THE TUMRING REDD+ PROJECT

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Project's Climate, Community and Biodiversity Benefits.	By concerted forest protection and livelihood development activities, the Tumring REDD+ Project will reduce over 3 million tCO_2e emissions over a 10-year timeframe. The Project will increase forest protection by expanding the current government ranger and community protection force. It will also assist local communities by promoting effective land-use planning and granting secure land tenure. Additionally, the Project will promote new income generating activities and improved agricultural methods. These activities will help create greater financial security in project communities, and therefore less need to perform unsustainable resource extraction from the Project Area. The Project Areas is a part of the Prey Long Landscape that contains the largest remaining area of lowland evergreen forest in Cambodia and forms part of the Indo-Burma Hotspot, one of the world's 34 biodiversity hotspots. The Project will protect the western edge of the Prey Long Landscape so that viable populations of threatened species, such as the clouded leopard, dhole and bear, are maintained. Protection of the Project Area contributes to fulfilling Cambodia's commitments under the Convention of Biological Biodiversity (CBD).
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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
NGO	Non-Governmental Organization
NPA	Natural Protected Area
NTFP	Non-Timber Forest Products
PA	Project Area
PAA	Project Accounting Area
PDD	Project Design Document
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	Tumring REDD+ Project
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
WWC	Wildlife Works Carbon

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1 GENERAL

1.1 Summary Description of the Project (G1.2.)

The Tumring REDD+ Project (TRP) lies on the southwestern edge of the recently declared Prey Long Wildlife Sanctuary (PLWS) and covers approximately 67,791.17 hectares in central Cambodia, to the west of the Mekong River. The Prey Long Wildlife Sanctuary contains the largest remaining area of lowland evergreen forest in Cambodia and forms part of the Indo-Burma Hotspot, one of the world's top 34 biodiversity hotspots (Mittermeier, et al., 2004; CEPF, 2011).

The PLWS is the primary watershed of central Cambodia that regulates water and sediment flow to the Mekong River and Tonle Sap Lake. An estimated 700,000 Cambodians depend on these watersheds for irrigation, and southern Vietnam—an area that makes up some of the richest agricultural and most densely populated areas of the region—lies within the Mekong River watershed area. Its forests are also recognized for their importance in securing rural livelihoods, with more than 250,000 people, mostly indigenous Kuy, living in and or adjacent to them (CI, 2011). Much of Prey Long is found on infertile soil with little value for rice cultivation, but freshwater systems in Prey Long are important spawning areas for fish and people rely heavily on non-timber forest products as a source of income and livelihoods (Tola, 2014).

The TRP is a buffer area for the Prey Long Wildlife Sanctuary. It stores carbon, whose release in the atmosphere through deforestation results in the emission of large quantities of greenhouse gases (GHG), which contribute to global climate change. Thus, protecting the TRP forests is critical for mitigating global climate change, conserving biodiversity, and ensuring the provision of ecosystem services to a marginalized local community.

Despite its global importance, unplanned small-scale land conversion of forests to agricultural land by immigrants and conversion to large-scale agro-industrial plantations by the private sector make the Tumring area one of most threatened forest landscapes in Cambodia. Rural communities depend on small-scale agricultural production to support their livelihood. A lack of sufficient employment opportunities for the growing rural population combined with a lack of knowledge regarding improved agricultural techniques drive the local population to clear forests for cultivating commercial crops. In the last decade, the threats to the area have increased with the conversion also undertaken by immigrants and private companies. New immigrants, often supported by agro-industrial companies, use slash and burn to clear the forest and create commercial crop cultivation, leading to increasing deforestation. This scenario will continue unless new mechanisms are designed to add tangible economic value to standing forest so that it can compete economically with other land uses.

In response, the Forestry Administration (FA) of the Ministry of Agriculture, Forestry and Fisheries (MAFF), in consultation with the Korean government, decided to protect the southwestern edge of the Prey Long landscape, which will achieve GHG emission reductions adding economic value to its standing forest. Currently, subsistence farming (both legally and illegally occupied) and commercial crop cultivations are the primary economic activity among settlers in the Tumring area. The small-scale farming techniques used by the vast majority of local communities within the Project area are highly unsustainable. When production decreases, the villagers convert forest areas to agricultural fields commonly using fire (i.e. slash and burn technique). Additionally, there is substantial immigration from lowland provinces into the Project area, and the immigrants are seeking new land for agriculture mostly through illegal small-scale forestland clearing. For commercial crop cultivation or large-scale agro-industrial plantation, such as rubber and cassava crops, there is very rapid and extensive deforestation within the Project area. Most of the commercial expansion has occurred at either Economic or Social

Land Concessions (ELCs) or (SLCs), which due to the lack of sufficient land use planning, have led to large-scale deforestation.

The proposed TRP will generate climate change mitigation benefits of approximately 3.8 million tCO_2e within a 10-year timeframe. This is due to the high rates of unplanned deforestation currently present in the Project area, mainly driven by encroachment for agricultural and commercial uses. The main objective of the TRP is to contribute to global climate change mitigation by supporting sustainable forest management and improving the livelihoods of people living in the project area. This will be accomplished by working with communities to limit their land clearing and by generating alternative livelihood opportunities.

The TRP has two main types of interventions:

1. Reducing Forest Clearing and Logging by Local Communities. The TRP identifies areas under threat of unplanned deforestation and hands over these forests to the local community to become community forests. In order to support community forestry in the Project area, each community forest will enter into a Conservation Agreement (CA) between the local community and the FA. The goal is to protect forests and support the needs of local communities. One solution proposed by the community is support for small scale farming with a goal of increasing individual farming productivity and reducing their need to deforest other areas to establish new agricultural land. In addition, FA is strengthening the governance and enforcement capabilities of its enforcement and community forest patrol teams in order to equip them with the necessary skills and resources to successfully manage the complex dynamics between local populations. Additionally, FA is performing extensive outreach and sensitization activities to build awareness among the local population and increase their involvement in conservation activities. The TRP designed a long-term strategic action plan to address the underlying cause of drivers of deforestation and forest degradation in the Project area such as strengthening effective forest land-use planning, managing the influx of migrants, and promoting effective stakeholder engagement and participation in addressing the actual deforestation and forest degradation in the Project Area.
2. Livelihood Improvement: This intervention will target all villages located within the Project area to reduce the overall pressure on the forest. The TRP will increase long-term employment by expanding the community ranger force, support local business development by the long-term practice of local liquid resin and wild honey collection and improving the value to local collectors, and enhancement technical skills to implement intensive agriculture. In addition, the Project will support private sector investment in agricultural businesses in order to create and market deforestation-free commodities. The project will also support improvements to community health care system, promote the raising of local awareness, and support the development of clean energy to the local communities.

Climate, community and biodiversity benefits are listed below.

Climate benefits

- Reducing GHG emissions from deforestation and forest degradation, approximately 3.8 million tCO_2e within a 10-year timeframe, after having discounted for a 20% permanence risk buffer.
- The Project will result in an average net annual emission reduction of 378,434 tCO_2e, with the total emission reduction over the Project's 30-year lifetime of an estimated 11,353,005 tCO_2e.
- Contributing to the national government in achieving national GHG reduction emission target plan (Cambodia Nationally Determined Contribution (NDC))

Community benefits

- Creating additional employment opportunities
- Improved farming techniques of local communities
- Alternative sources of income and livelihoods
- Enhanced food security
- Improving and strengthening the social infrastructure between provincial government and local communities
- Enhanced local participation and management of forest resources

Biodiversity benefits

- Protection of a corridor that connects viable populations of many threatened species, even those with large home ranges such as the clouded leopard, dhole and bear
- Buffer for the Prey Long Wildlife Sanctuary a high priority landscape of national and global conservation, which is an extremely rare example of lowland evergreen tropical forest that contains an abundance of globally threatened species
- Contributes to fulfilling Cambodia's commitments under the Convention of Biological Biodiversity (CBD)

1.2 Project Location (G1.3. & G3)

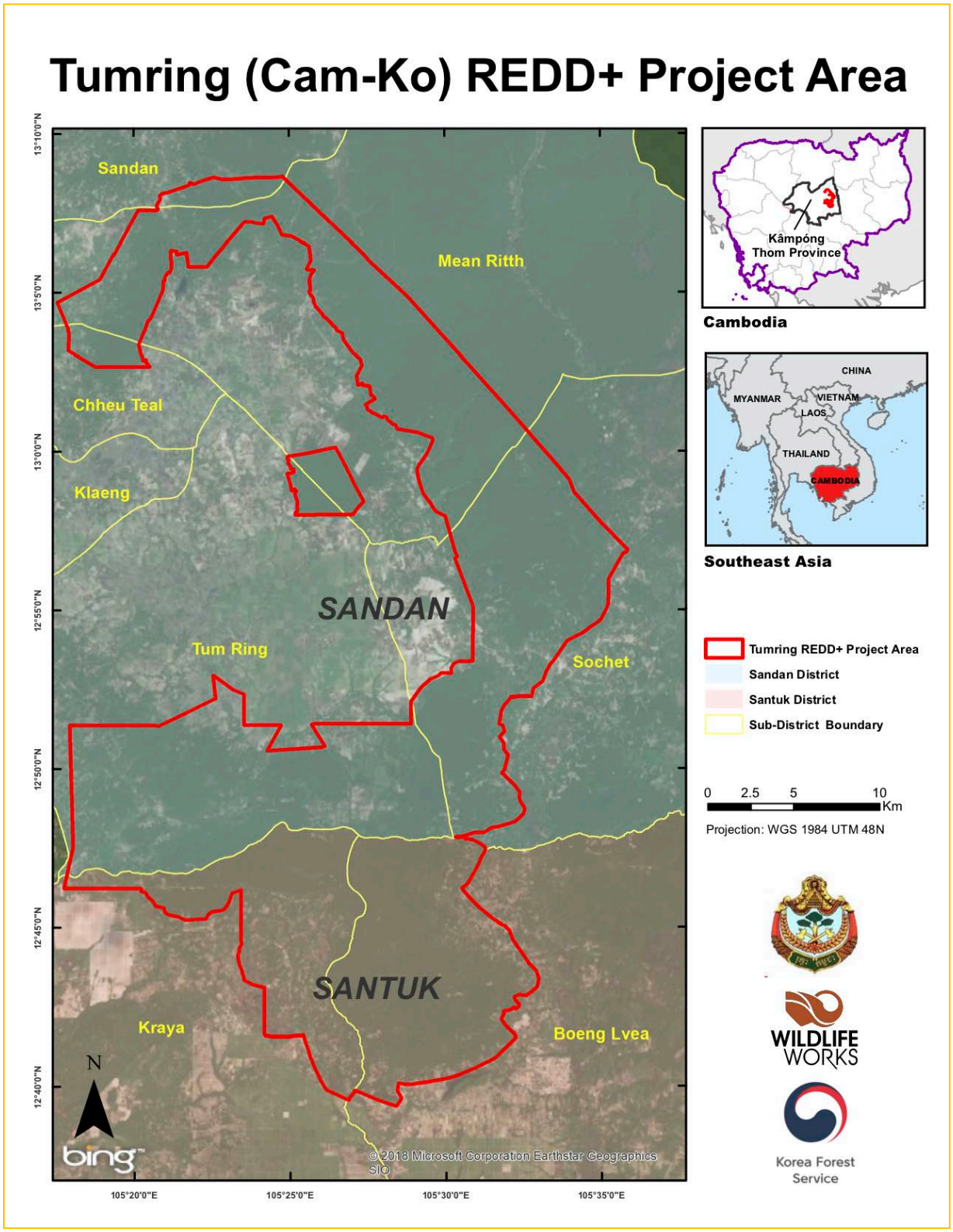


Figure 1: Tumring Project Area land units.

PDR.5 Credible documentation demonstrating control of the project area, or documentation that the provisos listed in the case of less than 80% project control at the time of validation delineated in section 5.1 of the methodology are met.

The entirety of the Tumring REDD+ Project Area is declared Permanent Forest Reserve under the Cambodian Forestry Law of 2002. The Forestry Administration under the Ministry of Agriculture, Fisheries and Forestry for the Royal Government of Cambodia is the designated national agency that manages all permanent forest reserves and they maintain full ownership of the forests under this law.

1.2.1 Project Area Location and Basic Physical and Social Parameters (G1.3.)

Cambodia

Cambodia has one of the highest levels of forest cover in Southeast Asia. According to the Forestry Administration (FA 2016), 48% of Cambodia's land area or 8.5 million hectares is forest, which puts Cambodia the eighth most forested country in South and Southeast Asia by area and sixth by percent of forested land out of 18 countries (FAO 2015). Cambodia also has a relatively high rate of land use change with Forestry Administration statistics showing that 379,485 hectares of forest were lost between 2002 and 2005/6 (FA, 2007), equivalent to a deforestation rate of 0.8% per year. The forest cover change between 2006 and 2010 estimated that forest declined from 59.64 percent in 2006 to 57.55 percent, which means that forest cover decreased 2.09 percent or the equivalent 385,349 hectares. The data of forest cover change between 2010 and 2014 indicated that forest cover declined from 57.55 percent in 2010 to 46.90 percent of the total country's total land area in 2014. Thus, from 2010 – 2014, Cambodia had its largest decrease in forest cover of 10.65 percent, which is equivalent 1,933,739 hectares (FA, 2016)[1]. As a consequence, Cambodia has been classified as a —high forest cover, high deforestation - country for the purposes of REDD+ (Griscom, et al., 2009).

Location of the Project Area and Project Zone

The TRP is located in Kampong Thom province in the central part of Cambodia, to the west of the Mekong River (Figure 1). The Project consists of a Project Accounting Area (PAA) (41,196 ha), the forested area from which all carbon accounting will be measured, and a Project Zone, a 5km buffer around the Project Accounting Area, all villages within this area influence the land-use of the PAA (Figure 2 and Figure 4). The Royal government of Cambodia is integrating sub-national reference emissions into national reference emissions and is in the process of defining sub-national units. One possible method of integration is by province. Thus, for this Project the RGC's forest reference emission levels for Kampong Thom province are applicable. For this assessment, the jurisdictional forest reference emission level for Cambodia is used, therefore the Project's reference area is the entire country of Cambodia (Figure 13). The human population in the area is steadily increasing and access to the forest is relatively easy (Olsson and Emmett, 2007).

[1] Forest under REDD+ program refers to a unit of an ecosystem in the form of wetland and dry land, covered by natural or planted vegetation with height from 5 meters on an area of at least 0.5 hectares and a canopy of more than 10 percent. Area also include in the REDD+ program are forest regrowth and areas under afforestation or reforestation. Rubber, oil palm plantation and perennial crops area excluded from this definition.

Table 1: The land units in Project Area and their respective administrative units.

Province	Land unit
Kampong Thom	RGC/Japan Hydrological Research Area
	Forest Restoration Area
	Prey Hongchamtit Community Forest
	O'Kranhak Community Forest
	O'bosleav Community Forest
	Khum Sochet Community Forest
	Tatey Community Forest
	Rumchek Community Forest
	O'Dascor Community Forest
	O'Thmor Community Forest
	Chaom Smach Community Forest
	Lbos Sral Community Forest
	O'Kranhoung Community Forest
	Srae Pring Community Forest
	Kbal Dontey Community Forest
	Neak Tala Community Forest
	Permanent Forest Reserve

The VM0009 methodology requires that 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

Maps containing the requirements listed above in detail are contained 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.

PDR.4 A digital (GIS-based) map of the project area with at least the above minimum requirements for delineation of the geographic boundaries.

1.2.1.1 Physical parameters

Geology

Three forces created the geologic patterns of Cambodia – ancient volcanic activity created its mountains, an ancient ocean laid sandstone deposits, and the action of its major drainages (the Mekong and Tonle Sap rivers) created alluvial plains and deposits (Cutter, 2014; McDonald, 2004).

The Project Area is composed of Quaternary sedimentary rock and Triassic intermediate to mafic basalt rocks that are found in alluvial and sandstone plains that were generated by the powerful action of the Mekong and Sen Rivers (Kubo et al., 2012; Cutter, 2014).

Topography

The topography of the Project area ranges from 60 – 110 m a.s.l. It is composed of mostly flat terrain with some slightly rolling hummocks to the northeast along the border of Prey Lang Wildlife Sanctuary.

Soil

Due to the action of the Mekong and Sen river systems, the Project Area is covered by a random patchwork of clay and sandy soils. Some areas of the Project Area are covered with pure, siliceous sands, while others are composed of sandy loams or sandy clay deposits (Kubo et al 2012; McDonald, 2004).

Climate, precipitation and hydrology

The Project Area has a tropical monsoon climate, with a rainy season from May – November and a dry season the rest of the year. It is cooler during the rainy season and hotter during the dry season, with an average annual temperature of 28° C, an average maximum temperature of 38° C in April and an average minimum temperature of 17° C in January (Heng 2015). The average annual rainfall in the central lowlands is 1462 mm (Kosal 2013). The hydrology of the Project area was created by the Sen and Mekong Rivers and is influenced by its forests. Recent land-use changes, the conversion of forest to agricultural, agroforestry, and non-forest, is transforming the region's hydrology (Kosal 2013). Waterways that used to have water year-round will now go dry during the dry season (Kosal 2013).

Vegetation and Forest Type

The Project Area is in the western edge of the Prey Long landscape. The Prey Long landscape is categorized as lowland rain forest and comprises a mosaic of forest types that includes evergreen, semi-evergreen and deciduous forest types each with varying species composition (McDonald, 2004). As a general practice, lowland forests of Cambodia are characterized on the basis of leaf behavior, for example as evergreen, semi-evergreen and dry-deciduous forests. Field botanical surveys in Prey Long have identified at least seven distinct types of vegetation based on floristic criteria (i.e. biodiversity), which differ significantly from each other in terms of species composition, dominant trees, and plant community structure (McDonald, 2004). Of these seven vegetation types only four are found in the Project Area and are further described in the Table 2.

Table 2: Vegetation Types of Tumring REDD+ Project. Adapted from McDonald (2004) Olsson and Emmett (2007) and Thelaide & Schmidt (2011).

Vegetation Type	Characteristics
Deciduous Forest	This type of forest is similar to the dry seasonal forest found in dryer climates Indochina. Trees are relatively short (5-12 m), with mainly drought tolerant species with small leaves and thick barks. Dry deciduous forests form a transition to natural grassland, which are found on the very dry sandy sites.
Semi-evergreen short forest	This forest is a transition type to tall evergreen forest, and often with similar species composition, yet trees are significantly smaller.
Sralao' (*Lagerstroemia*) forest	*Lagerstroemia* stands are distinct by their white bark and high, erect, fluted stems. They often dominate patches of forests.
Short riparian and Melaleuca forest	This forest type occurs near rivers and streams, periodically inundated and remaining moist during the dry season.

Wildlife

The Prey Long landscape is important for wildlife because it is one of the last remaining intact, contiguous lowland forest habitats left in Cambodia (Hayes et al., 2015). Studies (Hayes, 2015; Thelaide and Schmidt, 2011; Olsson and Emmet, 2007) found globally threatened large mammals present in the area, such as the Asian elephant (*Elephas maximus*; categorized as EN in IUCN Red List), clouded leopard (*Neofelis nebulosa*; VU), marbled cat (*Pardofelis marmorata*; VU), Malayan sun bear (*Helarctos malayanus*; VU), banteng (*Bos javanicus*; EN), gaur (*Bos gaurus*; VU), dhole (*Cuon alpinus*; EN), sunda pangolin (*Manis javanica*; EN), pileated gibbon (*Hylobates pileatus*; EN), pigtailed macaque (*Macaca memestrina*; not assessed under IUCN Red List yet), and smooth-coated otter (*Lutrogale perspicillata*; VU). Most large mammals are found at relatively low densities, probably due to the high levels of hunting pressure in the area (Hayes et al., 2015).

Prey Long is also rich in turtles and tortoises such as the elongated tortoise (*Indotestudo elongate*; EN), Asian box turtle (*Cuora amboinensis*; VU), Asian leaf turtle (*Cyclemys oldhamii*; not evaluated yet), giant Asian pond turtle (*Heosemys grandis*; VU), yellowed-headed temple turtle (*Heosemys annandalii*; EN), Malayan snail eating turtle (*Malayemys subtrijuga*; VU), black marsh turtle (*Siebenrockiella crassicollis*; VU) and Asiatic softshell turtle (*Amyda cartilaginea*; VU). The very rare, critically endangered Siamese crocodile (*Crocodylus siamensis*; CR) has also been recorded from this area (Thelaide & Schmidt, 2011). In addition, Prey long is home to a rich and diverse fauna of smaller animals such as amphibians and insects (Thelaide & Schmidt, 2011).

1.2.1.2 Social Parameters (G1.6)

Communities and main settlements

There are 7 communes with 26 villages within 5km of the Project that utilize the project area and its surrounding forests for their livelihoods. The average household size is 5.1 persons, slightly lower than

the national average of 5.3 persons per household (Tola, 2014). There are several roads that cross the Project area and the majority of villages are located along these roads. The majority of households are literate (64%) but only half of them are numerate (Tola, 2015).

Table 3: Targeted project villages and additional villages situated within 5Km from Project area.

ID	District	Commune	Village
1	Prasat Sambour	Sraeung	**Svay**
2	Santuk	Boeng Lvea	**Tbaeng Chas**
3	Sandan	Chheu Teal	**Andoung Pring**
4			**Prey Kanlaeng**
5		Mean Rith	Kanti
6			Boeng
7			Sam Aong
8			Choam Svay
9			Tboung Tuek
10			Trapeang Tralach
11			Rang Khnay
12		Sochet	Rumchek
13			**Krang**
14			Pou Roung
15			Trayang
16			Ansar
17			Pren
18			Srae Pring
19		Tum Ring	**Leaeng**
20			Roneam
21			Ronteah
22			Tum Ar
23			**Kbal Damrei**
24			**Samraong**
25			Sralau Sraong
26		Tumring	**Khaos**

Note: The bold village name is a village that does not have a Community Forest.

Table 4: Targeted Community groups and other relevant Project stakeholders.

Stakeholder or stakeholder sub-group	Current impact/ activities in landscape	Effect of project on their activities	Relationship with other stakeholders (Partnership/conflict)
Farmers	Forest Land conversion and expansion and cultivation	No further land conversion allowed, loss of potential agricultural land	Potential conflict with FA, local authority
NTPF collectors	Collection of resin, firewood, material for house construction (sometimes obtained through intrusion into state permanent reserve)	Regulated collection of wood for house construction. Prohibition of collection above subsistence use in the State Permanent Reserve	No conflict besides that resulting from over use. FA allows wood for house construction in state permanent forest
Loggers	Intrusion into state permanent reserve to cut trees for sales	Greater law enforcement and abatement of logging activities, prosecution.	Potential conflict between loggers and FA and community ranger teams
Women	Involve in forest land clearance	Participate in patrolling and management of forest resources	Partnership with FA and community forest, and potential conflict with immigrants, loggers, and forest land clearer.
Youth	Participation in the protection of Community forests	Participate in patrolling and education of community	Conflict with loggers and land clearers
Landless – Migrants	Living on land without secure land titles, forest land clearing and purchase of cleared land from villagers	Law enforcement and cooperation to engage in agricultural training activities, though legal titles needed	Potential conflict between landless and rightful landowners, such as FA and local authority.
Community Forest members	Given Management Rights to State Permanent Reserve Forests	Cooperation with FA to ensure protection and sustainable use of forests	Potential conflict between Community Forests and landless migrants, collector of wood for house construction
Community forestry management committees	management body and representation of community forestry	Cooperation with FA to ensure protection and sustainable use of forests	Potential conflict between Community Forests and landless migrants, collector of wood for house construction and land clearers and land speculators

Charcoal producers	Extraction of wood for charcoal making, often from project areas and community forestry	Prohibition of charcoal making in the Project Area, loss of income generating activities, increased law enforcement and potential prosecution	Conflict between charcoal burners and FA and Community rangers if illegally trespassing into State Permanent Reserve Forest.
Wood trader and land speculators	Loss of large trees and forest land	Strong law enforcement and education	Potential conflicts with FA and community forestry members
FA	Management and protection of Permanent Forest Reserve and support community forestry	Cooperate with community forestry and other competence agencies to strengthen law enforcement	Potential conflicts with loggers, land clearers and migrants
Local authority (district and commune, villages)	Provide intervention and assistance to community forestry	Cooperation with FA to ensure protection and sustainable use of forest and forestland security	Differences with FA on the proposed social forestland concession
Police and military	Cooperate with FA to crack down on forest illegal activities	Secure maintenance of forest resource	Potential conflicts with loggers and land grabbers

Land uses and economic activities

Households in the Project Area derive their livelihoods from agriculture, the collection of NTFPs, logging and hunting (Tola, 2014). The main source for food security in the Project Area is cultivated rice production. Thus, farming requires the greatest amount of local people's time and labor. Dominant activities are rice paddy cultivation, livestock raising and livestock products and services. Livestock is raised free range and without vaccination and consists of poultry, ducks, pigs, cows, or buffalo, the latter two are mostly raised for sale (Tola, 2014).

Project area forests provide a number of benefits to rural households in the region. Local communities rely greatly on the forest as a source of firewood, charcoal, thatch, rattans, medicines, bush meat, fish and wild vegetables. Many families increase their standard of living by harvesting non-timber forest products (NTFPs) before and after their sowing and harvest schedules, such as resin, honey, medicinal plants, and small construction material. (Tola, 2014; Thelaide & Schmidt, 2011).

Of particular importance as a source of supplementary income is the collection of oleoresin from dipterocarp trees. Similarly, to many other parts of Cambodia, local people use resin as a major source of alternative income. Twenty percent of the households in and around Prey Long rely on resin collection for income generation (Tola, 2014; Thelaide & Schmidt, 2011). Most families stake claim to specific dipterocarp trees and/or specific areas of dipterocarp forests, and they all respect such claims in a cooperative fashion. Illegal logging is also part of the local economy. In some cases, this is done by villagers, but in most cases, it is conducted by immigrants, who are employed by powerful businessmen or military figures (Poffenberger, 2009). Both McDonald (2004) and Tola (2014) note that the role of

timber in the local economy is underreported. Observations by Forestry Administration officials confirm that, as the roads have improved, illegal logging and land grabbing play a more important role in the local economy.

Many poor villagers also work as seasonal laborers, picking cassava, harvesting corn or planting crops. Other sources of income include having a local shop, making rice wine and raising pigs, construction work, while some families are supported by internal remittances sent from Phnom Penh or from agricultural labor in other provinces (Tola, 2014).

Ethnic groups and migration

Based on the 2012 Cambodian Population Census, there are 17 ethno-linguistically differentiated indigenous community groups, located across 15 provinces, including in the northeast. Geographically, indigenous communities in Cambodia have historically inhabited upland and forested areas, with particular concentrations in the northeastern provinces. Their locations follow the biodiversity corridors of, and natural boundaries between, Cambodia, Vietnam

and Laos including the Mekong River and its tributaries the Srepok, Sekong and Se San. There are also, however, upland communities living in the southwest and lowland communities with a history of practicing Buddhism and lowland/paddy-based agriculture living in the north-central plains. The group found at the Project Site in north-central Cambodia is the Kuy.

According to Tola (2014) about 58% of the Project area is comprised of the Kuy ethnic group. The Kuy are considered the aboriginal inhabitants of the Prey Long region and have a sacred connection to the forest (Keating, 2012). They have created a community-based conservation network to protect the Prey Lang landscape from deforestation. The word Prey Long comes from the Kuy language and means “our forest”.

Migration to the region has increased over the last 5 years. This is demonstrated by the number of conflicts occurring with regards to timber extraction in the Prey Long Landscape. According to Tola (2014), there were 14 conflicts between migrations and local community members over timber extraction in 2012 and 59 conflicts in 2013 a more than 400% increase. This is due to the improved access to the region which has caused an increase in immigrants that are paid by wealthy businessmen and soldiers to clear land for future sale.

Poverty

According to the Asian Development Bank (2014), the poverty line in rural Cambodia was $25.69/month per capita or $308.28/year per capita. In 2014, 25% of the rural population of Cambodia lived below this poverty line. Based on the SFB socio-economic baseline study, the majority of households in the study area are above the poverty line (Tola, 2014; Tola, 2015). According to the SFB study, the average formal income for households across the Prey Long landscape was $1,658 in 2013. Thus, the average income in the Project Area is five times above the national poverty line. Looking more closely at assets of local households, the SFB stated that around 15% of households surveyed had thatch roofs, an indicator of a cash poor household, that may fall closer to the poverty line.

Food security

From 2011 – 2016, in the communes of Tum Ring and Chheu Teal, USAID conducted a five-year integrated food security program called HARVEST. The program sought to reduce poverty and malnutrition by diversifying and increasing food production and income. It tried to develop sound, agricultural-focused solutions to poor productivity, postharvest losses, malnutrition, lack of market access, environmental degradation, and the effects of climate change on vulnerable rural populations.

Based on the HARVEST baseline report, hunger survey of households in Kampong Thom demonstrated the highest level of hunger in all the project sites that includes, Pursat, Siem Reap, Battambang provinces. Kampong Thom households were the only households that demonstrated moderate hunger in all 5 provinces (HARVEST, 2013). Results were similar for children 6 – 23 months receiving the minimum acceptable diet. Only 22 percent of children in Kampong Thom received a minimum acceptable diet as compared the lowest percentage in all 5 provinces. The average of the other five provinces was 38% or 16% points higher (HARVEST, 2013). This trend is maintained with households that exclusive breastfed children less than 6 months old; only 29% of Kampong Thom households exclusively breastfed children under 6 months old. In the case of breastfeeding, the average of the other five provinces was 68% or almost 40% higher (HARVEST, 2013). These results point to a lower level of food security for Kampong Thom and the Project Area as whole compared so similar provinces in central Cambodia.

Public Health

The Directorate General of Health oversees health service delivery in Cambodia. The Cambodian health care system includes provincial health departments (24) and health operational districts (81) (Annear et al., 2015). Within the operational districts the Directorate operates health centers that cover 10,000 – 20,000 people and provide a minimum package of activities that consist of preventative and basic services (Annear et al., 2015).

The communes of the TRP are serviced by two health centers one in Sandan and another in Chouk. These centers have a total of 2 primary nurses and 13 secondary nurses that attend to over 20,000 people (RGC 2004). Health Centers in the TRP provide outpatient consultation, antenatal care, delivery and inpatient services. The outreach services include vaccines for children and necessary medications for villagers. One of the common occurrences in the TRP is that nurses hired to work at the local health center are not paid a living wage and they open private clinics. Thus, villagers end up using these private services to meet their healthcare needs (Mizutani et al., 2013).

Education

Educational background plays an essential role and can greatly affect the implementation and impacts for projects like TRP with a strong emphasis on training and capacity building in rural communities. Understanding the educational background of community members in TRP target sites can help to design appropriate training materials and activities which contribute to the capacity development of community members and forest committee members, and enhance community enterprise development to improve community livelihoods. Equally important, education levels (and lack of basic skills like literacy and numeracy) can influence and affect community-based forest management. According to Tola (2014), 57% of the population of the TRP are literate or numerate (Tola, 2014). Thus, it is critical when conducting workshops to make sure to use images when conveying critical concepts in order to meet the needs of the whole audience.

1.2.2 Boundaries of the Project Area and the Project Zone (G1)

1.2.2.1 Project Area boundaries (G1.4.)

Please see Figure 1 in section 1.2 for a map of the Project Area.

Table 5: Project Area boundaries.

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

1.2.2.2 Project Zone (G1.4.)

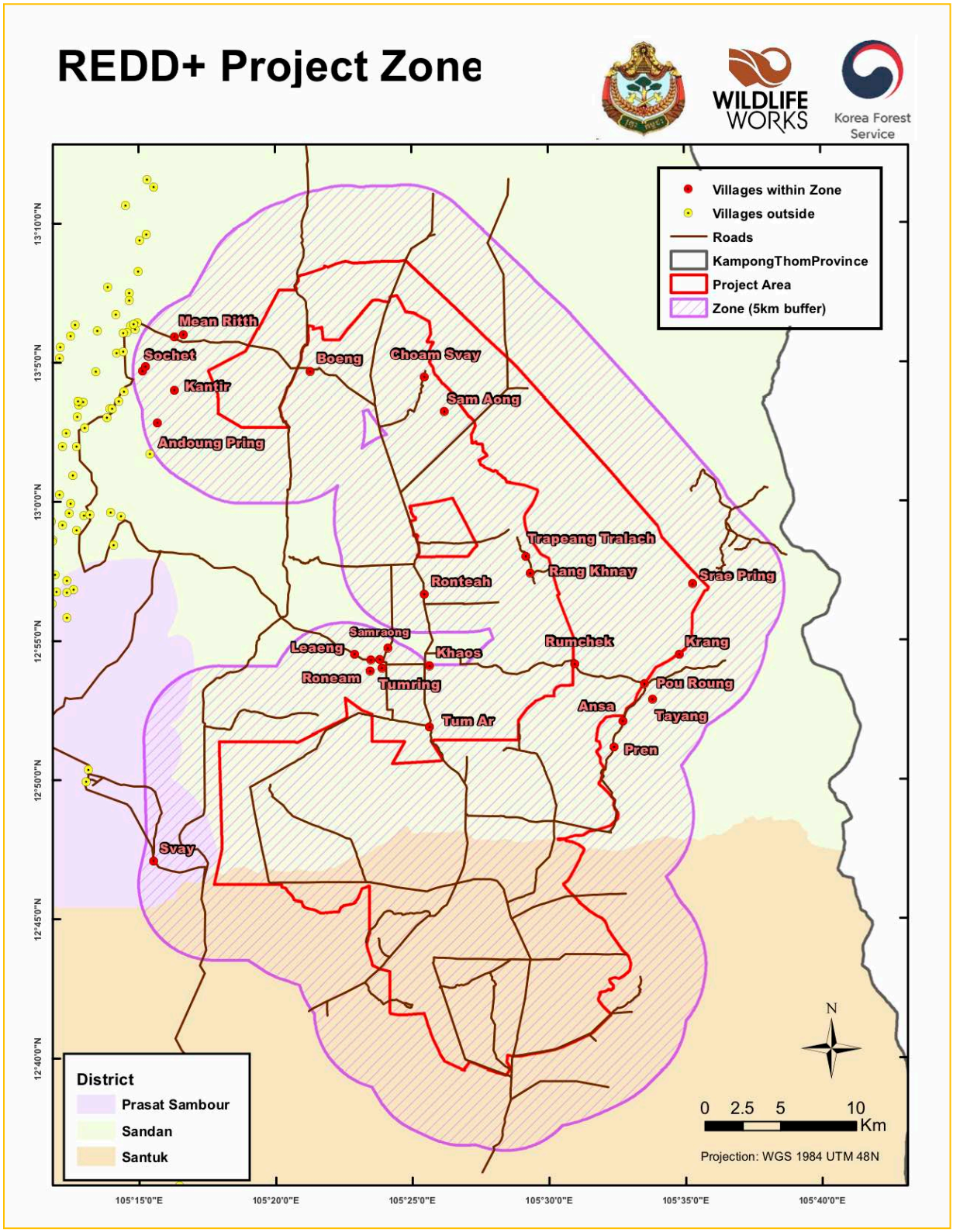


Figure 2: The Tumring REDD+ Project's Project Zone is shown

1.2.2.3 Project Areas that may be included in the future (G1.13.)

This is not a Grouped Project, nor being developed under the Programmatic Approach. There are no additional areas that may be included in the Project Area in the future.

1.3 Conditions Prior to Project Initiation (G1, CM1 & B1)

1.3.1 Types and Condition of Vegetation within the Project Area (G1.3.)

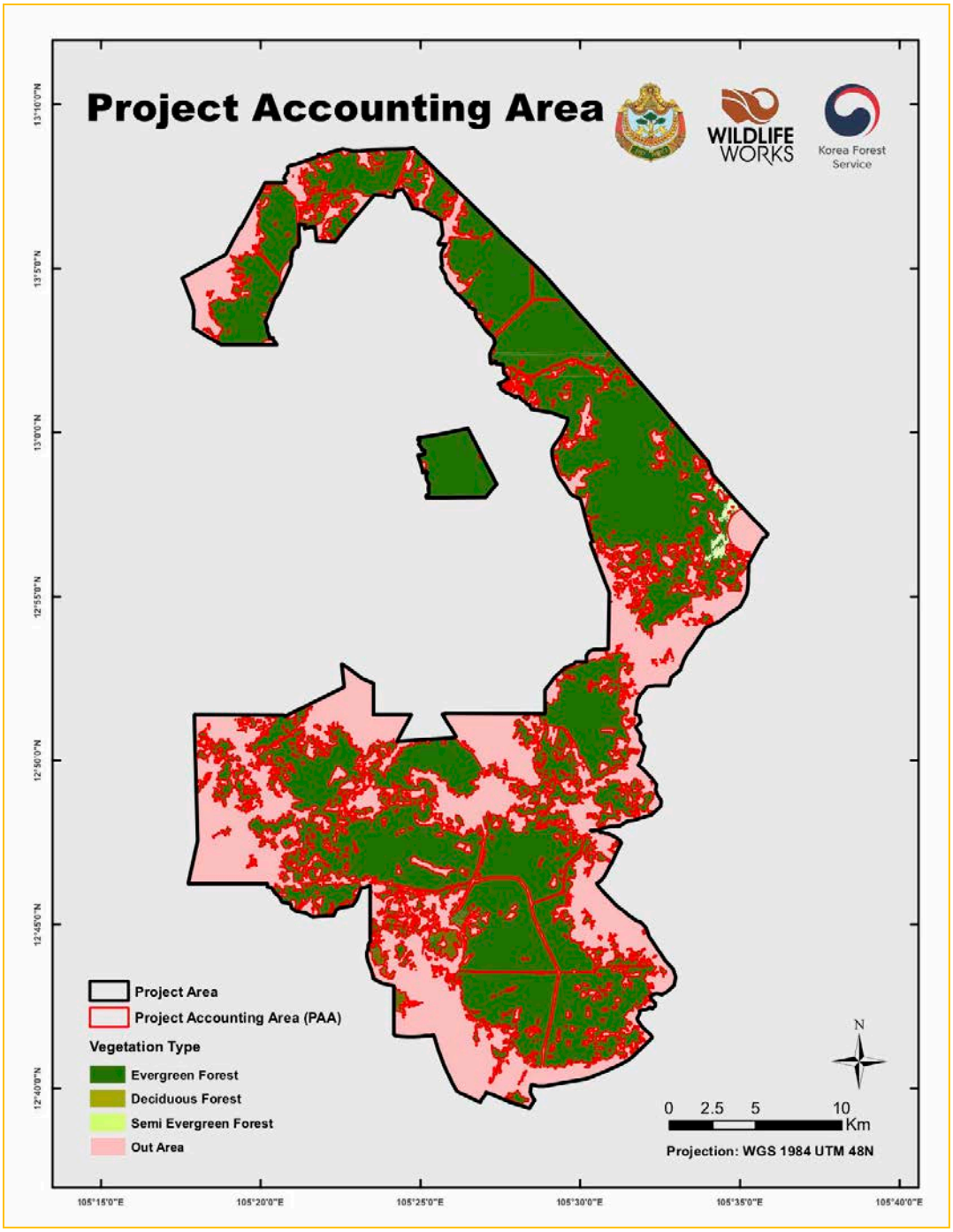


Figure 3: Project Area land cover

Please refer to section 1.2.1.1 for a description of the forest and the forest strata used in the TRP.

1.3.2 Current Carbon Stocks within the Project Area

Table 6: A summary of Current Carbon Stocks within the Project Accounting Area

Stratum	Area (ha)	Mean Carbon Stock (t CO_2e / ha)	Standard Error (t CO2e /ha)	Mean dbh (cm)
Evergreen Forest	40,541.01	495.4	21.38	19.11
Semi-Evergreen Forest	197.71	135.5	81.42	19.98
Deciduous Forest	456.78	118.64	42.73	24.57

1.3.3 Process of stakeholder identification, and description of Communities Located in Project Zone, Including Basic Socio-Economic and Cultural Information (G1.5.-1.7. & CM1.1.).

Stakeholder Identification (G1.5.)

The primary method for the identification of stakeholders in the TRP was through a SBIA workshop that was held in Sandan District Hall, Kampong Thom Province, November 9-11, 2015. This workshop had 28 participants, who were all identified by local experts as leaders or representatives of the Project stakeholder groups. Additionally, the expert knowledge of the Project Proponent was used to identify any project stakeholders who were not previously identified during the SBIA workshop.

Please refer to Table 3. of section 1.2.1 for the list of all the communities in the Project Zone as well as the map in Figure 4 below.

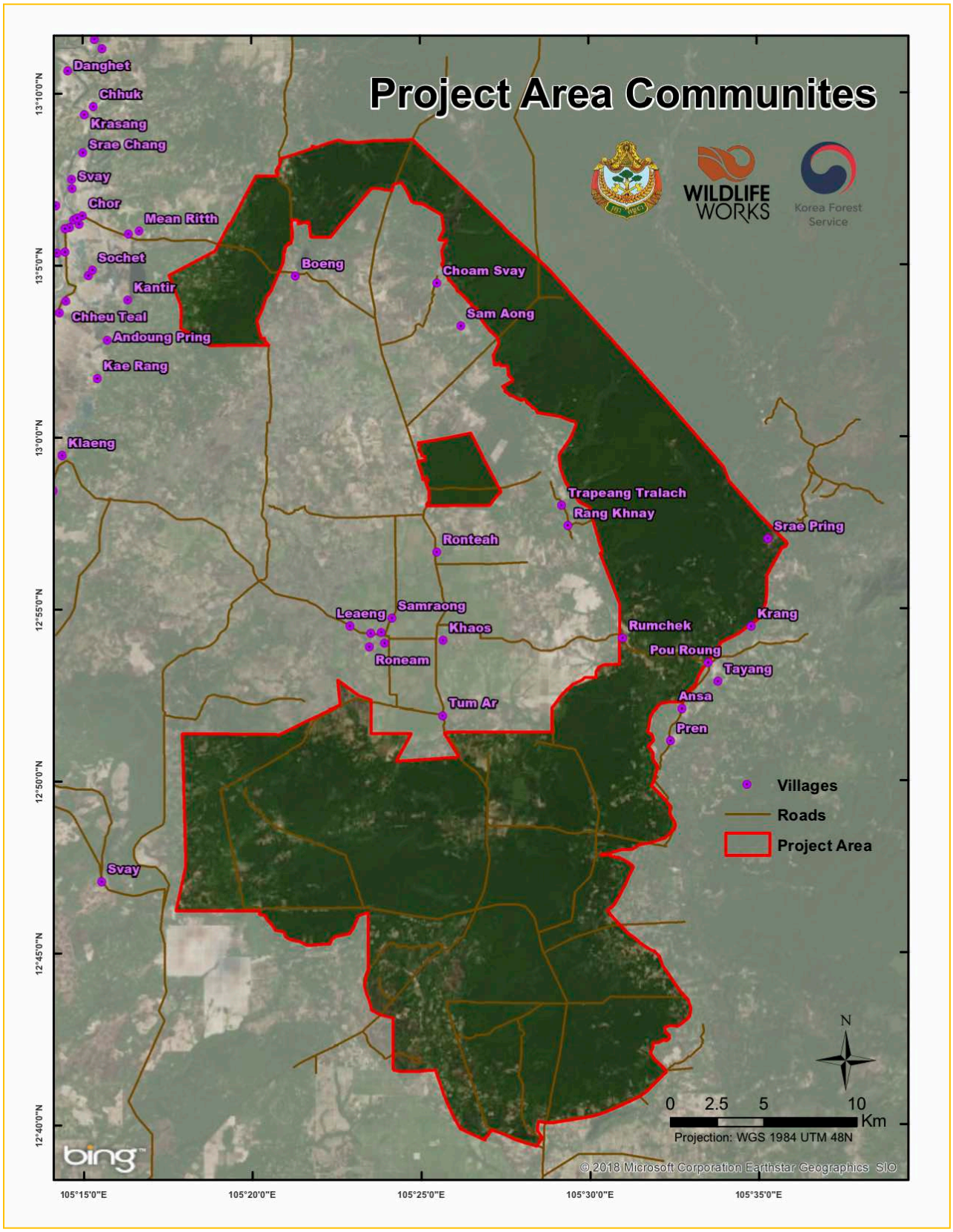


Figure 4: A map showing the Major cities, village and towns in the Project Zone

Project Zone Communities (G1.6. & G1.7.)

The Project Zone is mostly heterogeneous socially and economically. The surrounding communities can be most accurately and coherently understood by dividing the Project Zone into two; the northern and central portion (Sandan District) and the southern portion (Santuk and Prasat Sambour Districts). Most data is obtained from Government sources, in addition to some independent studies have been carried out within the Project Zone, providing further valuable insight. Figure 4 above shows the major towns, villages and other place-names within the defined Project Zone, which encompasses the Project Area as well as the surrounding areas and communities affected by the Project (see description and map of the Project Zone in Section 1.2.1.2 above). Please also refer to Appendix F for a larger, more detailed rendition of the map.

Demographic information

The last national census in Cambodia was conducted in 2008. In 2008, Kampong Thom district had a 1/1 ratio of males to females and the communes bordering the Project Area had the highest growth rates in the province. In the north and central areas of the Project area, the communes adjacent to the Project Area, Mean Rith and Tumring, had the highest population growth rates with both locations doubling their populations in from 1998 – 2008 (Mean Rith had a 8%/yr growth rate and Tumring had a 10%/yr growth rate). Similarly, in the south Tbang Chas, the commune adjacent to the Project Area, more than doubled from 1998 – 2008 (it had a 12% / yr growth rate). From our remote sensing analysis, these communes were mostly forest in 1998 and are former concessions. In migration from other provinces and land-grabbing have been the impetus for the population increases in these communities and the migrants are the main agent of deforestation in the Project Area.

1.3.4 Current Land Use, Customary and Legal Property Rights, and any Ongoing or Unresolved Conflicts (G5.1. & G5.5).

Land use

Please refer to section 1.2.1.1 for a description of land use within the Project Zone.

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 (ii) Private property:

1. **State Public Property:** According to the 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 7: The Customary and Legal Property Rights in the Project Area

Forest Management Unit in the Project Area	Legal Property Right	Customary
Community Forest **(14 community Forests)**	• 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 • 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) • Community Forest Agreements shall be in effect not more than a period of fifteen (15) years from the date of approval by the Forestry Administration Cantonment Chief (Article 27, CF sub-decree) .	• Article 2 of the Forestry Law (2002) outlines the state ensures customary user rights of forest products & by-products for local communities and as further provided in the provision of this Law or other relevant laws. • 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)

RGC/Japan Hydrological Research Area	• 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.	• Community who living surrounded area are allow by the law to use the resources traditional, not harmful to the forest resources
Forest Restoration Area	• 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.	• Community who living surrounded area are allow by the law to use the resources traditional, not harmful to the forest resources
Permanent Forest Reserve	• Potential be convert to community forest under the support from the project	

Ongoing or unresolved conflicts

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

1.3.5 Current Biodiversity in Project Zone (species and ecosystems), and Threats to that Biodiversity (B1.1.).

The TRP Project Area is home to a wide variety of wildlife and ecosystems that are all highly threatened under the baseline scenario. Section 1.2.1.1 documents the wildlife and ecosystems that are present in the Project Area. These species and ecosystem lists were developed through research of academic and specialist articles and papers, the expert knowledge of the Project Proponent, and on-site surveys and biodiversity monitoring.

The threats to the current biodiversity include, but are not limited to the following:

1. **Land conversion**

As documented in numerous sections of this document, including Sections 4.5 and 4.6, there is significant pressure in the Project Zone for land conversion from forest to agriculture. This results in the loss of the forest ecosystems and the habitat for wildlife. There is significant evidence that the boundaries of the Project boundaries are not enforced (see Section 4.6), and that there is a substantial amount of uncontrolled access into protected areas that leads to rampant conversion.

2. **Deforestation and forest fires**

As further described in Sections 4.5. and 4.6 there is evidence of significant encroachment into the Project Area already. Forested areas are being rapidly cleared due for use as agricultural lands, with the deforestation generally accomplished by hand through an unplanned process. These small-scale farming practices represent the primary cause of deforestation Project Area.

Illegal charcoal production and logging in the Project Area is also a significant driver of deforestation. Charcoal is produced either by targeted cutting of specific species across a larger area, or clear-felling areas and burning the trees in earthen kilns, usually built at the site of deforestation itself. This activity leads to significant forest degradation, and often results in eventual deforestation. Trees are also

selectively logged generally for sale in the local markets for building supplies. Trees are selected based on their species, sizes and form. The selective harvesting of trees acts to open up the forests, creating fragmentation and providing easier access into the forest for further deforestation activities. Forest fires are also common, especially in the deciduous forests. These fires may be from natural or anthropogenic sources. But as the forest is degraded, it's natural fire resistance and resilience is gradually degraded, making the fires more catastrophic.

Firewood is also collected on a large scale.

3. **Poaching and habitat loss**

Subsistence poaching of small game is still carried out in the Project Area. This is mainly through the use of snares and traps. The poaching is a significant potential risk to wildlife, especially as the local populations increase and forest fragmentation increases, providing easier access into the forest.

4. **Habitat fragmentation**

Habitat loss due to agricultural expansion, settlements and fences may influence wildlife migration routes, causing habitat fragmentation. The TRP is a buffer area for the large Prey Lang Wildlife Sanctuary. As the forests around the wildlife sanctuary are converted to agriculture it isolates the wildlife in the sanctuary and limits their ability to migrate and roam for food and water.

5. **Climate Change**

Climate change in Cambodia will result in increasing average temperatures, change traditional rainfall patterns, result in more frequent and prolonged droughts (MAFF, 2014), and reduce the productivity of the traditional crops grown by local farmers who already experience low variability and diversity of crops. High reliance on small-scale agriculture due to low skills and lack of knowledge concerning other income-generating activities can lead to the communities to a severe vulnerability to climate change, which in turn poses a large risk to biodiversity.

For Cambodia, the traditional pattern of rainy-season followed by periods of drought is very important for maintaining both the natural and anthropogenic systems. The native forest species are all highly adapted to this pattern and shifts in it result in severe stresses to the native ecosystems. Under the current predictions of climate change it is estimated that the wet seasons may become shorter, but with higher levels of overall rainfall, with the drier seasons being longer and drier. This will result in increased amounts of flooding and also, make the flooding less predictable. The impacts will also affect agriculture, potentially resulting in greater pressure on the forest for resources to replace income lost from farms or to provide food (MAFF, 2014).

Climate change is producing significant threats to both flora (through deforestation) and fauna (from increased poaching activities). Failed crops trigger increases in poaching for meat, which will be stressed by even lower rainfall and higher median temperatures in the future, and wildlife populations may be less able to withstand further stress from poaching.

