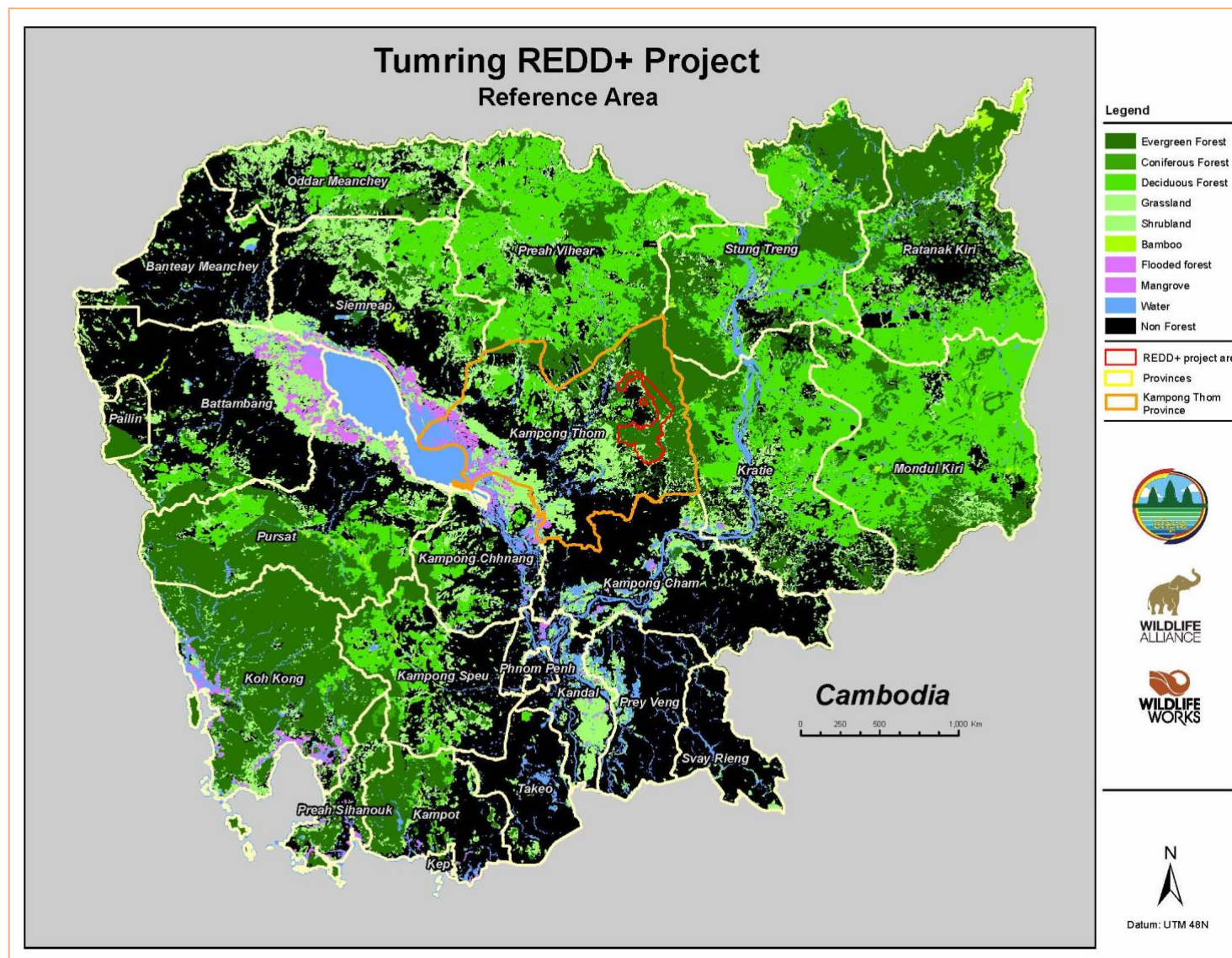
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Proxy Area

