

Forest Carbon Partnership Facility (FCPF)

Carbon Fund

Emission Reductions Program Document (ER-PD)

ER Program Name and Country:

**East Kalimantan Jurisdictional Emission Reductions
Program, Indonesia**

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EXECUTIVE SUMMARY

The East Kalimantan Jurisdictional Emission Reductions Program (ER Program) is a globally important project for addressing deforestation and climate change. The ER Program aims to reduce deforestation and forest degradation in an area that covers the entire 12.7 million hectares that comprise the Province of East Kalimantan. Around half of that area is covered by tropical rainforests which are home to a wealth of globally significant biodiversity, and that support indigenous and other local communities. In the ten-year period from 2006 to 2016 around 15% of that forest was lost mainly due to the expansion of oil palm areas, timber plantations and mining. In addition to reducing emissions from deforestation and forest degradation, the ER Program will support improved land governance, improve the livelihoods of local communities, and protect the habitat of numerous vulnerable and endangered species. The ER Program is also an important step toward the establishment of a national REDD+ mechanism in Indonesia, which will provide incentives for protecting one of the world's largest and most biodiverse tropical rainforests.

The ER Program is part of significant efforts by the national and provincial governments to reduce deforestation and degradation, and to set Indonesia and East Kalimantan on a path of green development. Indonesia has committed to a reduction of up to 41% of its greenhouse gas emissions by 2030 with international support, and the country recognizes that a significant share of emission reductions will have to come from reducing deforestation and degradation. GoI and East Kalimantan's Government have launched a number of important reforms including a moratorium on new licenses in primary and peatland forests, policies for more sustainable plantation and forest management, revocation of mining licenses, and improved recognition of the land rights of Indigenous Peoples. The ER Program is an important catalyst for further implementation of reforms and is fully integrated into East Kalimantan's development planning processes.

East Kalimantan's forests are under serious pressure from the expansion of oil palm estates, timber plantations, and mining. The GoI has tracked land cover changes in East Kalimantan over the period 2006 to 2016 to establish a reference level for emission reductions, and the analysis found that more than 1 million hectares of forests were lost over that period. Up to 51% of forest loss was associated with the expansion of oil palm plantations, 14% with timber plantations, 10% with mining, 8% with overlogging and poor concession management, 7% with illegal logging, and 6% with agricultural expansion. Other drivers of deforestation and forest degradation include encroachment, fires, and aquaculture. Besides loss of habitat and other key ecosystem services, deforestation and degradation have led to emissions of CO₂ averaging 62 million tonnes per year.

The ER Program will address deforestation by addressing underlying governance issues through policy reforms, by engaging with oil palm and forestry companies, and by engaging with local communities. The ER program will support a combination of enabling conditions and promotion of sustainable management practices that will directly address the underlying drivers of emissions. The program design considers the distribution of remaining forests, the threats to those forests, and the key stakeholders involved. The program has four main components:

- **Components 1 and 2 address weak land governance and weak forest administration respectively.** Component 1 addresses weakness in the licensing regime, seeks to

accelerate the recognition of indigenous land claims, and addresses conflict over land access. Component 2 strengthens the capacity of the government to protect remaining forests by strengthening Forest Management Units to oversee State Forest Areas, strengthening sustainable development planning at the village level, and strengthening the role of government agencies in supporting sustainable estate crop plantations.

- **Component 3 will support more sustainable management practices of oil palm and forestry companies and will protect remaining High Conservation Value Forests (HCVF) within their licensed areas.** The ER Program will work with key actors to support them in adopting and implementing sustainability approaches, centered around the recently developed HCV and RIL-C policies. In addition, the component will address the underlying drivers of fire through technical assistance for fire prevention and support for Community Based Fire Management and Monitoring Systems.
- **Component 4 addresses deforestation linked to encroachment and agriculture mainly by providing alternative livelihood opportunities.** The component will support the government's social forestry programs, as well as partnerships around conservation areas, and will provide sustainable livelihood opportunities to local communities, including through village development programs.

The ER Program is expected to lead to (gross) emission reductions of 97.1 million tCO₂e over a five-year period (2020-2024). Around half of this is expected to come from reduced deforestation within areas allocated to estate crops. All emission reductions will be registered with the National Registry System which is managed together with the national MRV system by the Climate Change DG of the MoEF. In addition to emission reductions, the Monitoring Measuring and Reporting system will also cover the key non-carbon benefits generated by the program.

The ER Program's benefit-sharing arrangements will address a number of challenges. Benefits need to reach a diverse group of beneficiaries, which includes four levels of government, companies, as well as communities that are often located in remote villages and that may not have official titles to land. The eligibility criteria for beneficiaries have been designed to ensure that all relevant contributors to emission reductions can benefit from the program, with the village governments playing a central role in channeling benefits to local people. Funding from the sale of Emission Reductions will be managed by the Environmental Fund Management Agency (BLU-BPDLH) while key decisions for disbursement at the subnational level will be made by the provincial government. In addition to rewarding performance, the allocation of benefits will take into account investment costs, and a portion of funding will be set aside for rewarding past sustainable practices, such as those of local communities that have sustainably managed forests for generations.

Gol has mainstreamed environmental and social risk mitigation measures into the ER program development. The advanced drafts of a SESA, ESMF, IPPF, RPF, and PF as well as FGRM have been prepared in line with the World Bank's safeguards policy requirements. Using the available information and consensus generated through the SESA and earlier safeguards processes, MoEF in close collaboration with the East Kalimantan Government has developed an ESMF to manage environmental and social risks under the ER Program. The safeguards instruments, supported with analytical processes through the SESA, are expected to enhance the existing country systems for the management of environmental and social aspects of the ER Program.

The ER program will be implemented by the Provincial Government with the guidance of the Ministry of Environment and Forestry. The overall cost of the program is expected to be USD 90.7 million. Funding will come mainly from government sources (74.5%), with the remainder coming from the private sector (21.7%) and development partners (3.8%). It is expected that the ER Program will generate USD 110 million in performance-based payments through the sale of Emission Reductions to the Carbon Fund.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
TABLE OF CONTENTS	5
LIST OF ACRONYMS/ABBREVIATIONS.....	10
LIST OF FIGURES	15
LIST OF TABLES	17
1 ENTITIES RESPONSIBLE FOR THE MANAGEMENT AND IMPLEMENTATION OF THE PROPOSED ER PROGRAM.....	22
1.1 ER Program Entity that is expected to sign the Emission Reduction Payment Agreement (ERPA) with the FCPF Carbon Fund.....	22
1.2 Organizations responsible for managing the proposed ER Program	22
1.3 Partner agencies and organizations involved in the ER Program	23
2 STRATEGIC CONTEXT AND RATIONALE FOR THE ER PROGRAM.....	31
2.1 Current status of the Readiness Package and summary of additional achievements of readiness activities in the country.....	31
2.2 Ambition and strategic rationale for the ER Program	43
2.3 Political Commitment.....	44
2.3.1 Political commitment to REDD+ and the ER Program at the national level	44
2.3.2 Political commitment to REDD+ and the ER Program in East Kalimantan	45
3 EMISSION REDUCTION PROGRAM LOCATION	46
3.1 Accounting Area of the ER Program	46
3.2 Environmental and social conditions in the Accounting Area of the ER Program	51
3.2.1 Natural Forest type	51
3.2.2 Climatic conditions	52
3.2.3 Forest Fire	52
3.2.4 Soil and topography.....	53
3.2.5 Rare and Endangered Species and their habitat within the ER Accounting Area ...	54
3.2.6 Demography, Livelihood and Socio-cultural diversity	57
4 DESCRIPTION OF ACTIONS AND INTERVENTIONS TO BE IMPLEMENTED UNDER THE PROPOSED ER PROGRAM.	59
4.1 Analysis of drivers and underlying causes of deforestation and forest degradation, and existing activities that can lead to conservation or enhancement of forest carbon stocks	59
4.1.1 Analysis of drivers of deforestation and forest degradation.....	59
4.1.2 Underlying causes of deforestation and forest degradation.....	69
4.1.3 Underlying drivers of deforestation within licensed areas.....	71
4.1.4 Underlying drivers of deforestation linked to local communities	72

4.1.5	Underlying drivers of land and forest fires	72
4.1.6	Existing activities and policies that can lead to conservation or enhancement of forest carbon stocks.....	74
4.2	Assessment of the major barriers to REDD+	77
4.3	Description and justification of the planned actions and interventions under the ER Program that will lead to emission reductions and/or removals.....	78
4.3.1	Description and Justification of Key Activities	78
4.4	Assessment of land and resource tenure in the Accounting Area	93
4.4.1	Introduction	93
4.4.2	Range of land and resource tenure rights	93
4.4.3	The legal status of land and resource tenure rights, and weaknesses in the legal framework	101
4.5	Analysis of laws, statutes and other regulatory frameworks	114
5	STAKEHOLDER CONSULTATION, AND PARTICIPATION	116
5.1	Description of stakeholder consultation process	116
5.2	Summary of the comments received and how these views have been taken into account in the design and implementation of the ER Program.....	119
5.3	Consultations as part of ERP implementation.....	121
6	OPERATIONAL AND FINANCIAL PLANNING	123
6.1	Institutional and implementation arrangements	123
6.2	EER Program Budget.....	129
6.2.1	ER Program Costs.....	129
6.2.2	Financing strategy.....	132
7	CARBON POOLS, SOURCES AND SINKS	135
7.1	Description of Sources and Sinks Selected	135
7.2	Description of Carbon Pools and greenhouse gases selected	137
8	REFERENCE LEVEL	139
8.1	Reference Period	139
8.2	Forest definition used in the construction of the Reference Level	139
8.3	Average annual historical emissions over the Reference Period.....	143
8.3.1	Description of method used for calculating the average annual historical emissions over the Reference Period.....	143
8.4	Activity Data.....	146
8.4.1	Land Cover mapping	147
8.4.2	Activity Data for deforestation and degradation from observed land cover change	147
8.4.3	Activity Data for additional forest degradation in secondary forest from fire.....	160
8.4.4	Activity Data for peat burn areas in secondary forest.....	162

8.4.5	Activity Data for logging area	164
8.5	Emission Factors.....	166
8.5.1	Emission Factors from deforestation and degradation from change in land use/land cover class.....	166
8.5.2	Emission factors from fire in secondary forest.....	173
8.5.3	Emission Factors from Peat fires	174
8.5.4	Emission Factors from waste and damage associated with logging	176
8.5.5	Emission Factors from soil	178
8.5.6	Calculation of the Average Annual Historical emission over Reference Periods ..	183
8.5.7	Estimated Reference Emission Level	195
8.6	Upward or downward adjustments to the average annual historical emissions over the reference period	198
8.7	Estimated Reference Emission Level.....	201
8.8	Relation between the Reference Level, the development of a FREL/FRL for the UNFCCC and the country's existing or emerging greenhouse gas inventory.....	202
9	APPROACH FOR MEASUREMENT, MONITORING AND REPORTING	203
9.1	Measurement, monitoring and reporting approach for estimating emissions occurring under the ER Program within the Accounting Area.....	203
9.1.1	Method for monitoring activity data and emission factors.....	203
9.1.2	Parameters to be monitored	204
9.2	Organizational structure for measurement, monitoring and reporting	218
9.2.1	Organizational Structure for measurement, monitoring and reporting of emissions from logging activities.....	221
9.2.2	Organizational Structure for measurement, monitoring and reporting of emissions from peat and forest fires.....	221
9.3	Relation and consistency with the National Forest Monitoring System	222
10	Displacement.....	223
10.1	Identification of risk of Displacement	223
10.2	ER Program design features to prevent and minimize potential Displacement	224
11	REVERSALS.....	227
11.1	Identification of risk of Reversals	227
11.2	ER Program design features to prevent and mitigate Reversals.....	229
11.3	Reversal management mechanism.....	233
11.3.1	Selection of Reversal management mechanism.....	233
11.4	Monitoring and reporting of major emissions that could lead to Reversals of ERs	234
12	UNCERTAINTIES OF THE CALCULATION OF EMISSION REDUCTIONS.....	235
12.1	Identification of sources of uncertainty of AD.....	235

12.2	Steps to minimize uncertainty	237
12.3	Identification of sources of uncertainty of EF	238
12.4	Quantification of Uncertainty in the Reference Emission Level	240
13	Calculation of Emission Reductions.....	244
13.1	Ex-ante estimation of the Emission Reductions.....	244
14	SAFEGUARDS	251
14.1	Description of how the ER Program meets the World Bank environmental and social safeguards (WB-SESA) and promotes and supports the safeguards included in UNFCCC guidance related to REDD+	251
14.1.1	Indonesia's REDD+ Safeguards processes	251
14.2	Environmental and social risks and impacts, and mitigation measures	268
14.2.1	The World Bank Safeguards Policies and their Relevance to the ERP	268
14.2.2	Analysis of Potential Environmental and Social Risks and mitigation measures... ..	283
14.3	Description of arrangements to provide information on safeguards during ER Program implementation.....	297
14.3.1	The development of the Safeguards Information System (SIS) and its application to the ER Program	297
14.3.2	Safeguards Information System (SIS) REDD+ as a Form of Gol's Commitments for Promoting Transparency and Effectiveness	300
14.3.3	Institutional and legal mandate.....	304
14.3.4	Capacity building on SIS-REDD+	304
14.4	Description of the Feedback and Grievance Redress Mechanism (FGRM) in place and possible actions to improve it.....	305
14.4.1	Existing FGRM Processes under ERP	308
14.4.2	Relevant Regulatory Frameworks for FGRM under the Social and Environmental Management	311
14.4.3	REDD+ Environmental and Social Conflict Resolution	314
14.4.4	REDD+ Environmental and Social Conflict Resolution	315
15	BENEFIT-SHARING ARRANGEMENTS	316
15.1	Description of benefit-sharing arrangements.....	316
15.1.1	Categories of potential Beneficiaries, eligibility and the types and scale of potential Monetary and Non-Monetary Benefits	316
15.1.2	Criteria, process and timelines for the distribution of Monetary and Non-Monetary Benefits	325
15.1.3	Monitoring provisions.....	327
15.2	Summary of the process of designing the benefit-sharing arrangements	328
15.3	Description of the legal context of the benefit-sharing arrangements	329
16	Non-carbon benefits	332
16.1	Outline of potential Non-Carbon Benefits and identification of Priority Non-Carbon	

	Benefits	332
16.2	Approach for providing information on Priority Non-Carbon Benefits	337
17	TITLE TO EMISSION REDUCTIONS.....	338
17.1	Authorization of the ER Program	338
17.2	Transfer of Title to ERs	339
18	DATA MANAGEMENT AND REGISTRY SYSTEMS	344
18.1	Participation under other GHG initiatives.....	344
18.2	Data management and Registry systems to avoid multiple claims to ERs.....	344
	REFERENCES	348
	ANNEXES	357

LIST OF ACRONYMS/ABBREVIATIONS

AMAN	Indigenous Peoples Alliance of the Archipelago (<i>Aliansi Masyarakat Adat Nusantara</i>)
APBD	Regional Revenue and Expenditure Budget (<i>Anggaran Pendapatan Belanja Daerah</i>)
APBN	National Revenue and Expenditure Budget (<i>Anggaran Pendapatan Belanja Nasional</i>)
APHI	Indonesian Forest Concessionaires Association (<i>Asosiasi Pengusaha Hutan Indonesia</i>)
APL	Areal Penggunaan Lain (land for other purposes)
BAPPEDA	Regional Development Planning Agency (<i>Badan Perencanaan Pembangunan Daerah</i>)
Bappenas	National Development Planning Agency (<i>Badan Perencanaan Pembangunan Nasional</i>)
BAU	Business As Usual
BFCP	The Berau Forest Carbon Program
BLU	Public Service Agency (<i>Badan Layanan Umum</i>)
BLU-BPDLH	Environmental Fund Management Agency
BMZ	German Federal Ministry for Economic Cooperation and Development
BRG	Peat Restoration Agency (<i>Badan Restorasi Gambut</i>)
BRWA	Customary Land Registration Agency (<i>Badan Registrasi Wilayah Adat</i>)
CBFM	Community–Based Forest Management
CF	Carbon Fund
CIFOR	Center for International Forestry Research
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Conference of the Parties to the 1992 United Nations Framework Convention on Climate Change (UNFCCC)
CSO	Civil Society Organization
CSR	Corporate Social Responsibility
DBH	Diameter at Breast Height
DG of CC	Directorate General of Climate Change

DDPI	Regional Council for Climate Change – East Kalimantan (<i>Dewan Daerah Perubahan Iklim – Kalimantan Timur</i>)
DPRD	Regional House of Representative (<i>Dewan Perwakilan Rakyat Daerah</i>)
ER	Emission Reduction
ERT	Emission Reduction Target
ERPIN	Emission Reduction Program Idea Note
ERPD	Emission Reduction Program Document
ERPA	Emission Reduction Payment Agreement
ESMF	Environmental and Social Management Framework
FCPF	Forest Carbon Partnership Facility
FCPF FMT	FCPF Facility Management Team
FGD	Focus Group Discussion
FGRM	Feedback and Grievance Redress Mechanism
FIP	Forest Investment Program
FLEGT	Forest Law Enforcement Governance and Trade
FMU	Forest Management Unit
FORCLIME	Forests and Climate Change Program
FOERDIA	Forestry and Environmental Research Development and Innovation Agency
FPIC	Free and Prior Informed Consent
FREL	Forest Reference Emission Level
FRL	Forest Reference Level
FSC	Forest Stewardship Council
GCF	Governors’ Climate Forest Task Force
GGGI	Global Green Growth Institute
GLAFOLU	Guidelines Agriculture, Forestry and Other Land Use
GoI	Government of Indonesia
GPG	Good Practice Guidance
GHG	Greenhouse Gas
HCV	High Conservation Values
HCVF	High Conservation Value Forest
HD	Village Forest (<i>Hutan Desa</i>)
HKm	Community Forest (<i>Hutan Kemasyarakatan</i>)

HL	Protection Forest (<i>Hutan Lindung</i>)
HOB	Heart of Borneo
HP	Production Forest (<i>Hutan Produksi</i>)
HPH	Logging Concession
HPT	Limited Production Forest (<i>Hutan Produksi Terbatas</i>)
HTI	Industrial Timber Plantation (<i>Hutan Tanaman Industri</i>)
HTR	Community Plantation Forest (<i>Hutan Tanaman Rakyat</i>)
ICRAF	The International Centre for Research in Agroforestry - World Agroforestry Center
IPCC	Intergovernmental Panel on Climate Change
ISPO	Indonesian Sustainable Palm Oil
IUCN	International Union for Conservation of Nature
IUPHHKHA	Business Permit for Timber Forest Product Utilization – Natural Forest (<i>Izin Usaha Pemanfaatan Hasil Hutan Kayu – Hutan Alam</i>)
IUPHHKHT	Business Permit for Utilization of Forest Plantation Timber (<i>Izin Usaha Pemanfaatan Hasil Hutan Kayu Pada Hutan Tanaman</i>)
IUPHHKHTR	Utilization License Forest Products from Community Forest Plantation (<i>Izin Usaha Pemanfaatan Hasil Hutan Kayu pada Hutan Tanaman Rakyat</i>)
IUPHHKRE	Product Utilization License Timber Forest Ecosystem Restoration (<i>Izin Usaha Pemanfaatan Hasil Hutan Kayu Restorasi Ekosistem</i>)
KALTIM	East Kalimantan (<i>Kalimantan Timur</i>)
KPH	Forest Management Units (<i>Kesatuan Pemangkuan Hutan</i>)
KPK	Anti-Corruption Commission (<i>Komisi Pemberantasan Korupsi</i>)
NGO	Non-Government Organization
LoI	Letter of Intent
MoEF	Ministry of Environment and Forestry
MoHA	Ministry of Home Affairs
MoU	Memorandum of Understanding
MMR	Measurement Monitoring Reporting
MRV	Measurement Reporting and Verification
NAMA	National Appropriate Mitigation Actions
NDC	Nationally Determined Contribution

NFI	National Forest Inventory System
NFMS	National Forest Monitoring System
NGO	Non-Government Organization (<i>Lembaga Swadaya Masyarakat</i>)
NTFP	Non-Timber Forest Product
OPD	Provincial Government Organization (<i>Organisasi Pemerintah Daerah</i>)
P3SEKPI	Centre for Research and Development on Socio-Economic, Policy and Climate Change (<i>Pusat Penelitian dan Pengembangan Sosial, Ekonomi, Kebijakan dan Perubahan Iklim</i>)
PERPRES	Presidential Regulation (<i>Peraturan Presiden</i>)
PES	Payments for Environmental Services
PP	Government Regulation (<i>Peraturan Pemerintah</i>)
PRISAI	Principles, Criteria and Indicators for REDD+ Safeguards in Indonesia (<i>Prinsip, Kriteria, Indikator, Safeguards Indonesia</i>)
PSP	Permanent Sample Plot
Puspijak	Center for Research and Development and Climate Change Policy (<i>Pusat Penelitian Perubahan Iklim dan Kebijakan</i>)
RAD GRK	Regional Action Plans to Reduce Greenhouse Gases (<i>Rencana Aksi Daerah Penurunan Emisi Gas Rumah Kaca</i>)
RAN GRK	National Action Plan to Reduce Greenhouse Gases Emissions (<i>Rencana Aksi Nasional Penurunan Emisi Gas Rumah Kaca</i>)
REDD+	Reducing Emissions from Deforestation and Forest Degradation
REL	Reference Emission Level
RIL	Reduced Impact Logging
RKTN	National Forestry Plan (<i>Rencana Kehutanan Tingkat Nasional</i>)
RPJMD	Provincial Mid Term Development Plan (<i>Rencana Pembangunan Jangka Menengah Daerah</i>)
RSPO	Roundtable for Sustainable Palm Oil
RTRW	Regional Spatial Plans (<i>Rencana Tata Ruang Wilayah</i>)
SEKDA	Provincial Secretary (<i>Sekretaris Daerah</i>)
SESA	Strategic Environmental and Social Assessment
S-G	Secretary General
SIS REDD+	Safeguards Information System for REDD+

SRAP – REDD	Strategy and Action Plans at Provincial Level - REDD (<i>Strategi Rencana Aksi Provinsi - REDD</i>)
SKPD	Regional and Local Government Agencies (<i>Satuan Kerja Perangkat Daerah</i>)
SRN-PPI	National System Registry of the Climate Change DG of the MoEF
SIGN-SMART	National GHG (Greenhouse Gas) Information System of the Climate Change DG of the MoEF
SVLK	Timber Legality Verification Standard (<i>Sistem Verifikasi dan Legalitas Kayu</i>)
TBI	The Borneo Initiative
TFCA II	Tropical Forest Conservation Act
TNC	The Nature Conservancy
TSP	Temporary Sample Plots
UNFCCC	United Nations Framework Convention on Climate Change
UU	Constitution (<i>Undang-Undang</i>)
WWF	World Wildlife Fund

LIST OF FIGURES

Figure 2.1 REDD+ Readiness Package Indonesia.....	34
Figure 3.1 Map of East Kalimantan Province in Indonesia.....	46
Figure 3.2. Administrative boundaries of East Kalimantan.....	47
Figure 3.3. Map of accounting area for ER program.....	48
Figure 3.4. Land type based on its function in East Kalimantan (Ministry Decree No.278/2017)	49
Figure 3.5. The distribution of concessions in East Kalimantan.....	51
Figure 3.6 Peatland in East Kalimantan.....	53
Figure 3.7. Protected Wildlife Distribution Map in East Kalimantan	57
Figure 4.1 Estate crop area in East Kalimantan, 2012-2016 (ha).....	63
Figure 4.2 International coal prices (USD/MT) 2009 to 2018, Source: tradingeconomics.com .	67
Figure 4.3 Deforestation due to fire, 2006-2016 (ha).....	69
Figure 4.4 Gazettement of East Kalimantan's State Forest Area, 2018	104
Figure 4.5 Process of Recognition of Communal Land Rights and Adat Forests	106
Figure 6.1 Institutional arrangement of ER Program at National Level.....	125
Figure 6.2 Institutional arrangements of ER Program at Provincial Level	127
Figure 6.3.....	Error! Bookmark not defined.
Figure 6.4 Institutional arrangements of ER Program at District/City Level.....	128
Figure 6.5 Financing sources for the ER-P implementation.....	133
Figure 8.1 Conceptual diagram of the different components of emissions sources	146
Figure 8.2 Flow chart for calculation of emissions from deforestation and forest degradation	151

Figure 8.3 Method for estimating burnt area from hotspot data (MoEF, 2016)	163
Figure 8.4 The design of permanent sample plot (PSP) in East Kalimantan	168
Figure 8.5 Flow chart for calculation of emissions from peat decomposition	179
Figure 8.6 . Relationship between total burnt area and emission from fire of the secondary forest, used to estimate emissions for years without forest cover map data.	192
Figure 8.7 Estimated average annual CO2 emission from deforestation and forest degradation during the reference period (2006-2016)	195
Figure 8.8 Estimated annual CO2 emission from deforestation and forest degradation by source of emission during the reference period (2006-2016).....	196
Figure 8.9 Projected emission from peat decomposition to 2025 taking into account the inherited emission.....	200
Figure 9.1 Organizational Structure for measurement, monitoring and reporting of the implementation of ER Program	218
Figure 9.2 Related institutions on NFMS management (MoEF, 2017)	219
Figure 9.3 Figure 9.3 Mobile application for ER entities for supporting the MRV activities	221
Figure 12.1 Results of Monte Carlo Simulation for the Emission of 2016	244
Figure 12.2 Historical emission and uncertainty of REDD activities	244
Figure 12.3 Historical emission and uncertainty of REDD activities	Error! Bookmark not defined.
Figure 14.1 Safeguards Implementation Flow chart.....	266
Figure 14.2. Institutional structure and information flow in SIS-REDD+	302
Figure 14.3. ERP FGRM Processes (source: MoEF)	310
Figure 18.1 National Registry System for Climate Change (SRN-PPI) Workflow	345

LIST OF TABLES

Table 2.1 Strategies and timeline for addressing the remaining gaps in Indonesia's REDD+ Framework	36
Table 3.1 Concessions in East Kalimantan	50
Table 3.2. Natural forests in East Kalimantan, 2016	52
Table 3.3. Percentage of Area by Regency/Municipality and Altitude Class from Ocean in East Kalimantan Province (Percent), 2016	54
Table 3.4. Ethnic groups in East Kalimantan as of 2010	58
Table 4.1 Current land cover of area deforested since 2006.....	59
Table 4.2. Current land use designations of shrub area that was forested in 2006 and inferred drivers of deforestation	Error! Bookmark not defined.
Table 4.3. Current land-use designations of bare land area that was forested in 2006 and inferred drivers of deforestation	61
Table 4.4. Estimated share of deforestation, by driver	62
Table 4.5. Estimated area of deforestation outside forestry concessions and estate crop areas 2006-2016	65
Table 4.6. Land cover burned, 2006-2016 (ha)	69
Table 4.7. Unlicensed land uses and associated deforestation	70
Table 4.8. Drivers and underlying drivers of deforestation and forest degradation	73
Table 4.9. Donor/Bilateral/Partners Projects' Core Activities in East Kalimantan.....	77
Table 4.10. Overall summary of how the ER activities respond to the underlying drivers of deforestation and forest degradation	79
Table 4.11. Project Management and Monitoring.....	90
Table 4.12. Forest Management Units in East Kalimantan.....	95
Table 4.13. State Forest Area zones in East Kalimantan Province (2017)	97

Table 4.14. Forestry concessions within the Production Forest zone	99
Table 4.15. Distribution of Social Forestry Schemes in East Kalimantan (ha).....	100
Table 4.16. Forest Cover in the State Forest Area and Non-Forest Area in East Kalimantan Province (2017)	103
Table 4.17. Adat Communities registered by BRWA in East Kalimantan.....	107
Table 4.18. Distribution of mining areas in East Kalimantan by Land Use Zone before Revocation (ha)	109
Table 4.19. Key regulations and documents impacting forest tenure.....	110
Table 4.20. Initial identification of customary land in East Kalimantan	113
Table 5.1 Consultations on the National REDD+ Framework	117
Table 5.2 Summary of the stakeholder consultation process for ERPD development	119
Table 5.3 Integration of issues raised by stakeholders.....	119
Table 6.1. National agencies involved in the implementation of the ER Program	124
Table 6.2.Sub-National Agencies and Organizations involved in the Implementation of the ER Program.....	125
Table 6.3 The estimated total ER Program cost 2020 – 2025	129
Table 6.4. Estimated total ER Program cost by Land Use/Driver 2020-2025	130
Table 6.5. Summary of the total ER-Program costs (expected uses of funds).....	131
Table 7.1 Sources and Sinks Selected	135
Table 7.2 Carbon Pools.....	137
Table 8.1 Characterization of natural forests in Indonesia used in national land cover mapping.	140
Table 8.2 Description and explanation of emission sources.....	144

Table 8.3 Detailed reporting of area (ha) of deforestation (forest class to nonforest class) from 2006-2016 before sample based estimation.	149
Table 8.4 Area (ha) of deforestation (forest class to nonforest class) from 2006-2016 after sample based estimation.	Error! Bookmark not defined.
Table 8.5 Area (ha) of forest degradation (primary forest class to secondary forest class) from 2006-2016 before sample based estimation	150
Table 8.6 Area (ha) of forest degradation (primary forest class to secondary forest class) from 2006-2016 after sample based estimation	150
Table 8.7 Activity data used for the estimation of emission from deforestation and degradation	152
Table 8.8 Number of Permanent Sampling Plots by forest type established in 2016–2018 along with maximum D and number of species observed.	167
Table 8.9 Summary of attributes of biomass equations from published papers.....	168
Table 8.10 Emission factors used for the estimation of emission from deforestation and degradation.....	170
Table 8.11 Emission factors used for the estimation of emission from fire in secondary forest	174
Table 8.12 Emission factors used for the estimation of emission from peat fire	175
Table 8.13 Emission factors used for the estimation of emission from waste and damage associated with logging.....	176
Table 8.14 Emission factors used for the estimation of emission from peat decomposition ..	179
Table 8.15 Emission factors used for the estimation of emission from mangrove soil.....	182
Table 8.16 Matrix of CO ₂ emission from deforestation due to loss of above living biomass in the period 2014-2015.....	185
Table 8.17 The estimated of emission from peat decomposition of the deforested area during the reference period. Black figures are emissions in the year of land cover change, red emissions are later year inherited emissions for the same land.	187
Table 8.18 The average historical emission from deforestation (tonnes CO ₂ e)	190

Table 8.19 Land cover transition matrix 2006-2009 on peat.....	192
Table 8.20 CO ₂ emission of peat decomposition in the secondary peat forests in the period 2006-2009	193
Table 8.21 The average historical emission from forest degradation (ton CO ₂ e).....	194
Table 8.22 Estimated historical emission from deforestation and forest degradation during the reference period	197
Table 8.23 Estimated Reference Emission Level	201
Table 9.1 Timeline of land cover change analysis under the current NFMS.....	220
Table 12.1 Source of uncertainty of Activity Data	236
Table 12.2 Source of uncertainty of Emission Factors (EF)	238
Table 12.3 Result of uncertainty of land cover change 2006-2016 using the Olofsson et al. method.....	240
Table 13.1. Breakdown of reference level emissions for the ERPA Period (tCO ₂ e)	245
Table 13.2. Ex-ante estimation of the ERs expected from reduced deforestation (tCO ₂ e)	246
Table 13.3. Ex-ante estimation of the ERs expected from the ER Program addressing primary forest degradation	247
Table 13.4. Ex-ante estimation of the ERs expected from the ER Program addressing peat decomposition	247
Table 13.5. Ex-ante estimation of the ERs expected from the ER Program addressing mangrove loss	248
Table 13.6. Ex-ante estimation of the ERs expected from the ER Program addressing unsustainable logging	248
Table 13.7. Ex-ante estimation of the ERs expected from the ER Program addressing fire	249
Table 13.8.Total expected gross Emission Reductions (tCO ₂ e).....	250
Table 13.9. Total expected net Emission Reductions (tCO ₂ e).....	250

Table 14.1. Overview of instrument relevance and coverage of safeguards against Cancun safeguards	255
Table 14.2. Matrix of important issues in East Kalimantan with Principles and Criteria of each SG initiatives	257
Table 14.3. SESA and ESMF Process	258
Table 14.4. Compatibility Analysis between Existing Indonesia Safeguards (Including relevant regulatory frameworks) with the World Bank Safeguards Policies	259
Table 14.5. Milestones for SESA and ESMF	267
Table 14.6. The WB Criteria on Indigenous People (IP) and GoI's Conformity	270
Table 14.7. Options for Land Tenure Settlements within the Forest Estates	277
Table 14.8. Matrix Summary of Environmental and Social Impacts, Mitigation Actions, and the corresponding activity and OP/BP	290
Table 14.9. Capacity building needs for SESA	295
Table 14.10. Summary of stakeholder consultations in East Kalimantan	306
Table 14.11. Initial analysis of the relevant regulatory frameworks of KLHS, AMDAL and GAKKUM	312
Table 15.1 Categories of beneficiaries	317
Table 15.2 Types of benefits	320

1 ENTITIES RESPONSIBLE FOR THE MANAGEMENT AND IMPLEMENTATION OF THE PROPOSED ER PROGRAM

1.1 ER Program Entity that is expected to sign the Emission Reduction Payment Agreement (ERPA) with the FCPF Carbon Fund

Name of entity	Ministry of Environment and Forestry
Main contact person	Dr. Bambang Hendroyono
Title	Secretary General
Address	Gedung Manggala Wanabakti, Jl. Jenderal Gatot Subroto, Jakarta (12070)
Telephone	+62 21 5730191
Email	Banghen_11@yahoo.co.id
Website	http://menlhk.go.id

1.2 Organizations responsible for managing the proposed ER Program

Name of entity	Ministry of Environment and Forestry
Type and description of organization	The MoEF is a line agency of the Republic of Indonesia. It has responsibility under Law 41 of 1999 to sustainably manage the forests and forest resources of the Republic of Indonesia. The Secretariat General of the Ministry of Environment and Forestry (S-G MoEF) coordinates the implementation and provision of supporting administration to activities from all directorates within MoEF. The S-G MoEF also has a role in coordinating the ER Program as it is implemented through the other Directorates-General.
Main contact person	Dr. Bambang Hendroyono
Title	Secretary General
Address	Gedung Manggala Wanabakti, Jl. Jenderal Gatot Subroto, Jakarta 12070
Telephone	+62 21 5730191
Email	Banghen_11@yahoo.co.id

Website	http://menlhk.go.id
Name of organization	Provincial Secretary of East Kalimantan
Type and description of organization	The Provincial Secretary is the Head of the Civil Service of the Province and has authority under the Governor and the DPRD (Regional House of Representation) to direct and coordinate the Agencies and Services within the Provincial Government.
Organizational or contractual relation between the organization and the ER Program Entity identified in 1.1 above	The Provincial Secretary heads the administrative arm of the Provincial Government. An MoU between the MoEF and the Governor will be used to define the cooperative relationship between the national and the sub-national entities engaged in implementing the FCPF ER Program.
Main contact person	Dr. Hj. Meiliana, SE., MM.
Title	Acting Provincial Secretary of East Kalimantan
Address	Jalan Gajah Mada No. 1, Samarinda
Telephone	+62541 733333
Email	humas@kaltimprov.go.id ; kaltimprov@gmail.com
Website	http://www.kaltimprov.go.id

1.3 Partner agencies and organizations involved in the ER Program

Central Government Agencies		
Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
<i>Ministry of Environment and Forestry:</i>		
<i>Secretariat General</i>	Ir. Bambang Hendroyono, MM; Secretary General Banghen_11@yahoo.co.id	To coordinate the implementation of tasks, and provide guidance and administrative support to all elements of the organization within MoEF; and also to represent the Minister for formal

Central Government Agencies		
Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
		submission of the ERPD on behalf of the Government of Indonesia to the World Bank.
<i>Directorate General of Climate Change</i>	Dr. Ir. Ruandha Agung Sugardiman, M.Sc (DG of Climate Change) ra.sugardiman@gmail.com	To provide guidance to East Kalimantan in addressing climate change particularly in the implementation of mitigation, monitoring, reporting and verification of climate change mitigation actions and forest and land fire control.
<i>Forestry and Environment Research, Development and Innovation Agency (FOERDIA) c.q. Center for Research and Development on Socio-Economics, Policy and Climate Change (P3SEKPI)</i>	Dr. Agus Justianto, MSc. (DG of FOERDIA) ajustianto@gmail.com Dr. Ir. Syaiful Anwar, M.Sc. (Director of P3SEKPI) Telp. +62 251 8633944 Fax. +62 251 8634924 syaifula09@gmail.com	To provide technical support to the East Kalimantan Provincial Government through research and innovation in relation to the ER Program at the Provincial Level. P3SEKPI focuses on social development, economy, policy, and climate change. It plays a key role in liaising, communication and coordination between the Provincial Secretary of East Kalimantan and S-G MoEF and in communication with the Facility Management Team (FMT) regarding the methodological framework and the preparation of the ER Program.
<i>Directorate General of Forestry Planning and Environmental Management</i>	Prof. Dr. Ir. Sigit Hardwinarto, M.Agr; shardwinarto@yahoo.com 08111588708	To oversee forestry planning, development of FMUs, and the provision of areas for the use of communities living near the forest.

Central Government Agencies		
Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
<i>National Development Planning Agency (Bappenas)</i>	Ir. Wahyuningsih Darajati, MSc, Director of Forestry and Water Resources +6221 392 6254 ext. 2209 ningsih@bappenas.go.id	To formulate and synergize the proposed budget for development of forestry management units (FMU) at the provincial level
<i>Ministry of Finance:</i>		
<i>Directorate General of Financing and Risk Management</i>	Suminto., Director of Loan and Grant Gedung Frans Seda, Lantai 6 Jl. Wahidin Raya No. 1, Jakarta Indonesia 10710 Phone. (6221) 3459616	To provide direction with regard to transfer of ERPA funding
<i>Directorate General of Fiscal Balance</i>	Putut Hari Satyaka Director of Financing and Regional Capacity putut.satyaka@gmail.com Gedung Frans Seda, Lantai 6 Jl. Wahidin Raya No. 1, JakartaIndonesia 10710 Phone. (6221) 3459616	To provide direction with regard to the mechanism of financing of Emission Reductions activities
<i>Fiscal Policy Agency (Badan Kebijakan Fiskal)</i>	Parjiono S.E., MPP. ; Head of Climate Change Policy and Multilateral Financing Gedung RM Notohamiprodjo Lantai 5, Jalan Wahidin Raya No. 1 Jakarta	To provide fiscal policy recommendations related to climate change mitigation including REDD+
<i>Directorate General of Regional Finance Development, Ministry of Home Affairs</i>	Dr. Mochamad Ardian Noervianto, M.Si., Director of Facilitation of Balance Fund	To provide direction to regional governments related to the administration and

Central Government Agencies		
Name of partner	Contact name, telephone and email	Core capacity and role in the ER Program
		operation of the balance fund at the regional level
Province and District Government Agencies		
Name of Partner	Contact name, telephone and email	Key capacity and role in the proposed ER Program
Development Planning Agency (BAPPEDA) of East Kalimantan Province	Dr. Ir. H. Zairin Zain, M.Si (Head) +62 541 741044; humasbappedakaltim@gmail.com	To coordinate development activities in East Kalimantan Province, including efforts to reduce emissions
Forestry Office of East Kalimantan Province	Ir. Amrullah, MM; Head of Provincial Forestry Service (0541) 733621, Fax. 744917 http://dishut.kaltimprov.go.id/	To oversee forestry programs at the provincial level, including the development of FMUs
Environment Agency of East Kalimantan Province	Ir. Nursigit; Head of Provincial Environment Agency (0541) 732443 https://www.dinaslh.kaltimprov.go.id/	To conduct monitoring and reporting of emission reduction efforts in East Kalimantan Province
Marine and Fishery Service of East Kalimantan	Ir. Riza Indra Riadi, MSi; Head of Provincial Marine and Fishery Service (0541) 7779423, 760304, Fax. 7779424, 760303	To provide support and monitoring for the development of sustainable fishery activities
Plantation Office of East Kalimantan Province	Ir. Ujang Rachmad, M.Si; Head of Provincial Estate Crops (0541) 736852 http://disbun.kaltimprov.go.id/	To support ER activities related to estate crops

Mining and Energy Office of East Kalimantan Province	Ir. H. Wahyu Widhi Heranata, MP , diditdayak@gmail.com	To support ER activities related to mining
BAPPEDA of Berau District	Ir. M. Gazali, S.IP.MM; Head of BAPPEDA Berau District	To coordinate regional development activities, including efforts to reduce emissions at the district/city level
BAPPEDA of Kutai Barat	Ir.H. Achmad Sofyan, MM ; Head of BAPPEDA District Kutai Barat	To coordinate regional development activities, including efforts to reduce emission at the district/city level
BAPPEDA of Penajam Pasir Utara District	Drs. Alimuddin, M.Si; Head of Bappeda Penajam Pasir Utara	To coordinate regional development activities, including efforts to reduce emission at the district/city level
BAPPEDA of Paser District	Ir. I Gusti Putu Suantara; Head of BAPPEDA Paser	To coordinate regional development activities, including efforts to reduce emission at the district/city level
BAPPEDA of Kutai Timur District	Ir. H. Sumarjana, MP; Head of BAPPEDA Kutai Timur District;	To coordinate regional development activities, including efforts to reduce emission at the district/city level
BAPPEDA of Kutai Kartanegara District	Wiyono, S.IP., M.Si; Head of BAPPEDA Kutai Kartanegara District	To coordinate regional development activities, including efforts to reduce emission at the district/city level
BAPPEDA of Mahakam Hulu District	Drs. Stephanus Madang, MSi; Head of BAPPEDA Mahulu District;	To coordinate regional development activities, including efforts to reduce emission at the district/city level
BAPPEDA of Bontang City	Ir. Zulkifli, MS; Head of BAPPEDA Bontang;	To coordinate regional development activities, including efforts to

		reduce emission at the district/city level
BAPPEDA of Balikpapan City	Ir. Nining Surtiningsih; Head of BAPPEDA Balikpapan;	To coordinate regional development activities, including efforts to reduce emission at the district/city level
BAPPEDA of Samarinda City	Dr. H. Asli Nuryadin; Head of BAPPEDA Samarinda City	To coordinate regional development activities, including efforts to reduce emission at the district/city level

Non-Government Institutions		
Name of Partner	Contact name, telephone and email	Key capacity and role in the proposed ER Program
Regional Council on Climate Change (DDPI)	Prof. Daddy Ruhiyat, Executive Director daddyrumbia68@gmail.com http://ddpi.kaltimprov.go.id/	To support coordination of the ER Program at the provincial level
National Forestry Council	Ir. Zulfikhar, MM; Head of Climate Change Commission	To coordinate the role of members of the Council in addressing climate change in forestry in Indonesia
Regional Forestry Council	Prof. Suyitno Sudirman; Head	To coordinate the role of stakeholders in forestry development in East Kalimantan
WWF Indonesia	Zulfira Warta, REDD+ Project Coordinator, WWF Indonesia, zwarta@wwf.or.id , +628121250127	Implementation partner in Kutai Barat and Mahakam Hulu Districts
The Nature Conservancy (TNC)	Saipul Rahman, Berau Program Senior Manager, +62 811 1637846, srahman@tnc.org	Implementation partner in Berau District and East Kalimantan Province

Non-Government Institutions		
Name of Partner	Contact name, telephone and email	Key capacity and role in the proposed ER Program
Forests and Climate Change Program (FORCLIME) GIZ	Ir. Tunggul Butar Butar, M.Sc; Tunggul.butarbutar@giz.de	Implementation partner in East Kalimantan Province and Berau District
Forests and Climate Change Program (FORCLIME) KfW	Harry Kuswondo	Implementation partner in East Kalimantan Province and Berau District
GGGI	Marcel J. Silvius	Partner of DDPI in developing a low-carbon development plan
BIOMA	Aspian Nur	Community assistance
KERIMAPURI	Asrani	Community assistance
Centre for Climate Change Studies (C3S)	Prof. Deddy Hadriyanto	To conduct analysis related to climate change mitigation and adaptation strategies in East Kalimantan
CSF (Centre for Social Forestry)	Dr. Fadjar Pambudhi	To provide analysis and advocacy for the development of community-based forest management
Centre for Tropical Ecosystem and Sustainable Development (TESD) UNMUL	Dr. Harmonis	To provide analysis on the sustainability of ecosystems in East Kalimantan
Indonesian Association for Forest Concession Holders (<i>Asosiasi Pengusaha Hutan Indonesia</i> , APHI)	Wayan Sujana	Private partner in the implementation of REDD+
Indonesian Palm Oil Association (GAPKI)	MS. Djafar	Private partner in the implementation of REDD+
PETKUQ MEHUY	Ledjie Taq	Indigenous Peoples' organization which is active

Non-Government Institutions		
Name of Partner	Contact name, telephone and email	Key capacity and role in the proposed ER Program
		in environmental conservation
PRAKARSA BORNEO	Dr. M. Muchdar	Support for local communities
Kawal Borneo Community Foundation (KBCF)	Mukti Ali Azis	Support for local communities
Yayasan Bumi	Erma Wulandari lembaga@bumibaru.id	Support for local communities
REDD+ Working Group of Berau District	Drs. Syamsul Abidin	Planning and monitoring of the implementation of REDD+ in the district
Working Group for Management of Forest and Timber Legality (TKHLK) of Kutai Kartanegara District	Hamly	Planning and monitoring the implementation of sustainable forest management in the district
REDD+ Working Group of Paser District	Ii Sumirat	Planning and monitoring of the implementation of REDD+ in the district
Green Economy Working Group of Kutai Timur District	Wahyu Gatut Purboyo	Implementation and monitoring of green development in the district

2 STRATEGIC CONTEXT AND RATIONALE FOR THE ER PROGRAM

2.1 Current status of the Readiness Package and summary of additional achievements of readiness activities in the country

Indonesia is a globally important country in terms of reducing GHG emissions from deforestation and forest degradation, and the successful implementation of REDD+ initiatives in Indonesia will contribute substantially to global efforts to contain climate change. Indonesia has been an active participant in REDD+ dialogues and programs since 2007, and although much is still to be done in terms of implementation, the country has made significant progress toward REDD+ Readiness (MoEF, 2018). In 2009, Indonesia committed to reduce GHG emissions by 26% through its own efforts, and by up to 41% with international support, below the business as usual scenario by 2020. Later in 2015, at COP 21 in Paris, Indonesia committed to reduce 29% of its emissions through its own efforts, and up to 41% with international support, below the business as usual scenario by 2030, through submission of the Nationally Determined Contribution (NDC).