1.3.6 High Conservation Values within the Project Zone (G1.7, CM1.2. & B1.2.)

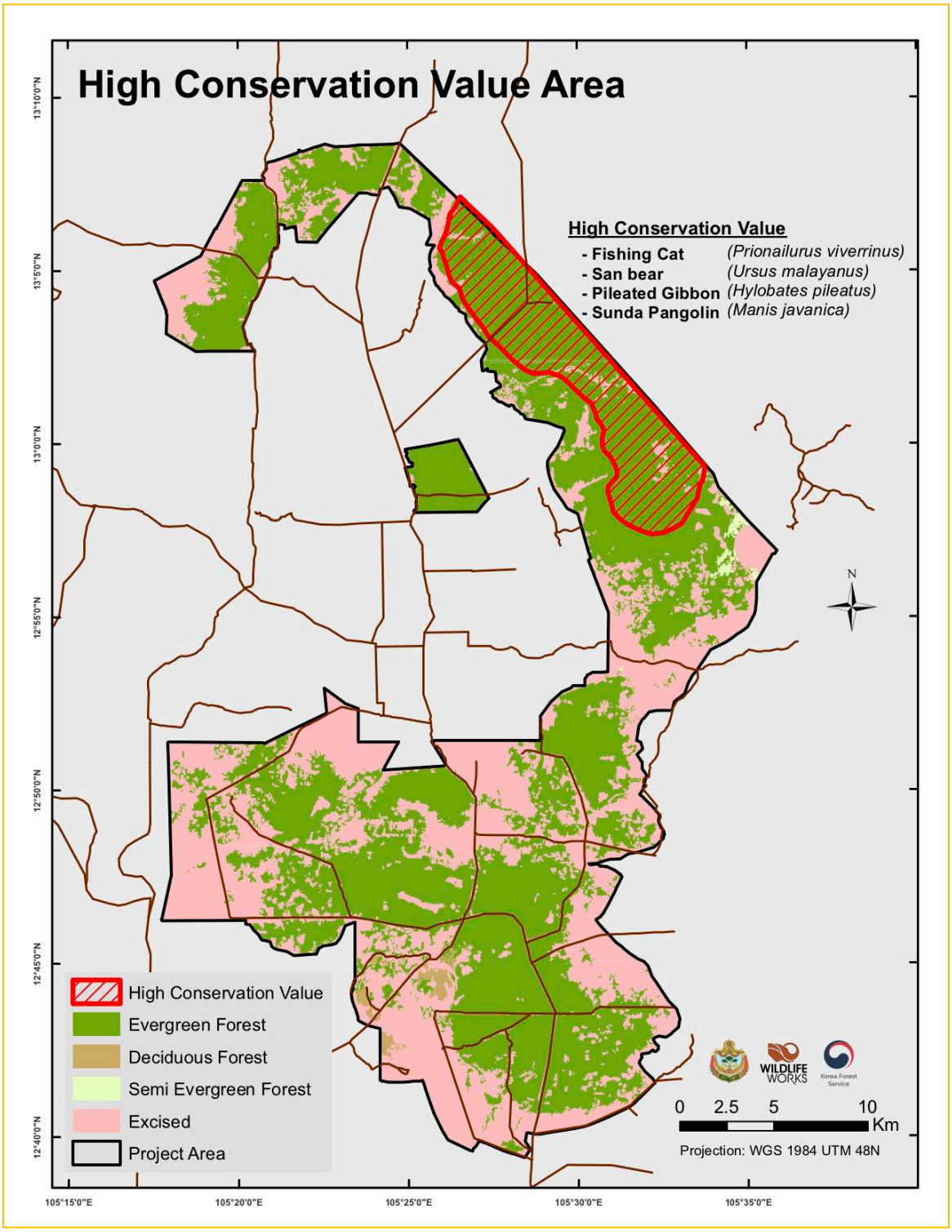


Figure 5: Map of the Tumring REDD+ Project showing locations of High Conservation Value (HCV) in the Project Area. For most HCVs the entire forested area of the Project Area is the area of HCV, except those of habitat for threatened, vulnerable or endangered species, which is concentrated in the area shown.

1.3.6.1 Globally, regionally or nationally significant concentrations of biodiversity values

Due to its diversity in habitats and species, the Project Zone contains a number of biodiversity values that are significant on a global, regional and national level.

1.3.6.2 Protected Areas

The north and eastern portions of the Project Zone include the newly created Prey Lang Wildlife Sanctuary, created on May 6, 2016. Until 2016 Prey Lang was part of the Permanent Forest Reserve and was mostly economic land concessions for logging. It was partially logged but local communities fought against it and with the support of international conservation organizations finally had it declared a protected area last year. The Prey Lang Wildlife Sanctuary has regional significance because it is one of the last, and largest, contiguous intact lowland tropical forests in Asia.

1.3.6.3 Threatened Species

There are a number of species in the Project Area that are classified as either near threatened, vulnerable, endangered or critically endangered. The following lists threatened species according to the IUCN within the Project Area:

Near Threatened (NT):

- Black Giant Squirrel (*Ratufa bicolor*)
- Indochinese Lutung (*Trachypithecus germaini*)
- Great Hornbill (*Buceros bicornis)*
- Siamese Fireback (*Lophura diardi)*
- Asian Golden Weaver (*Ploceus hypoxanthus*)
- Grey-headed Parakeet (*Psittacula finschii*)

Vulnerable (VU):

- Sun Bear (*Ursus malayanus*)
- Malayan Porcupine (*Hystrix brachyura*)
- Sambar (*Rusa unicolor*)
- Fishing Cat *(Prionailururs viverrinus)*

Endangered (EN):

- Pileated Gibbon (*Hylobates piletus*)
- Sunda Pangolin (*Manis javanica*)

1.3.6.4 Species Endemic to the Prey Long Ecosystem

There are several bird and one tree species that are endemic to the Prey Lang Ecosystem. They are listed below:

<u>Birds</u>

Regional endemics/near-endemics are well represented in Prey Lang, including the Siamese Fireback (*Lophura diardi)*, Bar-bellied Pitta (*Pitta elliottii*), and Black-browed Fulvetta (*Alcippe grotei)*, while regionally threatened species present include the Great Hornbill (*Buceros bicornis*),

Wreathed Hornbill (*Aceros undulates*) and Woolly-necked Stork (*Ciconia episcopus*) (Hayes et al 2015).

Tree

Diospyros bejaudii is the only endemic tree species recorded in Prey Lang. It is found in the endemic swamp ecosystem of Prey Lang (Theliade 2010).

1.3.6.5 Areas that support significant concentrations of a species during any time in their life cycle (e.g. migrations, feeding grounds, breeding areas).

The Project Area does not support significant concentrations of species during any time in their life cycle.

1.3.6.6 Globally, regionally or nationally significant large landscape-level areas where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance

The Project Area is the southwestern corner of the Prey Lang landscape, an area that has global, regional, and national significance as one of the more significant areas of lowland evergreen forest in the Indo-Burma hotspot. Within it are viable populations of most of the species that are present, and these populations are present in natural patters of distribution and abundance.

1.3.6.7 Threatened or Rare Ecosystems

The only endemic, rare ecosystem found in the Project Area is the Evergreen swamp forest. This forest type occurs on very wet sites with permanent high-water level. The forest consists of species adapted to permanent or long-term inundation. The forest is reported to contain species characteristic of mangroves.

1.3.6.8 Areas that provide basic ecosystem services in critical situations (e.g. watershed protection, erosion control)

Critical ecosystems services are those services where their disruption would pose a threat of severe, catastrophic or cumulative negative impacts on welfare, health or survival of local communities (Brown et al, 2013, p. 37). The TRP Project Area is critical to local communities for is hydrological services and erosion control. These services are described in more detail below.

1.3.6.9 Hydrological services

The Project Area is part of the Stung Chinit River watershed, a major tributary of Tonle Sap Lake, the heart of Cambodian aquaculture and one of the keys to the country's economic engine. The river provides sustainable water resources for daily use (household consumption), agriculture, irrigation, drainage, and fisheries. In the case of the households in the Project Zone, the predominately poor and rural population is highly dependent on the continued supply of water. For example, from 2003 – 2009, the Asian Development Bank, Agence Francaise de Developpement (AFD), and the RGC implemented an irrigation and rural infrastructure Project from which three communes and 24 villages received dry season irrigation support.

It is important to note that deforestation in the Stung Chinit watershed has contributed to a drop in water levels. It is predicted that deforestation over the last 10 years has led to an increase in localized flooding and longer dry periods. It is important that deforestation is halted to insure water resources are made available for cassava, rubber and other agricultural crops planted downstream.

1.3.6.10 Erosion control

Flooding in the Project Zone is due to deforestation and has led to increased erosion and a loss of agricultural land. It is important to design targeted conservation of riparian areas that provide critical protection to downstream fields and populated areas. It is therefore important to design a system of forest management that regulates the use of forest in riparian areas.

1.3.6.11 Areas that are fundamental to meeting the basic needs of local communities (e.g. for essential food, fuel, fodder, medicines or building materials without readily available alternatives)

Local communities depend on natural resources in the Project Zone and Project Area to satisfy their basic needs. Building materials such as poles and planks are sought after, as they are required to build houses. Cooking is almost exclusively done using firewood, leaves of trees and grasses are used for fodder, and land is needed to grow food (rice, maize, fruit (mangoes, papaya, banana, ect.) and vegetables (tomatoes, cucumbers, carrots, etc.).

As such, the Project will seek to provide ready alternatives to the unsustainable extraction of wood products. Buffer areas surrounding all villages, established collaboratively with local communities, will be utilized for the livelihoods of stakeholders. The size of the buffer areas shall be re-evaluated at baseline re-evaluation (in 10 years) or earlier, if needed. The juxtaposition between excluding buffered areas from the project for livelihood purposes, and inclusion of areas to be protected from deforestation and degradation is an important subject for FPIC and other community meetings. Communities will decide how much land they need (accounting for future agricultural expansion, NTFPs and other wood extraction) to continue their livelihoods, and how much area they wish to include in the REDD+ project in order to capture carbon revenue for their communities.

There are also a number of NTFPs and medicinal plants that are important in Kuy culture and in the local communities. These include, for example, resin a critical component of household income, as well as bamboo and rattan for household building materials. These are consumed in relatively small amounts and Carbon accounting does not track consumption of these products separately in forest biomass monitoring. Local stakeholders will continue to collect NTFPs and small amounts of wood from the Project Zone, and it is believed that no alternatives must be sought at this time.

Finally, fodder and grazing land with no readily available alternative represent areas of importance for local livelihoods. The local villagers are dependent on former forestlands for pasture for their livestock. At no point will local actors be forced to severely modify their traditional practices or moved from their communities, in which they have been residing.

1.3.6.12 Areas that are critical for the traditional cultural identity of communities (e.g. areas of cultural, ecological, economic or religious significance identified in cooperation with the communities)

To the TRP's knowledge, there are no globally or locally recognized areas that are critical for the traditional cultural identity of the communities. Moreover, upon consultation, it was found that no sacred sites have been established within the Project Area.

Given the above, the Kuy, do maintain some level of traditional practices. The aim of the TRP is to bolster and accentuate traditional practices, and through strong collaboration with local communities, will identify key areas which are required to be preserved, and use Carbon resources to protect the traditional lifestyle of the local stakeholders. Carbon must be seen as a

positive force in the eyes of the local communities. Should this fail, it is understood that the Project will likely fail as well.

1.4 Project Proponent (G1.1 & G4)

Organization name	The Royal Government of Cambodia, Forestry Administration
Contact person	Chhun Delux
Title	Deputy Director of Forest Industry and International Cooperation
Address	Number 40, Preah Norodom Boulevard (41), Phnom Penh, Cambodia
Telephone	+ 855.77.805.610
Email	chhundelux83@gmail.com

1.4.1 Project Partners (G4.1.)

Organization name	Wildlife Works Carbon
Role in the project	Project Development Consultant
Contact person	Brian Williams
Title	Director of Asia Sourcing
Address	242 Redwood Highway, Mill Valley CA 94941
Telephone	+1.415.331.8081
Email	Brian@wildlifeworks.com

1.5 Other Entities Involved in the Project (G4.2)

Organization name	Korea Forest Service
Role in the project	Donor (funding in project preparation phase)
Contact person	Mr. Manwoo Lee
Title	Deputy Director General of International Affairs Bureau
Address	Number 40, Preah Norodom Boulevard (41), Phnom Penh, Cambodia
Telephone	+82-481-4088
Email	mwlee2000@korea.kr

Organization name	Action for Development (AFD)
Role in the project	Local NGOs Partner
Contact person	Mr. Som Sopheak

Title	Executive Director
Address	Pou Bakkor village, Domry Cheankhla Sangkat, Stueng Sen City, Kampong Thom Province, Kampong Thom, Cambodia
Telephone	+855.062.6900.213
Email	sopheak@afd-cambodia.org http://www.afd-cambodia.org/

The key technical skills required to implement the TRP are an understanding of the science of remote sensing, biomass sampling, and conservation biology, experience implementing community and livelihood development programs, effective forest protection enforcement and monitoring and overall project management.

The Royal Government of Cambodia's Forestry Administration is the lead agency in forest management and biodiversity conservation. Its staff is well trained in project management, the science of remote sensing, biomass sampling and conservation biology. They have the human resources to support these areas of the TRP.

Wildlife Works Carbon is one of the leaders in REDD+ Project development. It has staff experienced in REDD+ Project design and implementation. It created and currently manages the first REDD+ Project under the VCS standard. It has the skills to support all REDD+ activities, remote sensing, biomass sampling, biodiversity sampling, project management and forest protection.

The Government of Korea provides the majority of financing for the TRP and has support staff that help in the management and implementation of the Project.

Action for Development is experienced in the implementation of livelihood development research, program management, development of programs to build capacity in local stakeholders, and has extensive experience working at the community level.

The team of the Forest Administration, Wildlife Works Carbon, Government of Korea, and Action for Development have the skills and resources to successfully implement the TRP.

1.6 Project Start Date (G1.9.)

PDR.6 The Project Start Date.

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

1.7 Project Crediting Period (G1.9.)

PDR.7 The project crediting period start date and length.

The project lifetime will be 30 years commencing from the Project start date of 01 January 2015. The GHG accounting period will be the same 30 years as the lifetime of the project.

PDR.8 The dates for mandatory baseline reevaluation after the project start date.

Per the VCS guidelines, a mandatory baseline re-evaluation is to be executed at a minimum of every 10 years after the project start. Therefore, there will be a mandatory baseline re-evaluation on or before 01 January 2025 and on or 01 January 2035.

PDR.9 A timeline including the first anticipated monitoring period showing when project activities will be implemented.

Table 8: Proposed Project timeline including project activities and first and second monitoring milestones.

Date	Project Activity or Event
01 January 2015	Project start date
October 2015 – June 2016	Project carbon stock measurement
July 2016	Proxy Area carbon stock measurement
November – December 2016	Leakage Area Assessment
June 2018	Project Validation
May 2019	Project Verification
June 2019	Project Registration
August 2019	Finalize Project Benefit Sharing Agreement and Operationalize
August 2019	Operationalize the project implementation plan (30 Year work plan) include the monitoring plan of climate, community and biodiversity.

PDR.10 A timeline for anticipated subsequent monitoring periods.

The following diagram depicts the proposed TRP validation and verification timeline.

Figure 6: Project verification and baseline re-evaluation timeline (Ve= Verification event; BR= Baseline Re-evaluation).

2 DESIGN

2.1 Sectoral Scope and Project Type

The 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 definitions provided in the VCS AFOLU Requirements version 3.5 published 19 October 2016 by virtue of the fact that it prevents emissions that would have otherwise taken place through unplanned deforestation.

The TRP is not a grouped project.

2.2 Description of the Project Activity (G1.8.)

The TRP activities build on the knowledge of the project partners, who have been engaging with local communities for several years and have collaborated with these communities to identify their needs.

Through their respective communal councils (outlined in more detail in 2.7.1.), communities have been engaged in designing the following Project activities. Existing project partners' activities have been successful, but their effectiveness and scope of the activities has been limited by a lack of sustainable and consistent funding. Therefore, the most effective manner that has been identified with which to achieve the climate, community and biodiversity objectives of the project is to enhance, expand and make sustainable these on-going project activities. Supporting these operations financially with carbon revenue, and operationally and politically with project resources will be the most direct way to deliver benefits to the communities in a timely fashion. It is envisioned that several new activities, directly supporting the sustainability of the REDD+ Project while simultaneously providing alternative means to the local communities, will be enacted with the introduction of carbon revenue.

Through further consultation of key informants and drawing on the information from FPIC meetings and existing literature, proposed project activities fall into four areas. These four activity areas have been identified as general Focal Issues and are explained in more detail in sections 4.5.2 and 4.5.3. Specific existing activities and envisioned activities are described below, followed by a description of the 8 activity areas that will serve as a framework for activity implementation:

Income Generating Activities (IGAs)

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

Resin tapping and wild honey collection are the most important income generation activities in the Project Area. The goal of the TRP will be to support the improvement of the resin and wild honey value chain. The goal is to increase the value of resin and honey by producing the highest quality products thus increasing the income of local households and link the product to the sustainable market.

Deforestation Free Commodities and Promote farmer production forestry

Agriculture is the main economic engine of the Project Area. Many companies are looking to purchase deforestation free commodities. In the case of the TRP, the goal is to support agricultural intensification so that the current area can increase its production, and the commodities will have an increased value since they are not produced on land that was newly deforested. Some potential agricultural commodities that may be included are organic rice, cassava, rubber latex, green bean, and soy bean. The project will provide financial and technical support to the farmers, middleman, and export companies to ensure that they are producing commodities without effecting forest resources, and to reduce deforestation from their value chains.

To address the timber and firewood shortage and to reduce pressure on the use of natural forest, while increasing income for farmers, the TPR will provide technical and financial support to farmers to promote tree plantations (short rotation methods will be introduced). The TPR will select farmers who live on the edge of the frontier of deforestation to pilot this activity. To promote income through farmer tree plantations, the TPR will link timber and firewood production to the market. The TPR pilot site for the promotion of farmer tree plantations will be identified and prioritized.

Promoting Effective Forest Land Use Planning and Tenure Security

Unsecure land use rights and ineffective land use in the communities is the backbone of the Project's baseline scenario and a driver of small and large-scale deforestation in the Project Area. Local farmers feel unsecure in their ability to control their current agricultural land, and outsiders and immigrants come to the Project Area and start clearing forest land. This especially occurs in the permanent forest reserves, while well-managed community forestry areas are often well protected. Outsiders and immigrants have perceived that permanent forest reserve areas as an open access area. The TRP will strengthen the current community forestry areas (14 CFs) and encourage communities to establish new CFs through the

conversion of permanent forest reserve to CF area. To promote land tenure security, the TRP will register all CFs in the Project Area and introduce an agricultural land titling program. The TRP will work closely with local authorities, farmers, and any relevant provincial departments to identify agricultural land that is situated inside the Project Area and the legal land owners of that land. The Project will assist in registering these plots under the agricultural land titling program.

Strengthening Community Organizations

The project will support capacity building for community groups and institutions directly involved in the management of natural resources. It will help to train local stakeholders in natural resource governance, land tenure and land rights, responsibilities, forest and fuelwood management and natural resource management education. This will include providing locations for meetings, materials, travel support, bringing in experts on specific subjects (such as conservation agriculture) and other logistical and organizational support.

Training on Agricultural Methods and Intensification

One of the primary goals of the Project is to provide alternatives to such destructive practices as slash and burn agriculture and unsustainable planting and harvesting techniques. These practices often fail, and require vast amounts of land. Using the tenets of conservation agriculture, particularly increased cover cropping, zero tillage and an emphasis on soil health and moisture retention, the project aims to increase yields on existing farms and decrease dependence on the clearing of additional land for new field. Additionally, the Project will build and support produce storage facilities and value-added technologies to take advantage of market price fluctuations and aid in achieving high sale prices.

Employment and Motivation of a Larger Ranger Force

Although a current ranger/community member force exists, its scope and scale is currently inadequate to address the threats to the Project Area landscape. Proceeds from the REDD+ Project will be used to directly hire and train additional rangers/community members, focusing on conservation principles and biodiversity monitoring. To increase motivation, the existing performance incentive program will be enhanced. The current ranger/community member force suffers from inadequate equipment and training. The Project will provide invaluable support to this vital program.

Establish Micro-financing schemes

Using best practices in micro-finance such as micro-loans, micro-insurance and other small and medium development practices (SME), the project aims to support access to capital and markets, thus providing more sustainable and valuable alternatives to current destructive forest practices.

Improve Health Facilities and Care

Proceeds from the Project will be used to enhance the delivery of health care through increased support to health care workers, hiring of additional health care employees and improvements of facilities such as rainwater collection, solar systems, sanitation and support for outreach (hand washing stands at local schools, etc.).

Activity Area 1: Poverty Reduction and Livelihood Diversification

Defined Activities:
Training on income generating activities (IGAs) and direct employment
Establishing micro-finance schemes
Improving health facilities and care

Strengthening community organization and specific promotion of female education
Expected positive impacts
Reduced dependence on extractive forest resources
Increased employment and income from legal IGAs
Increase in stability of income flow
Reduced risks through livelihood diversification
Improved community well-being

Activity Area 2: Food security

Defined Activities:
Training on agricultural methods and intensification
Training on income generating activities (IGAs) and direct employment
Strengthening community organization
Employment and motivation of a larger ranger force.
Expected positive impacts
Increased productivity (crop and livestock) for subsistence and cash purposes
Increase in stability and amount of income
Increased capacity and knowledge
Reduced risk through livelihood diversification
Increased employment and income from IGAs
Improved community well-being

Activity Area 3: Ecosystem enhancement

Defined Activities
Employment of a larger ranger force and increasing their motivation
Training on income generating activities (IGAs) and direct employment
Increasing environmental awareness
Strengthening community organization
Training on agricultural methods and intensification
Expected positive impacts
Reduced dependence on extractive resources

Enhanced ecosystem integrity and ability to provide for wildlife
Ensured maintenance of ecosystem services
Stabilization of water flow and quality for downstream producers
Increase in perception/ recognition of the value of forests resources

Activity Area 4: Biodiversity Conservation

Defined Areas
Employment of a larger ranger force and increasing their motivation
Raising environmental awareness
Training on IGAs and direct employment
Strengthening community organization, esp. female involvement and empowerment
Training on agricultural methods
Tree planting and habitat restoration
Expected positive impacts
Reduced poaching activities and associated impacts
The safeguarding of High Conservation Value Species
Enhanced ecosystem integrity and ability to provide for wildlife
Increase in perception/ recognition of the value of forests and wildlife

Activity Area 5: Forest Land Planning and Land Tenure Security

Defined Areas
Develop forest land use planning and implementation
Raising awareness on land use right and forest land governance
Demarcation agricultural land and registration
Strengthening the management of community forestry, new establishment of the community forestry, and registration
Mainstreaming land use planning into other sectorial planning (i.e. commune development plan.)
Strengthening the stakeholder participation in the implementation of forest land use planning and promote public awareness
Expected positive impacts
Reduced small and large scale deforestation

The safeguarding of community through promoting land rights holding
Enhance local governance, participation, and promote transparency over the forest land use rights.
Secure community land right and secure income from community land based investment.
Gain awareness of the local stakeholders on land use rights and land governance

2.3 Management of Risks to Project Benefits

2.3.1 Natural and Human-induced Risks to the Expected Climate, Community and Biodiversity Benefits, and Measures to Mitigate these Risks (G1.10.)

2.3.1.1 Human induced risks

1. Slash and Burn / Unsustainable Agriculture:

   The greatest human induced risk to the Project's benefits is continued deforestation. As described in Section 1.2.1 and parts of Section 1.3, the Project Zone is undergoing large pressures 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 benefits and thus the Project's sustainability.

   Mitigation for this risk is through the Project Activities, mainly in the form of increased protection of the Project Area, creation of new IGA and through the promotion of improved agricultural methods as described in Section 2.2.

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 are 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 early on. It has been recognized, however, that these law enforcement units lack resources and are consequently unable to effectively reduce the threat. The TRP therefore provides support of financial, political and human capacity. This is achieved by employing more rangers, increasing ranger motivation and providing rangers with more equipment, training and technology.

3. Anthropogenic fires:

   Another human induced threat is frequent fires; these can occur multiple times a year in the area. Many are set intentionally with the goal of clearing trees and brush for agriculture, or some may be the unintentional result of illegal activity, such as charcoal production. The TRP will monitor the Project Area for the occurrence of fire, and work to reduce the risk of the occurrence of fire. In addition, the Project aims to reduce illegal incursions of people into the Project Area, thus mitigating anthropogenic fire potential. Furthermore, the Project Proponent will monitor fire events and other potential contributions to reversals as part of their annual monitoring efforts, and is required to report on and account for any major loss of carbon in the Project Area. Through collaboration with the communities, awareness about carbon protection and forest stewardship will be enhance. It is the goal of the Project to work with communities to understand the value of

the forest, thus decreasing their willingness to destroy their forest resources, as they begin to realize tangible carbon benefits.

2.3.1.2 Natural Risks

The region in which the Project is located is not generally susceptible to severe or destructive natural events. The primary types of natural events that could occur would be geologic events, pests, disease, flooding or fire. The area is not prone to any geologic activity and poses little to no risk to the Project. As the Project Area is a native and biodiverse ecosystem the risk from pests or disease to result in a significant emissions reversal is low. The primary mitigation for this risk is to maintain the forest, and ensure through monitoring that the trees and ecosystem remains healthy and intact. There can be minor seasonal flooding from the annual monsoons. However, the species of this area are all adapted to the hydrological cycles and are not liable to flooding of this type. The Project Area is mostly flat, with very little topographical relief, so the risk of erosion or landslides is very low. The risk of fire has the most potential to cause damage to the forests of the Project Area. However, the risk of significant emissions reversal is low, as the deciduous forest species are fire adapted to withstand the common low intensity fires that commonly occur. The evergreen and semi-evergreen forest types are of a dense, evergreen, moist forest type that is not prone to forest fires. There have been no catastrophic fires in non-degraded forests of this type in this region. Therefore, natural events have low risks to the Project's benefits.

2.3.1.3 Political Risks

All countries possess a slight risk of shifting legislation or the potential for new policies that could in turn potentially affect natural resource management and/or land tenure. 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 considered to be extremely small, especially given that the entirety of the Project Area is currently under government ownership and is 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.

However, 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 the future jurisdictional program, that will only increase the Project's visibility and importance to the RGC.

2.3.1.4 Policy risks

1. Risk of reversal:

   Risk of project reversal due to community opposition is considered minimal, as they have openly and widely been consulted through numerous outreach and information-sharing meetings throughout project development. As a project governance policy, all stakeholders are always able to seek further information or air grievances if desired. The Project will continue to engage the surrounding communities, provide education and support for community social services, and improved livelihood opportunities.

   All these factors build and enhance community support for the project and make them authentic 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 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 sufficient buyers of carbon credits. The Project has been developed as a cooperative effort between Cambodia and Korea, making it an attractive Project to the greater Southeast Asian region. In addition, it is a vital forest resource to Cambodia, and is the frontier of the Prey Lang forest. The intention of the Project Proponent is to nest the Project into the potential future Cambodian jurisdictional REDD+ scheme, which could, in the future, allow for the sale of larger credit volumes, on a recurring, sustainable basis, to sovereign nations. Therefore, the project proponent believes that the risk of insufficient revenues to the Project's benefits is low.

2.3.2 Measures Taken to Enhance CCB Benefits beyond the Project Lifetime (G1.11.)

The TRP activities are all designed to enhance the CCB benefits beyond the Project's Lifetime. The Project is implementing activities that directly address the drivers of deforestation; with a focus on education, poverty reduction and sustainable management of natural resources. These activities will reduce the necessity of 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 this document.

2.4 Measures to Maintain High Conservation Values (CM2.2 & B2.2)

The following biodiversity and ecosystem related HCVs have been identified per the CCB indicators B1.2, in Section 1.3.61.3.6:

- B1.2 a) i. Protected Areas
- B1.2 a) ii. Endangered and Vulnerable plant and animal species
- B1.2 a) iii. Endemic plant species and subspecies
- B1.2 a) iv. Areas that support significant concentrations of a species during any time in their life cycle
- B1.2 b) Viable populations of plants and animals in natural patterns of distribution and abundance
- B1.2 c) Threatened ecosystems

The TRP is designed to ensure the maintenance and enhancement of HCVs by maintaining the species, landscapes and ecosystem of the Project Area intact and non-fragmented. Close cooperation with the communities as well as increased efforts on active protection are key components of the project strategy. Several of the Project Activities are also oriented toward further ensuring that the conservation related goals of the TRP are achieved, and HCVs maintained. These include increasing local awareness and capacity for conservation, generation of livelihood alternatives to reduce pressures on the land.

The following community related HCVs have been identified per Section 1.3.6 (CCB indicators CM1.2):

- CM1.2 a) Areas that provide basic ecosystem services in critical situations
- CM1.2 b) Areas that are fundamental to meeting the basic needs of local communities
- CM1.2 c) Areas that are critical for the traditional cultural identity of Communities

As with the measures outlined above for HCVs B1.2, active protection and alternative livelihood options are intended to reduce pressure on the land and therefore reduce deforestation. These values depend on the continued existence of an intact landscape and this is exactly what the TRP provides.

2.5 Project Financing (G1.12. & 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 has been supported by grants from the Government of Korea. Additionally, the Forestry Administration receives an annual budget support 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 predicted contracted sales 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.

The Project Proponent provides a 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). These both covers all members of the Project's leadership since they are government employees. 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 if needed.

2.6 Employment Opportunities and Worker Safety (G3)

2.6.1 Employee Orientation, Training and Capacity Building (G3.9.).

The TRP considers local employment a priority and local sourcing is strongly encouraged at all levels of the Project, from casual workers up to management positions. The TRP recognizes that local hiring, especially women, marginalized and vulnerable community members, is a major benefit to the implementation and operation of the Project due to the knowledge and familiarity local people possess of the landscape, its communities and its biodiversity. Their involvement will also ensure the sustainability and continuity of the Project throughout the Project's Lifetime and beyond. Currently, the majority of the Project staff is from the Forestry Administration Headquarters in Phnom Penh and the main field project office is located in Tumring. The Tumring office has one contracted Community Facilitator; TRP is also in discussions on the long-term partnership with the local NGO, and Action for Development (AFD). AFD includes local community members and hire from within local communities to work on the implementation of the Project.

The Project is designed to focus on the employment and training of local people, with a focus on women as well as marginalized and vulnerable community members, in order to increase local participation in the

Project as well as build local capacity, knowledge and a robust skills base. This will include hiring local community members as rangers to monitor their community forests for illegal activities, with special attention to the hiring of women and/or vulnerable and marginalized community members where appropriate. The TRP will advertise open positions broadly, with special attention to the recruitment of villagers and youth who live in the Project Zone. Women will also be highly encouraged to apply for the positions. A policy of providing priority in the hiring process will be given to women who are qualified and willing to commit to a period of work with the Project. However, as the tradition and culture of Cambodia may limit women from traveling far away from their home or staying in the field for long periods of time with other men there are some challenges to the recruitment of female employees. In addition, in the Cambodian traditional family structure women are responsible for caring for their children, which may restrict their ability and willingness to travel away from their home villages for work.

The Forest Administration will train local community members in the latest monitoring techniques, data collection methods, and laws in order to conduct effective enforcement. Training will be conducted on an ad-hoc basis as turnover happens to the community-rangers in order to maintain a pool of trained local rangers. Local community members will also be hired and trained to support and manage other activities including IGAs, agricultural intensification, and biodiversity monitoring. In all positions, informal training will happen for each position and local community members will have first priority on being hired.

Educating communities and employees in different areas related to the carbon project will also be on-going. Capacity building on aspects revolving around carbon measurement, accounting, climate change and carbon offsets will continue to take place in the form of meetings, workshops or training days. To date the primary training on REDD+ project management and carbon measurement has been focused on FA staff and management based at their headquarters. It is anticipated that future training will no longer need external experts but will be carried out by locally sourced employees who were trained in these initial stages.

2.6.2 Equal Opportunity for Employment (G3.10.)

The TRP has developed an Equal Opportunity Policy, which has been provided to the validator for review. Based on this policy future TRP job positions will be openly advertised through the Project Office within in the Project Area. The Project has the responsibility for the fair treatment of all, representation of all groups present in the Project Zone and for encouraging diversity within project staff and management. The TRP has a policy that there will be equal opportunity for all groups, including members of ethnic minorities, different socio-economic groups, genders and sexual orientations, for all employment positions and for inclusion in REDD+ program activities. The selection of potential employees is held on a democratic and neutral basis, providing equal opportunity to all applicants. The TRP operates a strict non-discrimination policy such that women and vulnerable groups of people will receive equal chances regardless of the type of work.

Job applicants are selected for an interview based on their skills and experienced required for the advertised positions. The Project Office will be closely involved during the selection process in conjunction with a committee from the Project Office and the Head of the relevant department for which the vacancy is advertised. Employment vacancies are publicly advertised through the same channels that other project news is publicized, such as through posters at villages and sign boards. Successful candidates are selected in a democratic, non-discriminatory manner in accordance with the Project's equal opportunity policy. Preference is given to applicants who live in the local communities in the case where two applicants show the same capacity for a given position whereas one is local and the other one not. Unsuccessful candidates are provided with an explanation for why they were not selected in order to assist them to improve if there is another vacancy in the future.

All capacity building activities in the local communities in the Project Zone will be open to all villagers, including women and vulnerable populations. A number of community forestry management committees currently contain women, who play a crucial role in the implementation of the TRP activities. As such, it is important that their capacity and skills are strengthened equally as the men. These trainings will not be limited solely to climate change and the REDD+ project, but a wide range of subjects which will ensure the successful implementation of the TRP. This includes agricultural training and other technical skills to improve the livelihood of their families and community. An assessment of the needs for capacity building with the forestry community members and other stakeholders in the project zone will be conducted with their participation and consultation to identify their priorities and needs.

The TRP will enact a policy on staff turnover where employee contracts will ask them to inform the Project at least two months before their resignation from their position. Announcement of recruitment for new staff will then be made at least two months before their final work date. This will allow new staff to have sufficient time for training and on the work and activities of the position, and to learn any lessons learned related to the position and the TRP. A training session will be conducted with the participation of the new staff member, to introduce the Project, and the officers responsible for each project components will present the work and activities that they are responsible for.

A project management structure has been developed with clear lines of communication between project staff to ensure direct communication and solidarity. New staff will be informed of this structure so that they will have good communication for which to ask for information, knowledge and experience of the project staff to improve their performance.

2.6.3 Employee Safety (G3.12.)

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 will be taken to inform employees of their rights, to assign roles and responsibilities to supervisors and workers and provide a safe workplace culture. This document will be 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 auditor and will be kept at the Project Office and be readily available for any consultation. In addition, TRP will set up Health and Safety Fund, the will be sourced from the contribution from the sale of TRP credit, charity, and the contribution from the FA budget. The fund will be used to compensate project workers that any accidental during their working hours/work mission. The TRP will ensure detailed orientation of newly recruited employee during their initial introduction at work and ensure that they are fully aware of their rights as well as responsibilities.

2.7 Stakeholders (G3)

2.7.1 Process to communicate Project costs, risks and benefits to Communities (G3.2.).

The TRP has been designed through the engagement of communities and stakeholders and has involved them in decision-making and implementation from the 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, which makes it possible to disseminate information to the communities in a quick and timely manner as well as to encourage their involvement in the Project. During the last year and a half, Project Partners have conducted a Social and Biodiversity Impact Assessment (SBIA) and suite of community meetings focused of Free Prior and Informed Consent (FPIC). These meetings were the basis for which Project costs, risks and benefits to communities have been communicated.

A Project Sub-Office has been established at Tumring FA Triage office ranch in the spring of 2016, and a REDD+ office was created. This office serves as the administrative headquarters of the TRP and is open to all community members and stakeholders to visit to gain information about the Project and/or place comments or grievances. The primary communication method to stakeholders and communities is through the Project Partner's existing channels of communication to 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 would communicate the information to the 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 read and have full access to any such material. The Project Office constructed seven sign-boards 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. In addition, community FPIC meetings took place from February 2016 to December 2016. For the FPIC process 26 community and stakeholder meetings were held. Significant time was given between the initial SBIA stakeholder consultation and the time that any formal decision-making was expected. Details of the SBIA consultation and all FPIC meetings including the dates, locations and number of attendants, are provided below in section 2.7.2.

2.7.2 Community and Stakeholder Identification and Involvement in Project Design (G3.4.)

The process of Community and Stakeholder identification was conducted through a series of key informant/Expert interviews, workshop discussions, an analysis of rights and a literature review. Through these methods it was possible to obtain a well-informed and comprehensive understanding of all communities and community groups in the Project Area. Consultations with each group were integral to the Project design, in particular during the SBIA training and workshop with FA officials and local community decision makers.

The SBIA training and workshop utilized the theory of change logic to hypothesize how the TRP intends to achieve its objectives. In other words, through the SBIA training and workshop Forestry administration officials and key community leaders created a roadmap of how the TRP plans to get from Point A (project activities) to Point Z (project impacts). First the participants created a Project Vision Statement, secondly they identified and prioritized the Project's focal issues, from which they created a problem statement and

vision statement for each focal issue. With these problem and vision statements they created a problem flow and results chain diagram for each focal issue. Next the participants conducted a risk analysis and negative impact assessment for each focal issue, and finally a theory of change statement. Once these items were created for each issue, a list of mitigating activities and indicators were created for the life of the Project. With this process described above, it demonstrates how key community members and project stakeholders were involved in every step of the Project's design process.

Key informants

Key informants are of particular value for providing inside information of the area and its communities due to the fact that they have been based in the area for decades, and therefore possess substantial local knowledge and experience. Key informants consulted include:

- Mr. Jeff Silverman: REDD+ Technical Advisor of the Wildlife Conservation Society (WCS) and who has been working in the area of REDD+ for more than 10 years. Jeff has been presented his successful experience in providing technical expert to the successful Seima REDD+ Project in Cambodia.
- Ms. Amanda Bradley: REDD+ Tenure Specialist of UN-FAO, she used to work as the Technical Advisor for Pact Inc. and Community Forestry International, she can speak Khmer and she lives in Cambodia for 12 years. Amanda has assisted the FA to facilitate development of the Oddar Meanchey REDD+ Project in Cambodia since 2008.
- Dr. Keo Omaliss: Deputy Director of the Forestry Administration, Dr. Omaliss provides his technical expert as forest policy expert and biologist to the TRP once the project had been started up, currently, Dr. Omaliss is serving as Tumring REDD+ Board Committee, he continues oversee the implementation of the TRP.

Table 9: Key Informant interviews were conducted on the following days:

Key Informant	Position	Date
Mr. Jeff Silverman:	REDD+ Technical Advisor	4/22/16
Ms. Amanda Bradley	REDD+ Tenure Specialist	4/24/16
Dr. Keo Omaliss:	Deputy Director of the Forestry Administration	4/29/16

Focus group discussion at SBIA training

An SBIA workshop took place from the 4th to the 7th of November 2015 at FA headquarters in Phnom Penh. A total number of 12 FA Officers from the TRP attended. During this workshop, discussion focused on the agents and drivers of deforestation, as well as on the community and community groups. Through the expert knowledge provided by the FA officers in these discussions all of the stakeholders of the TRP and a comprehensive list of the categories of people expected to be affected by the project were identified. This provided valuable background information for subsequent investigations and research.

Analysis of rights

An analysis of user rights helped provide a straightforward insight into which communities, community groups and stakeholders are present in the area. The analysis focused on customary rights and ownership to the land. The Project Area is comprised of government owned protected area, but community forestry organizations are also present in the Project Area. This process aided in identifying

communities and stakeholders. This analysis was carried out using expert knowledge and also drew from Wildlife Works' experience in other REDD+ Project development.

Literature review

To provide a listing of all potential stakeholders in the TRP a comprehensive review of the literature, including academic papers, published reports and any available open-source Internet resources was completed. This process provided further insight into local dynamics, cultural migration, and historic government land policy. These resources provided both specific information on local stakeholders in the project and general guidance for identifying and describing stakeholders in REDD+ projects.

Identified community groups and stakeholders

The following community groups and stakeholders have been identified in the project. Table 10 outlines their current impact on the land, the effects of the project on these activities and the relationship with other stakeholders. This allows the Tumring REDD+ Project to understand the complexities within the social structure and generates insight into potential conflict areas. This in turn informs where special care is needed and helps to target project activities more directly.

Table 10: The Stakeholders in the Tumring REDD+ Project.

Stakeholder or stakeholder sub-group	Current impact/ activities in landscape	Effect of project on their activities	Relationship with other stakeholders (Partnership/conflict)
Agriculturalists	Land conversion, cultivation and irrigation	No further land conversion allowed, loss of potential agricultural land	Potential conflict with Landless-migrants due to livestock and land incursions
Charcoal producers	Extraction of wood for charcoal making, often from protected areas	Prohibition of charcoal making in the Project Area, loss of income generating activities, increased law enforcement and potential prosecution	Conflict between charcoal burners and FA and Community rangers if illegally trespassing into State Permanent Reserve Forest.
Firewood gatherers	Collection of firewood (sometimes obtained through intrusion into state permanent reserve)	Regulated collection of firewood. Prohibition of collection above subsistence use in the State Permanent Reserve	No conflict besides that resulting from over use. FA allows firewood collection in state permanent forest under a managed scheme.
Subsistence hunters	Intrusion into state permanent reserve forests, killing of wildlife, igniting anthropogenic fires	Greater law enforcement and abatement of hunting activities, persecution.	Potential conflict between hunters and FA and community ranger teams

Women	In charge of firewood collection, increasingly involved in charcoal production	Regulation of firewood collection, stopping of charcoal production potentially leading to some loss of income	Underrepresentation in decision-making, which could lead to conflicts
Youth	Providing assistance for extractive activities, transportation of charcoal bags	Stopping of illegally produced charcoal therefore reducing demand for transportation, preventing intrusion into the state permanent reserve forest	Potential conflict between youth and ranger teams. Underrepresentation in decision-making due to seniority being main precedent for involvement
Landless – Migrants	Living on land without secure land titles, often practicing subsistence agriculture	Cooperation to engage in agricultural training activities, though legal titles needed	Potential conflict between landless and rightful landowners, such as the RGC.
Community Forests	Given Management Rights to State Permanent Reserve Forests	Cooperation with FA to ensure protection and sustainable use of forests	Potential conflict between Community Forests and landless migrants, firewood gathers, and subsistence hunters
Local authority (district and commune, villages)	Provide intervention and assistance to community forestry	Cooperation with FA to ensure protection and sustainable use of forest and forestland security	Differences with FA on the proposed social forestland concession
Police and military	Cooperate with FA to crack down on forest illegal activities	Secure maintenance of forest resource	Potential conflicts with loggers and land grabbers

Stakeholder Involvement

FPIC Activities

Information regarding the TRP was communicated through a series of community meetings that took place in a culturally-appropriate setting. Meetings were conducted by appointed FPIC officers, and were called at public locations, such as village public buildings and schools. It is common in Cambodia to provide tea and a snack at formal meetings, and this custom was also adhered to at these community consultations. The FPIC officers used posters to explain the concept of REDD+, climate change, project activities and conflict resolutions and bring across the project's anticipated benefits as well as costs and risks. An open discussion and question time followed, which often revolved around costs and benefits as well as risks and their concern with regard to implementation of the TRP. FPIC officers presented in Khmer. This ensured that the information was communicated to and understood by the whole audience.

The Initial Community FPIC meetings took place from December 2015 to November 2016. Significant time was given between the initial consultation and the second round of consultations. The second round took place from May 2016 to December 2016. Details of all FPIC meetings including the dates, locations and number of attendants, are provided in Table 1Table 11. Significant time was given between the initial consultation and the time that any formal decision-making was expected.

Table 11: Location, date and attendance of FPIC meetings.

Location	CF Name	Commune	District	Date	Place	Participants Total	Female
Initial Consultation							
Tum Ar	Choam Smach	Tum Ring	Sandan	17-Dec-15	Pagoda	47	22
Roneam	O' Thmor	Tum Ring	Sandan	19-Dec-15	Public building	52	25
Sralau Sraong	Neak Tala		Sandan	18-Dec-15	Primary school	42	24
Ronteah	O' bosleav	Tum Ring	Sandan	20-Dec-15	Public building	48	24
Leaeng		Tum Ring	Sandan	20-Mar-16	Public building	22	5
Kbal Damrei		Tum Ring	Sandan	14-Mar-16	Public building	39	19
Samraong		Tum Ring	Sandan	25-May-16	Public building	26	16
Khaos		Tum Ring	Sandan	24-Nov-16	Public building	33	27
Rumchek	Rumchek	Sochet	Sandan	19-Dec-15	Public building	41	27
Krang		Sochet	Sandan	27-May-16	Public building	67	30
Pou Roung	Khum Sochet	Sochet	Sandan	20-Feb-16	Public building	47	31
Trayang	Khum Sochet	Sochet	Sandan	26-Dec-15	Public building	42	25
Ansar	Khum Sochet	Sochet	Sandan	17-Dec-15	Public building	43	24
Pren	Khum Sochet	Sochet	Sandan	16-Dec-15	Public building	59	25
Srae Pring	Srae Pring	Sochet	Sandan	15-Dec-15	Public building	30	14
Kanti	Tatey	Mean Rith	Sandan	28-Feb-16	Public building	39	21
Boeng	Kbal Dauntey	Mean Rith	Sandan	16-Mar-16	Pagoda	42	22
Sam Aong	O ' Dasco	Mean Rith	Sandan	24-Feb-16	Public building	56	34

Location	CF Name	Commune	District	Date	Place	Participants Total	Female
Choam Svay	O' Kranhoung	Mean Rith	Sandan	19-Mar-16	Public building	65	31
Tboung Tuek	O' Kranhak	Mean Rith	Sandan	27-Feb-16	Public building	73	22
Trapeang Tralach	Prey Hong chamtet	Mean Rith	Sandan	22-Feb-16	Public building	40	14
Rang Khnay	Lbos Sral	Mean Rith	Sandan	25-Feb-16	Pagoda	29	10
Andoung Pring		Cheu Teal	Sandan	17-Mar-16	House	39	25
Prey Kanlaeng		Cheu Teal	Sandan	18-Mar-16	House	25	17
Tbaeng Chas		Boeng Lvea	Santuk	21-May-16	Pagoda	66	21
Svay		Sraeung	Prasat Sambo	23-May-16	Public building	71	21
Khaos		Mean Rith	Sandan	24-Nov-16	Public building	33	27
Total						**1216**	**603**
Second Consultation							
Tum Ar	Choam Smarch	Tumring	Sandan	27-Aug-16	Public building	35	21
Sralau Sraong	Neak Tala	Tumring	Sandan	20-Jun-16	Public building	61	39
Pou Roung	Khum Sochet	Sochet	Sandan	26-May-16	Public building	29	16
Srae Pring	Srae Pring	Sochet	Sandan	26-May-16	Public building	29	16
Boeng	Kbal Dauntey	Mean Rith	Sandan	24-Jun-16	Pagoda	59	30
Ronteah	O' bosleav	Tumring	Sandan	28-Aug-16	Public building	38	13
Sam Aong	O ' Dasco	Mean Rith	Sandan	22-Sep-16	Public building	53	22
Choam Svay	O' Kranhoung	Mean Rith	Sandan	24-Sep-16	Public building	33	25
Tboung Tuek	O' Kranhak	Mean Rith	Sandan	21-Sep-16	Public building	39	28
Roneam	O' Thmor	Tumring	Sandan	22-Jun-16	Public building	54	35
Kanti	Tatey	Mean Rith	Sandan	25-Jun-16	Public building	36	21

Location	CF Name	Commune	District	Date	Place	Participants Total	Female
Rumchek	Rumchek	Sochet	Sandan	23-Jun-16	Public building	40	18
Trayang	Khum Sochet	Sochet	Sandan	23-Aug-16	Public building	27	13
Pren	Khum Sochet	Sochet	Sandan	26-Aug-16	Public building	39	30
Ansar	Khum Sochet	Sochet	Sandan	25-Aug-16	Public building	49	34
Rang Khnay	Lbos Sral	Mean Rith	Sandan	20-Dec-16	Pagoda	30	18
Trapeang Tralach	Prey Hong chamtet	Mean Rith	Sandan	21-Dec-16	Public building	39	31
Total						**690**	**410**
Grant total						**1906**	**1013**

Community Forest Management Committees

Part of the Forestry Administration's long-term vision is to create 1,000 community forest groups and two million hectares of community forests in Cambodia by 2030. As part of this vision 14 community forests were created within the Project Area. The management committees of these forests are critical to the long-term protection and success of the TRP. Below in Table 12 and Table 13 is a profile of the 14 community forests in the Project Area. Consultations with the Community Forestry Management Committees have been held from June 2016 – December 2016. These meetings are highlighted in Table 14 and Table 15.

Table 12: Community Forest Profile in the Tumring (Korea-Cambodia) REDD+ Project Area.

N	Name of CF	Area	Date established	MAFF recognition	Agreement with Kampong Thom Cantonment	CF HH member	Number of HH (DoP, KT, 2013)	Village	Commune
1	Prey Khum Sochet	4,572	1/1/02	19/11/2008	11/11/09	227	162	Pou Roung	Sochet
							122	Pren	
							88	Ansar	
							65	Trayang	
2	Choam Smach	1,446	1/1/02	19/11/2008	11/11/09	132	319	Tum Ar	Tum Ring
3	O' Thmor	1,065	1/1/01	19/11/2008	11/11/09	61	84	Roniam	Tum Ring
4	Neak Tala	1,301	1/1/02	19/11/2008	11/11/09	103	132	Sralao Sroung	Tum Ring
5	O' Dasco	1,135	1/1/02	20/08/2010	25/08/2011	143	194	Sam Oang	Mean Rith
6	Prey Hongchamtet	1,016	25/8/2001	20/08/2010	25/08/2011	65	91	Trapeang Tralach	
7	O' Kranhoung	1,131	1/1/02	20/08/2010	29/01/2012	120	198	Choam Svay	
8	Lbos Sral	1,123	1/1/02	20/08/2010	25/08/2011	61	99	Rang Khnay	
9	Rumchek	497	28/3/2008	20/08/2010	29/01/2012	43	85	Rumchek	Sochet
10	Srae Pring	309	20/3/2008	20/08/2010	29/01/2012	24	39	Srae Pring	
11	O' bosleav	1,359	1/1/02	20/08/2010	25/08/2011	98	239	Ronteah	Tum Ring
12	Kbal Dauntey	1,789	1/1/02			87	166	Boeng	Mean Rith
13	O' Kranhak	1,593	1/1/02	19/11/2008	11/11/09	248	317	Tboung Tuek	
14	Tatey	1,395	2008	19/11/2008	11/11/09	89	126	Kanti	
	Total	**19,731**				**1501**	**2526**	**17**	**5**

Table 13: Community Forest Profile in the Tumring (Korea-Cambodia) REDD+ Project Area.