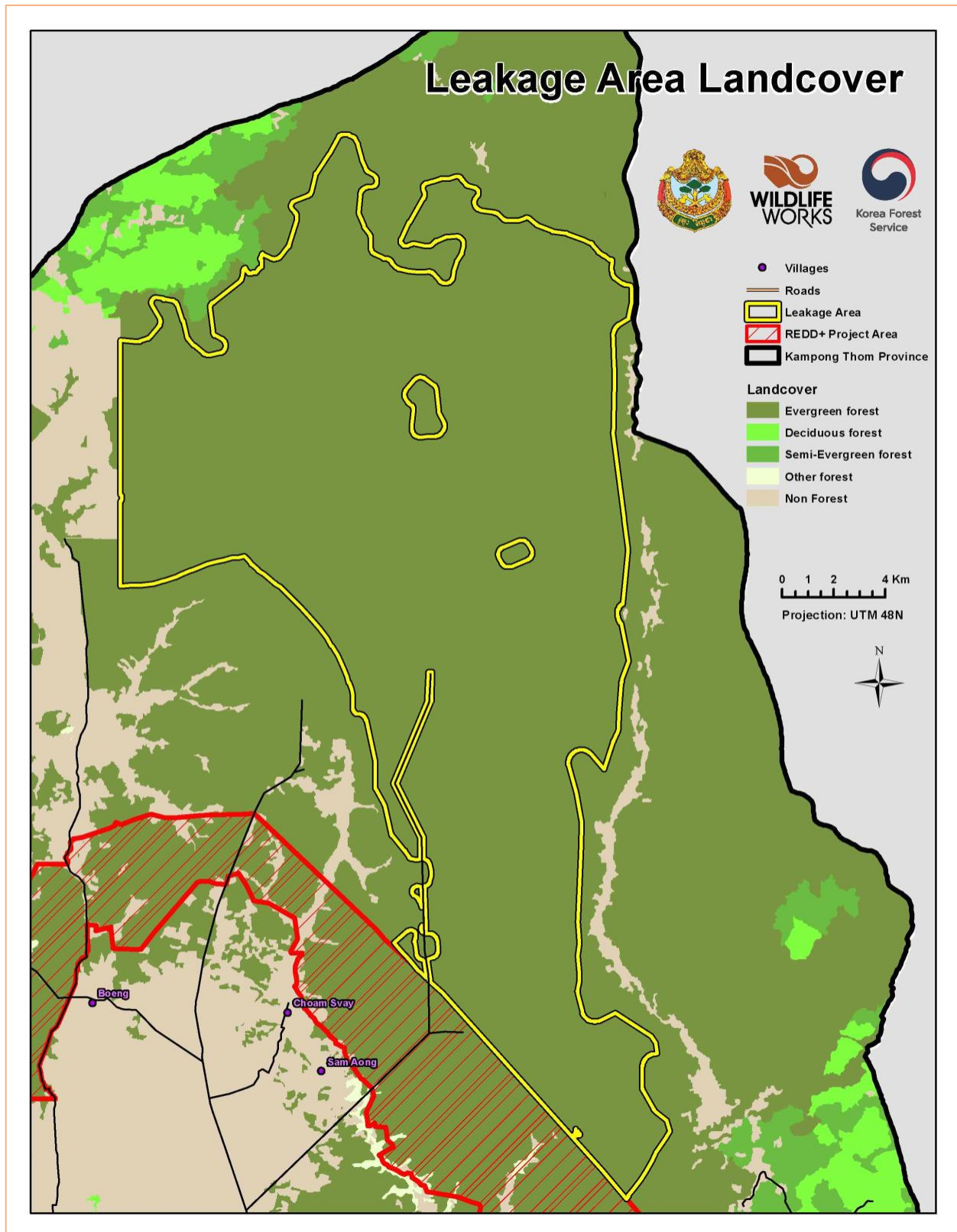


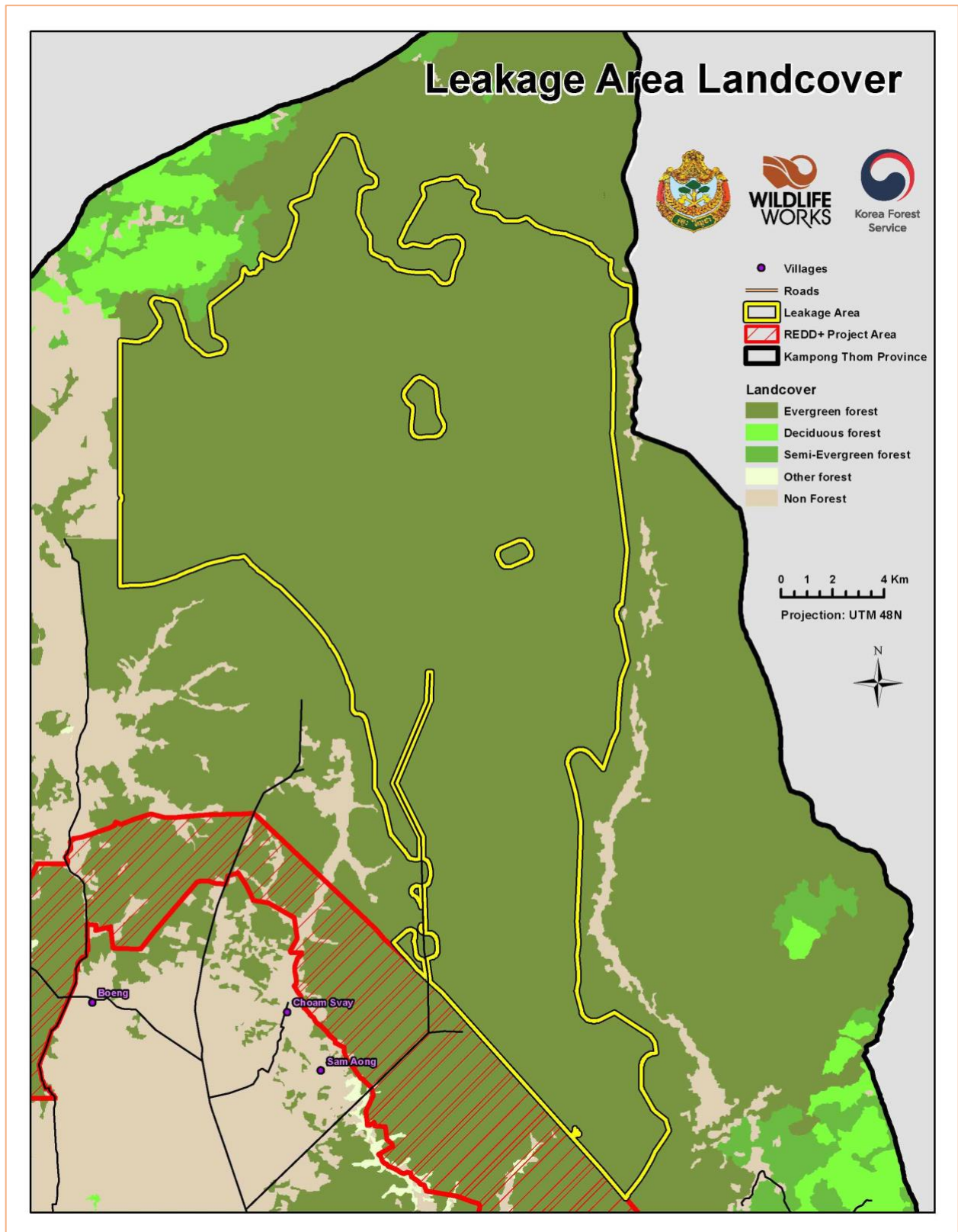