In 2010, Indonesia received FCPF funding, which together with other funding sources, has been used to improve Indonesia's readiness for implementing REDD+. In January 2017, Indonesia's Readiness Package was submitted and endorsed by the FCPF Participants Committee (<https://www.forestcarbonpartnership.org/sites/fcp/files/2017/Sep/FCPF%20Indonesia%20R%20Package%20-%20Final%20revised%20July%2028%20version.pdf>). The self-assessment of the REDD+ readiness package concluded that Indonesia, in general, has made significant progress in key areas including organizational readiness, strategy preparation, the establishment of a reference emission level (REL), and monitoring systems for forests and safeguards. The progress to date is the following:

Component 1. Readiness Organization and Consultation.

Sub-component 1a. National REDD+ Management Arrangement.

- Since 2015, all REDD+ related matters are managed under the Ministry of Environment and Forestry's Directorate General for Climate Change (DGCC).
- DGCC has 5 technical implementation units to speed up the readiness progress at the sub-national level. One of these is responsible for the Kalimantan Region.
- Sub-national REDD+ institutions have been developed in 11 provinces. Sub-national REDD+ institutions in 23 further provinces are under development.

Sub-component 1b. Consultation, Participation and Outreach.

- Participation, engagement and consultation processes for various REDD+ readiness aspects have taken place at the national and sub-national levels.

Component 2. REDD+ Strategy Preparation.

Sub-component 2a. Assessment of Land Use, Land-Use Change Drivers, Forest Law, Policy and Governance.

- Numerous studies related to land use and land use change, forest law, policy and governance have been undertaken. These studies have led to improved policies, such as the one map policy, the forest and peat land concession moratorium policy, forest and land fire prevention policy, and increased recognition of local community rights.

Sub-component 2b. REDD+ Strategy Options.

- Indonesia has developed a strategic framework for REDD+ and milestones include the following:
 - The National strategy for implementation of REDD+ Indonesia was developed in 2010.
 - By 2012, eleven pilot provinces had completed REDD+ strategies.
 - A Safeguard Information System (SIS) REDD+ was developed in 2013 and is operational in 3 provinces (East Kalimantan, Jambi, and West Kalimantan).
 - Indonesia's National Forest reference emission level was submitted in 2015 and assessed by the UNFCCC.
 - Guidance for National and sub-National FREL was developed in 2017 (Ministerial Regulation number 70 year 2017), and Sub-national FRELs for several provinces, including East Kalimantan, have been established.
 - Indonesia's REDD+ MRV system and National Registry System for Climate Change were developed in 2016. Training and capacity building in these systems are in progress.
 - The development of a funding instrument for REDD+ began in 2015 and is expected to be finalized in 2019.

Sub-component 2c. Implementation Framework.

- Numerous regulations and policies related to REDD+ programs and activities have been drafted, enacted, adopted, and implemented. These include the following:
 - Ministerial regulations on REDD+ implementation guidance.
 - The Moratorium on new licenses in primary forest and peatland (this is reviewed every 6 months).
 - The One Map Policy
 - Forest management units (FMU) as a basis for the implementation of the REDD+ framework are being developed
 - The REDD+ National Registry is ready to be operated.

Sub-component 2d. Social and Environmental Impacts.

- Indonesia has developed several safeguards instruments to address social and environmental impacts. These include the REDD+ SES, the national Environmental Impact Assessment System (AMDAL), Strategic Environmental Assessments (KLHS), and the Safeguard Information System (SIS) for REDD+.
- In 2016, the Ministry of Environment and Forestry produced a compilation of background information for the development of SESA and preparation of the ESMF was initiated.
- The SESA report will be completed in 2018.

Sub-component 2e. Funding Instrument and Benefit Sharing Mechanism
Funding Instrument.

- A strategic plan for financing climate change mitigation and adaptation has been developed.
- A Presidential Regulation on Environmental Economic Instrument (as an umbrella for Public Services Agencies, BLU) has been enacted (Presidential Regulation no 46 year 2017).
- Presidential Decree No. 77/2018 Management of Environmental Funds (BLU-BPDLH) has been issued. The BLU-BPDLH will be functioned as a public service agency (*Badan Layanan Umum/BLU*) that is able to receive and manage the funds.

Benefit Sharing Mechanism.

- There are existing vertical and horizontal benefit sharing mechanisms at the national and sub-national levels, such as fiscal transfers, trust funds, Village funds, and General Services Agencies (*Badan Layanan Umum/BLU*).
- Lessons have been learned for the development of horizontal benefit sharing mechanisms from experience with REDD+ Demonstration Activities and projects at the site level.

Component 3. Reference Emission Levels/Reference Levels.

- Indonesia's FREL document was developed based on a robust methodology and a participatory process, and was submitted to the UNFCCC.

Component 4. Monitoring System for Forest and Safeguards.

Sub-component 4a. National/Sub- national Forest Monitoring System.

- A National Forest Monitoring System (NFMS) and other forest monitoring-related systems have been established.
- National and sub- national institutions are available to implement the NFMS.
- There are other activities on forest and carbon monitoring developed by projects, Demonstration Activities and other REDD+-related programs (such as the FCPF, INCAS, etc.) that provide important additional data.

Sub-component 4b. Information System for Multiple Benefits, Other Impacts, Governance and Safeguards.

- National regulations and environment assessment instruments are available.
- SIS-REDD+ is ready to be operated.

<p>R-Package document was presented in Laos. The document officially is accepted by FCPF (24th participant committee meeting and</p>	REDD+ READINESS		MTR 2014	2016	<p>GREEN 'significant progress'</p> <p>YELLOW 'progressing well, further development required'</p> <p>ORANGE 'further development required'</p> <p>RED 'not yet demonstrating progress'</p>
	Component 1: Readiness Organization and Consultation				
	1.a. National REDD+ management arrangement				
	1.b. Consultation, participation and outreach				
	Component 2: REDD+ Strategy Preparation				
	2.a. Assessment of land use, land use change drivers, forest law, policy and governance				
	2.b. REDD+ strategy options				
	2.c. Implementation framework				
	2.d. Social and environmental impacts				
	2.e. Funding instrument and benefit sharing mechanism				
	Component 3: Reference Emission Level/Reference Level				
	3.a. Reference emission level/reference level				
	Component 4: Monitoring System for Forest and Safeguards				
	4.a. National forest monitoring system				
	4.b. Information system for multiple benefits, other impacts, governance, and safeguards				

Figure 2.1 REDD+ Readiness Package Indonesia

Although there has been significant progress, key remaining gaps are as follows:

Component 1. Readiness Organization and Consultation.

Sub-component 1a. National REDD+ Management Arrangement.

- Coordination among institutions and agencies (the Ministry of Finance, the National Planning Agency, and other sectoral agencies such as in agriculture, mining, agrarian or other sectors) needs to be further improved.
- Human resource capacity for local governments and DGCC regional offices needs to be strengthened.
- A Feedback and Grievance Redress Mechanism is available, but needs to be better adapted to REDD+.

Sub-component 1b. Consultation, Participation and Outreach.

- The existing consultation, participation and outreach processes need to be further extended to reach all relevant entities across the country.

Component 2. REDD+ Strategy Preparation.

Sub-component 2a. Assessment of Land Use, Land-Use Change Drivers, Forest Law, Policy and Governance.

- Unclear tenure rights remain a constraint to the implementation of land-use regulations.
- The data management system for spatial and statistical information related to the ER program needs to be put in place.

Sub-component 2b. REDD+ Strategy Options.

- Not all local political interests at the sub- national levels support the REDD+ strategy.
- Understanding of the National REDD+ Strategy across sectors needs strengthening.
- The role of REDD+ within Indonesia's NDC has not been finalized.

Sub-component 2c. Implementation Framework.

- Laws and regulations related to low carbon development have not been fully adopted by the private sector.
- Institutional authority and procedures for issuing REDD+ business permit within protection forest areas are not yet clear.
- The National REDD+ Registry System has not yet been fully disseminated to the responsible and relevant entities.

Sub-component 2d. Social and Environmental Impacts.

- Existing safeguards approaches related to REDD+ are not yet fully coordinated and the SESA and ESMF documents have not yet been finalized.

Sub-component 2e. Funding Instrument and Benefit Sharing Mechanism

- Participation by the private sector in REDD+ financing needs to be enhanced.
- The funding scheme needs a stronger legal basis.
- The Benefit Sharing Mechanism needs to be finalized and adopted at the national and sub-national levels.

Component 3. Reference Emission Levels/Reference Levels.

- Jurisdiction boundaries used by the national and sub-national systems are not fully aligned.
- Measurement timeframes across various schemes need to be harmonized.

Component 4. Monitoring System for Forest and Safeguards.

Sub-component 4a. National/Sub-national Forest Monitoring System.

- There are still uncertainties in the data.
- The system excludes forest regrowth and secondary forest degradation.
- Methodologies for assessing displacement and reversal have not yet been developed.
- The data validation process is still under development.

Other initiatives related to measurement and monitoring at the ground level need to be harmonized and aggregated to the national level.

Sub-component 4b. Information System for Multiple Benefits, Other Impacts, Governance and Safeguards.

- SIS-REDD+ needs a legal foundation to improve legitimacy.
- Coordination among agencies that possess forest related data at the national and sub-national levels needs to be improved.
- The REDD+ safeguards-related systems need to be better coordinated.
- Capacity of institutions at the sub-national level to operate the SIS REDD+ needs strengthening.
- Community involvement in the SIS needs to be improved.

The strategies and timeline for addressing the remaining gaps in Indonesia's REDD+ Framework are presented in the following table.

Table 2.1 Strategies and timeline for addressing the remaining gaps in Indonesia's REDD+ Framework

Activity/Strategy	Years				Responsible Entity
	2018	2019	2020	2021	
Sub component 1a. National REDD+ management arrangement					
Intensification of the REDD+ coordination process by DGCC.					DGCC
Further technical capacity building for local governments (provinces and districts) and DGCC regional offices.					DGCC
Capacity building for the FGRM related to REDD+.					DGCC

Activity/Strategy	Years				Responsible Entity
	2018	2019	2020	2021	
Development of a sub-national level FGRM adapted for REDD+.					DGCC, Provincial Forestry Services
Sub component 1b. Consultation, participation and outreach					
Continuing the consultation, participation and outreach process related to REDD+ strategies and implementation across Indonesia, prioritizing the sub-national level.					DGCC, Local Government, Project Proponents, NGOs
Improving the dissemination strategy.					DGCC, Local Government, Project Proponents, NGOs
Sub component 2a. Assessment of land use, land use change drivers, forest law, policy and governance					
Carrying out further work on land rights assessments related to REDD+, with East Kalimantan as a priority province and accelerating					FOERDIA and DGCC

Activity/Strategy	Years				Responsible Entity
	2018	2019	2020	2021	
the land administration process for REDD+ implementation.					
Developing and establishing a data management system for critical spatial and statistical information related to emission reduction programs, with East Kalimantan as a priority province.					FOERDIA and DGCC
Sub component 2b. REDD+ strategy options					
Mainstreaming the REDD+ Strategy at the provincial and district levels to strengthen their local development planning and strategy implementation.					DGCC, NGOs, DDPI and East Kalimantan Forestry Service
Intensive communication and outreach with land-based sectors at the national and sub-national levels.					DGCC, local government, NGOs
Sub component 2c. Implementation framework					
Enhancing the roles and participation of the private sector in low					FOERDIA

Activity/Strategy	Years				Responsible Entity
	2018	2019	2020	2021	
carbon development and REDD+, with a focus on East Kalimantan.					
Conducting analysis to develop the regulation on the REDD+ business permit in order to improve the Ministerial Decree/Regulation on REDD+ permit procedure.					MoEF
Building awareness of and disseminating the REDD+ registry.					DGCC
Operationalizing the data management system related to the National Registry System, and integrating it with sub-national data management systems.					DGCC, FOERDIA, DDPI
Field testing of MRV systems at the sub-national level					
Sub component 2d. Social and environmental impacts					
Finalization of the SESA and ESMF documents.					DGCC

Activity/Strategy	Years				Responsible Entity
	2018	2019	2020	2021	
Sub component 2e. Funding instrument and benefit sharing mechanism					
Further exploration of the role of the private sector in benefit sharing.					DGCC, FOERDIA, DDPI
Acceleration of Government Regulations, other statutory laws and related ministerial technical decrees, including the finalization of a REDD+ Public Service Agency (BLU), and the legal establishment of the Benefit Sharing Mechanism.					DGCC, FOERDIA
Adjustment of existing mechanisms for the REDD+ benefit sharing mechanism					DGCC
Reference emission level/reference level					
Development of standards and methodologies for aligning national and sub-national FREs.					DGCC
Developing the methodology or approach for synchronizing varied					DGCC

Activity/Strategy	Years				Responsible Entity
	2018	2019	2020	2021	
year-bases for different purposes.					
Sub component 4a. National forest monitoring system					
Development of additional PSP's to reduce uncertainty.					FOERDIA
Improving land cover data to detect forest regrowth and degradation.					MoEF
Improving the REDD+ policy, the REDD+ management arrangements, the NFMS and safeguards to cover leakage and non-permanence, both on the conceptual framework and practical guidelines					DGCC, FOERDIA, East Kalimantan (DDPI)
Further development of a data validation process.					MoEF, East Kalimantan
Development of clear mechanisms and procedures to facilitate the compilation and scaling-up of existing initiatives and ongoing					MoEF

Activity/Strategy	Years				Responsible Entity
	2018	2019	2020	2021	
activities into robust national capacity.					
Sub component 4b. Information system for multiple benefits, other impacts, governance, and safeguards					
Formalization of legal aspects for the full implementation of SIS-REDD+					DGCC
Capacity building for responsible institutions at the sub-national level.					DGCC
Improvement in synergy among agencies that collect forest related data at the national and sub national levels.					DGCC
Further alignment of existing safeguards approaches.					DGCC
Further raising of community awareness and applying capacity building.					DGCC

Activity/Strategy	Years				Responsible Entity
	2018	2019	2020	2021	
Further strengthening the implementation of REDD+ Safeguards.					DGCC, FOERDIA

2.2 Ambition and strategic rationale for the ER Program

The ER Program will advance the implementation of REDD+ at the national level; will contribute to the achievement of nationally and internationally significant emissions reductions, helping Indonesia achieve its climate targets and international commitments; and will support East Kalimantan's path toward a green economy.

As described in Section 2.1, Indonesia has made significant progress toward developing a national REDD+ architecture, and is at a point where a jurisdictional program will provide added stimulus and practical knowledge for finalizing the national system. A critical next step toward national REDD+ implementation is the finalization and implementation of subnational REDD+ frameworks. The proposed program offers to test a comprehensive approach to REDD+ that covers policy-level changes as well as field-based activities, and that addresses drivers of deforestation that are prevalent in most of Indonesia's forested regions. Provincial governments will have an important role in REDD+ implementation, for example through their responsibility for managing most Forest Management Units. The province-level approach will be scalable to other provinces across Indonesia. Lessons gained from implementing the ER Program in East Kalimantan will be valuable in finalizing the design of the national REDD+ framework, including the national MRV system, safeguards approaches, benefit sharing and ER registration.

The ER program will support transformative changes in forest governance, and is expected to lead to significant emissions reductions in one of the world's most significant forest regions. The proposed ER Program will cover the entire province of East Kalimantan which includes diverse forest and land types, including coastal forests, lowland forests, and upland forests, and which has been a significant source of national emissions. East Kalimantan's annual emissions from deforestation, forest degradation, mangrove soil, peat decomposition, and fire are approximately 62.9 million tCO₂e/yr. Over the ERPA period (2020 to 2024) the ER Program is estimated to lead to total emission reductions of 97.1 million tCO₂e (gross), which is equivalent to an 31% reduction in the province's reference level emissions over that period.

The ER Program will be sustained in the context of a longer term program. The enabling elements of this long term program commenced in 2010 and are continuing through national, provincial and local government processes that address the components of *REDD+ Readiness*. It is intended that the ER Program's activities will be integrated into the East Kalimantan Green

framework within the longer timeframe of transition of government activities through to 2035 and they are in line with the Ministerial Regulation No. 70 Year 2017. It more clearly places responsibilities in each of the sectors involved in land management that affect forest ecosystems in East Kalimantan. Specifically, the ER Program includes activities to reduce emissions in the forestry, estate crops, mining, agriculture, and fisheries sectors and will integrate these activities into East Kalimantan's up-coming mid-term strategic development plan to be implemented through the next period of government (*Rencana Pembangunan Jangka Menengah Daerah – RPJMD 2018-2023*). This process is illustrated in Figure 2.2. Framing the FCPF ER Program within the longer-term Green East Kalimantan transformation to 2035, allows the FCPF activities to continue beyond that period to ultimately achieve a *wall to wall* jurisdictional program in a reduced carbon economy, consistent with Indonesia's NDC.

2.3 Political Commitment

2.3.1 Political commitment to REDD+ and the ER Program at the national level

At the national level, the Indonesian Government has demonstrated its commitment to REDD+ through the establishment of:

- (i) The Directorate General of Climate Change (DG of CC) as the national institution to manage and coordinate REDD+ implementation in Indonesia,
- (ii) the Technical Management Unit of Climate Change to facilitate REDD+ implementation at the province level,
- (iii) the Peat Restoration Agency (Badan Restorasi Gambut-BRG), established through Presidential Decree No. 1 Year 2016, to develop a national peat land map, then restore and rehabilitate the degraded peat land; and,
- (iv) the Centre for Research and Development on Socio-Economic, Policy and Climate Change (P3SEKPI) as a research institution that has a mandate to provide scientific recommendations to inform climate change policy.

In addition there are numerous institutions to implement the REDD+ program at the sub-national level, including the working group on climate change in South Sumatera Province, the provincial Commission on REDD+ in Jambi Province, and the Provincial Council of Climate Change in East Kalimantan Province. The East Kalimantan Provincial Council on Climate Change (DDPI) is formed with Governor's Decree No. 02/2011 amended by Governor's Decree No. 09/2017.

Gol has further demonstrated its commitment to REDD+ by issuing key policies related to REDD+ implementation at national and sub-national levels. At the national level, these include:

- (i) The development of the national REDD+ framework and REDD+ related instruments. This includes the National Strategy for REDD+, the national FREL, the MRV System, the National Registry System on Climate Change, SIS-REDD+, and the REDD+ funding instrument (in progress);
- (ii) the ratification of the Paris Agreement through Act No. 16 of 2016. This Act indicates the commitment of the Government of Indonesia to join the global commitment to combat adverse impacts of climate change and to reduce global emissions of GHGs;

- (iii) the submission of Indonesia's NDC. Under the NDC, REDD+ is one of the climate change mitigating actions to be taken by GoI. The NDC was developed to follow up the political will of the GoI to voluntarily reduce GHGs emissions by 29 per cent of the business-as-usual (BAU) scenario without international support, or by 41 per cent with international support; and
- (iv) the issuance of national policies to support the implementation of REDD+. For example, in May 2011 GoI announced a two-year moratorium on the allocation of new logging concessions in areas in primary forests and in peatlands, through Presidential Instruction No. 10 of 2011. The suspension of new permits for logging concessions represents a new direction in Indonesia's political economy of forests (Ministry of Forestry, 2008). This moratorium policy has been extended three times through Presidential Instruction No. 6/20013, Presidential Instruction No. 8/2015, and Presidential Instruction No. 6/2017.

2.3.2 Political commitment to REDD+ and the ER Program in East Kalimantan

The national decision to implement the ER Program in East Kalimantan recognizes the extent of *Readiness* and political commitment in the province. East Kalimantan has been closely involved in supporting the national commitment to reduce carbon emissions since 2009. East Kalimantan was one of the first provinces to join the GCF association, and signed the Declaration of Rio Branco, a document firmly stating the commitment to reducing tropical deforestation, protecting the global climate system, improving rural livelihoods and reducing poverty. East Kalimantan was one of the first Indonesian provinces to appoint a REDD+ Task Force, to undertake REDD+ pilot projects and to embrace a Governor's priority policy for a transition to a low carbon economy. In 2014 the Governor of East Kalimantan augmented the national moratorium on peat land conversion and primary forest logging by issuing a province-level moratorium. East Kalimantan Province is integrating REDD+ into its Medium Term Development Plan, has allocated a portion of its budget (APBD, APBN) for activities related to REDD+, and has prepared various regional regulations in support of REDD+. The province has established a Working Group on REDD+ and a Regional Council on Climate Change (*Dewan Daerah Perubahan Iklim-DDPI*).

The multi-stakeholder DDPI represents the interests of the regional and local governments, university and civil society organizations. The DDPI has been closely involved with the development of the East Kalimantan Environmentally Sustainable Development Strategy (2011); the East Kalimantan Provincial Strategy and Action Plan for REDD+ (SRAP) and the East Kalimantan Master Plan for Climate Change (2015-2035).

In order to ensure continuity of the commitment beyond the next provincial government election in 2018, the provincial government issued a regulation (*Perda*) on Climate Change Management in East Kalimantan. The regulation provides guidance for climate change mitigation and adaption and will serve a reference for the next administration's development planning.

3 EMISSION REDUCTION PROGRAM LOCATION

3.1 Accounting Area of the ER Program

The Accounting Area for the ER Program encompasses the boundaries of the East Kalimantan provincial jurisdiction (Figure 3.1). East Kalimantan is Indonesia's third largest province, covering 6.6% of the total country area. The area consists of seven districts and three cities (Figure 3.2), 1,037 sub-districts, and 1,271 villages. East Kalimantan is geographically located at 4° 24' North Latitude (NL) and 2° 25' South Latitude (SL), 113° 44' East Longitude (EL) and 119° 00' East Longitude (EL). East Kalimantan is strategically located in an international sea transportation route. The province is rich in natural resources such as: timber, mining, oil, gas, and productive soils. It has hundreds of rivers that flow throughout the province and that form the main transportation infrastructure for the distribution of products extracted from natural resources.



Figure 3.1 Map of East Kalimantan Province in Indonesia

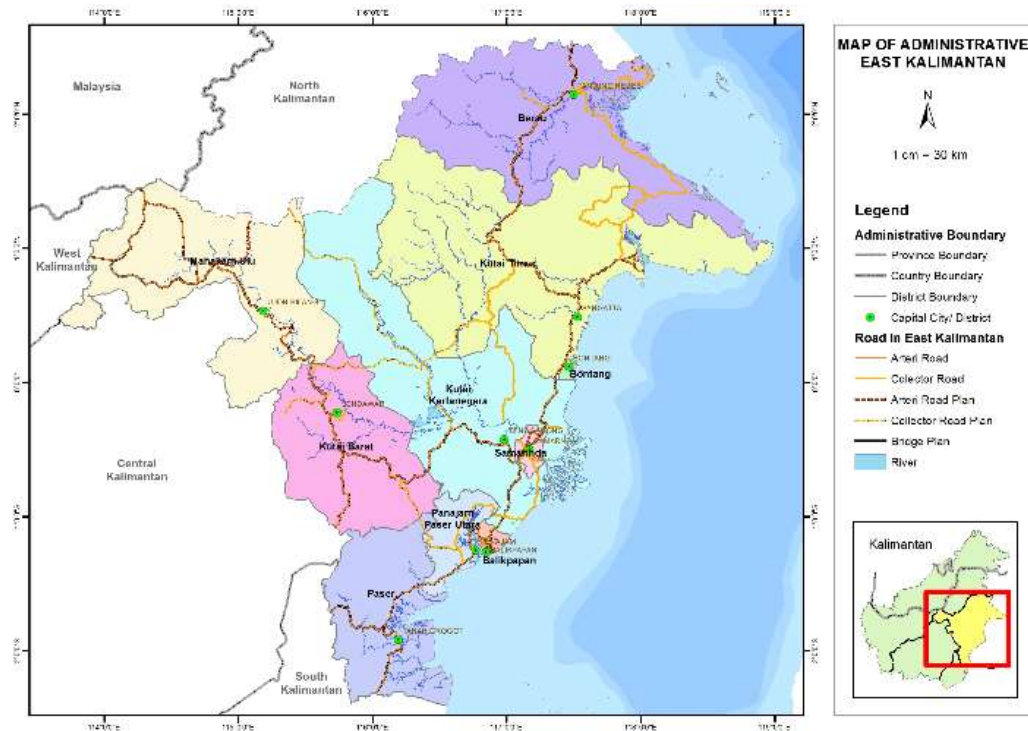


Figure 3.2. Administrative boundaries of East Kalimantan

The administrative boundaries of East Kalimantan Province are as follows:

- The northern boundary is shared with North Kalimantan Province
- The western boundary is shared with the State of Sarawak in Malaysia, and with West Kalimantan and Central Kalimantan Provinces
- The southern boundary is shared with South Kalimantan Province
- The eastern boundary is the coastline of the Makassar Strait and the Sulawesi Sea

The original boundaries of the East Kalimantan administrative area were established through Law No. 25 of 1956 and were subsequently amended through Law No. 20 of 2012 that established the new Province of North Kalimantan.

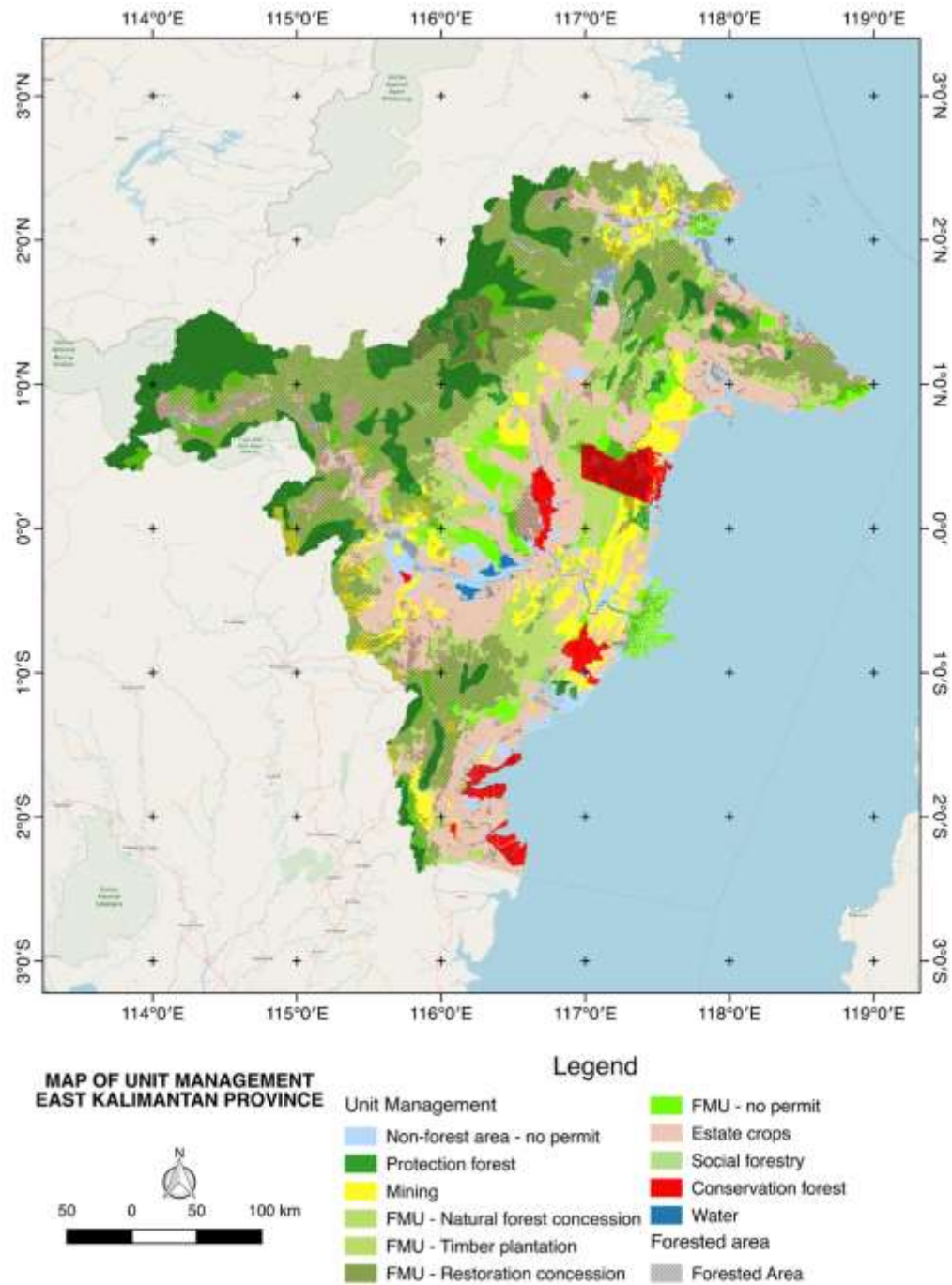


Figure 3.3. Map of accounting area for ER program

The total area of East Kalimantan is 12.7 million ha, of which 6.5 million ha (54%) is still covered by forests. Most of the forests are found within areas allocated to 20 discrete Forest Management Units (FMU or KPH) and in 6 conservation areas (see Table 4.11 and Table 4.15 in Section 4).

Based on its function, East Kalimantan's land area is divided into protection forest, conservation forest, limited production forest, production forest, convertible production forest (area that can

be converted for other uses outside of forestry), and land for other purposes (APL, Figure 3.4 and also see Table 4.15 in Section 4). APL is available for other uses including agriculture, settlement, and other uses. MoEF is responsible for managing the area in conservation forest, limited production forest, production forest, and convertible production forest. Protection forest is under the mandate of the provincial or district governments (discussed further in Section 4.4).

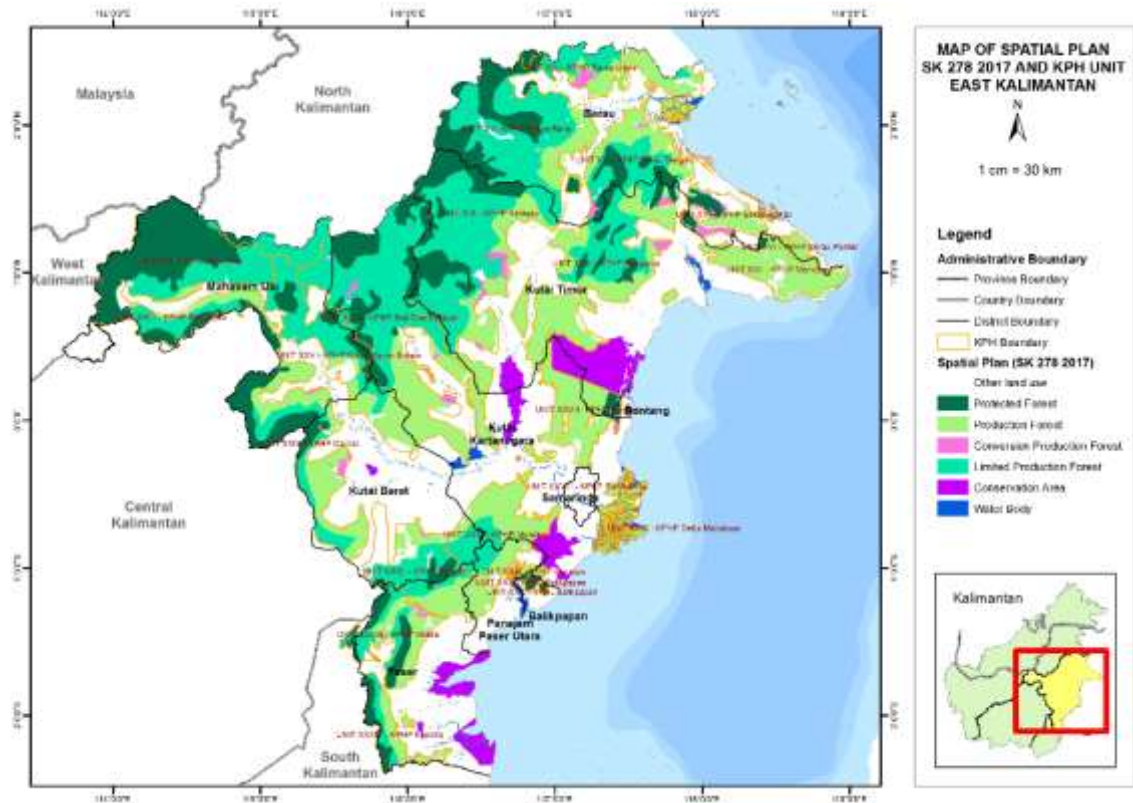


Figure 3.4. Land type based on its function in East Kalimantan (Ministry Decree No.278/2017)

Within these land use zones permits and concessions are allocated for selective logging, social forestry, ecosystem restoration, mining, palm oil plantations, and industrial timber plantations. Permit holders have rights and responsibilities to manage the area and any natural forest that still exists there (Table 3.1, Figure 3.5). Total remaining natural forest area inside concessions is about 4.1 million hectares and, as a result, they are considered key actors for the ER Program.

Table 3.1 Concessions in East Kalimantan

No	Type of Concessions	Units	Remaining forests by 2016 (ha)
1	Selective logging (IUPHHK-HA)	64	2,834,807
2	Forest plantation (IUPHHK-HTI)	42	325,416
3	Estate Crops plantation	373	467,721
4	Mining	1434	299,340*
5	Ecosystem Restoration	2	170,381
6	Social forestry	38	58,127
Total area of forests in concessions			4,155,792

Note: * size of remaining forests for mining Clean and Clear (CnC)

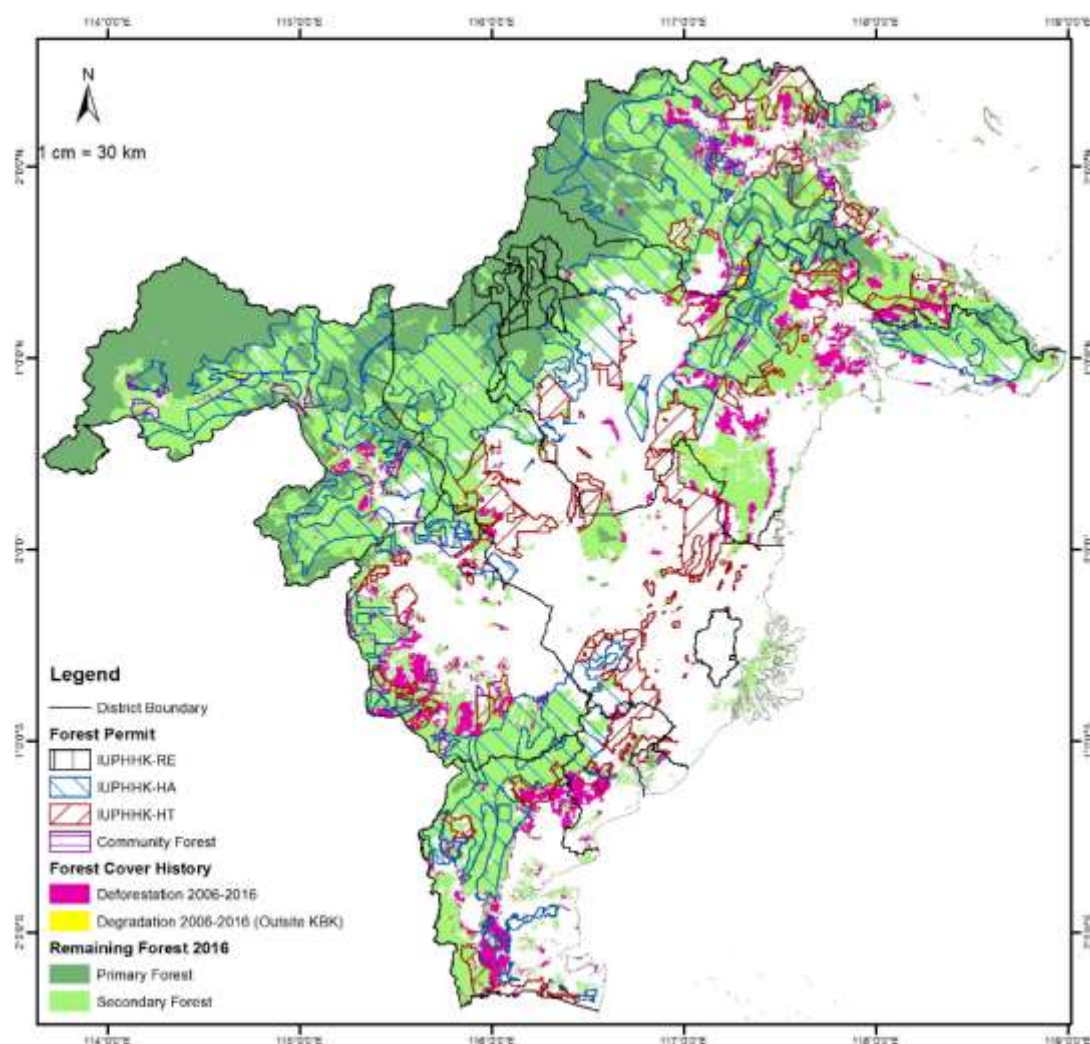


Figure 3.5. The distribution of concessions in East Kalimantan

3.2 Environmental and social conditions in the Accounting Area of the ER Program

3.2.1 Natural Forest type

According to the 2016 landcover map, the total remaining natural forest in East Kalimantan is 6,508,998 ha. It consists of primary dryland forest, secondary dryland forest, primary mangrove forest, primary swamp forest, secondary mangrove forest, and secondary swamp forest (Table 3.3). Dryland forest in East Kalimantan is dominated by Dipterocarp species, especially *Shorea spp.* that are used commercially for the timber industry. Mangrove forests are dominated by *Rhizophora spp.*, *Bruguiera spp.*, *Avicenia spp.*, and *Nypa spp.*

Table 3.2. Natural forests in East Kalimantan, 2016

Forest class	Area (ha)
Primary dryland forest	2,190,192
Secondary dryland forest	4,018,093
Primary mangrove forest	36,275
Primary swamp forest	22,674
Secondary mangrove forest	130,700
Secondary swamp forest	111,064
Total	6,508,998

3.2.2 Climatic conditions

East Kalimantan has a humid tropical climate with annual rainfall ranging from 1,363 to 2,150 mm. It is strongly influenced by monsoons, i.e. the west monsoon wind between November and April and the east monsoon wind between May and October. Thus, the dry season usually occurs in May to October, while the rainy season occurs in November through April. The impact of El Nino Southern Oscillation (ENSO) on rainfall variability is quite significant. During El Nino years, rainfall in the dry season is normally far below normal, and the forest is prone to fires that may cause degradation or deforestation. However, in recent years, rainfall was often far below normal during the rainy season. Air temperature also varies with location, depending on altitude and distance from the shore. In general, the average daily temperature in low altitude areas is about 28°C. The average night and day temperature is about 24 °C and 32 °C respectively. Average air humidity is between 82% and 86%¹.

3.2.3 Forest Fire

Fires occur annually in East Kalimantan, but periods of prolonged drought, such as those linked to El Niño - Southern Oscillation (ENSO) events, can lead to severe and large-scale fires that cover significant areas. Besides impacting forests, the smoke and haze from land fires affect the health of people nationally and regionally. This has led to significant negative attention for Indonesia from neighboring countries and globally. A more detailed discussion of fire as a cause of deforestation and forest degradation is included in Section 4.

¹ Source: <https://www.worlddata.info/asia/indonesia/climate-east-kalimantan.php>

3.2.4 Soil and topography

East Kalimantan is dominated by pure podsollic land, comprising 78.5% of the area, the rest is lithool (8.75%), alluvial (4.6%), organosol (3.3%), hydride gleisel (1.4%) and several combinations of various other types of soils in small quantities. These soils are generally low in fertility and not suitable for long-term agricultural production. East Kalimantan also has peat lands (peat soil) containing significant amounts of carbon. This area is relatively small, covering only 164,879 ha or 1.3% of the total land area. Peat soil is mostly located in the Kutai Kartanegara district, and the rest is in Kutai Barat and Kutai Timur districts (Figure 3.6).



Figure 3.6 Peatland in East Kalimantan

The topography of East Kalimantan is hilly, with altitudes ranging from 0 to 1,500 meters above sea level (Table 3.4). Topographically East Kalimantan is dominated by lands with slopes above 40 percent and altitude less than 500 meters above sea level. Flat areas (0-2% slope) cover 10.7% of the area and are generally found only in coastal areas and large river basins; sloping land (slope of 2-15%) covers 16.16%; hilly land (slope greater than 15%) covers about 73.1% of the total area. Forested areas are generally located on steep slopes.

Table 3.3. Percentage of Area by Regency/Municipality and Altitude Class from Ocean in East Kalimantan Province (Percent), 2016

Regency/ Municipality	Area (hectare)	Altitude Class (%)					
		0-7 m	7-25 m	25-100 m	100- 500 m	500- 1000m	>1000m
Balikpapan	51,224	13.87	34.29	51.84	0.00	0.00	0.00
Berau	2,179,627	3.75	8.27	27.44	43.27	17.27	3.01
Bontang	16,314	10.10	41.01	48.89	0.00	0.00	0.00
Kutai Barat	1,371,512	3.57	29.07	25.89	19.48	21.99	8.99
Kutai Kartanegara	2,617,891	4.76	26.57	21.89	22.65	24.13	7.89
Kutai Timur	3,088,799	0.04	11.70	39.51	39.21	9.54	5.96
Mahakam Ulu*	1,944,941						
Paser	1,109,630	18.80	19.88	33.98	22.92	4.42	0.03
Penajam Paser Utara	294,957	7.39	25.58	31.24	35.78	0.01	0.00
Samarinda	71,651	20.11	42.77	37.07	0.05	0.00	0.00
East Kalimantan	12,746,546*	4.65	24.05	28.11	26.94	16.25	5.28

*= No data was available for *Mahakam Ulu*

3.2.5 Rare and Endangered Species and their habitat within the ER Accounting Area

East Kalimantan is an important habitat for at least 11 vulnerable and endangered species (Figure 3.7), eight of which are mammals.² These include 2,500 orangutans, the largest remaining population of the northeast Borneo subspecies. It is estimated that the province contains roughly 10% of the world's remaining wild orangutan population³. Key rare and endangered species are the following:

1. Orangutan (*Pongo pygmaeus*) – critically endangered
 - Habitat: Bornean Orangutans are lowland forest specialists, rarely found above 500 m a.s.l. In the 1950s, the habitat suitable for orangutans extended across ~255,000 km² of the island of Borneo. Compounding loss of habitat, recent

² <http://www.iucnredlist.org>

³ <https://www.nature.org/ourinitiatives/regions/asiaandthepacific/indonesia/placesweprotect/east-kalimantan.xml>

interview surveys in Kalimantan have concluded that 2,000–3,000 orangutans were killed every year in Indonesian Borneo during the past four decades alone (Meijaard *et al.* 2011). This would represent a loss of 44,170–66,570 individuals (Davis *et al.* 2013), or more than 50% of the original population in just 40 years. Such a rate of killings is unsustainable (Marshall *et al.* 2009) and many populations will be reduced or become extinct in the next 50 years (Abram *et al.* 2015).