N	Name of CF	Village	District	Total Population (2013) (DoP, KT 2013)	Women	CF management plan	Demarcation
1	Prey Khum Sochet	Pou Roung	Sandan	743	379	Under preparation	yes
		Pren		586	294		
		Ansar		406	207		
		Trayang		266	134		
2	Choam Smach	Tum Ar		1412	714	Completed but not yet approved by FA	yes
3	O' Thmor	Roniam		353	184		
4	Neak Tala	Sralao Sroung		587	298		fire road
5	O' Dasco	Sam Oang	Sandan	791	396		
6	Prey Hongchamtet	Trapeang Tralach		420	211		
7	O' Kranhoung	Choam Svay		820	490		
8	Lbos Sral	Rang Khnay		422	210		
9	Rumchek	Rumchek		410	213		
10	Srae Pring	Srae Pring		176	85	Under preparation	yes
11	O' bosleav	Ronteah		958	480		
12	Kbal Dauntey	Boeng		686	359		
13	O' Kranhak	Tboung Tuek		1236	672		
14	Tatey	Kanti		626	323		
Total		**17**		**10898**	**5649**		

Table 14: Community Forest Management Committee Meetings.

N	CF Name	Commune	District	Date	Place	Participants	
						Total	Female
1	Choam Smach	Tumring	Sandan	22-Jun-16	Public building	13	1
				27-Aug-16	Public building	13	1
				22-Nov-16	Public building	18	2
2	O' Thmor	Tumring	Sandan	25-May-16	Public building	7	1
				22-Nov-16	Public building	6	0
3	Neak Tala	Tumring	Sandan	19-Jun-16	Primary school	12	1
				22-Nov-16	Public building	5	0
4	O' bosleav	Tumring	Sandan	28-Aug-16	Public building	9	0
				23-Sep-16	Public building	13	3
5	Rumchek	Sochet	Sandan	23-Jun-16	Public building	10	0
				23-Nov-16	Public building	7	0
6	Khum Sochet	Sochet	Sandan	20-Feb-16	Public building	10	0
				26-Aug-16	House	6	0
				23-Nov-16	Public building	18	0
7	Srae Pring	Sochet	Sandan	19-Jun-16	Public building	16	3
				24-Nov-16	Public building	4	1
8	Tatey	Mean Rith	Sandan	28-Feb-16	Public building	6	0

				22-Sep-16	Public building	8	3
9	Kbal Dauntey	Mean Rith	Sandan	16-Mar-16	Pagoda	9	0
				24-Jun-16	Pagoda	12	1
				20-Sep-16	House	11	0
10	O ' Dasco	Mean Rith	Sandan	22-Feb-16	Public building	9	2
				22-Sep-16	Public building	11	0
11	O' Kranhoun g	Mean Rith	Sandan	19-Mar-16	Public building	7	1
				24-Sep-16	Public building	7	2
12	O' Kranhak	Mean Rith	Sandan	27-Feb-16	Public building	5	2
				21-Sep-16	Public building	10	5
13	Prey Hong chamtet	Mean Rith	Sandan	22-Feb-16	Public building	9	2
				21-Dec-16	Public building	18	12
14	Lbos Sral	Mean Rith	Sandan	25-Feb-16	Pagoda	7	0
				20-Dec-16	Pagoda	9	2
						305	**45**

Table 15: Community Forest Consultation on the Tumring (Korea-Cambodia) 30-Year Agreement.

N	CF Name	Commune	District	Date	Place	Participants	
						Total	Female
1	Choam Smach	Tumring	Sandan	22-Nov-16	Public building	18	2
2	O' Thmor	Tumring	Sandan	22-Nov-16	Public building	6	0
3	Neak Tala	Tumring	Sandan	22-Nov-16	Primary school	5	0
4	O' bosleav	Tumring	Sandan	23-Sep-16	Public building	16	5
5	Rumchek	Sochet	Sandan	23-Nov-16	Public building	7	0
6	Khum Sochet	Sochet	Sandan	23-Nov-16	Public building	18	2
7	Srae Pring	Sochet	Sandan	24-Nov-16	Public building	4	1
8	Tatey	Mean Rith	Sandan	22-Sep-16	Public building	8	3
9	Kbal Dauntey	Mean Rith	Sandan	20-Sep-16	Pagoda	11	0
10	O ' Dasco	Mean Rith	Sandan	22-Sep-16	Public building	11	0
11	O' Kranhoung	Mean Rith	Sandan	24-Sep-16	Public building	7	2
12	O' Kranhak	Mean Rith	Sandan	21-Sep-16	Public building	10	5
13	Prey Hong chamtet	Mean Rith	Sandan	21-Dec-16	Public building	18	12
14	Lbos Sral	Mean Rith	Sandan	20-Dec-16	Pagoda	9	2
Total						**148**	**34**

2.7.3 Demonstration that all consultations and participatory processes have been undertaken directly with Communities or their representatives (G3.5.).

The Project has held a significant number of community meetings and workshops during the project development process. Section 2.7.2 lists the community meetings and workshops that were held for all Project stakeholders. A complete report of the SBIA workshops and community meetings, including pictures and meeting results have been provided to the validator.

2.7.4 Measures needed and taken to enable effective participation of Communities (G3.6.)

In order to ensure effective participation of TRP communities it was important to hold meetings and workshops during time periods where stakeholders could attend. As such, all meetings and workshops were held during the day 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 respond. This included via written invitations, and phone calls. All communication was conducted in Khmer, a language every participant speaks, thus enabling participants to fully understand enabling their full participation.

2.7.5 Steps to Communicate and Publicize the full Project Documentation, Project Validation and Verification Process, and CCB Public Comment Period (G3.1. & G3.3.).

The VCS and CCB 30 day public comment period was May 30th, 2017 until June 30th, 2017. The following steps have been taken to ensure all stakeholders have access to the PD and are aware of and provided a means to comment on the document for the public comment period:

- The Project Office and Project Sub-Office (Tumring commune) maintains a full printed version of the PD in English for public viewing.
- An executive summary of the PD was made available in English and Khmer at the Project Office and Project Sub-Office (Tumring commune). The executive summary is additionally be posted in public places in communities throughout the Project Zone.
- The full PD version and the executive summary of the PD in English and Khmer version are made available on the project webpage (http://tumringredd.org/) and the FA webpage and an official Facebook page.
- In addition to the executive summary, a poster/flyer in Khmer advertising the Project, and providing a contact email address will be posted in communities.
- A poster/notice in Khmer advertising the public comment period, and the validation field visit was posted in communities throughout the Project Zone. It included details on how a comment to the CCB can be made.
- The Project Proponent additionally actively communicated to community members and stakeholders at the start of the Public Comment Period the methods to submit comments and how to view full project documentation. This was specifically accomplished by communicating the Project, Public Comment Period and Validation field visit dates to previously identified stakeholders, community leaders, leaders of the faith communities and public officials. They were then requested to pass that information onto their communities.

During the VCS and CCB comment period no comments were received. This includes both comments submitted through the VCS website or through the Project's comment system detailed above. As there were no comments received, the project design was not updated, nor were any comments deemed insignificant or insignificant.

2.7.6 Process for Handling Unresolved Conflicts and Grievances (G3.8.).

The TRP strives to minimize the possibility of conflicts and grievances by maintaining close linkages between and working proactively with communities and stakeholders throughout the Project Zone. The Project additionally has an open-door policy, encouraging community members, stakeholders and employees to visit the Project Office and Project Sub-Office, which is located at the Forestry

Administration branch office in Tumring Commune, and discuss any issues or feedback directly with project staff.

In the case that conflicts or grievances arise, the TRP has a feedback and grievance redress policy and process, the purpose of which is to provide an efficient, fair and accessible mechanism for resolving complaints and conflicts, and ensure that the process is transparent and comprehensive. The TRP feedback and grievance redress process has been publicized to communities and a copy provided to the project validator.

The full grievance policy has been submitted to the validator and is available to anyone upon request. In summary, community members and project stakeholders are encouraged to submit grievances, comments or feedback to the Project Office through several channels, with all communication methods receiving the same level of response. The primary method for communication will be through the Project Office or Sub-office which is located at the Forestry Administration branch office in Tumring Commune, or the Community Forestry Management Committee (CFMC) offices, which are located throughout the Project Zone.

Two types of issues accounted for in the grievance process include:

- Issues or conflict between the community or other project stakeholder and the Forestry Administration, and
- Concerns regarding project employee rights, work practices, and employee safety raised by Forest Administration employees or contractors.

This procedure applies to the Forestry Administration and activities under the TRP. If a Project Stakeholder(s) has a complaint or grievance, it first step should be taken up with a member of the CFMC as soon as possible after the occurrence. The complainant could communicate this verbally or in writing to their nearest CFMC's offices. In 2016 there were 14 CFMC's offices spread out around the Project Zone. In addition, the FA has published an email address and phone number that project stakeholders can use to make comments or voice grievances.

This grievance policy is outlined in the document "Tumring REDD+ Project Grievance Redress Mechanism." This grievance process was described in general at community meetings, and the document has been provided to key locations in the Project Zone. In addition, a summary of the grievance policy was translated to Khmer and posted on the Project information boards located in the Project Zone.

In summary, once the CFMC has received a grievance, through any of the described channels, they are required to respond to the aggrieved person (s) within 7 working days. The CFMC will maintain full records of all grievances received, communications made between the CFMC and the aggrieved person (s), and the agreed resolutions. If the CFMC and the aggrieved person (s) cannot resolve the grievance to a mutually satisfactory manner, the aggrieved person (s) may raise complaints and grievances to the Provincial Project Committee or its members either verbally or in writing (using Complaints and Grievances Form provided). At his level, the FA Project Management Unit (PMU) is obliged to (1) record every complaint and keep track of the status, and (2) keep complaints and grievances confidential unless otherwise directed by the aggrieved person (s). If there is reason to believe that the Provincial Project Committee (PPC) will not provide an objective review of the concern, the matter may be taken up directly to PBC further review and decision-making. The PPC has to respond complaint within 7 working days since the date of the complaint has been submitted.

The PMU will maintain a record book of all grievances received and their resolutions, which can be views upon request from project stakeholders or auditors. The PMU will update and present the record of recorded cases to the PBC during the annual PBC meeting.

2.8 Commercially Sensitive Information

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 PD document, but will not be included in the public versions of the PD. The commercially sensitive information not included in this public PD includes the Project Proponent's financial and budget information and the Project's budget and carbon credit sales estimates. Additionally, this information includes the Project's standard operating procedures for the biomass inventory, proxy area inventory, leakage area assessment, disturbance monitoring and quality control procedures. These documents provide detailed instructions on each of these procedures, including sample plot identification, methods for data collection, instructions on the use of instruments for data collection and methods to ensure quality control and reduce error in measurement. Lastly, this information includes the calculations and models used to determine the carbon stock in the Project Area and Proxy Area, the activity shifting leakage and market leakage rates and the calculation of the project reference level. 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 validator but may not be distributed publicly.

2.9 Sustainable Development

The TRP will touch upon seven sustainable development themes that the Royal Government of Cambodia has committed to attaining (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 will work to improve local incomes and 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, supporting project activities, improved agricultural yield from agricultural intensification, as well as 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 will support poverty reduction by generating employment and supporting an increase in household incomes. The TRP will work with impoverished communities and focus on providing employment and livelihood support to the neediest community members. There are no indigenous communities within the Project Zone but women are consulted and are included in all Project activities.

Education

A critical component of creating economic development and stopping poverty is improving 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 will be to support farmers in increasing 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 will support 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 will also promote 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_2e/yr. It also demonstrates that the RGC has the capacity to implement REDD+ since it is the lead proponent of the TRP.

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.

All of Cambodia's sustainable development themes mentioned above including economic growth and development, poverty and equity, education, sustainable forest and land-use, climate change, and agriculture and food security, will be monitored and reported through the VCS and CCB monitoring, reporting and verification system at a minimum of every 5 years.

3 LEGAL STATUS

3.1 Compliance with Laws, Statues, Property Rights and Other Regulatory Frameworks (G3)

3.1.1 Employee Safety (G3.12.).

The TRP abides by all relevant Cambodian worker's rights laws and regulations. Workers will be 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 will be informed about the potential safety risks of their job and of methods to mitigate the risks. A hard copy of the relevant laws will be kept at the Project Office and any worker is free to consult these any time during working hours. Below can be found a list of the relevant laws.

The Labor Law, 1997, amended 2007

This 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 the Labor Law (Peng et al., 2012).

In addition to the Labor Law Cambodia 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 will ensure that any relevant international convention or government regulation is fully followed.

3.1.2 Compliance with Relevant National and Local Laws, Regulations, and International Agreements (G3.11. & 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.

Law on Environmental Protection and Natural Resources Management (1996)

The Objective of this law is to protect and upgrade the environment quality and public health by means of prevention, reduction and control of pollution; to assess the environmental impacts of all proposed projects prior to the issuance of decision by the Royal Government; to ensure the rational and sustainable preservation, development, management and the use of the natural resources of the Kingdom of Cambodia; to encourage and provide possibility to public to participate in the protection of environment and the management of the natural resources.

The mechanism for implementing this law is through the National Environmental Plan.

The Land Law (2002)

The Land Law classifies the different types of property and ownership rights in Cambodia: (1) State Public Property, (2) State Private Property, and (3) Private property:

1. **State Public Property*:*** According to the 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 Forestry Law (2002)

The Forestry Law is an important sector-specific law that defines the management framework for harvesting, use, development, conservation, and protection of forests in Cambodia. It aims to ensure sustainable forest management and customary user rights of forest resources for indigenous and local communities. Reaffirming the Constitution, the Forestry Law provides that all forests (referred to as the Permanent Forest Estate), belong to the State, noting that there is currently a lack of proper demarcation of Cambodia's forest estate. The Permanent Forest Estate is divided as follows:

Permanent Forest Reserves are State Public Property and fall under the jurisdiction of the Forestry Administration (FA) which is housed the Ministry of Agriculture, Forestry and Fisheries (MAFF). According to the Forestry Law, the Permanent Forest Estate is defined as all forested land within the Kingdom of Cambodia. Generally, all categories of forests fall within the definition of the Permanent Forest Reserves - including forests that occur on private lands, flooded forests, wetland forests and mangrove forests. However, while all these forests are under the jurisdiction of the FA, wetland and mangrove forests outside the Protected Areas (PA) are under the jurisdiction of the Fisheries Administration (FA) of the MAFF. Permanent Forest Reserves consist of three sub-categories:

1. Production Forests,
2. Protection Forests and
3. Conversion Forests. Production Forests are forests that are managed primarily for the sustainable production of timber and non-timber forest products. In these forests, protection is a secondary objective.

The Production Forests include Forest Concessions and Community Forests. Areas under Production Forests include those forests where harvesting is permitted (e.g. annual bidding coupes for domestic wood supply), degraded forests, forests to be rehabilitated, and forests reserved for regeneration or plantation. The government may grant an area of production forest, not under use, to a forest concession through public bidding consistent with the National Forest Management Plan and after consultation with concerned ministries, local authorities and communities. However, from January 2002, the RGC issued a Declaration on the Suspension of Forest Concession Logging in the country. Community forests are forests owned by the state that have been allocated to communities under a 15-year renewable agreement. The primary goal of community forests is to protect and rehabilitate forests and to enhance the sustainable use of forest resources by local communities.

Private Forests are those that are individually owned and these forests are managed by the owners for a range of benefits. The owners have the free will to utilize these forests the way they deem fit and in addition, forest carbon in private forests belongs to the owners. Land within the Permanent Forest Estate can also be zoned as a Protected Area. Protected Areas fall under the jurisdiction of the Ministry of Environment (MOE); applicable law includes the Protected Area Act 2008 and the Environmental Protection and Natural Resource Management Law 1996.

The Cambodian Community Forestry Sub-Decree (2003)

The National Forestry Program aims to register 1000 community forestry groups nationally and cover two million hectares by 2030. To achieve this target, the government adopted various guidelines and policies to support the development of community forests such as the community forestry sub-decree, community forestry guideline, and national community forestry program.

Declaration on Classification and List of Wildlife Species N^{O}: 020 PR.MAFF (2007)

This declaration lists and classifies all wild species in Cambodia. The decree groups species into three main categories, endangered, rare and common. The decree also declares that all wild species are technically owned by the State and are protected under this provision.

Code of Criminal Procedure adopted by COM

The purpose of the criminal code is to define the rule of law in Cambodia. It distinguishes what is a criminal and civil action and set the rule of law in Cambodia. The FA uses it to enforce protection of forests in the TRP.

3.1.3 Describe measures needed and taken to ensure that the Project is not complicit in any form of discrimination or sexual harassment (G3.7.)

The TRP is committed to fair treatment and equal opportunity for all Project stakeholders, community members and employees. The Project, nor any agent of the Project, will 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 drafted a

document outlining 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 will provide all Project employees, stakeholders, community members and participants to have a recourse method in the event that any discriminatory actions or sexual harassment does occur.

3.1.4 Approval from the Appropriate Authorities, Including Established Formal and/or Traditional Authorities Customarily Required by the Communities. (G5.7.)

The Project Proponent of the TRP is the Royal Government of Cambodia Forestry Administration. The Project Area is comprised completely of national forest reserves that are under the jurisdiction of the FA. Some areas of the forest reserves areas are under community management. In these areas approval for the Project has been secured from the representatives of the communities managing these lands.

3.2 Evidence of Project Ownership (G5.2. & G5.8.)

The main evidence for right of use for the TRP is under 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 above sections of the Project Accounting Area are community forest and 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.

3.3 Emissions Trading Programs and Other Binding Limits (G5.9.)

The TRP is not subject to any additional emission trading programs or other binding limits. The TRP is being developed under the VCS and CCB standards. The VCS standard requires that all carbon credits (VCUs) generated by the project are listed on a third-party registry and are tracked from the time of initial verification until their eventual retirement. Unique serial numbers will be generated for each tonne of CO_2e that remains sequestered under this protocol and issued as VCUs, so as to ensure that no credits can be sold more than once (double-counted). This project area will not be involved with any other projects developed under another voluntary or regulatory carbon offset protocol.

3.4 Participation under Other GHG Programs (G5.9.)

This is the first and only application for the TRP to a GHG credit program.

3.5 Other Forms of Environmental Credit (G5.9.)

The TRP has not and will not in the future seek any other forms of environmental credit.

3.6 Projects Rejected by Other GHG Programs (G5.9.)

The TRP has neither applied nor been rejected by any other GHG program.

3.7 Respect for Rights and No Involuntary Relocation (G5)

3.7.1 Encroachment on Private, Community or Government Property without Free Prior and Informed Consent from those Affected by the Project (G5.2.)

The project will not encroach uninvited on private property, community property or government property. Tenure of the Project Area is outlined in section 1.3.4. Furthermore, section 2.7.1. outlines the comprehensive procedure of FPIC activities which ensures that all stakeholders and communities are consulted.

3.7.2 Involuntary Relocation of People or Activities Important for Livelihood or Culture (G5.3.)

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

3.8 Illegal Activities and Project Benefits (G5.4.)

The PA is a 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 forest should be protected from resource extraction or conversion to other land uses. However, these activities are commonly observed to be occurring, including 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 included a larger ranger force, strengthening community organizations, agricultural intensification, microfinance, strengthening forest land use planning and secure forest land tenure, and income generating activities, such as the resin enterprise as well as deforestation-free commodities in the project design to reduce the occurrence of these illegal activities. This will include firstly, increased protections for the PA, and enforcement of the PA boundary against these illegal incursions. Additionally, increased efforts at confiscations of chainsaws and other logging equipment being used illegally with-in the PA will reduce the illegal activity. The TRP will also increase patrols and enforcement against charcoal kilns within the PA, by monitoring for their presence and quickly acting to stop them. The strengthening of community organizations will give local organizations 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.

3.9 Additional Information Relevant to the Project (G1)

Not Applicable.

4 APPLICATION OF METHODOLOGY

4.1 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.

4.2 Applicability of Methodology (CL1.1)

PDR.1 For each applicability condition, a statement of whether it applies to the project. If the applicability condition does not apply to the project, justification for this conclusion.

PDR.2 Where applicability conditions apply, credible evidence in the forms of analysis, documentation or third-party reports to satisfy the condition.

1. *This methodology was developed for avoiding land use conversion of forest and native grassland ecosystems. The drivers and agents of conversion in the baseline scenario must be consistent with those described in section 6 of this methodology and the end land use in the baseline scenario is non-forest or converted native grassland. Accordingly, the project activity must be Avoided Planned Deforestation (APD) or Avoided Unplanned Deforestation and/or Degradation (AUDD) for forested project accounting areas and Avoided Planned Conversion (APC) or Avoiding Unplanned Conversion (AUC) for grassland project accounting areas.*

VM0009 version 3.0 "Methodology for Avoided Ecosystem Conversion" is applicable to this project because the baseline scenario includes agents of deforestation who carry out native ecosystem-clearing activities that result in land use conversion to a non-forest state. The Project Proponent has documented significant evidence to show that the primary driver of conversion is agricultural land, and that substantial portions of the reference region have already undergone such conversion. In addition, agricultural conversion is already present in the Project Area. The primary agents of conversion are the predominantly agriculturalist communities live primarily to the South, East and North of the Project Area, with additional agents being new immigrants into the area. This conversion to agricultural land use is an unplanned native ecosystem conversion, and therefore falls under the AUDD baseline type for the Project Accounting Area.

2. *All project accounting areas must have been in an unconverted state (i.e., forest or native grassland) for at least 10 years prior to the project start date, according to the following:*

    a. *Land in all forested project accounting areas has qualified as forest on average across the project accounting areas as defined by FAO 2010 or as defined by the residing Designated National Authority (DNA) for the project country for a minimum of 10 years prior to the project start date.*

All of the land within PAA has been native tropical dryland or tropical moist upland forest for at least 20 years prior to the project start date. Additionally, this forest has been a native primary forest in its current state since recorded times. An analysis of canopy cover was performed to ensure that it met Cambodia's minimum requirements of canopy coverage and height on average across all forest strata. The definition of forest as set by the Cambodia Forest Administration, who is the designated national authority (DNA) established by the FAO, is for a minimum area of 0.5 hectares with 10% or greater canopy cover, with a minimum canopy height of 5 m (Forestry Administration, 2013)

    b. *Land in all grassland project accounting areas has qualified as native grassland or shrub land for a minimum of 10 years prior to the project start date.*

This project does not contain a grassland project accounting area. This application condition is not applicable to the Project.

3. *For project accounting areas of baseline type U (unplanned), a conversion threat must exist for each project accounting area as demonstrated by one of the following two options:*

    a. *Imminent conversion as predicted by a survey (see definition of imminent conversion). Moderate risk is defined as when more than 60% of respondents predict the end land use identified in the baseline scenario. The survey must meet the requirements of Appendix E.*

    OR

    b. *As of the project start date, some point within 2 kilometers of the perimeter of the project accounting area has been converted to the end land use identified in the baseline scenario (Broadbent et al., 2008).*

There is significant evidence of native ecosystem conversion within 2 km of the perimeter of the Project Accounting Area. These points have all been converted to agricultural, which is the identified baseline scenario. Additionally, there has already been ecosystem conversion to agriculture inside of the Project Area.

4. *In the case of baseline type F-U1, at least 25% of the project area boundary is within 120 meters of deforestation and at least 25% of the project area boundary is adjacent to the reference area (see VM0009 Methodology section 6.3).*

The Project Accounting Area meets this definition for a baseline type of F-U1. More than 25% of the Project Area boundary is within 120 m of existing deforestation. Additionally, at least 25% of the Forest Project Accounting Area boundary is adjacent to the Reference Area.

5. *In the case of baseline type G-U1, at least 25% of the project area boundary is adjacent to the reference area (see section 6.3).*

This project does not contain a grassland project accounting area. This application condition is not applicable to the Project.

6. *In the case of baseline type F-U2, at least 25% of the project area boundary is within 120 meters of deforestation (see section 6.3).*

The Project Accounting Area has a baseline type of F-U1. This application condition is not applicable to the Project.

7. *The project accounting area(s) must not contain peat soil.*

The Project Accounting Area does not contain any areas of peat soil. Please refer to Appendix B for a map showing the soil types present in the Project Area.

This map shows the soil types for the PAA and lists the soil types by name. The soil types included in the PAA are:

1) Acid Lithosol
2) Alluvial Lithosol
3) Grey hydromorphic
4) Red-yellow podzol

Peat soils are generally classified in the Histosol category, as this is the category for organic soils that have greater than 20-30% organic matter by weight. Peat is additionally a type of histosol that is

characterized by being completely water logged and having an extremely low oxidation potential resulted in the accumulation of undecomposed plant matter.

The hydromorphic soil listed would be one that developed under the presence and influence of a high amount of water, but that does not infer nor imply in any way that the soil would be a peat soil. Lithosol refers generally to a young soil that is thin, meaning shallow bedrock and podzols are well developed soils that show some aspects of the factors of formation, most likely rivers here. The auditor has been provided with a document that lists the soils and some background. This document is based on the same soil dataset as the soil layer in the Project Map.

8. *For each project accounting area, a reference area can be delineated for each baseline type in the baseline scenario that meets the requirements, including the minimum size requirement, of section 6.8.1 of the VM0009 methodology.*

A Reference Area was selected for the Project Accounting Area that meets of all the requirements in section 6.8.1 of the methodology VM0009. Please refer to Section 4.5.8.1 regarding the selection of the reference area. In the section referenced there is the results of the spatial analysis demonstrating that the Reference Area contained as much forest as the Project Accounting Area at the onset of the historic reference period.

9. *As of the project start date, historic imagery of the Reference Area(s) exists with sufficient coverage to meet the requirements of section 6.8.4 of the VM0009 methodology.*

As of the start of the historic reference period there is sufficient historic imagery available to ensure that the reference areas have coverage that meets all requirements of section 6.8.4 of the methodology VM0009. Additionally, all of this imagery meets all minimum requirements for imagery in section 6.8.4 in the methodology VM0009.

10. *Project activities are planned or implemented to mitigate ecosystem conversion by addressing the agents and drivers of conversion as described in section 8.3.1 of the methodology VM0009.*

The Project design includes a number of activities that will result in a reduction in ecosystem conversion. These activities are all designed to address the identified agents and drivers of conversion as documented in this document. Please refer to section 2.2 for a description of these activities.

11. *The project proponent has access to the activity-shifting leakage area(s) and proxy area(s) to implement monitoring (see sections 8.3.2.1 and 6.4) or has access to monitoring data from these areas for every monitoring event.*

The Project Proponent has full access to activity-shifting leakage area and proxy area. This is demonstrated by the collection of data on the post-conversion residual carbon stock from the proxy area. Additionally, the activity-shifting leakage area for the Project has also been fully delineated and the baseline data was collected, demonstrating that it is fully accessible by project staff.

12. *If logging is included in the baseline scenario and a market-effects leakage area is required per section 8.3, then the project proponent has access to (or monitoring data from) the market-effects leakage area if measurement is needed (see section 8.3.3).*

The TRP does include small-scale illegal logging in the baseline scenario, however a market leakage area is not required per the requirements of the VCC methodology VM0009 section 8.3.3. This is due to the fact that the logging which occurs in the Project's baseline is small-scale in nature and is to supply local needs, with only a small amount sold in local markets (Hayes et al., 2015). Therefore, the likely result of the Project would not affect the market supply of the wood commodity but be more like

a subsistence activity and shifted to the next available area and be consider activity-shifting leakage. As the reduction in the supply of wood from the Project Area will not result in a change to market commodity for timber in Cambodia. A market leakage deduction has been calculated utilizing the VCS Production Approach market leakage tool (See Section 5.5.2 and 5.6.4).

13. *This methodology is applicable to all geographies, however if SOC is a selected carbon pool and the default value from section 6.19.2 is selected then the project must be located in a tropical ecosystem.*

Soil organic carbon is not an included carbon pool in the TRP. This application condition is not applicable to the Project. However, the TRP is located in a tropical ecosystem.

14. *If livestock are being grazed within the project area in the project scenario, there must be no manure management taking place, as emissions from N2O as a result of manure management are not quantified or addressed in this methodology.*

There may be small areas of animal grazing within the Project Area by local communities. These livestock grazing activities are not a component of the project, nor are they a project activity. There will be no manure management of any type occurring on in the Project Area.

15. *Project activities must not result in significant GHG emissions. All GHG emissions from project activities must be shown to be de minimis (see section 8.3.1of the methodology VM0009).*

All project activities in the TRP will not result in any significant GHG emissions. The project activities have been designed to be low carbon in nature and do not include any industrial scale agricultural, large uses of fertilizer or other industrial type activity that may result in GHG emissions above the *de minimis* level.

PDR.3 Definition of forest used by the project proponent and its source.

Table 16: Definition of Forest for Cambodia (Forestry Administration, 2013).

Forest Definition	
Item	**Value**
Minimum Crown Cover (%)	10
Minimum Land Area (ha)	0.5
Minimum Tree Height (m)	5

4.3 Methodology Deviations

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

4.4 Project Boundary (CL1.1. & CL3.3)

4.4.1 Gases

PDR.11 A list of the greenhouse gases considered.

Carbon dioxide (CO_2) was determined to be the primary source of greenhouse gas emissions in the project, given the threat of deforestation from the drivers listed in the baseline scenario. Methane (CH_4) and nitrous oxide (N_2O) are conservatively excluded from the project.

Table 17: Baseline and Project Greenhouse Gases Considered

Source		Gas	Included?	Justification/Explanation
Baseline	Source 1	CO_2	Yes	Major pool considered in the baseline scenario
		CH_4	No	Conservatively excluded
		N_2O	No	Conservatively excluded.
		Other	No	No other GHG gases
Project	Source 1	CO_2	Yes	Major pool considered in the project scenario
		CH_4	No	Conservatively excluded
		N_2O	No	Conservatively excluded.
		Other	No	No other GHG gases

4.4.2 Selected Carbon Pools

PDR.12 A list of the selected carbon pools and evidence for the conservative exclusion of any optional pools.

Table 18: Selected carbon pools in the Forest Project Accounting Area (REDD+ baseline type).

Pool		Required	Included in Project	Justification
AGMT	Above-ground merchantable tree	Yes, if baseline scenario or project activity(ies) include the harvest of long-lived wood products. Otherwise, accounting for this carbon pool is not required	No	No commercial tree harvesting or production of long-lived wood products included in baseline
AGOT	Above-ground other (non-merchantable) tree	Yes	Yes	Major pool considered
AGNT	Above-ground non-tree	Yes, if the baseline scenario includes perennial tree crops. Otherwise, accounting for this carbon pool is optional.	Yes	Major pool considered
BGMT	Below-ground merchantable tree	Optional	No	No commercial tree harvesting or production of long-lived wood products included in baseline

BGOT	Below-ground other (non-merchantable) tree	Optional	Yes	Major pool considered
BGNT	Below-ground non-tree	Optional	Yes	Major pool considered
LTR	Litter	No	No	Conservatively excluded
DW	Dead wood	Yes, if AGMT is selected	No	Conservatively excluded
SD	Standing dead wood	Optional	No	Conservatively excluded
LD	Lying dead wood	Optional	No	Conservatively excluded
SOC	Soil organic carbon	Optional	No	Conservatively excluded
WP	Long-lived wood products	Yes, if AGMT is selected	No	Conservatively excluded

Several optional carbon pools have been conservatively excluded from the Project's baseline, as is shown in Table 18. The exclusion of these optional carbon pools is conservative in all cases, as their exclusion from the project will result in fewer emission reductions. Section 8.4.7 of the methodology VM0009 states that ex-ante estimates are required to demonstrate that the exclusion of a carbon pool is conservative only if a carbon pool is expected to increase in the baseline scenario. The carbon pools which have been excluded, including AGMT, BGMT, SD, LD, and SOC will all decrease under the baseline scenario, which is detailed in Section 4.5. The Project's baseline scenario is the complete conversion of the forest to non-forest, with most if not all above-ground living and dead carbon pools being removed, and additionally the below ground and soil carbon pools being reduced through the resulting agricultural activities. AGMT, BGMT, SD, LD and SOC carbon pools were excluded additionally to ensure that the TRP's included carbon pools are consistent with those used in the RGC's FRL program.

4.4.3 Map of Project boundary with locations of the Project's offices and project activities

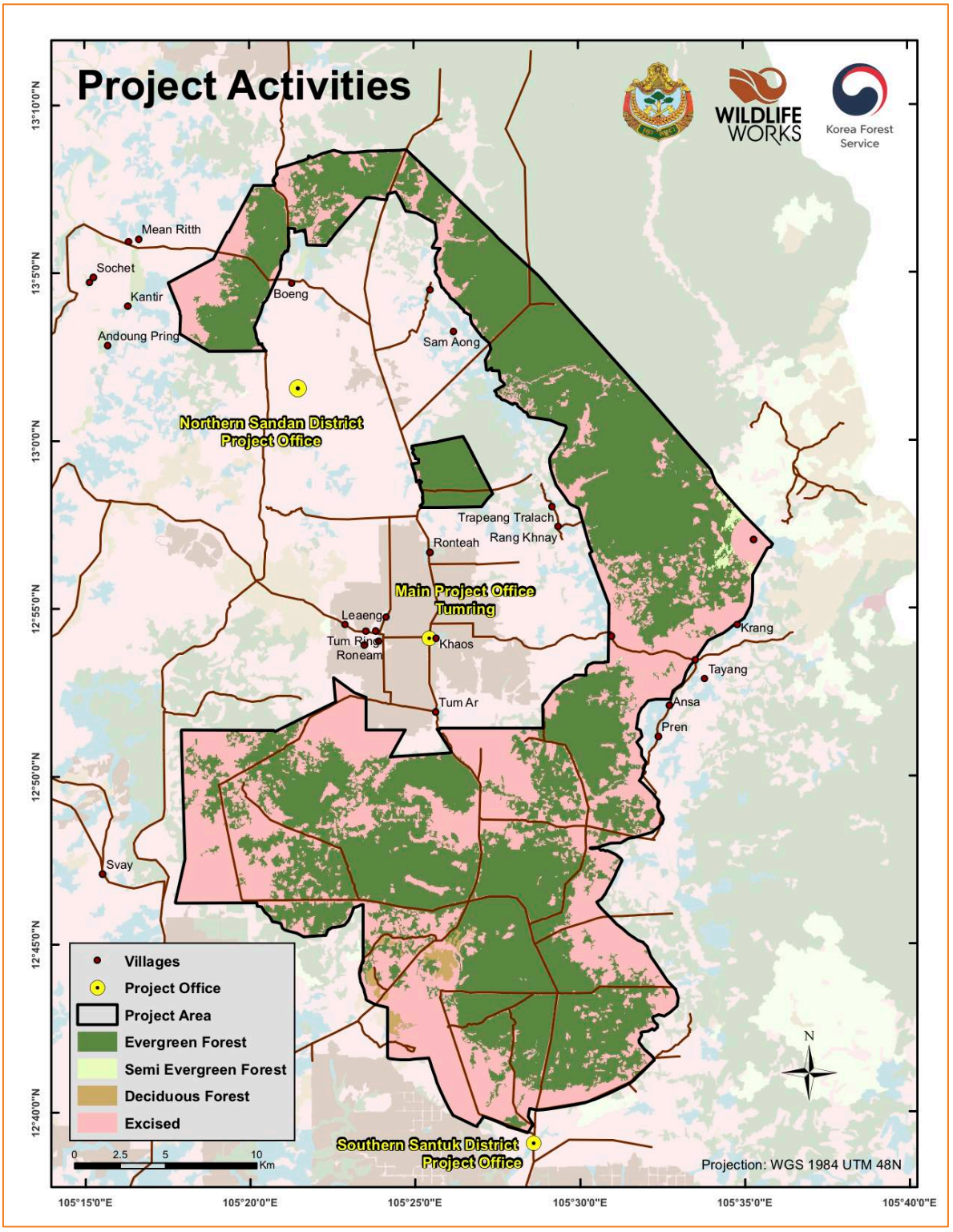


Figure 7: A map of the Project boundary, showing the locations of the Project's offices from which the project activities are managed. Please refer to Table 19 for a list of which activities are managed from each office.

Table 19: The locations of the Project activities

Tumring REDD+ Project Offices	Project Activity
Project Office – main office	• Income Generating Activities (IGAs) • Biodiversity Conservation • Poverty Reduction and Livelihood Diversification • Food Security • Ecosystem Enhancement • Forestland Planning and Land Tenure Security
Northern Sandan District – sub-office	• IGAs • Ecosystem Enhancement • Poverty Reduction and Livelihood Diversification • Biodiversity Conservation • Food Security
Southern Santuk District – sub-office	• IGAs • Ecosystem Enhancement • Poverty Reduction and Livelihood Diversification • Biodiversity Conservation • Food Security • Land Tenure Security

4.5 Baseline Scenario (G2)

4.5.1 Most Likely Land Use Scenario in the Absence of the Project (G2.1)

PDR.17 Show that the identified baseline type is the most plausible baseline scenario identified in section 7.

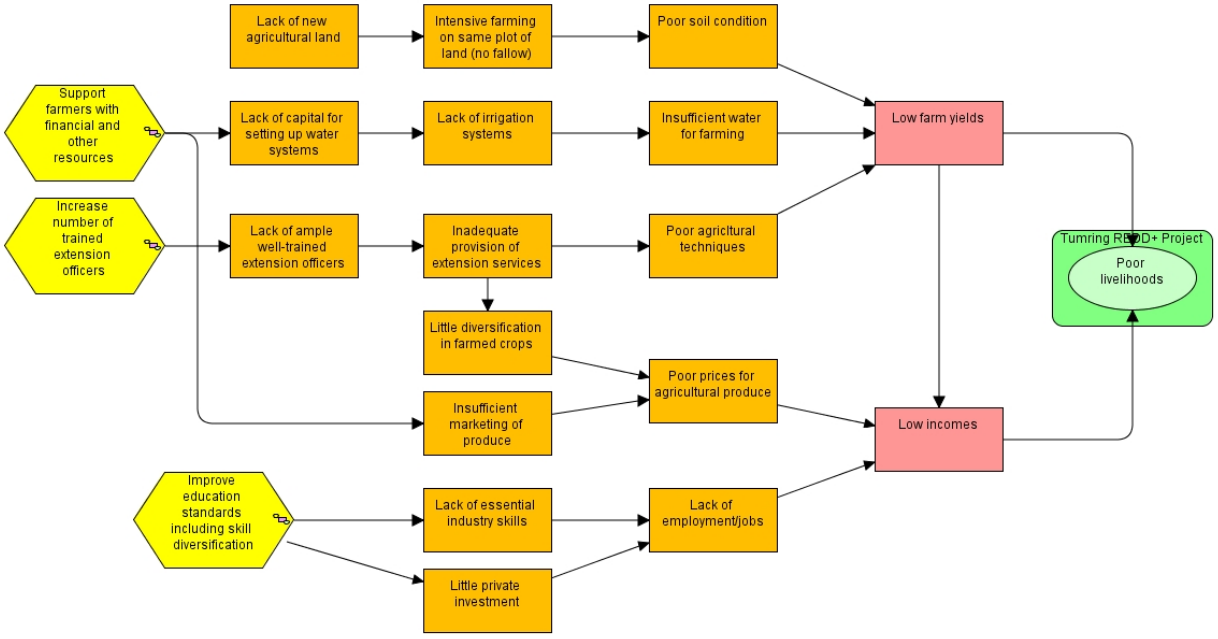
The identified baseline scenario is conversion of native ecosystems from a natural forested landcover to a non-forest or agricultural state. As shown in Section 4.5.6, the Project has demonstrated that per the requirements of the methodology VM0009 baseline type F-U1 is the most plausible baseline type. The baseline scenario outlined in the VCS Additionality Tool of Section 4.6 demonstrates that the entire Project Accounting Area would be converted through unplanned deforestation to subsistence agricultural. The historic conversion of the Proxy Area, as shown in Figure 15, through unplanned deforestation to agriculture shows that this is the common practice in this area. A map of the land use of the Project Area is shown in Appendix B, which shows no social or economic land concessions present in the Project Area, so planned deforestation is a very unlikely scenario. Further, Section 4.5.6.1 and Figure 11 show that the Project has deforestation that occurred within the last 10 years within 120 m of more than 25% of the Project Area perimeter, and Appendix D shows that the Reference Area is adjacent to the Project Area, therefore the Project meets all requirements of baseline type F-U1. As discussed in Section 4.6 conservation of forests does commonly occur in Cambodia, but there are few examples of it successfully protecting the forest area in the absence of additional funding and often other support from NGOs or foreign aid. Please refer to Section 4.6 the VCS Additionality Tool for more details.

4.5.2 How the 'Without Project' Scenario (baseline) would Affect Communities in the Project Zone (CM1.1)

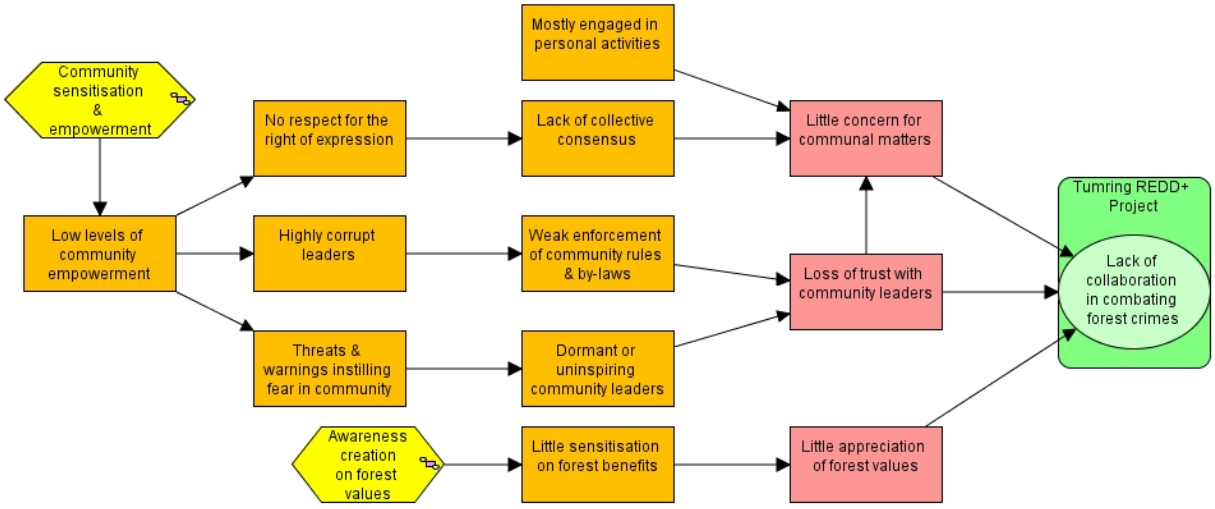
The Without-Project land-use scenario would affect the communities in the Project Zone in myriad ways. In order to analyze these potential impacts systematically and pragmatically, we focused on several key issues, hereafter termed Focal Issues. Focal Issues are defined as the social and biodiversity factors or issues that are most important for the success of the REDD+ project (Richards & Panfil, 2011). These are issues or problems most associated with the deforestation and/or forest degradation process, which could prevent the project from achieving its (carbon) objectives. They could also be issues or problems in the project area that the REDD+ project could have most influence on (Richards & Panfil, 2011). Selection of the most relevant social and biodiversity variables requires a strong understanding of local social and ecological processes, including, *inter alia* local social structures and governance mechanisms, and the likely response of target species to changes in forest cover. In order to select and prioritize potential social and biodiversity issues, we used a combination of the project partners' experience of the project area, the local community (environment) advisory committees they work with, information from the FPIC meetings, and literature.

For the community component of this project, four focal issues were prioritized from a pool of potential issues as key to reducing deforestation and forest degradation. These were: Poor community livelihoods, Forest loss and degradation, Limited knowledge and awareness, including lack of understanding of forest and climate change, and Lack of collaboration and participation in effective crackdown forest crime. A situational analysis of these four focal issues resulted in conceptual diagrams showing the root causes of the problems (also referred to as Problem Flow Diagrams by Richards and Panfil (2011)). From these diagrams, potential project entry points (or project strategies/activities) that would help address some key root causes were then identified.

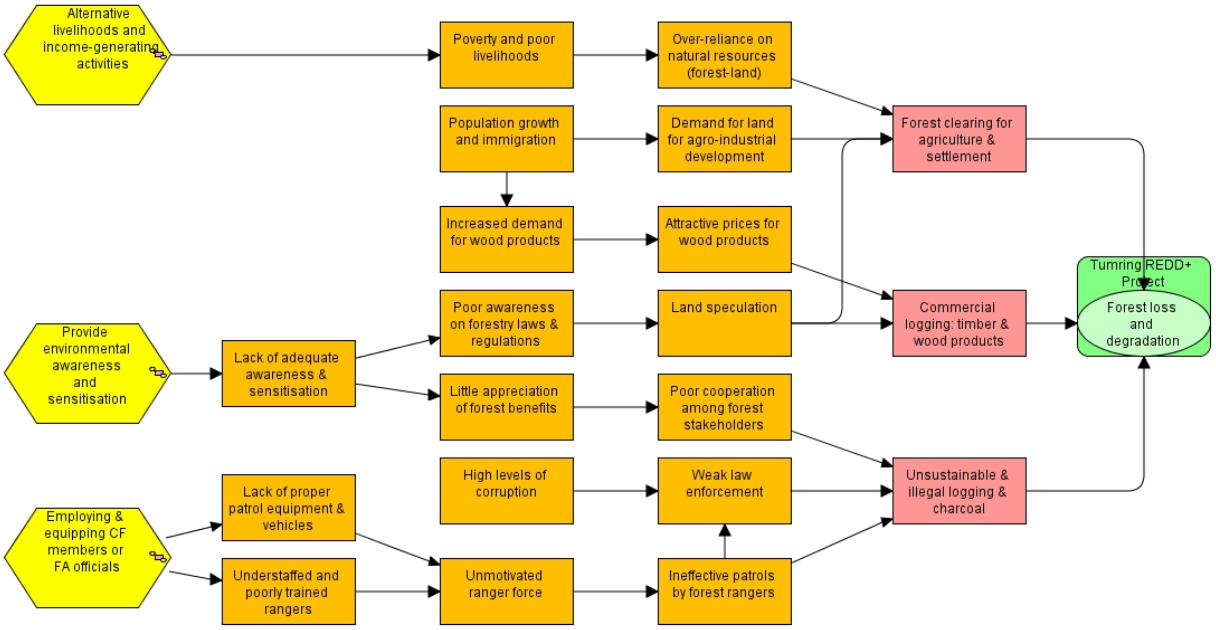
a) Poor livelihoods



b) Lack of collaboration



c) Deforestation & degradation



d) Lack of awareness

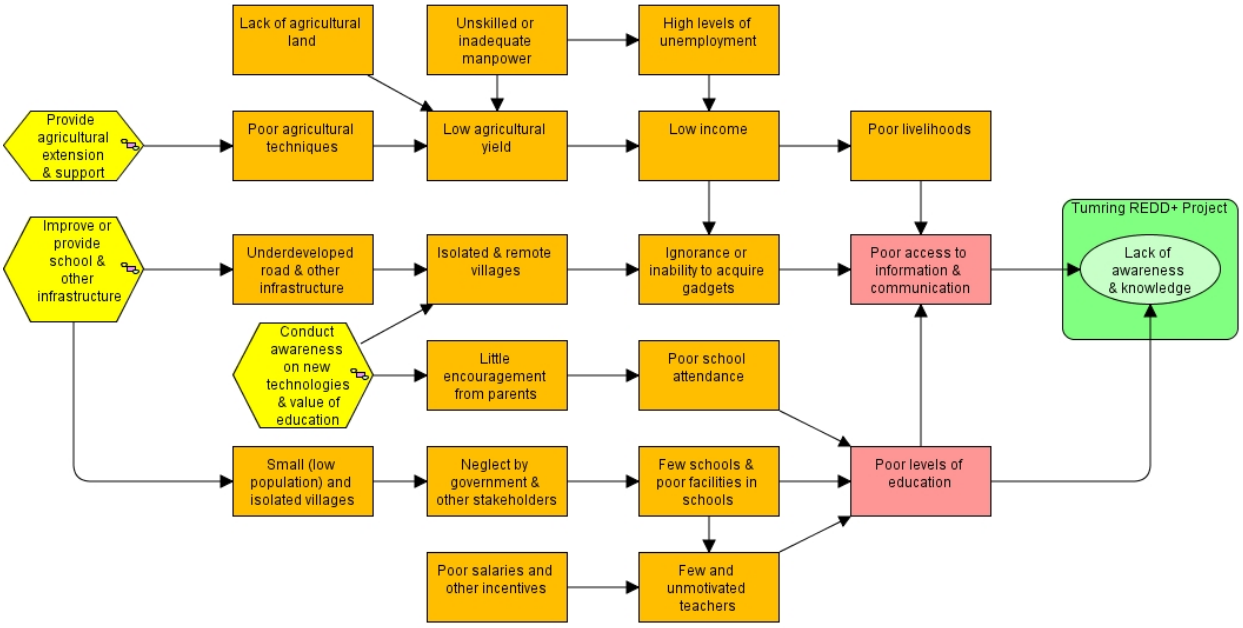


Figure 8: The Problem flow diagrams for the four focal community issues.

Next, we used these problem flow diagrams to help analyze what would happen to the key community issues without the TRP. We focused on the Direct Threats (in pink on the Problem Flow Diagrams) and utilized the Project Proponent's expertise on the communities in the Project Zone as well as literature to draw projections about the direction these Direct Threats will take over the short to medium term (5-10

years). Appropriate justification is provided for each projection as well as any additional supporting remarks (Table 20).

Table 20: Short-to-medium term Without-project projections for the major Direct Factors affecting the Social Focal Issues in the TRP Project Zone.

Direct Threat	Condition expected in 5-10 yrs. Improve, worsen or remain unchanged.	What will drive the change	Remarks
Low Farm Yield	Worsen	• Top soil gradually degraded • Overuse of agriculture land • Shortage of rainfall	
Low Income	Worsen	• Shortage of rainfall • Competition over jobs and forest land by increasing immigrants • Lack of private or government investment • Rising agriculture investment capital • Low agriculture productivity • Unstable agriculture commodities and low price • Low wage of employment	
Little concern for communal matters	Worsen	• Personal benefits and activities are higher than communal issues • Corruption • Lack of effective dissemination on forest values	
Loss of trust with community leaders	Worsen	• Inactive, corrupt and personal benefit of community leaders • Weak enforcement of by-laws	
Little appreciation of forest values	Worsen	• Limited awareness of values of forest, its functions and benefits • Values of forest is lower than cash crop and land speculation	
Forest clearing for agriculture & settlement	Worsen	• Lack of equipment, vehicles and budget for patrol • Lack of extension on the benefits of forest and Law on Forestry • Not enough rangers • Lack of infrastructure (patrolling stations)	

Commercial logging, timber and wood products	Worsen	• Lack of patrolling and equipment and vehicles • Not enough rangers • Lack of infrastructure (patrolling stations) • Lack of cooperation • Lack of illegal information sharing • Corruption	
Unsustainable logging & illegal logging & charcoal	Worsen	• Demand for charcoal • High price for wood • Weak law enforcement • Corruption	
Poor access to information and communication	Improve	• Poor livelihoods • Lack of networking to share information • Isolated and remote villages • Poor infrastructure	
Poor levels of education	Unchanged	• Poverty • Lack of facility and schools • Poor school attendance • Unmotivated teachers	

4.5.3 How the 'Without Project' (Baseline) Scenario would Affect Biodiversity in the Project Zone (B1.3.)

The "Without Project" Scenario would result in significant loss of habitat and lead to an increase in hunting, leading to a reduction in the biodiversity found within the Project Zone. As described in the above sections, the Project's baseline Scenario will result in all forested areas being converted to either agricultural or settlements. Therefore, there would be no native forest habitat remaining for biodiversity, and the biodiversity would be increasingly concentrated in the Prey Lang Wildlife Sanctuary forest.