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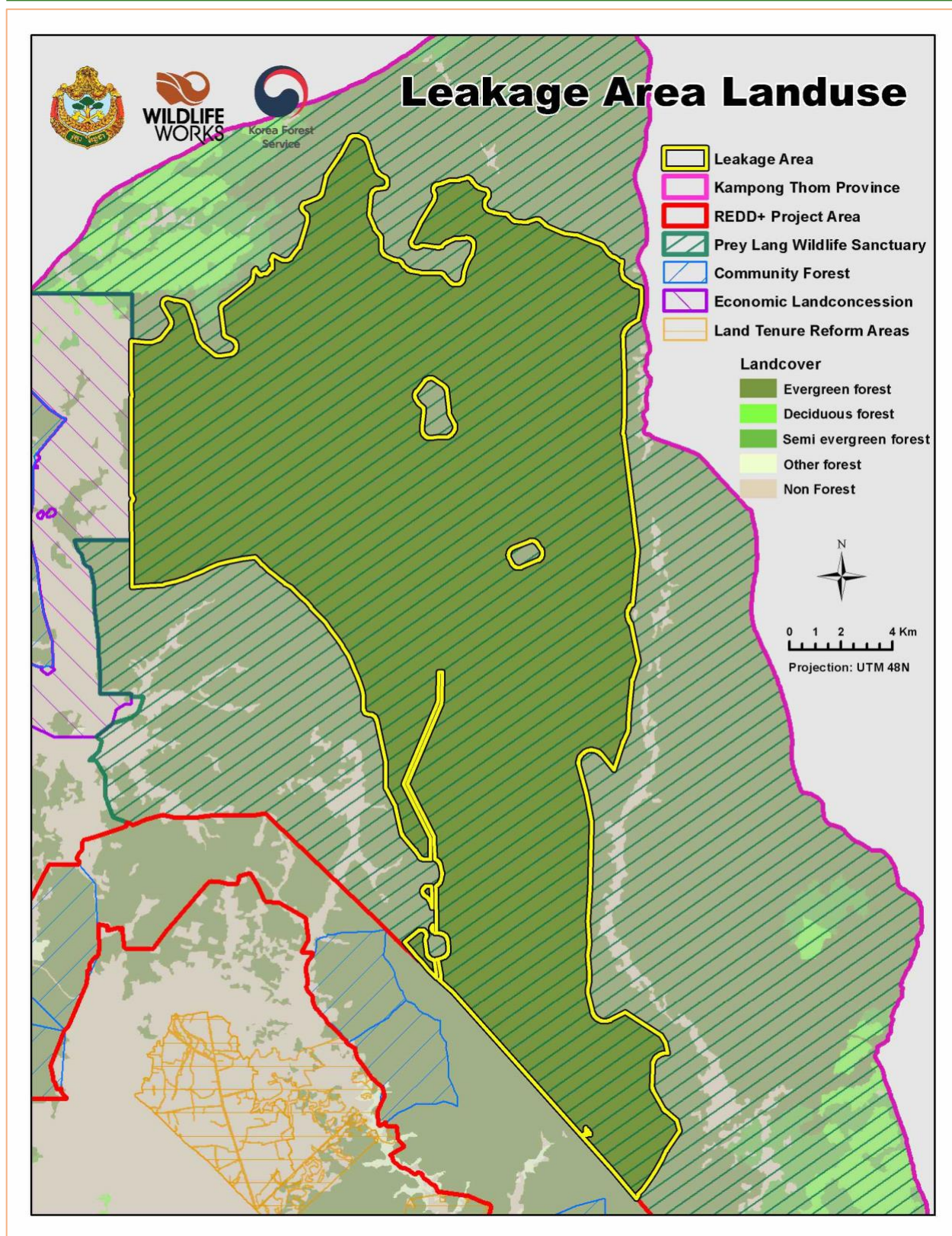


**APPENDIX E. DOCUMENTATION