2. Sun Bear (*Helarctos malayanus*) – vulnerable species
 - Habitat: Tropical evergreen rainforest is the sun bear’s main habitat in Borneo. This seasonal habitat receives high annual rainfall that is relatively evenly distributed throughout the year. Tropical evergreen rainforest, includes a wide diversity of forest types used by sun bears, including lowland dipterocarp, peat swamp, freshwater swamp, limestone/karst hills, hill dipterocarp, and lower montane forest
3. Enggang Bird (*Buceros rhinoceros*) – near threatened species
 - Habitat: This species occurs in extensive areas of primary lowland and hill forest, extending into tall secondary forest and swamp forests, up to 1,400 m. In Borneo, it is shot for food and hat feathers by local tribes. It returns to customary nest-holes, even after surrounding forest has been disturbed, and studies demonstrate that logging reduces overall numbers.
4. Irrawaddy Dolphin (*Orcaella brevirostris*) – vulnerable species
 - Habitat: In rivers and mangrove channels, the species is most often observed at channel confluences and divergences and downstream of sharp meanders. Deforestation and gold, sand and gravel mining are causing major changes to the geomorphologic and hydraulic features of rivers and marine-appended lakes where Irrawaddy dolphins occur (Smith *et al.* 2007-b). Increased sedimentation resulting from deforestation in surrounding watersheds has resulted in declining water depths in Semayang Lake, Kutai Kartanegara District. Based on reports from local fishermen and the retrieval of eight carcasses along the Mahakam River between 1995 and 2005, Kreb *et al.* (2007) documented 48 deaths, 66% of them from entanglement in large-mesh (10 –17.5 cm) gillnets.
5. Proboscis Monkey (*Nasalis larvatus*) – endangered species
 - Habitat: the species is in greater abundance in Kalimantan (Indonesian Borneo). The Indonesian populations range in size from over 1,000 to less than 100, depending on past and current threats (Meijaard and Nijman 2000).
6. Green Turtle (*Chelonia mydas*) – endangered species
 - Habitat: green turtles are highly migratory and use a wide range of broadly separated localities and habitats during their lifetimes. Green turtles, like other sea turtle species, are particularly susceptible to population declines because of their vulnerability to anthropogenic impacts during all life-stages: from eggs to adults. Perhaps the most detrimental human threats to green turtles are the intentional harvests of eggs and adults from nesting beaches and juveniles and adults from foraging grounds.
7. Wild Bulls (*Bos javanicus*) – endangered species
 - Habitat: On Borneo (East Kalimantan, Indonesia), ancient cave art (circa 10,000 BP) depicting a bovid figure, thought to be *Bos javanicus*, was found in 1994 (Chazine 2005), which suggests the natural range of Banteng extended up until Wallace’s line. In Eastern Kalimantan, it occurs in Kutai National Park (S.

Cheyne pers. comm. 2013). Banteng may also be present in Hutan Kapur Sangkulirang Nature Reserve.

8. Clouded Leopard (*Neofelis diardi*) – vulnerable species
 - Habitat: The Sunda Clouded Leopard appears to be a relatively adaptable species, and is found in a range of forest types, elevations and levels of disturbance. Recent camera trap surveys have recorded the felid in primary lowland, upland and sub montane Dipterocarp forest (Ross *et al.* 2010, Brodie and Giordano 2012, McCarthy *et al.* 2015, Loken *et al.* unpubl data, Hearn, Ross and Macdonald unpublished data), selectively logged Dipterocarp forest (Ross *et al.* 2010, Wilting *et al.* 2012, Mathai *et al.* 2014, Sollmann *et al.* 2014, Loken *et al.* unpublished data), and peat-swamp forest (Cheyne *et al.* 2011, 2013).
9. Sambar Deer (*Cervus unicolor*) – vulnerable species
 - Habitat: Sambar is listed as vulnerable through sustained declines across its range. These vary in severity between regions, and in some areas considerably exceed the threshold for vulnerable. In the last three generations (taken to be 24–30 years), declines in mainland South-east Asia, and possibly Borneo and Sumatra have exceeded 50%.
10. Western Tarsier (*Tarsius bancanus*) – vulnerable species
 - Habitat: This species can live in both primary and secondary forest, as well as along the coasts or on the edge of plantations (Niemitz 1979). This is often described as a lowland species, most common below 100 m elevation.
11. The Bornean rhinoceros (*Dicerorhinus sumatrensis harrissoni*) – critically endangered
 - The Bornean rhinoceros, also known as Eastern Sumatran rhinoceros or Eastern hairy rhinoceros, is one of the three subspecies of Sumatran rhinoceros. Signs of rhinoceros presence in Borneo were detected in early 2000. The Bornean rhinoceros is found in West Kutai, until now identified through camera traps and footprints. There are at least 15 individuals in three pockets of population in West Kutai.

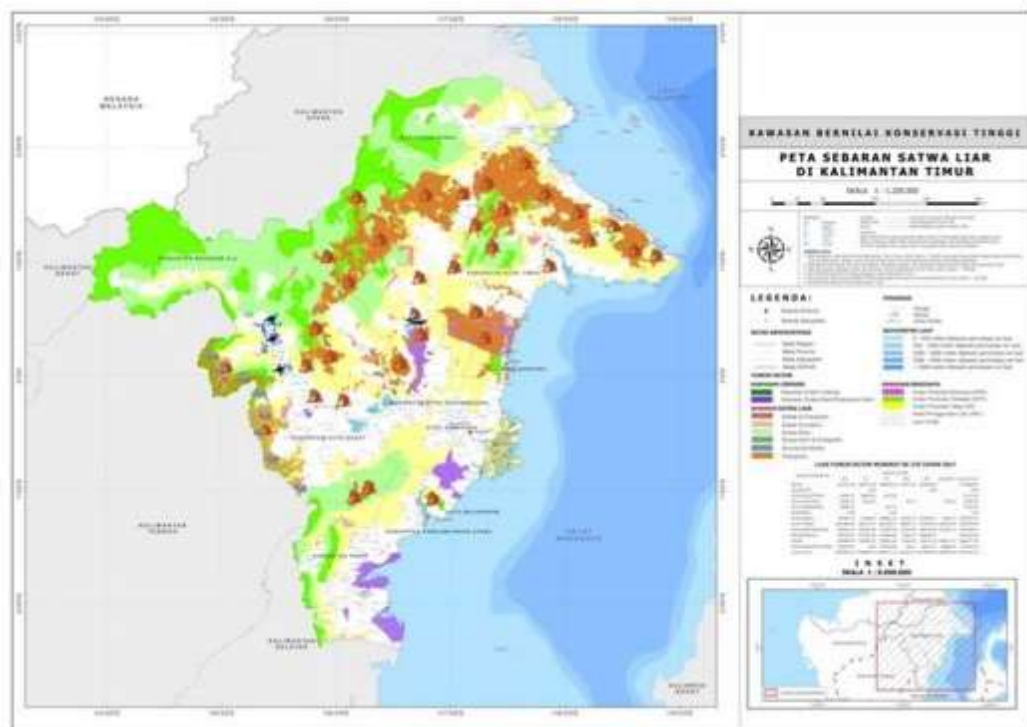


Figure 3.7. Protected Wildlife Distribution Map in East Kalimantan

3.2.6 Demography, Livelihood and Socio-cultural diversity

East Kalimantan has a population of about 3.5 million (2016) and this includes indigenous Dayak and Kutai, as well as Javanese, Chinese, Banjarese, Bugis, and Malay people (Table 3.5). The population increased significantly in recent years: between 2010 and 2016 the population increased by 15% from 3,047,479 to 3,501,232. Bugis and Malay, who are mostly Muslim, dominate the southern part and most coastal areas; the northern and north-western parts are home to minorities of Christians and Indigenous Peoples. Communities in remote areas often practice traditional lifestyles, governed by customary law, and most of the people who live in rural upstream areas still practice swidden agriculture.

Population density in East Kalimantan is 27.13 people/km², and around 6.11% of East Kalimantan's population was classified as poor in 2016⁴. The distribution of poverty is skewed towards rural areas where 10.1% of the population was classified as poor, compared to 4% of the urban population.

⁴ Center of Statistics Bureau for East Kalimantan, 2017

Table 3.4. Ethnic groups in East Kalimantan as of 2010

No	Ethnic group	Population (2010) ⁵	Percentage (2010)
1	Javanese	1,069,605	30,24%
2	Bugis	735,819	20,81%
2	Banjar	440,453	12,45%
4	Dayak	351,437	9,94%
5	Kutai	275,696	7,80%
6	Toraja	78,251	2,21%
7	Paser	67,015	1,89%
8	Sunda	55,659	1,57%
9	Madura	46,823	1,32%
10	Buton	44,193	1,25%
11	Others	371,552	10,51%
Total		3,536,503	100,00%

Source: Statistical Bureau (2010) <http://kaltim.bps.go.id>

Centers of trade and government are concentrated along the coastal area of East Kalimantan, and this area has attracted migrants, both from other islands in Indonesia, as well as from outside Indonesia. Some settlers live and settle in the coastal areas and along major rivers. Ethnic migrants whose numbers are quite dominant in East Kalimantan are Java, Bugis and Banjar. Forest natural resources are concentrated in the uplands and have long supported local Dayak and Kutai populations.

⁵ Aris Ananta, Evi Nurvidya Arifin, M. Sairi Hasbullah, Nur Budi Handayani, dan Agus Pramono (2015). *Demography of Indonesia's Ethnicity*. Institute of Southeast Asian Studies dan BPS – Statistics Indonesia

4 DESCRIPTION OF ACTIONS AND INTERVENTIONS TO BE IMPLEMENTED UNDER THE PROPOSED ER PROGRAM.

4.1 Analysis of drivers and underlying causes of deforestation and forest degradation, and existing activities that can lead to conservation or enhancement of forest carbon stocks

4.1.1 Analysis of drivers of deforestation and forest degradation

A quantitative analysis of land cover change was conducted as part of ER Program preparation. The FREL analysis shows a decline in East Kalimantan's forested area of 1,140,536 ha between 2006 and 2016, which is equivalent to an average annual forest loss of 114,054 ha. Degradation of primary forest to secondary forest occurred on 83,192 ha over the same period. Qualitative information on the drivers of deforestation and forest degradation was collected through a series of consultative meetings, conducted with local stakeholders between October 2015 and March 2018 (see Section 5). These meetings identified the following 7 main drivers of deforestation and forest degradation in East Kalimantan:

1. Timber plantations
2. Estate crops
3. Mining
4. Subsistence agriculture
5. Unsustainable logging practices
6. Forest and land fires
7. Aquaculture

The spatial analysis of land cover changes provides evidence for the above drivers, and gives an indication of their relative scales. A two-part analysis was carried out. The first part involved identifying the final (2016) land cover of the areas that had been deforested since 2006. Of the 1,140,536 ha of forest lost between 2006 and 2016, 34% had been planted with oil palm, 7% had been planted with plantation timber, 6% was used for agriculture, 2% was mining area, and 1% had been turned into ponds.

Table 4.1 Current land cover of area deforested since 2006

Land Cover (in 2016)	Overlap with area deforested since 2006 (ha)	Share of deforested area
Shrubs	397,085	35%
Oil Palm	383,882	34%
Bare Land	163,283	14%
Timber plantation	84,053	7%

Land Cover (in 2016)	Overlap with area deforested since 2006 (ha)	Share of deforested area
Agriculture	72,302	6%
Mining	28,150	2%
Aquaculture	11,046	1%
Others	735	0%
Total deforested area since 2006	1,140,536	100%

The second part of the analysis involved identifying the likely drivers in the areas where the new land cover itself did not point to a specific land use, i.e. on the areas of shrub and bare land which made up 49% of the deforested area. By analyzing the location of these areas relative to land use designations, it was possible to further categorize land use changes and to make inferences about the drivers. The following broad assumption were made:

- Bare land and shrub within timber plantation concessions (71,947 ha) was assumed to be associated with timber plantations;
- bare land and shrubs within areas licensed for oil palm (192,305 ha) were assumed to be associated with oil palm; and
- bare land and shrubs within areas licensed to mining were assumed to be associated with mining (84,190 ha).
- The remaining 50,457 ha of bare land was categorized as unlicensed land clearing. Remaining shrubs were categorized as overlogging/poor concession management if they were found within forest concessions (84,679 ha), and as illegal logging if not (76,789 ha).

Table 4.2 Current land use designations of shrub area that was forested in 2006 and inferred drivers of deforestation

Land-use designation	Shrubs overlapping with deforested area (ha)	Likely Driver
Outside State Forest Area with no license	28,257	Illegal logging
Protection Forest (HL)	7,511	Illegal logging
Ecosystem Restoration Concession (IUPHHK-RE)	142	Overlogging/Poor concession management
Natural Forest Management Concession (IUPHHK-HA)	78,070	Overlogging/ Poor concession management

Land-use designation	Shrubs overlapping with deforested area (ha)	Likely Driver
Timber Plantation Concession (IUPHHK-HT)	51,033	Timber Plantations
State Forest Area without License	28,026	Illegal logging
Conservation Area (KSA/KPA)	12,995	Illegal logging
Oil Palm License (HGU/IUP)	118,583	Estate Crops
Social Forestry License	6,467	Overlogging/ Poor concession management
Mining Exploitation License, CNC	66,001	Mining
Total Shrub Area overlapping with deforestation	397,085	

Table 4.3. Current land-use designations of bare land area that was forested in 2006 and inferred drivers of deforestation

Land-use designation	Bare land overlapping with deforested area (ha)	Likely Driver
Outside State Forest Area with no license	25,586	Unlicensed land clearing
Protection Forest (HL)	742	Unlicensed land clearing
Ecosystem Restoration Concession (IUPHHK-RE)	-	Unlicensed land clearing
Natural Forest Management Concession (IUPHHK-HA)	10,709	Unlicensed land clearing
Timber Plantation Concession (IUPHHK-HT)	20,913	Timber Plantations
State Forest Area without License	7,773	Unlicensed land clearing
Conservation Area (KSA/KPA)	5,278	Unlicensed land clearing

Land-use designation	Bare land overlapping with deforested area (ha)	Likely Driver
Oil Palm License (HGU/IUP)	73,723	Estate Crops
Social Forestry License	367	Unlicensed land clearing
Mining Exploitation License, CNC	18,190	Mining
Total bare land overlapping with deforestation	163,283	

Combining the two parts of the land cover analysis, leads to the estimate provided in Table 4.4. It should be noted, that a number of the assumptions used for bare land and shrub land (part 2 of the analysis) cannot be verified and may not be fully accurate. For example, in addition to inaccuracies in identifying land cover, some of the land use designations may have been made after deforestation had already taken place. Also, some of the deforestation attributed to illegal logging, may in fact be sanctioned by local licenses, that were not part of the analysis. The analysis also ignores potential drivers that were not identified through the consultation process. In spite of these caveats, the result of the analysis provides an indication of the relative scale of each driver, which helps to identify activities that can address deforestation in East Kalimantan.

Table 4.4. Estimated share of deforestation, by driver

Driver	Area Deforested since 2006 (ha)	Share of total deforestation
Oil Palm	576,188	51%
Timber plantation/ Poor Concession Management	156,000	14%
Mining	112,340	10%
Overlogging/Poor Concession Management	95,389	8%
Illegal Logging	76,789	7%
Agriculture	72,302	6%
Unlicensed land clearing	39,746	3%
Aquaculture	11,046	1%
Total deforested area since 2006	1,140,536	100%

4.1.1.1 Conversion of forest to oil palm

Indonesia's palm oil sector has long been criticized for causing deforestation and more recently has been identified as a leading contributor to greenhouse gas emissions (MOFR 2008). In recent years, the Indonesian palm oil industry has expanded rapidly, positioning the country as the largest global producer of palm oil. Indonesia supplies approximately half of the commodity globally from both large oil palm estates (accounting for approximately half of the production) and smallholdings (accounting for 35 percent of production).⁶ Growing demand for palm oil as cheap cooking oil especially from China and India, and increasingly as a biofuel, is likely to sustain the sector's attractiveness well into the future (World Bank 2010).

As land for expansion of large oil palm estates on the island of Sumatra has become less available, new development is being targeted at Kalimantan and Papua (World Bank 2010). East Kalimantan's area of oil palm in 2016 was 1.19 million ha⁷, up from 800,000 ha in 2012. The only other significant estate crop in East Kalimantan is rubber, which has remained fairly constant at only around 115,000 ha (Figure 4.1).

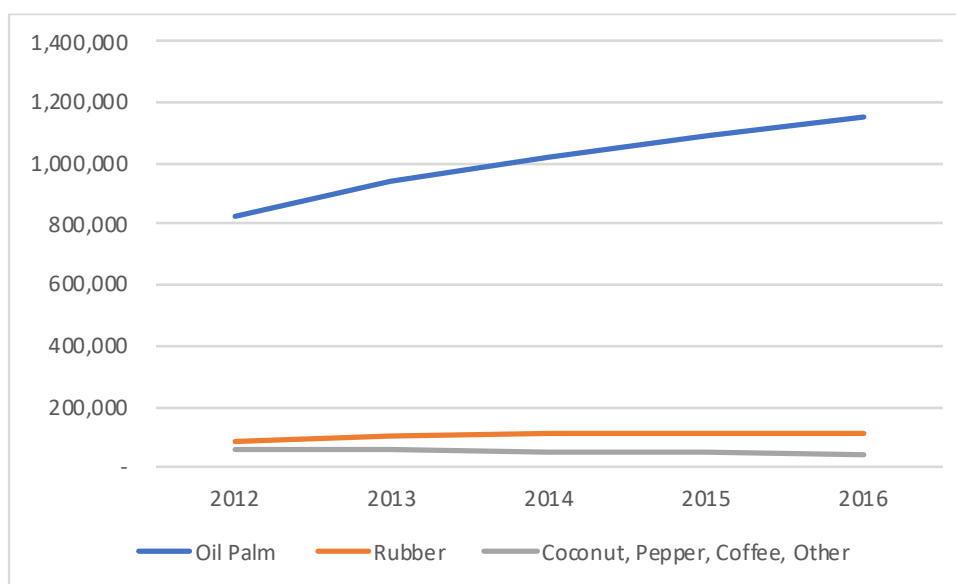


Figure 4.1 Estate crop area in East Kalimantan, 2012-2016 (ha)

While oil palm can be planted in a wide range of soils, estate companies often favor previously forested areas (Fairhurst and McLaughlin 2009). Based on the spatial analysis presented above, up to 51% of East Kalimantan's deforestation between 2006 and 2016 is associated with oil palm development. Of the total area that was deforested, 383,882 ha (34%) were covered by oil palm in 2016. Most of this is found within areas allocated for estate crop development, while 36,954 ha (3% of the deforested area) lies outside of the licensed area. Additional deforested area that

⁶ Pittman in Chelsea Petrenko, Julia Paitseva, and Stephanie Searle. "Ecological Impact Palm Oil Expansion in Indonesia". International Council on Clean Transportation. Washington D.C., 2016.

⁷ Evaluation of Estate Crop Development in East Kalimantan Second Quarter 2018 (presented by Head of Estate Crop East Kalimantan in Balikpapan on 31 July 2018)

was bare land or brushland found within areas licensed for oil palm expansion covered 192,306 118,074 ha, or 17% of the total deforested area.

A total of 3.2 million ha are currently allocated for oil palm development across East Kalimantan and the remaining forest in this area is 376,414 ha, or 6% of the total remaining forest area. While these forests are under most direct threat from conversion to oil palm, further expansion of oil palm is also likely to occur outside of the areas that are currently licensed. This includes unlicensed expansion as well as expansion associated with the issuance of further licenses.

Only a small portion of East Kalimantan's oil palm growers have achieved mandatory or voluntary certification. The Indonesian Sustainable Palm Oil (ISPO) standard, introduced in 2011 by the Government of Indonesia, is designed to ensure that all Indonesian oil palm growers conform to higher agricultural standards. Based on existing Indonesian legislation, it aims to improve the sustainability and competitiveness of the Indonesian palm oil industry, whilst contributing to the Indonesian government's commitments to reducing greenhouse gas emissions. It is mandatory for all oil palm growers operating in Indonesia to adhere to the Standard; however, so far an area of only 198,171 ha is ISPO certified in East Kalimantan (23 companies), or around 17% of the planted area. The Roundtable on Sustainable Palm Oil (RSPO) is the main voluntary certification standard palm oil, but the total RSPO certified oil palm area in East Kalimantan is only 137,083 ha, or about 12% of the planted area.

4.1.1.2 Conversion of natural forests to industrial timber plantations

Industrial tree plantation development is supported through the Ministry of Forestry's Industrial Forest Plantation (*Hutan Tanaman Industri*, or HTI) program, which was initiated in the late-1980s. The program was largely developed to supply the growing national pulp industry, and coincided with a productivity decline of many of Indonesia's natural forest timber concessions. However, in spite of significant government subsidies for planting, only a small portion of the areas cleared for plantations were properly planted and maintained (Barr 2001). In 2011, the Ministry of Forestry recorded an allocation of 249 HTI licenses covering a total of 10 million hectares nationwide. The main species planted are *Acacia mangium* and *Acacia crassiparpa* which are grown on six to seven-year rotations for pulpwood. East Kalimantan was among the first regions in Indonesia to have industrial timber plantation (HTI) licenses issued, with the first concessions appearing in 1984. By 2016, East Kalimantan had 42 HTI concessions licensed, covering 1.6 million hectares. The average concession size is over 40 thousand hectares, ranging from 9,000 to 200,000 thousand hectares.

While plantation development can take place on non-forested land timber plantations are associated with between 7% and 14% of the deforestation that occurred in East Kalimantan between 2006 and 2016. Of the total area that was deforested, 84,053 ha (7%) was covered by timber plantations in 2016. Additional deforested area that can be associated with timber plantations includes the deforested area within timber plantations that is currently brushland or bare land. This area covers 71,947 ha.

An issue of concern is the presence of 255,398 ha of remaining forests within areas allocated for timber plantation concessions. Legally, only highly degraded forest should be converted to timber plantations; however, in the past, lax enforcement of rules allowed concession holders to log the natural forests in their concessions (Kartodihardjo and Supriono 2000).

4.1.1.3 Poor management of natural forest concessions and illegal logging

Around 2.6 million hectares of forest is found within East Kalimantan's 64 forest management concessions (IUPHHK-HA). These provide timber mainly for the province's wood-processing industry, which is focused on plywood, and to a lesser degree on sawnwood production. Currently only a few of the existing logging concessions have voluntary SFM certificates, although this number has recently increased. A recent study indicates that, even the selective logging which concessionaires are meant to apply, while not always leading to deforestation, leads to significant forest degradation. The emissions derived from timber harvesting in East Kalimantan are estimated at 129 tCO₂e/ha⁸. By using Reduced Impact Logging techniques that are designed to preserve carbon stock (RIL-C), these emissions can be reduced by 40%⁹.

In addition to forest degradation from selective logging, there was also substantial loss of forest cover within logging concession areas during the reference period. For the purpose of the drivers of deforestation analysis, it was assumed that all deforestation within logging concessions that led to bare land or shrub land, can be attributed to poor management of the concession. This area, consisting of shrub and bare land, covers 88,778 ha or 8% of the total deforested area. It should be noted, however, that some of this area may be linked to other drivers and may be in a transition to a different (non-licensed) land use.

Around 7% of total deforestation between 2006 and 2016 took place in areas where logging was not sanctioned by appropriate land use licenses, including in protection forest and conservation forest areas (Table 4.5). While this forest loss, which covers 76,789 ha, may be due to a variety of drivers, for the purpose of the analysis, it is categorized as illegal logging.

Table 4.5. Estimated area of deforestation outside forestry concessions and estate crop areas 2006-2016

Land Use Zone	Logged Area (ha)
Outside State Forest Area with no license	28,256
Protection Forest (HL)	7,512
State Forest Area without License	28,026
Conservation Area (KSA/KPA)	12,995
Total (illegal) logging	76,789

⁸ Griscom et al 2014, Emissions performance from commercial logging in East and North Kalimantan. Global Change Biology Journal.

⁹ Ibid.

4.1.1.4 Deforestation due to agriculture

Around half of East Kalimantan's population lives in rural areas and many people practice a traditional form of shifting cultivation, or swidden agriculture. Increasing population pressure and cultural shifts have meant that this form of agriculture, in some cases, is not sustainable and may also lead to deforestation and forest degradation. Encroachment in these communities is often an expression of traditional land use practices without clear boundaries. Local communities often lack alternative livelihood options, and inadequate land rights decrease the incentive for long-term management.

There is a lack of quantitative data on the impact of encroachment on forests; however, encroachment by smallholder farmers is generally believed to have a small impact on deforestation in Indonesia, at least in comparison to the large-scale clearing associated with the expansion of industrial-scale plantations. At local levels there is evidence of small-scale clearing having significant impacts on deforestation, with specific crops having regional importance. The land cover analysis shows that agriculture is present on 72,302 ha of the deforested area (6% of the total). The analysis, however was not able to fully distinguish between large-scale and small-scale agriculture. Also, it should be noted that some land clearing by local communities would be aligned with legitimate land claims.

4.1.1.5 Mining

East Kalimantan is at the heart of Indonesia's coal production and the mining sector dominates the province's economy, accounting for 46% of its GDP in 2017 (followed by the manufacturing sector accounting for 19%). International and national demand for electrical power has driven the expansion of coal mining activities in East Kalimantan. Currently, the licensed area for exploration is 3,2 million ha¹⁰, or approximately one-fifth of the province's land area. Most of the over 1,400 mining licenses are small-scale national companies which obtained their permits from district governments, prior to 2016, when the right to issue mining licenses reverted to the province. The recentralization of mining licensing coincided with a dramatic decline in international demand for coal, with a subsequent severe impact on provincial and local government earnings. However, after reaching a low of USD 49 per ton in 2016, coal prices have recovered (Figure 4.2), and coal mining is likely to continue to put significant pressure on East Kalimantan's forests going forward.

¹⁰ Provincial Mine and Mineral Service of East Kalimantan, 2016



Figure 4.2 International coal prices (USD/MT) 2009 to 2018, Source: tradingeconomics.com

Mining operations can lead to a direct loss of forest cover, especially with surface (or open pit) mines where the topsoil including vegetation is removed prior to mineral extraction. Land reclamation is often difficult or poorly executed, leading to excessive erosion and preventing reestablishment of forest cover. In addition, road access and social problems associated with mining such as conflicts over land, ethnic tensions, in-migration of laborers, and land squatting are common and can lead to indirect impacts on forest cover (McMahon et al. 2000). While mining is known to lead to deforestation at local scales, the cumulative impacts of mining on deforestation in Indonesia have not been fully assessed, in part because of lack of data over the extent of mining operations. A recent study using ultrahigh-resolution satellite imagery to monitor forest change in Indonesia, found that coal mining alone contributed 2 per cent of forest loss in Indonesia.¹¹

The spatial analysis shows that mining may have contributed up to 10% of deforestation in East Kalimantan over the 2006 to 2016 period. This includes areas identified as mining area within the deforested area (28,150 ha), and shrubs and bare land within areas allocated to mining that were previously forests. Remaining forest in current mining concessions is 249,686 ha, or 4% of the total.

4.1.1.6 Aquaculture in mangrove forests

Mangrove forests occur along East Kalimantan's coastline and extensive deltas, and they provide important ecological and economic functions as well as being stores of carbon. Based on spatial analysis, the total area of mangrove forests covered approximately 170,000 ha in 2017, which is a decrease of nearly 7% from its extent in 2006. Conversion to fish and shrimp ponds is regarded as the greatest single cause of mangrove degradation and decline.¹² Other causes include conversion to agriculture, development of industrial and urban areas, and logging for wood and

¹¹ Chatham House. The Royal Institute of International Affairs. "The Impact of Mining on Forests: Information Needs for Effective Policy Responses". Energy, Environment and Resources Meeting Summary. 3 June 2015

¹² Hamilton, S. 2015. Mangrove forest to shrimp farm conversion in Indonesia from 2000 to 2012. A report prepared for the Moore Foundation. Department of Geography and Geosciences, Salisbury University, Salisbury.

charcoal. The recorded change in mangrove forest area over the 2006-2016 period is 15,787 ha, which is small compared to overall forest losses; however, consultations with local stakeholders have indicated that a significant portion of remaining mangrove area is under threat from the expansion of aquaculture. There are few conservation efforts for mangrove forests in East Kalimantan, and only a few mangrove areas are incorporated within legally protected areas. Consequently, large areas of mangroves are left vulnerable to human pressures¹³.

4.1.1.7 Fire

Fires occur across administrative land use zones, and are linked to several of the drivers described above, in particular to land-clearing for estate crops and agriculture. Fires occur annually in East Kalimantan, but periods of prolonged drought, such as those linked to El Niño - Southern Oscillation (ENSO) events, can lead to severe and large-scale fires that cover significant areas. While the causes of fire are complex and are not exclusively anthropogenic, the use of fire for land clearing appears to be an important proximate cause. Fire is used for large-scale land clearing, for example for pulpwood and oil palm estates, as well as by farmers to clear land and burn agricultural waste (Schweithelm, 1998, Boonyanuphap et al. 2001). Areas that have been previously logged-over are particularly prone to burning, as logging leaves behind dead biomass, which serves as fuel for fires (Lennertz and Panzer, 1983). Peat fires are linked to clearing and drainage of peat areas for cultivation, including for oil palm and timber plantations.

In 1982/83, fires destroyed about 3.5 million ha of forests in East Kalimantan^{14,15}. In 1997/98, after a prolonged El Nino event, fires are reported to have burned approximately 5 million ha of forests in the province¹⁶. Yulianti et al (2012) stated that in 2004, East Kalimantan had the highest numbers of hotspots (5,440 fires) compared to the other provinces in Kalimantan. It was found that the active fires throughout Kalimantan in 2002, 2004, 2006, and 2009 occurred when the total precipitation of the three driest months (August, September, and October) was less than 100 millimeters (Putra et al, 2011 cited in Yulianti et al., 2012).

During the 2006 to 2016 period, based on the years for which land cover data are available, the average annual forest area burned was 15,552 ha, with substantial variation between years. Thus in 2006, 2009, 2014 and 2015 the forest area burned was greater than 20,000 ha, while in 2011, 2013, and 2016 the area was less than 5,000 ha (Table 4.6 and Figure 4.3). These numbers are significantly lower than those cited in the above paragraph, as only 25% of the area burnt is classified as forest under the ER Program, while around 45% is classified as brush, which others may define as forest (Table 4.6). While emissions from fire on brushland are not accounted for under the ERP carbon accounting framework, the ER Program recognizes the need to address the emissions from land fires as they make up a significant share of LULUCF emissions. Also, there is likely to be some risk of fires spreading to secondary forests where they can lead to forest degradation, should climatic conditions favor this.

¹³ WRI: <http://www.wri.org/blog/2015/02/satellite-data-reveals-state-world's-mangrove-forests>

¹⁴ Malinau, Tarakan, Nunukan, and Bulungan were still part of East Kalimantan

¹⁵ <http://www.fire.uni-freiburg.de/Manag/CiF-Ch-8-East-Kalimantan.pdf>

¹⁶ Malinau, Tarakan, Nunukan, and Bulungan were still part of East Kalimantan

Table 4.6. Land cover burned, 2006-2016 (ha)

Land Cover	2006	2009	2011	2012	2013	2014	2015	2016
Primary Forest	403	562	113	326	197	1,041	775	13
Secondary Forest	26,059	21,188	8,322	12,046	8,445	21,914	19,207	3,808
Forest Plantation	2,719	2,970	2,110	1,473	1,691	5,198	5,209	1,985
Estate Crops	7,142	8,195	1,487	1,592	2,069	14,181	14,548	2,669
Agriculture land	8,813	13,195	5,663	6,205	1,258	4,562	4,528	2,048
Shrubs	57,707	43,800	12,112	18,673	17,575	37,131	35,608	8,219
Savana & Bareland	4,971	4,826	1,302	2,466	1,591	3,488	7,643	4,560
Sum	107,814	94,736	31,108	42,781	32,826	87,515	87,519	23,301

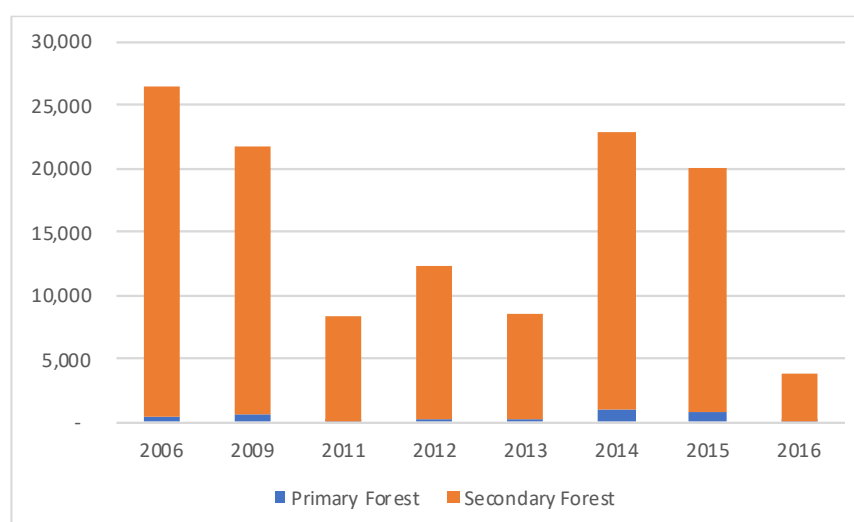


Figure 4.3 Deforestation due to fire, 2006-2016 (ha)

4.1.2 Underlying causes of deforestation and forest degradation

Cross-cutting weaknesses in forest and land governance

Weak governance underlies most deforestation in East Kalimantan and cuts across the eight proximate drivers. Key governance issues that drive deforestation include weaknesses in the land and resources tenure framework, which includes weaknesses in the licensing regime, and lack of formal recognition of customary territories. In addition, weaknesses in the administration of forest area facilitate illegal land uses and overlogging. These underlying governance issues are discussed in detail in Section 4.4 and summarized here.

Poor land governance and resulting overlapping land claims can in part be attributed to lack of clarity in the underlying legal framework; to a lack of accurate data and information; and to a lack of coordinated sectoral development plans. Land governance is further impeded by the unclear status of land ownership, lack of clear demarcation of state forest land boundaries, lack

of recognition of customary and local rights to land, and lack of ownership at the local level. This has led to conflict between different land claimants, and underinvestment in long-term sustainable land uses.

A significant area of East Kalimantan is allocated to private companies through land use licenses, making the licensing regime an important component of land governance. Most of East Kalimantan's remaining forests are within areas that are licensed to forestry, mining, or estate crop companies and this is where most deforestation has occurred. Lack of transparency in license allocation, poor coordination across sectors, shifts in institutional responsibility for issuing licenses, and the lack of a single map have all contributed to overlapping licenses, to a high cost of business, to conflict with local land users, and ultimately to poor accountability over land and forest management.

A critical shortcoming in Indonesia's forest governance framework is the current weakness of forest supervision at the local level. A direct result of this, are the high level of illegal logging and the deforestation associated with poor concession management and overlogging. Illegal land clearing is evidenced by the existence of land uses outside of their designated areas as shown in Table 4.7. The land cover analysis revealed that around 11% of the deforestation since 2006 occurred through land uses that were outside of their designated areas. If poor management of forestry concessions is included, which arguably also is in contravention of existing regulations, poor land governance appears to be associated with at least 296,409 ha of deforestation between 2006 and 2016, or 26% of the total.

Government capacity to plan, monitor, and manage activities in forestry areas is critical to translating national level policy developments to the local level, and to achieving positive outcomes for forests and local communities. Implementation of acceptable forest management practices has been ineffective due to misaligned institutional capacity at the local level, including underfunding and understaffing. Regional governments, which have been in charge of managing Protection Forests, have not performed well in this role. Meanwhile, responsibility for the management of Production Forest areas has been largely with concession holders who have acted with little government oversight in the past. The development of the FMU program is seen as an important pathway for improving forest governance. However, the recent transfer of FMU responsibility from the districts to the province through Law No. 23 of 2014 on Local Government, which went into effect in 2016, means that many of the FMU institutions are still at a very early stage of development.

Table 4.7. Unlicensed land uses and associated deforestation

Unlicensed Land Use	Associated Deforestation 2006-2016 (ha)
Timber plantations in Natural Forest Management concessions	3,932
Oil palm in Natural Forest Management concessions	4,432
Agriculture in Natural Forest Management concessions	9,342

Unlicensed Land Use	Associated Deforestation 2006-2016 (ha)
Oil palm in Timber Plantation Concessions	5,010
Agriculture in Timber Plantation Concessions	11,878
Timber Plantations on State Forest land without permit	29,823
Agriculture on State Forest land without permit	2,717
Timber plantations within conservation areas	2,099
Agriculture within conservation areas	5,153
Timber plantations on areas licensed for oil palm	9,500
Agriculture on areas licensed for oil palm	21,308
Timber plantation on mining areas	5,647
Oil palm on mining areas	4,824
Agriculture within mining areas	8,567
Total deforestation associated with unlicensed activities	124,231

4.1.3 Underlying drivers of deforestation within licensed areas

Weaknesses in forest and land governance also underlie deforestation within areas that are allocated to private companies through legitimate forestry concessions and estate crop licenses. Additional underlying drivers of deforestation that are important within these areas, are weak policies for the protection of remaining forests, and a lack of incentives for sustainable management practices.

Key policies that should improve the protection of remaining forest and that should lead to improved logging practices are under development and require finalization and implementation. Policies to protect remaining forests within timber plantation concessions and estate crop areas are currently weak, facilitating forest clearing in these areas. MoEF has issued a number of regulations to support the protection of High Conservation Value Forests (HCVF) within forestry concessions and the Ministry of Agriculture and the National Land Agency have issued a joint letter in support of HCVF implementation within areas licensed for estate crops. A key target is the protection of 640,000 ha of natural forests and 50,000 ha of peatlands by 2030 in the allocated plantation areas.

Current logging practices within forest management concessions (HPH) lead to significant residual damage to remaining trees, causing forest degradation and leading to emissions that could be avoided through the implementation of Reduced Impact Logging (RIL) techniques.

Reduced Impact Logging-Carbon (RIL-C) regulations are being developed, and will be applied to all production forest concession holders. RIL-C is an intensive logging system that involves the use of low impact techniques and equipment, with close monitoring to ensure the minimal possible damage to soil and remaining forest stands, and thus the minimal release of carbon. The implementation of RIL-C is expected to reduce emissions by up to 40 percent from the Business as Usual baseline for logging practices. To date, 11 forestry concession holders have implemented RIL-C. The policy still needs to become mandatory for all forestry concession holders and needs to be disseminated and properly implemented.

Private companies generally have little incentive to implement sustainable forest management practices and to protect remaining forests within their areas. In part this is due to weak governance which creates an unlevel playing field, and which entails weak enforcement of existing rules. Responsible producers find themselves competing in commodity markets for timber and oil palm where a significant share is produced unsustainably. In addition, the weak governance framework imposes high costs on production as companies are forced to navigate a complex regulatory environment and often lack legal certainty for their investments. For example, the costs of dealing with overlapping land claims can be significant. In addition to high costs that can be addressed partly through governance improvements, companies also lack positive incentives for sustainable management. Companies' financial benefits of protecting forests tend to be low, while the costs of compliance can be high. Experience in Indonesia and elsewhere has shown that market premiums for sustainable production of timber and palm oil tend to be small.

4.1.4 Underlying drivers of deforestation linked to local communities

Encroachment is facilitated by poor forest protection and is driven by population pressure and a lack of alternative livelihood opportunities. Productivity of farming in East Kalimantan tends to be low, especially as smallholders have only limited access to technology and finance. This promotes extensification of agriculture, requiring more land area and often replacing natural forests. This is evident in smallholder oil palm cultivation where yields tend to be significantly lower than in large estates. In areas near mangroves, communities often have few alternatives to opening land for aquaculture; and in peatland areas, communities may not have access to sustainable paludiculture technologies.

Weak tenure rights for local communities also inhibit good forest management. Traditional practices can play an important role in protecting natural forests, but lack of formal recognition of land rights threatens these practices and there is evidence that stronger tenure will lead to improved outcomes for forests. In addition to undermining traditional management practices, weak tenure impacts overall land governance, and leads to conflict between local communities and other land users. East Kalimantan has only recently adopted the process for the recognition of adat communities and so far, implementation has been slow, with only four territories recognized by 2018.

4.1.5 Underlying drivers of land and forest fires

Climate factors are an important driver of fires. Severe and wide-spread fires occur during periods of prolonged drought, such as those linked to El Niño - Southern Oscillation (ENSO)

events. During ENSO years, rainfall in the dry season is normally far below normal, making forests and brushlands prone to burning.

An underlying driver of anthropogenic fires is poor land governance, which reduces accountability and undermines fire monitoring and control. In addition, poor management of natural forests and overlogging leads to a buildup of dead biomass, which serves as fuel for fires allowing them to burn out of control. Drainage of peat areas for cultivation, including for oil palm and timber plantations, allows otherwise wet peatlands to burn. Smallholder farmers, including swidden cultivators, may not have access to technologies that facilitate land clearing without the use of fire.

Following the fires of 1997, the government implemented a zero-burning policy, banning the use of fire for land clearing. In 2009, the Provincial Government issued Local Regulation No. 5/2009 on Forest and Land Fire Control, which is currently being revised. The provincial government has also established a forest and land fire control unit at the management unit level and has strengthened the Community Fire Prevention program (Masyarakat Peduli Api). Forest and Land Fire Patrol Posts have been established in 15 villages in East Kalimantan covering 90 villages. However, additional efforts are needed to build fire management and monitoring capacity at the plantation and farmer levels.

Table 4.8. Drivers and underlying drivers of deforestation and forest degradation

Proximate Causes	Key Underlying Drivers
Mining	Poor land governance Ineffective forest supervision and administration
Timber plantations	Poor land governance Ineffective forest supervision and administration Weak policies for forest protection Lack of incentives for sustainable management practices
Estate crops	Poor land governance Ineffective forest supervision and administration Weak policies for forest protection Lack of incentives for sustainable management practices
Agriculture/ Encroachment	Poor land governance Ineffective forest supervision and administration Limited alternative livelihood opportunities for local communities
Aquaculture	Poor land governance Ineffective forest supervision and administration Limited alternative livelihood opportunities for local communities
Forest and land fires	Poor land governance Ineffective forest supervision and administration Lack of fire management capacity and lack of alternatives for land clearing

Proximate Causes	Key Underlying Drivers
	Climate factors
Unsustainable logging practices	Poor land governance Ineffective forest supervision and administration Weak policies for forest protection Lack of incentives for sustainable management practices

4.1.6 Existing activities and policies that can lead to conservation or enhancement of forest carbon stocks

The ER Program coincides with, and supports, important reforms within Indonesia's forest sector. More transparency and stakeholder involvement, combined with a process of decentralization, have led to an important push toward addressing many of the underlying drivers that are discussed above. Of particular importance are potentially transformative changes in the institutional framework for forest governance, with a shift from the center to the province level in the form of Forest Management Units. Also, there are important national and province-level efforts to address the broader land governance issues, such as overlapping land rights, lack of access for local communities, and resulting conflict. At the same time, there are significant changes in private sector governance with greater focus on sustainability, driven in part by market pressure. Many of the ER Program's activities are integrated into national and province-level strategies and development plans. The ER Program also builds on a number of ongoing partner activities in East Kalimantan.

The main land governance reforms, which are described in Section 4.4 below, are as follows:

- The ongoing delineation of the boundaries of the State Forest Area. Clear boundaries between the State Forest and lands that lie outside, as well as clear demarcation of land use designations within the State Forest, are expected to lead to improved legal certainty in forest management, and to increase public recognition of community rights.
- The "One Map Policy" (*Kebijakan Satu Peta*), which is expected to lead to more transparent, better informed, and less contested land allocation.
- The establishment of discrete Forest Management Units, which will oversee management of the State Forest areas, including supporting the delineation of the State Forest, overseeing concession companies, and building partnerships with communities.
- Acceleration of social forestry programs, which provide local communities access to forest land and provide sustainable livelihood alternatives.
- Implementation of recent constitutional court decisions which recognize the land rights of adat communities.
- The moratorium on the issuance of new land use licenses in peatland and primary forest areas.
- The review and revocation of mining licenses that are not considered "Clean and Clear".
- Implementation of policies related to the sustainable development and management of estate crops.
- The establishment of land use zones within national parks that allow adat communities to practice traditional livelihoods.

The Government has taken a number of far-reaching measures to minimize unsustainable or illegal forest production practices. Indonesia has a mandatory national system for the certification of forest sustainability known as PHPL. It also has a national chain of custody system which ensures the legality of timber (SVLK) which in turn has allowed Indonesia to be the first country to successfully complete a legal timber trade agreement with the EU. To address illegal logging, the government of Indonesia has undertaken hundreds of anti-illegal logging operations since 2000.

Ongoing partner activities in East Kalimantan

The ER Program has been designed in consultation with a number of partner organizations that have programs in East Kalimantan, and that will be providing investment during the program period. Broadly the partners are engaged in activities that include the resolution of land use disputes, support for improved land governance, support to FMUs, regulatory improvement, and support for improved practices of private sector stakeholders (Table 4.9).

The Nature Conservancy (TNC) has been working in Indonesia for 25 years. TNC's Indonesia Terrestrial Program (ITP) has five 5 main implementation strategies:

- Corporate Sustainable Practices (CSP): Promoting sustainable practices in resource-based industries with particular focus on natural forest logging concessions, forest plantations, and oil palm plantations.
- Community-based Natural Resources Management (CBNRM): Strengthening community engagement in sustainable natural resource management while improving the community's well-being.
- Conservation Land Management (CLM): Developing models and approaches for managing protected areas, particularly protection forests (hutan lindung) and essential ecosystems.
- Endangered Species Habitat Conservation (ESC): Supporting endangered species habitat conservation, particularly orang utan, through science, policy, and best management practices.
- Jurisdictional Forest & Climate Initiative (JFCI): Demonstrating jurisdictional approaches in green development at the provincial/district level.