4.5.4 Identifying the Agents and Drivers

PDR.18 A list of the agents and drivers of conversion, including quantitative descriptions of agent mobilities.

Table 21: The agents and drivers of deforestation in Kampong Thom province. This table is adapted from the report Delux *et al*., 2017.

Agents of Deforestation	Drivers of deforestation in Kampong Thom Province							Agent Mobility
Drivers or factors effect deforestation and forest degradation	ELC	SLC & Directive001	CF&CPA	Small scale land conversion	Illegal logging	Fuel & dead wood collection	Forest Fire	
Community Forestry Group and members (insiders)			x	x	x	x	x	Generally limited by hand tractor 5-10 km / day. If on motorcycle can be 20-50 km / day
Local Authority: **Provincial governor** **District governor** **Commune Chief**	x	x	x	x				If on motorcycle can be 20-50 km / day. If utilizing a vehicle can be up to 100-500 km / day
In-migrant and Outsider: **Landless household** **Forest land speculator** **Poor households**		x	x	x	x	x	x	Generally limited by hand tractor 5-10 km / day
Private: **Economic Land Concessionaire** **Powerful and rich land owner** **Local middleman (local timber and land trader)**	x	x		x	x			If utilizing a vehicle can be up to 100-500 km /day

PDR.19 A narrative describing the agents and drivers of conversion.

The primary agent of deforestation for the TRP are in-migrants and outsiders. This refers to individuals or group of people who move to Kampong Thom Province and the TRP Project Area aim to claim for land either through legal or illegal claiming process. It was agreed among the SBIA workshop participants that two classes of this agent (please see the detailed description of the classes of this agent below under PDR.20), the forestland speculator or forestland grabber and middleman, are predominantly responsible for the deforestation in the TRP Project Area.

The drivers of deforestation are predominantly a high demand for new agricultural and cash crop land in the TRP Project Area, and throughout Kampong Thom Province in general. The population in the Province and the area around the Project has significantly increased over the last several decades. This is from both in-migration and also an increase in child birth rates. Currently, there are low education rates in the area, due to the need for children to work on the families' farms during the day, perpetuating the cycle of poverty and deforestation. Additional drivers of deforestation include illegal logging, fuel gathering and charcoal production.

PDR.20 Descriptions of agents and drivers including any useful statistics and their sources.

In the SBIA workshop that was held with project stakeholders the participants classified the agent of in-migrants and outsiders who are coming to the Project Area into three categories:

1. Landless households: This includes households who have never previously owned land, households that have sold their land to third parties, and households whose land was destroyed by flooding. These households come to the Project Area and clear plots of forest land for the building of houses and for agricultural plots. Generally, it is observed they then gain title to the deforested land and settle in the area permanently.
2. Forestland speculator or forest land grabber: These are individuals or groups of individuals who immigrate to the TRP Project Area and illegally clear forest land for individual property. After clearing the land they will construct simple buildings and plant agricultural crops to legitimize their land claim. They will then sell the land to another party, mainly wealthy people who live in the cities or provincial towns. The land speculator or forest land grabber will then look for new forest area where they will repeat the process. Generally, these people are not landless households and they will not settle in the area permanently.
3. Middleman: These are individuals who come to the TRP Project Area to purchase plots of land from the forestland speculators or forest land grabbers. They then sell these land plots to landless households or to wealthy or powerful people who are live the cities, or provincial towns.

4.5.5 Delineating the Project Accounting Areas

PDR.22 A digital (GIS-based) map of the project accounting areas, including aerial or satellite imagery showing that they are forested as of the project start date and 10 years prior to the project start date.

Please refer to Appendix B and Figure 10 for a map showing the land cover in the Project Area 10 years prior to the project start date, confirming that the Project Accounting Area was forested at that point.

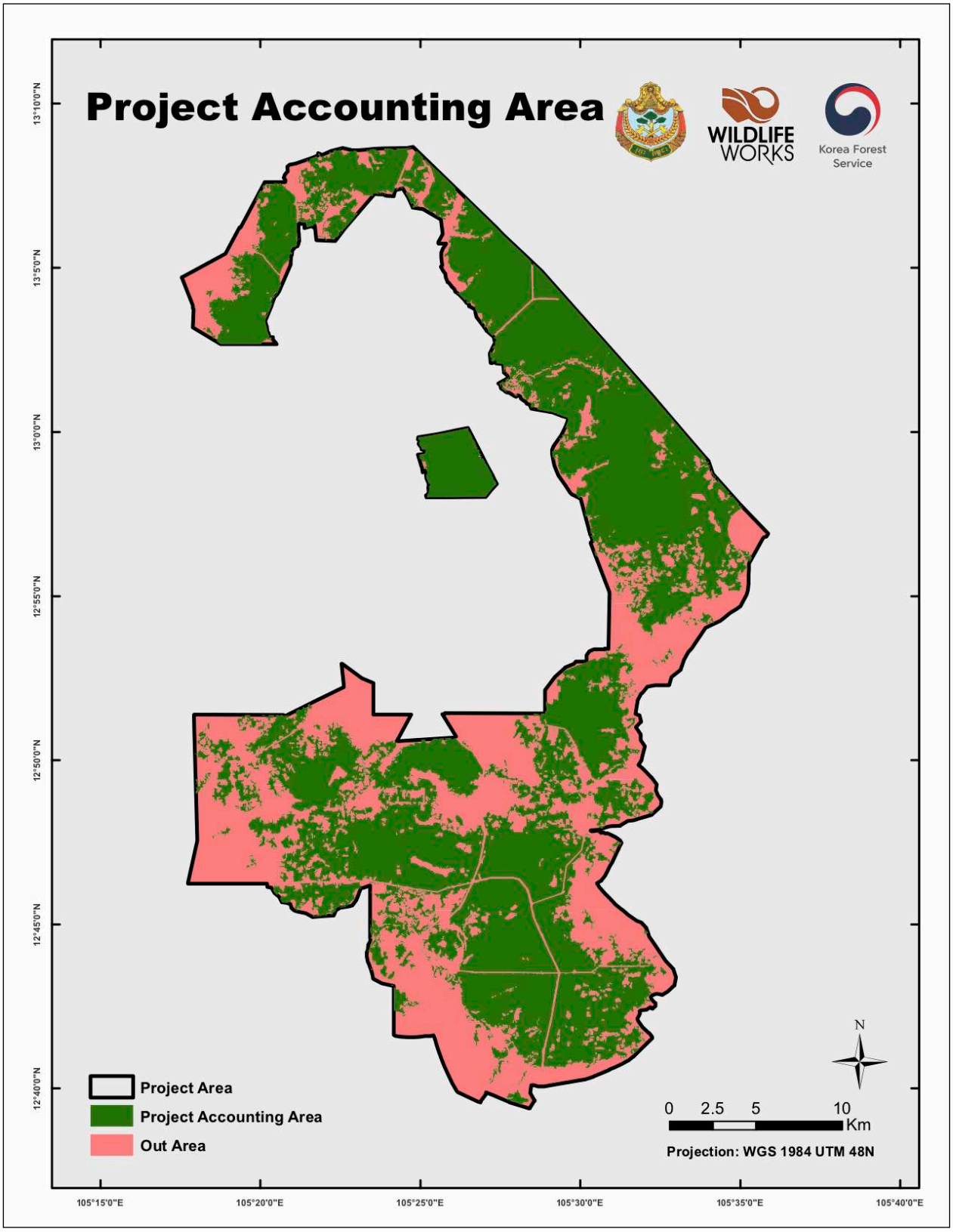


Figure 9: The Project Area and the Forest Accounting Area. “Out areas” are areas inside the Project Area that have been previously converted, and therefore removed from GHG accounting.

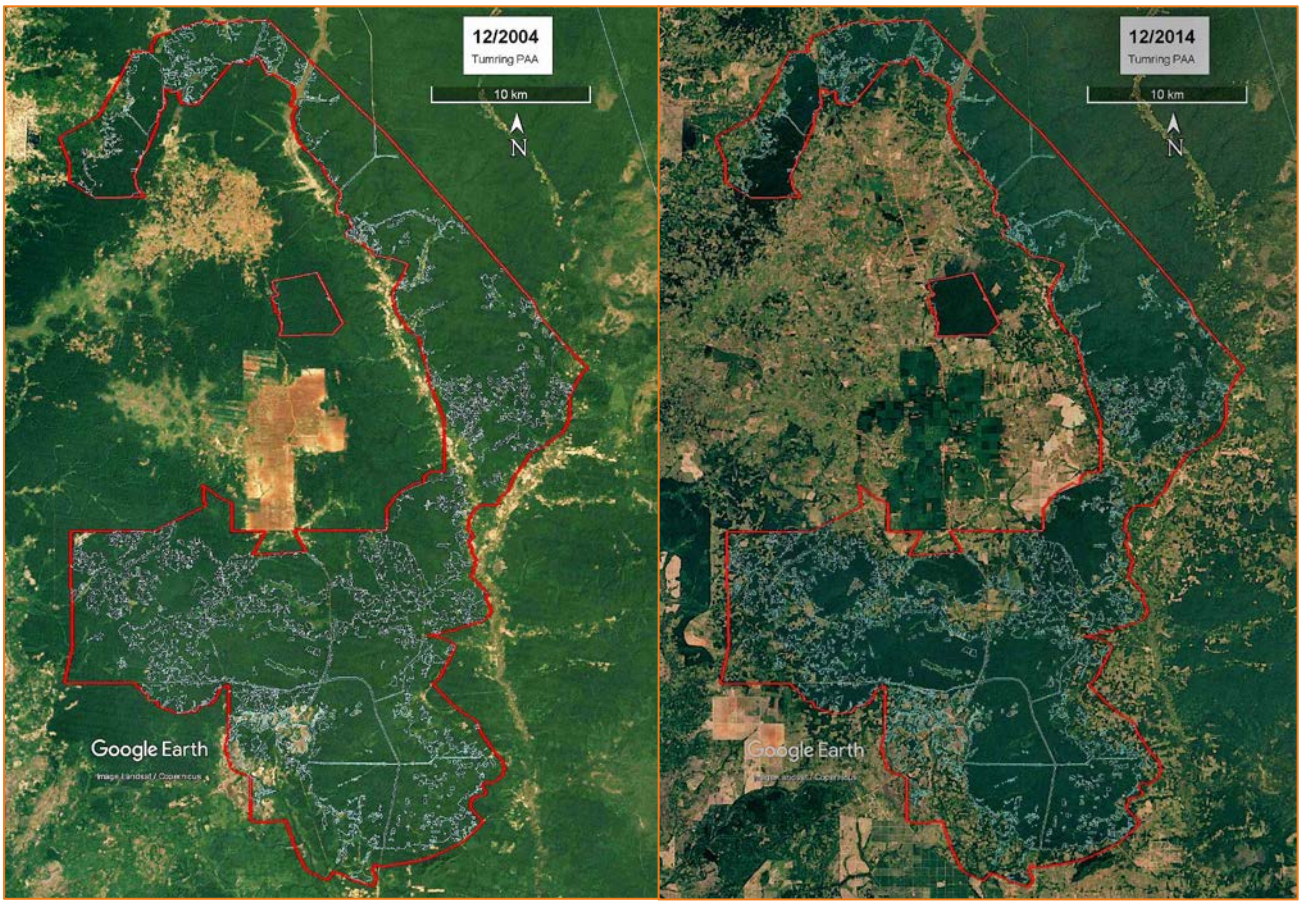


Figure 10: The Tumring REDD+ Project Area (red outline) and the Project Accounting (blue outline) over a base map of satellite imagery. On the left, the Project Area is shown 10 years prior to the project start date (December, 2004) and on the right at Project Start (December, 2014). These images indicate visually that the entire Project Accounting Area was forested 10 years prior to the project start date.

PDR. 23 Justify the project accounting areas using the identified agents and drivers of conversion, constraints to conversion, and attributes listed above in the methodology VM0009 section 6.2.

There is a single Project Accounting Areas in the Project Area, which was selected to conform to the F-U1 baseline types. This PAA was defined by the land cover in the area, as identified using a land cover/ land use remote sensing data set provided by the FA. This analysis stratified the Project Area into a number of areas based in relation to the land cover. Any areas identified as settlements, agriculture, surface water or any other non-forest land cover was removed from the PAA. The remaining strata that met the Cambodian definition of forest was then placed into the PAA. Forest inventory data was then used to confirm that all strata included in the PAA meets the Cambodian definition of forest.

High resolution imagery was then used to identify any areas within the PAA that showed evidence of already being converted to settlements or agriculture. Additionally, to help support a good working relationship with the local communities that were located within the PAA at the project start date, and to support the project FPIC efforts of the Project Proponent, a community buffer was established around the

communities. This 0.5 km buffer around the existing communities and agriculture will provide for future expansion and additional resources for these communities.

The agents and drivers of conversion, as described in Section 4.5.4, have full and unconstrained access to the Project Area. As is seen in the Project Area Infrastructure map in Appendix B there are many large villages surrounding the Project and several major roads that bisect the Project Area. The Project Accounting Area itself is on the frontier of some of the only remaining forest area in the region, and is therefore highly accessible to the agents and drivers of conversion. In addition to these large roads shown in the map, there are countless logging roads that were created during commercial logging operations that occurred historically extending throughout the Project Area and providing access to all of the forest area. As is seen in the map Project Area Topography in Appendix B the Project Area is largely flat, with very little topographic feature that could limit access to or influence the conversion of any area of the Project Area. In Appendix B the Map Project Area Rivers shows that there are several rivers present in the Project Area, however, these do not pose any major obstruction to the agents and drivers of deforestation. This is shown by the fact that one of the rivers also passes through the Proxy Area and did not provide any deterrent to the conversion of that area to agriculture. Additionally, in Appendix B is the Project Area Land Use map, which shows that there are no social or economic land concessions, or any other land use type present in the Project Area that would limit or restrict the identified agents and drivers of conversion from undertaking the baseline scenario in the Project Accounting Area. The Project Accounting Area is smaller in total size than the Project Area, due to the large amount of non-forest area within the Project Area that has been excluded from carbon accounting.

4.5.6 Baseline Types

4.5.6.1 Forest Project Accounting Area

PDR.30 If Type F-U1 is selected, a spatial analysis of the project area showing that at least 25% of the perimeter is within 120 meters of deforestation that occurred within 10 years prior to the project start date and showing that the reference area is adjacent to at least 25% of the project area.

PDR.32 If Types F-U1, F-U2 or F-U3 is selected, a spatial analysis of the project area showing that it is within 120 meters of deforestation that occurred within 10 years prior to the project start date.

Edge analysis was performed per VM0009 and VCS AFOLU Guidance and the percentage of the Project Area perimeter within 120 m of deforestation that had occurred within 10 years prior to the Project Start Date was found to be 49.6%. This analysis is not shown here but was provided to the auditor. Additionally, the percent of land area with deforestation within a period of 10 years prior to the Project start date and within 120m of the PA boundary was calculated as 37.27%. Additionally, the Project's reference area includes the entirety of Kampong Thom province, the province in which the PA is located, so 100% of the PA boundary is adjacent to the reference area. Therefore, the TRP has been determined to be of type F-U1 (Avoided Unplanned Deforestation that meets the VCS definition of a Mosaic Deforestation Pattern and that Features an Adjacent Reference Area). Figure 11 below shows the results of the edge analysis, depicting deforestation between the years 2006-2014.

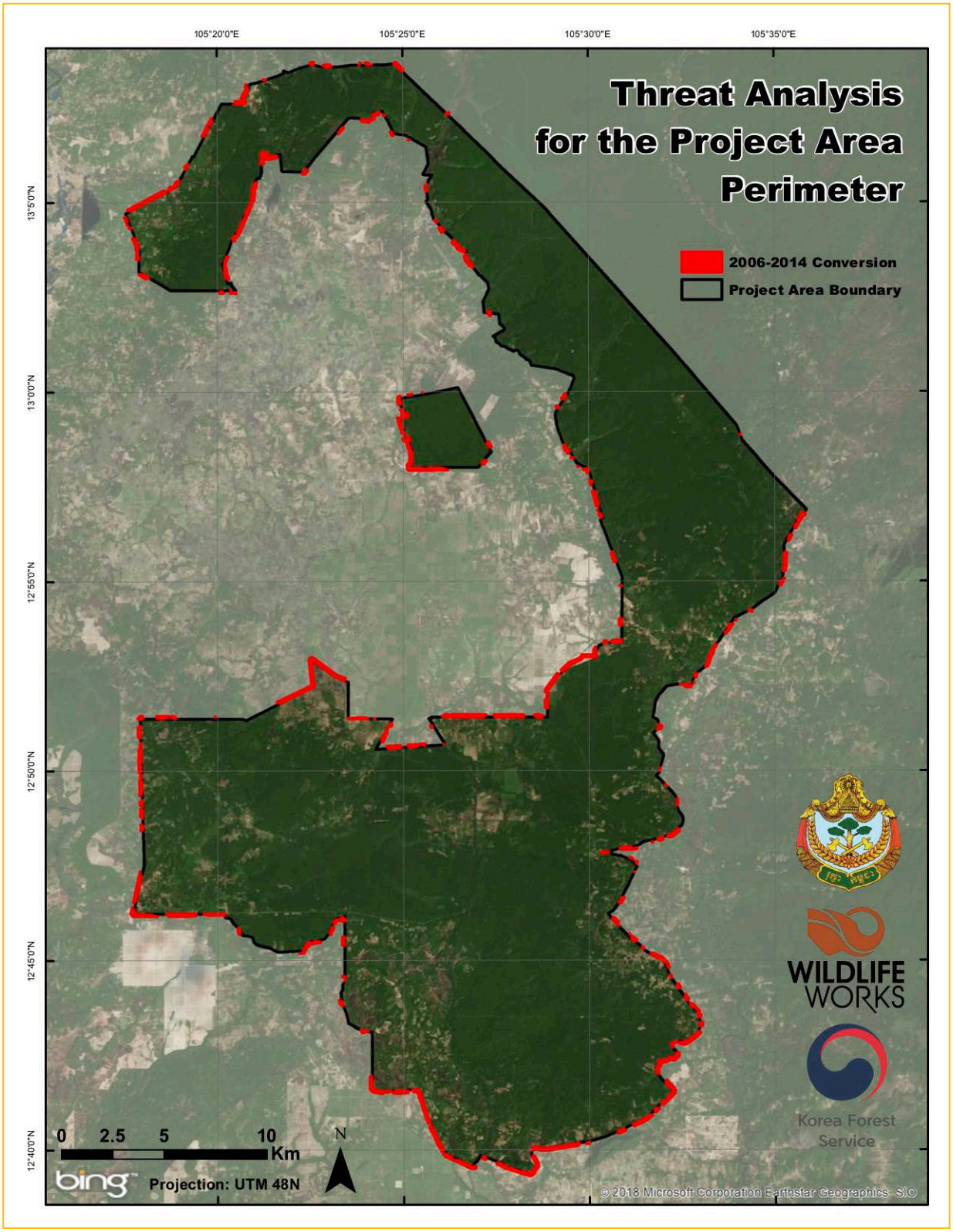


Figure 11: Edge threat analysis for the Project Area perimeter. Percentage deforested within 10 years prior to project start date and within 120m of the project boundary was calculated to be 37.27%.

4.5.7 Delineating Proxy Areas

PDR.35 A map of the delineated boundaries.

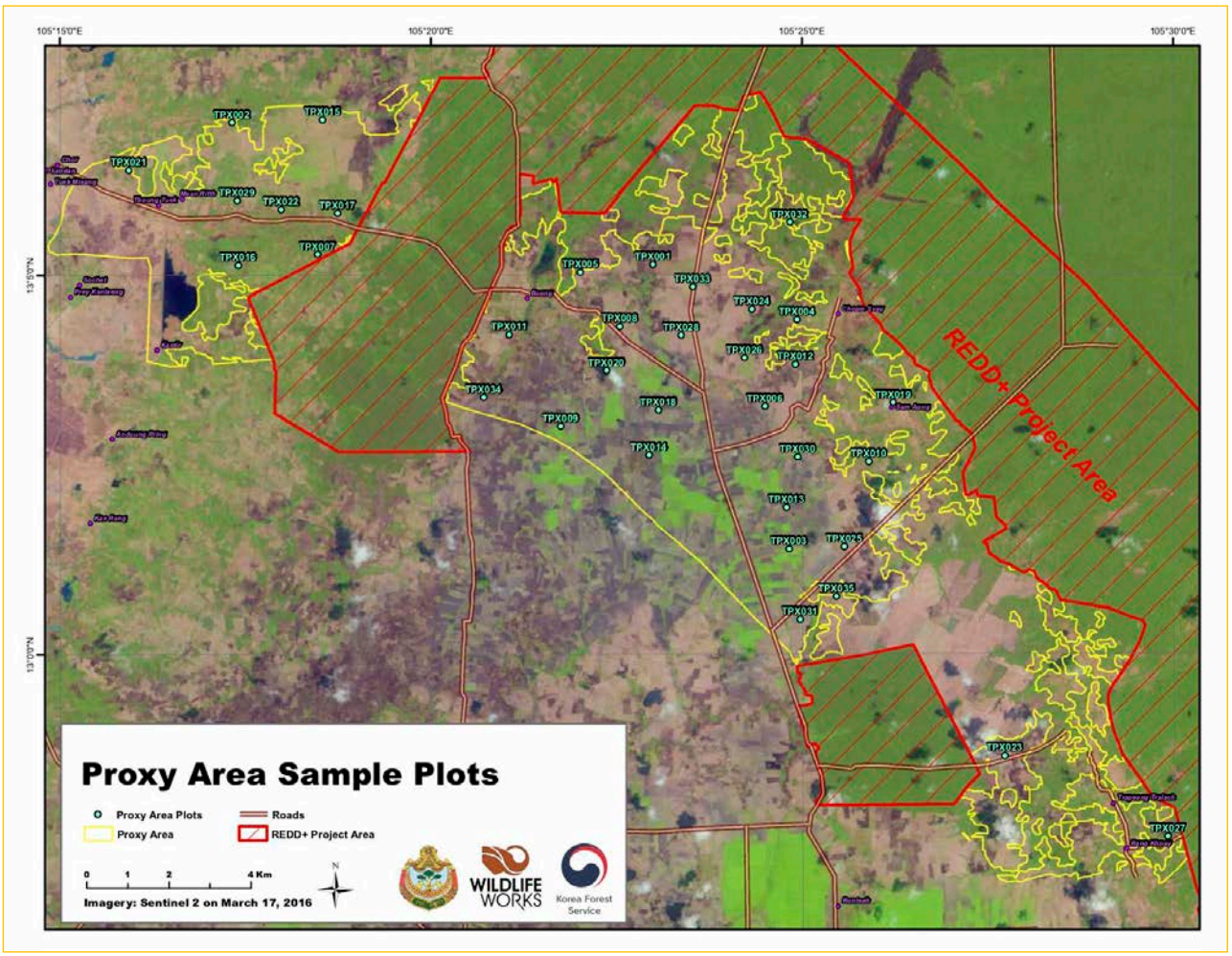


Figure 12: The Tumring REDD+ Project's Proxy Area and Proxy Area biomass plot locations are shown.

PDR.36 Maps or other evidence that the proxy area's site characteristics and landscape configuration is similar to its respective Project Accounting Area, including:

a. Vegetation;

Please see Appendix C 'Map of the Proxy Area Landcover." The Proxy Area landcover shown in the referenced map meets all of the Proxy Area requirements of the methodology VM0009. Additionally, please see Figure 10 which shows the Project Area at the Project Start date and at a point 10 years prior to the start date over a base map of high resolution satellite imagery. Although an outline of the Proxy Area is not shown in this map, the area can be viewed immediately adjacent of the Project Area's western boundary, and it can be seen that in the map 10 years prior to Project Start Date the Proxy Area vegetation cover was very similar to that which is observed

b. Climatic conditions (e.g. mean temperature, rainfall, etc.);

Please refer to Section 1.2.1.1. The referred section describes the climatic conditions, including temperature and precipitation, present in the general region where the Project Area is located. As the

Proxy Area is located immediately adjacent to the Project Area as shown in Figure 12 and has very similar topography, slope and aspect, as seen in Appendix C, the climatic conditions present in the Proxy Area are nearly identical to those in the Project Area.

c. Topographic constraints to conversion (slope, aspect, elevation);

Please see Appendix C 'Map of the Proxy Area Topographic Maps.'

d. Land use and/or land cover;

Please see Appendix C 'Map of the Proxy Area Landuse.'

e. Soil map (if available) or other soil information;

Please see Appendix C 'Map of the Proxy Area Soil Class.'

f. Applicable infrastructure (e.g. water ways, roads, railroad, airports, provision of electricity, and other access points); and

Please see Appendix C 'Map of the Proxy Area Infrastructure.'

g. Ownership/tenure boundaries that influence conversion (e.g. government holdings, private holdings and reserves).

Please see Appendix C 'Map of the Proxy Area Landuse.' The referenced map indicates that there are not any social or economic land concessions present in the Proxy Area that were responsible for its conversion. Therefore, as the Proxy Area was not converted through planned deforestation, it shows that the Proxy Area was deforested in the same manner as is described in the Project's baseline, namely, unplanned, illegal slash and burn agriculture. The community forests do not cover the entire extent of the Project Area, but rather less than half. Additionally, the community forest designation does not convey or imply ownership or tenure of the forest, but instead the right of a community for sustainable use. The ownership and tenure of the land is held by the state, as was much of the land in the Proxy Area. However, after conversion to non-forest, the community members are able to obtain land tenure to their farms and households in the Proxy Area, leaving much of that area in private ownership now. But the community forest designation alone does not always result in protection of the forest area from conversion. This can be seen in the TRP Project Area Landuse map in Appendix B, where within the community forest areas that are observed within the Project Area, areas of non-forest can be observed. To be an effective forest protection program, community forests takes time, resources and organization, something that in the absence of funding from a REDD+ project or an NGO is not likely to occur. Therefore, working with Community Forests in the Project Area to strengthen their management and provide them with resources is an important Project Activity.

PDR.37 A narrative describing the rationale for selection of proxy area boundaries, including the proxy area's similarity to the corresponding project accounting area with respect to vegetation, soil and climatic conditions.

The Proxy Area was chosen primarily for its accurate representation of the most likely "end state" of the baseline scenario that has been identified for the Project Area. Local expertise suggests that the chosen area, adjacent to the Project Area, is emblematic of the Project Area, and of the types of land use on this deforested land are typical in this region. The Proxy Area is also required to be accessible to the project proponents, providing the ability to install permanent plots that can be re-visited for monitoring of the carbon stocks for the lifetime of the project. The Proxy Area delineated for this project meets this requirement. The Proxy Area was delineated using land cover data, so as to identify areas that are classified as having a land use of agriculture. The delineated area was then confirmed using high-resolution imagery and through on the ground verification.

PDR.38 Results of a spatial analysis to demonstrate the proxy area is converted, on average, as of the project start date.

Please see a map demonstrating that the Proxy Area has all been converted to an agricultural land use as of the project start date in Appendix C.

PDR.123 Summary of sampling procedures for the proxy areas, with a copy of a sampling protocol used to carry out measurements.

The procedures used for locating and sampling the Proxy Area sample plots are found in the document Annex 8 – 'Standard Operating Procedure Tumring - Proxy Area v1.1_20160725'. The sampling procedure used is exactly the same as that used for the biomass sample plots. The plot locations are randomly placed within the Proxy Area. The sample design is a nested circular plot, with a 15m radius circle in which all trees are measured, and an inner 5 m sample plot where shrubs are measured. In the 15 m radius plot all trees over 10 cm DBH are measured and recorded. In the 5m shrub plot, all woody shrubs are classified into 3 size categories and counted. The only difference between the sampling procedures used in measuring the Project Area versus the Proxy Area is procedures used in determining the sample plot location and the inclusion in the Proxy Area SOP of a decision tree for the sampling team to move the sample plot location. These differences are due to the importance in ensuring the Proxy Area plot location is characteristic of the Project's baseline scenario, and due to the many additional restrictions and difficulties of access in the Proxy Area. The Proxy Area sample plot locations are shown in Figure 12.

4.5.8 Estimating the Deforestation Parameters

4.5.8.1 Estimating the Reference Level

The TRP elects to invoke the option in VM0009 v3.0, section 6 which allows for the use of a jurisdictional baseline that has been established and applicable to the project activity. The Royal Government of Cambodia submitted a Forest Reference Emission Level (FREL) under the UNFCCC Framework in July 2016 (MoE, 2016).

The national FREL is calculated over above-ground and below-ground carbon pools and presents average net total annual CO_2 emissions and removals (tCO_2e / yr). It was calculated by the Ministry of Environment (MoE) using the IPCC 2006 guidelines approach by utilizing 1. activity data (A) and 2. emission factors (EF) to achieve the FREL.

Historical Deforestation (Activity Data)

Activity data (historical deforestation) was calculated using a detailed, robust remote sensing approach with average individual map accuracy of 79.5% (MOE, 2016). The Royal Government of Cambodia's national FREL measures the historical deforestation that occurred during the reference period over the entirety of the country. The RGC is considering the proportional allocation method as one of the potential methods for FREL distribution. The Proportional Reference Level Allocation Method is fully described in a concept note recently presented to the RGC (Wildlife Works, 2017) and has been presented to RCG for inclusion in Cambodia's national REDD+ Program.

This method is an incentive-based approach that provides an equitable FREL allocation to the protectors of all remaining forest area in Cambodia under the assumption that all those areas are under a comparable level of threat. The proportional allocation method also facilitates the nesting process for existing projects within the future national REDD+ system.

The TRP province, Kampong Thom, has experienced very high historical deforestation rates compared to other Cambodian Provinces, and the Project Area represents one of the few remaining forest tracts in the province. We, therefore, expect a Project-specific REL to comprise a similar or higher deforestation rate

when compared to the national FREL allocated proportionally to the Project. However, because the TRP applied the national FREL to support the future nesting of the Project, the Project proponents have not completed a project-specific REL analysis (i.e. the BEM process described in VM0009), and the deforestation rate utilized from the FREL is based on RGC's official submission to the UNFCCC. It is, therefore, not currently possible to state whether or not the applied national FREL deforestation rate is conservative.

Per the Warsaw framework for REDD+ and to support the national REDD+ strategy, the RGC is moving rapidly toward a program in which all activity areas will utilize the national FREL and National Forest Monitoring System (NFMS) for monitoring, reporting and verification. With this premise in mind, the RGC has determined that one of the most conservative and equitable methods of incentive allocation is through a proportional FREL allocation

In the spirit of conservatism, if once the sub-national FREL allocation is complete and implemented by the RGC, it is found that the currently calculated REL diverges from the NREF allocated FREL, the TRP will conduct a baseline adjustment and corresponding crediting "true-up". This would, of course, be required once the Project nests into the national REDD+ system.

National Forest Inventory (Emission Factors)

Cambodia's NFI is in progress, and as such the RGC's provisional FREL submission to the UNFCCC utilizes emission factors calculated with preliminary data, some of which as old as 10 years. The RGC has already utilized plot data from all Cambodian Projects, including the TRP, to inform the design of the National Forest Inventory (NFI) and will use Project data on an ongoing basis in their official UNFCCC NFI submission and updates.

Because the TRP Project Accounting Area is representative of the Cambodian upland forest strata (the largest strata identified for the NFI), it is assumed that locally-measured biomass values will closely align with future NFI values. The RGC ultimately desires accuracy in its biomass measurements and has elected to measure EFs locally to provide a more accurate estimate of biomass than the preliminary EFs listed in the RGC's national UNFCCC NFI submission. RGC further notes the importance of measuring local TRP plots for future MRV efforts and accuracy assessments.

To support nesting into the national REDD+ system and the TRP's REL alignment with the national FREL, once the NFI is complete and national EFs are finalized, the TRP will switch to using the them. While the RGC cannot guarantee whether the locally-measured EFs will ultimately prove to be lower or higher than the NFI-based EFs, a Project REL adjustment and corresponding crediting "true-up" will nonetheless be performed upon nesting.

4.5.8.1.1 Delineating the Reference Area

PDR.40 A map of the delineated boundaries, demonstrating that the reference area was held by the identified baseline agent or agents and does not include the project area.

As stated above, the TRP uses the national UNFCCC FRL activity data (deforestation rate) and project-level emission factors. The TRP reference area is therefore defined synonymously with the national FRL area: e.g. the country of Cambodia. As stated above, the proportional allocation approach is utilized to ensure fair and equitable benefit distribution. The proportional allocation approach entails the scaling of the national FRL to the Project level based on its proportion of the forested area of the country of Cambodia. The reference area selected for the TRP is shown in Figure 13 below.

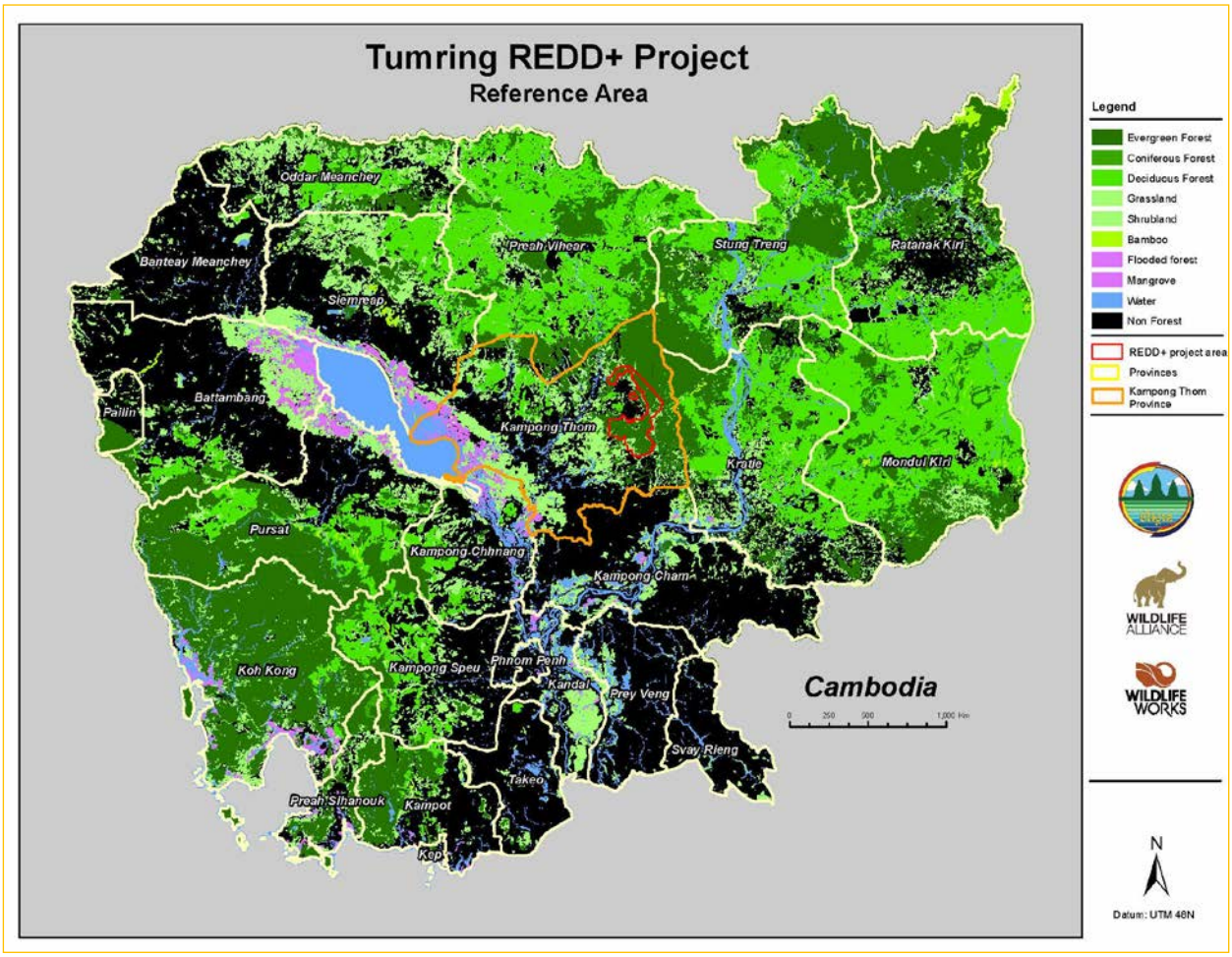


Figure 13: The reference area is shown in relation to the Project Area.

The reference area fully contains the REDD+ Project Area. It therefore contains the same agents of conversion that were identified in the baseline scenario. As the TRP uses a jurisdictional reference level, the criteria of PDR.40 requiring that the reference area does not include the Project Area does not apply.

PDR.41 Results of a spatial analysis to demonstrate the reference area had as much forest or native grassland as the project area at some point in time during the historic reference period.

Based on a spatial analysis of the MoE 2015 Land Cover dataset, the reference area (country of Cambodia) contains more forest (7,557,582 ha) than the REDD+ PAA (41,195 ha). Numerical results from the MOE land cover dataset for 2006 are shown below in in Table 22, and clearly indicate that the reference area contains as much native vegetated area as each respective PAA. VM0009 requires that this criterion is met “at some point within the historical reference period”.

Table 22: Results of spatial analysis to demonstrate validity of the reference area(s)

PAA area (ha)	Reference area Forested area (ha) (2006)	Reference area % of PAA
41,195.5	10,831,727	26,293 %

PDR.42 Evidence that the management practices of the baseline agents in the reference area are similar to those that would have been applied to the Project Accounting Area or areas in the baseline.

The Project Area is located entirely within the reference area and contains a similar cultural mix and socio-economic factors (Please refer to Section 4.6 the VCS Additionality Tool for more details). Having been successfully protected, the Project Area is one of the last contiguous forest blocks remaining in Kampong Thom province. The same factors that have led to significant deforestation throughout Cambodia during the Project's reference period still present a heavy threat to the Project.

PDR.43 A description of the rationale for selection of reference area boundaries.

As stated above, because the national FRL was selected, the reference area for the TRP is therefore defined as synonymous with the national FRL area: the country of Cambodia.

PDR.44 The documentation required in the Reference Area selection requirements that the selected reference area meets the Reference Area Selection Requirements.

Because the reference area is synonymous with the Kingdom of Cambodia, a sovereign entity, it is assumed to be inherently justified and reference area selection criteria is not required. This PDR is therefore not applicable.

4.5.8.1.2 Defining the Historic Reference Period

PDR.48 Established reference period boundaries.

The reference period for the Cambodian national FRL is a 9-year period between 2006 and 2014 inclusive (MoE, 2016).

PDR.49 A list of available historic imagery for the reference area.

According to the national FRL submission, 3 epochs were used to calculate historical deforestation %, 2006, 2010 and 2014. Landsat legacy imagery were used for the 2006 epochs, while Landsat 8 imagery was used for the 2014 map (see MoE, 2016 for detail). A detailed list of images may be acquired from MoE.

PDR.50 A timeline of important events as they relate to the agents and drivers of conversion.

Deforestation in Cambodia has occurred as a result of economic development that the government has had little capacity to enforce (MoE, 2016). The REDD+ Roadmap identified a series of direct drivers, including clearance for agriculture, settlement expansion, infrastructure development, illegal logging, and unsustainable harvesting of wood fuel, alongside a large set of indirect factors related to the socioeconomic environment and governance conditions both within and outside the forestry sector (Forestry Administration, 2010). A dramatic increase deforestation since 2010 is likely a consequence of an increase in forestland conversion, timber harvesting and agricultural expansion for cash crops. Forest disturbance resulting from the expansion of monoculture plantations for rubber has been statistically linked to international market price fluctuations, with the past few years seeing higher market prices and consequentially exceptionally high disturbance rates (Grogan, Pflugmacher, Hostert, Kennedy, & Fensholt, 2015).

PDR.51 Narrative rationale for the selection of the reference period.

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

4.5.8.1.3 Selecting Historical Imagery

PDR.53 Quantification of "double coverage"(greater than 90%).

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

PDR.54 A line plot of the historic image dates to confirm stationarity.

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

PDR.55 Evidence that all image pixels are not more than 30m x 30m.

All of the imagery used for the analysis of the historic reference period is from the Landsat program, which features a spatial resolution of 30mx30m (MoE, 2016*)*.

PDR56 Empirical evidence that imagery is registered to within 10% RMSE, on average.

The national FRL submission (MoE, 2016) describes the image Pre-processing procedure for development of activity data (deforestation rate) as shown below in Figure 14.

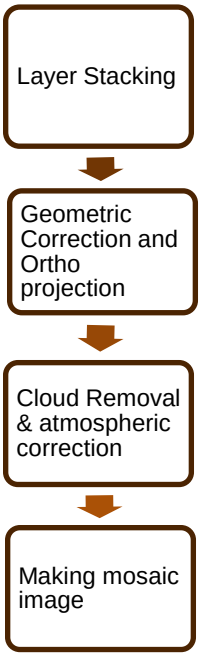


Figure 14: FRL Image Pre-processing

PDR.57 The sample size.

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

PDR.58 A map of the Reference Area showing the sample point locations.

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

4.5.8.2 Minimizing Uncertainty

PDR.63 A protocol for interpreting land cover state from imagery, which must include guidance for interpreting the following:

a. Discerning conversion features using shape, texture and context in the reference area landscape

b. Addressing seasonal variation of vegetation (phenology) within imagery

c. Identifying and addressing the characteristics of specific landscape configurations (i.e. mosaic forest, grassland, etc.)

The national FRL submission describes the image interpretation process in detail that includes:

- Establishment of a global land cover class hierarchy scheme
- Comparison and melding of the 2014 map classification scheme and interpretation protocol with those for the 2006 and 2010 maps
- Re-establishment of the forest definition
- Re-stratification of 2006 and 2010 maps to match the global land cover class hierarchy
- Use of external imagery such as FAO maps and Google Earth as reference
- An amelioration process involving identification of "unlikely" temporal land cover transitions and subsequent modification of maps.

Further detail describing the quality assurance and consistency procedures employed can be found in the national FRL submission document (MoE, 2016).

Table 23 depicts the final land cover class hierarchy used for the image interpretation process

Table 23: National FRL Land Cover Class Hierarchy (MoE, 2016)

No	Forest/Non-Forest	IPCC Land-use Category	No	National Land-Use Categories	FRL Classes (Initial FRL)	IPCC Category
1	**Forest**	Forest	1	Evergreen forest	Evergreen forest	Forest Land
			2	Semi-evergreen Forest	Semi-evergreen Forest	Forest Land
			3	Deciduous forest	Deciduous forest	Forest Land
			4	Pine trees	Pine forest	Forest Land
			5	Pine plantation	Pine plantation	Forest Land
			6	Tree plantation	Tree plantation	Forest Land
			7	Mangrove forest	Mangrove	Forest Land
			8	Rear mangrove	Rear Mangrove	Forest Land
			9	Forest regrowth	Forest regrowth	Forest Land
			10	Flooded forest	Flooded forest	Forest Land
			11	Bamboo	Bamboo	Forest Land
2	**Non-Forest**	Crop land	12	Rubber plantation	Non-forest	Cropland
			13	Oil palm		Cropland
			14	Paddy field		Cropland
			15	Crop Land		Cropland
3		Grassland	16	Grassland		Grassland
			17	Wood shrub		Other Land
4		Wetlands	18	Water		Wetland
5		Settlements	19	Built-up area		Settlement
			20	Village		Settlement
6		Other	21	Rock		Other Land
			22	Sand		Other Land

PDR.64 The results of an independent check of the interpretation.

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

PDR.65 Evidence that systematic errors, if any, from the independent check of the interpretation were corrected.

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

4.5.8.2.1 Reference Level

As described above, activity data results from the national FRL submission (MoE, 2016) were used in conjunction with emission factors calculated from carbon stock data collected within the Project Area. The proportional allocation method was then used to apply the reference level to the TRP Project Accounting Area. Table 24 lists the emission factors used and Table 25shows the calculation of the TRP reference level.

Table 24: Emission Factors used for the TRP reference level calculation.

TRP land cover stratum	Area (ha)	Average Stock (tCO_2e/ha)
Evergreen Forest	40,541.01	495.4
Deciduous Forest	456.78	118.6
Semi-Evergreen Forest	197.71	135.5
Proxy Area	5,873	5.6
Emission Factors (tCO2e/ha)		
Evergreen Forest		489.9
Deciduous Forest		113.1
Semi-Evergreen Forest		130.0
TRP area-weighted mean Emission Factor		484.0

Table 25: Reference Level calculation for TRP

Description	Value
Cambodia area (ha) ‡	18,160,674
Cambodia forested area in 2014 (ha)‡	8,518,173
Cambodian National deforestation % (2006 - 2014) ‡	21.40%
Tumring REDD+ PAA (ha)	41,195.5
Cambodia FRL scaled to TRP REDD+ PAA (% of Cambodia forest 2014) (tCO2e/yr)	474,029

‡from MoE, 2016

4.5.8.2.2 Estimating Uncertainty

PDR.66 The estimated uncertainty σ_{EM} from [F.13] and statistical summaries from model fitting software, if available.

A detailed assessment of accuracy was performed on the activity data model for the national FRL submission.

Separate accuracy assessments were carried out for each of the land cover maps, summarized as follows:

Accuracy assessment of the original 2006 and 2010 forest assessment maps was performed by Geographic Resource Analysis & Science A/S (GRAS). The report was compiled as Accuracy Assessment Report (draft final). Overall accuracy of the five classes – Evergreen Forest, Semi-evergreen forest, Deciduous Forest, Other Forest and Non-Forest, was **74% for the 2006 map** and **85% for the 2010 map**.

New accuracy assessments of the upgraded 2006 map and 2010 map was performed after the completion of the amelioration process described above. For the accuracy assessment of 2014 map, the total number of reference points was calculated using (Congalton & Green, 2009) and distributed for each class proportional to class area. Overall accuracy of the 22 land cover classes was **81.23% with a kappa value of 79.49% for the 2014 map.**

Full confusion matrices are available in MoE, 2016.

Cambodia is currently undertaking an accuracy assessment of change of land use change data between 2006 and 2010, and between 2010 and 2014. The results are expected to be made available as part of future FRL submissions.

PDR.67 Reference to uncertainty calculations.

As stated above, Congalton & Green, 2009 was used to estimate accuracy for each of the maps:

2006 map

See Geographic Resource Analysis & Science A/S (GRAS), 2007.

2010 and 2014 map

The number of accuracy assessment points was determined using Congalton & Green, 2009:

$$n = B/4b^2$$

where

Confidence level (95%)	α	0.05
Number of class	κ	22
upper (α/κ) x 100th percentile of the χ2 distribution with 1 degree of freedom	B	9.3151
Desired precision	b	5% (0.05)

hence

2010 map: $n = B/4b^2 = 9.3151 / 4 \times (0.05)^2 = 932$

MoE decided to use 1233 assessment points for the 2010 map due to an adjustment of points per land cover class. For the 2014 map, the same adjustment procedure was used for a total of 1252 assessment points (MoE, 2016)..

PDR.78 The project shift parameter γ as the number of days between the beginning of the historical reference period and the project start date.

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

PDR.79 The parameter q as the number of days between the onset of degradation and the beginning of conversion.

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

4.5.9 Baseline Scenario for Selected Carbon Pools

PDR.39 A qualitative description of the baseline scenario for each selected carbon pool.

4.5.9.1 Project Accounting Area

Above-ground other tree (AGOT): The above-ground portion of the tree carbon pool is assumed to be completely removed from the forest ecosystem during the conversion process for the baseline scenario. The trees in this pool are assumed to have immediate loss to CO_2e emissions, with no wood used for long-lived wood products. Conversion of this pool is carried out either in-situ via combustion or by removal and direct combustion for fuel wood. Any residual AGOT biomass that remains following conversion by the agents is determined using data collected from biomass sample plot measurement in the proxy area.

Above-ground non-tree (AGNT): The AGNT pool is assumed to be completely removed from the forest ecosystem during the conversion process for the baseline scenario. Plants and shrubs in this pool are assumed to have immediate loss to CO_2e emissions, with no portion going to long-lived products. As this pool is comprised of generally low-density and small woody material, it is assumed in the baseline scenario that biomass from this pool is either combusted in-situ or entirely cleared and left to decay. This decay occurs very quickly due to the ecosystem climate and physical characteristics of the material. Any residual biomass from the AGNT pool that remains after conversion by the agents is determined using data collected from biomass sample plot measurement in the proxy area.

Below-ground other tree (BGOT): The below-ground component of the tree carbon pool is assumed to be minimally impacted by the activities of the agents of deforestation. Emission from this pool are determined using a root:shoot ratio of 0.4 (the IPCC default) of below-ground to above-ground biomass. The below-ground carbon pool is assumed to decay at a constant (linear) rate over a period of 10 years.

4.6 Additionality (G2.1. & G2.2.)

Step 1. Identification of alternative land use scenarios to the proposed VCS AFOLU project activity

Sub-step 1a. Identify credible alternative land use scenarios to the proposed VCS AFOLU project activity.

PDR.99 A list of alternative land use scenarios to the project

a) Identify realistic and credible alternative land-use scenarios to the proposed REDD+ project activity.

i. Continuation of the pre-project land use;

The most likely alternative land-use scenario to the planned REDD+ Project is the continuation and proliferation of the historically observed unplanned deforestation, degradation and conversion of the Project Area. This ‘unplanned’ deforestation and forest degradation, as defined by the VCS methodology VM0009 v3, occurs across the Project Area both legally, as under Cambodian law community members are allowed sustainable use of forest products, and illegally as forest is converted to agriculture. This stems from lax enforcement of property tenure and resource planning, coupled with the communities’ economic need for resources and land. There is a single land ownership within the Project Area, the government of Cambodia through the Forest Administration, however

several land management types. However, the general pattern of unplanned deforestation, driven by the need for wood for building materials and firewood, and new agricultural land, is identical across all of the forest management types.

End land-use in the greater Prey Lang ecosystem is generally observed as slash and burn agriculture. This is precipitated by several factors, the most prominent being immigration into the Project Area and population growth. Small-scale subsistence agricultural offers a crucial livelihood to communities in the Project Area, where there is limited access to other economic activities and export markets. Additionally, as current agricultural practices are based on unsustainable and inefficient land uses, the soil fertility of converted land is quickly depleted, necessitating the continual conversion of new lands to maintain crop yields.