REQUIRED FOR THE LEAKAGE AREA SELECTION CRITERIA.**

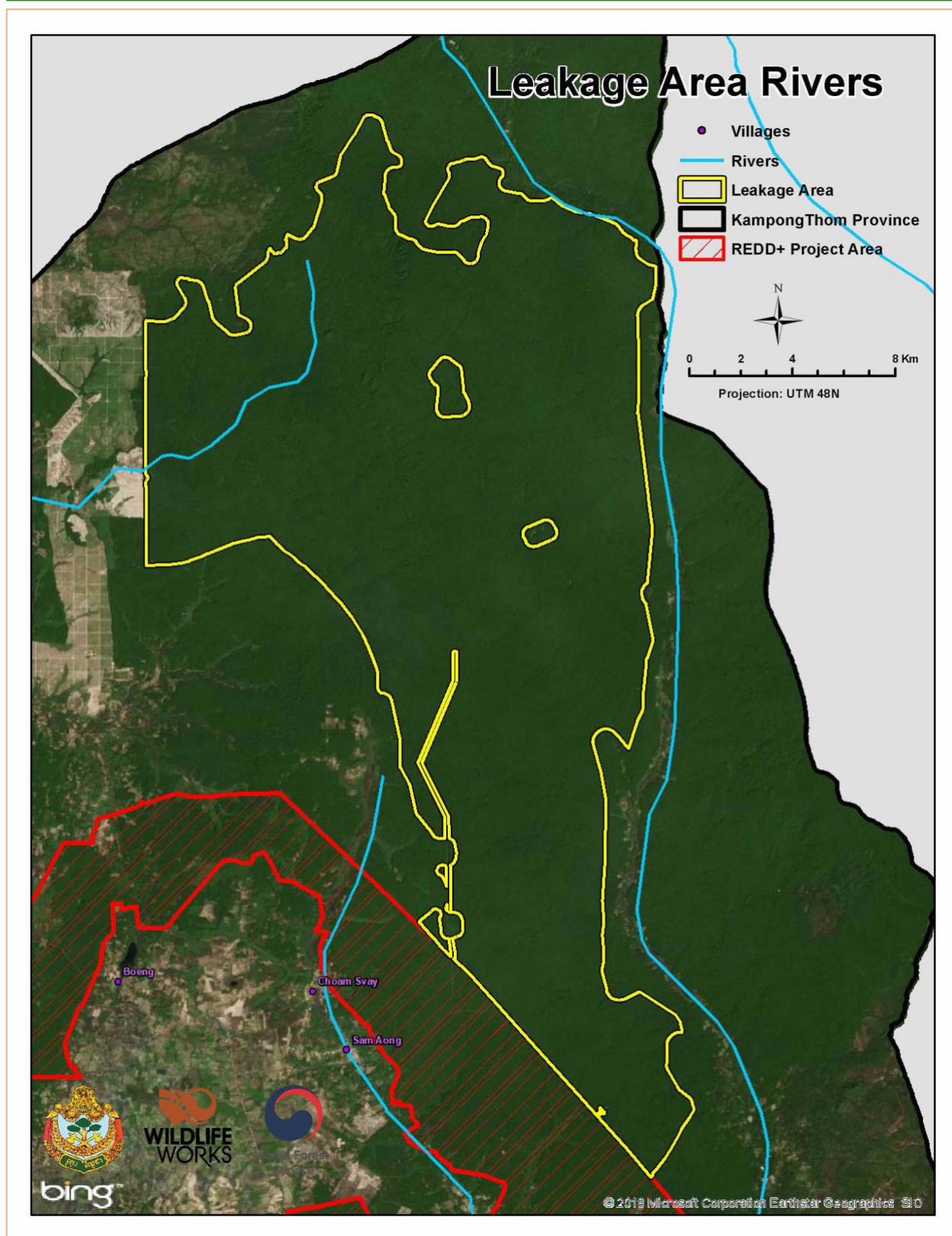