For much of the past decade, the ITP has focused on implementing these strategies in the Indonesian province of East Kalimantan. TNC has helped 27 natural forest concessions with the total of 2,772,860 hectares achieve mandatory and FSC certification. TNC's funding for the East Kalimantan initiative is mostly obtained from the Packard Foundation (CLUA). The investment plan of TNC for East Kalimantan estimates USD 1,624,497 for period of 2020 – 2025.

The Gesellschaft für Internationale Zusammenarbeit (GIZ) FORCLIME program in Indonesia aims to reduce greenhouse gas emissions from the forest sector while improving the livelihoods of Indonesia's poor rural communities. GIZ FORCLIME plans to invest approximately USD 1 million in East Kalimantan for the period 2020 – 2025.

The World Wild Fund (WWF) in East Kalimantan has been facilitating numerous forest conservation, community, and biodiversity projects. The focus area of WWF East Kalimantan is

in West Kutai District, Mahakam Ulu and Derawan Islands. The program in Derawan Islands is focused on marine protected areas, whereas the programs in West Kutai and Mahakam Ulu are focused on biodiversity conservation. WWF has developed an MRV REDD+ portal for East Kalimantan (mrv.kaltimprov.go.id). WWF plans to invest USD 264, 678 in East Kalimantan between 2020 and 2025.

The Global Green Growth Institute (GGGI) is an international organization headquartered in Seoul, South Korea. The organization aims to promote green growth, a growth paradigm that is characterized by a balance of economic growth and environmental sustainability. GGGI's role and objective in Indonesia is to assist the Government of Indonesia in delivering green growth by driving investment and designing green projects with social, environmental and economic benefits for the people of Indonesia. GGGI plans to invest USD 316,946 in East Kalimantan between 2020 and 2025.

East Kalimantan is a member of the Governor Climate Forum Task Force (GCF Task Force). The GCF aims to support the political leadership of committed Governors in the fight against climate change and deforestation. It also seeks to strengthen and support the actors involved in building East Kalimantan's low emissions development programs. The Task Force plans to invest USD 105,214 between 2020 and 2025.

The World Bank's Forest Investment Program (FIP) supports the Kendilo Forest Management Unit (KPH), located in Paser District East Kalimantan. The program aims to support the FMU by strengthening the expertise of local governments, community organizations, forest management permit holders and strengthening the partnership among them. The program also aims to support regulatory reforms to strengthen FMU performance.

Belantara Foundation is an Indonesian grant-making institution formed in 2014 by Asia Pulp and Paper Group (APP) with the goal of delivering wide-ranging community and conservation results. Belantara Foundation plans to invest USD 157,341 in East Kalimantan to address resource management issues in the Essential Ecosystem Areas (KEE) in Kalimantan. Belantara has programs in East Kutai and Kutai Kartanegara.

Table 4.9. Donor/Bilateral/Partners Projects' Core Activities in East Kalimantan

Partner Programs	Resolution of Land Use Disputes	Support for Land Governance	FMU Financial support, business planning, and regulatory improvement	Support for improved practices of private sector stakeholders
FORCLIME	✓	✓	✓	.
GGGI Indonesia (Norwegian Embassy)		✓	✓	✓
Packard/TNC	✓	✓	✓	✓
FIP (World Bank)	✓	✓	✓	
Belantara	✓	✓	✓	✓
WWF	✓	✓	✓	✓
GCF Task Force			✓	✓

4.2 Assessment of the major barriers to REDD+

A number of the underlying drivers of deforestation discussed above, also present barriers to the implementation of policies, including those that are linked to REDD+. Key barriers are as follows:

Ineffective land governance and weak tenure. Land governance been hampered by a lack of accurate data and information and by a lack of coordinated sectoral development plans. Land governance is further impeded by the unclear status of land ownership, lack of demarcation of state forest land boundaries, lack of recognition of customary and local rights to land, and lack of ownership at the local level. As noted, this has led to conflict between different land claimants, and underinvestment in long-term sustainable land uses. According to the National Forestry Plan (RKTN), up to 15% of the State Forest Area cannot be effectively used due to ill-defined land use rights and conflicting claims. Lack of clear accountability for specific forest areas makes it difficult to efficiently target interventions and can be a barrier to channeling incentives such as performance-based REDD+ funding to the right stakeholders.

High opportunity costs of REDD+. According to some private sector stakeholders, an underlying driver of deforestation is the lack of incentives for implementing more sustainable management practices. In some cases, the short-term benefits associated with deforestation also outweigh the incentives that REDD+ payments can provide. Where deforestation occurs illegally, law enforcement would be an effective strategy for REDD+. However, REDD+ funding alone may not be able to compete with the private economic benefits of, for example, legally converting forest to oil palm plantations or mining sites. These activities provide significant financial returns, and protection of forests- including sustainable management practices such as reduced impact logging and voluntary certification- are often seen as incurring significant costs, without direct benefits. This problem is compounded by the lack of differentiation of commodity prices on the basis of sustainability. In some cases, REDD+ also competes with substantial public benefits. East

Kalimantan is pursuing economic development and the improvement of people's welfare, and emission reduction efforts, such as REDD+, need to be pursued in line with economic growth.

Coordination issues between government levels and between sectors. Coordination across sectors remains a challenge in Indonesia, especially for the land-based sectors. Separate ministries continue to be responsible for mining, agriculture, and forestry, and conflicts in the legal frameworks of each sector as well as overlapping land claims are a barrier to sustainable land use. Government capacity to plan, monitor, and manage activities in forestry areas is critical to translating national-level policy developments to the local level and to achieving positive outcomes for forests and local communities. This is particularly true for REDD+ with its added technical requirements, such as social and environmental safeguards, MRV, and benefit sharing.

4.3 Description and justification of the planned actions and interventions under the ER Program that will lead to emission reductions and/or removals

4.3.1 Description and Justification of Key Activities

The ER program will support a combination of enabling conditions and promotion of sustainable management practices that will directly address the underlying drivers of emissions resulting from sectoral activities including, timber plantations, estate crops, subsistence agriculture, aquaculture, and unsustainable logging practices. The program design considers the distribution of remaining forests, the threats to those forests, and the key stakeholders involved in the respective areas.

Components 1 and 2 address the two cross-cutting governance issues that were identified in the drivers of deforestation analysis: weak land governance and weak forest supervision and administration. These issues underlie much of the deforestation associated with each of the eight proximate drivers. The component builds on the significant ongoing reforms taking place at the national level and within East Kalimantan. The proposed governance improvements are essential for achieving long-lasting impacts and form an important part of the strategy for managing risks of reversal and for producing equitable outcomes and non-carbon benefits. This component will also contribute to improving the incentives framework for sustainable investment by creating a more level playing field.

Component 1 directly addresses issues related to overlapping licenses and to conflict. Component 2 strengthens the capacity of the government to protect remaining forests. Within the State Forest Area, this will be achieved by strengthening the capacity of forest management institutions to oversee the State Forest Area. On land outside of the State Forest, the Program will strengthen the role of villages in implementing sustainable development and the role of government agencies in the administration of estate crops.

Component 3 is concerned with the management practices of oil palm and forestry companies. The ER Program will work with key actors to support them in adopting and implementing sustainability approaches, centered around the recently developed HCV and RIL-C policies. In addition, the component includes activities for addressing the underlying drivers of fire through

technical assistance to companies for fire prevention and support for Community Based Fire Management and Monitoring Systems (CBFMMS).

Component 4 addresses deforestation linked to encroachment and agriculture mainly by providing alternative livelihood opportunities. The component will support the government's social forestry programs, as well as partnerships around conservation areas. The component will seek to provide sustainable livelihood opportunities to local communities, including through village development programs, thereby addressing a key driver of encroachment.

Component 5 includes all activities related to program management, including monitoring and evaluation. Annex 4.1. describe result chains of project development objectives and Annex 4.2. provides an overall summary of the key activities and indicators for the implementation of Components 1 to 4. Table 4.10 provides an overall summary of how the ER activities respond to the underlying drivers of deforestation and forest degradation.

Table 4.10. Overall summary of how the ER activities respond to the underlying drivers of deforestation and forest degradation

Key Underlying Drivers	Activities to address drivers	Proximate Drivers Addressed
Weak land governance	Component 1: <ul style="list-style-type: none"> • Strengthening the licensing regime • Dispute Settlement • Support for the recognition of adat land • Strengthening village spatial planning 	All
Ineffective forest supervision and administration	Component 2: <ul style="list-style-type: none"> • Strengthening management capacity within the State Forest Area through FMU development • Strengthening provincial and district governments to supervise and monitor the implementation of sustainable Estate Crops 	All
Weak policies for forest protection	Component 3: <ul style="list-style-type: none"> • Implementation of HCV policies for Oil Palm Estates • Implementation of HCV and RIL-C policies for Forestry Concessions 	Estate crops, timber plantations, unsustainable logging

Key Underlying Drivers	Activities to address drivers	Proximate Drivers Addressed
Lack of conducive incentives framework for sustainable management practices	<ul style="list-style-type: none"> • Technical support and other benefits received through the benefit sharing mechanism • Reduced investment cost and improved investment climate through improved governance (Components 1 and 2) 	Estate crops, timber plantations, unsustainable logging
Limited alternative livelihood opportunities for local communities	<p>Component 1:</p> <ul style="list-style-type: none"> • Improved land access through social forestry <p>Component 4:</p> <ul style="list-style-type: none"> • Sustainable Alternatives for Communities 	Agriculture/ encroachment, aquaculture (mangrove loss)
Lack of fire management capacity and lack of alternatives for land clearing	<p>Component 1:</p> <ul style="list-style-type: none"> • Integration of community-based fire management into village plans <p>Component 2:</p> <ul style="list-style-type: none"> • FMUs to focus on supervising, facilitating, and monitoring the implementation of Fire Prevention and Control activities carried out by concessions and local communities. <p>Component 3:</p> <ul style="list-style-type: none"> • Technical assistance to companies for fire prevention. • Support for Community Based Fire Management and Monitoring Systems (CBFMMS) <p>Component 4:</p> <ul style="list-style-type: none"> • Support for sustainable swidden agriculture that does not use fire for land clearing 	Fire

Component 1: Forest and Land Governance

As discussed in Section 4.4, Indonesia is undergoing critical reforms related to land governance and there is an opportunity for supporting on-the-ground practical processes that complement wider policy developments. The ER Program will focus on four key aspects that support

improved land governance: improvements to the licensing regime, dispute resolution, the recognition of customary land, and village planning. In addition to leading to significant emissions reductions, it is expected that this component will provide important non-carbon benefits to local stakeholders, including concession companies and local and customary communities.

1.1 Strengthening the licensing regime

The licensing moratorium, which was recently confirmed through Governor Regulation 1 of 2018, provides a window of opportunity for advancing reforms related to licensing processes. With 53% of remaining forests located within areas that are licensed to forestry or estate crop or mining companies, the activities under this component are expected to have significant impacts on deforestation rates. The component will monitor the enforcement of the moratorium, will strengthen transparency in licensing, and will support the review and revocation of existing licenses. Further, the ER Program will support the expansion of area under social forestry licenses. Additional interventions related to the licensing regime will take place under Component 3, which engages forestry and estate crop companies, and which includes the rollout of policies for the protection of remaining forests within licensed areas.

The ER Program will monitor the moratorium on licensing (Governor Regulation 1/2018) to ensure that it continues to be enforced. This will protect forests that are potentially at risk of conversion. The regulation covers mining, forestry, and estate crop licenses.

The Provincial Investment and Licensing Integrated Service (DPMPTSP) will lead the development of a policy to strengthen information management and documentation related to land-use licensing processes. The policy development will be conducted through consultation with the mining, estate crop, agriculture and forestry sectors. Agencies involved in licensing processes will be empowered to manage and provide information on land-use licenses and licensing processes. All spatial data will be linked to the “one map” data being developed by the central government (Act No.4/2011 on Geospatial Information).

Permits for forestry, mining, and estate crops will be reviewed and revoked where applicable, leading to clearer land-use boundaries. The Provincial Mine and Energy Service will revoke mining permits that are not “clean-and-clear”. The total mining permits to be withdrawn are 809 out of 1404 permits. Up to now, 405 permits have been revoked, and the other 404 permits are being examined. The ER program is expected to accelerate and enforce the process of revocation. The review of estate crop permits will be led by the Provincial Estate Crop Service. There are 373 licenses for estate crops, some of which overlap with other existing licenses or are found inside areas that are off-limits due to the moratorium. Concessions found inside these areas will be reviewed and boundaries will be amended by the Provincial Estate Crop Service. The results of reviews will be published.

The acceleration of social forestry licenses will be facilitated by MoEF through the Directorate General for Social Forestry. Social forestry programs that will be promoted are Village forests (*Hutan Desa*), community forests (*Hutan Kemasyarakatan*), community-based timber plantations (*Hutan Tanaman Rakyat*), customary forests (*hutan adat*), private forests (*hutan rakyat*), and forest partnerships (*kemitraan*). The target of the social forestry program is 341

licenses delivered by 2024. The targeted area for social forestry is based on indicative maps for social forestry programs developed by MoEF (PIAPS). The facilitation will be supported by the Provincial Forestry Service through the working group of social forestry, and by the FMUs.

1.2 Dispute Settlement

The sub-component will accelerate and enforce land tenure settlements for communities in forest areas. This process, which is an integral part of the national Agrarian Reform Program (TORA), will be facilitated and mediated by the Forestry Service with the guidance of relevant Ministries.

As part of program preparation, a participatory assessment, involving adat communities, will be conducted. This will map existing and potential conflicts, identify existing mechanisms for settling land disputes between the government and adat communities, and assess indigenous traditions and knowledge for conflict handling and dispute resolution. The assessment will feed into the development of guidelines for community-based conflict handling and resolution, produced in close consultation and with the consent from adat communities, and the provincial and district governments.

The Provincial Forestry Service is in charge of mediating land tenure disputes, and will conduct focus group discussions and consultations with relevant stakeholders, advancing and resolving disputes where possible.

To address overlaps of community activities with concessions that are near forest conservation areas, the ER Program will support forest conservation partnerships. These are regulated under Ministry Decree No P.83/2016 on Social Forestry, which aims to reduce conflict areas between communities and concession owners. Under the regulation, communities are allowed to partner with national parks and other conservation areas. This activity will be led by Provincial Forestry Service which will conduct conflict mediation followed by livelihood development activities (described under Component 4).

The social forestry programs will be designed to reduce tenure conflicts in existing concession areas. By providing regulated access rights and livelihood opportunities, social forestry licenses are expected to reduce conflict. The Forestry Service will organize consultations with academics and other experts to develop the social forestry program as an option for dispute resolution.

To address any overlapping areas between forestry and mining or estate crops, the program will seek regulations by the Governor to settle disputes. A governor regulation on disputes is being drafted and under discussion by stakeholders. The Economic Bureau of the Governor's Office will lead the policy development and facilitate the process until the regulation is signed by the Governor.

Conflicts will be further addressed through a number of mitigation actions, such as:

- the development of joint decrees
- supporting and refining existing local conflict handling protocols

- developing the FGRM which will include a mediation mechanism
- identification of tenurial conflicts by FMUs
- identification and assessment of existing conflict resolution mechanisms
- enhancement of communication between community/customary leaders with company representatives related to the management of HCV areas
- capacity building of stakeholders including training for paralegals for community-based conflict handling mechanisms

1.3 Support for the recognition of adat land

The ER Program will support the implementation of recent regulations concerning the recognition of Adat Law Communities and their territories. Specifically, the East Kalimantan Provincial Government will accelerate the settlement of customary rights and control of land inside forest areas, in accordance with the mechanism stipulated in East Kalimantan Regional Regulation No. 1/2015.

District and City Governments will establish Adat Law Community Committees, which form an important step in the adat recognition process. The Provincial Government, along with District and City Governments will implement Article 14 of East Kalimantan Regional Regulation No. 1/2015, which deals with reducing the number of conflicts between adat communities and the state, or companies.

The Provincial Government and district/municipal governments will be encouraged to actively identify adat territories through participatory mapping. The ER Program will facilitate participatory mapping for 200 villages. Forest Management Units will support this process by assessing and recording adat claims within the State Forest Area, as part of the process of carrying out social inventories within their boundaries.

1.4 Strengthening village spatial planning

The ER Program will develop guidelines and regulations for integrating REDD+ activities into village spatial planning, and will support the integration of emission reduction activities into village development plans. The activity will be carried out by the District Community Empowerment and Village Government Service (DPMPD), which will support communities in integrating REDD+ activities into village spatial and development plans. Facilitation will include community training to develop guidelines for village development plans and village spatial planning. The budget will be derived from district and provincial government budgets. The facilitation may be supported by development partners, such as TNC and TFCA.

The ER Program will build the capacity and skills of village institutions to integrate low emissions development planning into village development plans. At the village level, ER program activities will be integrated into village development plans. The establishment of Green Villages, or *Kampung Iklim* aims to reduce emissions based on village development plan. The activity will target 150 priority villages throughout the province. Specific ER activities that could be integrated into village plans include supervision of forested areas, community-based fire management, and other ER activities.

The East Kalimantan Community Empowerment and Village Government Service will lead the preparation of village spatial and village development plans. The activity will include trainings, consultations, and community meetings. Training will cover the development of village spatial land use plans. This includes development of village policies on land use. The plans will be designed in a participatory way with communities and will be submitted to the district governments for approval. Local academics and NGO representatives will be invited as resource persons and facilitators. The village plans will aim to reduce deforestation and forest degradation at the village level.

Expected Outcomes of Component 1

- Strengthened and more transparent information management and documentation related to land-use licensing process
- Permits for forestry, mining, and estate crops are reviewed and revoked where applicable, leading to clearer land-use boundaries
- Land use boundaries are clarified as the forest area demarcation process is completed
- The moratorium on licensing (Governor Regulation 1/2018) continues to be enforced, protecting forested areas potentially at risk of conversion.
- Strengthened conflict resolution mechanisms contribute to improved land governance
- Clear guidelines and regulations are in place for integrating REDD+ activities into village spatial planning
- Customary forest and lands are identified through participatory mappings
- Adat law communities and their territories are recognized
- Key villages implement Forest Fire Management Plans leading to a reduction of fires
- Villages incorporate ER activities into their spatial and village development plans (target 150 villages in 7 districts)

Component 2: Improving forest supervision and administration

The ER Program will address institutional weaknesses to improve forest supervision and administration. Within the State Forest Area, the focus will be on strengthening East Kalimantan's FMUs, which cover the entire production forest and protection forest areas. To improve the governance of forests outside the State Forest Area, in particular remaining forests within estate crop areas, the Program will strengthen relevant non-forestry institutions.

2.1 Strengthening management capacity within the State Forest Area: FMU development

The ER Program will strengthen the capacity of FMUs to manage forest areas and to supervise concession companies. Activities will include the development of planning documents, knowledge exchange, and business development.

An early part of this activity will focus on supporting FMUs in developing sustainable approaches to forest management through the development of planning documents. Development of long-term management plans known as RPHJP for FMUs will be supported by the MoEF. This includes the collection of social and environmental field data. The program will also support FMUs in the development of short-term development plans (RPHJPendek) and strategic business plans.

The East Kalimantan Forest Service will work with 20 FMUs to identify business opportunities, develop business plans, and strengthen their capacity to become partially self-financing. The focus will be on business activities linked to SFM and social forestry that will directly support the reduction of deforestation and forest degradation. There will be at least five business plans completed by 2020 and 20 business plans completed by 2022.

The East Kalimantan Forest Service will also support selected FMUs with the development of guidelines and approaches for monitoring and supporting concessions in the implementation of HCV and RIL policies. The capacity of FMUs to support and implement Social Forestry programs will also be strengthened. Further capacity building of FMUs will focus on supervising, facilitating, and monitoring the implementation of Fire Prevention and Control activities carried out by concessions and local communities.

Determination of FMU boundaries and Forest Utilization Blocks will be conducted by the FMUs. This activity will be supervised by the Provincial Forestry Service of East Kalimantan. Determination of boundaries will ensure that the concession area inside FMUs does not overlap with other permits or community lands. The boundary marking will be conducted through mapping and ground checking in the field. Consultations with MoEF, the Provincial Government, and District Governments will be conducted in order to ensure overlaps are minimized and settled.

To decrease the incidence of fires, FMUs will work with forestry concession companies and with communities surrounding forest areas to support fire prevention and control.

The ER Program will support coordination activities and learning across FMUs by supporting the FMU Centre, which was established in early 2017. The Centre aims to enrich and improve the capacity of FMUs to achieve their objectives and goals. The Centre will facilitate exchange of information and knowledge among FMUs in East Kalimantan.

2.2 Strengthening provincial and district governments to supervise and monitor the implementation of sustainable Estate Crops

The ER Program will build on the recent declaration to restore 640,000 ha of natural forests and 50,000 ha of peat land inside estate crop concessions by 2030. This draft has been circulated to district governments and the ER program will facilitate and accelerate the signing and approval of the declaration by district governments. The facilitation will be hosted by the Provincial Government (Governor) and includes dissemination of the declaration to a wide variety of stakeholders.

The East Kalimantan Estate Crops Service will lead a consultation process with district governments and with private companies, aiming toward a commitment to implement sustainable estate crop plantations, including the protection of remaining HCV forest areas. The Program will offer technical assistance to the government agencies for the implementation of these commitments. MoEF's Forestry Education and Training Center (Pusdiklat) will provide training on HCV management for government officials of the Forestry Service and Estate Crop Services from province and district governments. There will be seven districts targeted for the trainings. In addition, the ER program will facilitate government supervision on the

implementation of HCV management by plantation companies. The target for supervision will be 100 estate crop companies by 2024.

Expected Outcomes of Component 2

- FMUs are strengthened by being partially self-financed through sustainable forest-related businesses
- FMUs supervise district-level forest concessions and timber plantations for compliance with RIL and HCV policies
- The declaration on sustainable estate crops is signed by seven districts and by key companies.
- Local government agencies have the capacity to oversee and implement the commitment, leading to protection of HCV forests within estate crop areas.

Component 3: Reducing deforestation and forest degradation within licensed areas

Component 3 aims to protect forests that are located within oil palm estates and within forestry concessions by supporting the finalization and implementation of HCV, and RIL-C policies. These activities directly engage the concession and estate crops companies, and thereby complement the broader policy improvements related to the licensing regime that are covered under Component 1. To further support the adoption of RIL and HCV policies, the ER Program will develop a mechanism to provide nonmonetary incentives. This will be developed through a consultative process with private and public-sector stakeholders and will be linked to the REDD+ Benefit Sharing Mechanism (Section 15).

3.1. Implementation of HCV policies for Oil Palm Estates

Component 3.1 will target the 3.2 million¹⁷ ha that are allocated to estate crops across East Kalimantan. In 2016 this area had 677,137 ha of natural forest remaining and much of these forests are at risk of being cleared for oil palm plantations. Activities under this component will be led mainly by the East Kalimantan Estate Crops Service and will involve government agencies at the district level and up to 100 estate crop license holders.

The Estate Crops Service will work with the relevant government agencies at the district level and with plantation companies toward a declaration of commitment to sustainable estate crops, including the protection of remaining HCV forest areas. The declaration will be facilitated through consultations involving the government agencies and the private sector. The Program will offer technical assistance to the companies and to the government agencies for the implementation of these commitments. As a further incentive, the Program will provide technical assistance to companies to improve plantation productivity and for fire prevention.

Estate crop companies will receive capacity building for conducting inventories of HCV forests and other natural remaining forests within their concession boundaries. Training on inventories and HCV management, including field guidance, will be provided by the Provincial Forestry

¹⁷ Evaluation of Estate Crop Development in East Kalimantan Second Quarter 2018 (presented by Head of Estate Crop East Kalimantan in Balikpapan on 31 July 2018)

Service in coordination with the Provincial Estate Crop Service. Capacity building will be supported by academics from local universities and by specialists from NGOs. Forest protection systems for developing and managing estate crop areas will be developed and implemented by the companies. The Provincial Estate Crop Service will manage HCV inventory data and will monitor progress.

3.2 Support for smallholders and Community Based Fire Management and Monitoring Systems (CBFMMS)

Partnerships between large estate crop companies and local communities in controlling forest and land fires will be facilitated. Companies will identify communities in areas that are vulnerable to fires and will facilitate the development of community groups for fire prevention. Capacity building for the groups will be provided. Training will focus on a community-based fire management and monitoring system (CBFMMS), which will cover fire management, response, monitoring, and prevention of fires. The companies, together with guidance from district estate crop service, will develop standard operation procedures (SOP) for CBFMMS. The companies and the district service will monitor and evaluate the implementation of CBFMMS. The training module can be replicated in other districts or villages within the province. It is expected that 100 estate crop companies will develop and implement this initiative model partnership with 180 local farmer groups in controlling forest and land fires.

The East Kalimantan Estate Crop Service will provide technical assistance and training for fire prevention and control by smallholders and will provide relevant equipment for smallholders.

3.3 Implementation of HCV and RIL-C policies for Forestry Concessions

This subcomponent seeks to protect the remaining natural forests within timber plantation and natural forest management concessions by respectively supporting the implementation of HCV and RIL-C policies. The ER Program will support the finalization of the RIL-C policy, will support concessions in the implementation of RIL-C and HCV policies (see Annex 4.3.), and will strengthen monitoring.

The Directorate General of Sustainable Production Forest Management (DG PHPL) will lead the finalization of the RIL-C policy through policy review, gap analysis, focus group discussions and public consultations to complete the formulation of the draft RIL policy. Under the ER Program, the DG PHPL will invite the East Kalimantan Provincial Government and forest concessionaires of East Kalimantan to further discuss the commitment of the companies to implement RIL-C.

Training on RIL, SFM, and HCV management will be provided to concessionaires. DG PHPL together with DG PPI, the Forestry Training Center, and partners will collaborate to develop the official RIL/RIL-C training module. The Forestry Training Center will conduct a series of trainings on RIL/RIL-C practices and monitoring to forest managers of logging concessions and to FMU field officers. The workshop and training will be conducted at the national level or in East Kalimantan. There will be 26 trainings provided by the Forestry Training Center by 2024. Training on HCV management will be provided to FMUs and to timber plantation companies. 26 trainings on HCV management will be provided by 2024.

The RIL/RIL-C implementation on the ground will be monitored by DG PHPL and its partners, to make sure all the processes on the ground are in line with the RIL/RIL-C module. In the initial phase, 11 logging concessions and 4 KPHs would implement RIL/RIL-C. FMUs will monitor the implementation of RIL/RIL-C in logging concessions. They will conduct field measurements and will share field data and estimates of emission reductions with the MRV task force.

The Provincial Forestry Service and FMUs will monitor and facilitate the implementation of HCV protection by timber plantation companies. Under the ER program, by 2024, 20 timber plantation companies (IUPHHK-HT) will identify and manage HCV forests inside their concessions.

Expected Outcomes of Component 3

- A substantial increase in the number of estate crop companies implementing sustainable plantation policies (including ISPO, RSPO, and HCV) leads to improved protection of remaining forests within areas allocated to estate crops.
- Estate crop companies commit to and implement more sustainable practices leading to reduced deforestation through improved management and protection of remaining forests within areas allocated for estate crops
- Improved management practices by smallholder oil palm farmers leads to reduced deforestation in and around smallholder plantations.
- Improved capacity of smallholders to prevent and control fires leads to fewer and less severe forest fires.
- Forest concessionaires adopt Sustainable Forest Management practices and the area of sustainably managed forest is increased
- Forest management concessions carry out improved forest management practices (Reduced Impact Logging)
- Timber plantations implement policies to protect remaining High Conservation Value (HCV) Forests within their concessions

Component 4: Sustainable Alternatives for Communities

Component 4 directly addresses the lack of alternative sustainable livelihoods which was identified as an underlying driver of encroachment. Activities are designed to provide livelihood opportunities within sensitive areas, including peat areas, mangroves, and conservation areas. Also, by promoting social forestry activities within the State Forest Area, the component supports improved access to forested areas for local communities and contributes to improved land governance. In addition to reducing deforestation and degradation linked to encroachment, the activities in this component are expected to lead to significant non-carbon benefits, contribute to more equitable outcomes, and are an important part of the strategy to reduce the risk of reversal.

4.1 Sustainable livelihoods

Activities in this sub-component support sustainable swidden agriculture, paludiculture, mangrove management, smallholder oil palm cultivation, and other sustainable livelihoods. The activities will be integrated into village development planning and, depending on their location,

will be supported by the East Kalimantan Estate Crops Service, the East Kalimantan Coastal and Fisheries Service, the DPMPD, or the provincial forestry service.

The ER Program will support sustainable swidden agriculture that does not use fire for land clearing and sustainable riparian rice farming as an alternative to converting forests to paddy fields. Under the lead of the Village and Community Empowerment Agency, training, workshops, and demonstration plots will be provided to farmers in 10 villages in 2 districts.

Sustainable mangrove practices will be supported through capacity building. The Provincial and District Fishery and Ocean Service will provide trainings, seminars, and workshops for communities in coastal areas (Kutai Kartanegara, Berau, Paser, and Penajam Paser Utara Districts). The FMUs in Berau Pantai and the Delta Mahakam areas will play a key role in targeting communities living within the State Forest Area in coastal areas. Activities will include raising awareness of the ecological and social impacts of mangrove conversion; and capacity building for sustainable livelihood options, such as ecotourism, eco-friendly pond management, and nipah sugar production. Farmers will also be introduced to financing options, including microfinancing and small-grants schemes.

The East Kalimantan Estate Crop Service will provide technical assistance to oil palm smallholders to improve their capacity for complying with sustainability principles. The program will help smallholders meet the principles of the Indonesian Sustainable Palm Oil (ISPO) standard. Module capacity building on sustainable estate crop development (particularly for sustainable palm oil) for smallholder estate crops will be developed by district services through focus group discussions and consultations. Training and field facilitation to smallholders will be provided, with academics and NGO representatives as resource persons and facilitators. The district estate crop services will monitor and evaluate the implementation of ISPO by smallholders.

4.2 Conservation partnerships

The ER Program will facilitate conservation partnerships in or near conservation areas, which will include support for sustainable livelihoods. MoEF's DG of Forest Conservation will support training of communities in four conservation areas. Training will focus on forest protection and on the sustainable utilization of areas surrounding conservation areas.

Potential sustainable business opportunities will be identified and the provincial forestry service will provide capacity building. The program will target six conservation areas (Kutai National Park, Muarakaman/Sedulung Natural Reserve, Teluk Adang Natural Reserve, Teluk Apar Natural Reserve, Padang Luway Natural Reserve, Tahura Soeharto) and will provide training for 18 village communities on alternative livelihoods.

4.3 Social forestry

It is expected that by 2024 there will be 341 licenses issued by MoEF on social forestry. The ER program on Social Forestry will target 50 villages. This will include empowerment of village institutions (village forest management agencies) and capacity building of community businesses. The target is 70 business plans developed by 2024. This also includes formulation

and facilitation of the community and village program. The facilitation will be supported by the Provincial Forestry Service through the working group of social forestry, and by the FMUs. Training will be conducted in 50 villages and will focus on the development of social forestry work plans (RKU), business plan development and forestry management. The implementation of Social Forestry schemes will be further supported through training and technical support. This will include coaching and mentoring programs, and will focus on the implementation of work plans and business plans.

Expected Outcomes of Component 4

- Reduced conflict in and around conservation forest areas
- Improved community capacity to respond to forest fires and reduced fire incidence in conservation forest areas
- Villages implement community-focused investments that lead to emissions reductions and sustainable land use
- Sustainable mangrove practices declared and adopted by coastal and peatland stakeholders
- Increased establishment of social forestry groups (RKU) leading to sustainable livelihood options and reduced deforestation from encroachment in forested areas.
- An increase in social forestry licenses promotes sustainable forestry and provides alternative livelihoods to local communities

Component 5: Project Management and Monitoring

Component 5 covers all project management and monitoring activities, as outlined in Table 4.11.

Table 4.11. Project Management and Monitoring

Subcomponents	Key Activities	Scale of Intervention
5.1 Project coordination and management	5.1.1. Management and coordination of ER program implementation across levels: <ul style="list-style-type: none"> • Strengthening institutions for ER project management and coordination across sectors • Develop coordination mechanism 	National and Provincial
	5.1.2. Provision of operating costs for ER program implementation: <ul style="list-style-type: none"> • Develop financial management system for ER program • Training on Financial management 	National and Provincial
5.2 Monitoring and evaluation	5.2.1. Implementation of monitoring and evaluation for ER program implementation: <ul style="list-style-type: none"> • Training on SESA and ESMF 	National and Provincial

Subcomponents	Key Activities	Scale of Intervention
	<ul style="list-style-type: none"> Monitoring and evaluation of SESA and ESMF implementation Training on monitoring (incl. safeguards) Monitoring and evaluation of ER Program implementation Development and implementation of HCV monitoring system 	
	5.2.2. Measurement and Reporting: <ul style="list-style-type: none"> Improving activity data through ground truthing Improving emission factor data through Permanent Sampling Plots Developing capacity on ER Measurement Updating satellite imagery on ER Accounting Area Developing and implementing the sub-national MMR System (including SIS) 	Provincial
5.3 Program communication	5.3.1 Knowledge management: <ul style="list-style-type: none"> Knowledge management database development and maintenance Developing information, education and communication materials for shared learning 	National and Provincial
	5.3.2 Information dissemination: <ul style="list-style-type: none"> Establishing and maintaining ER program website Dissemination of information, education and communication materials 	National and Provincial

The summary of proposed timeline ER activities can be shown as follows (see also Annex 4.2.a.)

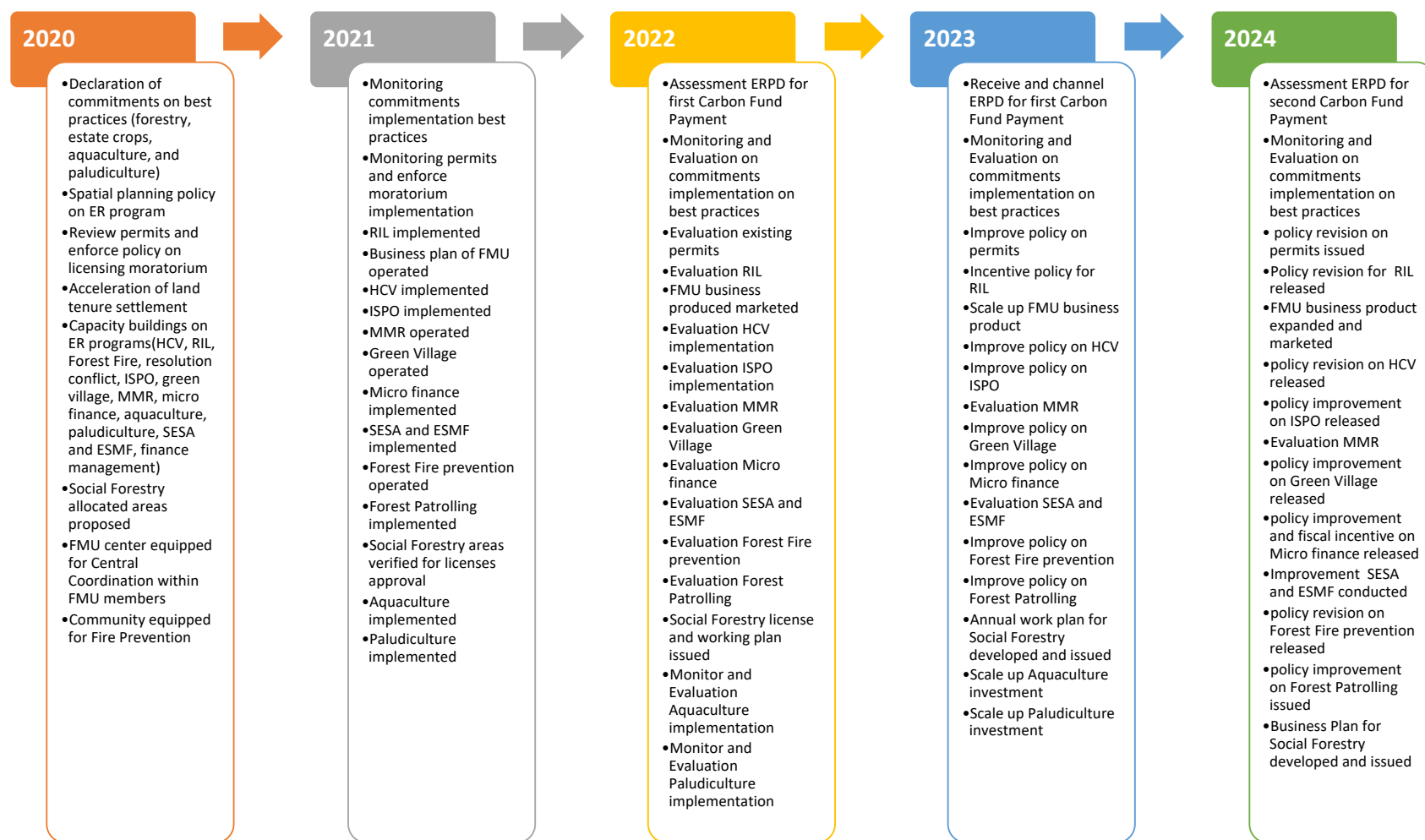


Figure 4.4 Summary of proposed timeline ER activities for East Kalimantan 2020 - 2024

4.4 Assessment of land and resource tenure in the Accounting Area

4.4.1 Introduction

The state of land and resource tenure in East Kalimantan is critical for the design and implementation of the ER Program for a number of reasons. As discussed above, weak land governance, which includes lack of formal recognition of customary land claims, is a key underlying driver of deforestation. This makes activities to improve land governance an important component of an emission reduction strategy. Equally important is the need to ensure that the Program supports equitable outcomes, which requires that local stewards of forests receive a fair share of benefits irrespective of their statutory rights to forestland. It is therefore essential that the design of the benefit sharing plan and the articulation of Title to ERs consider the unclear rights of customary communities to their land. In addition to striving for positive outcomes, the ER Program will seek to avoid negative impacts on land governance which could result from increasing pressure on land by introducing carbon values.

The ER Program will be implemented in the midst of major reforms related to land and resource tenure and this presents opportunities for the program to support positive outcomes for forests and local communities. Over the past decade, the GoI has launched a number of important initiatives to deal with the lack of recognition of customary claims and weaknesses in land governance. The ongoing reforms are far-reaching and complex, and their success will depend on the implementation of policy-level changes as well as continued support to local communities and to institutions tasked with implementing land use planning and management.

This section presents an overview of land rights regimes in East Kalimantan as they relate to REDD+ and specifically to the ER Program. The analysis was able to draw on a number of recent studies¹⁸ that have been carried out in the context of regulatory and policy changes related to land rights and on a number of consultation processes related to these changes and to REDD+ readiness nationally and in East Kalimantan. Public consultations on tenure have formed part of the preparation of the National REDD+ Strategy, and have been an integral part of consultations related to the design of the ER Program.

4.4.2 Range of land and resource tenure rights

The distinction between land designated as State Forest Area and non-forestland

Indonesia's land governance system distinguishes between forest and non-forest land, each with separate regulatory frameworks and institutional arrangements. According to the Forestry Law No. 41/1999, forests in Indonesia that do not have private entitlements are state forestlands (*hutan negara*, or State Forest Area), while those that have private entitlements are private or titled forests (*hutan hak* or *hutan rakyat*). The recent constitutional court decision MK35 introduced a third category of land- customary forest. Nationally, less than 3% of forests

¹⁸ Key assessments that serve as further reference include the following: "Towards Indonesian Land Reforms: Challenges and Opportunities", The World Bank, draft 2014; "Overview of forest tenure reforms in Indonesia", Siscawati et al. 2017; "Improving Indonesia's Forest and Land Governance" Toubmourou, The Asia Foundation

are under private ownership (Siscawati et al. 2017), and most of this is in Java, which means that most forest is part of the state administered State Forest Area. In East Kalimantan this covers 8.4 million hectares, or 66%, of the province. According to the Basic Forestry Law, this area is considered state land, which precludes individual or communal property rights.

State control over forestlands is supported by Indonesia's Constitution, which states that "land and water and the natural riches therein shall be controlled by the State and made use of for the greatest welfare of the people" (Article 33). While private ownership within the State Forest Area is not possible, the government can issue land use licenses to private entities. Importantly for the ER Program, parts of the State Forest Area overlap with lands that are claimed by local communities, including adat communities. This has been an ongoing concern for the government and has led to a number of reform processes, which provide an important context for the ER Program and which are described below.

The ER Program is also affected by the land governance regime outside of the State Forest Area. The ER Program Activities are chiefly concerned with the protection of East Kalimantan's remaining natural forests, a portion of which is located outside of the State Forest Area. Most forests (5.8 million ha) are located within the State Forest Area, but the 0.8 million ha that are outside of it also face significant threats, as that is where most conversion to oil palm plantations is expected. In East Kalimantan, the area outside the State Forest Area (often referred to by its acronym APL, which stands for *Area Penggunaan Lain*, or Other Use Area) covers 4.3 million ha, of which around 3.3 million ha are allocated to estate crop companies, mostly for oil palm plantations.

Administrative arrangements

Law No. 23 of 2014 on Local Government, which went into effect in 2016, regulates the distribution of authority among the various levels of government, including authority over spatial planning and the management of land and forest resources. Under this law, the authority and administrative responsibility over the forestry sector mainly falls to the central and province governments. The central MoEF has authority over planning and licensing, forest management, and gazettelement, while most of the implementation of these functions is the responsibility of the provincial government. The province, mainly through the FMUs, is responsible for designating forest functions and for forest management, while the central MoEF monitors forest plans that are proposed by the province. An exception are forest conservation areas (such as Nature Reserves, Wildlife Reserves, and National Parks), which are controlled and managed directly by the central Ministry of Environment and Forestry. The provincial government has the authority to issue licenses, monitor compliance, and to oversee company-community relations, including conflict resolution. District governments, through the District Environmental Services, have an important role in the recognition of adat territories, as described below.

The introduction of Forest Management Units (KPHs) is intended to improve and further decentralize forest management, increase accountability over forest outcomes, improve local stakeholder involvement, and potentially increase transparency. Prior to Indonesia's *reformasi* period, the administration of the State Forest Area was under the domain of the central Ministry of Forestry. As part of the general decentralization process, local forestry agencies- Dinas Kehutanan (Dinas)- were placed under the jurisdiction of district and provincial governments. The Dinas carry out mainly administrative tasks, but they lack the mandate and capacity for

effective resource management and law enforcement. The KPH program divides state forest land into discrete area units to be managed by dedicated local institutions that are staffed by forestry professionals. There are two types of FMUs: Production Forestry FMUs (KPHP) and Protection Forest FMUs (KPHL). A countrywide KPH system is firmly anchored in the forestry legal framework and in forestry development plans.

While forest concession licenses will still be issued by the central Ministry of Forestry, the KPHs will be responsible for developing management plans, for overseeing license holders, and for monitoring land use activities, particularly in open access areas not under license. Importantly, KPHs will be part of the provincial government structure, strengthening decentralized forest governance. By placing forestry professionals at the local and field levels, KPHs will facilitate better law enforcement, improved outreach to local communities, and more structured and localized approaches to addressing land-based conflicts and improving local people's access to forests.

Table 4.12. Forest Management Units in East Kalimantan

No	Unit Management	Natural forest area (Ha)	No	Unit Management	Natural forest area (Ha)
1	UNIT IX - KPHP	671	14	UNIT XXIV - KPHP	459,817
2	UNIT XII - KPHP	711,193	15	UNIT XXIX - KPHP	30,207
3	UNIT XIII - KPHP	12,098	16	UNIT XXV - KPHP	323,680
4	UNIT XIV - KPHP	203,594	17	UNIT XXVI - KPHP	698,506
5	UNIT XIX - KPHP	607,905	18	UNIT XXVII - KPHP	20,334
6	UNIT XV - KPHP	267,533	19	UNIT XXVIII - KPHP	274
7	UNIT XVI - KPHP	118,799	20	UNIT XXX - KPHL	6,625
8	UNIT XVII – KPHP	146,043	21	UNIT XXXI - KPHP	72,881
9	UNIT XVIII - KPHP	238,797	22	UNIT XXXII - KPHP	243,574
10	UNIT XX - KPHP	16,409	23	UNIT XXXIII - KPHP	216,785
11	UNIT XXI - KPHP	82,588	24	UNIT XXXIV - KPHP	93,084
12	UNIT XXII - KPHL	634,986	25	Conservation Area	153,835
13	UNIT XXIII - KPHP	196,914			
TOTAL Forest Area within KPHs					5,557,132

State lands outside the State Forest Area are under the mandate of the district and provincial governments. These can issue licenses for agriculture (including estate crops), mining, and public works. Outside of the State Forest Area, district and municipal governments also have the authority to issue construction and settlement area permits as well as proposals for spatial planning which are coordinated by the provincial government.