In the absence of the REDD+ Project, the deforestation and forest degradation patterns described above, coupled with inadequate financial resources across the landscape, will continue unabated. It is clear that in the absence of funding from the sale of emission reductions the Project Proponent will be unable fund project activities at a level significant enough to protect the Project Area from ecosystem conversion.

ii. Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project;

Conservation is a common practice in Cambodia, with several small conservation sites run by the Government and non-governmental organizations. However, many of these are in much less threatened areas, are larger in size than the Tumring REDD+ Project, or have additional funding from governments or donor funds, not the financial return from Project Activities. There have been limited conservation activities previously in portions of the Project Area prior to the onset of the Project. Existing activities mainly has included enforcement of forest boundaries and attempts to reduce illegal logging activities. The lack of a consistent source of significant funding has limited the scope of these project activities and their effectiveness at reducing the widespread deforestation and forest degradation that has been occurring across the area. Furthermore, this area has not historically attracted significant attention from conservation NGOs and donor funding has been unsustainable and inconsistent over the long term, which has limited the ability of the Project Proponent to expand the project activities to the scale needed to stop the ecosystem degradation and conversion from occurring. The funds from the sale of emissions reductions provided garnered by the REDD+ Project will be instrumental in the development of an independent, and long-term sustainable revenue stream to support these project activities and expand their reach across the Project Area to additional communities.

iii. Activities similar to the proposed project activity on at least part of the land within the project boundary of the proposed VCS AFOLU project at a rate from legal requirements;

The land within the project boundary is all Cambodian state owned and administered by the Cambodian Forest Administration, the Project Proponent. On these land parcels there is a legal requirement to perform activities similar to the proposed project activities, such as conserve the forest and enforce the boundaries of the areas against deforestation and degradation activities. Some sustainable use of the forest resources by the local communities is allowed, such as the non-commercial harvesting of trees for use as building materials. While this land is managed for conservation purposes and is protected

under national legislation, it has undergone significant forest degradation and deforestation over the last 10 years. This is largely due to a lack of funding at the Forest Administration, limiting their ability to enforce the forest boundaries and patrol the areas to stop the unsustainable activities that lead to forest degradation and deforestation. The primary source of revenue for the protection of the forest is the general budget allocation of the Forest Administration. All areas under the Forest Administration jurisdiction have to compete for the limited funds available to support the protection of the areas, which leaves most of the forest areas under funded. Deforestation activities inside of the Project Area include widespread “slash and burn” subsistence agriculture as the primary driver of deforestation. Additionally, trees are harvested in an unplanned fashion for use as building materials, charcoal production and firewood.

Sub-step 1b. Consistency of credible land use scenarios with enforced mandatory applicable laws and regulations

The majority of the alternative land use scenarios listed in sub-step 1a represent illegal land uses, with the major exception of the sustainable harvesting of trees by the local communities to be used as building materials. However, local expert knowledge and historical satellite imagery both document that all of these alternative scenarios have been commonly occurring in the areas around the Project Area, despite being illegal.

Forest degradation and deforestation are major threats to all land units in the Project Area despite the presence of official legal protection. In addition to slash and burn agriculture, tree harvesting for charcoal production, firewood and building materials from the state owned protected areas is also clearly illegal under Cambodian Law. There is significant evidence that the boundaries of many Cambodian forested areas and protected areas are not enforced, and that there is a substantial amount of uncontrolled access into protected areas that leads to their conversion. This gap in enforcement is largely caused by a lack of funding, limiting the Cambodian Forest Administration from the ability to patrol the forested area with enough frequency and efficacy to deter conversion activities, as detailed in the above section Sub-Step 1a. An analysis of the land cover / land use in Kampong Thom province in which the Project Area is located showed that greater than 30% of the land area has been converted to agriculture. This shows that conversion to Agriculture is a common and prevalent scenario in this area, and that laws and regulations on land use are systematically not enforced. The evidence of this analysis was provided to the validator. This risk is shown in Figure 15, where an analysis of recent satellite imagery (2010 and 2015) of an area adjacent to the Project Area demonstrates that a substantial amount of its area has undergone complete deforestation and conversion to agriculture. This site exhibits extremely similar conditions to the Project Area Project, including presence of, and ease of access by, the same agents of degradation and deforestation as well as the same drivers of deforestation and degradation.

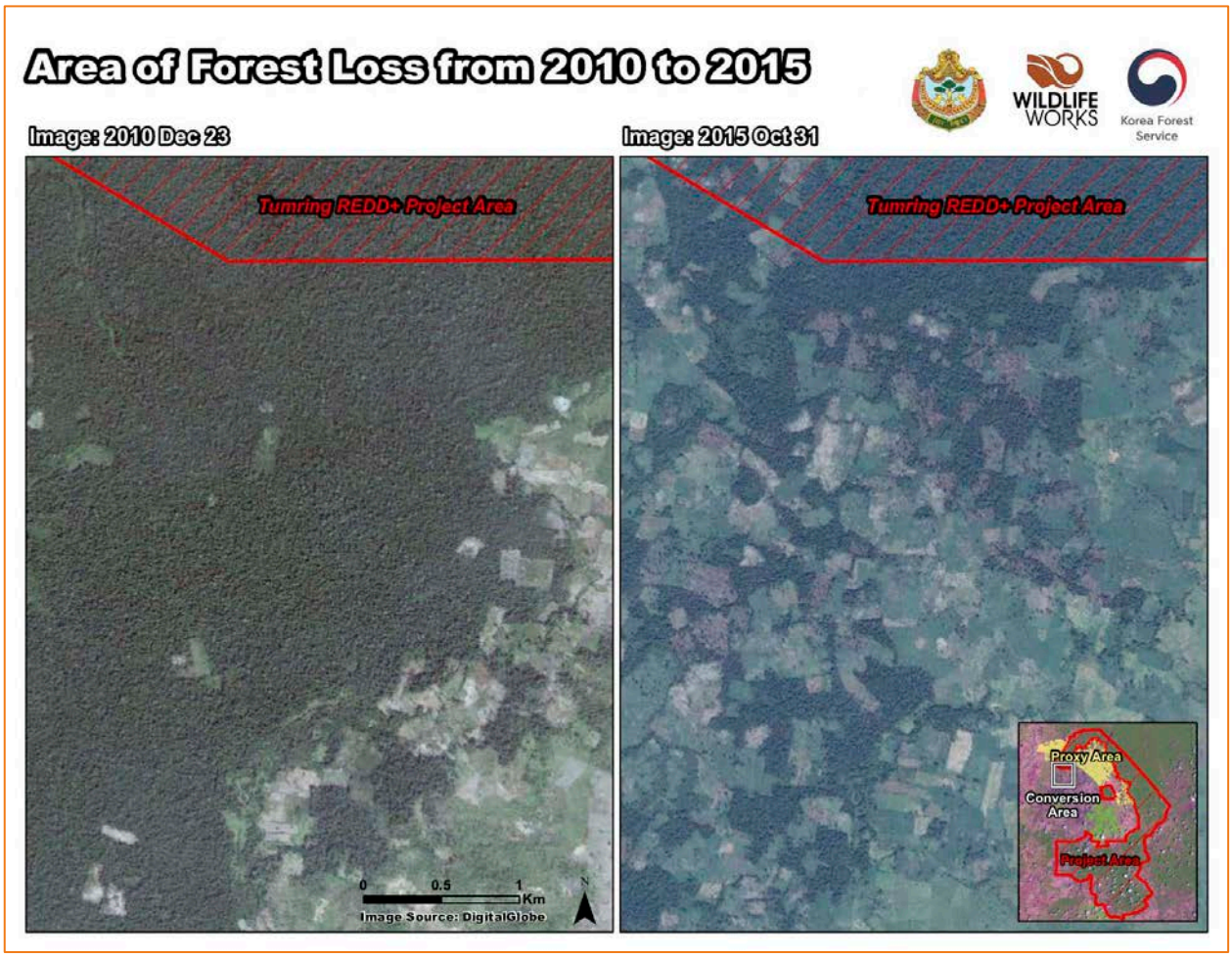


Figure 15: An area adjacent to the Project Area is shown in 2010 and 2015. The amount of forest conversion to agriculture can be seen. This area was under similar land use and management during this period as the Project Area.

Sub-step 1c. Selection of the baseline scenario:

PDR.100 Justification for the selected baseline scenario. This justification can include expert knowledge, results from the participatory rural appraisal and ex-ante estimates of avoided emissions

VM0009, 'Methodology for Avoided Ecosystem Conversion' v3 provides a step-wise approach for selecting the most plausible baseline scenario. For the Tumring REDD+ Project, the most plausible scenario was determined to be the continuation of pre-project land-use activity: namely, conversion to subsistence agriculture, as described in Step 1a above. There is evidence of significant encroachment into the Project Area already, with areas of active conversion to agriculture. Those areas that have already been converted to agriculture during the project development period were excised from the Project Area according to VCS and VM0009 regulations. The surrounding areas, including other protected areas, have all seen significant levels of ecosystem conversion from forest to agriculture, demonstrating that slash and burn agriculture is the primary driver of ecosystem conversion in this region, and it is also the most obvious scenario that would occur in the absence of a REDD+ project.

Step 2. Investment analysis

PDR.101 An investment or barriers analysis proving that the project is not the most economical option.

Sub-step 2a. Determine appropriate analysis method

The VCS AFOLU project generates no financial or economic benefits other than VCS-related income derived from the sale of carbon credits. Therefore, simple cost analysis applies.

Sub-step 2b. Apply simple cost analysis

The proposed project activities are non-revenue generating (other than VCS-related carbon income) and the physical protection of the Project Area, and provision of deforestation mitigation activities are projected to cost the Project Proponent over $300,000 USD per annum. There exists no significant income from other Project Activities or other sources from the land to offset these costs. In the absence of active protection, both physical, and that created by partnering with the communities to create new economic alternatives, it is clear the land in the Project Area would be cleared aggressively for subsistence agricultural purposes, as has already been observed in the Project Area currently. Slash and burn subsistence agriculture faces no economic barriers and is therefore clearly identified as the most likely land use in the baseline (without-project) scenario.

Step 4. Common Practice Analysis

PDR.102 A common practice analysis including a list of project activities and the drivers of conversion that they address.

The common practice of forest protection in Cambodia is through the financial and technical support of international non-governmental organizations (INGO), such as WCS, WWF, and CI. These INGOs receive financial support from donors and collaborate with the Cambodian government on forest conservation activities. Each INGO has been working in their respective area for at least a decade and uses funding cycles of 1-3 years to support the continued operation of their conservation site. The nearby conservation sites in Preah Vihear and Kulen Promtep (WCS/MOE) and Prey Lang (CI/MOE) follow this pattern.

There are fundamental differences in the management regime, timeframe, and finances between the aforementioned activities and that of the TRP. The existing projects engage in co-management, of which the INGO is often the lead in law enforcement, thus providing more funding for the halting illegal activities. The INGOs have worked in their respective sites for a minimum of 10 years building a foundation of conservation ethos not only amongst the government staff but amongst local communities as well, and work at a larger scale then is seen in the Project. The 1-3-year funding cycles that the INGOs rely on make long term planning and project activity sustainability difficult, as changes in donor priorities and politics can result in funding fluctuations. Funding is provided by INGOs to the projects based on their priorities and funding requirements, generally not in a consistent or long-term manner nor based on the project's measured success of forest protection achieved.

The TRP is unmistakably dissimilar from these comparable "common practice" forest conservation activities based on the following essential distinctions:

1. Primary funding for project activities will come from the sale of carbon credits, linking project funding with the measured success of the forest protection, while also providing the project with a long term, sustainable and stable funding source.
2. A strictly RGC led management structure without support of an INGO.

3. A newly implemented project with a lack of existing conservation ethos amongst the government staff and local communities.
4. Lack of major donor support from an INGO for on-going project activities

The TRP will provide new, ecologically sustainable, economic alternatives for local communities, dramatically reducing their unsustainable reliance on the natural resources within the Project Area. Section 4.5.4 describes the agents and drivers of conversion. The full descriptions of all of the Project Activities can be viewed in Section 2.2. Table 26 below provides a list of the Project Activities and the respective conversion drivers addressed.

Table 26: The list of Project Activities and the drivers of conversion that they address is provided.

Project Activity	Driver of Conversion Addressed
Income Generating Activities (IGA)	High demand for agricultural land and cash crop land
Deforestation Free Commodities and Promote farmer production forestry	High demand for agricultural land and cash crops land, Illegal forest land clearing, fuel gathering and charcoal production.
Promoting Effective Land Use Planning and Tenure Security	High demand for agricultural land and cash crops land, Illegal logging, fuel gathering and charcoal production.
Strengthening Community Organizations	High demand for agricultural land and cash crops land, Illegal logging, fuel gathering and charcoal production.
Training on Agricultural Methods and Intensification	High demand for agricultural land and cash crops land
Employment and Motivation of a Larger Ranger Force	High demand for agricultural land and cash crops land, Illegal logging, fuel gathering and charcoal production.
Establish Micro-financing schemes	High demand for agricultural land and cash crops land, Illegal logging, fuel gathering and charcoal production.
Improve Health Facilities and Care	High demand for agricultural land and cash crops land, Illegal logging, fuel gathering and charcoal production.

PDR.103 Evident compliance with the minimum requirements of the aforementioned VCS tool. This evidence may be the same as the evidence provided to meet reporting requirements listed in section 4.

The Project Proponent has demonstrated that the project complies with the applicability conditions of the methodology (see Section 4.2). Further, the Project Proponent has demonstrated that the REDD+ Project complies with all applicable local and National laws (see Section 3). Finally, the method for determining the baseline scenario (described in section 4.5) is consistent with that prescribed in VM0009 methodology

version 3.0. Thus, the Project Proponent has fully complied with the minimum requirements of the VCS Additionality tool.

5 QUANTIFICATON OF GHG EMISSION REDUCTIONS AND REMOVALS (CLIMATE) (CL1.)

5.1 Project Scale and Estimated GHG Emission Reductions or Removals (CL1.1.)

Table 27: Project type

Project	
Large project	X

Table 28: Project estimated annual NERs

Year	Estimated GHG emission reductions or removals (tCO2e)
2015	424,256
2016	376,853
2017	376,853
2018	376,853
2019	376,853
2020	376,853
2021	376,853
2022	376,853
2023	376,853
2024	376,853
2025	376,853
2026	376,853
2027	376,853
2028	376,853
2029	376,853
2030	376,853
2031	376,853
2032	376,853

2033	376,853
2034	376,853
2035	376,853
2036	376,853
2037	376,853
2038	376,853
2039	376,853
2040	376,853
2041	376,853
2042	376,853
2043	376,853
2044	376,853
Total estimated ERs	11,353,005
Total number of crediting years	**30**
Average annual ERs	**378,434**

5.2 Leakage Management (CL3.2.)

5.2.1 Leakage Mitigation Strategies

PDR.104 A list of project activities designed to mitigate leakage.

Risk of Project leakage will be minimized by a number of Project activities designed to provide improved agricultural methods and yields, diversification of and implementation of new income generating activities. These activities will reduce the potential risk of conversion shifting to areas outside of the Project Area. For a comprehensive and detailed list of all Project Activities please refer to Section 2.2. A brief overview of the significant Project Activities is provided in Table 29.

Table 29: Brief Overview of leakage mitigation strategies in the Tumring REDD+ Project.

Leakage Management Activity	Description
Improved and Intensified Agriculture	Training will be provided to the communities on the methods and best practices involved in conservation agriculture. This program will aim to increase yields on existing farms and decrease the rate of land conversion. It will also build and support produce storage facilities and value-added technologies to take advantage of market price fluctuations and aid in achieving high sale prices.
Employment of a Ranger Force	This Project will hire and equip a ranger force that provides direct protection of the land from conversion. This force acts as a deterrent to the conversion of the project area but also a powerful outreach tool to the local communities, providing assistance with wildlife issues and information.
Strengthen forest land use planning and secure land tenure	The project will work with key relevant government departments, local authority, and community to introduce agricultural land titling program, develop forest land use planning, implementation and register community forest area, other forest land in the PA to ensure the long security.
Alternative-Income Generation	The Project has several programs to help develop new income generating activities for members of the communities in the Project Area. This includes a variety of individual activities such as promoting and supporting resin collection and the production of deforestation free commodities.
Micro-finance schemes	The Project will use best-practice in micro-finance to enhance community member's access to capital and markets. This will include micro-loans, micro insurance and other small and medium development practices (SME).

5.3 Baseline Emissions (G2.2)

As described above in Section 4.5.8, a jurisdictional reference level was calculated using national FRL activity data and project-level emission factors. The justification for this choice of methodology is also described above in Section 4.5.8. The method applied uses the emissions calculation approach for forest conversion stated in the IPCC 2006 guidelines, which multiplies activity data (A) by emission factors (EF) to achieve the FRL.

FRL = Activity Data (A) × Emission Factor (EF)

5.3.1 Calculating Baseline Emissions from Biomass

Historical emission estimates were developed based on the national FRL activity data from 2006 to 2014. Annual CO_2 Emissions and Removals (tCO2e / 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;

ΔC_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-1

$C\ t_2$ = total carbon in biomass for each land sub-category at time t_2 ; tonnes C
$C\ t_1$= total carbon in biomass for each land sub-category at time t_1; tonnes C $C\ t$ (Total Emission) = Activity Data (A) × Emission Factor (EF)

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

5.3.1.1 Calculating Carbon Not Decayed in DW

The TRP does not include planned forest harvesting in the baseline scenario. Additionally, the Cambodian national FRL excluded deadwood as a carbon pool, and as the Project is utilizing this national FRL as a jurisdictional baseline it should also exclude deadwood as a carbon pool to maintain consistency. Therefore, the deadwood carbon pool has been conservatively excluded from Project carbon accounting.

5.3.2 Calculating Carbon Not Decayed in BGB

The TRP applied a jurisdictional reference level. A BGB decay model therefore does not apply per guidance supplied by VCS.

5.4 Project Emissions (CL2.1.)

5.4.1 Calculating Emissions from Changes in Project Stocks

PDR.122 Summary of sampling procedures for the project accounting areas, with a copy of the sampling protocol used to carry out measurements.

To accurately estimate the biomass in the Project Area, a stratification analysis is done based on the different land cover types present. Random sample plots are generated for and placed within each of the strata to account for variance within each stratum. The number of sample plots needed to meet the uncertainty and error requirements of the VM0009 are determined using equation [B.2]. The UTM coordinates associated with the plots are generated using a geo-referenced map and then distributed to the field crews. Extra plots are often generated for each stratum in the event that some of the original plots are not accessible due to slope, terrain, rivers, landslides, ravines and other such environmental issues.

The sampling procedures used in the TRP for measurement of the sample plots are described in detail in the document ‘Standard Operating Procedure Tumring - Forest Inventory v4.3_20172908’, located in Annex 5 of this document. This document has been provided to the auditor for review, however is not publicly available due to the sensitive and proprietary information provided in it. A summary of the procedures is provided below.

A nested circular sample plot design was used for the TRP. The largest plot had a radius of 15m and the smaller plot had a radius of 5 m. All trees are measured in the larger plot whereas in the smaller plot shrubs were measured. The minimum diameter for considering an individual plant as a tree for the TRP is 10 cm diameter measured at 1.3 m above the ground (DBH). All smaller woody plants are considered shrubs.

The SOP provides a checklist for plot sample teams to ensure full preparedness before initiating any work. Sample teams then navigate to the coordinates of the plot center using a GPS device. If the team is establishing a new sample plot, then a monument is to be driven into the ground to permanently mark the plot center. If the team is re-measuring an existing plot than the center monument must be found. The SOP describes several methods to help discover the monument. Sample plot teams must navigate to the original plot center coordinates as provided by project management, there are only a few instances for team safety or other reasons in which a team may move a plot center or abandon a plot location, this process is described in detail in the SOP. The sample plot locations for the TRP are shown in Figure 16.

Once the plot center has been established, then first all shrubs within the 5 m plot must be counted. The shrubs are counted in 3 size ranges, small, medium and large, the SOP describes these classifications in detail. Then all trees are measured within the 15 m large plot. The primary measurement taken for each tree is diameter at breast height (DBH), which is defined as 1.3 m above ground. Due to environmental constraints or tree morphology the DBH location may be moved up or down on the tree bole, the SOP provides a detailed decision tree to determine DBH location for each tree. Standing dead trees and lying dead trees are both excluded from measurement. All tree measurements are recorded on site on the data collection sheet. The team leader is responsible for quality assurance in tree measurement and data recording, and are must monitor and check the work of the team as needed.

Biomass plots must be re-measured at a minimum every five years. 20% of the biomass plots will be re-measured annually, achieving 100% sample plot coverage every five years. Biomass plot locations are depicted below in Figure 16. Changes in project carbon stocks are calculated as the difference in project stocks in each stratum for 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.

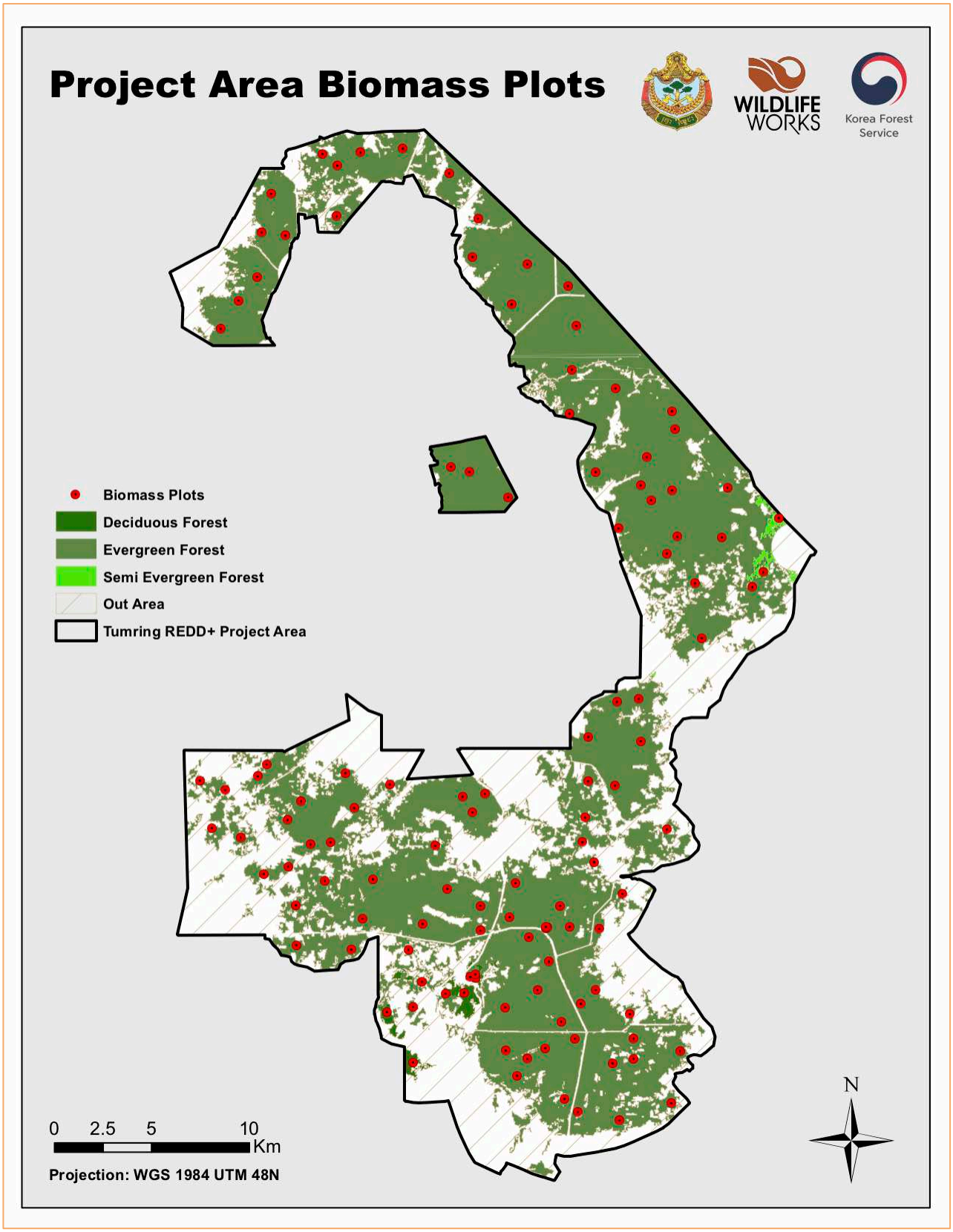


Figure 16: Biomass sample plot locations in the Tumring REDD+ Project

5.4.2 Calculating Emissions from Burning

Currently, no planned project activities involve the burning of biomass burning in any manner. As such, emissions from burning are included in carbon accounting. However, 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.

5.5 Leakage (CL3.1.)

5.5.1 Activity-Shifting Leakage

5.5.1.1 Delineation of Activity-Shifting Leakage Area

PDR.105 A map of the delineated boundaries.

Activity shifting leakage, as described in detail by PDR 107 below, is measured in the activity shifting leakage area, which is shown below:

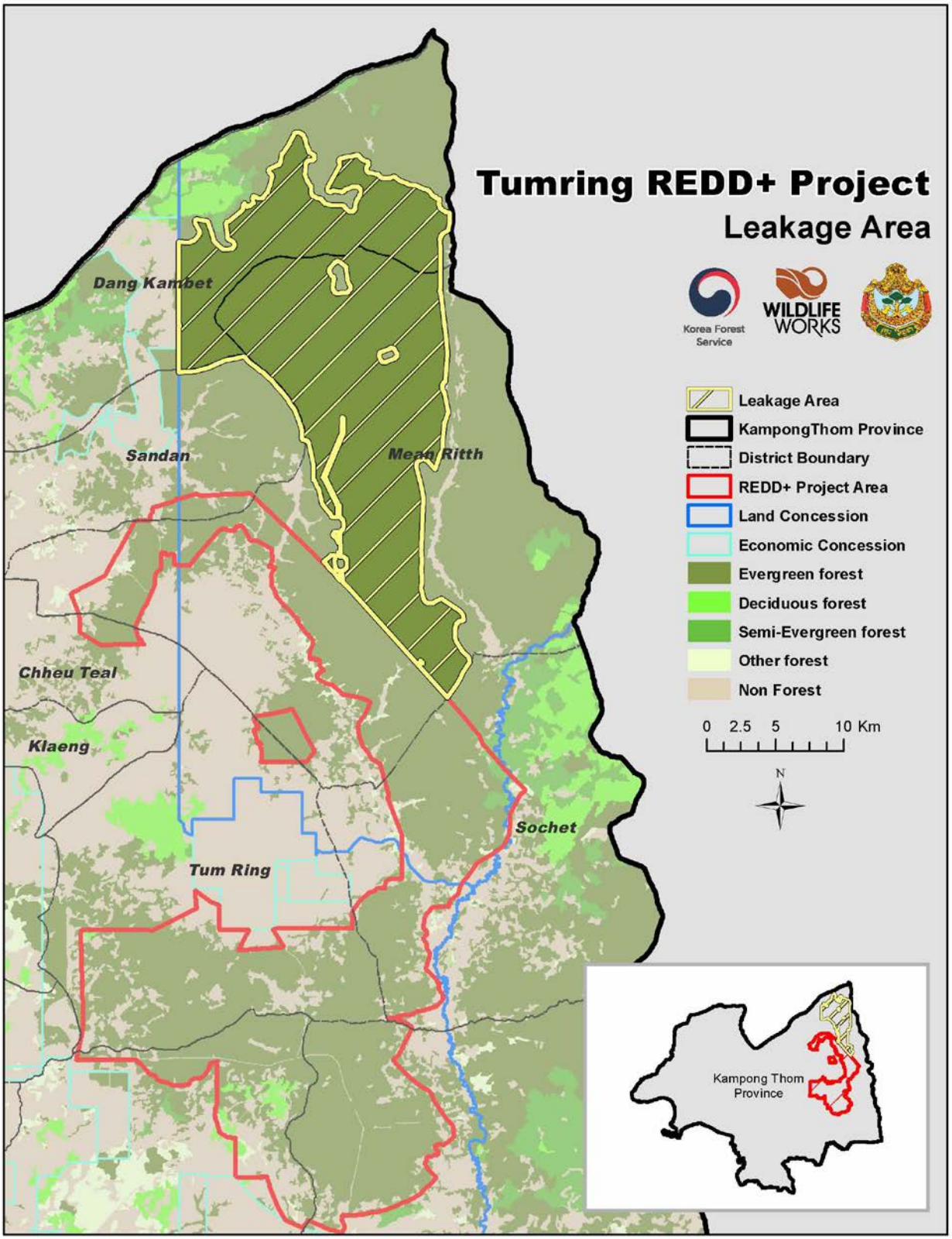


Figure 17: Leakage areas for the PAA

PDR.106 Maps of the landscape configuration, including:

a. Topography (elevation, slope, aspect);

Please see Appendix E 'Map of Activity-Shifting Leakage Area topography.' The map of the leakage area in this appendix depicts a digital elevation map of the leakage areas (DEM), a map of the leakage area slope and a map of the leakage area aspect.

b. Recent land use and land cover (either a thematic map created by the project proponent or publicly available map);

Please see Appendix E 'Map of Activity-Shifting Leakage Areas Land cover.

c. Access points;

Please see Appendix E 'Map of Activity-Shifting Leakage Area's Infrastructure' for a map of the primary points of access for the Leakage Areas.

d. Soil class maps (if available);

Please see Appendix E 'Map of Activity-Shifting Leakage Area soil class.'

e. Locations of important markets;

Please see Appendix E 'Map of Activity-Shifting Leakage Area's Infrastructure' for a map of the important markets in the Leakage Areas. There are no important markets present in the leakage area, therefore the closest markets to the leakage area are those shown in the Proxy Area on the map referenced.

f. Locations of important resources like waterways or roads; and

Please see Appendix E for 'Map of Activity-Shifting Leakage Area's Infrastructure' and 'Map of Activity-Shifting Leakage Area's Rivers' for maps of important resources in the Leakage Areas.

g. Land ownership/tenure boundaries.

Please see Appendix E 'Map of Activity Shifting Leakage Area's Landuse' for a map of the landownership/land tenure boundaries in the Leakage Areas.

PDR.107 A narrative describing the rationale for selection of activity-shifting leakage area boundaries. If the activity-shifting leakage area is smaller than the project accounting area or cannot be defined, justification for the size of the area. If foreign agents have been identified as an agent of conversion, justification that they are unlikely to shift their activities outside the activity-shifting leakage area.

Areas near the Project Area were examined using recent high-resolution imagery from Google Earth and Bing Maps. The closest appropriate regions to the Project Area that met VCS activity shifting leakage area requirements were selected. In the interest of conservativeness, it was confirmed that the identified leakage area is the next closet area of forest to the agents of deforestation and is also of similar land tenure. This is to ensure that any conversion that is potentially displaced from the Project Area is captured through the sampling of the activity-shifting leakage areas. A land cover stratification was then used to confirm that the selected activity-shifting leakage area contains as much forest as the PAA. It was additionally confirmed, using geospatial analysis, that the leakage area is similar to the Project Area in landscape configuration, such as elevation, slope and proximity to infrastructure and settlements.

PDR.108 Results of a spatial analysis to demonstrate the activity-shifting leakage area is entirely in a non-converted state (e.g. forested or native grassland) as of the project start date.

The activity shifting area was selected to include only areas that are currently forested. A Land cover stratification that was developed by the Royal Government of Cambodia Forestry Administration was first used to select areas that met the criteria for the two leakage areas. Then recent medium and high-resolution imagery was utilized to confirm that the leakage area does not contain any areas of deforestation. Please refer to Appendix E for maps demonstrating and cover within the leakage area.

PDR.109 Results of a spatial analysis to demonstrate the activity-shifting leakage area is no larger than the project accounting area.

The leakage area was selected to contain the same area of forested as the Project Accounting Areas. The leakage area is 41,195 ha, while the Project Accounting Area is 41,196 ha. An effort was made to make the activity shifting leakage area the same size as the Project Area, however due to the constraints of GIS it is approximately 1 ha smaller than the Project Area. This size difference will not impact the activity shifting leakage assessment or model in any way.

Table 30: Results of spatial analysis to demonstrate validity of the leakage areas

Activity shifting leakage area	Leakage area (ha)	PAA area (ha)
Forest	41,195	41,196

5.5.1.2 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. These observations are used to estimate the cumulative emissions from activity shifting leakage for each monitoring period according to equations [F.46] and [F.47] (from the methodology VM0009) using the leakage emissions model. The leakage emissions model is parameterized using equations [F.48] and [F.49] in the VCS methodology VM0009 v3.

5.5.1.3 Sampling Conversion and Forest Degradation to Build the Leakage Model

PDR.124 Summary of sampling procedures for the activity-shifting leakage areas, with a copy of a sampling protocol used to carry out measurements.

Conversion and forest degradation is 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 35 leakage area plots. Please see Figure 17 for a delineation of the leakage area and the locations of the plots. The procedures used for locating and sampling the activity shifting leakage Areas are found in Annex 14 – ‘Standard Operating Procedure_Densiometer Forest Leakage v4_02112016’. Plot teams visited each leakage plot a priori 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.

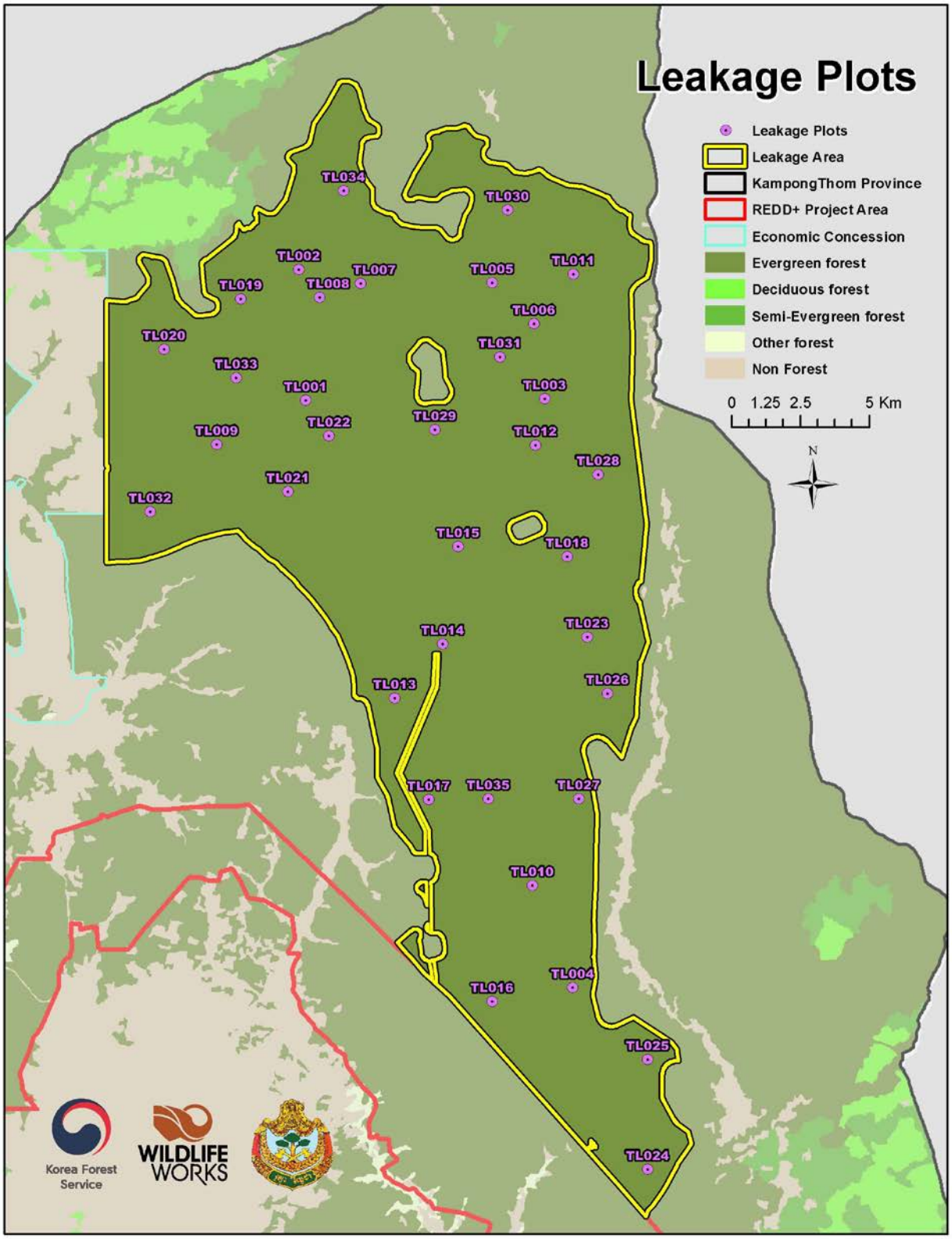


Figure 18: The sample plot locations in the activity shifting leakage area is shown.

5.5.1.4 Fitting the Leakage Model

The Leakage Emissions Model is dictated by the VCS methodology VM0009 v3 equation [F.48] for the PAA. These models estimate cumulative carbon emissions from activity shifting leakage based on the conversion parameters α, and β and field measurements in the leakage areas.

Where equation [F.48] is:

$$LEM_F(c_P, c_B, p_{L\,DEG}, t, x) = p_{L\,DEG}^{[m]} A_{AS}(c_P - c_B) - \frac{A_{AS}(c_P - c_B)}{1 + e^{\ln\left(\frac{1}{p_{L\,DEG}^{[m=0]}} - 1\right) - \beta t - \boldsymbol{\theta}(\boldsymbol{x}_0 - \boldsymbol{x})^T}}$$

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 given in Annex 14- “Standard Operating Procedure_Densiometer Forest Leakage v4_02112016.pdf”.

5.5.2 Market Leakage

Market leakage can occur if a project reduces the supply of market goods, such as timber, relative to the baseline. As described in Section 4.5.1, 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 Section 4.5.2, in 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. Additionally, under the baseline scenario small-scale logging will occur resulting in degradation. 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 in 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).

5.6 Net GHG Emission Reductions and Removals (CL1 & CL2)

5.6.1 Determining Reversals

A Project reversal can occur if during any monitoring period throughout the project crediting period, quantified gross emission reductions (GERs) are negative (as a result of a carbon stock loss). The procedure for identifying Project reversals within the TRP meets all VCS procedures and requirements as listed in the VCS methodology VM0009 v3. Please refer to Annex 7 – 'Disturbance Monitoring Standard Operating Procedure' for a detailed description of the monitoring methods proposed to identify any potential significant conversion events within the Project Area, and subsequently quantify emissions from any potential Project disturbances and reversals.

5.6.2 Determining Reversals as a Result of Baseline Re-evaluation

In the event that a reversal occurs due to a baseline re-evaluation, the project proponent shall document the cause of reversal, quantify the emissions from the reversal and supply all supporting data for the in the respective monitoring report, following all guidance and requirements from section 8.4.2.1 in the VCS methodology VM0009 v3.0.

5.6.3 Quantifying Net Emission Reductions for a PAA

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

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

NERs are calculated both for the Forest Project Accounting Area for each monitoring event.

5.6.3.1 Determining Deductions for Uncertainty

A potential confidence deduction is determined from NERs, based on a linear combination of the weighted standard errors associated with estimates from baseline emission models and carbon stock measurements from the Project Area and Proxy Area. Equation [F.57] from the methodology VCS VM0009 v3.0 is used to calculate the confidence deduction, if any, to be applied to Project NERs. Confidence deductions are documented for each monitoring event for each PAA.

$$E_{U}^{[m]} = E_{B\,\Delta}^{[m]} \left[\frac{1.64}{E_{B\,\Delta}^{[m]} + A_{PAA} c_{P}^{[m]} + A_{PX} c_{B}^{[m]}} \sqrt{\left(U_{EM}^{[M]}\right)^2 + \left(U_{P}^{[m]}\right)^2 + \left(U_{B}^{[m]}\right)^2} - 0.15 \right]$$

5.6.3.2 Determining Buffer Account Allocation

The quantity of NERs to be allocated to the VCS buffer account is determined annually for the Project using the VCS AFOLU Tool for Non-permanence Risk and Buffer Determination. The Project Proponent used this tool to assess all relevant risks to the TRP from natural, economic and management sources. It was determined that the overall risk level is moderate. Many risks can be minimized through the efficacy of Project Activities, community outreach, involvement in Project design and operation and experienced management. The Project Proponent has significant experience in the design and operation of REDD+ projects and Jurisdictional REDD+ approaches. These experiences will be drawn upon to mitigate potential risks to the TRP throughout the Project lifetime.

Non-permanence risk assessment for the TRP was performed using the VCS Non-Permanence Risk Tool v3.2 and Risk Report Calculation Tool v3.0. Please refer to Annex 15 – 'Non-Permanence Risk Tool'.

5.6.4 *Ex-Ante* Estimation of NERs (CL2.2)

Ex-Ante NERs are calculated for the Project Accounting Area according to the guidance and process detailed in various sections above. Please refer to Annex 12 – 'NER Worksheet- PAA' and Annex 13 – 'NER – Project Summary' for detailed NER calculations. The Ex-Ante NERs presented here are based on an initial ecosystem inventory performed on the PAA. All parameter values have been identified at the time of validation. Ex-ante estimates for NERs are assumed to be conservative, as they fail to consider additional emission reductions due to forest growth within the PAA or further degradation within the proxy area(s).

In the case when *ex-ante* estimates are used to prove the significance of emissions sources or estimate the quantity of NERs over the project crediting period, the project description must include the following:

PDR. 118 The projected avoided baseline emissions, project emissions and leakage for each monitoring period and vintage year over the lifetime of the project.

Table 31: *Ex-Ante* estimates for Baseline Emissions, Project Emissions, Leakage Emissions and Net Emission Reductions (NERs) for each monitoring period throughout the Project lifetime.

Monitoring Period	Date of Monitoring	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
1	1/1/16	474,029	0	-2,370	424,256
2	1/1/17	474,029	0	-49,773	376,853
3	1/1/18	474,029	0	-49,773	376,853
4	1/1/19	474,029	0	-49,773	376,853
5	1/1/20	474,029	0	-49,773	376,853
6	1/1/21	474,029	0	-49,773	376,853
7	1/1/22	474,029	0	-49,773	376,853
8	1/1/23	474,029	0	-49,773	376,853
9	1/1/24	474,029	0	-49,773	376,853
10	1/1/25	474,029	0	-49,773	376,853
11	1/1/26	474,029	0	-49,773	376,853
12	1/1/27	474,029	0	-49,773	376,853
13	1/1/28	474,029	0	-49,773	376,853
14	1/1/29	474,029	0	-49,773	376,853
15	1/1/30	474,029	0	-49,773	376,853
16	1/1/31	474,029	0	-49,773	376,853
17	1/1/32	474,029	0	-49,773	376,853
18	1/1/33	474,029	0	-49,773	376,853
19	1/1/34	474,029	0	-49,773	376,853
20	1/1/35	474,029	0	-49,773	376,853
21	1/1/36	474,029	0	-49,773	376,853
22	1/1/37	474,029	0	-49,773	376,853

23	1/1/38	474,029	0	-49,773	376,853
24	1/1/39	474,029	0	-49,773	376,853
25	1/1/40	474,029	0	-49,773	376,853
26	1/1/41	474,029	0	-49,773	376,853
27	1/1/42	474,029	0	-49,773	376,853
28	1/1/43	474,029	0	-49,773	376,853
29	1/1/44	474,029	0	-49,773	376,853
30	1/1/45	474,029	0	-49,773	376,853
	Total	**14,220,883**	**0**	**1,445,790**	**11,353,005**

*the estimated Net GHG emissions shown are also inclusive of the 10% VCS buffer withholding.

PDR.119 A narrative description of sources used to estimate the leakage rate and demonstration that the estimated rate is conservative.

The activity shifting leakage area for the Project Accounting Area was delineated as part of the Project's development process. All Project Activities detailed in Section 2.2 are designed to mitigate potential leakage from the project. The Project Proponent contends that there will be little to no leakage associated with the Project, due to their extensive prior experience working with communities and project stakeholders to mitigate leakage. However, in the absence of actual measurements of potential leakage or any precedent in this area for the estimation of ex-ante leakage emissions, a conservative estimate of an 10% annual leakage rate has been applied for the purposes of ex-ante NER estimates. This estimate Is derived based on the extensive REDD+ experience of Wildlife Works. They utilized their Kasigau Corridor Phase I and II REDD+ Projects, which have both been in operation for over 8 years and verified 4 time as examples of potential leakage from Projects. Although these projects are located in Africa, and have very different ecosystems and community social dynamics, they provide the best examples of a successfully operated REDD+ project available. The TRP additionally has been designed in a similar manner as the Kasigau Corridor Projects. These projects have continually enjoyed leakage rates under 10%. We conclude that that an 10% Ex-ante estimate for activity-shifting leakage represents a fair and conservative estimate for the TRP.

The market leakage rate was determined using the process described in Section 5.5.2. This was done in accordance with the methodology VM0009 and VCS guidance using the VCS tool VMD0037 Global Commodity Leakage Module: Production Approach (LM-P). This tool uses the planted area of the primary agricultural crops in the jurisdiction in which the Project Area is located and potential volume of timber that would have been cut to estimate potential emissions from the market leakage of those crops and timber. Public data sources were used to determine the primary crops in Kampong Thom province, their yield, and the total area in which these crops are planted within Kampong Thom province, and nationally. Public data sources were also used to determine the total timber production in Cambodia and forest area, while the volume of timber in the PA was determined from the Project's forest inventory. Data on the primary crops grown in Kampong Thom province, and the total area planted of these crops in 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).

The VCS tool calculates a leakage deduction as a percent for a Project based on the procedures and inputs cited above. For this tool public sources of data or values measured in the Project Area were

utilized for all inputs, providing a high degree of accuracy in this analysis. Where an input was unknown, conservative estimates were always used. The conservative assumptions that were made are that 100% of the Project Area would be converted to agriculture and 100% of the trees in the Project would be harvested for timber in the baseline scenario. Additionally, to calculate the volume of standing timber in the Project Area, due to limitations in the data available, it was assumed that 100% of the estimated height of the tree was harvestable timber and that the bole did not contain any taper.

The market leakage deduction calculated by this tool is 0.5%. We believe that this is an accurate estimate of market leakage calculated by an approved VCS tool using Cambodia and Project specific parameters, and therefore meets the principles of conservatism.

5.6.5 Evaluating Project Performance

The Project Proponent will evaluate Project performance, including any deviations from the ex-ante NER estimates, during each monitoring event. The Project Proponent plans on performing monitoring on a biennial basis, however at a minimum will monitor at least once every 5 years as is required by VCS and CCB. Sources of deviation could include changes in data quality (i.e. estimates from literature vs. in-situ measurements), additional sampling and development of tree allometry, disturbance events in the Project Area, or inherent baseline re-evaluation deviations. At each verification event, the Project Proponent shall demonstrate comparisons between verification NERs and ex-ante NER estimates presented in this PDD. Any significant deviations will be documented and their causes explained in subsequent verification documents as well as at baseline re-evaluation.

5.7 Climate Change Adaptation Benefits (GL1)

5.7.1 Identify likely regional climate change and climate variability scenarios and impacts, and potential changes in the local land-use from these scenarios in the absence of the project (GL1.1)

Not Applicable to this Project.

5.7.2 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 (GL1.2.)

Not Applicable to this Project.

5.7.3 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 (G1.3.).

Not Applicable to this Project.

5.7.4 Demonstrate that the project activities will assist communities and/or biodiversity to adapt to the probable impacts of climate change (GL1.4.).

Not Applicable to this Project.

6 COMMUNITY

6.1 Net Positive Community Impacts (CM2)

6.1.1 Estimated Impacts on Communities from Project Activities (CM2.1)

6.1.1.1 Result Chain Diagrams

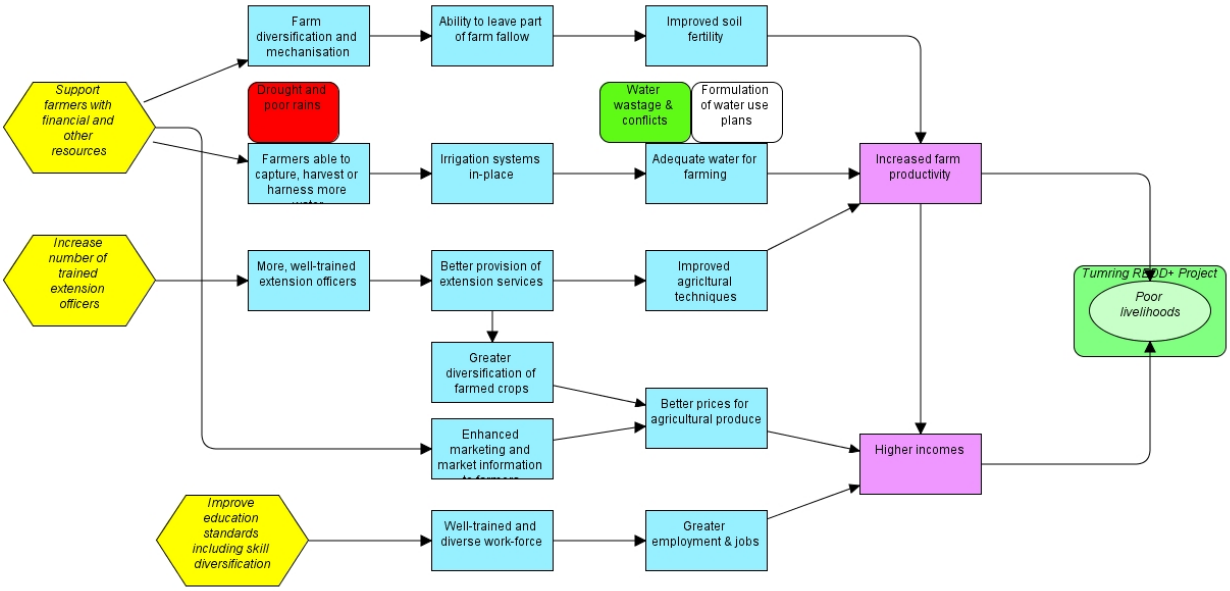
Based on the extensive experience of the Project partners working on biodiversity and community projects in this landscape, a literature review, and from information obtained from the FPIC workshops held, we applied the theory of change approach to justify our project rationale and to produce indicators for the CCB monitoring plan. The theory of change is a hypothesis about how a project intends to achieve its stated objectives, or a roadmap of how it plans to get from project activities to project impacts (Richards & Panfil, 2011). As such, we developed a theory of change for each of the four key issues (hereafter referred to as **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 are:

1. Poor Community Livelihoods
2. Forest loss and degradation
3. Limited knowledge and awareness, lack of understanding of forest and climate change
4. Lack of collaboration and participation in effective crackdown on forest crime.

The assumptions we make about the cause-and-effect relationships are made explicit in the Result Chain diagrams below, from which the theories of change statements that follow are based. Indicators were developed for key results and assumptions; monitoring of assumptions was included to enable us identify points of deviation early enough. In sum, the indicators outlined in the Monitoring Plan will enable measuring progress towards achieving the desired project activity outcomes and impacts from project activities and strategies.