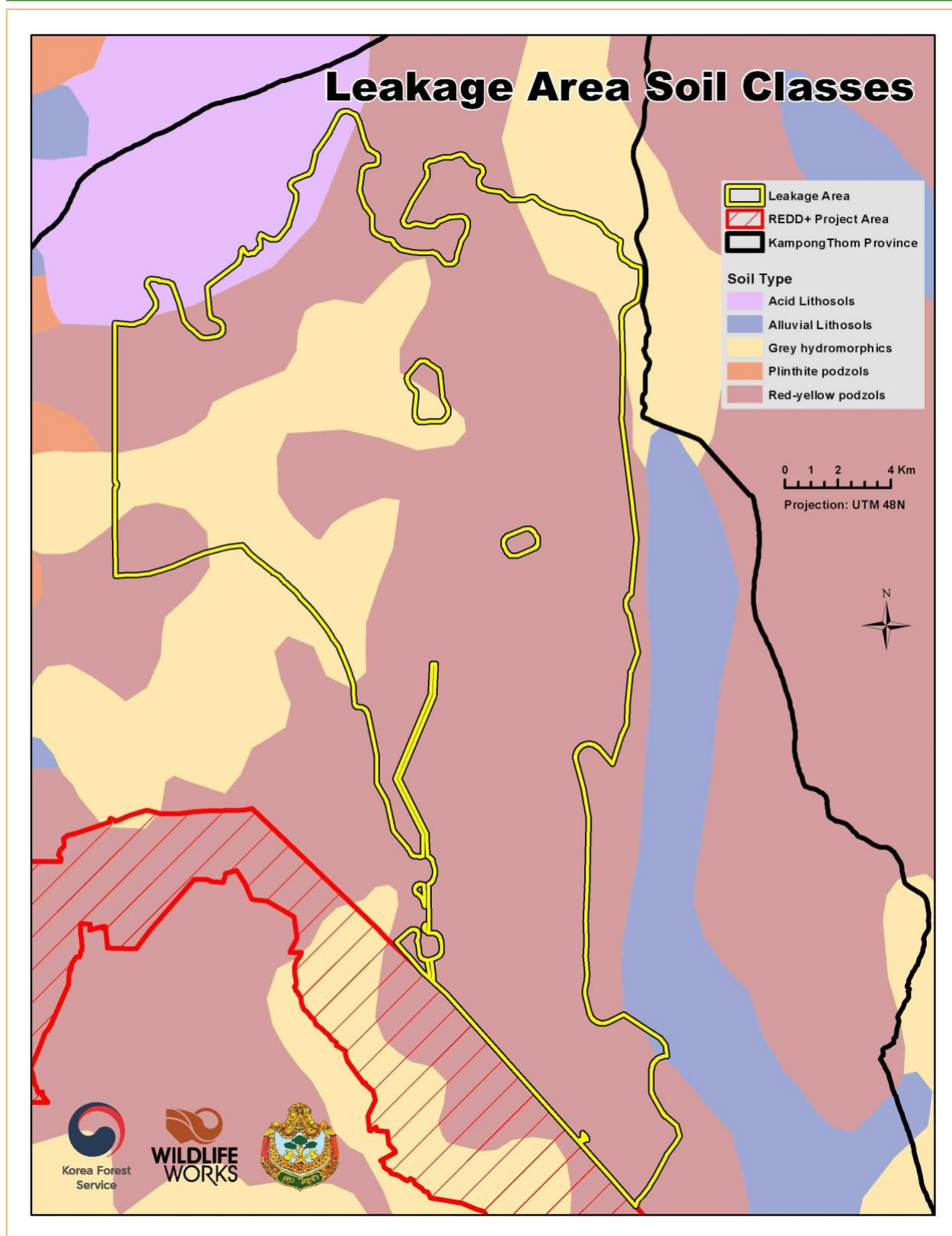




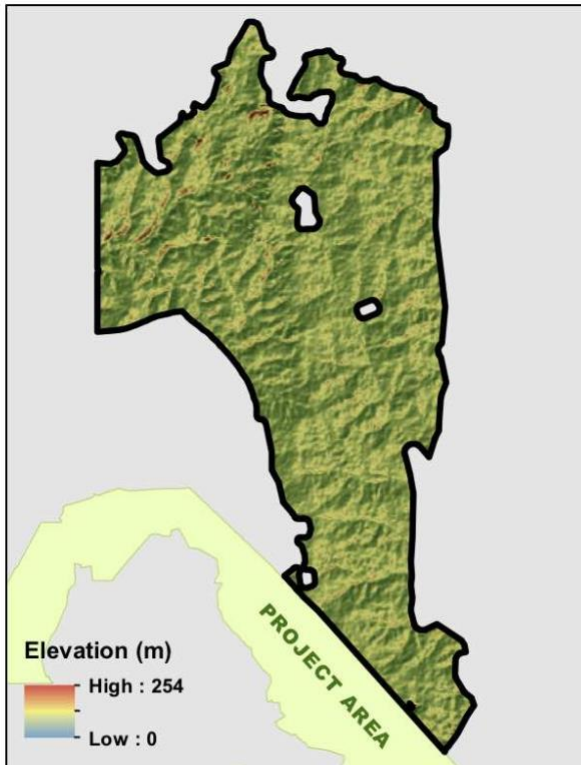