Administrative zones within the State Forest Area

Land within the State Forest Area is reserved for “forest functions” which are articulated in the Forestry Law, revised in 1999. This law establishes types of forest lands and the management objectives assigned to each. Article 6 states that “forest has three functions: conservation, protection, and production” and the government determines which lands are assigned to produce these functions. The following categories are defined in Article 1 of the 1999 Forestry Law:

Production Forest is a forest area whose main function is to produce forest products (Article 1). Protection Forests can be utilized for environmental services, and collection of non-timber forest products. Production Forest can be used for the production of environmental services, timber and non-timber forest products, and the collection of timber and non-timber forest products. Utilization of production forest shall be implemented through granting of business licenses (Article 28).

Previous forestry laws and most current forestry statistics and planning documents also recognize two sub-types of Production Forest: i) Convertible Production Forest, which is a segment of the production forest that could be released for conversion (i.e., clearing) for agricultural and plantation purposes; and ii) Limited Production Forest, which is a segment of the Production Forest area, where some additional land-use restrictions apply.

Protection Forest is a forest area whose main function is the protection of life-supporting systems for hydrology, preventing floods, controlling erosion, preventing sea water intrusion and maintaining soil fertility (Article 1). Use of protection forest shall be implemented through granting of business licenses for area utilization, environmental services and collection of non-timber forest products (Article 26).

Conservation Forest is a forest area whose main function is the preservation of plant and animal diversity and its ecosystem (Article 1). The Conservation Forest area consists of nature reserve forest areas, nature conservation forest area, and hunting parks (Article 7).

The areas allocated to the above forest zones in East Kalimantan are summarized in the following table:

Table 4.13. State Forest Area zones in East Kalimantan Province (2017)

Forest Zone	Area (ha)
Protection Forest	1,857,654
Limited Production Forest	2,933,729
Production Forest	3,057,206
Conservation Forest	441,750
Convertible Production Forest	121,341
East Kalimantan's State Forest Area	8,411,680

Land and resource tenure rights of local communities and Indigenous Peoples

Most of East Kalimantan's local communities, including customary communities (*Masyarakat adat*), live within the area designated as State Forest Area. While the statistics are incomplete, a recent preliminary study by Mulawarman University identified lands in East Kalimantan that met social High Conservation Value criteria. These are either sites and resources that are fundamental for satisfying the basic necessities of local communities or indigenous peoples (HCV5) or sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples (HCV6). The study found that at least 1 million ha met either the HCV5 or HCV6 definition, of which at least 892,580 ha overlap with the State Forest Area (UnMul PPIIG, 2017; Sulistioadi, et.al., 2017, see Table 4.12).

Communities in remote areas often practice traditional lifestyles, governed by customary law and customs. Local communities in East Kalimantan manage land areas for settlement, cultivation, and for social facilities and worship. Small-scale cultivation of various agricultural products is widespread, and tribal groups in the province's interior, such as the Kenya and Dayak, mostly practice swidden agriculture (Peluso 1991). Local land-uses also include the collection of non-timber forest products such as damar resin and rattan and various forms of agroforestry systems. Such land use systems can preserve important forest functions, including biodiversity and sequestration of greenhouse gases (van Noordwijk et al. 2012, Tata et al. 2008). Indigenous peoples (*masyarakat adat*) have been managing land and forest resources for centuries, using their own customary tenure systems. These systems include customary rules and norms to manage the land and forest resources within their customary territories, often through collective ownership and management.

The basic forestry law regulates rights and access of “customary law communities.” As long as they are recognized, they have the rights to: collect forest products for daily needs, undertake forest management under customary laws (that do not contradict national laws), and be empowered for improving their welfare. Communities can utilize forest and forest products and be informed about plans of forest allocation, forest product utilization and forestry information. Communities also have the right to compensation for losing access to their forests due to its designation as forest area, in accordance with prevailing laws and regulations. Communities are obliged to participate in maintaining and preventing forest areas from disturbance and damage and can seek assistance and guidance in this task.

While the national law has, until recently, not accommodated communal ownership within the State Forest Area, *de facto* rights can be based on existing local conditions, including prevailing local practices, and may be supported by local level land licenses. The type of land ownership claim depends on the history of each community group. Recognized physical evidence can be an orchard (having various local names, such as *Lembo*, *Rondong/Kutai*, *Munaant/Tunjung*, *Simpukng/Benuaq*) or previous evidence of use. Knowledge of land ownership is held by Customary Institutions and may be recorded by village officials. Documents that have been used as evidence for ownership include: Land Certificates from Village Heads, Letters of Declaration of Release of Land Rights from Heads of Sub-districts or Notaries, and individual or communal land certificates for land ownership. A recent decision by Indonesia’s constitutional court (MK 35, 2013) has paved the way for formal recognition of customary lands, but so far only a small portion of community claims have been officially recognized. The total adat area that is officially recognized is currently only 11,878 ha.

Licensing regimes

Given the significant share of land that is under state ownership, the licensing regime, which provides limited use rights to private entities, plays an important role in East Kalimantan’s land and resources tenure framework. Important licenses are forestry licenses, estate crop licenses, and mining licenses. Together, these licenses cover over 10 million ha (80% of the land area, though this number includes some double counting due to overlaps of licenses).

Forestry licenses

Most of the area that falls within the Production Forest Zone is allocated to private forestry companies through concessions. These are issued by the MoEF and comprise Natural Forest Concessions (IUPHHK-HA) which allow owners to carry out sustainable logging in natural forests, Timber Plantation Concessions (IUPHHK-HT) which are mainly for the establishment of short-rotation pulpwood species, Ecosystem Restoration Concessions (IUPHHK RE) which require concessionaires to carry out ecosystem restoration activities, and various Social Forestry Licenses. In total 4.5 million ha are allocated to forestry concessions (Table 4.13). In addition, the MoEF can issue borrow-use licenses to mining companies for mining exploration and extraction. The total area of mining licenses in East Kalimantan’s State Forest Area is 1.7 million ha.

Table 4.14. Forestry concessions within the Production Forest zone

Forestry License	Area (ha)
Ecosystem Restoration Concessions (IUPHHK RE)	164,151
Natural Forest Concessions (IUPHHK-HA)	3,213,531
Timber Plantation Concessions (IUPHHK-HT)	1,014,321
Social Forestry Licenses	69,032
Total Forestry Concessions	4,461,035

While communal rights have until recently not been recognized within the State Forest Area, the government has designated areas for the use of local communities through social forestry licenses. Forestry Law No. 41 of 1999 forms the basis for social forestry schemes in Indonesia. Under these social forestry schemes, local communities obtain forest management licenses, but land ownership remains with the State. These are agreements between the state and communities for accessing and using areas within the State Forest Area for specified purposes. However, implementation has been slow and falls far short of government targets. In 2016, only 113 thousand ha had been allocated. The main social forestry schemes are Community Forests (Hutan Kemasyarakatan or HKm), Village Forests (Hutan Desa or HD), and Community Plantation Forests (Hutan Tanaman Rakyat, HTR) and partnerships (kemitraan):

- The HKm social forestry program was initiated in 2001 as part of the reform period. With an HKm permit, farmer groups can continue to farm on state forestland in exchange for supporting sustainable forest management and protecting environmental services.
- Village Forests (Hutan Desa, or HD) are based on Government Regulations number 6 of 2007 and number 3 of 2008. Villages can apply for permits to manage nearby forest areas, with a focus on sustainable forest management and the application of customary management practices. While villagers are allowed to harvest timber trees, the focus is on natural forest management and small-scale agroforestry.
- The Community Plantation Forest (HTR) model was developed in 2007 to allow and encourage communities to develop timber plantations in the State Forest Area, to help address the supply shortfall of sustainable timber. These concessions can be allocated directly to households, to partnerships between households and other entities, and to private and public companies that agree to develop the plantation and transfer it to the local community. Plantations can consist of main timber species, with up to 30% of the area dedicated to other woody species, and with intercropping with annual plants possible in the first two to three years of plantation establishment. An important element of the HTR scheme is the offer of long-term subsidized financing through a public service delivery unit that is managed by the Ministry of Environment and Forestry.
- The Kemitraan program requires concessions companies (state-owned or private) to provide access rights to local communities. Generally, local communities get the right to harvest non-timber forest products, while the companies maintain the rights to timber. The purpose of this scheme is to facilitate collaboration between forest-based companies and

community groups in the management of forest resources, and to facilitate state-sponsored community empowerment in State Forest Area areas in which the government has issued licenses for companies to carry out logging or to establish timber plantations.

Table 4.15. Distribution of Social Forestry Schemes in East Kalimantan (ha)

District	Village Forest (<i>Hutan Desa</i>)	Community Forest (<i>Hutan Kemasyarakatan</i>)	Community Timber Plantation (<i>Hutan Tanaman Rakyat</i>)	Partnership with concessions (<i>Kemitraan Kehutanan</i>)	Total
Balikpapan		1,400			1,400
Berau	38,616		1,096		39,712
Kutai Barat	8,476		5,790	64	14,379
Kutai Kartanegara				1,147	1,147
Kutai Timur	19,936	590	4,058	3,846	28,430
Mahakam Ulu	28,380				28,380
Total	95,408	1,990	10,944	5,057	113,448

Starting in 2015, conservation programs have been conducted to enable communities to access and utilize non-timber forest products in designated Traditional Zones, in National Parks. These zones may be utilized for the benefit of communities that have traditionally been dependent on certain non- timber forest products found in these zones.

Estate crop and mining licenses

Estate crop licenses can be issued on APL as well as on Convertible Production Forest land. In the latter case, a Ministerial Decree for the Release of HPK is required from the MoEF. Small-scale plantations (less than 25 ha) can operate with a simplified business license. This comprises a receipt of sale issued by the village head or the sub-district head and the registration of the area with the district government. Larger plantations are required to first obtain a Location Permit (Ijin Lokasi), which allows them to enter into negotiations with local communities for land release to plant oil palm and to carry out preparatory activities, including the mandatory Environmental Impact Assessment (AMDAL). The Location Permit (Ijin Lokasi) is valid for three years with possible extension for one year. Once the AMDAL is completed and approved, the local environment office (DLH) issues an (Environmental Permit (Ijin Lingkungan). Following the submission of a number of further documents, including the plantation development plan and a commitment to develop smallholder plots, the company receives a Plantation Business License (Ijin Usaha Perkebunan, IUP). Plantation boundaries are demarcated in the field by local offices of the National Land Agency (BPN). In addition to the IUP, the company must obtain a long-term Business Use Right (Hak Guna Usaha, HGU) for control over the plantation. The HGU provides control over the land for a period of 35 years, with option for extension of a further 25 years.

If the area to be licensed falls within the State Forest Area (Hutan Produksi Konversi, HPK), then a request for HPK release must be filed with local MoEF offices. After the Location Permit has been received, the MoEF can issue approval in principle (Persetujuan Prinsip Pelepasan Kawasan HPK). Once the boundaries of the plantation have been agreed, MoEF can issue a Ministerial Decree for release of HPK (Keputusan Menteri tentang Pelepasan Kawasan HPK).

In total 3.2 million ha are allocated to estate crops in East Kalimantan. This number is comprised of: 0.7 m ha of location permits, 1.0 m ha of IUP, and 1.5m ha of HGU.

Under Government Regulation No. 24/2010 as amended by GR No. 61/2012 and GR No. 105/2015 and Minister of Forestry Regulation No. P-16/Menhut-II/2014, Production Forest Areas and Protection Forest Areas can be allocated for mining through “borrow and use” permits issued by the MoEF. Permits for underground mining can be issued in both Protection Forest and Production Forest areas, while open pit mining is, with a small number of exceptions, only allowed in Production Forest Areas. Mining is prohibited in Conservation Forest areas. The borrow-and-use permit holder is required to pay fees and to undertake reforestation activities upon ceasing its use of the land. Governor Regulation no. 17/2015 which is updated through Governor Regulation no. 1/2018 has suspended the issuance of permits for new coal mining and has placed additional requirements on companies that want to extend their permits. Mining licenses are discussed further below.

4.4.3 The legal status of land and resource tenure rights, and weaknesses in the legal framework

Law Enforcement

A critical issue to consider, when evaluating Indonesia’s land and resource tenure framework, is that land governance is weak, and that relevant laws, regulations, and spatial plans are often poorly enforced. There are a number of reasons for this, including: weaknesses in the legal framework, incomplete designation of land use boundaries, lack of a definitive map, poor enforcement capacity, and a recent history of changing administrative arrangements.

Weaknesses in the legal framework include the lack of an overarching land law and the separate administrative systems that apply to forest and non-forest land. The existence of multiple legal and regulatory frameworks leads to overlapping land-related regulations and guidelines, and to overlapping authorities for governing land affairs, often with inadequate coordination across sectors.

As discussed below, the areas currently zoned as State Forest Area and their boundaries were declared without adequate demarcation, mapping or consideration of existing customary use rights, and a significant portion of the boundaries have not yet been formally gazetted. In many areas, the State Forest Area boundaries also do not match the reality on the ground, as settlements, roads, and large areas without forest cover are located within the boundaries. Procedural delays, ambiguities, and mismatches have resulted in challenges being posed to the validity of State Forest Area boundaries from local leaders, communities and CSOs. This results in tenure uncertainty and in problems for good governance of the State Forest Area. Governance is further impeded by the use of multiple land-use maps that are not aligned across sectors or

levels of government. This has contributed to overlapping land use licenses and has undermined accountability.

Poor governance and weak law enforcement also afflict the licensing regime. Some licenses are issued without the proper administrative processes; some businesses, especially in the palm oil and mining sectors, operate without the required licenses; and many license holders do not follow regulations that are meant to ensure positive environmental and social outcomes. The spatial analysis carried out for this assessment, confirms that land use plans, including forest zone maps, often don't match the reality on the ground. For example, within the State Forest Area boundaries there are 136,793 ha of oil palm plantations and 92,720 ha of mining area is located within the conservation forest zone.

The GoI has in recent years undertaken serious efforts to improve land governance, including law enforcement. These include the establishment of the Corruption Eradication Commission (KPK) which has a broad mandate that includes investigating a number of land-based sectors, including the mining, forestry and estate crops sectors; the launch of the One Map policy, which seeks to create a unified map; several critical Constitutional Court decisions relating to land rights and the delineation of the State Forest Area; efforts to create local institutions (KPH) to oversee management of forest areas; and clarifications in the administrative arrangements for land management. It should be noted, however, that some of these efforts imply fundamental regulatory and administrative shifts which will take long time to implement and whose effects may be limited during the ERPA period.

Spatial Planning

Indonesia's Spatial Planning framework, which is based on Law No.26/2007 (which replaced the original Spatial Planning Law 24/1992) requires the development of spatial plans at various levels of government: a national spatial plan (RTRW Nasional), provincial spatial plans (RTRW Propinsi) and district spatial plans (RTRW Kabupaten and RTRW Kotamadya). Each spatial plan is valid for 20 years, (consistent with the planning periods of the respective long-term development plans (RPJP)), and is revised every 5 years. Under the law's implementing regulation, GR No. 26/2008, governors and ministers have the right to override land use decisions made by the districts. The implementing regulation also acknowledges the importance of public participation in spatial planning.

The overall authority responsible for drafting the National Spatial Plan is the National Spatial Planning Coordination Board, chaired by the Coordinating Minister for the Economy. The board's office is set up within Bappenas. The Directorate General of Spatial Planning of the Ministry of Public Works is charged with handling the practical implementation of the board's plan. The current national spatial plan (Law No. 26/2008), covers the period from 2008 to 2028. The RTRWN serves as a guideline for the planning processes required to achieve the plan's stated objectives. The Ministry of Land and Spatial Planning was established in 2015 to further support spatial planning. The ministry was set up by merging the relevant departments of the Ministry of Public Works, whose role included spatial planning, into the former National Land Agency which had responsibility for land registration. The ministry will be responsible for administrative work related to spatial planning including coordination of interests among local governments and enhancement of local planning capacity, development and implementation of plans.

Spatial planning related to forestland, in practice, continues to be under the mandate of the MoEF. The areas currently designated as State Forest Area and the delineation of forest zones by “function” were initially determined for each Province through agreements in the early 1980s (following a process outlined in earlier forest laws and regulations). The agreement, known as the Forest Boundary Setting by Consensus (Tata Guna Hutan Kesepakatan, or TGHK) was arrived at in 1984 with the participation of the Provincial Government Agencies of Forestry, Agriculture, Lands (Agraria), Public Works, Planning, and Transmigration. In response to the initial Spatial Planning Law of 1992, the MoF in 1997 produced “integrated maps” or *peta paduserasi*, to integrate the TGHK maps into the provincial level spatial plans (RTRW), and with the process of decentralization also into the district level spatial plans (RTRWP/K). East Kalimantan’s current Spatial Plan (RTRWP), which covers the period from 2016 to 2036, incorporates State Forest Area boundaries that are defined in the Ministry of Forestry Decision (SK 718/Menhut-II/2014) on the State Forest Area of East Kalimantan and North Kalimantan.

The legal status of the State Forest Area and adat rights

The delineation of the State Forest Area has resulted in an administrative classification of forest areas that often does not match the realities on the ground. Though some biophysical information is built into the delineation of State Forest Area boundaries, large areas categorized as State Forest Area are not actually forested, and the area includes agricultural land, roads and settlements. In East Kalimantan, 2.6 million ha (31%) of the State Forest Area has no tree cover, while 0.8 million ha of forested area are located outside of the boundary of the State Forest Area on land that is accessible for conversion to agriculture (Table 4.15). Because the mapping of State Forest Area largely ignored existing local land uses, the State Forest Area overlaps with large areas of customary territories and homelands of communities.

Table 4.16. Forest Cover in the State Forest Area and Non-Forest Area in East Kalimantan Province (2017)

<i>Spatial plan</i>	<i>Forest Cover</i>	<i>No Forest Cover</i>	<i>Sub total</i>
Forest Area	5,765,862	2,645,819	8,411,680
<i>Protection forest</i>	<i>1,752,238</i>	<i>105,415</i>	<i>1,857,654</i>
<i>Limited production forest</i>	<i>2,505,731,86</i>	<i>427,997</i>	<i>2,933,729</i>
<i>Production forest</i>	<i>1,304,721</i>	<i>1,752,485</i>	<i>3,057,206</i>
<i>Conservation forest</i>	<i>155,762</i>	<i>285,988</i>	<i>441,750</i>
<i>Convertible production forest</i>	<i>47,408</i>	<i>73,933</i>	<i>121,341</i>
Non-Forest Area	818,017	3,514,162	4,332,179
EAST KALIMANTAN	6,583,879	6,159,981	12,743,859

Until recently there was a lack of a formal process to protect and recognize adat land. However, a series of rulings of the Constitutional Court between 2010 to 2013 support the validity and recognition of land rights of existing communities, and uphold the role of traditional authorities and customary arrangements. These rulings call into question the validity of a significant share of the State Forest Area and highlight the need for resolving the ambiguities between customary and formal law.

The most important rulings are Constitutional Court Decision MK 45/2011 (MK45) and Constitutional Court decision MK35/2013 (MK35). MK45 finds that State Forest Area boundaries are only valid if these have been formally gazetted- a process that needs to consider existing individual as well as communal rights. The ruling found that only 14 percent of the State Forest Area had been gazetted according to the required procedures. Constitutional Court decision MK35, found that if adat communities can demonstrate valid claims to forest areas, the rights to these areas shall be transferred to them, excluding these areas from state land and making them private (titled) forests (Hutan Hak). The ruling allows for the collective ownership of forest areas by adat communities. These areas remain under customary communal ownership and cannot be sold.

In December 2013, the Ministry of Forestry issued an important follow-up regulation to the Constitutional Court rulings. Regulation 62/Menhut-II/2013 further defined the responsibilities and methods for the demarcation of the State Forest Area and for the recognition of land rights of adat communities. A key response to MK45 has been the accelerated gazettal of the State Forest Area to fully establish its boundaries and to improve legal certainty, while protecting the rights of communities in and near forest areas. By 2018, 6.5 million ha, or 78%, of East Kalimantan's State Forest Area had been gazetted (Figure 4.5).

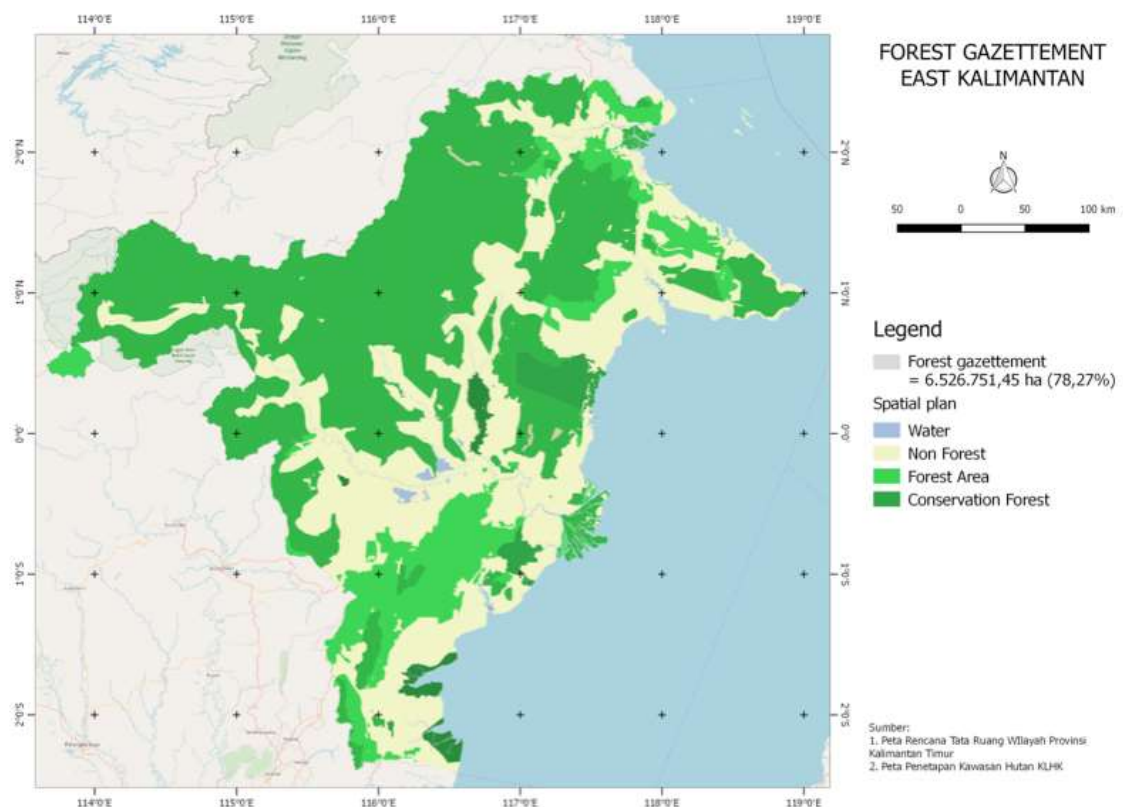


Figure 4.4 Gazettement of East Kalimantan's State Forest Area, 2018

After the MK35 decision, a number of implementing regulations have been released including:

- Joint Ministerial Regulations of the Ministry of Home Affairs (Number 79 of 2014), the MoEF (PB.3/MENHUT-II/2014), the Ministry of Public Works (17.PRT/M/2014), and the National Land Agency (8/SKB/X/2014) concerning the resolution of land claims within the State Forest Area. These regulations call for the establishment of dedicated teams at the province and district levels for registering various claims and land uses within the State Forest Area. These teams are known by their Indonesian acronym, IP4T Team and include representatives from BPN, forestry, other relevant government agencies, local representatives of adat law communities, and NGOs.
- Regulation of the Ministry for Agraria and Spatial Planning Number 10 of 2016 concerning the registration of Communal Adat Land Rights on Adat Law Community Land within the State Forest Area.
- MoEF Regulation No. 32 of 2015 concerning titled forest. The regulation includes a mechanism for the recognition of Adat Forest.
- Minister of Home Affairs regulation number 52 of 2014 and East Kalimantan Provincial Regulation No. 1 of 2015 concerning guidelines for the recognition and protection of Adat Law Communities. These guidelines, place the responsibility for the recognition and protection of Adat Law Communities with the provincial and district governments which are required to form Adat Law Community Committees.
- Governor's Regulation number 1 of 2016 on Spatial Planning in East Kalimantan for the period 2016 to 2036. This calls for the resolution of communal rights and land claims within the State Forest Area based on existing laws and regulations.

Based on these regulations, the recognition Adat Forest (Hutan Adat) and Customary Land (Tanah Ulayat) follows a multi-step process. First, the proposal of the adat community is evaluated by an Adat Law Community Committee at either the district or province-level. Based on that evaluation, the Area Head can issue a decision letter that recognizes the adat territory. If the territory is outside of the State Forest Area, BPN can then directly grant communal land rights to the community. For land that is within the State Forest Area, the IP4T Team (also at the district or province-level) further evaluates the proposal and can recommend the release of the land from the State Forest Area. The decision will be based on the existence of an established adat history, of adat territory, of functioning adat law and institutions, and of adat resources. After a community is recognized as an Adat Law Community and has received the communal land right from BPN, it can apply to the MoEF for the registration of Adat Forest based on MoEF regulation P32 of 2015. Recognition of indigenous peoples in East Kalimantan can be seen in Annex 4.4.

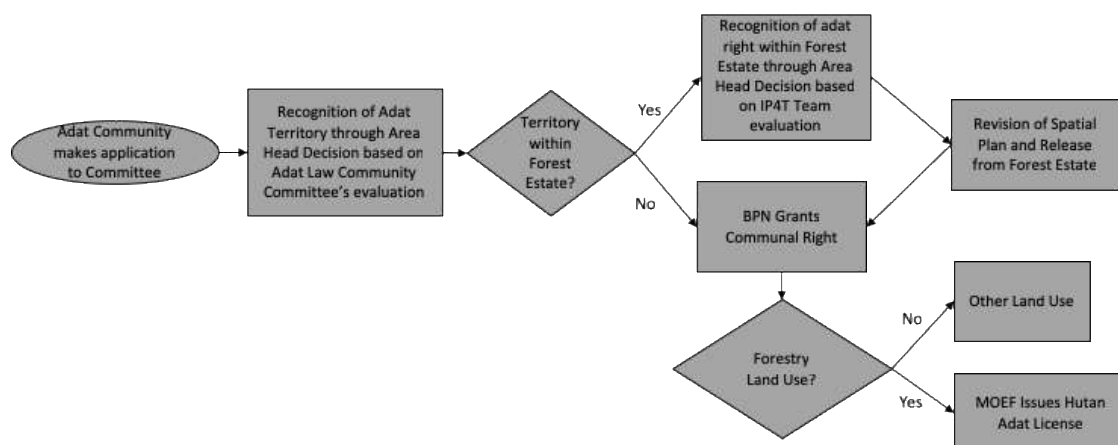


Figure 4.5 Process of Recognition of Communal Land Rights and Adat Forests

Source: BUMI 2017 (adapted)

So far, however, only four Adat Forests have been recognized through this process in East Kalimantan . This includes a 49 ha Hutan Adat area in Hemaq Beniung village, a Wilayah Adat in Kekau covering 4,026 ha, and a Wilayah Adat area in Mului which covers 7,803 ha. The total adat area that is officially recognized is currently 11,878 ha. Key actions for accelerating the process of adat land recognition include the following:

- Districts should issue local regulations and establish Adat Law Community Committees in line with Provincial Regulation 1 of 2015.
- The Provincial Government should fully implement Provincial Regulation number 1 of 2016 on Spatial Planning by accelerating the resolution of communal claims within the State Forest Area.
- Forest Management Units should play a key role in the assessment of and recording of adat claims within the State Forest Area, through the process of carrying out social inventories within their boundaries.

Civil society also plays a critical role in supporting the process of adat recognition by supporting local communities in the process of mapping their territories, and by guiding them through the administrative processes. For example, AMAN (Indigenous Peoples Alliance of the Archipelago) and their partners the Participatory Mapping Network (JKPP) have formed an NGO initiative called the Ancestral Domain Registration Agency (Badan Registrasi Wilayah Adat, BRWA), which so far has registered adat community land totaling 168,418 ha in Pasir and Kutai Barat districts alone. Further efforts are needed to develop comprehensive documentation of Adat communities, including their claims and existing tenurial conflicts with other communities, companies and the Government, and subsequent recognition and protection of their rights.

Table 4.17. Adat Communities registered by BRWA in East Kalimantan

Name of Community	District	Area
Lusan	Pasir	68,962
Benuaq Sembuan	Kutai Barat	389
Sei Terik	Pasir	8,840
Sayo	Pasir	10,588
Samurangau	Pasir	17,643
Pasir Mayang	Pasir	8,889
Olog	Pasir	3,510
Muluy	Pasir	12,972
Benua Muara Tae	Kutai Barat	11,594
Modang	Pasir	10,866
Lembok	Pasir	10,385
Kelurahan Sepan	Pasir	3,780
Total		168,418

Source: www.brwa.or.id

Efforts to improve the licensing regime

In parallel to the ongoing shift in the tenure regime related to the State Forest Area and adat land rights, the GOI has implemented a number of reforms in licensing that should lead to improved recognition of local land rights and to improved land governance. For example, the Law on Plantations, UU No. 18/2004, requires plantations to provide development benefits to local communities, and to ‘purchase’ use rights from them prior to any development. Communities are in principle free to accept or reject offers negotiated directly with a company (Paoli, et al., 2013). Under the more recent Law No. 39/2014 on Plantations, local authorities are also prohibited from issuing permits where adat communities have customary rights.

A licensing moratorium was put into force in 2011 and was recently extended by President Joko Widodo in December 2017. The moratorium suspends the granting of new palm oil licenses in primary natural forest and peat lands. The Moratorium on the utilization of primary natural forest and peatlands is based on a MoEF Decree with an Indicative Map for the Suspension of the Issuance of New Permits, for the Utilization of Forest Resources and Forest Areas and

Revisions to the Designation of Forest Areas and Other Use Areas (PIPPIB; more commonly known as the moratorium map). Nationally, the map covers more than 66 million hectares of mostly primary and/or peat forests, none of which are believed to be encumbered with resource licenses (for logging, plantations, mining, etc.). Within the 66 million hectares, no new resource concessions may be awarded, for as long as the moratorium is in place. Several ministries and government agencies are instructed to take the necessary steps per their respective authority to implement the moratorium.

The Governor of East Kalimantan has issued Governor Regulation no. 17/2015 which is updated through Governor Regulation no. 1/2018. The regulation put additional requirements on plantation companies to be committed to manage high conservation value areas, to involve local communities, and to support regional economic development and food security. Complementing the regulatory approach, seven key oil palm districts have signed the Declaration of Sustainable Plantation Development. This is a voluntary commitment which includes the protection of high-carbon areas within licensed areas, as well as evaluating licensing arrangements.

Policies that should lead to reduced deforestation from the palm oil sector include the moratorium on new licenses in primary forests, the implementation of the Indonesian Sustainable Palm Oil (ISPO) scheme, and sustainability policies of a number of estate companies. The Indonesian Sustainable Palm Oil (ISPO) standard, introduced in 2011 by the Government of Indonesia, is designed to ensure that all Indonesian oil palm growers conform to higher agricultural standards. Based on existing Indonesian legislation, it aims to improve the sustainability and competitiveness of the Indonesian palm oil industry, whilst contributing to the Indonesian government's commitments to reducing greenhouse gas emissions. It is mandatory for all oil palm growers operating in Indonesia to adhere to the Standard, from large plantation companies to smallholders, although requirements for each vary. ISPO criteria are closely aligned with existing legal and regulatory requirements, and the system relies heavily on the Indonesian Environmental Impact Assessment (AMDAL), in its requirements. Voluntary implementation of ISPO for independent smallholder farmers began in 2015, and the Ministry of Agriculture has set a target for mandatory ISPO certification by 2022 for smallholders. So far, an area of 198,171 ha is ISPO certified in East Kalimantan (23 companies), or around 17% of the planted area.

A number of policies related to the development and management of Estate Crops in East Kalimantan are expected to be included in the provincial and district development plans:

- Prioritizing increased productivity rather than establishing new estate crop plantations;
- Directing new development of estate crop plantation to smallholders on land with low carbon stock values (shrubs and open land on mineral soils) through partnerships with large estate crop companies (low-emission supply chain).
- Encouraging the acceleration of estate crop plantations on areas where the permits have been issued and evaluating the existing permits.
- Protecting natural forests and peatlands with high carbon stock values. To the extent possible, collectively maintain 640,000 ha of natural forests and 50,000 ha of peatlands by 2030 in the allocated plantation areas.
- Ensuring compliance with the principles of sustainable estate crop development.

The One Map initiative aims to digitize data and information related to primary and secondary forests, including peatlands, on a single public portal, synchronized with data on licenses attached to the land area, with the urgent aim of eliminating duplicate licenses issued for the same land area. The One Map Initiative should facilitate the process of identifying ecologically suitable, appropriately classified, and uncontested (or weakly contested) land for oil palm licensing and make monitoring of legal compliance easier and more transparent.

Another important approach to reducing overlaps and to improving the licensing regime involves the review and revocation of licenses that do not fully comply with regulatory requirements. Following decentralization, regional governments issued thousands of Mining Business Licenses (IUP) across Indonesia, often without proper administrative procedures, leading to significant overlaps with existing natural resource licenses. The New Regional Government Law (Law No. 23 of 2014, as lastly amended by Law No. 9 of 2015) transferred mining authority from regents and mayors back to governors and in some cases to the MEMR. An investigation by Indonesia's anti-graft agency, the KPK, in 2014 into the mining industry found that that 40 percent of the nearly 11,000 licenses issued in 12 provinces were not clean and clear, mostly because they failed to pay taxes. This led to a review of existing mining licenses as codified in MEMR Regulation No. 43 of 2015 regarding Procedures for Evaluation of Issuance of Mineral and Coal Mining Business Licenses (MEMR 43/2015). Mining companies were given until 31. December 2016 to obtain mandatory Clean and Clear (CnC) Certificates.

For IUPs to qualify for a CnC Certificate, they have to demonstrate that their licenses were validly issued and that they conform to the requirements of the Mining Law. These requirements include evidence of payment of taxes and royalties, required environmental assessments (such as AMDAL), and other reports, having the necessary forestry permits (if the mining activity occurs in a forest area), property delineation. Failure to obtain a CnC Certificate may result in administrative sanctions in the form of written warnings, temporary suspension of mining activities or the revocation of the IUP license. At the beginning of the process, East Kalimantan had 1,404 IUP licenses covering around 5.3 million ha. Of these, 889 (covering around 2.3 million ha) have failed to obtain the mandatory CnC Certificate. So far 406 of these "non CnC" licenses have been withdrawn by the provincial mining board and there are plans to revoke the remaining 403 permits.

Table 4.18. Distribution of mining areas in East Kalimantan by Land Use Zone before Revocation (ha)

Land Use Zone	CnC Area	Mining Non-CnC Area	Mining	Total Mining Area
Conservation Forest	90,817	1,454		92,270
Protection Forest	98,041	31,177		129,217
Limited Production Forest	501,794	531,790		1,033,585
Production Forest	1,007,225	974,208		1,981,433

Land Use Zone		CnC Area	Mining Area	Non-CnC Area	Mining Area	Total Mining Area
Convertible Forest	Production	23,113		31,781		54,894
Sub-total State Forest Area		1,720,990		1,570,409		3,291,399
Non-Forest Area (APL)		1,293,834		707,483		2,001,316
Total		3,014,823		2,277,892		5,292,715

Efforts to revoke licenses in the other sectors have not proceeded as effectively. In the mining sector these efforts have been facilitated by a shift in administrative responsibility from the districts to the provinces, which led to an overall review. In contrast, a previous effort by the Ministry of Forestry to restructure timber plantation licenses (HTI) during the reformasi era was successfully resisted by concession holders. Faced with a large number of HTI companies that had failed to establish viable plantations within their concessions, or were not repaying reforestation loans, the Ministry attempted to revoke 14 licenses on the grounds of technical or financial unfeasibility. Ten of the companies responded by submitting court appeals and in July 2003, the court forced the Ministry of Forestry to reinstate the licenses.

Table 4.19. Key regulations and documents impacting forest tenure

Year	Regulation	Impact on Forest Tenure
1999	Law No. 22 on Regional Governance	<ul style="list-style-type: none"> Provinces and district received authority to prepare their own rules including forest management
1999	Forestry Law No. 41	<ul style="list-style-type: none"> Replaced the Basic Forestry Law No. 5/1967 Reversed the shift of forest authority to districts and reaffirmed the authority of the central government for key forestry functions Legal basis for social forestry schemes
2007	Government Regulation 6/2007 on Forest Use and Forestry Management and Utilization Plan and Forestry Minister Regulation Number P.23/Menhut-II/2007	<ul style="list-style-type: none"> Elaborated procedures for community plantation forests (HTR)

Year	Regulation	Impact on Forest Tenure
2011	Constitutional Court decision No. 45 / PUU-IX / 2011	<ul style="list-style-type: none"> Confirmed that gazettement of State Forest Area boundaries is mandatory Found that a significant portion of the State Forest Area had not been properly gazetted.
2012	Constitutional Court Decision No. 35/PUU-X/2012	<ul style="list-style-type: none"> Defined indigenous forests as private forests as opposed to State forests
2014	Village Law No. 6	<ul style="list-style-type: none"> Recognized indigenous villages
2014	Forestry Minister Regulation Number P.88/Menhut-II/2014 on Community Forestry	<ul style="list-style-type: none"> Revised HKm establishment processes including the zoning of HKm area, social mobilization and facilitation by the government; it also defines the obligations of the communities
2014	Forestry Minister Regulation Number P.89/Menhut-II/2014 on Village Forest	<ul style="list-style-type: none"> Establishment and obligations of village forest zone, government facilitation, license granting, forest utilization and logging permits
2014	Joint regulation No. 79, PB.3/MENHUT-II/2014, 17.PRT/M/2014, 8/SKB/X/2014 on 'Procedures for the Resolution of Land Control in the Forest Zone'	<ul style="list-style-type: none"> Jointly issued by the Minister of Forestry, the Minister of Home Affairs, the Minister of Public Works and the Head of the National Land Agency Grants land rights to people who have been managing the land for over twenty years Calls for the establishment of IP4T Teams at the province, district and city levels
2014	Law no 23 on Regional Governance	<ul style="list-style-type: none"> Shifts the authority for issuing mining and logging permits from districts to provinces
2015	The National Medium-Term Development Plan (2015-2019)	<ul style="list-style-type: none"> Sets a target of 12.7 million ha for the allocation of land to local people including customary communities
2015	Ministerial Regulation No. 32 on titled forest	<ul style="list-style-type: none"> Defines customary forests as Titled forest Defines the procedure for registering land as a titled forest (Hutan Adat)
2015	Minister of Home Affairs regulation number 52 of 2014	<ul style="list-style-type: none"> Provides guidelines for the recognition and protection of Adat Law Communities.

Year	Regulation	Impact on Forest Tenure
		<ul style="list-style-type: none"> Places the responsibility for the recognition and protection of Adat Law Communities with the provincial and district governments which are required to form Adat Law Community Committees.
2015	East Kalimantan Provincial Regulation No.1 / 2015	<ul style="list-style-type: none"> Provides guidelines for the recognition and protection of indigenous peoples
2016	Regulation of the Ministry for Agraria and Spatial Planning Number 10 of 2016	<ul style="list-style-type: none"> Concerns the registration of Communal Adat Land Rights on Adat Law Community Land within the State Forest Area
2016	Governor's Regulation number 1 of 2016	<ul style="list-style-type: none"> On Spatial Planning in East Kalimantan for the period 2016 to 2036. Calls for the resolution of communal rights and land claims within the State Forest Area based on existing laws and regulations.

Source: Adapted from Siscawati et al. 2017.

4.4.1. Areas within the Accounting Area that are subject to significant conflicts or disputes

Lack of clearly and formally recognized rights to customary forest areas has led to the overlap of commercial land use licenses and state claimed forest areas with customary lands, often resulting in conflict or dispossession, or both. A significant portion of the State Forest Area overlaps with community claims and the past allocation of land concessions often ignored the customary rights and interests of other rights holders often leading to conflict. Concessions have been granted without accurate field surveys leading to overlaps with lands claimed by local and adat communities. While major reforms are being undertaken, customary rights continue to be threatened by the ongoing demand for oil palm plantations, timber plantations and mining, and tensions over access to and use of land and natural resources is likely to continue throughout the ER Program period and beyond.

According to the Agrarian Reform Consortium there were 450 land-based conflicts across Indonesia in 2016, and these conflicts covered an area of 1.3 million ha¹⁹. The GoI has developed an indicative map of tenurial conflict with an inventory of around 201 conflicts, 33 of which are located in the Kalimantan provinces. MoEF's Law Enforcement Agency (Gakkum) lists three ongoing disputes between local people and companies in East Kalimantan. This number however does not capture the scale of overlapping land claims. According to a recent analysis, approximately one-third of all land with importance to local communities (HCV5 or HCV6) is located within areas that have been allocated to private companies for estate crop production, forest management, or mining (Sulistioadi, et.al., 2017). The resulting land access regimes are

¹⁹ <http://www.kpa.or.id/news/blog/category/berita/>

often the outcome of negotiated processes, where lack of clearly codified rights often places customary communities at a disadvantage to large concession holders.

Table 4.20. Initial identification of customary land in East Kalimantan

Land use designation	Customary Land (ha)	
Natural Forest Concession	262,632	26%
Timber Plantation	4,475	0%
Estate crops	52,891	5%
Mining	26,924	3%
Protection forest	374,558	37%
No Permit - Non Forest	48,300	5%
No Permit - Forest area	194,452	19%
Conservation area	4,905	0%
Social forestry	51,558	5%
Total	1,020,696	100%

Source: Sulistioadi, et.al., 2017

Since 2012, Indonesia has mobilized significant efforts to identify existing tenurial and other land use and forestry related conflicts, as well as develop relevant policies and regulatory frameworks. The government has initiated several measures to address disputes related to land ownership. National milestones include the development of special agrarian courts to resolve disputes related to land tenure, and the issuance of Presidential Decree No. 88/2017 on the settlement of forest tenure disputes. In East Kalimantan there is extensive experience in resolving conflict through conciliation, mediation, and arbitration. Also, the provincial Forestry Office has established a Forest Conflict Resolution Desk, and the provincial Plantation Office has developed an Integrated Team to resolve plantation conflict. The GoI is undertaking a joint assessment with local communities to further identify tenurial conflicts in forest areas and to determine ways forward to settle conflicts through consensus.

4.4.2. Impacts of the ER Program on existing land and resource tenure in the Accounting Area

The ER Program explicitly recognizes that unclear land tenure is a major underlying driver of deforestation and degradation and that it is an important barrier to REDD+. The ER Program will be implemented in the context of major reforms related to land tenure and land governance.

On the one hand, this provides an opportunity for the Program to support improvements in land governance and in particular in the rights of local and adat communities. On the other hand, the reforms involve complex changes in the legal and institutional framework, which will not be completed by the end of the ER Program, so that safeguards related in particular to uncertain rights for local and adat communities need to be in place. While progress in reforms depends also on actions that are beyond its scope, the ER Program will support the process through on-the-ground activities. These are described in Section 4.3 and include the following:

- **Strengthening licensing processes.** The licensing regime is an important part of land governance, and the Program will support increased transparency, and better monitoring of licenses. This is expected to reduce overlaps and conflicting claims, and to improve overall land governance. It should be noted that most existing forestry licenses are considered legal and that these are not affected by the moratorium, which applies only to the issuance of new licenses. Also, the moratorium only affects primary forests and peatlands, but does not prevent the allocation of licenses outside of those areas. By supporting improved land governance, in particular improved concession management, the ER Program will directly reduce negative impacts of current, as well as future concessions.
- **Supporting village-level spatial planning and development.** This will support local community development, as well as improved spatial planning at the village level.
- **Building the capacity of FMUs to carry out social inventories, mapping, and boundary delineation.** FMUs are ideally placed to support these activities, which are an important step in the recognition of adat claims.
- **Supporting dispute resolution mechanisms.** Ongoing disputes over land rights are often an impediment to resolving land issues, and processes of dispute resolution will help to strengthen legitimate land claims.
- **Strengthening local communities.** The Program will support local community development through the FMUs, through supporting social forestry initiatives, and through village development. In addition, the ER Program will strengthen the positions of local communities through the Benefit Sharing Mechanism.

These activities are expected to support the ongoing policy processes related to land governance, while directly providing benefits to local communities and other land users in terms of reduced conflict, increased recognition of community claims, and more empowered communities.

4.5 Analysis of laws, statutes and other regulatory frameworks

Indonesia has ratified international treaties on climate change (Law no. 6/1994, Law no. 17/2004, Law No. 16/2016). In implementing the development of land-based sectors, there is Forestry Law no. 41/1999 jo 19/2004, Plantation Law no. 39/2014, National Development Planning Law no. 25/2004, the Long-term Development Plan Law no. 17/2007, the National Spatial Planning Law no. 26/2007, and the Environmental Law no. 32/2009, which already has government regulations and implementing regulations at the ministerial level. ER activities are affected by Presidential Regulation no. 61/2011 and no. 71/2011. MoEF has published four ministerial regulations related to the implementation of REDD+ in Indonesia, namely as follows:

- MoEF Regulation No. P.71/Menlhk/Setjen/Kum.1/12/2017 on REDD+ Procedures

- MoEF Regulation No. P.72/Menlhk/Setjen/Kum.1/12/2017 on the National Registry System
- MoEF Regulation No. P.71/Menlhk/Setjen/Kum.1/12/2017 on MRV Implementation Guidelines, and
- MoEF Regulation No. P.71/Menlhk/Setjen/Kum.1/12/2017 on Guidelines on Inventory and Reporting on GHG Emissions.