Poor Community Livelihoods



Theory of Change Statement:

If capacity of agriculture is improved, If there is irrigation system, and if high income is generated, then livelihood of local community is improved.

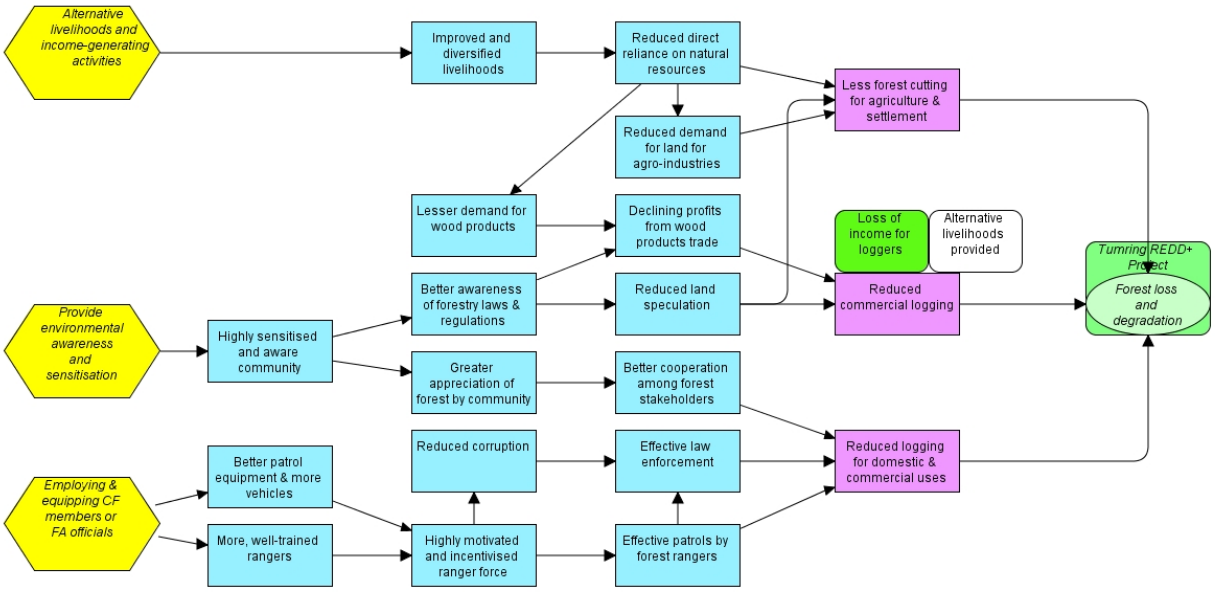
Comparison between the 'Without Project' and 'With Project' scenario

Section 4.5.2 outlines the 'Without Project' scenario. In summary, the direct threats to poor community livelihoods are i) low farm yields, and ii) low income. In the absence of the project, these are expected to worsen and thereby increase poverty and livelihood vulnerability.

The Result Chain Diagram depicts how the TRP aims to reduce poverty and improve overall livelihoods over the project's lifetime. Project activities (strategies) are designed to achieve intermediate results, which will lead to a threat reduction result that lead to an improved outcome. For example, it is believed that more trained extension officers and water management will lead to greater crop diversification and increased agricultural education will lead to better process for crops and water availability. This in turn will lead to higher farm productivity and farm income, thereby increasing community livelihoods.

Similar result chains from each other project activities regarding poverty are displayed in the above diagram, all of which support a net-positive impact of the 'With Project' scenario. Monitoring will confirm the ability of the project to achieve these positive impacts and provide information for adjusting activities and approaches over time to ensure these results are achieved.

Forest loss and degradation



Theory of Change statement:

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.

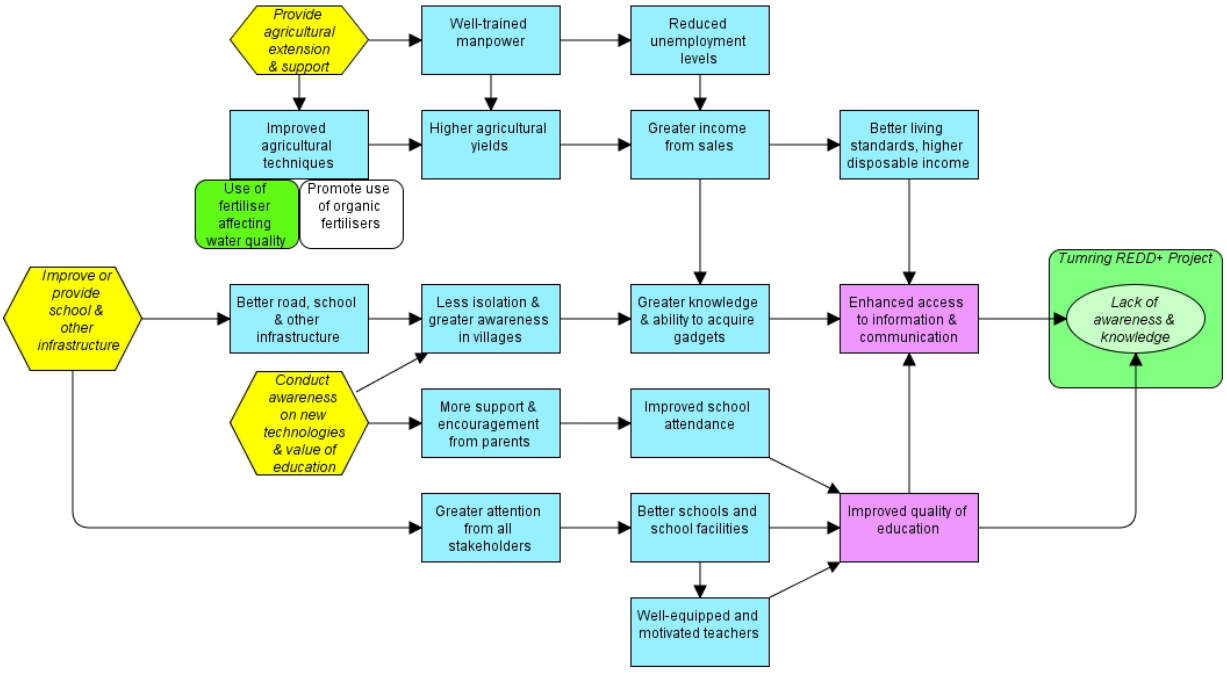
Comparison between the 'Without Project' and 'With Project' scenario

Section 4.5.2 outlines the 'Without Project' scenario. In summary, the direct threats to poor community livelihoods are i) forest clearing for agricultural and settlement, ii) commercial logging for timber and wood products, and iii) unsustainable and illegal logging and charcoal. In the absence of the project, these are expected to worsen and thereby increase poverty and livelihood vulnerability.

The Result Chain Diagram depicts how the TRP aims to reduce the amount of forest destruction and loss over the project's lifetime. Project activities (strategies) are designed to achieve intermediate results, which will lead to a threat reduction result that lead to an improved outcome. For example, it is believed that with greater community awareness and better forest patrols, that there will be a greater appreciation of the forest and a highly motivated ranger force. This in turn will lead to better cooperation from the forest communities and more effective forest patrols, thereby reducing the forest destruction and loss.

Similar result chains from each other project activities regarding poverty are displayed in the above diagram, all of which support a net-positive impact of the 'With Project' scenario. Monitoring will confirm the ability of the project to achieve these positive impacts and provide information for adjusting activities and approaches over time to ensure these results are achieved.

Lack of Awareness and Knowledge



Theory of Change Statement:

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.

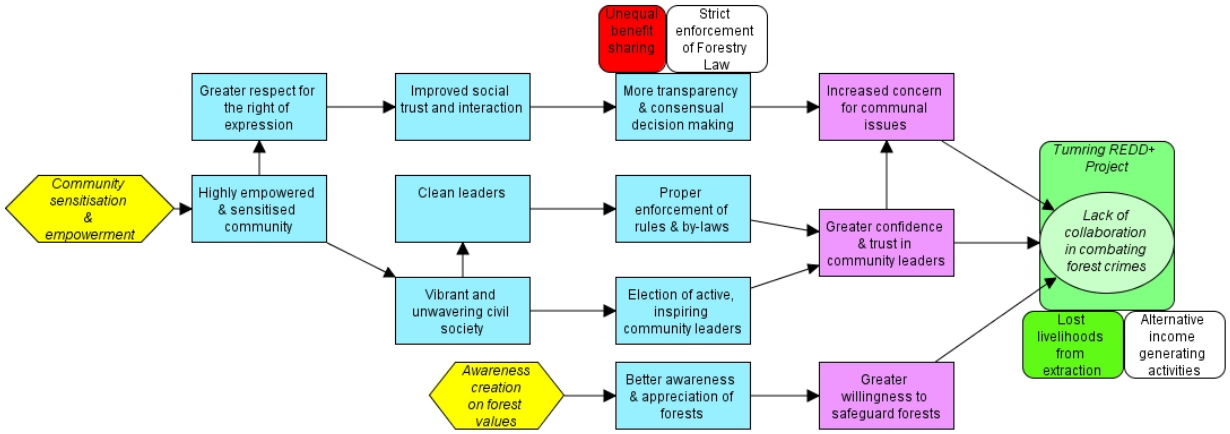
Comparison between the 'Without Project' and 'With Project' scenario

Section 4.5.2 outlines the 'Without Project' scenario. In summary, the direct threats to lack of awareness and knowledge are i) poor livelihoods, ii) poor access to information and communication, and iii) poor levels of education. In the absence of the project, these are expected to worsen and thereby decrease community awareness and knowledge.

The Result Chain Diagram depicts how the TRP aims to increase the communities level of awareness and knowledge over the project's lifetime. Project activities (strategies) are designed to achieve intermediate results, which will lead to a threat reduction result that lead to an improved outcome. For example, it is believed that with increased agricultural yields and infrastructure, there will be higher farm incomes and less isolation with greater awareness. This in turn will lead to increased livelihoods and enhanced access to information and communication, thereby increasing community awareness and knowledge.

Similar result chains from each other project activities regarding poverty are displayed in the above diagram, all of which support a net-positive impact of the 'With Project' scenario. Monitoring will confirm the ability of the project to achieve these positive impacts and provide information for adjusting activities and approaches over time to ensure these results are achieved.

Lack of Collaboration and Participation



Theory of Change Statement:

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 increasing effective participation, and better forest management.

Comparison between the 'Without Project' and 'With Project' scenario

Section 4.5.2 outlines the 'Without Project' scenario. In summary, the direct threats to lack of collaboration and participation are i) little concern for communal matters, ii) loss of trust with community leaders, and iii) little appreciation for forest values. In the absence of the project, these are expected to worsen and thereby decrease community collaboration and participation.

The Result Chain Diagram depicts how the TRP aims to increase the communities level of awareness and knowledge over the project's lifetime. Project activities (strategies) are designed to achieve intermediate results, which will lead to a threat reduction result that lead to an improved outcome. For example, it is believed that with increased social trust and a vibrant civil society it will lead to greater transparency and the election of active leaders. This in turn will lead to increased concern for communal matters and greater confidence in community leaders, thereby increasing community collaboration and participation.

Similar result chains from each other project activities regarding poverty are displayed in the above diagram, all of which support a net-positive impact of the 'With Project' scenario. Monitoring will confirm the ability of the project to achieve these positive impacts and provide information for adjusting activities and approaches over time to ensure these results are achieved.

6.1.1.2 Risks and negative impact analysis

As with any project (including REDD+ projects) that have impacts on communities and their surrounding environment, there is a possibility that negative, and/or unforeseen impacts may occur. According to CCB guidance (Richards & Panfil, 2011) it is recommended to identify any potential negative impacts, develop mitigation methods where necessary, and derive indicators to ensure that potential negative impacts are included within the monitoring program.

We used our theory of change rationale in the Result Chain diagrams to check for likely negative impacts and implementation risks. (NB: A negative impact is a negative side-effect of an otherwise successful result, while a risk is a threat to achieving key results in the results chain (Richards & Panfil 2011)). We focused on the key results and assessed the risks or assumptions in our logical framework analysis

(Results Chains) that are outside the REDD+ project's control, e.g., policy or institutional reforms, and which would make it difficult to implement the desired project strategies. For all the Risks and Negative Impacts identified, we assessed their likelihoods and magnitudes (should they happen), as well as possible mitigation strategies.

Risk Analysis

Table 32: Project community risk analysis

Result	Potential Risks to Result	Likelihood of risk	Magnitude of Impact of risk	Risk mitigation strategy	Explanation
Reduced subdivision	National or County Land Policy on adjudication	High	Medium	Reduce	Sensitization so that any such land policy does not affect land use and productivity negatively
	Corruption	Low	Medium	Resist	Sensitization to enable community to oppose corrupt land deals
Sustainable agricultural intensification	Low uptake	Low	High	Reduce	Work with the community to ensure recommendations are culturally acceptable
Compensation for human-wildlife conflicts	Cheating the system	Medium	High	Reduce	Have good checks, monitoring teams and strong punitive measures
Positive attitudes towards education	Resistance to change	Low	Medium	Remove	Work with community and Government to ensure right to education is respected
Greater Government support to education sector	Not prioritized in County Government and unpaid teachers	Low	High	Resist	Sensitize community to hold County leaders accountable to this Constitutional right

NB: **Likelihood** and **Magnitude**: Low, Medium, High; **Risk mitigation strategy**: Reduce, Remove, Resist, Do nothing

Negative impacts (NI) analysis

Table 33: Project potential community negative impacts

Result	Potential Negative Impacts	Like-lihood	Magnitude	Duration	Stakeholders affected	Mitigation measure	Explanation
Reduced subdivision	Loss of land rent	Medium	Low	Short	Land owners	Compensate	They will gain revenue from carbon and other land uses
Effective enforcement	Loss of livelihoods	High	Low	Short	Charcoal burners; Wood carvers; Hunters	Minimize / Compensate	They will lose the illegal part but retain sustainable harvesting, NTFPs and other IGAs
More education, jobs and income	Social disruption	Medium	Medium	Medium	Entire community	Minimize	Ensure community sets up strong local institutions and structures to guard against this
Enhanced farm productivity	Price collapse from over-production	Low	Medium	Short	Agriculturists; Agro-pastoralists	Minimize	Diversify farm production; Develop storage and market access

NB: **Likelihood** and **Magnitude**: Low, Medium, High; **Duration**: Short, Medium, Long; **Mitigation measure**: Eliminate, Minimize, Compensate, Do nothing**.**

6.1.2 Describe the expected changes in the well-being conditions and other characteristics of Communities under the without-project land use scenario (CM1.3.)

As described in Section 6.1.1, in the SBIA workshop, four focal issues were found to be important to the well-being of project communities.

These four focal issues are:

1. Poor Community Livelihoods
2. Forest loss and degradation
3. Limited knowledge and awareness, lack of understanding of forest and climate change
4. Lack of collaboration and participation in effective crackdown on forest crime

The communities were asked to describe the problem and how it would affect them under the without-project land use scenario. Below is a table of each focal issue and its problem statement (Table 34).

Table 34: Focal issues problem and vision statements formulated in the SBIA workshop

Tumring REDD+ Project SBIA workshop focal issues
Poverty – Poor Community Livelihoods
Problem statement: Lack of employment and alternative occupation, increase land demand, population growth, lack of modern agriculture machine lead to deforestation and forest degradation.
Deforestation – Forest Loss and Degradation
Problem statement: Forest loss, climate change, natural disaster, habitat and biodiversity loss as well as loss of valuable trees affect livelihood of local community.
Lack of Awareness – Forestry Law
Problem statement: Lack of awareness on Law on Forestry, lack of extension, lack of attention from stakeholders result in the loss of forest resources.
Lack of Collaboration and Participation
Problem statement: Due to the irresponsibility and a lack of consensus in decision-making, there is a lack of collaboration among stakeholders in crackdown on forest crime.

6.1.3 Describe measures needed and taken to mitigate any negative well-being impacts on Community Groups and for maintenance or enhancement of the high conservation value attributes (CM2.2.)

In Section 6.1.1.2 the potential risks and negative impacts identified by the SBIA Workgroups are listed. In Table 32 and Table 33 the potential mitigations for each potential risk and negative impact is listed.

6.1.4 Demonstrate that the net well-being impacts of the project are positive for all identified Community Groups compared with their anticipated well-being conditions under the without- project land use scenario (CM2.3.)

As outlined in 6.1.1.2, the TRP does not expect any net negative impacts on other Stakeholder Groups. The comprehensive Monitoring Plan will monitor for any impacts on community groups. Once the plan has been implemented and data gathered, more concrete conclusions can be drawn.

6.1.5 Demonstrate that no High Conservation Values are negatively affected by the project (CM2.4.).

HCV CM1.2 a) Areas that provide basic ecosystem services in critical situations
HCVs under this category include forests critical to provision of hydrological services and for the prevention of soil erosion. Conservation of these services are the main priority of the project and its project partners, and activities are designed to ensure greater protection. This inherently provides positive effects on these high conservation values. No related negative effects are anticipated as a result of the project.

HCV CM1.2 b) Areas that are fundamental to meeting the basic needs of local communities
HCVs under this category include provisioning services, such as poles for building material, fodder, fuel and medicinal plants. Through collaborative management with the communities and a development of a zoning plan, these services are not negatively affected by the project.

HCV CM1.2 c) Areas that are critical for the traditional cultural identity of Communities
HCVs under this category include areas of cultural, ecological, economic or religious significance identified in collaboration with the communities. During the SBIA workshop process the community did not identify any areas of this category. However, the Project will continue to work with communities in a collaborative manner to identify any areas that may. Additionally, the protection and conversation of the Project Area will also provide protection for any areas under this category. This inherently provides positive effects on these high conservation values. No related negative effects are anticipated as a result of the project.

The TRP will monitor for negative impacts on HCVs.

6.2 Negative Offsite Stakeholder Impacts (CM3)

6.2.1 Identify any Potential Positive or Negative Impacts on Other Stakeholders (CM3.1)

The TRP believes that there are no net negative impacts on legitimate other stakeholders. Potential offsite stakeholders may include charcoal traders along the Siem Reap – Phnom Penh highway and urban real estate speculators. Although we recognize that halting certain extractive activities from the Project area may affect the temporary income of such offsite stakeholders, such activities are a legal offence and therefore their abatement ultimately support law enforcement in the area. On the contrary, halting these activities may in fact lead to a positive impact on such offsite stakeholders as individuals may aim to generate their income in a more legal manner.

In addition, the TRP is aware that there is a heightened risk of increasing the potential for human-wildlife conflict as wildlife numbers increase. This could be in the form of crop damage, loss of livestock or even personal injury of offsite stakeholders. Potential mitigation strategies are outlined in section 6.1.1.2.

6.2.2 Describe Measures needed and taken to Mitigate Negative Impacts on Other Stakeholders (CM3.2)

The Project Activities are designed to provide alternative income generating methods to local communities. This is meant to reduce the pressure on the Project Area and to mitigate the loss of resources that local communities may experience due to the added protection of the Project Area.

6.2.3 Demonstrate no Net Negative Impacts on Other Stakeholder Groups (CM3.3)

As outlined in section 6.1.1.2, the TRP does not expect any net negative impacts on other Stakeholder Groups. The comprehensive Monitoring Plan will monitor for any potential impacts on community groups. Once the plan has been implemented and data gathered, more concrete conclusions can be drawn.

6.3 Exceptional Community Benefits (GL2)

6.3.1 Project Zone is in a Low Human Development Country (GL2.1).

Not Applicable to this Project.

6.3.2 Demonstrate that the project generates short-term and long-term net positive well-being benefits for Smallholders/ Community Members (GL2.2)

Not Applicable to this Project.

6.3.3 Identify, through a participatory process, risks for the Smallholders/Community Members to participate in the project, including those related to tradeoffs with food security, land loss, loss of yields and short-term and long-term climate change adaptation. Explain how the project is designed to avoid such tradeoffs and the measures taken to manage the identified risks. Include indicators of risks for Smallholders/Community Members in the monitoring plan (GL2.3.)

Not Applicable to this Project.

6.3.4 Identify Community Groups that are marginalized and/or vulnerable. Demonstrate that the project generates net positive impacts on the well-being of all identified marginalized and/or vulnerable Community Groups (GL2.4.)

Not Applicable to this Project.

6.3.5 Demonstrate that the project generates net positive impacts on the well-being of women and that women participate in or influence decision-making and include indicators of impacts on women in the monitoring plan (GL2.5.)

Not Applicable to this Project.

6.3.6 Describe the design and implementation of a benefit sharing mechanism (GL2.6.).

Not Applicable to this Project.

6.3.7 Explain how relevant and adequate information about predicted and actual benefits, costs and risks has been communicated to Smallholders/Community Members (GL2.7.).

Not Applicable to this Project.

6.3.8 Describe the project's governance and implementation structures, and any relevant self- governance or other structures used for aggregation of Smallholders/Community members (GL2.8.).

Not Applicable to this Project.

6.3.9 Demonstrate how the project is developing the capacity of Smallholders/Community Members, and relevant local organizations or institutions, to participate effectively and actively in project design, implementation and management (GL2.9.).

Not Applicable to this Project.

7 BIODIVERSITY

7.1 Net Positive Biodiversity Impacts (B2)

7.1.1 Estimated Changes in Biodiversity in the Project Zone as a Result of the Project (B2.1.)

As discussed throughout this document, Kampong Thom province, in addition to Cambodia and Southeast Asia in general are facing immense threats to their biodiversity. There has been significant loss of forest cover and biodiversity over the last few decades. The TRP's goal is to reduce the deforestation and forest degradation in the Project Area, to maintain the existing biodiversity, to increase the populations of existing species, and have additional species return to the Project Area.

The two primary net benefits anticipated from the Project include:

1) Ecosystem Enhancement
2) Stable and / or increasing levels of biodiversity.

To ensure that these anticipated changes are occurring the Project will monitor key biodiversity indicators. These indicators outlined in the Monitoring Plan will enable measuring progress towards achieving the desired project outcomes and impacts from project activities and strategies. These indicators were developed through the following methods:

a. **Community Meetings and Key Informant Interviews**: July 2015, the FA wildlife survey team conducted community meetings and key informant interviews in five villages in the Project Zone. During these meetings and interviews the team collected primary information from villagers and former hunters on wildlife present and current threats to the biodiversity in the Project Area.

b. **Biodiversity Surveys**: Biodiversity surveys were conducted three times (19th - 25th December 2015, 13-22 August 2016 and 18-23 September 2016). For the surveys, six Forestry Officers and eight community members were trained by the Project Biodiversity Specialist, a wildlife datasheet was developed for data collection, and the field team was equipped with GIS, topo-map, bird and mammal guidebook, binoculars and other wildlife research tools. The first biodiversity survey was conducted in the Hydrological Forest Conservation Area, the second survey was conducted in O's bosleav, Chaom Smach, O's Dasco community forests and the third survey was conducted in an adjacent area of the project area. Community members were included as part of the survey team because they have traditional local knowledge that allows for more accurate identification of flora and fauna of the project area. During the surveys, a total of 14 line transects were conducted which focused on mammals, birds, and reptiles. With the combination of data from the line

transects and community meetings, the TRP developed a biodiversity assessment. In the biodiversity assessment, the TRP recorded 59 bird species, 23 mammal species and 3 species of reptile. Below is a more detailed account of the data from the line transects:

Some of the **Bird** species recorded during the surveys were Yellow-bellied Prinia, Dark-necked Tailort, Black Drongo, Brinzed Drongo, Greater Racket-tailed, Orange-heated Thrush, Black-Naped Oriole, Rufous-bellied Woodpecker, Blue-winged Leafbird, White-crested Laughing Thrush, Yellow-vented Flowerpecker, White-bellied Woodpecker, Spotted Dove, Red Collared Dove, and Hill Myna; as well as the raptors Lesser Fish Eagle and Barn Owl.

Mammals were recorded by direct observation, dung, footprint and claw prints. Some of the species observed were Sambar, Common Palm Civet, Leopard Cat, Long-tailed Macaques, Pileated Gibbon, and wild pigs.

Reptiles were rarely encountered during field observation; only two types of snake, Modest Keelback and Banded Kukri Snake, were met and recorded. Another species was the Dambok turtle, who's dung was observed.

In addition to the biodiversity data, the TRP has analyzed the tree species recorded within the 128-forest biomass plots. The field biomass inventory found that there are 4601 standing trees within the 128 plots; the two dominant tree species are Vatica odorata (1257 trees-) and Eugenia sp (520 trees). The other 408 standing trees were recorded with local Khmer names and have not been identified by scientific name.

TRP's Biodiversity Focal Issues

Ecosystem enhancement

Section 2.3.1 describes the extreme threats to the Project Area, one of the last vestiges of lowland evergreen forest in Cambodia. Large tracts of forests in the Project Zone have been cleared in the last 10 years by local people, especially throughout the Northeastern section. The clearing has changed the composition of the forest, increased pioneer species and opened the forests up to increased hunting. In the community discussions, it was decided that improving degraded habitat on the edges of the Project Area was a critical component of the TRP.

The Forestry Administration has nurseries at their beat offices around the periphery of the Project. One of the recommendations of the community consultations was to focus the Project on the enhancement of all of the Project Areas degraded land to maintain the integrity of this portion of the Prey Lang Landscape, with hopes that the species that are sensitive to human disturbance will be able to repopulate the Project Area in the future. This is just one example of a group of activities that will be implemented to provide ecosystem enhancement. All of the ecosystem enhancement activities and their associated indicators are listed in the Biodiversity Monitoring Plan.

Stable or increasing levels of biodiversity

As part of the Prey Long Landscape, the TRP is an important buffer area to maintain the core parts of the Prey Long Landscape. The TRP preliminary biodiversity assessment recorded 59 bird species, 23 mammal species and 3 species of reptile as well as several hundred tree species. Activities to protect the forest are central to the TRP and include but are not limited to protection activities such as increased monitoring by FA rangers, increasing community patrols, increasing community forest area. All of the activities that will generate a stable or increasing level of biodiversity and their associated indicators are listed in Biodiversity Monitoring Plan.

7.1.1.1 Demonstrate that the project's net impacts on biodiversity in the Project Zone are positive, compared with the biodiversity conditions under the without-project land use scenario (B2.2.).

We used our theory of change rationale in the Result Chain diagrams to check for likely negative impacts and implementation risks. (NB: A negative impact is a negative side-effect of an otherwise successful result, while a risk is a threat to achieving key results in the results chain (Richards & Panfil 2011)). Focusing on the key results, we assessed the risks or assumptions in our logical framework analysis (Results Chains) that are outside the REDD+ project's control, e.g., policy or institutional reforms, which would make it difficult to implement the desired project strategies. For all the Risks and Negative Impacts identified, we assessed their likelihoods and magnitudes (should they happen), as well as possible mitigation strategies. Primarily, the protection of the forest under the Project is ensuring 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 demonstrate that the forest is currently in-tact and providing important habitat, and the biodiversity monitoring demonstrates the amount of native species that currently rely on the Project Area.

Risk analysis

Table 35: Risk analysis

Result	Potential Risks to Result	Likelihood of risk	Magnitude of Impact of risk	Risk mitigation strategy	Explanation
Secure tenure and reduced subdivision	National or County Land Policy	Medium	Medium	Reduce	Sensitization such that land policy & adjudication does not affect land use negatively
	Corruption	Low	Medium	Resist	Sensitization to enable community to oppose corrupt land deals
	External market forces adding pressure to sell land	Medium	High	Reduce	Strengthen land tenure to increase value; Sensitize and training to ensure agricultural intensification is done sustainably
Wildlife dispersal areas maintained thru shared grazing areas	Tragedy of the anti-commons	Low	Medium	Reduce	Strive to get the community to pass and endorse land-use associated issues collectively
Effective enforcement	Corruption	Medium	Medium	Reduce & Resist	Ranger vetting before employment; Employing technology including remote cameras and geo-spatial tools, and ensuring

					community is engaged in fighting poaching
Sustainable agricultural intensification	Low uptake	Low	High	Reduce	Work with the community to ensure recommendations are understood, culturally acceptable, practical and applied
Compensation for human-wildlife conflicts	Falsification of claims	Medium	High	Reduce	Have good checks, monitoring teams; Strong punitive measures
Reduced demand/supply of game meat	Resistance to change	Medium	Medium	Reduce / Remove	Work with community and relevant Government authorities to ensure subsistence poaching is reduced and illegal, commercial poaching severely punished
More jobs and IGAs	Stringent County laws and taxes making doing business difficult	Medium	High	Resist	Work with the County Government to support SMEs and environment-related project thru low taxation or rebates

NB: **Likelihood** and **Magnitude**: Low, Medium, High; **Risk mitigation strategy**: Reduce, Remove, Resist, Do nothing

Negative impacts (NI) analysis

Table 36: Negative impact analysis

Result	Potential NIs	Likelihood	Magnitude	Duration	Stakeholders affected	Mitigation measure	Explanation
Reduced subdivision	Loss of land rent	Medium	Low	Short	Land owners	Compensate	They will gain revenue from carbon and other land uses
Effective enforcement	Loss of income	High	Medium	Short	Charcoal burners and wood carvers	Minimize	They will lose the illegal component but have sustainable harvesting including NTFPs and

							gain other IGAs
	Loss of livelihoods	High	Medium	Short	Women, Landless	Minimize / Compensate	Provide alternative sources of livelihood e.g., food and fuel & NTFPs
More education, jobs and income	Social disruption	Medium	Medium	Medium	Those receiving education, training and employment	Minimize	Ensure community sets up strong local institutions & structures (including cultural) to guard against this
	Increased consumption and new needs & tastes (e.g., game meat)	Low	Medium	Medium	Land owners and other beneficiaries	Minimize	Build community cohesion; Sensitize on impacts of such changes
Wildlife using the dispersal areas	Increased human-wildlife conflicts	Medium	Medium	Long	Agriculturists, Pastoralists	Minimize & Compensate	Improve wildlife habitats; Promote compatible land uses; Compensate unmitigated losses
	Increased competition for forage excluding livestock	Low	Medium	Long	Pastoralists	Minimize	Have corridors to facilitate wildlife movement in and out of the area

NB: **Likelihood** and **Magnitude**: Low, Medium, High; **Duration**: Short, Medium, Long; **Mitigation measure**: Eliminate, Minimize, Compensate, Do nothing

7.1.2 Describe measures needed and *taken* to mitigate negative impacts on biodiversity and any measures needed and *taken* for maintenance or enhancement of the High Conservation Value attributes (B2.3.).

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. These activities will not result in any negative impacts on the biodiversity in the Project Area. Therefore, no measures are needed. For the maintenance of the HCV attributes of the Project Area, no measures beyond the Project Activities described above are needed.

7.1.3 No Negative Affect on HCVs as a Result of the Project (B2.4.)

The following biodiversity related HCVs have been identified per Section 1.3.6:

- B1.2 a) i. Protected Areas
- B1.2 a) ii. Endangered and Vulnerable plant and animal species
- B1.2 a) iii. Endemic plant species and subspecies
- B1.2 a) iv. Areas that support significant concentrations of a species during any time in their life cycle
- B1.2 b) Viable populations of plants and animals in natural patterns of distribution and abundance
- B1.2 c) Threatened ecosystems

By protecting habitats, reduce the amount of poaching and ensuring landscape connectivity, these high conservation values will be much better in the 'With Project' versus 'Without Project' scenario for the reasons noted above.

7.1.4 Species Used by the Project, Including and 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 gown in nurseries on site. All farms in the Project Zone have been excised from the Project Accounting Area a priori.

7.1.5 Potential Adverse Effects of Non-native Species, Including Impacts on Native Species and Disease Introduction or Facilitation, and Justification for their Use over Native Species (B2.6.).

As discussed in Section 7.1.4 above, no non-native species will be used in this project.

7.1.6 Genetically Modified Organisms (B2.7.)

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

7.1.7 Describe the possible adverse effects of, and justify the use of, fertilizers, chemical pesticides, biological control agents and other inputs used for the project (B2.8.).

No fertilizers, chemical pesticides, biological control agents or other inputs will be used to generate GHG reductions or removals.

7.1.8 Describe the process for identifying, classifying and managing all waste products resulting from project activities (B2.9.).

The Project Activities will not result in any waste products over the normal amount created through general operations.

7.2 Negative Offsite Biodiversity Impacts (B3)

7.2.1 Potential negative offsite Impacts on biodiversity that the project activities are likely to cause outside the Project Zone (B3.1.).

There is little chance of having significant negative biodiversity impacts outside the Project Zone for two reasons. Firstly, the sources of threat to biodiversity are mainly local and they are unlikely to be transferred outside the Project Zone (e.g. fuel wood collection and subsistence poaching). Secondly, commercial poaching threats, which could be transferred further, are unlikely to be because of the national drive and commitment to reducing poaching and should show an overall decrease.

7.2.2 Measure needed and taken to mitigate potential negative impacts on biodiversity outside of the Project Zone (B3.2.).

Due to the reasoning outlined in Section 7.2.1, mitigation strategies are non-applicable.

7.2.3 Evaluation of Unmitigated Negative Offsite Impacts against the Biodiversity Benefits of the Project within the Project Boundaries (B3.3.).

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

7.3 Exceptional Biodiversity Benefits (GL3)

7.3.1 Vulnerability: Critically Endangered (CR) and Endangered (EN) species - presence of at least a single individual (GL3.1).

Not Applicable to this Project.

7.3.2 Describe recent population trends of each of the Trigger species in the Project Zone at the start of the project and describe the most likely changes under the without-project land use scenario (GL3.2.).

Not Applicable to this Project.

7.3.3 Describe measures needed and taken to maintain or enhance the population status of each Trigger species in the Project Zone (GL3.3.).

Not Applicable to this Project.

7.3.4 Include indicators of the population trend of each Trigger species and/or the threats to them in the monitoring plan and demonstrate the effectiveness of measures needed and taken to maintain or enhance the population status of Trigger species (GL3.4.).

Not Applicable to this Project.

8 MONITORING

8.1 Description of the Monitoring Plan (CL4, CM4 & B4)

8.1.1 Development of Climate Monitoring Plan (CL4.1.)

A plan has been developed to monitor the TRP's impact on its climate related objectives, namely the reduction in the emissions of CO_2e by reducing 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 37.

Table 37: The three primary monitoring activities, the frequency that they will be performed and the method to be used.

Activity	Frequency	Method
Forest Patrols and Perimeter Observation	Annually	Patrol team inspects perimeter of project area
Plot Measurements	Bi-Annually	Sampling teams visit a portion of plots in project and proxy areas
Identification of significant disturbance	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 4 – 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 outreaches to the communities. These additional monitoring activities will serve to identify many 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.

8.1.2 Dissemination of Climate Monitoring Plan and monitoring results (CL4.2.).

The Project Proponent will have the climate monitoring plan available for public review at the Project Office. The full results of the initial climate monitoring are included in this project document, which is being made publicly available in the Project Area. Additionally, a project document summary has been written and provided to communities throughout the Project Area and Zone in English and Khmer. This project document and the project document summary have additionally been posted to the CCB website (http://www.vcsprojectdatabase.org) for public review and comment.

8.1.3 Development of Community Monitoring Plan (CM4.1.).

The selection of appropriate indicators is considered to be invaluable to the impact assessment process, as they respond to the basic question: "what should be measured in order to show that the claimed net

social benefits are real and additional?" (Richards & Panfil 2011). An ideal indicator from the perspective of showing attribution is one that measures an 'intermediate state' or assumption between an output and outcome or an outcome and an impact, clearly showing progress along a causal chain. Again, our theory of change logic in the Result Chain diagrams (section 6.1.1.1.) provided us with a good basis for selecting indicators that factor in attribution. Additionally, stakeholders provided input into the selection of indicators during the SBIA workshops. We determined a total of **30 indicators** in three categories: Output 15; Outcome 10; and Impact 5. We then decided on the best sampling methods to use to collect these data, keeping in mind the need to achieve acceptable levels of accuracy, precision and cost effectiveness whilst retaining transparency and simplicity. From this, a monitoring plan was designed to collect information on the identified indicators. For the TRP we shall use two major data sources for these indicators: In-house reporting systems and Household interviews. In addition, Focal Group Discussions will be used to validate findings and obtain any further information/clarification, while Government departments will be visited for secondary data about the general community. In-house reporting will mainly follow input and output indicators (and some outcome too), while the other methods will mainly assess outcome and impact indicators.

Social Impact Assessment: Monitoring Plan

Table 38: Social impact assessment

Key results	Indicator	Indicator type	Data collection method	Who?	When?
Increased Farm Productivity	Number of agriculture extension workshops held	Output	Internal report	Agriculture Team	Biannually
	Number of community members trained	Output	Internal report	Community Outreach Team	Biannually
	Number of households applying new agriculture techniques	Outcome	Household survey	Social Monitoring Team	Annually
	Amount or yield/ha	Outcome	Household survey	Social Monitoring Team	Annually
Higher Incomes	Number of local jobs created by project	Output	Internal report	Human Resources Team	Annually
	Number of key assets owned by household (e.g., motorbike, phone, radio, TV)	Outcome	Household survey	Social Monitoring Team	Annually
	Amount of household income	Impact	Household survey	Social Monitoring Team	Annually

	Number of household livelihood/income sources (diversification)	Impact	Household survey	Social Monitoring Team	Annually
Reduced Forest Clearance for Agriculture & Settlement	Number of rangers and community scouts employed & trained	Output	Internal report	Internal report	Annually
	Number of rangers and community scouts outposts or equipment supplied	Output	Internal report	Internal report	Annually
	Number of workshops educating community on forestry laws and regulations	Output	Internal report	Internal report	Biannually
	Number of km or patrols done by the rangers and community scouts	Output	Internal report	Internal report	Biannually
	Number of illegal forest clearing and logging incidents	Outcome	Internal report	Internal report	Biannually
	Number of people arrested for illegal logging or clearing	Outcome	Internal report	Internal report	Biannually
	Number of charcoal kilns/bags recorded	Outcome	Internal report	Internal report	Biannually
	Number of ha of forest cleared or trees cut (m^3)	Impact	RS/GIS & Internal report	RS/GIS & Internal report	Annually
	Number of tree seedlings planted and surviving beyond 3rd year	Output	Internal report	Internal report	Annually
	Number of ha of forest restored	Outcome	Internal report	Internal report	Annually
Greater Awareness and Appreciation of Forests	Number of forest extension workshops or meetings conducted	Output	Internal report	Forestry Team	Community areas

	Number of awareness raising materials developed and distributed	Output	Internal report	Community Outreach Team	Community areas
	Percentage of community members with improved understanding of forest benefits	Outcome	Household survey	Social Monitoring Team	Community areas
Improved Quality of Education	Number of bursaries provided to students	Output	Internal report	Community Outreach Team	Annually
	Number of schools with improved infrastructure (buildings, desks)	Output	Internal report	Community Outreach Team	Annually
	Highest level of education attained by a household member	Impact	Household survey	Social Monitoring Team	Annually
Greater Willingness of Community to Safeguard Forests	Number of CF Management Plans approved by FA and operationalized	Output	Internal report	Forestry Team	Biannually
	Number of CF institutions established to deal with forest matters	Output	Internal report	Forestry Team	Annually
	Number of local-level rules and by-laws established and enforced in CF	Outcome	Internal report	Forestry Team	Annually
	Number of ha of new CF established and protected	Impact	Internal report	Forestry Team	Biennially
	Number of CF members trained in forest management issues	Output	Internal report	Forestry Team	Annually
	Number of CF members actively participating in forest management	Outcome	Internal report	Forestry Team	Annually

8.1.4 Development of Community HCV Monitoring Plan (CM4.2.).

High Conservation Values related to CCB indicators CM1.2 (see section 1.3.6) are expected to be positively impacted by the increased conservation-focused activities. The major community-related HCV ecosystem services were water provisioning and erosion control, both of which are captured in the Social Monitoring Plan above (Table 38).

8.1.5 Dissemination of the Community Monitoring Plan and monitoring results (CM4.3.).

The TRP will have the community monitoring plan available for public review at the Project Office. The results of the initial community monitoring will be included in the monitoring reports / project implementation reports for the Project. Additionally, a project document summary will be written at each monitoring event and provided to communities throughout the Project Area and Zone in English and Khmer. These documents will additionally be posted to the CCB website (http://www.vcsprojectdatabase.org) for public review and comment.

8.1.6 Development of Biodiversity Plan: Variables to be Monitored, and Monitoring Frequency (B4.1)

Indicators are important in impact assessment because they respond to the basic question “what should be measured in order to show that the claimed net social benefits are real and additional” (Richards & Panfil 2011). An ideal indicator from the perspective of showing attribution is one that measures an ‘intermediate state’ or assumption between an output and outcome or an outcome and an impact, clearly showing progress along a causal chain (Richards & Panfil, 2011). Thus, we used our theory of change logic as the basis for selecting indicators that factor in attribution. We then decided on the best sampling methods to use to collect these data to acceptable levels accuracy, precision and cost effectiveness whilst retaining transparency and simplicity. From this, a Monitoring Plan was developed to guide data collection.

Further, the indicators will be analyzed based on the **Pressure-State-Response framework,** where threats negatively impact the status/condition of biodiversity, while responses or project interventions reduce pressure. Most **Response** indicators can be grouped under: Habitat improvement; Security enhancement; Employment of locals; and Alternative sources of income. **Pressure** indicators fall under: Human population size and dynamics and Incidences (OI) including poaching, grazing, encroachment, charcoal and firewood collection. Finally, **State** indicators are grouped into three categories: wildlife (including species presence, diversity, distribution and movement); vegetation (including species composition and diversity, distribution, disturbance and regeneration); and land-uses (including changes in various vegetation/habitat types, encroachment and fire). Fourteen (14) of these indicators (especially response and pressure indicators) correspond to the 30 Social indicators developed in CM 4, and so data collection follows the protocols outlined therein. On top of these indicators, we determined **12 biodiversity indicators** that are not a part of the Social indicator set, which are classified into three categories: Outcome **3**; Output **5** and Impact **4**. For these new indicators, two main strategies will be used to obtain the data: In-house reporting, mostly for response and pressure indicators, and Fieldwork for most state indicators. We envision three main aspects of state indicators to measure, each with a fairly distinct set of monitoring protocols:

- Wildlife: wildlife surveys and monitoring for all species – with a focus on HCVs – will be done using several methods: permanent road transects, ranger patrols, camera traps, aerial surveys, daily logs, and information from other research projects.
- Vegetation: two main methods to be used here are carbon plot monitoring and vegetation

transects surveys e.g., radiating away from waterholes.

- Land use: monitoring major land-use changes (e.g., fire effects, encroachment) shall done using remote sensing (based on LANDSAT imagery) and GIS techniques.

Biodiversity Impact Assessment: Monitoring Plan

Table 39: Project biodiversity impact assessment for monitoring plan.

Key results	Indicator	Indicator type	Data collection method	Who?	When?
Sustainable agricultural intensification	Four indicators included in the SIA Monitoring Plan				
Livelihood diversification enhanced	Four indicators included in the SIA Monitoring Plan				
Reduced Forest Clearance for Agriculture & Settlement	Seven indicators included in the SIA Monitoring Plan				
Greater Willingness of Community to Safeguard Forests	Six indicators included in the SIA Monitoring Plan				
Ecosystem improvement	# degraded sites identified for inclusion into a restoration programme (document}	Output	Internal Report	Biodiversity team	Annually
	# trees planted & surviving (3rd year) in Project Area	Output	Internal Report	Biodiversity Team	Annually
	# seedlings and saplings within Project Area	Outcome	Biomass monitoring plots	Carbon sampling team	Annually
	Abundance and diversity of trees & shrubs	Impact	Biomass monitoring plots	Carbon sampling team	Annually
	# active outposts/observation posts	Output	Internal Report	Biodiversity Team	Annually

Biodiversity improvement	# patrols done (coverage)	Output	Internal Report	Law enforcement team	Daily
	# patrol distances	Output	Internal Report	Law enforcement team	Daily
	# snares and # chainsaw recovered and confiscated	Outcome	Ranger patrols	Law enforcement team	Daily
	# bushmeat poachers arrested	Outcome	Ranger patrols	Law enforcement team	Daily
	# animals injured or killed (carcasses)	Impact	Ranger patrols & Transects	Law enforcement team & Biodiversity teams	Quarterly
	Presence, abundance and diversity of wildlife in the Project Area	Impact	Transect, Camera traps & Ranger patrols	Biodiversity & Law Enforcement teams	Quarterly
	Wildlife distribution & evidence of movement between National Parks & Project ranches	Impact	Transect, Camera traps & Ranger patrols	Biodiversity & Law Enforcement teams	Quarterly

8.1.7 Dissemination of the Biodiversity Monitoring Plan and monitoring results (B4.3.).

The TRP will have the biodiversity monitoring plan available for public review at the Project Office. The results of the initial biodiversity monitoring will be included in the monitoring reports / project implementation reports for the Project. Additionally, a project document summary will be written at each monitoring event and provided to communities throughout the Project Area and Zone in English and Khmer. These documents will additionally be posted to the CCB website (http://www.vcsprojectdatabase.org) for public review and comment.

8.1.8 Development of a plan for assessing the effectiveness of measures to maintain or enhance biodiversity HCVs (B4.2.).

Biodiversity HCVs, such as critically endangered species, key threatened ecosystems and ecosystem services, biome, corridor function, are captured in the Monitoring Plan above.

8.2 Data and Parameters Available at Validation (CL4)

PDR.121 The value for each variable in the Methodology VM0009 Appendix G

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

Any comment:	Parameter is not used as BEM is not used.

Data Unit / Parameter:	$\boldsymbol{\theta}$
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 as BEM is not used

Data Unit / Parameter:	$\widehat{\boldsymbol{\sigma}}_{\boldsymbol{EM}}$
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:	
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of Data:	Determination of baseline scenario
Any comment:	

Data Unit / Parameter:	$\boldsymbol{\mathcal{B}}$
Data unit:	set
Description:	The set of all selected carbon pools in biomass. Is a subset of $\mathcal{C}$
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:	

Data Unit / Parameter:	$\mathcal{C}$
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:	N/A
Purpose of Data:	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	$\mathcal{J}$
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:	

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:	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 measurement methods and procedures applied:	N/A
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:	N/A
Purpose of Data:	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	$c_{L\,p}$
Data unit:	tCO_2e/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:	Direct measurement
Purpose of Data:	Calculation of baseline emissions
Any comment:	Parameter not used

Data Unit / Parameter:	o_i
Data unit:	unitless
Description:	State observation for the ith 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

Data Unit / Parameter:	$p_{L\,ME}$
Data unit:	unitless
Description:	Portion of leakage related to market
Source of data:	VCS methodology VM0009 Section 8.3.3
Value applied:	0.5
Justification of choice of data or description of measurement methods and procedures applied:	
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:	$r_{CF\,b}$
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:	0.4
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:	Measured using GIS
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:	

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:	N/A
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 measurement methods and procedures applied:	N/A
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 ith 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 not used.

Data Unit / Parameter:	$\boldsymbol{x}$
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:	$\boldsymbol{x_i}$
Data unit:	geographic coordinates
Description:	Latitude of the ith sample point
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:	$\boldsymbol{x_o}$
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

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

Data Unit / Parameter:	y_i
Data unit:	geographic coordinates
Description:	Longitude of the ith sample point
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

8.3 Data and Parameters Monitored (CL3, CM3 & B3)

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 as BEM not used.

Data Unit / Parameter:	$A_{P\,1}^{[m=0]}$
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:	GIS analysis of best available data
Frequency of monitoring/recording:	First monitoring period
Value applied:	40,541.01
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Cross-check of GIS analysis
Purpose of data:	Calculation of baseline emissions
Calculation method:	GIS analysis
Any comment:	

Data Unit / Parameter:	$A_{P\,2}^{[m=0]}$
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:	GIS analysis of best available data
Frequency of monitoring/recording:	First monitoring period
Value applied:	197.71
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Cross-check of GIS analysis
Purpose of data:	Calculation of baseline emissions
Calculation method:	GIS analysis
Any comment:	

Data Unit / Parameter:	$A_{P\,3}^{[m=0]}$
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:	GIS analysis of best available data
Frequency of monitoring/recording:	First monitoring period
Value applied:	456.78
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Cross-check of GIS analysis
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

Data Unit / Parameter:	$c_B^{[m]}$
Data unit:	tCO_2e/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:	VCS Methodology VM0009 v3 Section 6.4 and Appendix B.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	5.55
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 [B.33]
Any comment:	

Data Unit / Parameter:	$C_{B\,BGB}^{[m]}$
Data unit:	tCO_2e
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:	NA
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]
Any comment:	Parameter not used as BEM is not used

Data Unit / Parameter:	$C_{B\,DW}^{[m]}$
Data unit:	tCO_2e
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]
Any comment:	Carbon pool not included

Data Unit / Parameter:	$C_{B\,SOC}^{[m]}$
Data unit:	tCO_2e
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:	$C_{B\,WP}^{[m]}$
Data unit:	tCO_2e
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]
Any comment:	Carbon pool not included

Data Unit / Parameter:	$C_{B\ AGMT}^{[m]}$
Data unit:	tCO_2e/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_2e/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_2e
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_2e
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_2e/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:	VCS Methodology VM0009 v3 Appendix B.1.5
Frequency of monitoring/recording:	Every monitoring period
Value applied:	5.55
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:	

Data Unit / Parameter:	$c_{B\,BM}^{[m]}$
Data unit:	tCO_2e/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:	VCS Methodology VM0009 v3 Appendix B.2
Frequency of monitoring/recording:	Every monitoring period
Value applied:	5.55
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.18]
Any comment:	

Data Unit / Parameter:	$c_{P}^{[m]}$
Data unit:	tCO_2e/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:	VCS Methodology VM0009 Appendix B.2

Frequency of monitoring/recording:	Every monitoring period
Value applied:	489.5
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 [B.31]
Any comment:	

Data Unit / Parameter:	$c_P^{[m-1]}$
Data unit:	tCO_2e/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:	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording:	Prior monitoring period
Value applied:	489.5
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Already reviewed
Purpose of data:	Calculation of baseline emissions
Calculation method:	Equation [B.31]
Any comment:	

Data Unit / Parameter:	$c_P^{[m=0]}$
Data unit:	tCO_2e/ha
Description:	Project carbon stocks prior to first verification event for the Project Accounting Area
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording:	Prior monitoring period
Value applied:	489.5
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Already reviewed
Purpose of data:	Calculation of baseline emissions
Calculation method:	Equation [B.31]
Any comment:	

Data Unit / Parameter:	$c_{P\,1\,BM}^{[m=0]}$
Data unit:	tCO_2e/ha
Description:	Project carbon stocks in biomass in Project Accounting Area stratum 1 at project start – Evergreen Forest
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	495.4
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:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$c_{P\,2\,BM}^{[m=0]}$
Data unit:	tCO_2e/ha
Description:	Project carbon stocks in biomass in the Project Accounting Area stratum 2 at project start – Semi-Evergreen Forest
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	135.5
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:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$c_{P\,3\,BM}^{[m=0]}$
Data unit:	tCO_2e/ha
Description:	Project carbon stocks in biomass in the Project Accounting Area stratum 3 at project start – Deciduous Forest
Source of data:	Project accounting area sampling

Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	118.64
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:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$c_{P\ AGMT}^{[m=0]}$
Data unit:	tCO_2e/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:	VCS Methodology VM0009 Appendix B.2
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:	Review of monitoring records
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:	$c_{P\ BM}^{[m=0]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	20,165,031.95
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.17]
Any comment:	

Data Unit / Parameter:	$c_{P\,b}^{[m]}$
Data unit:	tCO_2e/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:	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	489.5
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:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$C_{P\,\Delta\,WP}^{[m]}$
Data unit:	tCO_2e
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:	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.2]
Any comment:	

Data Unit / Parameter:	$E_{\Delta\,GER}^{[m]}$
Data unit:	tCO_2e
Description:	GERs for the current monitoring period

Source of data:	Area measurements
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.4.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	474,029
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of GER calculations
Purpose of data:	Calculation of baseline emissions
Calculation method:	Equation F.53
Any comment:	

Data Unit / Parameter:	$E_{\Delta GER}^{[i]}$
Data unit:	tCO_2e
Description:	GERs for monitoring period i
Source of data:	Area measurements
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.4.1
Frequency of monitoring/recording:	Prior monitoring period
Value applied:	474,029
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of GER calculations
Purpose of data:	Calculation of baseline emissions
Calculation method:	Equation F.53
Any comment:	

Data Unit / Parameter:	$E_{\Delta NER}^{[i]}$
Data unit:	tCO_2e
Description:	NERs for monitoring period i
Source of data:	Area measurements
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.4.3
Frequency of monitoring/recording:	prior monitoring period
Value applied:	424,256
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of GER calculations
Purpose of data:	Calculation of baseline emissions

Calculation method:	Equation F.55
Any comment:	

Data Unit / Parameter:	$E_B^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative baseline emissions at the end of the current monitoring period
Source of data:	Proxy area measurements
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	474,029
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.16]
Any comment:	

Data Unit / Parameter:	$E_B^{[m-1]}$
Data unit:	tCO_2e
Description:	Cumulative baseline emissions at the beginning of the current monitoring period
Source of data:	Proxy area measurements
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.1
Frequency of monitoring/recording:	Prior monitoring period
Value applied:	0
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.16]
Any comment:	

Data Unit / Parameter:	$E_{B\,\Delta}^{[m]}$
Data unit:	tCO_2e
Description:	Change in baseline emissions

Source of data:	Proxy area measurements
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	474,029
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.15]
Any comment:	

Data Unit / Parameter:	$E_{B\,\Delta\,BGB}^{[i]}$
Data unit:	tCO_2e
Description:	Change in baseline emissions from below-ground biomass during monitoring period i
Source of data:	Monitoring the proxy area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Appendix B.2.3
Frequency of monitoring/recording:	Already Monitored
Value applied:	NA
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.30]
Any comment:	Parameter not used as BEM is not used.