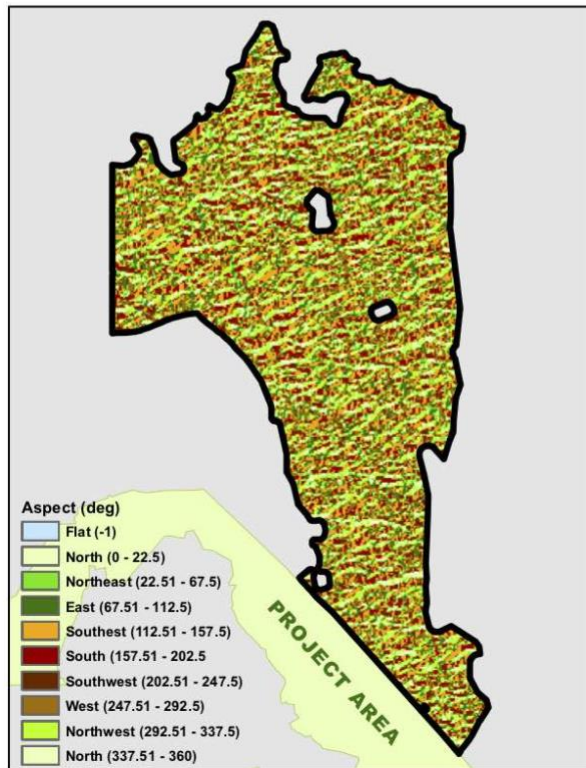
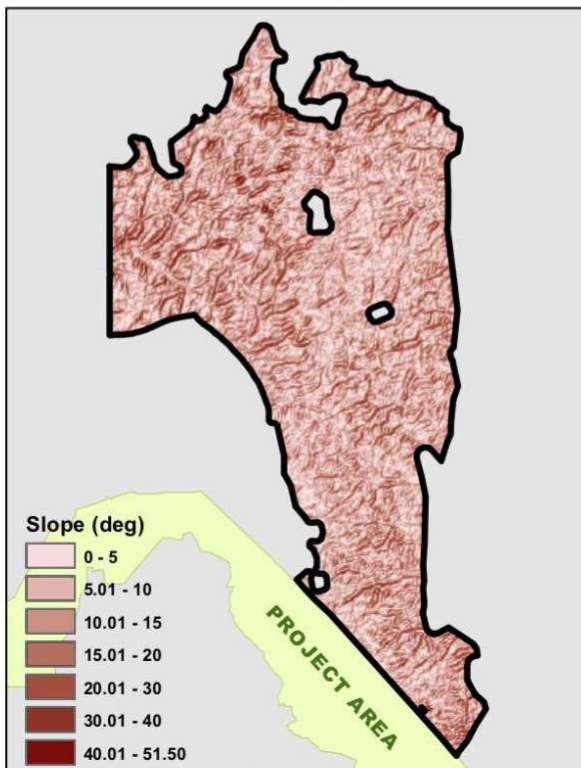
## Leakage Area Topographic Maps

0 4 8 16 Km

Projection: UTM 48N  
Datum: WGS 1984



Leakage Area





**APPENDIX F. THE PROJECT ZONE**