The Government of East Kalimantan has also issued Provincial Regulations on Long Term Development Plans (Provincial Regulation No. 15/2008), Environmental Regulation no. 1/2014, Regional Regulation Spatial Plans No. 1/2016, and Local Regulation on Sustainable Plantations No. 26/2017. Table 4.18 above lists key regulations on land and resources tenure, including the Regional Regulation on Spatial Planning, and Provincial Regulation no. 1/2015 on Guidelines for the Identification and Recognition of Indigenous People in East Kalimantan. A Governor Regulation on Social Forestry was released in 2018 (Governor Regulation No. 34/2018).

As part of the effort to prevent forest and land fires, the province has issued Provincial Regulation no. 5/2009. Provincial Regulation no. 8/2013 relates to the implementation of reclamation and post-mining supervision.

Directions for regional development programs, including the land-based sectors, are contained in the Provincial Regulations on the Medium-Term Development Plan, which are issued every five years; and in the Governor's Regulations on the Annual Government Work Plan; and in the Regional Regulation on Provincial Revenue and Expenditure Budget, which is issued annually.

The implementation of FMUs is governed through Governor Regulation no. 101/2016 and Governor Regulation no. 19/2011 on the Long-term Forestry Plan.

5 STAKEHOLDER CONSULTATION, AND PARTICIPATION

5.1 Description of stakeholder consultation process

Indonesia's National REDD+ Strategy is based on an extensive stakeholder consultation process, and aims to provide for equitable involvement of stakeholders. In total, more than 300 experts representing more than 200 local, national, and international organizations participated in the 7 regional and national REDD+ strategy public consultations. The process produced three public drafts ahead of the strategy being launched by the REDD+ Task Force in September 2012.

Other major national REDD+ mechanisms that are based on extensive consultation processes, and that are linked to the ER Program, include the FREL, the SIS-REDD+, and the NDC (Table 5.1). The National FREL is the result of a process involving a series of initial technical analyses followed by public multi-stakeholder consultation. The SIS-REDD+ consultation process was intensively carried out over the course of 2011 to 2012, involving multiple stakeholders, including community representatives. The consultative process resulted in several revisions to the initial design. The ongoing consultative process to develop the NDC began in 2015 and covers all 34 provinces.

The proposed ER Program is closely linked to East Kalimantan's REDD+ Strategy and Regional Action Plan for Reducing Greenhouse Gas Emissions (RAD GRK), which are outcomes of comprehensive consultation processes involving key forest stakeholders. Stakeholders' inputs and concerns related to the East Kalimantan REDD+ Strategy, have been collected in a participatory manner, involving a series of national and sub-national consultative workshops, Focus Group Discussions (FGDs), informal discussions with target communities and document reviews. This process began in 2011. The SRAP and RAD GRK were developed through consultation processes, reaching out to communities, NGOs, universities and the government (provincial and district). In addition, the FCPF Readiness Program has sponsored numerous outreach events both at the national and subnational levels on REDD+ in general. Outreach and communication material from various programs and development partners have been published on-line, in print, through workshops, trainings, and other means. These consultations have aimed to involve a diverse range of stakeholders in the REDD+ planning process. Other key documents and plans that were developed with inputs from provincial and local stakeholders include the East Kalimantan Environmentally Sustainable Development Strategy, and the Green Growth Compact.

Identification of stakeholders has been mainly through self-selection. At the national level, the MoEF coordinates with other ministries and agencies to conduct a self-selection process to determine the relevant stakeholders for consultations. At the subnational level, the self-selection process has been supported by local agencies. Indigenous peoples have been engaged through CSOs as well as through Indigenous Peoples' institutions at the village level.

Various channels have been used to reach targeted entities, and media types have included: film, printed material, radio, and online publications. Information has been shared and stakeholders have been consulted through seminars, workshops, and focus group discussions. Strategies to reach local stakeholders including vulnerable groups have included: coordinating

with local government agencies and NGOs, establishing provincial and district REDD+ working groups, and creating climate change networks at the local level.

Table 5.1 Consultations on the National REDD+ Framework

Activity	Period of consultation process	Target regions involved
REDD+ Strategy Development	2011-2012	34 Provinces
FREL Development	2014-2016	National level only
SIS-REDD+ Development	2011-2016	East Kalimantan, South Sumatra, West Kalimantan
NDC Development	2015-now	34 Provinces

The Regional Council on Climate Change (DDPI) in East Kalimantan, which is a key partner in the implementation of the ER Program and represents the interests of the regional and local governments, university and civil society organizations, has been closely involved with the development of the East Kalimantan Environmentally Sustainable Development Strategy, the SRAP and the East Kalimantan Master Plan for Climate Change (2015-2035). Under the SES-REDD+ process, which is a provincial extension of the SIS-REDD+, the East Kalimantan Taskforce, under the leadership of DDPI, undertook a participatory multi-stakeholders process to adjust the national-level PCIs to fit into the province-specific context. A writing workshop on SESA and ESMF was conducted in Kutai Kartanegara District. The workshop aimed to define proposed ER activities that might have environmental and social impacts. Strategies to mitigate those impacts were consulted with relevant stakeholders at the district level.

The ER program itself was also developed through a participative process involving all relevant stakeholders. Initial discussions were held with GOI and with development partners to gauge interest and capacity in participating in the ER Program. This was followed by a process aimed at identifying suitable jurisdictions for the program. The ER-PIN was then developed with inputs gathered from stakeholders at the national and subnational levels through workshops and focus group discussions. In early 2017, consultations and discussions with relevant stakeholders to develop the ER-PD were launched. Early meetings aimed to gather inputs from the provincial government on the institutional arrangements for the ER Program. Consultations with the key sectors were held to gather inputs to the program design and relevant stakeholders were consulted on the ER Program's logframe in July 2017. On 20 November 2017, a focus group discussion was conducted to define high priority areas for proposed ER activities within East Kalimantan. Drivers of degradation and deforestation, ER Program activities, and the benefit sharing mechanism were discussed with the key stakeholders in East Kalimantan in November 2017. A full description of the process is included as Annex 5.1. and Annex 5.2.

Stakeholders in East Kalimantan helped identify the local drivers of deforestation, which are the basis of the ER activities proposed by this program. Qualitative data on drivers of deforestation

were collected through a series of consultative meetings, conducted with local stakeholders between May 2017 and March 2018. These meetings confirmed the findings from the quantitative analysis, and identified additional drivers of deforestation as well as drivers of degradation and underlying causes, that were not picked up by the spatial analysis. For example, the threat to remaining mangrove areas from the expansion of aquaculture was identified only through consultations with local stakeholders.

Feedback from the stakeholders was properly addressed and ways to mitigate the potential impact of the ER program were discussed and consulted. The process involved the provincial government (BAPPEDA, the Office of the Environment, and Government offices responsible for the relevant land-based sectors), district governments (BAPPEDA, Environmental agencies, and estate crop agencies), local and international NGOs in East Kalimantan, an Indigenous Peoples Organization (AMAN Kaltim), Academics (Unmul, Widya Gama University, UNTAG, STMIK SPB), and Employers' Associations (including some forestry and plantation companies). All inputs were compiled by DDPI East Kalimantan, and discussed with the East Kalimantan Secretary, FOERDIA and DGCC.

The Benefit Sharing Plan will be designed through a consultative process involving the key stakeholders. The system for benefit sharing, including non-carbon benefits, has been discussed at the national and province levels. Further arrangement on financial management and benefit sharing will be discussed with stakeholders, including CSOs and NGOs at the district, provincial, and national levels

The ongoing SESA, which is in the process of finalization, seeks, among other things, to strengthen local stakeholder engagement, including potentially affected communities. The SESA also aims to look at potential opportunities and key challenges for the operationalization of the FGRM under the program, particularly with regards to people's access to information and ability to provide feedback as well as raise complaints and necessary resources for managing potential grievances. The final SESA report and ESMF will be disclosed and approved by the World Bank prior to the World Bank's appraisal of the program.

Table 5.2 Summary of the stakeholder consultation process for ERPD development

No	Activities	Number of workshop/consultation/ meetings	Number of Participants (Persons)
1	Workshop at national level	3	131
2	Workshop at province level	6	361
3	Public consultation at national level	1	58
4	Public consultation at province level	2	88
5	Meetings at national level	11	325
6	Meetings at province level	15	570

5.2 Summary of the comments received and how these views have been taken into account in the design and implementation of the ER Program

Table 5.3 Integration of issues raised by stakeholders

Institutions	Issues Raised	Integration of input into the ERP Design
MoEF	<ul style="list-style-type: none"> • Harmonization with the national REDD+ framework • Synchronization with NDC 	<ul style="list-style-type: none"> • MRV, Safeguards, Registry System and FGRM, were aligned with the national mechanisms • The ER Program contributes to the NDC
Provincial and District Government	<ul style="list-style-type: none"> • The ER Program should be integrated with development programs, both national, provincial and district/city 	<ul style="list-style-type: none"> • The ER Program is based on the analysis of development plans and is aligned with the provincial medium-term development plan, and supports village development planning

Institutions	Issues Raised	Integration of input into the ERP Design
	<ul style="list-style-type: none"> • Not interfere with development program and investment 	
Academics	<ul style="list-style-type: none"> • The program design should be directly aimed at reducing GHG emissions • The program should consider providing economic benefits to local communities • The roles and responsibilities of stakeholders should be clear 	<ul style="list-style-type: none"> • The ER Program was designed to address drivers of deforestation • A major community livelihood component (Component 4) has been included in the ER Program • Institutional arrangements provide clear roles and responsibilities for stakeholders
Association of companies or companies	<ul style="list-style-type: none"> • The cost of RIL-C is a concern for companies and subsidies may be needed. • Guarantee on continue running the business 	<ul style="list-style-type: none"> • The ER Program will provide non-monetary incentives for RIL-C implementation through the ER activities and through the benefit sharing plan
AMAN Kaltim (Indigenous communities)	<ul style="list-style-type: none"> • Social and environmental safeguards must be implemented • Tenurial conflict must be resolved • Guarantee of benefit sharing for communities 	<ul style="list-style-type: none"> • The ER Program integrates findings from the SESA and implements an ESMF • An accountable and transparent FGRM is being prepared • The ER Program supports several activities related to the recognition of customary tenure • The BSM has been designed to allow communities to receive benefits, including rewards for traditional sustainable management practices
NGOs	<ul style="list-style-type: none"> • Social and environmental safeguards must be implemented • Guarantee of benefit sharing for communities 	<ul style="list-style-type: none"> • The ER Program integrates findings from the SESA and implements an ESMF • An accountable and transparent FGRM is being prepared

Institutions	Issues Raised	Integration of input into the ERP Design
	<ul style="list-style-type: none"> • Transparency and accountability in the implementation 	

The detailed summary of public consultations can be found on Annex 5.3.

5.3 Consultations as part of ERP implementation

A significant portion of the ER Program relies on the commitment of local stakeholders for adopting sustainable management practices, making consultations and outreach a necessary and integral part of the program. For example, the ER Program will work with key actors to support them in adopting and implementing sustainability approaches. This will include the adoption of certified sustainability standards, such as RSPO or ISPO for oil palm²⁰, and FSC for the timber sector. These standards themselves, include robust consultation processes. Also, the Provincial Environment Service will seek commitments from different stakeholders to protect and restore mangrove forest. The resolution of land tenure disputes is an important goal of the ERP, and one that can only be achieved through engagement with the affected parties. The Provincial Forestry Service will conduct focus group discussions and consultations with relevant stakeholders, advancing and resolving disputes where possible. The ER Program will support activities designed to improve community livelihoods, and these activities will need to be designed through consultations with local stakeholders.

At the village level, the ER program is expected to integrate with village development plans (RPJMDes), and these are based on consultations with local villagers. The Village Law clearly states that meetings on village planning and budgeting must involve community representatives including religious leaders, farmers, fishermen, women groups, and marginalized people.

The Directorate General of Sustainable Production Forest Management (DG PHPL) will support the formulation of the RIL policy by, among other activities, supporting focus group discussions and public consultations. To further support the adoption of RIL and HCV policies, the ER Program will develop a mechanism to provide incentives, which also will be developed through a consultative process with private and public sector stakeholders.

SIS-REDD+ has been designed to be open to inputs from various stakeholders and allows SIS management bodies at sub-national and national levels to work with independent third parties through the establishment of a Multi-Stakeholder Forum. The Multi-Stakeholder Forum can be established as necessary with members including representatives from the government, indigenous peoples, the private sector, NGOs, universities, and community leaders. The Multi-Stakeholder Forum serves as a point of communication and coordination between related agencies, provides regulatory recommendations, becomes the contact center for complaints related to the implementation of REDD+ safeguards, and conducts information, education and communication program and activities for awareness-raising and capacity building. SIS REDD+

²⁰ 100 estate crop companies and 50 smallholders for 5 years will be facilitated through technical assistance directly to the companies in order to comply with criteria and indicators of the ISPO

will be based on consultations with target stakeholders such as local ethnic groups, women, and other vulnerable persons, and this can be compared to the baseline information collected as part of the safeguard, SESA qualitative and quantitative socio-economic information.

6 OPERATIONAL AND FINANCIAL PLANNING

6.1 Institutional and implementation arrangements

The Constitution of Indonesia (UUD 1945 with new amendment) describes the Republic as a *Unitary State*. Under current arrangements for Regional Autonomy set out in Law 23 of 2014 and supporting laws and regulations, the President is the Head of Government. Law No. 23/2014 has shifted the autonomy domain from the district/city government to the province government. The province government, under the leadership of the Governor, is a representative of the central government. There are four vertically integrated strata of government: the Central/Nation, the Provinces, the Districts/Cities and Villages. Villages were given a formal and special status in government in the Law 6 of 2014 regarding Villages. Each level of government makes local laws and regulations that must be consistent with, and in line with, existing national laws and policies.

Under this system of governance, the arrangements for the ER Program are authorized by the National Government through its Executing Agency, the Forestry and Environmental Research and Development and Innovation Agency (FOERDIA) within the Ministry of Environment and Forestry. Thus, the FCPF Program is a national program and implemented by the Center for Socio-Economic, Policy and Climate Change R&D (P3SEKPI) and the DG of Climate Change Control (Dirjen PPI). This system of governance is a critical point as similar programs under the FCPF have been in states such as Mexico, which is a Federation in which Governors have much greater autonomy than is the case in Indonesia.

At the central level, the ER Program is under the responsibility of the MoEF. The Secretary General of MoEF signed and submitted the ERPIN and the draft ERPD to the World Bank. MoEF has a mandate to assist the President in the coordination, planning, management, monitoring, and supervision of REDD+ activities. The Ministry, in accordance with Law No 5/1990, Law No. 41/1999, and Law No. 32/2009, has the legitimacy and capacity to manage and implement REDD+ programs. The ER Program also provides an important role for the provincial and district/city governments in implementing the Indonesian approach to REDD+, which is based on national accounting and sub-national implementation. In addition, FMUs provide forest services at the provincial and district levels. The FOERDIA would be a technical advisor for the MoEF in the implementation of the ER Program at the national level. Table 6.1 lists the national agencies involved in the implementation of the ER Program and outlines their main roles.

MoEF will be the primary managing agency. It will provide guidance and perform supervision of the ER Program through FOERDIA the Research, Development and Innovation Agency, Centre for Socio-Economics, Policy and Climate Change (P3SEKPI). The Director- General for Climate Change (DGCC) will be the main partner with FOERDIA in implementing the ER Program. P3SEKPI is tasked with conducting research on the socio-economic aspects of forestry, climate change policy and the implementation of REDD+ programs, including Indonesia's FCPF Readiness Program.

After a series of consultations conducted by the Program Entity and relevant key stakeholders, GoI decided that the Ministry of Environment and Forestry (MoEF), as Program Entity, will sign the ERPA.

Table 6.1. National agencies involved in the implementation of the ER Program

National Agency	Status	Roles
Secretary General of Ministry of Environment and Forestry	MoEF Representative	<ul style="list-style-type: none"> • Submission of ERPIN and ERPD • Chairman of Steering Committee
DG of FORDIA (MoEF)	Technical Advisory	<ul style="list-style-type: none"> ▪ Signing ERPA ▪ Program Design ▪ Consultation for Methodologies (technical assistance) ▪ Preparation for agencies for field implementation ▪ Consultation and Communication with Facility Management Team ▪ A member of Steering Committee
Director General Climate Change (MoEF)	National Focal Point of REDD+	<ul style="list-style-type: none"> ▪ Management of the National Registry ▪ Development and management of the FREL ▪ Management of the MMR ▪ Finalization and implementation of safeguards plans ▪ Finalization and implementation of the FGRM ▪ Technical Assistance ▪ Recommendation for Payment (BSM) ▪ A member of Steering Committee
Ministry of Finance (DG BLU)	Financial Authority	<ul style="list-style-type: none"> ▪ Oversees the BPDH (BSM) ▪ Channels funds to the BPDH and government agencies (BSM) ▪ A member of Steering Committee

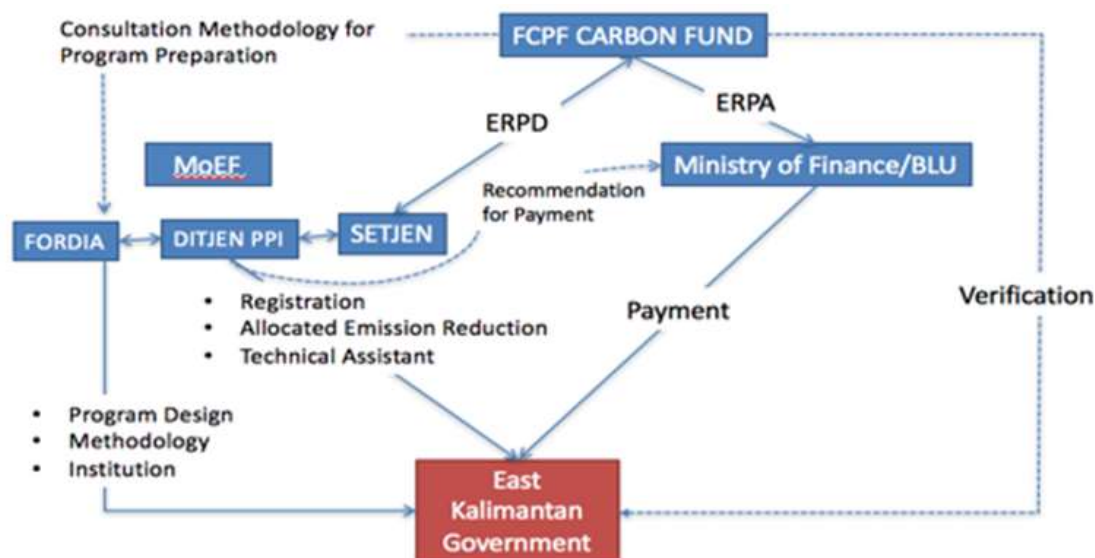


Figure 6.1 Institutional arrangement of ER Program at National Level

At the provincial level, the responsible party for ER Program implementation is the Provincial Secretary (Sekda Provinsi Kaltim), with the Provincial Environmental Service (Dinas Lingkungan Hidup) acting as coordinator or undertaking the day-to-day management of the ER Program. During the implementation of the ER Program, the Sekda will be advised by the Provincial Climate Change Council (Dewan Daerah Perubahan Iklim-DDPI). Table 6.2 lists the sub-national agencies involved in the implementation of the ER Program and outlines their main roles.

The Regional Council on Climate Change (DDPI) in East Kalimantan Province is a key partner in the implementation of the ER Program. DDPI is a multi-stakeholder organization that has coordinated the planning and implementation of low emission development in East Kalimantan Province. It has significant experience (as well as operational infrastructure) in the management of donor development funding.

Table 6.2. Sub-National Agencies and Organizations involved in the Implementation of the ER Program

Agency	Status	Role
Provincial Secretary (SEKDA)	Executing Agency at Province Level	<ul style="list-style-type: none"> • Responsible for Implementation and achievement of ER Program in the Province • A member of Steering Committee
The Regional Council on Climate Change (DDPI)	Advisory	<ul style="list-style-type: none"> • Providing advice and inputs to local government in relation to ER Program • A Member of Steering Committee

Agency	Status	Role
East Kalimantan Environment Service (Dinas Lingkungan Hidup)	Implementing agency	<ul style="list-style-type: none"> Local responsibility for FREL and MMR ER Program implementation
Other Provincial Government Services (OPD)	Implementing Agencies	<ul style="list-style-type: none"> ER Program implementation Leading consultation processes within their respective jurisdictions
Provincial Planning Board (BAPPEDA) East Kalimantan Province	Coordinative implementation at provincial level	<ul style="list-style-type: none"> Coordinate all activities done by OPD in relation to ER program
Development Partners (Prov. & Kab/Kota)	Partner	<ul style="list-style-type: none"> Provide supporting funds and technical advice to DDPI or District/City Government
University/NGOs (Prov. & Kab/Kota)	Partner	<ul style="list-style-type: none"> Provide scientific support and facilitation to DDPI and District/City Government A Member of Steering Committee (observer)
District/City Secretary	Executing Agency at District/City Level and Field Site	<ul style="list-style-type: none"> Responsible for Implementation of the ER Program in the district and field level
BAPPEDA District/City	Coordinative implementation at district/city level and field site	<ul style="list-style-type: none"> Coordinates all ER Program activities carried out by district/city level
OPD District/City	Implementing Agencies	<ul style="list-style-type: none"> Implement the ER Program at district/city and field level
Village Government	Implementing Agencies	<ul style="list-style-type: none"> Implementing ER Program at village and field level

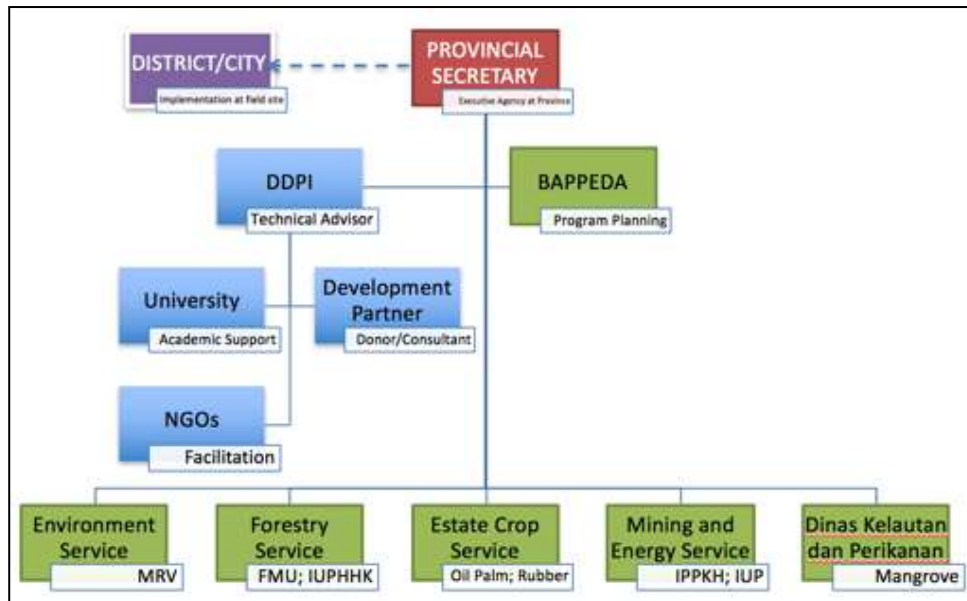


Figure 6.2 Institutional arrangements of ER Program at Provincial Level

At the district/city level, the ER Program will be implemented by the District Environmental Service (Dinas Lingkungan Hidup). Each respective district/city government will be responsible for the implementation of the ER Program in its region. The detailed institutional arrangements for the ER Program at the district/city level can be seen in Figure 6.3. At the village level, the village government, including the local community, is responsible for the ER activities within their respective village area.

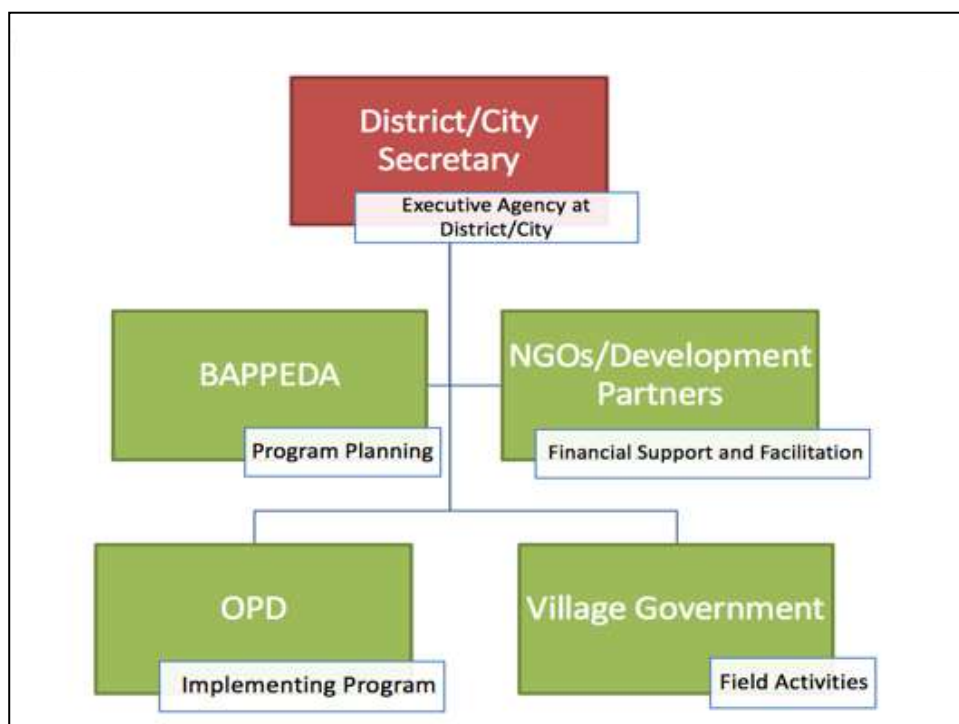


Figure 6.3 Institutional arrangements of ER Program at District/City Level

To ensure effective coordination among the various implementing agencies, a Steering Committee will be established to represent the interests of the relevant Ministries of the National Government and the Governor of East Kalimantan. Other members of the Steering Committee will represent development partners and civil society. This high-level committee (Directorates-General) will be chaired by the MoEF. The World Bank and selected partner agencies will be given observer status. Steering Committee meetings will be held every 6 months to evaluate activities and progress. Technical coordination meetings, will be held as required.

As noted above, accountability for program implementation, at least for the public agencies, is facilitated through the national governance system, where district institutions are accountable to the province, and the province is accountable to the center. It is important to note, however, that the ERP is not a top-down program. Program activities are largely based on policies and commitments that have come from the province and district levels. This includes East Kalimantan's GHG reduction commitments, the Governor's moratorium on issuing licenses in primary forests, district-level commitments to sustainable estate crop development, and ongoing sustainability efforts by the private sector. The ERP, places these efforts into the national REDD+ framework (which is based on national accounting and sub-national implementation) and provides performance-based incentives for successful implementation.

6.2 EER Program Budget

6.2.1 ER Program Costs

The total program cost over the period 2020-2025 is estimated at **USD 90,701,740**. The breakdown of costs by components, and by land use, and by year is presented in the following three tables:

Table 6.3 The estimated total ER Program cost 2020 – 2025

COMPONENT	BUDGET (USD) COMPONENT	BUDGET (IDR) COMPONENT	Share
1. Forest and Land Governance	903,995	12,203,927,980	1.0%
2. Strengthening Government Capacity for Forest Administration	9,228,881	124,589,900,167	10.2%
3. Reducing deforestation and degradation within licensed areas	25,117,505	339,086,325,400	28%
4. Sustainable Alternatives for Communities	48,260,119	651,511,609,651	53.2%
5. Program Management and Monitoring and Evaluation	7,191,239	97,081,720,922	7.9%

Table 6.4. Estimated total ER Program cost by Land Use/Driver 2020-2025

DRIVER	USD	%
Oil Palm	11,314,871	12.47%
Timber plantation	9,414,121	10.38%
Mining	2,370	0.00%
Overlogging/ Poor Concession Management	8,353,407	9.21%
Illegal Logging	3,408,381	3.76%
Agriculture	5,782,942	6.38%
Unlicensed land clearing	43,900,193	48.40%
Aquaculture	1,334,215	1.47%
Cost for Project Management (not driver)	7,191,239	7.93%

Table 6.5. Summary of the total ER-Program costs (expected uses of funds)

COMPONENT	BUDGET (USD)	BUDGET (IDR)	2020	2021	2022	2023	2024	2025
1. Forest and land governance	903,995	12,203,927,980	2,110,700,000	1,767,722,295	1,966,982,063	1,954,739,381	2,177,738,621	2,226,045,621
2. Strengthening Government Capacity for Forest Administration	9,228,881	124,589,900,167	13,424,770,000	11,785,937,576	18,253,809,912	18,332,727,140	35,052,701,885	27,739,953,654
3. Reducing deforestation and degradation within licensed areas	25,117,505	339,086,325,400	23,619,767,000	30,415,666,706	44,415,343,233	61,571,404,257	85,323,220,791	93,740,923,415
4. Sustainable Alternatives for Communities	48,260,119	651,511,609,651	52,836,203,000	26,475,540,168	102,385,202,279	41,397,281,023	181,702,031,753	246,715,351,429
5. Program Management and Monitoring and Evaluation	7,191,239	97,081,720,922	14,287,502,000	2,914,625,642	55,396,478,250	3,319,158,406	17,384,118,706	3,779,837,920

6.2.2 Financing strategy

The main source of funding for the ER Program is the Government of Indonesia, through its national, province, district and village budgets. The Government of Indonesia and the Government of East Kalimantan are committed to the successful implementation of the ER Program, and they will integrate the Program into their development and budget plans. For example, the East Kalimantan Representative Council is preparing a Provincial Regulation that will lead to ER activities being included in the Provincial Kalimantan Medium Term Development Plan 2018-2023. The largest share of the domestic budget will be from the village budget which will support activities at the village level. Programs under the MoEF and the Ministry of Agriculture will be funded by the respective ministry budgets. The total government budget support to the ERP will be **USD 69,518,306**.

The second largest source of funding for the ER Program is the private sector, which has committed **USD 20,258,132 to the Program**.

A number of development partners have committed support for the ER Program. Commitments so far total **USD 3,528,590** and are from:

- WWF Indonesia, which will support activities related to peat land management, SFM, sustainable plantations, and village development);
- The Nature Conservancy, which will provide support through its terrestrial and blue carbon programs;
- The Global Green Growth Institute which will support activities linked to green economy and to strengthen FMUs;
- The Governors' Climate and Forests (GCF) Task Force;
- Belantara which will support HCV management and village activities; and
- GIZ

Total identified funding from the budget, the private sector, and development partners, so far is **93,305,028**.

It is expected that the program will generate around 91.3 million tonnes of CO₂e (after 4% uncertainty) in Emission Reductions (see Section 13, Table 13.9). Of this, 27.2 million tonnes will be offered to the Carbon Fund, of which 5.2 million tonnes (26%) will be set aside as a buffer. For the remaining 22 million tonnes the ERP assumes a value of USD 5 per tonne, generating USD 110 million in payment from the Carbon Fund, with the first share of the payment expected in 2023 and the second share expected in 2025.

The financing sources of the program are summarized in Figure 6.5, and in Table 6.6.

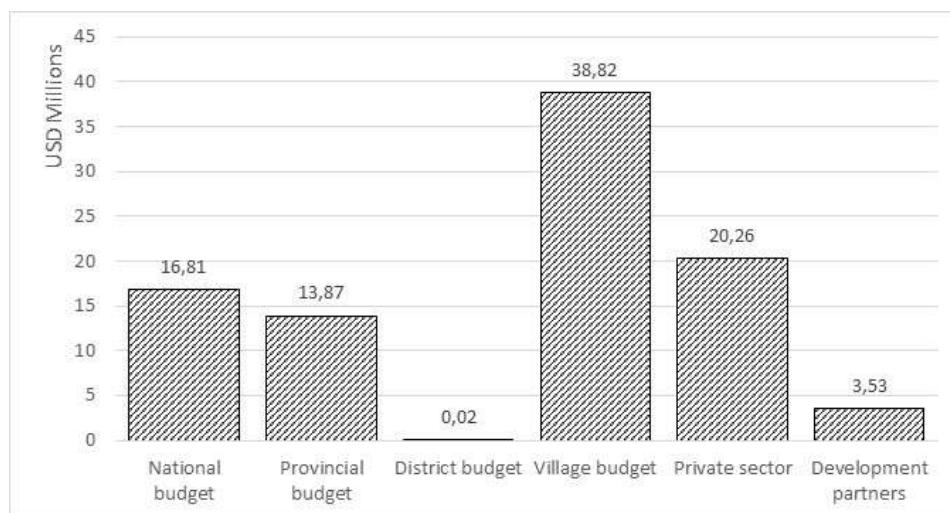


Figure 6.4 Financing sources for the ER-P implementation

Table 6. 6. Financing sources by years (Sources of funds)

SOURCES OF FINANCING	2020	2021	2022	2023	2024	2025	SUBTOTAL (USD)
GOVERNMENT							
National budget	2.120.407	2.276.764	2.993.767	2.823.233	3.112.872	3.483.739	16.810.782
Provincial budget	1.673.759	1.887.950	2.170.304	2.460.796	2.696.047	2.981.627	13.870.483
District budget	7.544	0	0	9.168	0	0	16.713
Village budget	1.896.415	2.867.728	3.938.899	6.976.674	9.937.650	13.202.963	38.820.328
PRIVATE SECTOR							
Private sector	1.008.256	1.698.331	2.389.033	3.883.398	4.874.883	6.404.232	20.258.132
DEVELOPMENT PARTNERS							
Belantara	17.567	21.953	22.681	27.162	31.695	36.283	157.341
GCF TF	14.815	15.810	16.871	18.004	19.213	20.503	105.214
GGGI	46.667	46.638	49.770	56.712	56.677	60.483	316.946
GIZ	169.470	149.367	161.226	192.580	186.757	200.512	1.059.913
TNC	229.904	224.446	250.852	278.061	306.127	335.108	1.624.497
WWF	46.815	38.101	40.659	43.389	46.302	49.411	264.678
Total Sources of Budget	7.231.618	9.227.088	12.034.061	16.769.177	21.268.223	26.774.860	93.305.028
Total Cost	7.872.514	5.434.036	12.595.020	9.130.085	22.791.488	27.438.687	90.701.740

7 CARBON POOLS, SOURCES AND SINKS

Table 7.1 illustrates the REDD+ activities (adopted by 1/CP.16, paragraph 70) selected by the ER-Program and the associated emission sources and sinks.

7.1 Description of Sources and Sinks Selected

Table 7.1 Sources and Sinks Selected

Sources/Sinks	Included?	Justification / Explanation
Emissions from deforestation	Yes	<p>Emissions from deforestation are identified as GHG emissions from the IPCC Land Use Change category forest land to non-forest land, plus emissions from peat decomposition, peat fire, and mangrove soils that are linked to deforestation.</p> <p>Deforestation in this context is defined as a conversion of natural forest to other land uses (non-natural forest; see section 8.2). In the period 2006 to 2016 deforestation contributed 80% of total emissions in East Kalimantan. Conversion to agriculture, particularly to oil palm plantations, was the major cause of the deforestation, while conversion to monoculture timber plantations also contributed significantly.</p>
Emissions from forest degradation	Yes	<p>Emissions from forest degradation include:</p> <ul style="list-style-type: none"> -Emissions due to the degradation of primary forest into secondary forest within non production forest areas (to avoid double counting with logging, see below) - Emissions due to degradation of secondary forest caused by fire - Emission from peat decomposition - Emissions from logging in production forest areas <p>Forest degradation in the national FREL is defined as a change of a primary forest class to a secondary forest class. Primary forest classes, include primary dryland, primary mangrove and primary swamp forests. However, the use of the definition excludes losses of carbon in the secondary forest due to further disturbance. Identifying the degree of forest degradation within secondary forests is not a simple task, especially not on a routine basis with the currently</p>

Sources/Sinks	Included?	Justification / Explanation
		<p>used medium-resolution satellite imagery (Landsat); and at present, Indonesia has no capacity and data available to assess different levels of degradation occurring within secondary forests. However, the loss of carbon in the secondary forest due to fire as well as due to logging activities by the concessionaires is included as a proxy.</p> <p>Further disturbance of secondary forest that leads to the change of secondary forest into shrubs is considered deforestation. Thus emission due to loss of carbon from the conversion of secondary forest to shrubs is reported under deforestation.</p>
Emissions and removals from conservation of carbon stocks	No	The national REDD+ framework does not define activities for the conservation of carbon stocks.
Emissions and removals from sustainable management of forest	No	This activity is not included due to limited data and information.
Removals from enhancement of carbon stocks	No	The national FREL does not account for removals from the enhancement of carbon stocks. Also, there is limited data and information, especially on relevant emission factors. Inclusion of this activity would not be in line with the national REDD+ framework and would result in a higher uncertainty level.

7.2 Description of Carbon Pools and greenhouse gases selected

The following Table 7.2. explains which pools were recorded in the FREL for each activity.

Table 7.2 Carbon Pools

Carbon Pools	Selected?	Justification / Explanation
Above Ground Biomass (AGB)	Yes	<p>According to Indonesia's FREL document, emissions from AGB accounted for around 70% of total emissions from biomass, making AGB the largest pool of emissions.</p> <p>Moreover, many studies for estimating above-ground tree biomass in Indonesia are available, enabling Tier 2 or Tier 3 approaches. AGB data are widely available and can be estimated from forest inventory or sample plot data.</p>
Below Ground Biomass (BGB)	Yes	Based on research conducted at sites in Sumatra and Kalimantan, this pool accounts for an average of 13.6% of total biomass (MoEF, 2016). This pool is estimated using shoot-root ratios, following IPCC (2014).
Dead Wood	No	Based on research conducted at sites in Sumatra and Kalimantan, this pool accounts for an average of 14.3% of total biomass emissions. In spite of being significant, this carbon pool is excluded due to lack of sampling data.
Litter	No	Emissions from litter are excluded as per Indonesia's FREL document. It was estimated that emissions from litter accounted for only 1% of total emissions from biomass, and the pool is therefore considered insignificant.
Soil Carbon	Yes for organic Soils No for mineral soils	The ERP accounts for losses of carbon from peat and mangrove soils due to decomposition (gradual loss) and fire. Emissions from soil carbon in mineral soils is excluded, since they are not significant.

Table 7.3 Type of Gases

Greenhouse gases	Selected?	Justification / Explanation
CO₂	Yes	The ER Program shall always account for CO ₂ emissions and removals
CH₄	No/Yes	Excluded for peat drainage due to insufficient data in estimating methane emissions and included for peat and forest fire following the IPCC (2014)
N₂O	Yes	Included only for forest fire following the IPCC (2014)

8 REFERENCE LEVEL

8.1 Reference Period

Following the Criteria 11 of the FCPF Methodological Framework (2016), the end-date for the Reference Period should be the most recent date prior to two years before the TAP starts the independent assessment of the draft ER Program Document (i.e. 2018-2 years = 2016) and for which forest-cover data is available to enable IPCC Approach 3; and the start date of the Reference Period is about 10 years before the end-date. Considering this criterion, the reference period selected for the ERPD is from 2006 to 2016. This is understood to cover a 10 year period from 2006 to 2016, reflecting the 10-year period between the forest cover map developed for 2006 and the forest cover map developed for 2016. To ensure consistency with the national framework, the land use/cover data for the development of the FREL for the ER Program are the same as the data used in the development of the national FREL supplied by the Ministry of Environment and Forestry, i.e. data of years 2006, 2009, 2011, 2012, 2013, 2014, 2015 and 2016.

8.2 Forest definition used in the construction of the Reference Level

In accordance with UNFCCC decision 12/CP.17, forest in Indonesia is defined as a land area of more than 6.25 ha with trees higher than 5 meters at maturity and a canopy cover of more than 30 percent. This is a formal definition of forest which is used as a guiding principal definition and which is mostly based on forest ecology. For the construction of the national FREL for REDD+, Indonesia used a different definition that considers limitations of methods and data used in generating the Indonesia forest data. A “working definition” of forest was used to produce land-cover maps through visual interpretation of satellite images at a scale where the minimum area for polygon delineation is 0.25 cm² at 1: 50,000 of scale which represents 6.25 ha. This definition is in accordance with the Indonesian National Standard (SNI) 8033:2014 on “Method for calculating forest cover change based on results of visual interpretation of optical satellite remote sensing image” (<http://sni.bsn.go.id/product/detail/22270>). Other definitions of forest submitted to international organizations by Indonesia can be accessed from http://ditjenppi.menlhk.go.id/kcpi/dokumen/national_frel_final%20revisi_10des.pdf

The SNI defined forest based on satellite data features including color, texture and brightness. Forests were classified into 7 classes based on forest types and degradation or succession level, while non-forests were classified into 15 classes with one class being cloud (Table 8.1). The first six forest classes are natural forests, and the seventh class is plantation forest. These 23 land cover classes are based on physiognomy and biophysical appearance that is captured by remote sensing (Landsat at 30 meter spatial resolution). However, the object identification is purely based on the appearance in the imagery. Manual-visual classification through an on-screen digitizing technique based on key elements of image/photo-interpretation was applied as a classification method. Several ancillary data sets (including concession boundaries of logging and plantation, forest area boundaries) were utilized during the process of delineation, to integrate additional information valuable for classification. The process for analyzing satellite data to monitor the land/forest cover change is described in detail in Margono et al. (2016) and can be accessed from the following link http://webgis.menlhk.go.id:8080/nfms_simontana/ and <https://jurnal.ugm.ac.id/ijg/article/view/12496/9041>. References for technical assessment related to the carbon accounting can be

seen in Annex 8.2. The data/informations/methodology was posted in <http://puspijak.org/index.php/front/content/erpd> (official website of Research and Development Center for Social Economy, Policy and Climate Change, Ministry of Environment and Forestry).

For the construction of the national FREL, Indonesia only included natural forest in its forest definition; plantation forest is treated as non-forest land for purposes of the FREL, and the ERPD follows the same convention for consistency.

The submitted national FREL has successfully undergone technical assessment by the UNFCCC. In the construction of the FREL for the ER Program, the same definition has been adopted, which excludes plantation forests. The use of this definition is in line with the spirit of REDD+ activities as defined in paragraph 2e in the Appendix 1 of Decision 1/CP.16 that REDD activities should not be used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests.

Table 8.1 Characterization of natural forests in Indonesia used in national land cover mapping.

No	Land cover type	Code	Description
Forests			
1	Primary dry land forest	2001	Natural tropical forests growing on non-wet habitat including lowland, upland, and montane forests with no signs of logging activities. The forest includes heath forest and forest on ultramafic and lime-stone, as well as coniferous, deciduous and mist or cloud forest, which shows no, or little, influence from human activities such as logging.
2	Secondary dry land forest / logged forest	2002	Natural tropical forests growing on non-wet habitat including lowland, upland, and montane forests that exhibit signs of logging activities indicated by patterns and signs of logging (appearance roads and patches of logged-over area). The forest includes heath forest and forest on ultramafic and lime-stone, as well as coniferous, deciduous and mist or cloud forest.
3	Primary swamp forest	2005	Natural tropical forests growing on wet habitat in swamp form, including, brackish swamp, marshes, sago and peat swamp, which shows no, or little, influence from human activities such as logging.

No	Land cover type	Code	Description
4	Secondary swamp forest / logged forest	20051	Natural tropical forests growing on wet habitat in swamp form, including brackish swamp, marshes, sago and peat swamp that exhibit signs of logging activities indicated by patterns and signs of logging (appearance roads and logged-over patches).
5	Primary mangrove forest	2004	Wetland forests in coastal areas such as plains that are still influenced by the tides, muddy and brackish water and dominated by species of mangrove including Nipa (<i>Nipafrutescens</i>), which shows no, or little, influence from human activities such as logging.
6	Secondary mangrove forest / logged forest	20041	Wetland forests in coastal areas such as plains that are still influenced by the tides, muddy and brackish water and dominated by species of mangrove and Nipa (<i>Nipa frutescens</i>), and exhibit signs of logging activities, indicated by patterns and signs of logging activities.
7	Plantation forest	2006	The appearance of the structural composition of the forest vegetation in large areas, dominated by homogeneous trees species, and planted for specific purposes. Planted forests include areas of reforestation, industrial plantation forest and community plantation forest.
Non-Forests			
8	Dry shrub	2007	Highly degraded logged over areas on non-wet habitat that are ongoing process of succession but not yet reach stable forest ecosystem, having natural scattered trees or shrubs.
9	Wet shrub	20071	Highly degraded logged over areas on wet habitat that are ongoing process of succession but not yet reach stable forest ecosystem, having natural scattered trees or shrubs.
10	Savanna and Grasses	3000	Areas with grasses and scattered natural trees and shrubs. This is typical of natural ecosystem and appearance on Sulawesi Tenggara, Nusa Tenggara Timur, and south part of Papua island. This type of cover could be on wet or non-wet habitat.