Data Unit / Parameter:	$E_{B\,\Delta\,DW}^{[i]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Appendix B.2.4 and B.2.5
Frequency of monitoring/recording:	Already Monitored
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.34]
Any comment:	

Data Unit / Parameter:	$E_{B\,\Delta\,SOC}^{[m]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.1.2.1, 8.1.2.2, 8.1.2.3 and Appendix B.2.6
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.26]
Any comment:	Carbon Pool not included.

Data Unit / Parameter:	$E_{B\,\Delta\,SOC}^{[i]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.1.2.1, 8.1.2.2, 8.1.2.3 and Appendix B.2.6
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.26]
Any comment:	Carbon Pool not included.

Data Unit / Parameter:	$E_{B\,AGMT}^{[m]}$
Data unit:	tCO_2e

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:	VCS Methodology VM0009 Section 8.1.6.1, 8.1.6.2, 8.1.6.3
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.37]
Any comment:	Parameter not used

Data Unit / Parameter:	$E_{B\ BGB}^{[m]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.1.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	NA
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.30]
Any comment:	Parameter not used as BEM is not used

Data Unit / Parameter:	$E_{B\ BGB}^{[m-1]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.1.4

Frequency of monitoring/recording:	Every monitoring period
Value applied:	NA
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.30]
Any comment:	Parameter not used as BEM is not used

Data Unit / Parameter:	$E_{B\,BM}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative baseline emissions from 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:	VCS Methodology VM0009 Section 8.1.1, 8.1.1.5.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	474,029
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.19]
Any comment:	

Data Unit / Parameter:	$E_{B\,DW}^{[m]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.1.3
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:	Carbon Pool not included

Data Unit / Parameter:	$E_{B\,DW}^{[m-1]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.1.3
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:	Carbon Pool not included

Data Unit / Parameter:	$E_{B\,SOC}^{[m]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.1.2.1, 8.1.2.2, 8.1.2.3
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:	Carbon Pool not included

Data Unit / Parameter:	$E_{B\,SOC}^{[m-1]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.1.2.1, 8.1.2.2, 8.1.2.3

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:	Carbon Pool not included

Data Unit / Parameter:	$E_{BA}^{[m]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.4.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	47,403
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:	Multiplication
Any comment:	

Data Unit / Parameter:	$E_{L}^{[m]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	2,370
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of leakage
Calculation method:	Equation [F.45]

Any comment:	

Data Unit / Parameter:	$E_L^{[m-1]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.3
Frequency of monitoring/recording:	Already monitored
Value applied:	2,370
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of leakage
Calculation method:	Equation [F.45]
Any comment:	

Data Unit / Parameter:	$E_{L\,\Delta}^{[m]}$
Data unit:	tCO_2e
Description:	Change in emissions due to leakage
Source of data:	N/A
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	2,370
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of leakage
Calculation method:	Equation [F.44]
Any comment:	

Data Unit / Parameter:	$E_{L\,AS\,F}^{[m]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of leakage
Calculation method:	Equation [F.46]
Any comment:	

Data Unit / Parameter:	$E_{L\,ME}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative emissions from market leakage at the end of the current monitoring period
Source of data:	Measurements in the market leakage area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	2,370
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of leakage
Calculation method:	Equation [F.51]
Any comment:	

Data Unit / Parameter:	$E_{P\,\Delta}^{[m]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.2
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
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:	Equation [F.41]
Any comment:	

Data Unit / Parameter:	$E_{P\ \Delta BRN}^{[m]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.2.2
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
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:	Equation [F.42]
Any comment:	

Data Unit / Parameter:	$E_{P\ \Delta\ LS}^{[m]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 8.2.4
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:	Equation [F.43]
Any comment:	

Data Unit / Parameter:	$E_{P\ \Delta\ SF}^{[m]}$

Data unit:	tCO_2e
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:	This parameter is not used in the Project and the CDM A/R methodological tool is also not used in this project.

Data Unit / Parameter:	$E_U^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative confidence deduction at the end of the current monitoring period
Source of data:	N/A
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Section 8.4.1.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
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.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:	VCS Methodology VM0009 Section 8.2.4
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 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:	VCS Methodology VM0009 Section 8.3.2.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Review of monitoring records
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_2e
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:	VCS Methodology VM0009 Section 8.3.2.3
Frequency of monitoring/recording:	At project start
Value applied:	0
Monitoring equipment:	Equipment list in Annex 17
QA/QC procedures to be applied:	Project verification
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:	VCS Methodology VM0009 Section 8.1.6.3
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:	

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:	N/A
Frequency of monitoring/recording:	N/A
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:	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:	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:	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:	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:	Subtraction
Any comment:	

Data Unit / Parameter:	$U_B^{[m]}$
Data unit:	tCO_2e
Description:	Total uncertainty in proxy area carbon stock estimate
Source of data:	Monitoring records
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Appendix B.1.5
Frequency of monitoring/recording:	Every monitoring period
Value applied:	4.65
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of baseline emissions

Calculation method:	Equation [B.34]
Any comment:	

Data Unit / Parameter:	$U_{EM}^{[M]}$
Data unit:	tCO_2e
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:	VCS Methodology VM0009 Section 6.8.10
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 not used

Data Unit / Parameter:	$U_{P}^{[m]}$
Data unit:	tCO_2e
Description:	Total uncertainty in the Project Accounting Area carbon stock estimate
Source of data:	N/A
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 Appendix B.1.5
Frequency of monitoring/recording:	Every monitoring period
Value applied:	21.06
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of data:	Calculation of baseline emissions
Calculation method:	Equation [B.34]
Any comment:	

Data Unit / Parameter:	$wc_{Pi}^{[m=o]}$
Data unit:	tCO_2e
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:	Inventory or GIS
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:	$x^{[m]}$
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:	

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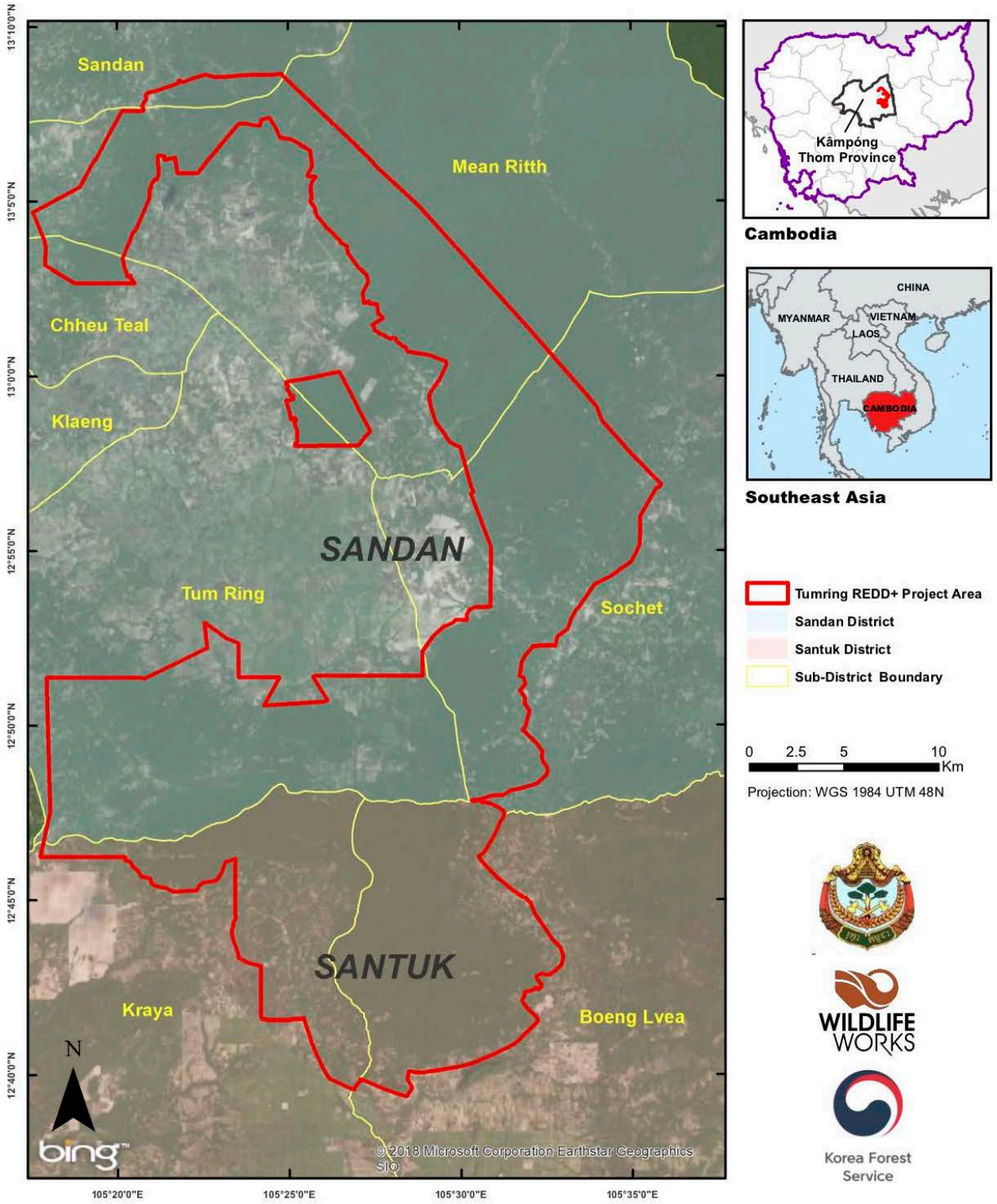
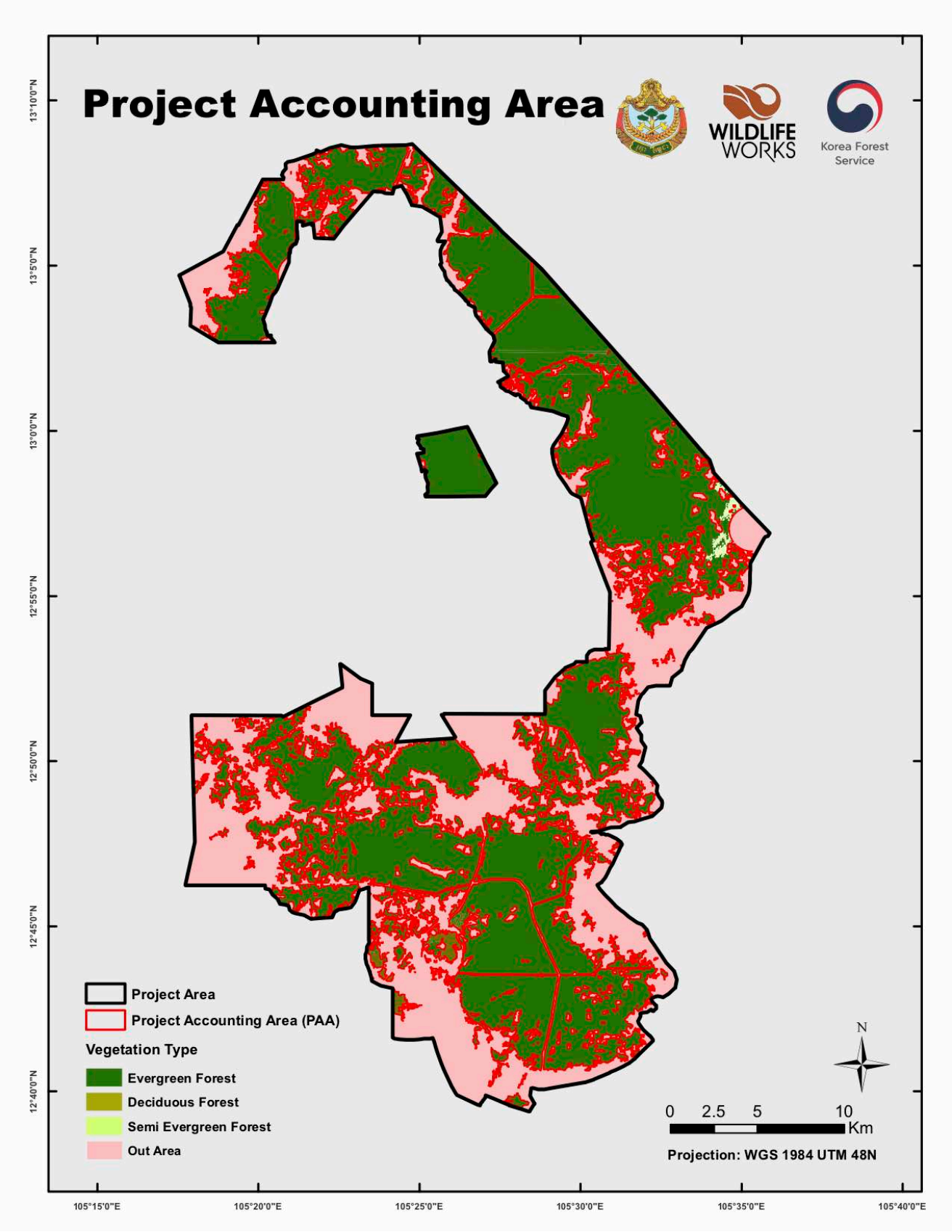
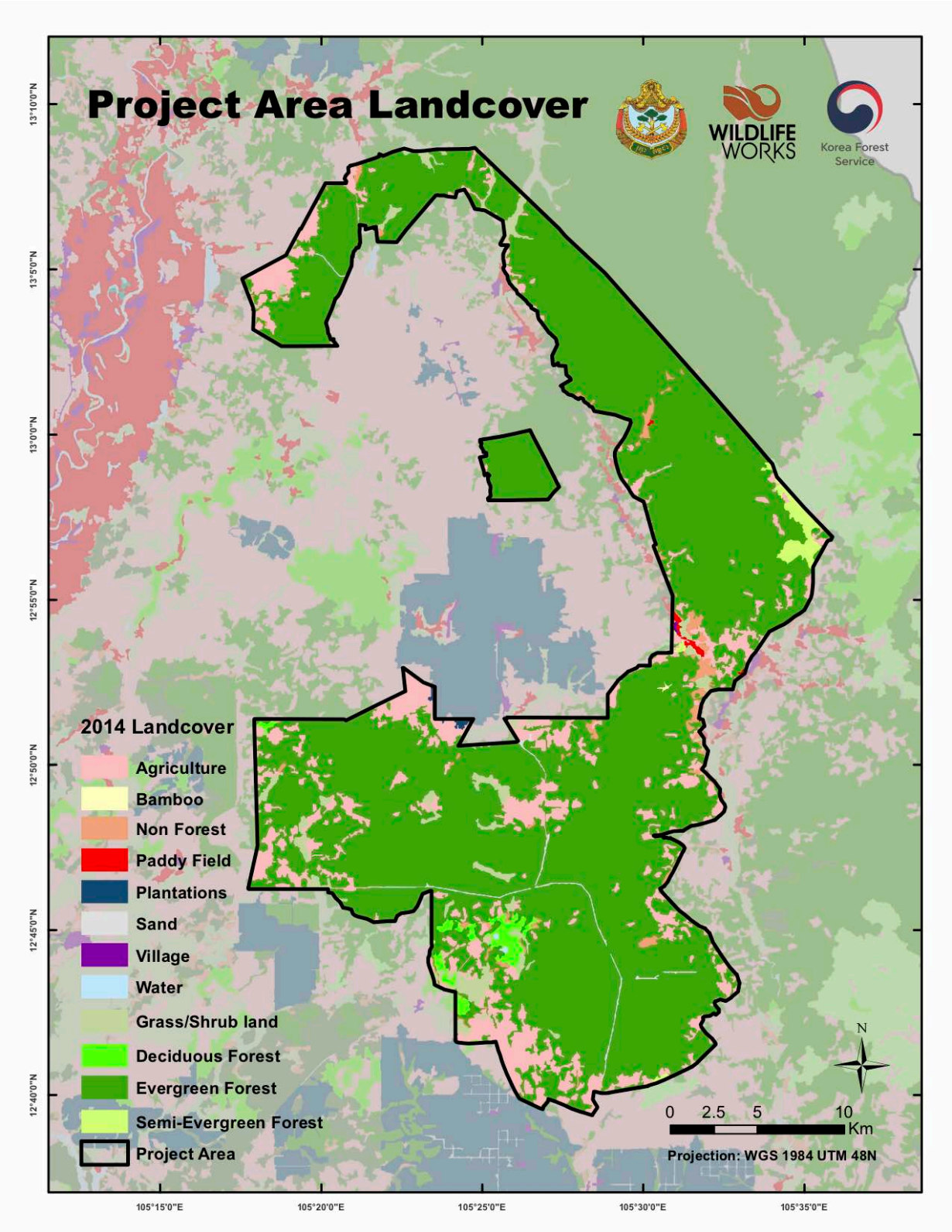
APPENDIX A. The Project Area and Project Accounting Areas

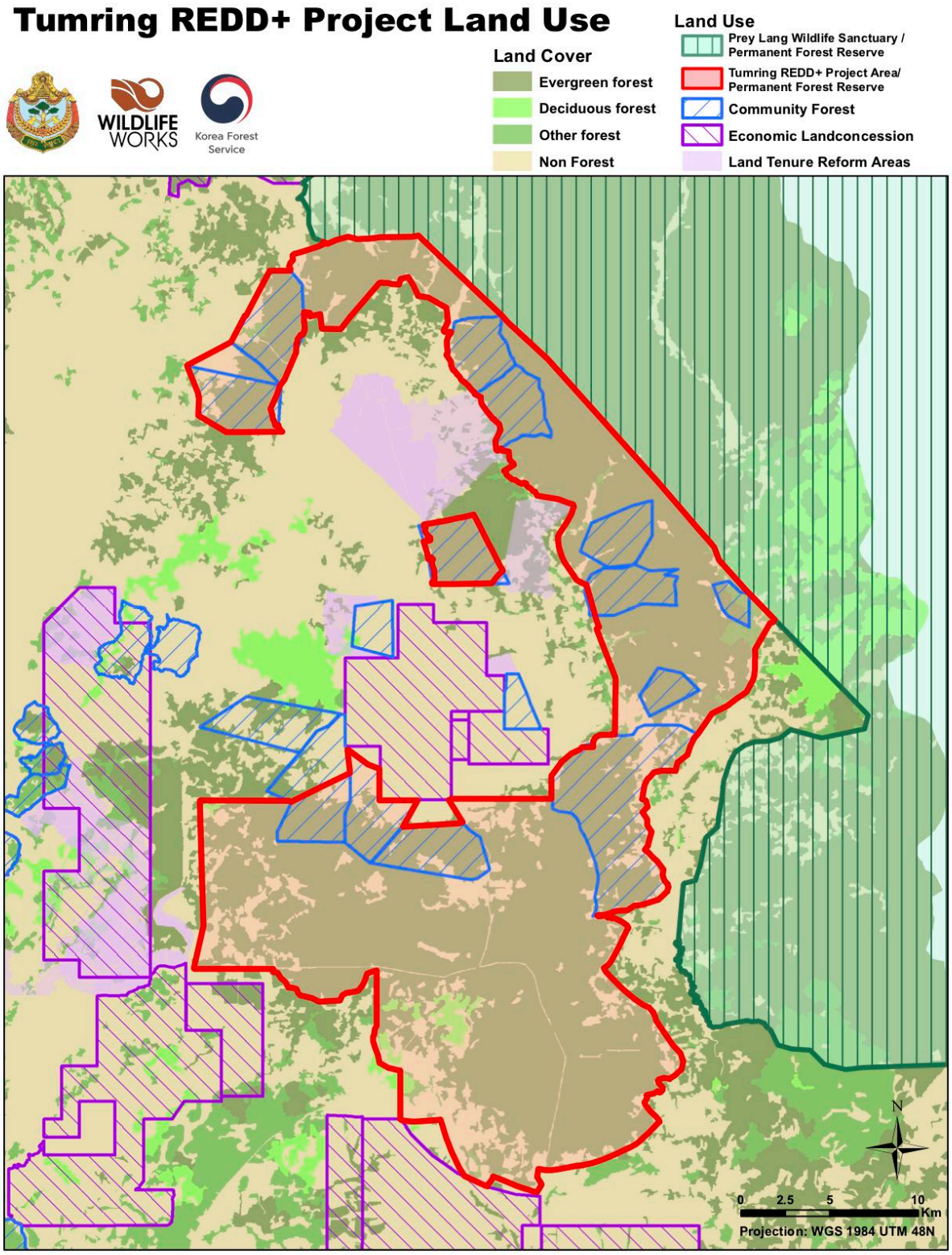
Tumring (Cam-Ko) REDD+ Project Area

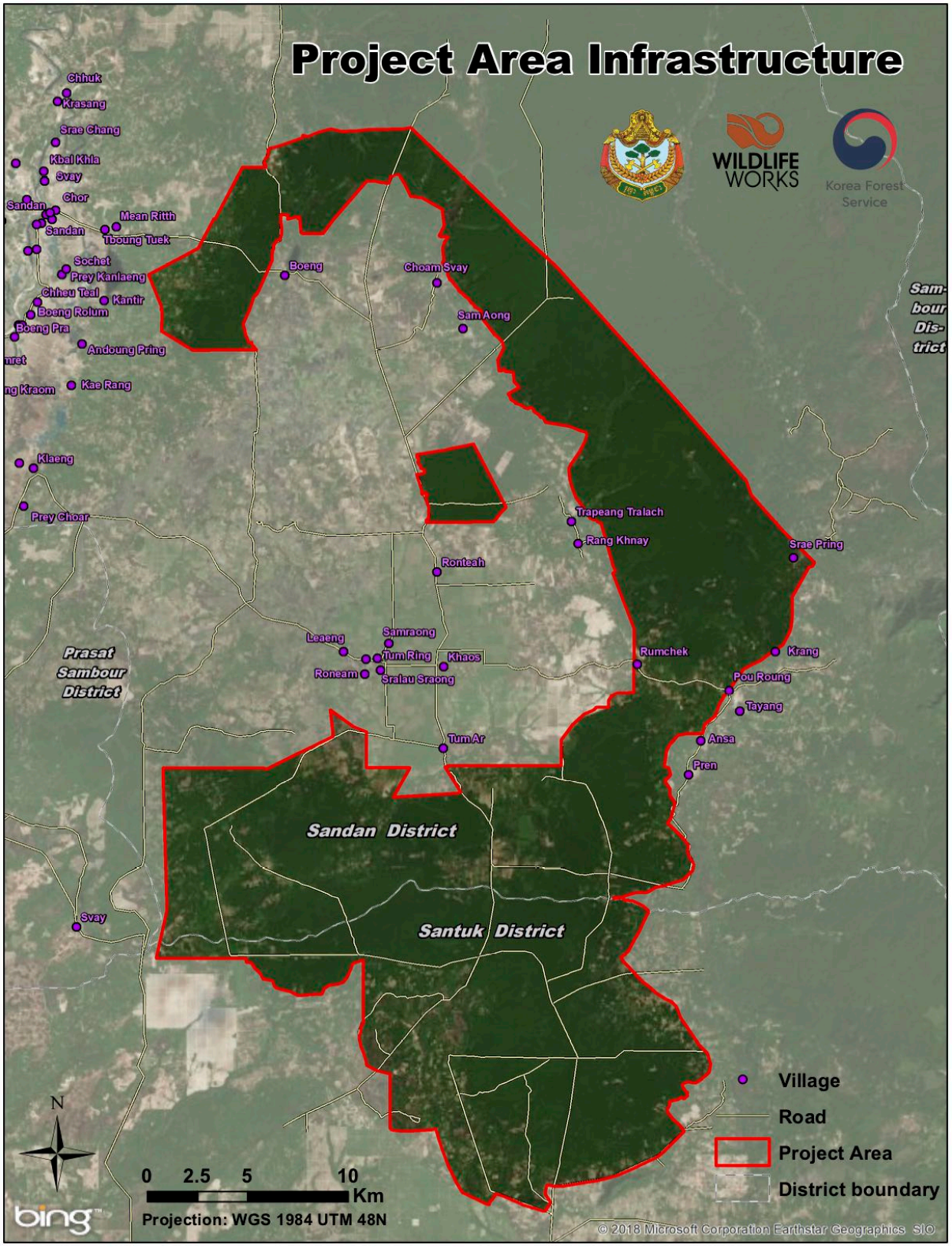


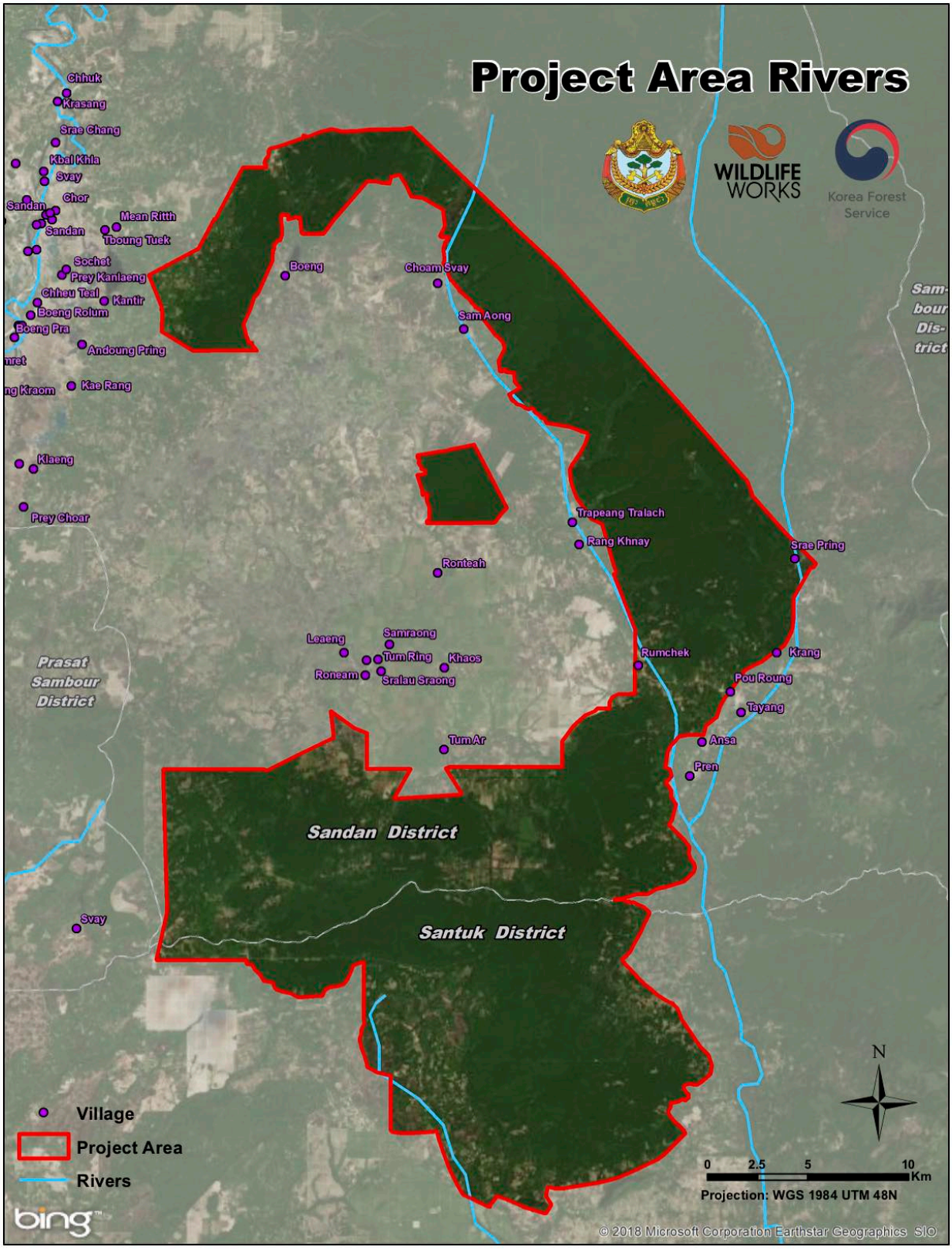

Project Accounting Area
WILDLIFE WORKS
Korea Forest Service
13°10'0"N
13°5'0"N
13°0'0"N
12°55'0"N
12°50'0"N
12°45'0"N
12°40'0"N
105°15'0"E
105°20'0"E
105°25'0"E
105°30'0"E
105°35'0"E
105°40'0"E
Project Area
Project Accounting Area (PAA)
Vegetation Type
Evergreen Forest
Deciduous Forest
Semi Evergreen Forest
Out Area
N
0 2.5 5 10
Km
Projection: WGS 1984 UTM 48N

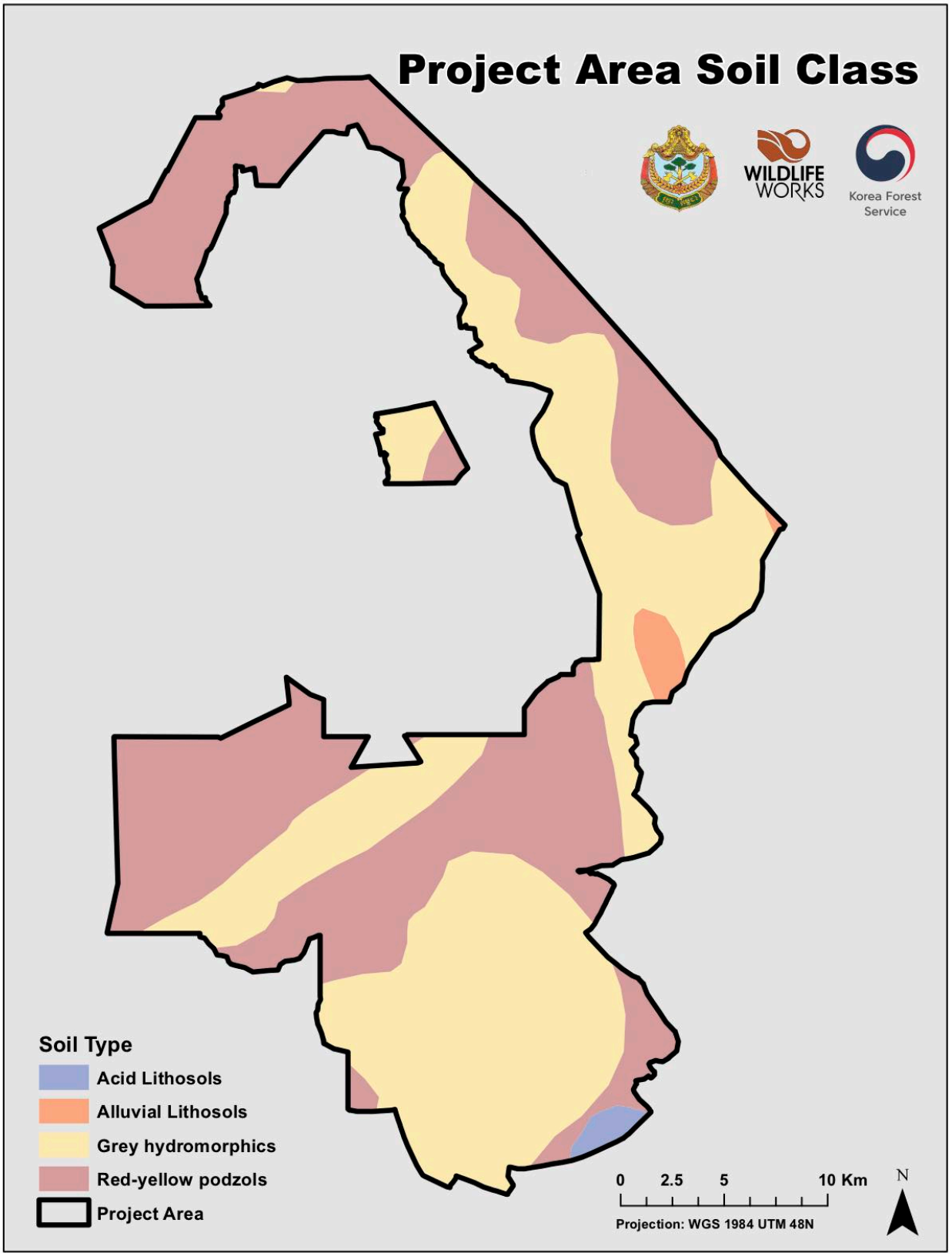
APPENDIX B. Project Area Vegetation, Rivers & Streams, Biomass and Soil Plots, Soil Types, Infrastructure, Communities and Landscape Configuration

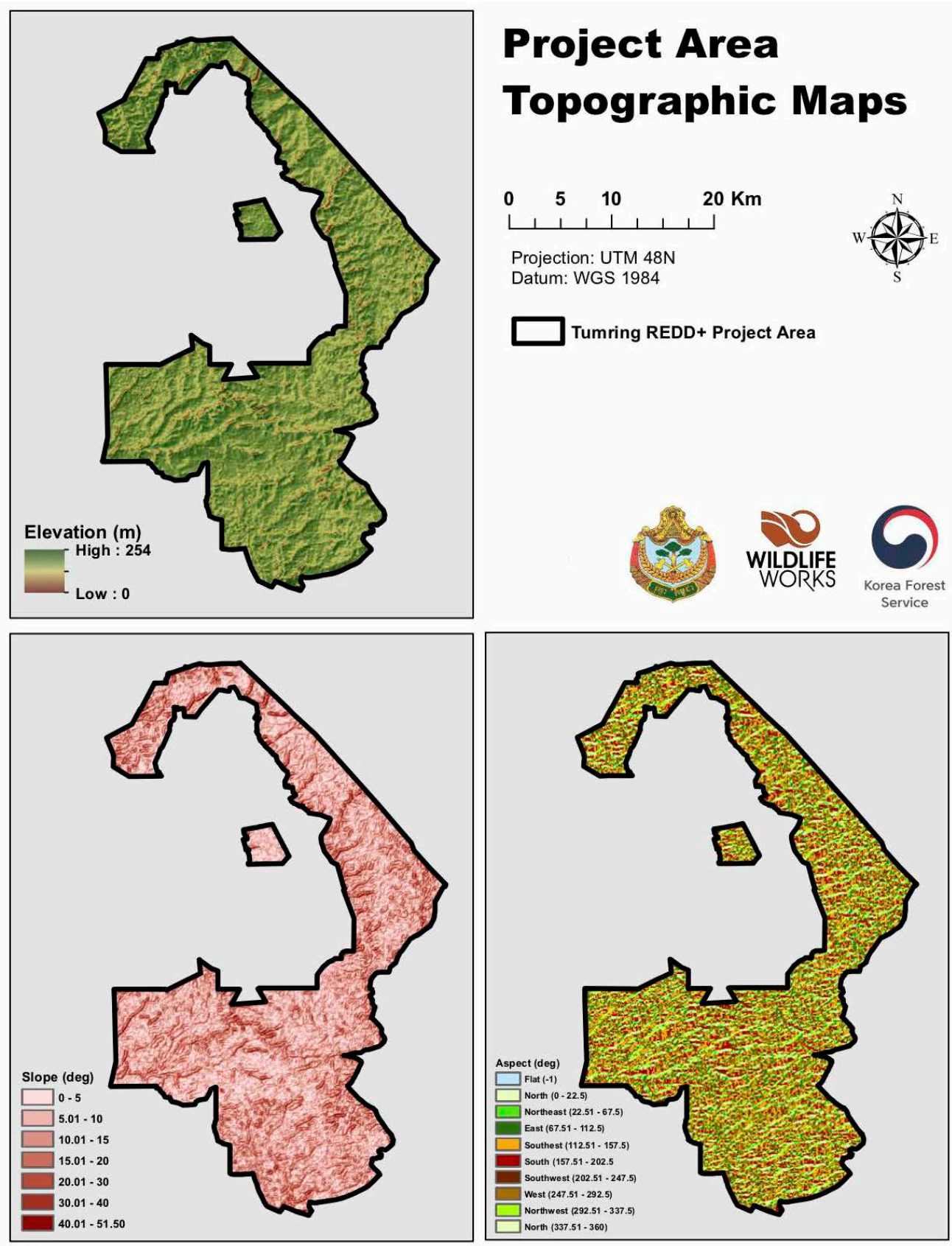



Tumring REDD+ Project Land Use
WILDLIFE WORKS
Korea Forest Service
Land Cover
Evergreen forest
Deciduous forest
Other forest
Non Forest
Land Use
Prey Lang Wildlife Sanctuary / Permanent Forest Reserve
Tumring REDD+ Project Area/ Permanent Forest Reserve
Community Forest
Economic Landconcession
Land Tenure Reform Areas
N
0 2.5 5 10 Km
Projection: WGS 1984 UTM 48N

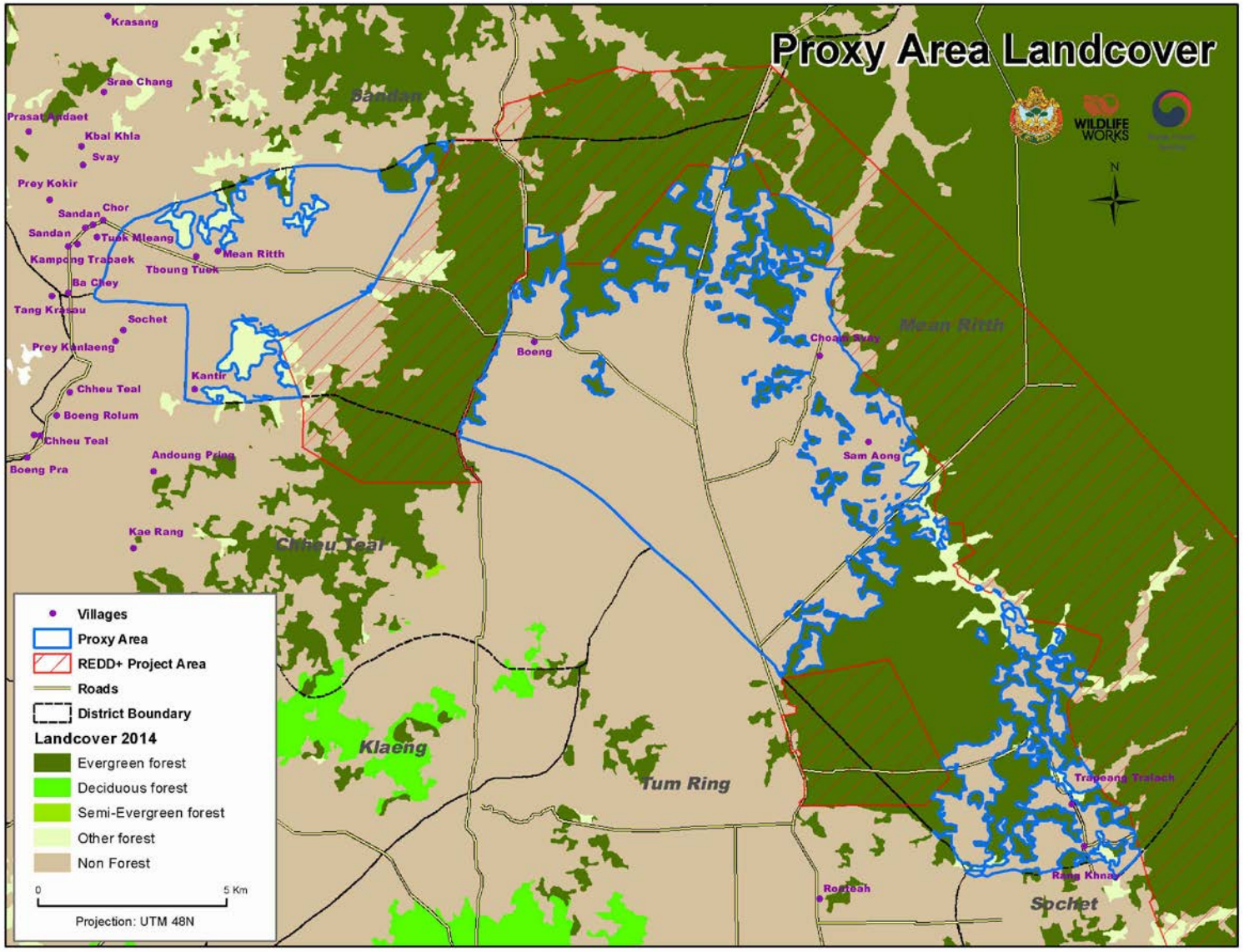

Project Area Infrastructure
WILDLIFE WORKS
Korea Forest Service
Chhuk
Krasang
Srae Chang
Kbal Khla
Svay
Chor
Sandan
Mean Ritth
Sandan
Tboung Tuek
Sochet
Prey Kanlaeng
Chheu Teal
Kantir
Boeng Rolum
Boeng Pra
Andoung Pring
Kae Rang
Klaeng
Prey Choar
Boeng
Choam Svay
Sam Aong
Trapeang Tralach
Rang Khnay
Srae Pring
Ronteah
Leaeng
Samraong
Tum Ring
Khaos
Roneam
Sralau Sraong
Rumchek
Krang
Pou Roung
Tayang
Ansa
Pren
Tum Ar
Prasat Sambour District
Sandan District
Santuk District
Svay
Sam-bour Dis-trict
Village
Road
Project Area
District boundary
N
0 2.5 5 10
Km
Projection: WGS 1984 UTM 48N
bing
© 2018 Microsoft Corporation Earthstar Geographics SIO

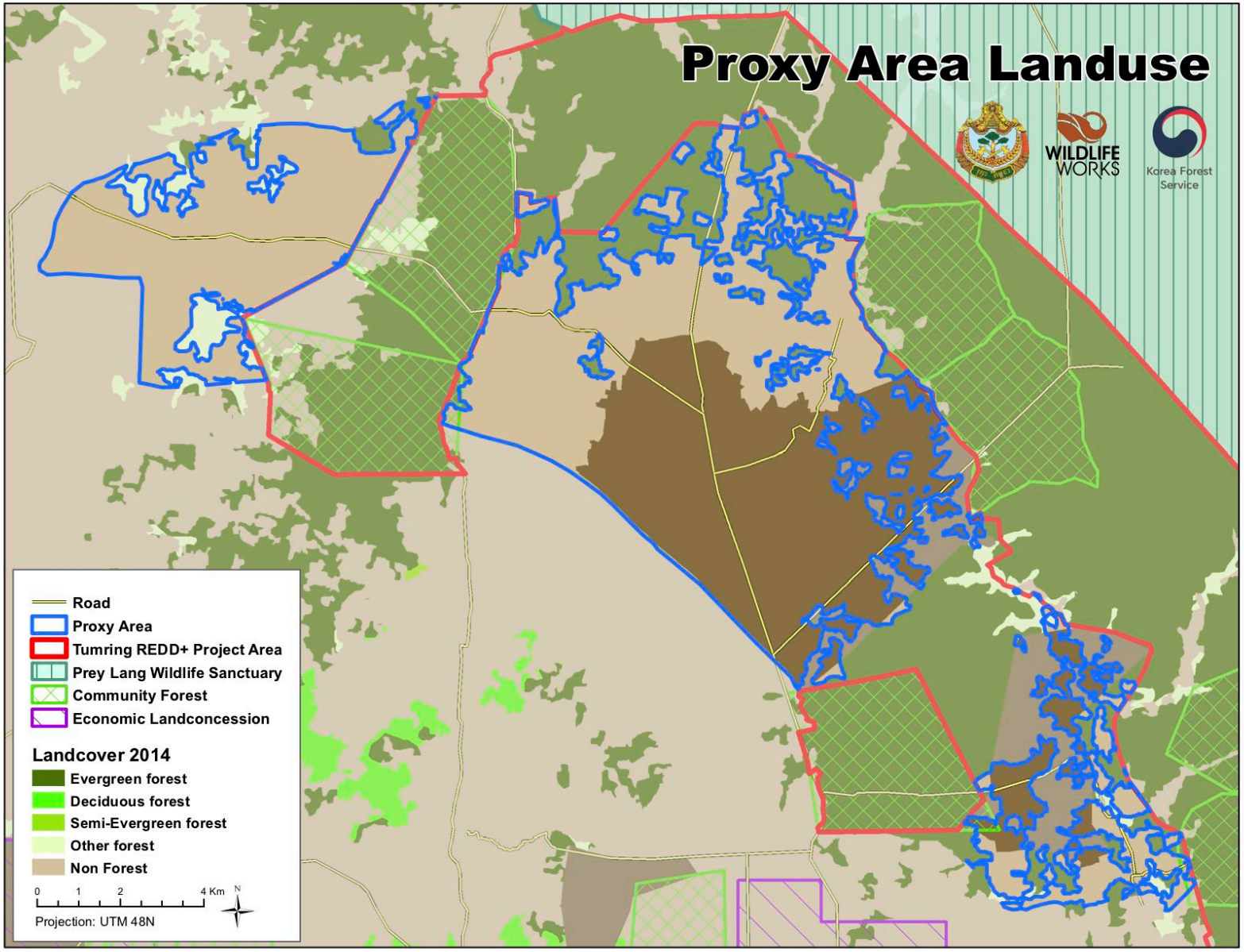

Project Area Rivers
WILDLIFE WORKS
Korea Forest Service
Chhuk
Krasang
Srae Chang
Kbal Khla
Svay
Chor
Sandan
Mean Ritth
Sandan
Tboung Tuek
Sochet
Prey Kanlaeng
Chheu Teal
Kantir
Boeng Roium
Boeng Pra
Andoung Pring
Kae Rang
Klaeng
Prey Choar
Boeng
Choam Svay
Sam Aong
Trapeang Tralach
Rang Khnay
Srae Pring
Ronteah
Leaeng
Samraong
Tum Ring
Khaos
Roneam
Sralau Sraong
Rumchek
Krang
Pou Roung
Tayang
Ansa
Pren
Tum Ar
Prasat Sambour District
Sandan District
Santuk District
Svay
Sam-bour Dis-trict
Village
Project Area
Rivers
N
0 2.5 5 10 Km
Projection: WGS 1984 UTM 48N
bing
© 2018 Microsoft Corporation Earthstar Geographics SIO

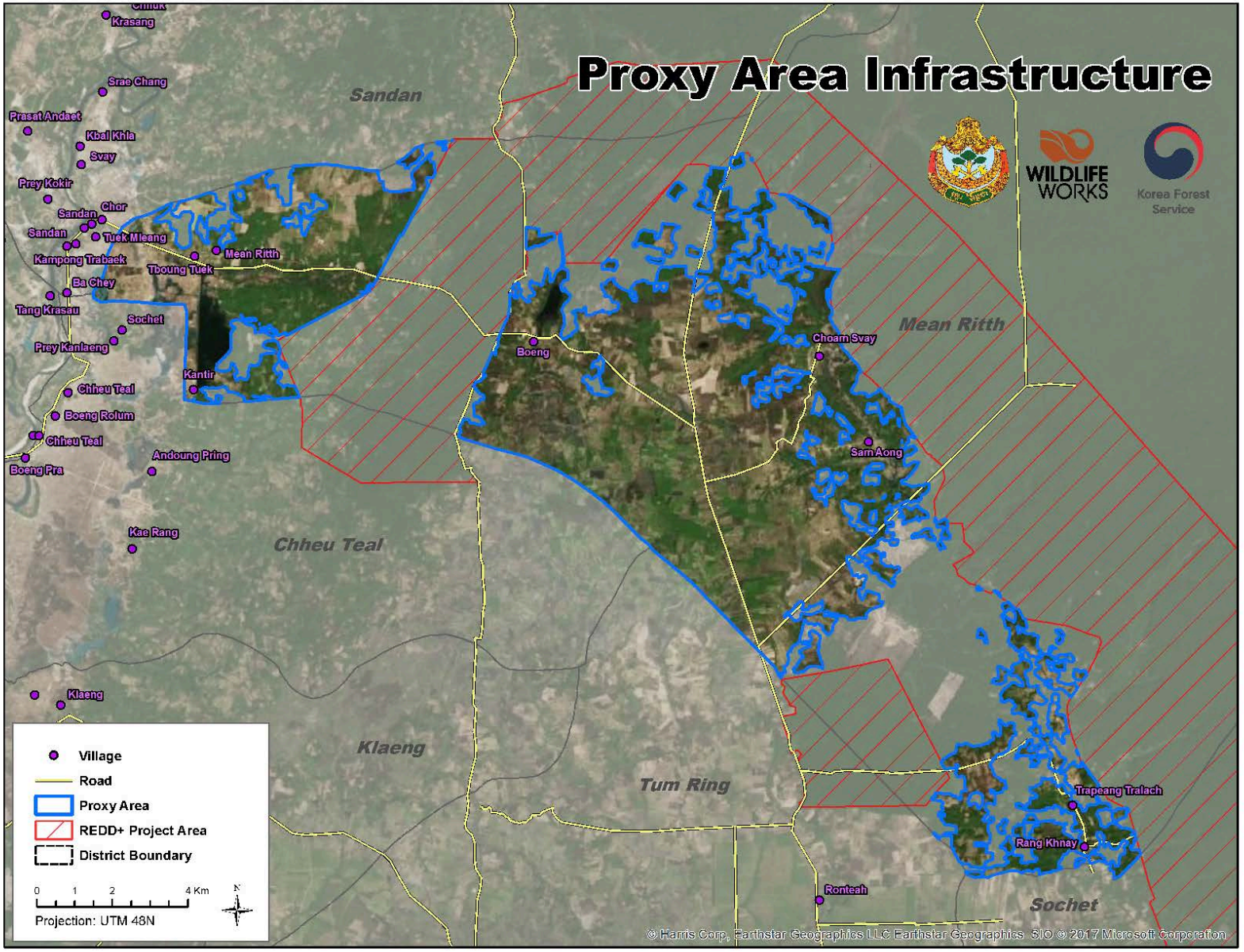

Project Area Soil Class
WILDLIFE WORKS
Korea Forest Service
Soil Type
Acid Lithosols
Alluvial Lithosols
Grey hydromorphics
Red-yellow podzols
Project Area
0 2.5 5 10 Km
Projection: WGS 1984 UTM 48N
N