No	Land cover type	Code	Description
11	Pure dry agriculture	20091	All land covers associated with agriculture activities on dry/non-wet land, such as tegalan (moor), mixed garden and ladang (agriculture fields).
12	Mixed dry agriculture	20092	All land covers associated with agriculture activities on dry/non-wet land that is mixed with shrubs, thickets, and log over forest. This cover type often results of shifting cultivation and its rotation, including on karts.
13	Estate crop	2010	Estate areas that has been planted, mostly with perennials crops or other agriculture trees commodities.
14	Paddy field	20093	Agriculture areas on wet habitat, especially for paddy, that typically exhibit dyke patterns (pola pematang). This cover type includes rainfed, seasonal paddy field, and irrigated paddy fields.
15	Transmigration areas	20122	Kind of unique settlement areas that exhibit association of houses and agroforestry and/or garden at surrounding.
16	Fish pond/aquaculture	20094	Areas exhibit aquaculture activities including fish ponds, shrimp ponds or salt ponds.
17	Bare ground	2014	Bare grounds and areas with no vegetation cover yet, including open exposure areas, craters, sandbanks, sediments, and areas post fire that has not yet exhibit regrowth.
18	Mining areas	20141	Mining areas exhibit open mining activities such as open-pit mining including tailing ground.
19	Settlement areas	2012	Settlement areas including rural, urban, industrial and other settlements with typical appearance.
20	Port and harbor	20121	Sighting of port and harbor that big enough to independently delineated as independent object.
21	Open water	5001	Sighting of open water including ocean, rivers, lakes, and ponds.
22	Open swamps	50011	Sighting of open swamp with few vegetation.

No	Land cover type	Code	Description
23	Clouds and no-data		Sighting of clouds and clouds shadow with size more than 4 cm2 at 100.000 scales display.

8.3 Average annual historical emissions over the Reference Period

8.3.1 *Description of method used for calculating the average annual historical emissions over the Reference Period*

The following is a high level overview of the steps taken to calculate the average annual historical emissions over the Reference Period. These steps will be discussed in more detail in the following sections.

- Activity Data, the estimated areas of deforestation and degradation, is generated from existing sample-based approach called as Sample Based Estimation (SBE) following the procedure of Olofsson (2014), with post stratification using land cover maps. Estimates of degradation are augmented by additional data on fires and logging.
- Emission factors come from forest inventory data and biomass equations (for forest land) and from published literature (for nonforest land, logging, fire and soil), with IPCC default assumptions for converting biomass to carbon.
- Activity data and emission factors are combined to estimate emissions from different sources.
- Historical Emissions will be calculated and reported for the following components:
 - Emissions from biomass associated with deforestation (change from forest to nonforest cover class) and forest degradation (change from primary to secondary forest cover class in non production forest areas. Consideration is limited to non-production forests in order to avoid double counting with logging estimates, described below.)
 - Emissions from organic soil associated with deforestation of swamp and mangrove forest (change from forest to nonforest cover class)
 - Emissions from forest fires in secondary forest and peat lands (emissions from fires in primary forest are captured in the land cover mapping described above)
 - Emissions from waste and damage during logging in production forest areas. NOTE – this does not include the harvested wood products, it only includes the emissions associated with waste and damage which remains in the forest to decay.





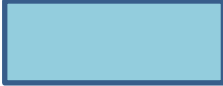
All Emissions are only counted from land which was in a forested class at the start of the Reference Period in 2006.

The method used for the calculation of average annual historical emissions follows the method that is consistent with the IPCC Guidelines for National Greenhouse Gas Inventories. Historical emissions over the reference period is calculated as combination of the Activity Data (AD) and Emission Factor (EF) from different sources. According to the Revised 1996 IPCC Guidelines for

National Greenhouse Gas Inventories, AD is defined as a data on the magnitude of human activity resulting in GHG emissions or removals taking place during a given period of time, such as area of deforestation, and area of forest degradation due to fire and selective logging. AD is primarily taken from the analysis of land cover maps in certain periods, and also from the hot spots data sets. Using the current forest monitoring system, it is difficult to capture the forest area impacted by selective logging; therefore the actual logged area (in hectares) as reported by logging concessions has been used in this calculation.

EF is defined as the average emission rate of a given GHG for a given source, relative to units of activity. EF in this emission calculation comes from site specific forest inventory data in East Kalimantan, and from the literature published internationally.

Table 8.2 Description and explanation of emission sources

1. Emission from Deforestation	Area
<ul style="list-style-type: none"> • Living Biomass (ABG & BGB). This is to estimate the emission from the loss of living biomass in the whole area of East Kalimantan due to conversion for forest classes to non-forest classes. 	
<ul style="list-style-type: none"> • Soil 	
<ul style="list-style-type: none"> ○ Peat Decomposition. This is to estimate the emission from the loss of peat (decomposition process) due to deforestation after 2006 	
<ul style="list-style-type: none"> ○ Peat fire. This is to estimate the emission from the loss of peat due to fire in non-forested land that was deforested after 2006. 	
<ul style="list-style-type: none"> ○ Mangrove soil. This is to estimate the emissions from the loss of mangrove soil due to conversion of mangrove forests aquaculture/fishpond 	
2. Emission from forest degradation	
<ul style="list-style-type: none"> • Living Biomass, a transition of primary forest to secondary forest (ABG & BGB). This is to estimate the emission from the loss of living biomass in the whole area of East Kalimantan due to transition of primary forest to secondary forest outside production forest area. Degradation within production forest area is not counted from land cover 	

mapping, only counted from logging data (see below) in order to avoid double counting,

- **Soil; Peat Decomposition.** This is to estimate the emission from the loss of peat (decomposition process) due to forest degradation after 2006.



- **Fire on Secondary forest.** This is to estimate the emission from the loss of living biomass due to fire in secondary forest 2006. * the fires do not cause deforestation



- **Selective logging in production forest.** This is to estimate the emissions from the loss of living biomass due to selective logging activities within production forest area. * selective logging practices do not cause deforestation.



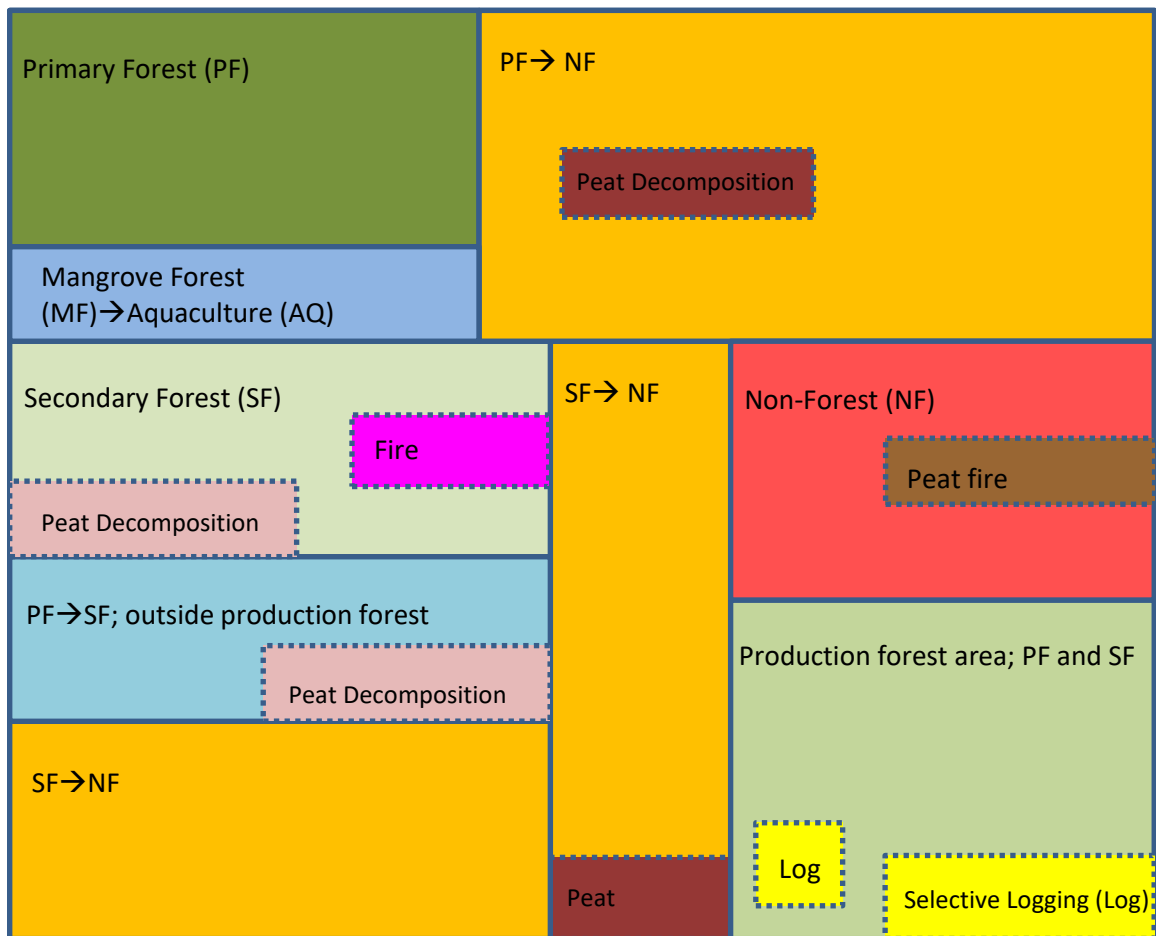


Figure 8.1 Conceptual diagram of the different components of emissions sources

8.4 Activity Data

There are several kinds of activity data used in the historical emissions calculation;

- Activity data from land cover mapping; for emissions calculation due to deforestation (forest to non-forest) and forest degradation (primary forest to secondary forest). The 23 land cover classification was built based on visual on-screen digitizing interpretation of Landsat mosaic data of East Kalimantan for periods 2006, 2009, 2011, 2012, 2013, 2014, 2015, and 2016. The activity data were shown in land cover change matrix transition to describe their emission. Land cover change can describe deforestation, forest degradation, forest and non-forest stable as well as forest gain. This information was combined with Reference Data to conduct a sample based estimation (SBE) analysis (see Annex 12.1)
- Activity data from hot spot analysis, for emission calculation due to fire on secondary forest. These data are spatially explicit, derived from Modis mapping of fire activity

(described below).

- Activity data from selective Logging practices; for emission calculation due to selective logging practices on production forest. These data are not spatially explicit, they are derived from reporting tables from logging concessions.

8.4.1 Land Cover mapping

The land cover map of Indonesia was generated from the National Forest Monitoring System (NFMS). Since 2000, Indonesia has produced land cover maps regularly in 2000, 2003, 2006, 2009, 2011, 2012, 2013, 2014, 2015, 2016, and 2017. The maps from 2006-2016 are used in the development of the ERPD. The data cover 23 land cover classes that are 6 natural forest classes, plantation forest and remaining class of non-forest including class of cloud cover and no data. The process is described in detail in Belinda (2016). Below is a summary of the method.

Landsat data have been as main data source and combine with other remote sensing data such as SPOT data due to limitation on Landsat less-cloud data availability. National land cover map was generated wall-to wall based on manual visual image interpretation. The method carried out by digitizing on screen technique based on physiognomy or appearance of bio-physical covers as key elements of image/photo interpretation. Object with distinctive existing appearance were visually taken and manually delineated on the screen to create polygons and assigned into designated classes. The interpretation process was used multispectral bands composite of Landsat (Red and Infra-Red combination) with maximum scale is 1:100.000. A minimum unit polygon is 6.25 hectares or equal to 2.5 cm x 2.5 cm at the magnification of the screen scale on 1:50.000. On the process was used Landsat multispectral mosaic to reduce problem of unmatched polygon as well as reduce cloud coverage.

Validation and quality assessment are final process on land cover mapping. Field-check was held to assure the quality of land cover classification based on the remote sensing data. Then the results of it can be utilized to calculate the level of land cover accuracy. The land cover map has compared to field data as reference data. Field activity is designed using stratified random sampling points that based on land cover classification as well as ecosystem classification (dry land, swamp, and mangrove). Land cover map accuracy for each year was estimated based on the result of field-check that showed on table of accuracy (contingency table).

8.4.2 Activity Data for deforestation and degradation from observed land cover change

Quantifying the extent of land cover changes that include deforestation, forest degradation, stable forest and stable non forest were done by finding their difference from land cover map time-1 to time-2. Technically via overlaid those two maps, that are map 2006 - 2009, map 2009 - 2011, map 2011 - 2012, map 2012 - 2013, map 2013 - 2014, map 2014 - 2015, and map 2015 - 2016. This process was done under standard Geographic Information System (GIS) software. There are 8 land cover changes periods for East Kalimantan, including total land cover changes for 2006-2016 period. The land cover changes from natural forest (primary and secondary forest in map time-1 to non forest in map-2 were called deforestation. While changing of primary forest to secondary forest was named forest degradation. Results in quantifying land cover change present in tabular data (matrix transition) with area on hectares unit. Results are shown both for the

original map-based analysis (Tables 8.3, 8.5) used for stratification, as well as the final estimates of Activity Data derived from the sample-based estimation reported in Annex 12.1 (Tables 8.4, 8.6). All calculations of emissions from land cover change resulting in deforestation and degradation were done using the map periods listed above.

Table 8.3 Detailed reporting of area (ha) of deforestation (forest class to nonforest class) from 2006-2016 before sample based estimation.

	2016																Grand Total
	Row Labels	0	2006	2007	2010	2012	2014	5001	20071	20091	20092	20094	20121	20122	20141	50011	
2006	2001	0		3,367	978		2,454	4			817						7,620
	2002	0	51,608	230,501	225,146	168	91,016	29	860	474	41,763			134	17,061	17	658,777
	2004	0		54	43		194	23	242		7	130					693
	2005				1,216		118										1,334
	20041	2	3	28	2,541	40	2,165	59	4,252	10	739	4,415	18	3	183		14,458
	20051			71	5,829	352	4,308		4,603	203	392	2,238			39		18,034
	Grand Total	2	51,611	234,021	235,753	560	100,254	115	9,956	686	43,718	6,782	18	136	17,284	17	700,917

Table 8.4 Area (ha) of deforestation (forest class to nonforest class) from 2006-2016 after sample based estimation.

	2016																Grand Total
	Code	-	2,006	2,007	2,010	2,012	2,014	5,001	20,071	20,091	20,092	20,094	20,121	20,122	20,141	50,011	
2006	2001	0	-	5,479	1,591	-	3,993	6	-	-	1,330	-	-	-	-	-	12,399
	2002	0	83,977	375,073	366,359	274	148,102	46	1,399	771	67,957	-	-	218	27,763	28	1,071,966
	2004	0	-	88	70	-	315	38	394	-	12	211	-	-	-	-	1,128
	2005	-	-	-	1,979	-	192	-	-	-	-	-	-	-	-	-	2,171
	20041	4	5	45	4,135	65	3,522	97	6,919	16	1,202	7,183	30	4	298	-	23,526
	20051	-	-	116	9,485	573	7,009	-	7,489	330	637	3,642	-	-	64	-	29,345
	Grand Total	4	83,982	380,800	383,619	912	163,135	187	16,201	1,117	71,139	11,036	30	222	28,124	28	1,140,536

Table 8.5 Area (ha) of forest degradation (primary forest class to secondary forest class) from 2006-2016 before sample based estimation

2016					
2006	Code	2002	20041	20051	Grand Total
	2001	92,538.62			92,538.62
	2004		575.52		575.52
	2005			792.19	792.19
	Grand Total	92,538.62	575.52	792.19	93,906.32

Table 8.6 Area (ha) of forest degradation (primary forest class to secondary forest class) from 2006-2016 after sample based estimation

2016					
2006	Code	2002	20041	20051	Grand Total
	2001	272,748.48			272,748.48
	2004	-	1,696.28		1,696.28
	2005	-		2,334.91	2,334.91
	Grand Total	92,538.62	575.52	792.19	276,779.67

Deforestation was monitored in the area that was forested in 2006 and counted only once for deforestation that occurs at one particular area. This is defined as gross deforestation. Thus deforestation only applies when there is loss of natural forest cover. Any regrowth/reforestation that results in the area meeting forest definition will not be taking into account.

As there was no sequential annual data of land cover between 2006 and 2009, and between 2009 and 2011 the annual average used in the analysis was a proxy of annual rates of deforestation for individual years. From 2006-2016, the land cover data sets were averaged to attain annual rates of deforestation. The data analysis process for deriving activity data for deforestation is depicted in Figure 8.2.

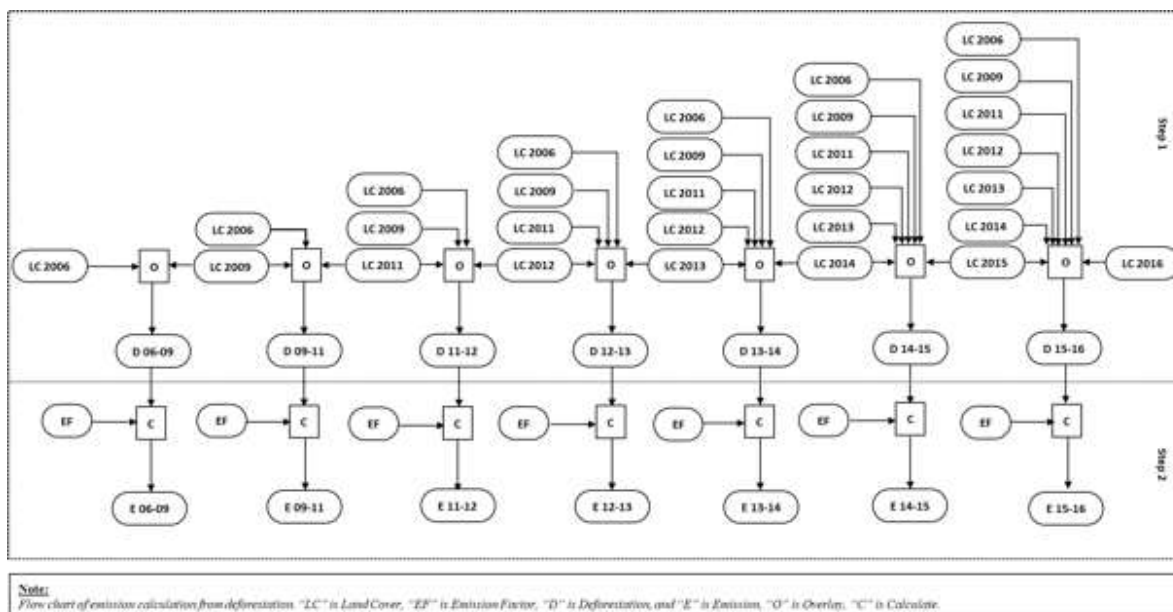


Figure 8.2 Flow chart for calculation of emissions from deforestation and forest degradation

It is noted that the initial land cover mapping shows a much higher area of deforestation in the period 2015-2016 compared to other years – specifically 330,346 ha in 2015-2016 vs. an average of 94,629 ha/year for other 1-year periods in the Reference Period (from Annex 8.1., Adjusted Activity Data). It is not completely clear what the reason for this is. As in all other periods, most of the deforestation (about 90%) in 2015-2016 occurred in the Secondary Dry Forest class. Conversion to Dry Shrub (class 2007) was the dominant form of deforestation, as it was in several earlier periods. Conversion to Plantation Forest (class 2006) and to Bare Ground (class 2014) also occurred in 2015-2016 as it had in some previous years. Change in all of these classes was higher in 2015-2016 than it had been in any other 1-year period. Additionally, 2015-2016 included a substantial conversion of 48,047 ha to Mixed Dry Agriculture (class 20092), a type of change which had not occurred significantly in earlier periods. Taken together, the increases may indicate increasing pressure on the secondary forests of the region, with increases in bare land and dry shrub possibly being intermediate steps to a final conversion of land to forest plantations and to agriculture. Continued monitoring over the ER period will examine this assumption.

There were two steps for calculating emissions from the loss of living biomass (above ground biomass (AGB) and below ground biomass (BGB)) due to deforestation. The first was generating deforestation area for each interval period, i.e. 2006 – 2009, 2009 – 2011, 2011 -2012, 2012-2013, 2013-2014, 2014-2015 and 2015-2016. For example, the forest cover maps of 2006 and 2009 were overlaid to create deforestation areas. As the analysis applied gross deforestation, the calculation of the deforested area in any given year is filtered with the natural forest cover of the previous years. With this filtering, natural forests that have been deforested before will no longer be counted in future calculation of emission from deforestation in the case the converted forest may revert back to forest cover. We adopt this approach as to follow Decision 1/CP.16 as define above.

The second step was generating deforestation polygons which then were multiplied by associated emission factors (loss of carbon from the change of natural forest to non-natural forest (see Figure 8.2) to calculate emissions from deforestation and forest degradation for each interval period. Later the result was divided by the number of years for each interval period, to generate annual emissions from deforestation.

Activity data used in the estimation of annual historical emission over reference period is adjusted data based on the results of uncertainty assessment sample based estimation of land cover changes using Olofsson et al. approach (2014, see Annex 12.1). The detailed estimates of deforestation and degradation area by period, initial forest class, and ending nonforest class are reported in Annex 8.1. The detailed data from Annex 8.1 are combined with respective emission factors to generate the estimates of emissions for the Reference Level.

Table 8.7 Activity data used for the estimation of emission from deforestation and degradation

Description of the parameter including the time period covered (e.g. forest-cover change between 2006-2016 or transitions between forest categories X and Y between 2006-2016:	Area of land cover change between 2006-2009, 2009-2011, 2011-2012, 2012-2013, 2013-2014, 2014-2015, and 2015-2016. The land use transition matrices between these periods are generated to estimate the change of area from forest categories to non-forest categories.	
Explanation for which sources or sinks the parameter is used (e.g. deforestation or forest degradation):	Deforestation	
Data unit (e.g. ha/yr):	Ha/yr	
Value for the parameter:	This data is an aggregation of deforestation rate of the six natural forest classes. Annex 8.1 reports the detailed estimates of area of deforestation by period, forest class, and nonforest class which are used with emission factors to calculate emissions from deforestation.	
	Period	Deforestation area (ha/year)

	2006-2009	313,255	
	2009-2011	95,835	
	2011-2012	165,794	
	2012-2013	119,365	
	2013-2014	55,633	
	2014-2015	101,778	
	2015-2016	288,876	
Source of data (e.g. official statistics) or description of the method for developing the data, including (pre-) processing methods for data derived from remote sensing images (including the type of sensors and the details of the images used):	<p>National Forest Monitoring System (NFMS) named Simontana (<i>Sistem Monitoring Hutan Nasional</i>) (MoFor, 2014).</p> <p>It is available online at http://webgis.menlhk.go.id:8080/nfms_simontana/, which coupled with webGIS at geoportal.menlhk.go.id for display and viewing. The two websites are part of geospatial portal under the one map policy.</p> <p>The description of methods for data derived from remote sensing images including type of sensors and the details of the images used is can be found https://jurnal.ugm.ac.id/iig/article/view/12496/9041</p>		
Spatial level (local, regional, national or international):	Regional (Province)		
Discussion of key uncertainties for this parameter:	Two main sources of uncertainties are from image processing and interpretation of land cover types from the image (depend on quality of satellite images, method of land cover map generation process; uncertainty of land cover) and that of land cover changes.		
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:	The estimation of uncertainty follows a modified method presented by Olofsson <i>et al.</i> (2014), substituting a poststratified estimator of variance (Olofsson 2019, pers. com.). The uncertainty of the land cover change (deforestation) is 23.48%.		

Description of the parameter including the time period covered (e.g. forest-cover change between 2006-2016 or transitions between forest categories X and Y between 2006-2016):	Area of land cover changes between 2006-2009, 2009-2011, 2011-2012, 2012-2013, 2013-2014, 2014-2015, and 2015-2016. The land use transition matrices between these periods are generated to estimate the change of areas from forest categories to non-forest categories occurred in the peatland for the estimation of emission from peat decomposition from the deforested areas																																										
Explanation for which sources or sinks the parameter is used (e.g. deforestation or forest degradation):	Deforestation																																										
Data unit (e.g. ha/yr):	Ha/yr																																										
Value for the parameter:	<table><tr><th>Period</th><th>PeatDecomposition</th><th>Area(ha)</th></tr><tr><td>2006-2009</td><td>NoDeforestation</td><td>0</td></tr><tr><td>2009-2011</td><td>NoDeforestation</td><td>0</td></tr><tr><td>2011-2012</td><td>NoDeforestation</td><td>0</td></tr><tr><td>2012-2013</td><td>20051-20071</td><td>1137.5</td></tr><tr><td rowspan="2">2013-2014</td><td>20041-2014</td><td>33.4</td></tr><tr><td>20071-20071</td><td>1137.5</td></tr><tr><td rowspan="4">2014-2015</td><td>20041-2010</td><td>10.3</td></tr><tr><td>20051-2014</td><td>915.7</td></tr><tr><td>2014-2014</td><td>33.4</td></tr><tr><td>20071-20071</td><td>1137.5</td></tr><tr><td rowspan="5">2015-2016</td><td>20051-20071</td><td>776.5</td></tr><tr><td>20051-2014</td><td>0.2</td></tr><tr><td>2014-2014</td><td>949.1</td></tr><tr><td>20071-2010</td><td>1137.5</td></tr><tr><td>2010-2010</td><td>10.3</td></tr></table>			Period	PeatDecomposition	Area(ha)	2006-2009	NoDeforestation	0	2009-2011	NoDeforestation	0	2011-2012	NoDeforestation	0	2012-2013	20051-20071	1137.5	2013-2014	20041-2014	33.4	20071-20071	1137.5	2014-2015	20041-2010	10.3	20051-2014	915.7	2014-2014	33.4	20071-20071	1137.5	2015-2016	20051-20071	776.5	20051-2014	0.2	2014-2014	949.1	20071-2010	1137.5	2010-2010	10.3
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Note: Second column shows land cover change using cover class codes. Black figures are emissions from new land cover																																											

	changes in each period, red numbers are continuing degradation emissions from land cover change in prior years.
Source of data (e.g. official statistics) or description of the method for developing the data, including (pre-) processing methods for data derived from remote sensing images (including the type of sensors and the details of the images used):	<p>National Forest Monitoring System (NFMS) named Simontana (<i>Sistem Monitoring Hutan Nasional</i>) (MoFor, 2014).</p> <p>It is available online at http://webgis.menlhk.go.id:8080/nfms_simontana/, which coupled with webGIS at http://webgis.menlhk.go.id:8080/nfms_simontana/ for display and viewing. The two websites are part of geospatial portal under the one map policy.</p> <p>The description of methods for data derived from remote sensing images including type of sensors and the details of the images used is can be found https://jurnal.ugm.ac.id/ijg/article/view/12496/9041</p>
Spatial level (local, regional, national or international):	Regional (Province)
Discussion of key uncertainties for this parameter:	Two main sources of uncertainties are from image processing and interpretation of land cover types from the image (depend on quality of satellite images, method of land cover map generation process; uncertainty of land cover) and that of land cover changes.
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation	The estimation of uncertainty follows a modified method presented by Olofsson <i>et al.</i> (2014), substituting a poststratified estimator of variance (Olofsson 2019, pers. com.). The uncertainty of the land cover change (deforestation) is 23.48%.

Description of the parameter including the time period covered (e.g. forest-cover change between 2006-2016 or transitions between forest categories X and Y between 2006-2016):	Area of land cover changes between 2006-2009, 2009-2011, 2011-2012, 2012-2013, 2013-2014, 2014-2015, and 2015-2016. The land use transition matrices between these periods are generated to estimate the change of areas from mangrove forests to aquaculture/fishpond for the estimation of emission from the loss of soil carbon																																								
Explanation for which sources or sinks the parameter is used (e.g. deforestation or forest degradation):	Deforestation																																								
Data unit (e.g. ha/yr):	Ha/yr																																								
Value for the parameter:	<table><tr><th>Period</th><th>Changes</th><th>Area (ha)</th></tr><tr><td rowspan="2">2006-2009</td><td>2004-20094</td><td>22.00</td></tr><tr><td>20041-20094</td><td>1,302.41</td></tr><tr><td rowspan="2">2009-2011</td><td>2004-20094</td><td>-</td></tr><tr><td>20041-20094</td><td>87.38</td></tr><tr><td rowspan="2">2011-2012</td><td>2004-20094</td><td>14.08</td></tr><tr><td>20041-20094</td><td>646.04</td></tr><tr><td rowspan="2">2012-2013</td><td>2004-20094</td><td>-</td></tr><tr><td>20041-20094</td><td>1,130.07</td></tr><tr><td rowspan="2">2013-2014</td><td>2004-20094</td><td>-</td></tr><tr><td>20041-20094</td><td>-</td></tr><tr><td rowspan="2">2014-2015</td><td>2004-20094</td><td>-</td></tr><tr><td>20041-20094</td><td>2,745.50</td></tr><tr><td rowspan="2">2015-2016</td><td>2004-20094</td><td>179.21</td></tr><tr><td>20041-20094</td><td>1,218.21</td></tr></table>			Period	Changes	Area (ha)	2006-2009	2004-20094	22.00	20041-20094	1,302.41	2009-2011	2004-20094	-	20041-20094	87.38	2011-2012	2004-20094	14.08	20041-20094	646.04	2012-2013	2004-20094	-	20041-20094	1,130.07	2013-2014	2004-20094	-	20041-20094	-	2014-2015	2004-20094	-	20041-20094	2,745.50	2015-2016	2004-20094	179.21	20041-20094	1,218.21
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Note: Second column shows land cover change using cover class codes.																																									

<p>Source of data (e.g. official statistics) or description of the method for developing the data, including (pre-) processing methods for data derived from remote sensing images (including the type of sensors and the details of the images used):</p>	<p>National Forest Monitoring System (NFMS) named Simontana (<i>Sistem Monitoring Hutan Nasional</i>) (MoFor, 2014).</p> <p>It is available online at http://webgis.menlhk.go.id:8080/nfms_simontana/, which coupled with webGIS at geoportal.menlhk.go.id for display and viewing. The two websites are part of geospatial portal under the one map policy.</p> <p>The description of methods for data derived from remote sensing images including type of sensors and the details of the images used is can be found https://jurnal.ugm.ac.id/ijg/article/view/12496/9041</p>
<p>Spatial level (local, regional, national or international):</p>	<p>Regional (Province)</p>
<p>Discussion of key uncertainties for this parameter:</p>	<p>Two main sources of uncertainties are from image processing and interpretation of land cover types from the image (depend on quality of satellite images, method of land cover map generation process; uncertainty of land cover) and that of land cover changes.</p>
<p>Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:</p>	<p>The estimation of uncertainty follows a modified method presented by Olofsson <i>et al.</i> (2014), substituting a poststratified estimator of variance (Olofsson 2019). The uncertainty of the land cover change (deforestation) is 23.48%.</p>

Description of the parameter including the time period covered (e.g. forest-cover change between 2006-2016 or transitions between forest categories X and Y between 2006-2016):	Area of degradation, change of primary forest into secondary forests between 2006-2009, 2009-2011, 2011-2012, 2012-2013, 2013-2014, 2014-2015, and 2015-2016 that occurred in non-production forest (estimates of area change for production forest come from logging data). The land use transition matrices between these periods are generated to estimate the change of area from Primary forests to Secondary Forests.												
Explanation for which sources or sinks the parameter is used (e.g. deforestation or forest degradation):	Degradation												
Data unit (e.g. ha/yr):	Ha/yr												
Value for the parameter:	<p>This data is an aggregation of the degradation of the three natural forest classes (Dry land forest, swamp forest and mangrove forest) that occurred in non-production forest</p> <table border="1"> <thead> <tr> <th>Period</th><th>Production forest (ha)</th></tr> </thead> <tbody> <tr> <td>2006-2009</td><td>41,363.41</td></tr> <tr> <td>2009-2011</td><td>1,851.65</td></tr> <tr> <td>2011-2012</td><td>402.31</td></tr> <tr> <td>2012-2013</td><td>2,261.84</td></tr> <tr> <td>2013-2014</td><td>2,598.17</td></tr> </tbody> </table>	Period	Production forest (ha)	2006-2009	41,363.41	2009-2011	1,851.65	2011-2012	402.31	2012-2013	2,261.84	2013-2014	2,598.17
Period	Production forest (ha)												
2006-2009	41,363.41												
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2011-2012	402.31												
2012-2013	2,261.84												
2013-2014	2,598.17												

	2014-2015	25,996.54
	2015-2016	8,718.32

Similar to deforestation, land use transition matrix each period is also developed for the analysis. For example, the land use transition period for 2006-2009 can be seen below:

2009			
2006	Code	2002	20041
	2001	39,800.89	-
	2004	-	1,562.53

Source of data (e.g. official statistics) or description of the method for developing the data, including (pre-) processing methods for data derived from remote sensing images (including the type of sensors and the details of the images used):

National Forest Monitoring System (NFMS) named Simontana (*Sistem Monitoring Hutan Nasional*) (MoFor, 2014).

It is available online at http://webgis.menlhk.go.id:8080/nfms_simontana/, which coupled with webGIS at geoportal.menlhk.go.id for display and viewing. The two websites are part of the geospatial portal under the one map policy.

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Spatial level (local, regional, national or international):

Regional (Province)

Discussion of key uncertainties for this parameter:

Two main sources of uncertainties are from image processing and interpretation of land cover types from the image (depend on quality of satellite images, method of land cover map generation process; uncertainty of land

	cover) and from land cover changes (uncertainty of land cover changes).
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:	The estimation of uncertainty follows a modified method presented by Olofsson <i>et al.</i> (2014), substituting a poststratified estimator of variance (Olofsson 2019). The uncertainty of the land cover change (degradation) is 52.08%.

8.4.3 Activity Data for additional forest degradation in secondary forest from fire

The estimation of burnt area follows the method developed by MRI (2013) that was applied by the REDD+ demonstration activity project in Central Kalimantan. There are three steps of the analysis to estimate the burnt area from the hotspot data (Figure 8.3). First, MODIS hotspot data are compiled annually and data with a confidence level of more than 80% are selected. Second, a raster map with 1×1 km grid (pixel size) is generated and overlaid on top of the hotspot data. Pixels without hotspots are considered as not burned and excluded from the activity data. Each 1km ×1 km (100 ha) pixel with at least one hotspot is considered as burned but with the assumption that the burned area is 76.9% of the pixel area (76.9 ha). This rule applies for each pixel regardless of the number of hotspots within a particular pixel. Third, these burned areas were overlaid with the land cover map to identify fires in secondary forest class.

In years where the land-cover map data are not available, i.e. 2007, 2008, and 2010, the emissions from degradation of secondary forest due to fire are estimated using a regression equation that related the emission estimates from the available years (Y in ton CO₂e) with the corresponding burnt area derived from the hotspot (X in ha) as described in Figure 8.3, resulting following equation :

$$Y = 37,252 * X + 52,099; R^2 = 96.5\% \quad (\text{Equation 1})$$

The calculation of fire emission is confined to secondary forest as carbon loss from forest fire in primary forest is captured in emission from the loss of carbon degradation from the change of land cover from Primary to Secondary.

Description of the parameter including the time period covered (e.g. forest-cover change between 2006-2016)	Area of secondary forest affected by fires in 2006, 2009, 2011, 2012, 2013, 2014, 2015, and 2016. Burnt area
--	--

or transitions between forest categories X and Y between 2006-2016):	estimated from Hotspot data, derived from NASA FIRMS (https://earthdata.nasa.gov/firms)																																				
Explanation for which sources or sinks the parameter is used (e.g. deforestation or forest degradation):	Forest degradation. This is to estimate the loss of above ground biomass of secondary forest due to fire.																																				
Data unit (e.g. ha/yr):	Ha																																				
Value for the parameter:	<p>This data is aggregation of the three secondary forest classes (Dry land forest, swamp forest and mangrove forest).</p> <table><tr><td>Year</td><td>2001</td><td>2005</td><td>2004</td></tr><tr><td>2006</td><td>24,940</td><td>700</td><td>418</td></tr><tr><td>2009</td><td>20,074</td><td>596</td><td>417</td></tr><tr><td>2011</td><td>7,996</td><td>159</td><td>167</td></tr><tr><td>2012</td><td>11,796</td><td>194</td><td>56</td></tr><tr><td>2013</td><td>7,731</td><td>595</td><td>120</td></tr><tr><td>2014</td><td>20,127</td><td>1,460</td><td>326</td></tr><tr><td>2015</td><td>17,818</td><td>1,073</td><td>316</td></tr><tr><td>2016</td><td>3,434</td><td>257</td><td>117</td></tr></table>	Year	2001	2005	2004	2006	24,940	700	418	2009	20,074	596	417	2011	7,996	159	167	2012	11,796	194	56	2013	7,731	595	120	2014	20,127	1,460	326	2015	17,818	1,073	316	2016	3,434	257	117
Year	2001	2005	2004																																		
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Source of data (e.g. official statistics) or description of the method for developing the data, including (pre-) processing methods for data derived from remote sensing images (including the type of sensors and the details of the images used):	Hotspot data, derived from NASA FIRMS (https://earthdata.nasa.gov/firms). Method for estimating the burnt area follows the method adapted from MRI (2013).																																				
Spatial level (local, regional, national or international):	Regional (Province)																																				

Discussion of key uncertainties for this parameter:	Key uncertainty comes from the processing of Hotspot data and selection of confidence level of the Hotspot data for this analysis, which is >80% and assumption of the burnt area for grid (1x1 km). There is no information on the accuracy of burnt area estimates using MRI method (2013).
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:	<p>Uncertainty level 52.08%.</p> <p>This uncertainty is assumed to be the same as that of accuracy estimates of degradation land cover classification estimated using Olofsson (2014, 2019).</p>

8.4.4 Activity Data for peat burn areas in secondary forest

The estimation of peat burn area follows the method developed by MRI (2013) that was applied by the REDD+ demonstration activity project in Central Kalimantan. There are three steps of the analysis to estimate the burnt area from the hotspot data (Figure 8.3). **First**, MODIS hotspot data are compiled annually and data with a confidence level of more than 80% are selected. **Second**, a raster map with 1×1 km grid (pixel size) is generated and overlaid on top of the hotspot data. Pixels without hotspots are considered as not burned and excluded from the activity data. Each 1km ×1 km (100 ha) pixel with at least one hotspot is considered as burned but with the assumption that the burned area is **76.9% of the pixel area (76.9 ha)**. This rule applies for each pixel regardless of the number of hotspots within a particular pixel. **Third**, these burned areas were overlaid with the land cover and peat land map (produced by MoA) to identify the type of land cover being affected by the fire.

The Ministry of Environment and Forestry is developing a new approach for estimating the burned area for the improvement of the current MRI method. This improved method has been applied for estimation of the burn scar, i.e. by combining the hotspot data with the Landsat image (quick look original with composite band 645) that is able to delineate the burn area. This new approach will be used for the development of the reference level beyond 2024.

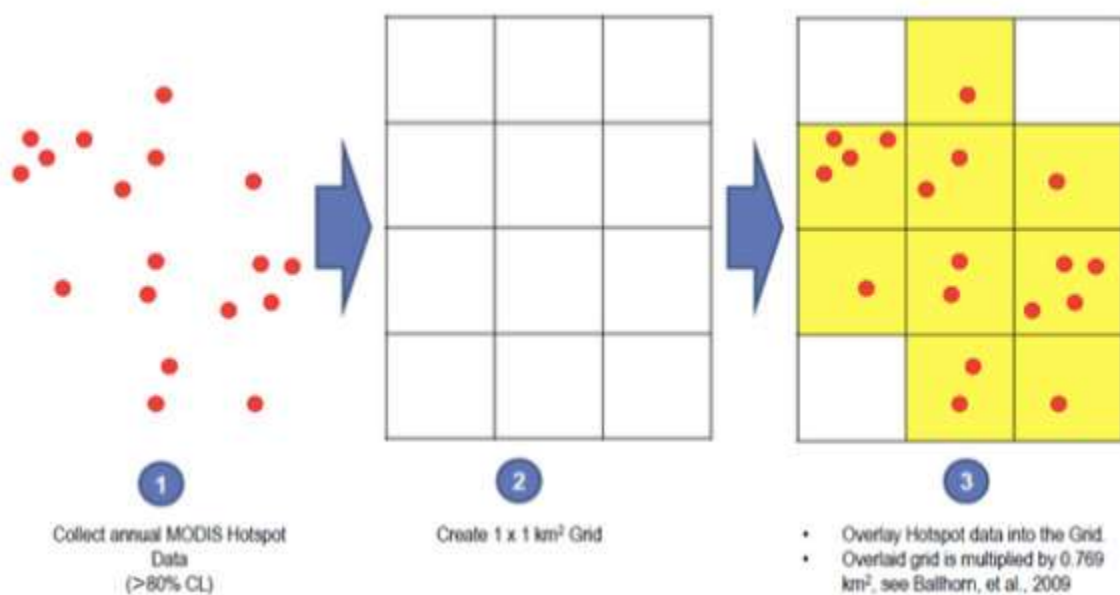


Figure 8.3 Method for estimating burnt area from hotspot data (MoEF, 2016)

Description of the parameter including the time period covered (e.g. forest-cover change between 2006-2016 or transitions between forest categories X and Y between 2006-2016):	Area of peat deforested after 2006 affected by fires in the period 2006-2016. Burnt area estimated from Hotspot data, derived from NASA FIRMS (https://earthdata.nasa.gov/firms)		
Explanation for which sources or sinks the parameter is used (e.g. deforestation or forest degradation):	Deforestation. This is to estimate the emission from the loss of peat due to fire in non-forested land that was deforested after 2006.		
Data unit (e.g. ha/yr):	Ha		
Value for the parameter:	Year	Burnt peat (ha)	
	2013	370	
	2014	-	
	2015	51	
	2016	23	

Source of data (e.g. official statistics) or description of the method for developing the data, including (pre-) processing methods for data derived from remote sensing images (including the type of sensors and the details of the images used):	Hotspot data, derived from NASA FIRMS (https://earthdata.nasa.gov/firms). Method for estimating the burnt area follows the method adapted from MRI (2013).
Spatial level (local, regional, national or international): Discussion of key uncertainties for this parameter:	Regional (Province) Key uncertainty comes from the processing of Hotspot data and selection of confidence level of the Hotspot data for this analysis, which is >80% and assumption of the burnt area for grid (1x1 km). There is no information on the accuracy of burnt area estimates using MRI method (2013).
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation	Uncertainty level 40.5%. This is combined uncertainties of accuracy estimates of land cover classification estimated using Olofsson (2014, 2019) for stable non forest (6.1% and that of correction factor of 0.769 for burnt area (assumed to be 40%).

8.4.5 Activity Data for logging area

Further degradation of secondary forest due to logging activities cannot be detected through remote sensing data that is used by the NFMS. Therefore, emissions from this activity in production forest are estimated by using actual logging area (activity data) that is accessible in provincial forestry agencies, and the emission factors from Griscom et al. (2014). The actual logged forest area in production forest of East Kalimantan is taken from the logging concession's annual work plan document, which is regularly reported to the provincial forestry agency. There are 41 active logging concessions in East Kalimantan encompassing 2.6 million ha of forest, or 36% of the province's total. Total of forest logged area is about 29,560 ha/year. The reported actual logged forest area still needs to be adjusted using a correction factor (0.69) based on Ellis et al. (2016).

To avoid double counting in the calculation of emission from the loss of carbon from the change of land cover from Primary to Secondary, and second time within the estimates of emissions from logging which changed the land from Primary to Secondary, **the accounting area for logging is only within production forest (HP, HPT, and HPK), while the accounting area for degradation (Primary to Secondary) is within non-production forest (protection and conservation forest).**

Description of the parameter including the time period covered:	Actual selective logging area was derived from the annual logging plan document (2006-2016) from natural forest logging concessions. This document can be accessed from the East Kalimantan province forestry agency																							
Explanation for which sources or sinks the parameter is used (e.g. deforestation or forest degradation):	Degradation (logging)																							
Data unit (e.g. ha/yr):	Ha/yr																							
Value for the parameter:	<table><tr><td>Year</td><td>Actual logging area (ha)</td></tr><tr><td>2007</td><td>23,157</td></tr><tr><td>2008</td><td>24,508</td></tr><tr><td>2009</td><td>24,591</td></tr><tr><td>2010</td><td>28,509</td></tr><tr><td>2011</td><td>28,179</td></tr><tr><td>2012</td><td>31,386</td></tr><tr><td>2013</td><td>23,627</td></tr><tr><td>2014</td><td>46,299</td></tr><tr><td>2015</td><td>42,201</td></tr><tr><td>2016</td><td>32,621</td></tr></table>		Year	Actual logging area (ha)	2007	23,157	2008	24,508	2009	24,591	2010	28,509	2011	28,179	2012	31,386	2013	23,627	2014	46,299	2015	42,201	2016	32,621
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2016	32,621																							
Source of data (e.g. official statistics) or description of the method for developing the data, including (pre-) processing methods for data derived from remote sensing images (including the type of sensors and the details of the images used):	Annual logging plan of the East Kalimantan province forestry agency. The logging data is reported annually by the forest concession company as mandated by Ministerial Regulation No. 62/2008 regarding Annual Working Plan.																							