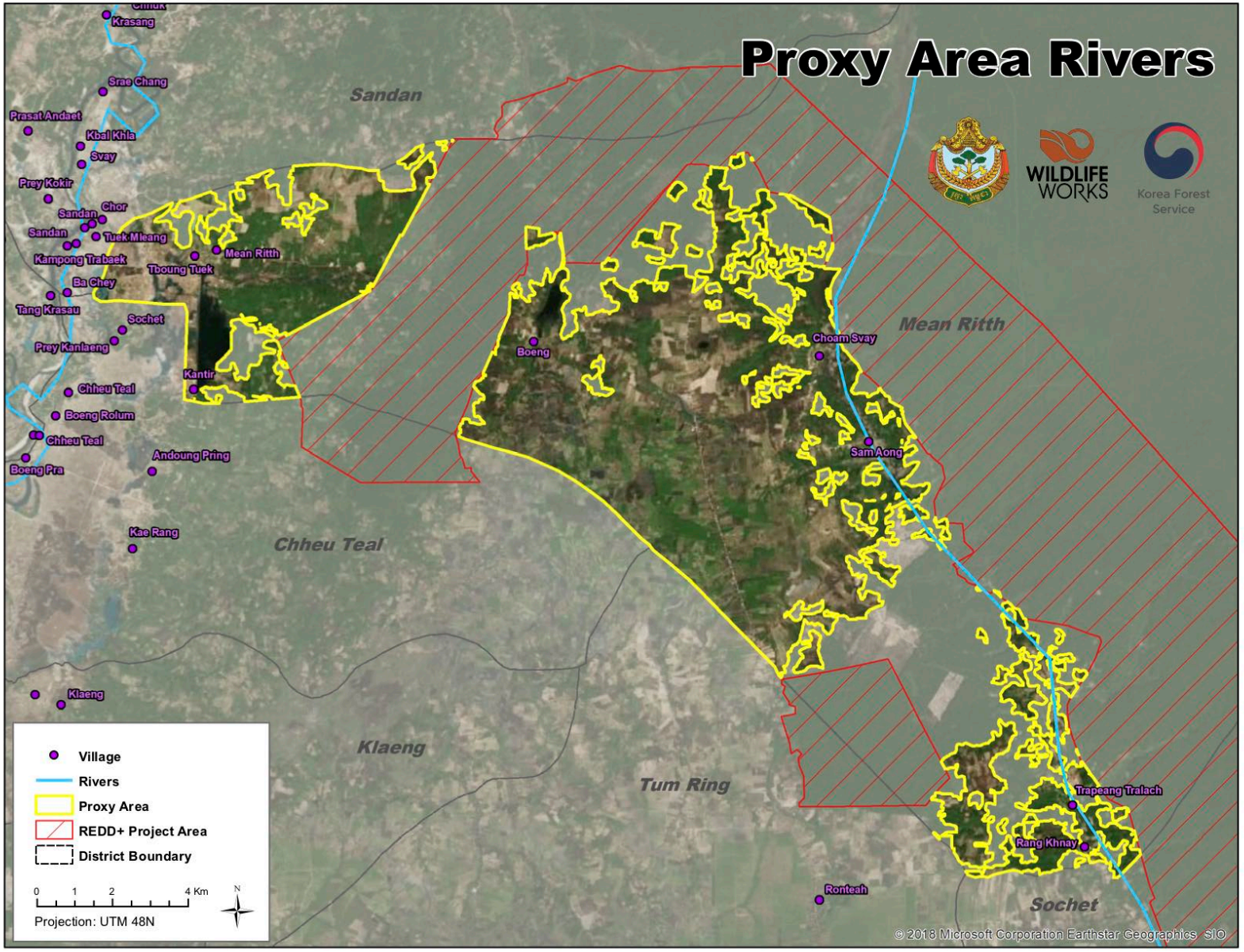

Project Area
Topographic Maps
0 5 10 20 Km
Projection: UTM 48N
Datum: WGS 1984
N
W
E
S
Tumring REDD+ Project Area
Elevation (m)
High : 254
Low : 0
WILDLIFE WORKS
Korea Forest Service
Slope (deg)
0 - 5
5.01 - 10
10.01 - 15
15.01 - 20
20.01 - 30
30.01 - 40
40.01 - 51.50
Aspect (deg)
Flat (-1)
North (0 - 22.5)
Northeast (22.51 - 67.5)
East (67.51 - 112.5)
Southest (112.51 - 157.5)
South (157.51 - 202.5
Southwest (202.51 - 247.5)
West (247.51 - 292.5)
Northwest (292.51 - 337.5)
North (337.51 - 360)

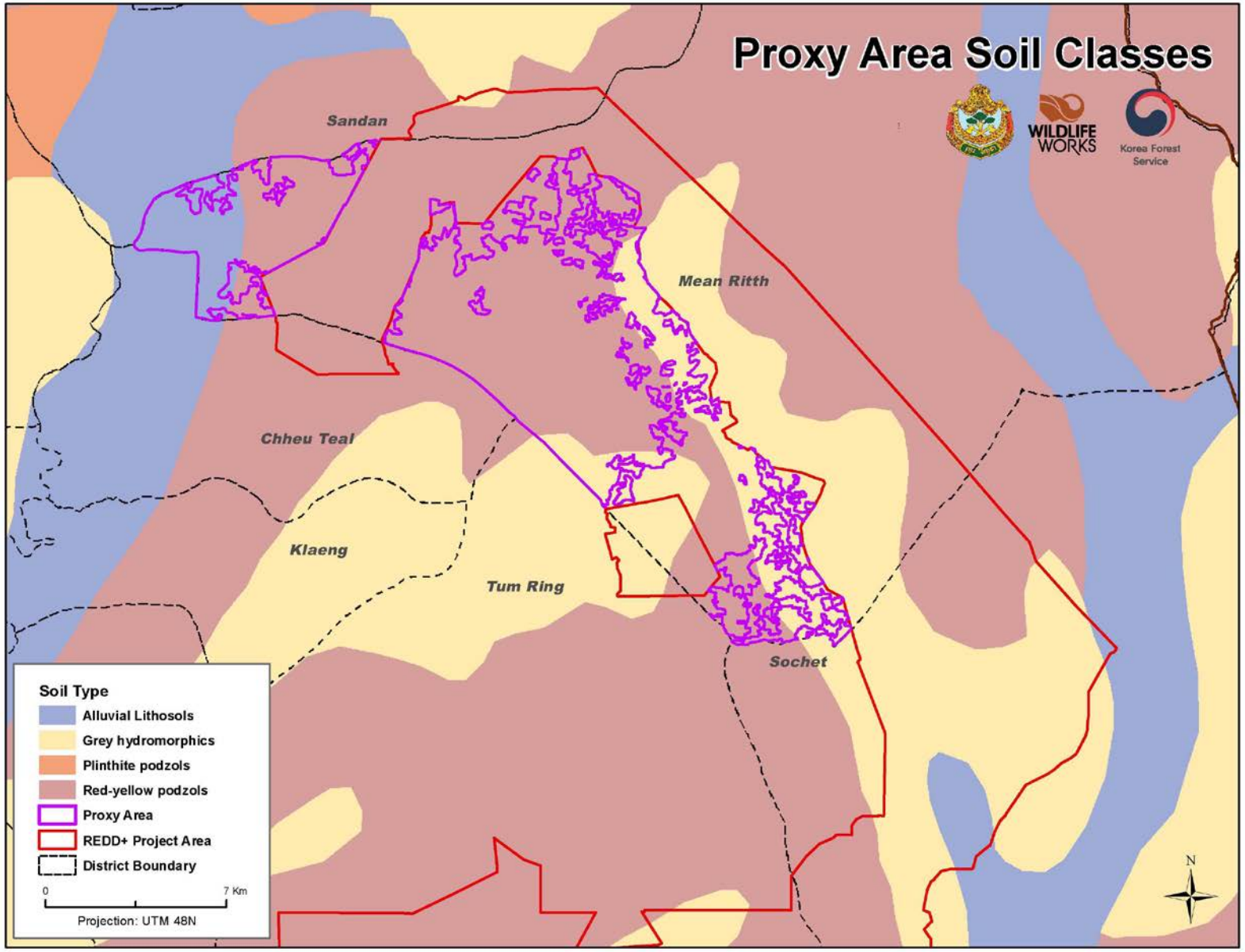
APPENDIX C. Documentation Required for the Proxy Area Selection Criteria

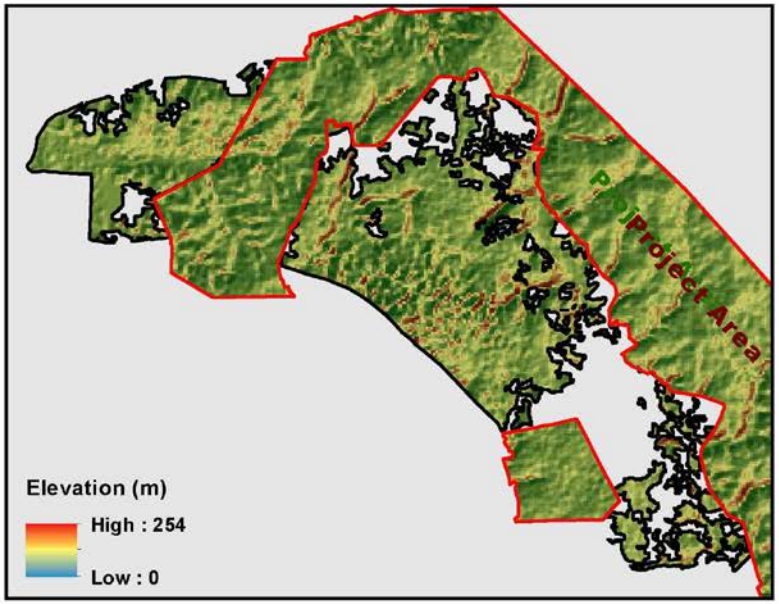


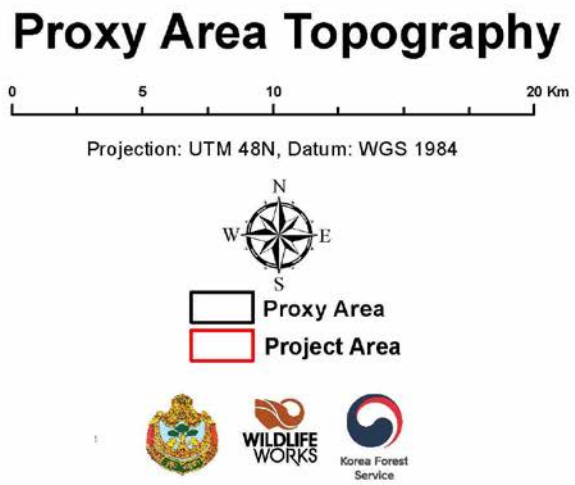

Proxy Area Landuse
WILDLIFE WORKS
Korea Forest Service
Road
Proxy Area
Tumring REDD+ Project Area
Prey Lang Wildlife Sanctuary
Community Forest
Economic Landconcession
Landcover 2014
Evergreen forest
Deciduous forest
Semi-Evergreen forest
Other forest
Non Forest
0 1 2 4 Km
N
Projection: UTM 48N

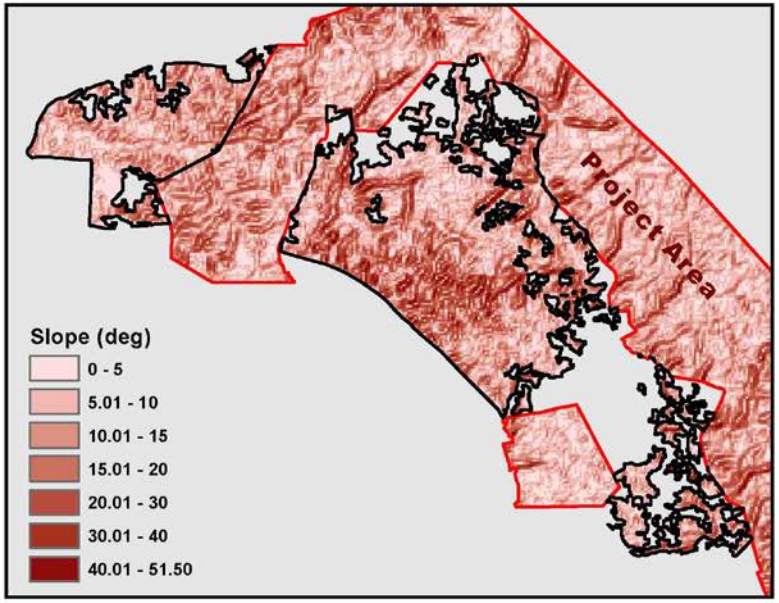

Proxy Area Infrastructure
WILDLIFE WORKS
Korea Forest Service
Sandan
Mean Ritth
Chheu Teal
Klaeng
Tum Ring
Sochet
Krasang
Srae Chang
Prasat Andaet
Kbal Khla
Svay
Prey Kokir
Chor
Sandan
Tuek Mleang
Kampong Trabaek
Mean Ritth
Tboung Tuek
Ba Chey
Tang Krasau
Sochet
Prey Kanlaeng
Kantir
Chheu Teal
Boeng Rolum
Chheu Teal
Boeng Pra
Andoung Pring
Kae Rang
Klaeng
Boeng
Choam Svay
Sam Aong
Trapeang Tralach
Rang Khnay
Ronteah
Village
Road
Proxy Area
REDD+ Project Area
District Boundary
0 1 2 4 Km
Projection: UTM 48N
© Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2017 Microsoft Corporation

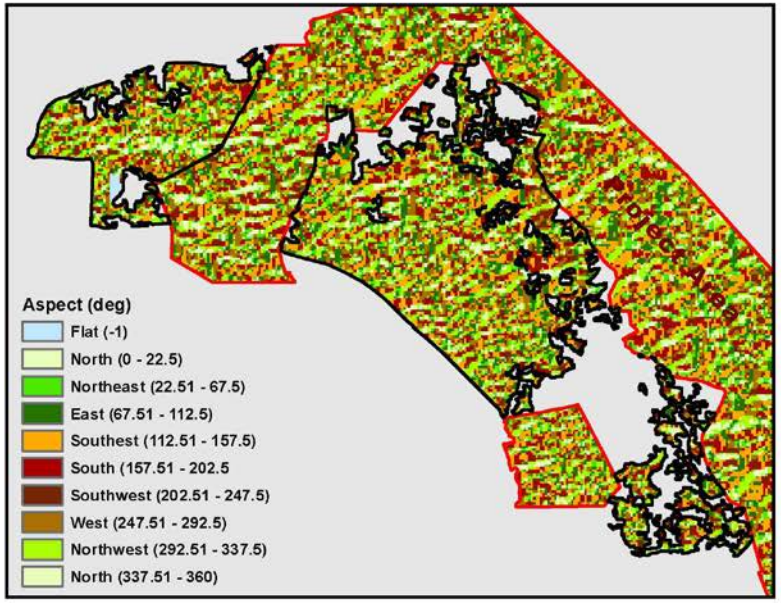

Proxy Area Rivers
Sandan
Mean Ritth
Chheu Teal
Klaeng
Tum Ring
Sochet
Krasang
Srae Chang
Prasat Andaet
Kbal Khla
Svay
Prey Kokir
Sandan
Chor
Sandan
Tuek Mleang
Kampong Trabaek
Mean Ritth
Tboung Tuek
Ba Chey
Tang Krasau
Sochet
Prey Kanlaeng
Kantir
Chheu Teal
Boeng Rolum
Chheu Teal
Boeng Pra
Andoung Pring
Kae Rang
Klaeng
Boeng
Choam Svay
Sam Aong
Trapeang Tralach
Rang Khnay
Ronteah
Village
Rivers
Proxy Area
REDD+ Project Area
District Boundary
0 1 2 4 Km
Projection: UTM 48N
N
WILDLIFE WORKS
Korea Forest Service
© 2018 Microsoft Corporation Earthstar Geographics SIO


Proxy Area Soil Classes
WILDLIFE WORKS
Korea Forest Service
Sandan
Mean Ritth
Chheu Teal
Klaeng
Tum Ring
Sochet
Soil Type
Alluvial Lithosols
Grey hydromorphics
Plinthite podzols
Red-yellow podzols
Proxy Area
REDD+ Project Area
District Boundary
0
7 Km
Projection: UTM 48N
N

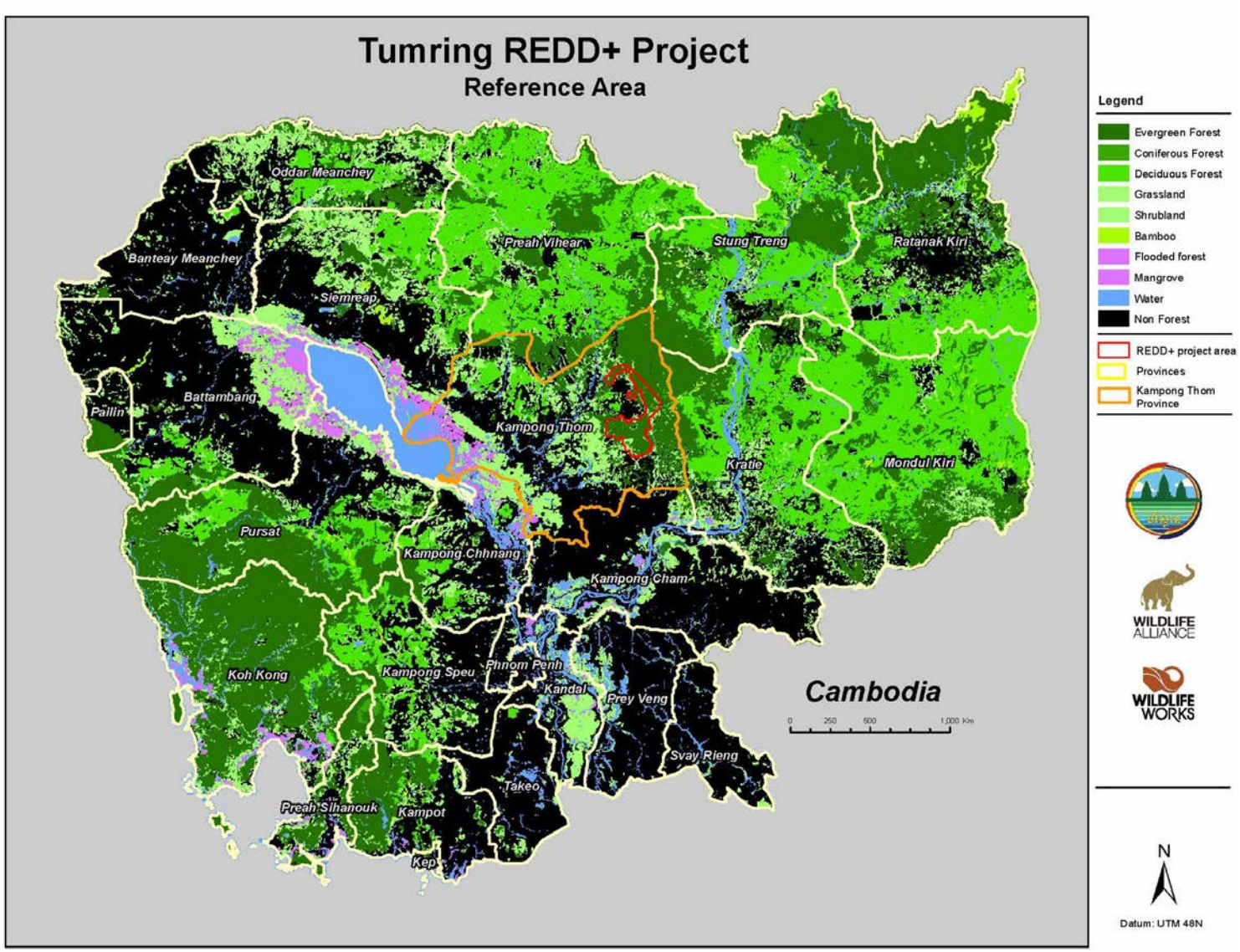

Project Area
Elevation (m)
High : 254
Low : 0


Proxy Area Topography
0
5
10
20 Km
Projection: UTM 48N, Datum: WGS 1984
N
W
E
S
Proxy Area
Project Area
WILDLIFE WORKS
Korea Forest Service

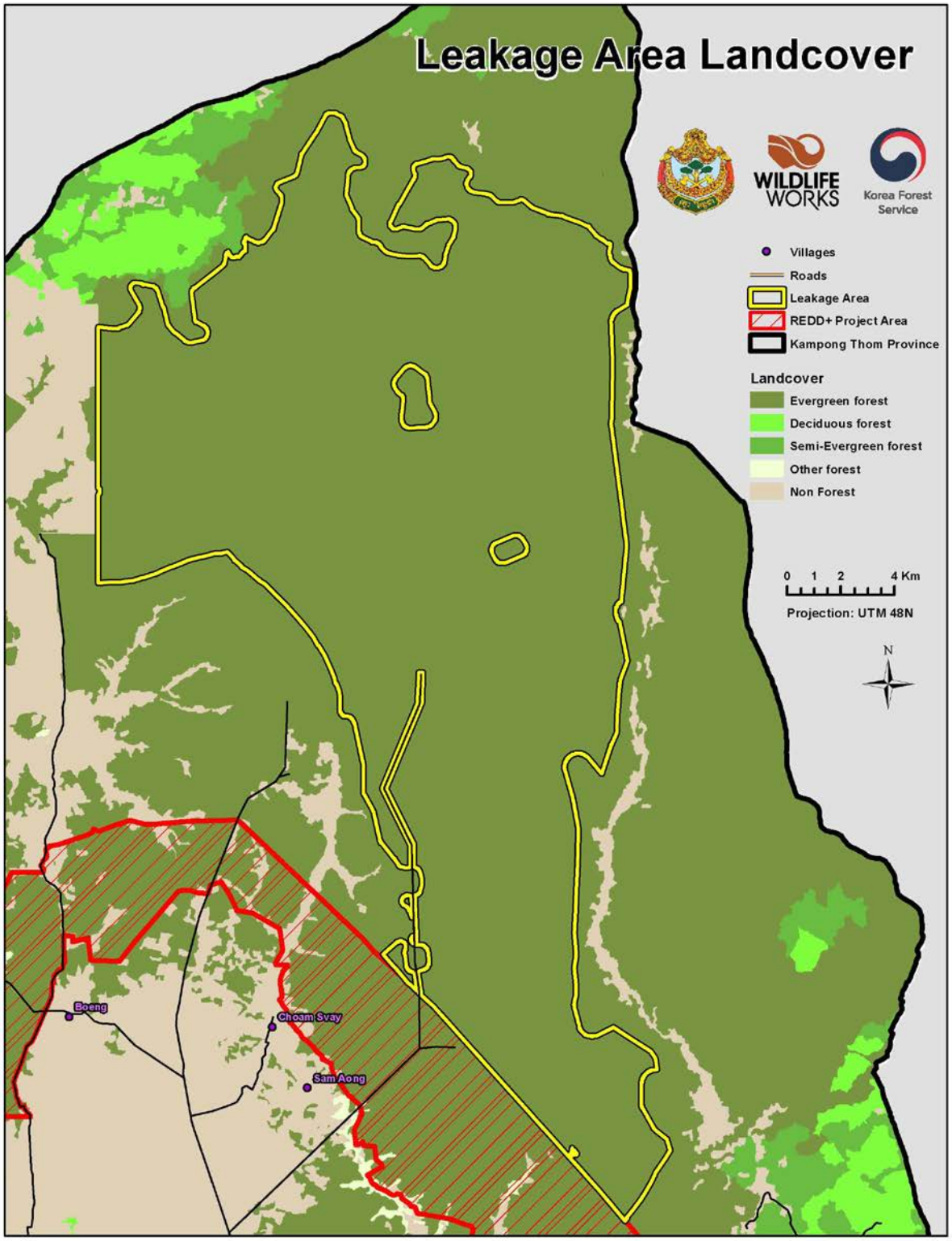

Project Area
Slope (deg)
0 - 5
5.01 - 10
10.01 - 15
15.01 - 20
20.01 - 30
30.01 - 40
40.01 - 51.50

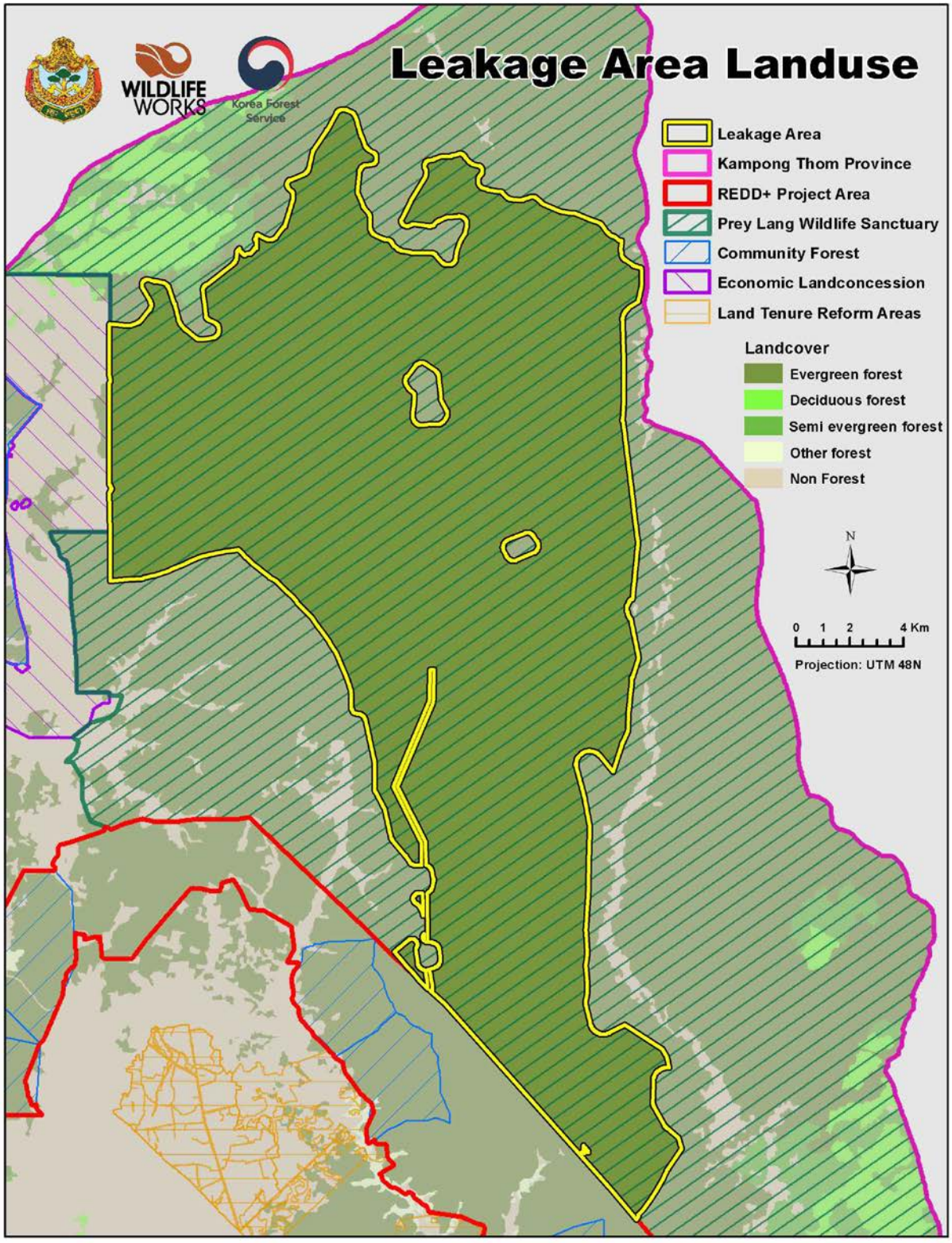

Project Area
Aspect (deg)
Flat (-1)
North (0 - 22.5)
Northeast (22.51 - 67.5)
East (67.51 - 112.5)
Southest (112.51 - 157.5)
South (157.51 - 202.5
Southwest (202.51 - 247.5)
West (247.51 - 292.5)
Northwest (292.51 - 337.5)
North (337.51 - 360)

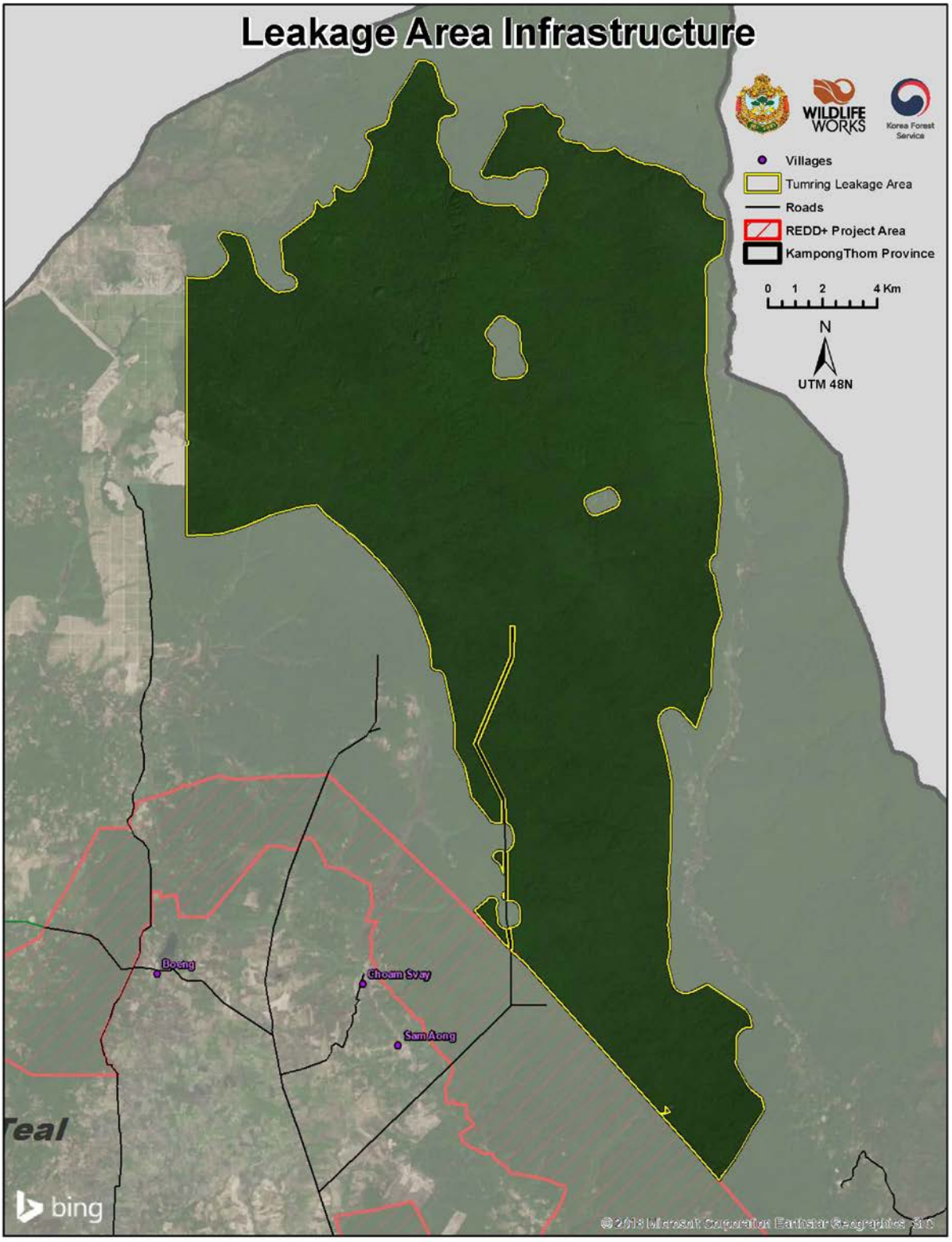
APPENDIX D. Documentation Required for the Reference Area Selection Criteria.

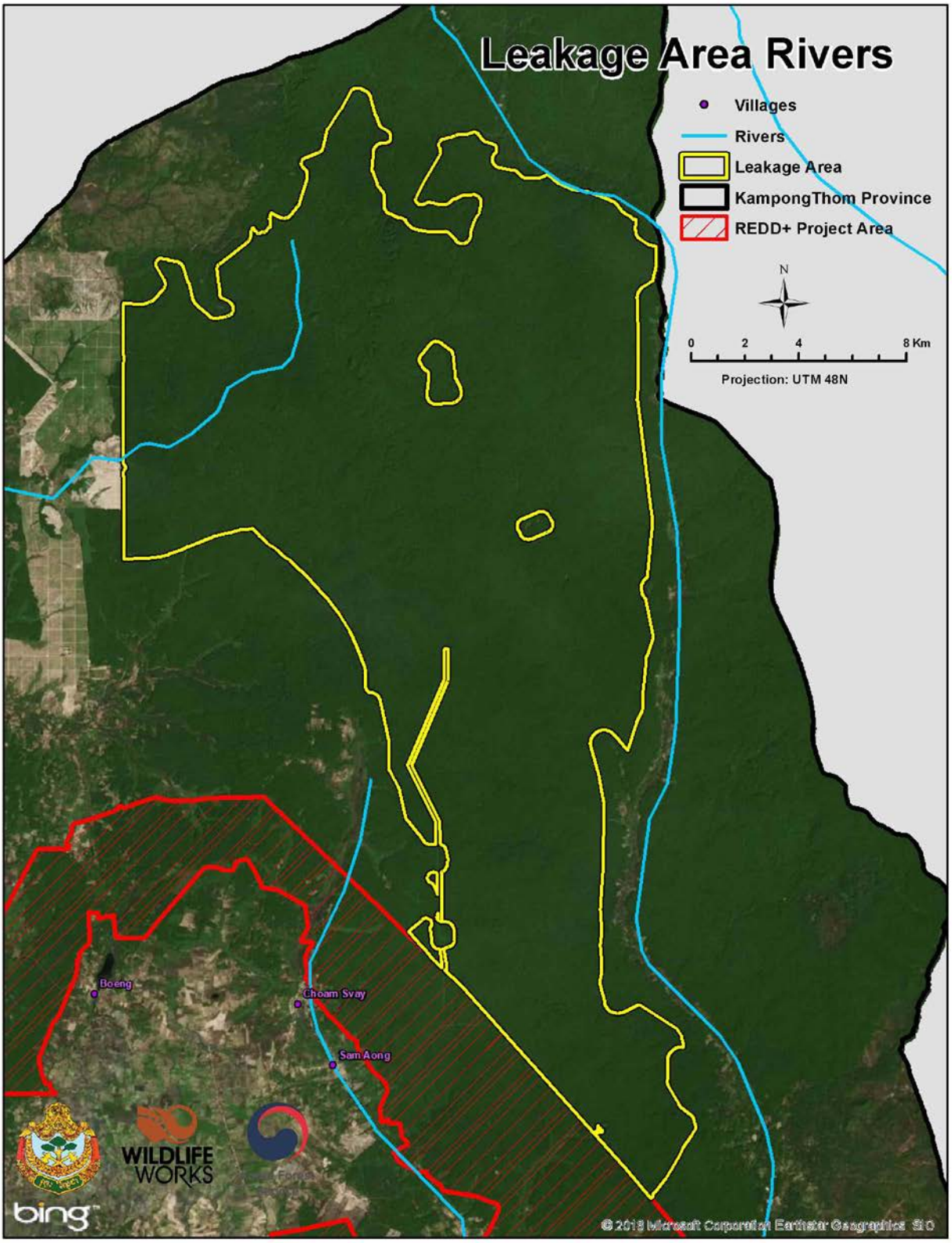


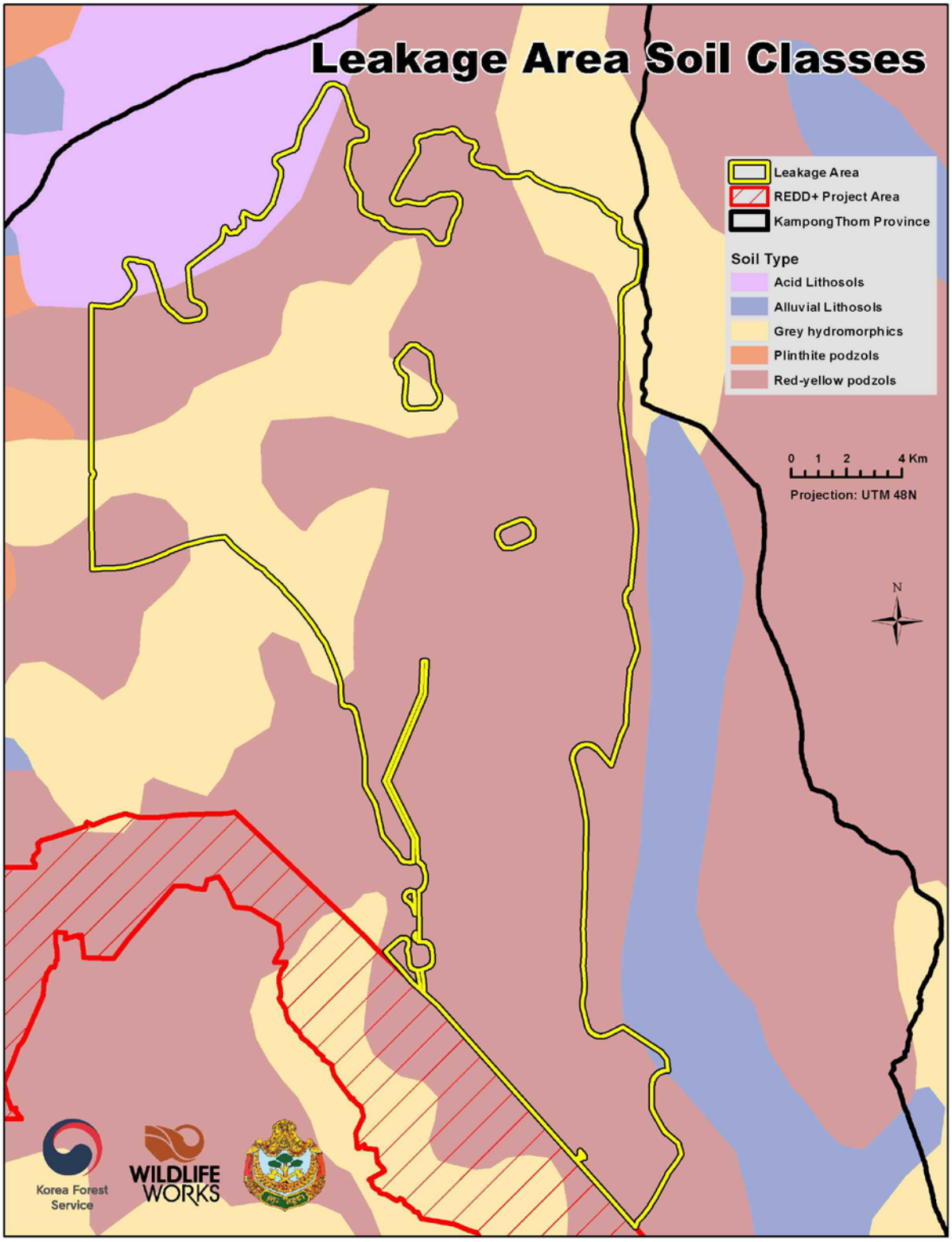
APPENDIX E. Documentation Required for the Leakage Area Selection Criteria

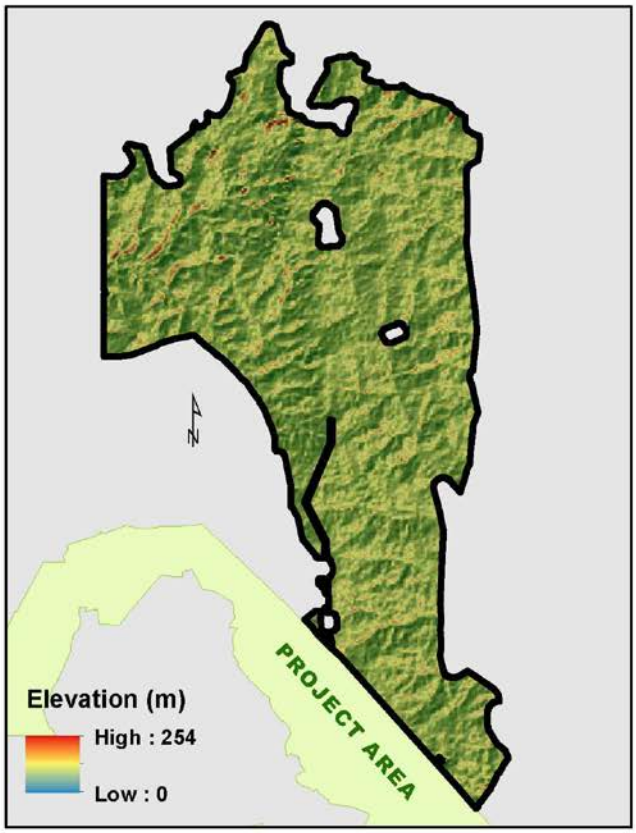



Leakage Area Landuse
WILDLIFE WORKS
Korea Forest Service
Leakage Area
Kampong Thom Province
REDD+ Project Area
Prey Lang Wildlife Sanctuary
Community Forest
Economic Landconcession
Land Tenure Reform Areas
Landcover
Evergreen forest
Deciduous forest
Semi evergreen forest
Other forest
Non Forest
N
0 1 2 4 Km
Projection: UTM 48N


Leakage Area Infrastructure
WILDLIFE WORKS
Korea Forest Service
Villages
Tumring Leakage Area
Roads
REDD+ Project Area
KampongThom Province
0 1 2 4 Km
N
UTM 48N
Boeng
Choam Svay
Sam Aong
bing


Leakage Area Rivers
Villages
Rivers
Leakage Area
KampongThom Province
REDD+ Project Area
N
0
2
4
8 Km
Projection: UTM 48N
Boeng
Choam Svay
Sam Aong
WILDLIFE WORKS
bing


Leakage Area Soil Classes
Leakage Area
REDD+ Project Area
Kampong Thom Province
Soil Type
Acid Lithosols
Alluvial Lithosols
Grey hydromorphics
Plinthite podzols
Red-yellow podzols
0 1 2 4 Km
Projection: UTM 48N
N
Korea Forest Service
WILDLIFE WORKS

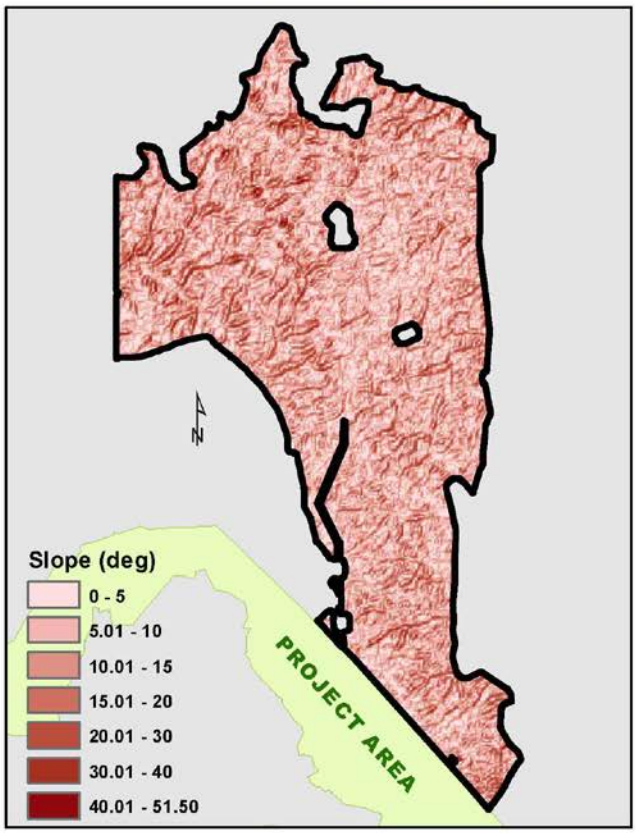


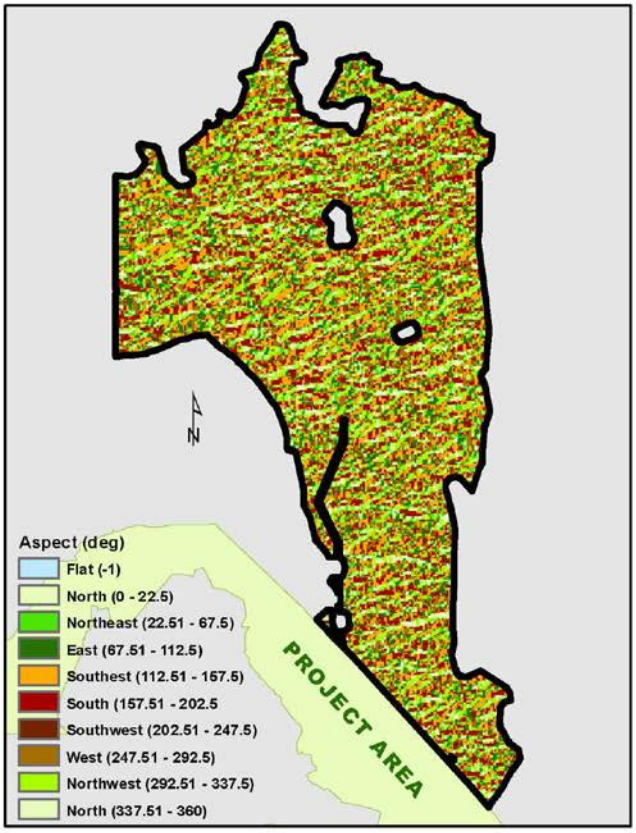
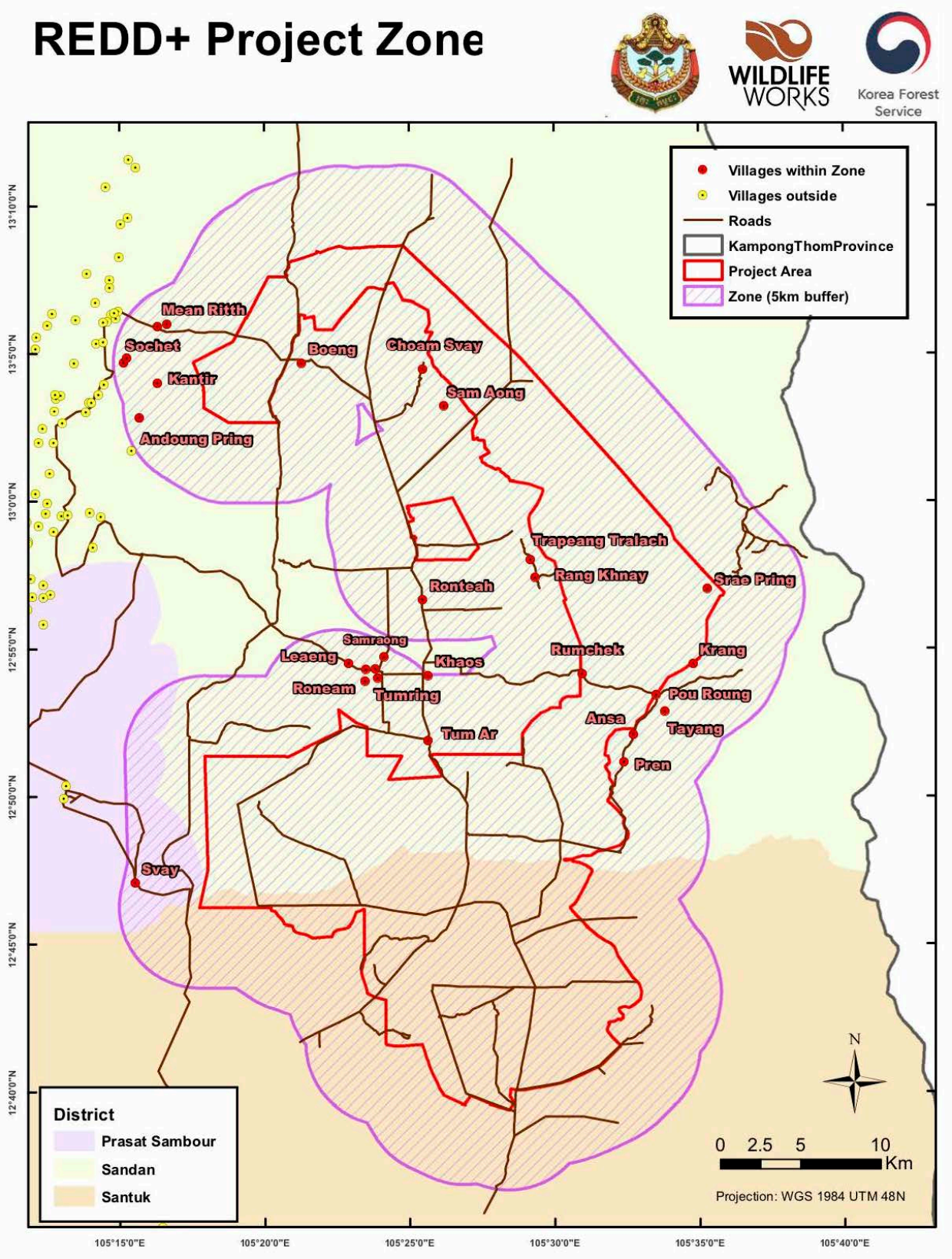
Leakage Area Topography

Leakage Area

0 5 10 20 Km

Projection: UTM 48N
Datum: WGS 1984





APPENDIX F. The Project Zone