Spatial level (local, regional, national or international):	Regional (Province)
Discussion of key uncertainties for this parameter:	Key uncertainty for this data is coming from the process of data management in the forestry agency. The archiving data system is still manual (conventional) thus there are possibilities for loss of data.
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:	It is assumed the uncertainty is 25%.

8.5 Emission Factors

Emission factors used in the historical emissions calculation come from various sources. Emission factors for the calculation of emissions from deforestation (forest to non-forest) and forest degradation (primary forest to secondary forest) come from the Carbon stock value of each land cover classes. The carbon stock value of each land covers classes is taken from forest inventory data and also literature that accessible for public. Emission factor for other source of emissions such as logging, fires, and organic soil is taken from research literature described below.

8.5.1 *Emission Factors from deforestation and degradation from change in land use/land cover class*

8.5.1.1 Estimates of C/ha for forest classes

The main sources of data used to derive emission factors for six forest types is from Permanent Sample Plots (PSP) established in East Kalimantan. The PSPs were established in 2016-2018 under FCPF Readiness program to fill the gap in providing emission factor data specifically in East Kalimantan. Incorporation of these data follows the recommendation from the TAP review, for the ERP RL as also suggested by the IPCC, as the local data is better represented the local condition and relatively more accurate than the National NFI data which were used in the earlier draft ERPD of August 2018.

The establishment of the Permanent Sampling Plot (PSP) for carbon measurement in East Kalimantan follows stratified random sampling in which the locations are selected based on Ministry of Environment and Forestry land cover map. The method used for data collection is based on Indonesian National Standard (SNI) 7724:2011 regarding forest carbon accounting. The size of each plot is 20mx20m, and within the plot there are 3 nested plots with the size of 10mx10m, 5mx5m and 2mx2m (Figure 8.4). For aboveground carbon measurement, we collected vegetation data from seedlings (diameter < 2cm), saplings (diameter 2 cm to < 10cm), poles (DBH

10cm to < 20 cm) and trees (DBH \geq 20cm). Seedlings data was collected in 2x2m sub plot, saplings in 5x5m sub plot, poles in 10x10m sub plot and trees in 20x20m sub plot. Species name and diameter of each individual found within the plots were recorded. The wood density for each sample tree is taken from species wood density database develop by ICRAF (<http://db.worldagroforestry.org/wd>).

NOTE: The previous draft ERPD used inventory data from the National Forest Inventory for Indonesia to calculate average AGB/ha for each forest type. **Using the newer East Kalimantan inventory data results in a substantial increase in the estimates of AGB/ha compared to the national estimates.** This results in higher estimates of annual historical emissions. We are confident that the local data are more robust and reliable for estimating emission factors for East Kalimantan because the sample has been collected specifically in East Kalimantan.

Table 8.8 Number of Permanent Sampling Plots by forest type established in 2016–2018 along with maximum D and number of species observed.

Land cover types	Number of PSP	Data summary	Location
Primary dry land forest	55	Max D: 175.7 #genus: 128	HL Sungai Wain; PT. UDIT; PT. Karya Lestari; KPHP Batu Ayau; Pt. KEM
Secondary dry land forest/ logged forest	68	Max D: 121.3 #genus: 149	Tahura Bukit Soeharto; KHDTK Samboja; Kebun Raya Unmul Samarinda (KRUS); KPHP Berau Barat; HL Wehea; KPH Telake; KHDTK BDLHK Loa Haur
Primary swamp forest	18	Max D: 109.6 #genus: 20	Muara Siran; Genteng Tanah
Secondary swamp forest / logged forest	42	Max D: 109 #genus: 23	Muara Siran; Penyinggahan Melak; Genteng Tanah; Sebelimbingan
Primary mangrove forest	37	Max D: 76.8 #genus: 5	Delta Mahakam; BTNK
Secondary mangrove forest / logged forest	23	Max D: 89.2 #genus: 7	Delta Mahakam; CA Teluk Adang; PT. Inhutani I Batu Ampar; BTNK
Total	243		

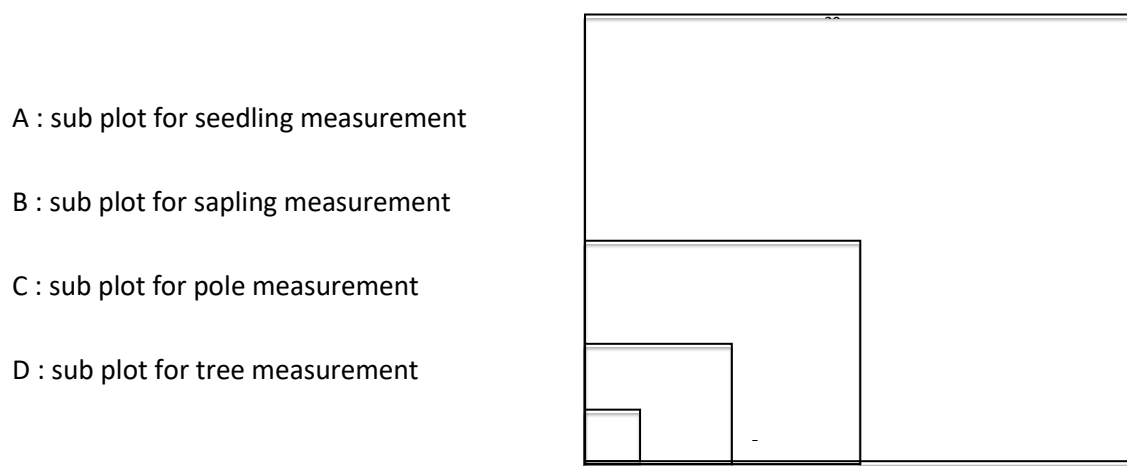


Figure 8.4 The design of permanent sample plot (PSP) in East Kalimantan

East Kalimantan has published, peer reviewed biomass equations for the three forest types (Basuki 2009 for dry forest; Manuri 2014 for peat swamp forest; and Komiyama 2005 for mangrove forest). Earlier versions of the ERPD used the pan-tropical biomass equation from Chave (2005).

In order to decide whether or not to use the local equations, we considered several factors including the sample domain and forest type where the sample was collected; the sample size; and the maximum diameter included in the sample. This information is summarized in the table below:

Table 8.9 Summary of attributes of biomass equations from published papers

Equation source				
Attribute	Chave 2005	Basuki 2009	Manuri 2014	Komiyama 2005
Sample Domain	Global, pan-tropical	E Kalimantan	Sumatra and W Kalimantan	Indonesia
Forest type	pan tropical	low dipterocarp	peat swamp	Mangrove
Sample size (trees)	2,410	122	148	104
Max D (cm)	156	200	167	55

The Chave equation clearly has the largest sample size, but this sample is an aggregate from all

tropical regions of the globe and all forest types and may not well reflect the specific sample population of East Kalimantan. The three local biomass equations are much more specifically targeted to the specific populations of interest for East Kalimantan. The local equations also included higher diameter trees in the sample compared to Chave. This last factor is very important because extrapolation of a biomass equation can quickly lead to biased results. In addition, we graphed each of the local equations against the Chave equation to compare performance. In general the Chave equation yielded higher estimates of the local equations; the difference was small within the range of D of the Chave data (up to about D=160), but Chave departed quite dramatically for higher diameters.

Based on this analyses we believe that the local equations are more suited for application in the ERPD and so have used these to generate estimates of AGB for calculating Emission Factors.

The estimation of the carbon stock of the above ground biomass of the six forest-types uses local allometric models, i.e.

- Dryland forest (Basuki et al., 2009)

$$AGB = \exp (-0.744 + 2.188 \ln(DBH) + 0.832 \ln(WD)) \quad (\text{Equation 2})$$

$$\text{Swamp forest (Manuri et al., 2014)} \quad AGB = 0.242 \times DBH^{2.473} \times WD^{0.736} \quad (\text{Equation 3})$$

- Mangrove forest (Komiya et al., 2005)

$$AGB = 0.251 \times WD \times DBH^{2.46} \quad (\text{Equation 4})$$

To convert AGB (t/ha) to C (t/ha) for each forest types, carbon fraction of 0.47 is used as suggested by the IPCC 2006 ($C = 0.47 \times AGB$).

The below ground biomass (BGB) for dry forest is estimated using root-shoot ratio from the IPCC GPG LULUCF (Table 3A.1.8. page 3.168). The value of the ratio is 0.24 for dry forest. For mangrove forest the value is 0.36 based on measurement reported in Komiya et al., 2005 for mangrove forest in Indonesia. For swamp forest is assumed to be the same as that of mangrove forest in Indonesia.

8.5.1.2 Estimates of C/ha for non-forest classes

The data source for the carbon stock of non-forest lands is derived from mainly Indonesian literatures (Annex 8.3.). The below ground biomass (BGB) of non-forest classes is also estimated using root-shoot ratio based on IPCC default values (IPCC GPG GL for LULUCF page 3.168 table 3A.1.8). The values of the ratio vary between land cover types, i.e. 0.32 for forest plantation and estate crops), 0.48 for dry and wet shrubs, mix dryland agriculture and transmigration area, and 1.58 for savanna/grassland, pure dryland agriculture, rice paddy, bare ground and settlement.

Table 8.10 Emission factors used for the estimation of emission from deforestation and degradation

Description of the parameter including the forest class if applicable:	Emission Factor for deforestation and forest degradation, i.e. living biomass (AGB+BGB) of the six forest classes, primary and secondary dryland forests; primary and secondary swamp forests; primary and secondary mangrove forests; and non-forest lands		
Data unit (e.g. t CO₂/ha):	Ton C/ha		
Value for the parameter:	Forest lands		
	Land cover	Code	C stock (t C/ha)
	Primary dryland forest	2001	281.3
	Secondary dryland forest	2002	168.7
	Primary mangrove forest	2004	344.2
	Primary swamp forest	2005	233.5
	Secondary mangrove forest	20041	160.8
	Secondary swamp forest	20051	126.8
	Non-forest lands		
	Land cover	Code	C stock (t C/ha)
	Plantation forest	2006	82.6
	Dry shrub	2007	29.9
	Wet shrub	20071	26.7
	Savanna and Grasses	3000	7.2
	Pure dry agriculture	20091	19.4
Mixed dry agriculture	20092	33.3	
Estate crop	2010	65.6	

	Paddy field	20093	11.4
	Transmigration areas	20122	14.8
	Fish pond/aquaculture	20094	0
	Bare ground	2014	6.5
	Mining areas	20141	0
	Settlement	2012	10.3
	Port and harbor	20121	0
	Open water	5001	0
	Open swamps	50011	0
<p>Source of data (e.g. official statistics, IPCC, scientific literature) or description of the assumptions, methods and results of any underlying studies that have been used to determine the parameter:</p> <p>The primary data source for the carbon stock of natural forests is derived from the measurement of AGB from the Permanent Sampling Plots in East Kalimantan under the FCPF. National Forest Inventory (NFI). The carbon stock data used are total of above ground (AGB) and below ground biomass (BGB). The estimation of AGB used local allometric equations (Manuri et al., 2015 for swamp forests; Basuki et al., 2009 for dryland forest; Komiyama et al., 2005 for mangrove. The below ground biomass (BGB) is estimated using root-shoot ratio from the IPCC GPG LULUCF (Table 3A.1.8. page 3.168). The value of the ratio is 0.24 for primary forest. For mangrove forest the value is 0.36 based on measurement from Komiyama et al., 2005. For swamp forest is assumed to be the same as that of mangrove.</p> <p>The data source for the carbon stock of non-forest lands is derived from mainly Indonesian literatures. The below ground biomass (BGB) is also estimated using root-shoot ratio based on IPCC default values (IPCC GPG GL for LULUCF page 3.168 table 3A.1.8). The values of the ratio vary between land cover types, i.e. 0.32 for forest plantation and estate crops), 0.48 for dry and wet shrubs, mix dryland agriculture and transmigration area, and 1.58 for savanna/grassland, pure dryland agriculture, rice paddy, bare ground and settlement.</p>			

Spatial level (local, regional, national or international):	Regional (Kalimantan island)		
Discussion of key uncertainties for this parameter:	Key uncertainty comes from (1) sampling error (between 13 to 31%), (2) allometric model (27%-31%), (3) biomass conversion factor to carbon (5.3% Table 4.3 of the 2006 IPCC) and (5) root:shoot ratio (based on the IPCC GPG for LULUCF. And measurement, i.e. between 9% & 32%; See Annex 12.1 for details).		
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:	Method to estimate the uncertainty of the living biomass is using error propagation: $\sqrt{U_1^2+ U_2^2+ ...+U_n^2}$, the subscript 1, 2, ... n are uncertainties for source of error 1 th , 2 nd etc. respectively.		
	For forests		
	Land cover	Code	Uncertainty (%)
	Primary dryland forest	2001	38.2
	Secondary dryland forest	2002	35.8
	Primary Swamp forest	2005	46.0
	Secondary swamp forest	20051	41.7
	Primary mangrove forest	2004	37.4
	Secondary swamp forest	20041	39.5
	For non-forests		
	Land cover	Code	Uncertainty (%)
	Plantation forest	2006	22.5
	Dry shrub	2007	41.0
	Wet shrub	20071	41.0
	Savanna and Grasses	3000	41.0
Pure dry agriculture	20091	35.5	
Mixed dry agriculture	20092	41.0	
Estate crop	2010	23.3	

	Paddy field	20093	35.5
	Transmigration areas	20122	41.0
	Bare ground	2014	35.5
	Settlement	2012	35.5

8.5.2 Emission factors from fire in secondary forest

Emission factors EF_f for biomass consumed by fire can be developed based on Eq. 2.27 in the IPCC 2006 Guidelines for National Greenhouse Gas Inventories (GL), Volume 4, using the following formula:

$$L_{fire} = A * EF_f \quad (\text{Equation 5})$$

$$EF_f = M_B * C_f * G_{ef} * 10^{-3} \quad (\text{Equation 6})$$

$$L_{fire} = A * M_B * C_f * G_{ef} * 10^{-3} \quad (\text{Equation 7})$$

L_{fire} = amount of greenhouse gas emissions from fire, tonnes of each GHG e.g., CO₂, CH₄, N₂O

A = burnt area, ha

M_B = mass of fuel available for combustion, tonnes ha⁻¹.

C_f = combustion factor, dimensionless (default values in Table 2.6 of the 2006 IPCC Guideline, Chapter 2-page 2.48)

G_{ef} = mission factor, g kg⁻¹ dry matter burnt (1580 for CO₂, 6.8 for CH₄ and 0.20 for N₂O, Table 2.5 of 2006 IPCC Guideline, Chapter 2- Page 2.47)

Table 8.11 Emission factors used for the estimation of emission from fire in secondary forest

Description of the parameter including the forest class if applicable:	Emission Factor for biomass fire																													
Data unit (e.g. t CO ₂ /ha):	t C02e/ha burnt area																													
Value for the parameter:	<table><tr><td>Forest cover</td><td></td><td>EF_CO2</td><td>EF_CH4_CO2</td><td>EF_N2O_CO2</td><td></td></tr><tr><td>Secondary Dryland</td><td>2002</td><td>143.8</td><td>13.0</td><td>5.6</td><td></td></tr><tr><td>Secondary Swamp</td><td>20051</td><td>207.8</td><td>18.8</td><td>8.2</td><td></td></tr><tr><td>Secondary mangrove</td><td>20041</td><td>112.7</td><td>10.2</td><td>4.4</td><td></td></tr></table>						Forest cover		EF_CO2	EF_CH4_CO2	EF_N2O_CO2		Secondary Dryland	2002	143.8	13.0	5.6		Secondary Swamp	20051	207.8	18.8	8.2		Secondary mangrove	20041	112.7	10.2	4.4	
Forest cover		EF_CO2	EF_CH4_CO2	EF_N2O_CO2																										
Secondary Dryland	2002	143.8	13.0	5.6																										
Secondary Swamp	20051	207.8	18.8	8.2																										
Secondary mangrove	20041	112.7	10.2	4.4																										
Source of data (e.g. official statistics, IPCC, scientific literature) or description of the assumptions, methods and results of any underlying studies that have been used to determine the parameter:	2006 IPCC Guideline (Table 2.5 and 2.6 of IPCC 2006 Vol 4-CH2 Table 2.6)																													
Spatial level (local, regional, national or international):	Regional (province)																													
Discussion of key uncertainties for this parameter:	Key of uncertainty is error in estimating the amount of biomass available for burning, combustion factor and EFs of three gases (CO2, CH4 and N2O).																													
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:	<table><tr><td>Forest cover</td><td>Code</td><td>U_CO2(%)</td><td>U_CH4(%)</td><td>U_N2O(%)</td><td>U_Pooled(%)</td></tr><tr><td>Secondary Dryland</td><td>2002</td><td>71</td><td>91</td><td>88</td><td>145</td></tr><tr><td>Secondary Swamp</td><td>20051</td><td>75</td><td>94</td><td>91</td><td>151</td></tr><tr><td>Secondary mangrove</td><td>20041</td><td>74</td><td>93</td><td>90</td><td>149</td></tr></table>						Forest cover	Code	U_CO2(%)	U_CH4(%)	U_N2O(%)	U_Pooled(%)	Secondary Dryland	2002	71	91	88	145	Secondary Swamp	20051	75	94	91	151	Secondary mangrove	20041	74	93	90	149
Forest cover	Code	U_CO2(%)	U_CH4(%)	U_N2O(%)	U_Pooled(%)																									
Secondary Dryland	2002	71	91	88	145																									
Secondary Swamp	20051	75	94	91	151																									
Secondary mangrove	20041	74	93	90	149																									

8.5.3 Emission Factors from Peat fires

Emission factors EF_f for the peat fires can be developed based on Eq. 2.27 in the IPCC 2006 Guidelines for National Greenhouse Gas Inventories (GL), Volume 4, using the following formula:

$$L_{fire} = A * EF_f \quad (\text{Equation 8})$$

$$EF_f = M_B * C_f * G_{ef} * 10^{-3} \quad (\text{Equation 9})$$

$$L_{fire} = A * M_B * C_f * G_{ef} * 10^{-3} \quad (\text{Equation 10})$$

L_{fire} = amount of greenhouse gas emissions from fire, tonnes of each GHG e.g., CO₂, CH₄, N₂O

A = burnt area, ha

M_B = mass of fuel available for combustion, tonnes ha⁻¹.

C_f = combustion factor, dimensionless (default values in Table 2.6 of the 2006 IPCC Guideline, Volume 4, Chapter 2-page 2.48)

G_{ef} = mission factor, g kg⁻¹ dry matter burnt (default values in Table 2.7, Chapter 2 of 2013 Supplement to 2006, page 2.36)

The M_B for the peat is 353 tons dry matter per hectare following IPCC default (Table 2.6 of the Chapter 2 in page 2.40, 2013 Supplement to the 2006 IPCC). The M_B depends on depth of peat and bulk density of the peat. Based on measurement in Central Kalimantan, the M_B is about 505 tons dry matter per hectare with assumption that the average depth of peat burn is 0.33 m and bulk density 0.153 t/m³ (MRI 2013). However, we adopt the IPCC default as the default considering the data was based on measurement from multiple locations that may represent better general condition. The C_f is taken from the IPCC default value (Tables 2.6 of 2006 IPCC Vol. 4 Chapter 2). The G_{EF} for CO₂ is 1,701 g/kg dry matter burnt (Table 2.7 of the Chapter 2 of the 2013 Supplement to the 2006 IPCC, page 2.36) and for CH₄ is 21 g/kg dry matter burnt.

Table 8.12 Emission factors used for the estimation of emission from peat fire

Description of the parameter including the forest class if applicable:	Emission Factor for peat fire
Data unit (e.g. t CO₂/ha):	t CO ₂ e/ha burnt area
Value for the parameter:	756 t CO ₂ e/ha.

	The value is estimated from the summation of the result of the multiplication of MB, C _f , and G _{ef} for CO ₂ and CH ₄ (see equation 8)
Source of data (e.g. official statistics, IPCC, scientific literature) or description of the assumptions, methods and results of any underlying studies that have been used to determine the parameter:	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (GL), Volume 4 IPCC 2013_Supplement Wetland (Table 2.6 and Table 2.7 of the 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands, page 2.40 and 2.41).
Spatial level (local, regional, national or international):	Regional (province)
Discussion of key uncertainties for this parameter:	Key of uncertainty is error in estimating the amount of biomass available for burning, combustion factor and EFs of three gases (CO ₂ , and CH ₄).
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:	Uncertainty level is 73.5% (Pooled uncertainty based on confidence interval EF of Tables 2.6 and 2.7 of the 2013 Supplement to the 2006 IPCC Guidelines, $U_{\text{Pooled}} = \sqrt{(U_{\text{CO}_2}^2 + U_{\text{EF-CH}_4}^2)}$

8.5.4 Emission Factors from waste and damage associated with logging

The emission factor for waste and damage associated with selective logging activities is derived from field measurement conducted at 9 logging concessions in East Kalimantan. The measurement is done to estimate the waste impacted from Logging practices (not include harvested wood product). The result of field measurement is reported in international journal, the Carbon emissions performance of commercial logging in East Kalimantan, Indonesia (Griscom et al 2014).

Table 8.13 Emission factors used for the estimation of emission from waste and damage associated with logging

Description of the parameter including the forest class if applicable:	Emission Factor for waste impacted from Logging practices
Data unit (e.g. t CO₂/ha):	Tonne C/ha

Value for the parameter:	<table> <tr> <th data-bbox="656 277 977 373">Emissions Source</th><th data-bbox="977 277 1258 373">Emissions (tC/Ha Area Accessed)</th></tr> <tr> <td data-bbox="656 373 977 449">Felling - Harvest Tree</td><td data-bbox="977 373 1258 449">19.59</td></tr> <tr> <td data-bbox="656 449 977 522">Felling - Collateral</td><td data-bbox="977 449 1258 522">10.73</td></tr> <tr> <td data-bbox="656 522 977 598">Skid Trails</td><td data-bbox="977 522 1258 598">12.51</td></tr> <tr> <td data-bbox="656 598 977 674">Haul Roads</td><td data-bbox="977 598 1258 674">7.05</td></tr> <tr> <td data-bbox="656 674 977 749">Yards</td><td data-bbox="977 674 1258 749">1.26</td></tr> <tr> <td data-bbox="656 749 977 787"><i>Total</i></td><td data-bbox="977 749 1258 787"><i>51.12</i></td></tr> </table>	Emissions Source	Emissions (tC/Ha Area Accessed)	Felling - Harvest Tree	19.59	Felling - Collateral	10.73	Skid Trails	12.51	Haul Roads	7.05	Yards	1.26	<i>Total</i>	<i>51.12</i>
Emissions Source	Emissions (tC/Ha Area Accessed)														
Felling - Harvest Tree	19.59														
Felling - Collateral	10.73														
Skid Trails	12.51														
Haul Roads	7.05														
Yards	1.26														
<i>Total</i>	<i>51.12</i>														
Source of data (e.g. official statistics, IPCC, scientific literature) or description of the assumptions, methods and results of any underlying studies that have been used to determine the parameter:	Griscom et al (2014). The emission factor is derived from field measurement in nine logging concessions in East Kalimantan.														
Spatial level (local, regional, national or international):	Regional (Kalimantan island)														
Discussion of key uncertainties for this parameter:	Key uncertainty comes from sampling error and human error in estimating effective logging area (Griscom et al., 2014; Ellis et al., 2016).														
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:	Uncertainty level 74% (See Annex 12.1)														

8.5.5 *Emission Factors from soil*

8.5.5.1 Emission Factors from peat soils

Peat emissions happen slowly over time once land is cleared for a number of years depend on the depth of the peat soil. Thus the emissions in any given year is the sum of emissions from all peat lands disturbed over the previous years. These emissions from prior year deforestation are called 'inherited emissions' (e.g. Agus et al., 2011). This means that total emissions from peat decomposition is defined as accumulation of peat emissions from forested lands starting with the Reference Period base year of 2006 onward.

The procedures of calculating peat decomposition from deforestation follow three steps as shown in Figure 8.6. First is defining natural forest in 2006 over peat land, and then step 2 is generating land cover change from each interval year to define a transition area matrix for the associated year of interval. The third step is calculating total annual emissions by multiplying the transition matrix of both areas and associated emission factors².

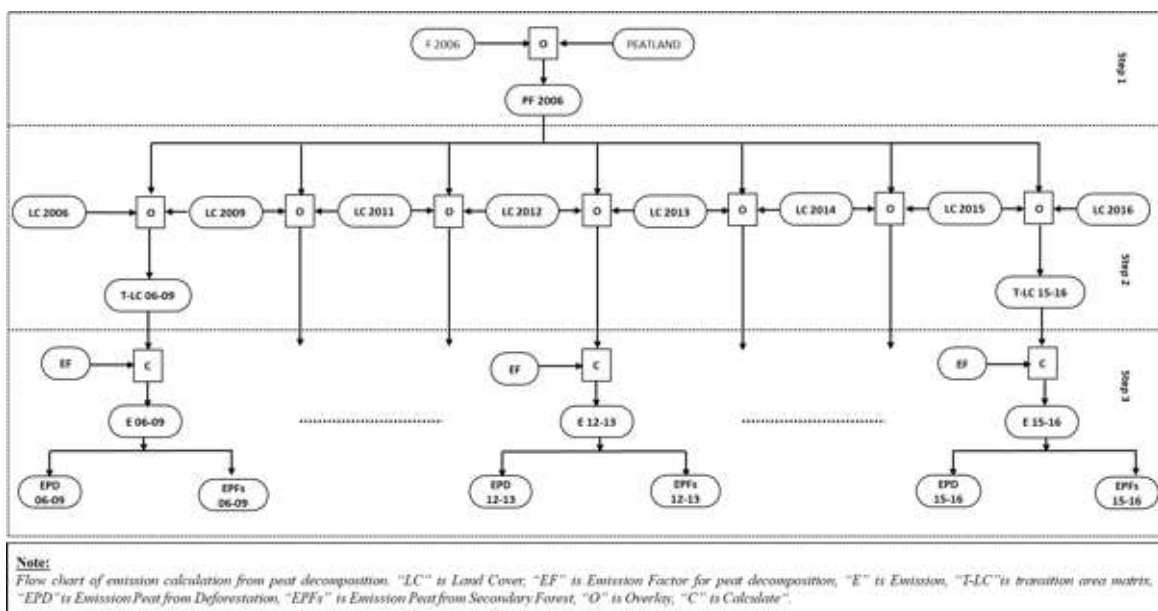


Figure 8.5 Flow chart for calculation of emissions from peat decomposition

The emissions from peat decomposition do not continue indefinitely, as they cease when the peat has completely decomposed or reached the water table. For the purpose of the ER Program, the time frame ends in 2024 by which time the peat will not be completely decomposed and should not thus affect the calculation. On average, the rate of loss of peat due to decomposition after drainage is about 5.6 cm per year in secondary forest (Maswar and Agus, 2015). After a period of 5 years of drainage in acacia and oil palm plantations, the rates appear to stabilize at around 5 cm per year (Hooijer et al, 2012). With an average peat depth of more than 2 m, it will thus take about 40 years to decompose the peat. By reference to the existing data on peat depth in Sumatra and Kalimantan, it appears that peat depth of deforested areas in Indonesia is generally more than 2 m (Ritung et al. 2011). A refinement of the peat depth map particularly in deforested areas is required for the development of the Reference Level beyond 2024.

Table 8.14 Emission factors used for the estimation of emission from peat decomposition

Description of the parameter including the forest class if applicable:	Emission Factor for peat decomposition		
Data unit (e.g. t CO ₂ /ha):	Ton CO2/ha/year		
Value for the parameter:			
	Land cover	Code	EF (t CO ₂ /ha/yr)

	Primary forest	2001, 2004, 2005	0
	Secondary forest	2002, 20041, 2051	19
	Plantation forest	2006	73
	Estate crop	2010	40
	Pure dry agriculture	20091	51
	Mixed dry agriculture	20092	51
	Dry shrub	2007	19
	Wet shrub	20071	19
	Savanna and Grasses	3000	35
	Paddy Field	20093	35
	Open swamp	50011	0
	Fish pond/aquaculture	20094	0
	Transmigration areas	20122	51
	Settlement areas	2012	35
	Port and harbor	20121	0
	Mining areas	20141	51
	Bare ground	2014	51
	Open water	5001	0
	Clouds and no-data		Nd
	<p>Source of data (e.g. official statistics, IPCC, scientific literature) or description of the assumptions, methods and results of any underlying studies that</p>		
	<p>Paciornik and Rypdal (2006) and IPCC (2014). These emission factors are reported in 2013 Supplement Guideline to 2006 IPCC Guidelines for National GHG Inventory: Wetlands. Most of the data reported in this guideline come from Indonesian sites.</p>		

have been used to determine the parameter:			
Spatial level (local, regional, national or international):	National		
Discussion of key uncertainties for this parameter:	Key uncertainty comes from sampling error (number of sampling, timing of sampling, length of the time between sampling taken to processing in laboratory).		
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:	The uncertainty is taken from the 2013 supplement for 2006 IPCC Guideline (IPCC, 2014)		
	Land cover	Code	Uncertainty (%)
	Primary forest	2001, 2004, 2005	0.0
	Secondary forest	2002, 20041, 2051	84.2
	Plantation forest	2006	20.5
	Estate crop	2010	55.0
	Pure dry agriculture	20091	86.3
	Mixed dry agriculture	20092	86.3
	Dry shrub	2007	84.2
	Wet shrub	20071	84.2
	Savanna and Grasses	3000	108.6
	Paddy Field	20093	108.6
	Open swamp	50011	0.0
	Fish pond/aquaculture	20094	0.0
	Transmigration areas	20122	86.3
	Settlement areas	2012	108.6
	Port and harbor	20121	0.0

	Mining areas	20141	86.3
	Bare ground	2014	86.3
	Open water	5001	0
	Clouds and no-data		Nd

8.5.5.2 Emission Factors from mangrove soils

Calculation of emissions from mangrove soil in the ER program is considered only for conversion to aquaculture. Emissions released are calculated as potential emissions assuming that emissions from organic soil removed from the floor of the aquaculture system are emitted once at the time of the conversion. Thus, the calculation of the emissions from conversion of mangrove to aquaculture (E_{MS}) used the following formula:

$$E_{MS} = A_{MA} \times EF_{MA} \quad (\text{Equation 11})$$

A_{MA} is area of mangrove converted to aquaculture, EF_{MA} is emission factor, i.e. the difference between amount of carbon in the mangrove soil (C_M) and amount of carbon in soil on the floor of the aquaculture system (C_{AQ}). Data on the soil carbon of mangrove and abandoned pond is taken from Kauffman *et al.* (2017) based on measurement from the 20 locations in East Kalimantan. The procedure for the sampling is described in Kauffman *et al.* (2016). Based on measurement in 20 locations in East Kalimantan, the value of C_M is 902.91 tC/ha and the value of C_{AQ} is 487.31 tC/ha, thus the EF for conversion of mangrove soil to aquaculture system is 415.6 tC/ha (Kauffman, 2017).

Table 8.15 Emission factors used for the estimation of emission from mangrove soil

Description of the parameter including the forest class if applicable:	Emission Factor for mangrove soil and abandoned shrimp pond
Data unit (e.g. t CO₂/ha):	Ton C/ha
Value for the parameter:	902.91 (mangrove) 487.31 (abandoned shrimp pond) EF = 415.6
Source of data (e.g. official statistics, IPCC, scientific literature) or description of the assumptions, methods and results of any underlying studies that	Data on the soil carbon of mangrove and abandoned pond is taken from Kauffman <i>et al.</i> (2017) based on measurement from the 20 locations in East Kalimantan. The procedure for the sampling is described in Kauffman <i>et al.</i> (2016)

have been used to determine the parameter:	
Spatial level (local, regional, national or international):	National
Discussion of key uncertainties for this parameter:	Key uncertainty comes from sampling error.
Estimation of accuracy, precision, and/or confidence level, as applicable and an explanation of assumptions/methodology in the estimation:	Uncertainty level 33.4%. The estimation of uncertainty is provided in Annex 12.1.

8.5.6 Calculation of the Average Annual Historical emission over Reference Periods

The calculation of the annual historical emission over the reference period is given in two files, i.e. “*FREL ESKAL 2006-2016_Dec_2018 Edit.xlsx*” (upon request) and ‘*Fire Emission of ESKAL 2006-2016-November 2018.xlsx*’ (upon request). These spreadsheets show the detailed calculations combining Activity Data and Emission Factors which are summarized below.

The following sections show the calculations of annual historical emissions for the different components discussed above.

8.5.6.1 Emissions from deforestation

Emissions from deforestation include the following:

- Emissions associated with loss of living forest biomass
- Emissions associated with soil carbon

As described in the previous section, the carbon pools used to measure emissions for the REL depend on the land type. For deforestation on mineral soils AGB and BGB are included. For deforestation on organic soils (peat forests and mangroves) soil carbon is also included. The methods for calculating emissions from deforestation are described below.

A. Deforestation emissions from living biomass

The method used for the calculation of average annual historical emissions follows the national method (MoEF, 2015) that is consistent with the IPCC. Emissions from deforestation at a given period were calculated by aggregating CO₂ emissions resulting from newly identified deforested areas within that period.

The calculation of CO2 emissions from deforested areas used the following equation:

$$GE_{ijk} = A_{ijk} \times EF_{jk} \times (44/12) \quad (\text{Equation 12})$$

GE_{ijk} = CO2 emissions from deforested area-i at forest change class-j to non-forest class-k, in tCO2e

A_{ijk} = Deforested area-i in forest change class-j to non-forest class-k, in hectare (ha). The detailed deforestation area estimates by time period, forest class j and non forest class k are shown in Annex 8.1.

EF_j = Emission Factor which is calculated as the difference between carbon stock of forest class-j and carbon stock of non-forest class-k, in ton carbon per ha (tC ha-1). Emission factors for each forest and nonforest class are listed in Table 8.10

(44/12) is conversion factor from tC to tCO2e

Carbon stock of the lands after the conversion used in the calculation of the emission from the deforestation is the lifetime average carbon stock. It is assumed that land-cover types after deforestation will not change. This assumption is adopted since it is not practical to track the changes of land cover after deforestation, and it is unlikely that the natural forest that have been converted to non-forest lands will change back to natural forest.

The emission from gross deforestation at period t (GE_t), was estimated using equation below,

$$GE_t = \sum_{i=1}^N \sum_{j=1}^P GE_{ijk} \quad (\text{Equation 13})$$

GE_t = total emission at period t from deforested area-i in forest class-j to non-forest class-k, expressed in tCO2

N = number of deforested area units at period t (from t0 to t1), expressed without unit

P = number of forest classes which meet natural forest criterion.

Further, average emissions from deforestation from all period were calculated as follows:

$$MGE_P = \frac{1}{T} \sum_{t=1}^P GE_t \quad (\text{Equation 14})$$

MGE_P = mean or average emissions from deforestation from all period P (expressed in tCO2yr-1)

T = number of years in period P

The estimation of emission from deforestation from the loss of living biomass between two years (period) used the land use transition matrix.

The emissions from the change of a land use category to other land use category from the transition matrix used the equation 12 and their corresponding emission factors as defined in the above emission factor table. For example, the emission from deforestation (change from secondary dryland forest (2002) to plantation forest (2006) is calculated as follow:

$$E_{2002-2006} = A * (EF_{BC} - EF_{AC}) * 44/12 = 174.13 * (147.29 - 82.58) * 44/12 = 41,316.93 \text{ ton CO}_2$$

Where EF_{BC} and EF_{AC} are emission factors before and after conversion respectively, which is 147.29 tC/ha for the secondary dry land forest and 82.58 tC/ha for plantation forest. The final result of the emission for each type of conversion is presented below (Table 8.15).

Table 8.16 Matrix of CO2 emission from deforestation due to loss of above living biomass in the period 2014-2015

2014	2015							
	LC Code	2006	2007	2010	2014	20092	20094	20141
	2001	-	10,251.42	-	1,713,345.54	-	-	-
	2002	41,316.93	8,541,865.36	2,765,235.90	25,803,235.77	2,238,037.22	-	1,436,901.89
	2004	-	-	-	108,981.39	-	-	-
	2005	-	-	-	247,918.10	-	-	-
	20041	-	-	542,906.75	491,490.99	-	1,276,139.47	50,956.63
	20051	-	-	-	4,071,946.45	-	990,329.58	-

The total emission from the deforestation of natural forests to non-forest covers (resulted from the loss of living biomass) occurred in the period 2014-2015 is the summation of emissions from all changes (equation 13). The total emission from deforestation (loss of living biomass) during this period is 50,330,859.41 t CO₂. In the case the period between the years is more than 1 year, then the annual emission is calculated by dividing the total emission with the length of the period (equation 14).

The assessment of changes of primary forest to secondary forest and the estimation of emissions from the removal of the living biomass (AGB and BGB) and decomposition of organic soils follows a similar procedure as that of the deforestation (Figure 8.3 and Equations 12-15). The degradation of primary forest to secondary forest was also counted only once that occur at one particular area,

similar to the procedure used in calculating the deforested area. Identification of secondary forest area in particular year is filtered using the primary forests of the previous years. Thus, the degradation of primary forest to secondary forest will be detected only in remaining primary forests of the previous years that have never been degraded before.

B. Deforestation emissions from soil carbon

B1. Emissions from Peat decomposition in deforested areas

Calculation of historical emissions from peat decomposition used the same basis as emissions from deforestation. This is due to the fact that once deforestation occurs in peat forest, there will be emissions from removal of the ABG at the time of conversion as describe above, and plus from peat decomposition subsequently. The formula for estimating the emission from peat decomposition is the following:

$$PDE_{ijt} = A_{ijt} \times EF_j \quad (\text{Equation 15})$$

PDE = CO₂ emission (tCO₂yr⁻¹) from peat decomposition in peat forest area-i changed into land cover type-j within time period-t

A = area-i of peat forest changed into land cover type-j within time period-t

EF = the emission factor from peat decomposition of peat forest changed into land cover class-j (tCO₂ ha yr⁻¹)²¹

From the land use transition matrix, deforestation of natural peat started in 2012-2013. About 1,137.5 ha of secondary swamp forest (SSF) is converted to wet shrubs (WS) in this period. The emission from peat decomposition is calculated using the Equation 15. The emission from the peat decomposition occurs at a rate of $1137.5 \times (19+19)/2 = 21,613$ ton CO₂. After this year, the emission of peat decomposition from wet shrubs continues as inherited emission at a rate of 21,613 ton CO₂ as the EF for the wet shrubs (WS) is also 19 ton CO₂/ha/y. This rate will change if the shrubs is converted to other land use that have higher emission factor, in this case to estate crops (EC). The conversion of the WS to EC occurred in 2015-2016, thus the rate of emission from peat decomposition from this deforested peat forest increased to 33,557 ton CO₂. Thus in total, the emission from peat decomposition from the 1,137.5 ha deforested secondary peat swamp

²¹ Emission factor for an area of change is an average of the emission factors of the respective land cover before and after. This reflects the assumption that conversion of land cover on peatland between two time periods gradually affects the peat water table implying a gradual peat decomposition emission. For example, the emission factor of secondary forest is 19 tCO₂ ha⁻¹ y⁻¹ and the emission factor of bare ground is 51 tCO₂ ha⁻¹ y⁻¹, so that the average emission factor for an area changing from secondary forest to bare ground is 35 tCO₂ ha⁻¹ y⁻¹.

forest in period 2013-2016 was about 98,396 ton CO₂, in which 76,783 ton CO₂ as inherited emission (78% of the total).

Overall, during the reference period, the total deforested natural peat was 2,873.6 ha, all in the years from 2013 to 2016. This deforestation all occurred in secondary forest (2,829.9 ha in secondary swamp and 43.7 ha in secondary mangrove). Total emission from deforestation of the natural peat and mangrove forest in the period was 197,192 ton CO₂e in which 127,298 tCO₂e as inherited emission (Table 8.16).

Table 8.17 The estimated of emission from peat decomposition of the deforested area during the reference period. Black figures are emissions in the year of land cover change, red emissions are later year inherited emissions for the same land.

Period	Peat Decomposition	Area (ha)	EF _{before} tCO ₂ /ha/y	EF _{after} tCO ₂ /ha/y	Emission (tCO ₂)
2012-2013	SSF - WS	1137.5	19	19	21,613
2013-2014	SMF – BG	33.4	19	51	1,167
	WS – WS	1137.5	19	19	21,613
2014-2015	SMF - EC	10.3	19	40	303
	SSF - BG	915.7	19	51	32,050
	BG - BG	33.4	51	51	1,701
	WS - WS	1137.5	19	19	21,613
2015-2016	SSF - WS	776.5	19	19	14,754
	SSF - BG	0.2	19	51	7
	BG - BG	949.1	51	51	48,403
	WS - EC	1137.5	19	40	33,557
	EC - EC	10.3	40	40	411
	Deforested area 2012-2016	2,873.60			69,894
	Inherited (2012-2016)				127,298
	Total				197,192

B2. Emissions from Peat Fire in deforested areas

Calculation of historical emissions from peat fire in the deforested area (L_{fire}) is calculated using the following formula (IPCC, 2014):

$$L_{\text{fire}} = A * EF_f = A * M_B * C_f * G_{ef} * 10^{-3} \quad (\text{Equation 16})$$

L_{fire} = amount of greenhouse gas emissions from fire, tonnes of each GHG e.g., CH₄, N₂O, etc.

A = area burnt, ha

M_B = mass of fuel available for combustion, tonnes ha⁻¹.

C_f = combustion factor, dimensionless (default values in Table 2.6 of the 2006 IPCC Guideline, Volume 4 Chapter 2-page 2.48)

G_{ef} = emission factor, g kg⁻¹ dry matter burnt (default values in Table 2.5 of the 2006 IPCC Guideline, Volume 4 Chapter 2-page 2.47)

Emissions from soil carbon due to deforestation may also come from peat fires. However, since satellite data for the reference period is not always available on an annual basis, it is difficult to determine which part of the deforested area are experiencing peat fires in a particular year within the period. Therefore, the estimation of the peat fire emission for the years between the period is estimated using the proxy data (estimated burnt area from the hotspot of these corresponding years).

The loss of soil carbon from deforested peat forest occur not only from decomposition process but also from fire. The estimation of the emission from peat fire in the deforested area is calculated using Equation 16. The deforested peat affected by fires only occurred in 2013, 2015 and 2016 with total area of about 370, 51, and 23 ha respectively. By multiplying with the EF, the total emissions were 279,483; 38,569 and 17,505 t CO₂e respectively.

B3. Emissions from *Mangrove Soil in deforested areas*

When mangrove forests are converted to aquaculture, they normally are being cleared and the soil being removed or excavated, normally 1.5 to 2 meters deep. When the organic soils are excavated, they exposed to aerobic condition and being oxidized that emit CO₂. Considering that soil mangrove has very high organic content (Kauffman et al, 2017 and Murdiyarso et al, 2015), conversion of mangroves will result in a significant amount of CO₂ emissions.

Calculation of emissions from mangrove soil in the ER program is considered only for conversion to aquaculture. Emissions released are calculated as potential emissions assuming that emissions from organic soil removed from the floor of the aquaculture system

are emitted once at the time of the conversion. Thus, the calculation of the emissions from conversion of mangrove to aquaculture (E_{MS}) used the following formula:

$$E_{MS} = A_{MA} \times EF_{MA} \quad (\text{Equation 17})$$

A_{MA} is area of mangrove converted to aquaculture, EF_{MA} is emission factor, i.e. the difference between amount of carbon in the mangrove soil (C_M) and amount of carbon in soil on the floor of the aquaculture system (C_{AQ}).

Estimation of emission from the conversion of mangrove forest to aquaculture is also straight forward using equation 17. In the period of between 2006-2009, about 1,324.412 ha of mangrove forest was converted to aquaculture. In this conversion, about 415.6 ton of soil carbon per hectare is removed. Thus total carbon emission is about $(1,324.412 \times 415.6 \times 44/12) = 2,018,227.30$ t CO₂e or about 672,743 t CO₂e per year.

8.5.6.2 Summary: average historical emissions from deforestation

Emissions from deforestation is calculated based on the emissions associated with loss of living forest biomass (AGB and BGB), and the emissions associated with soil carbon. The Emission from soil includes the emission from peat soil due to decomposition process, and fire events, and also the emission from mangroves soil due to mangrove conversion to aquaculture. Total historical emission deforestation during the reference period is about 52,169,544 tCO₂-e/year The summary of the estimated emission from deforestation during the reference period can be seen in Table 8.17. **NOTE: This average total is substantially higher than the average reported in the August 2018 draft ERPD (22,180,607 tCO₂e/yr), for two reasons: (1) the sample based area estimation resulted in significant increases in estimated area of deforestation and forest degradation (+62% and +195% respectively, Annex 12.1 Accuracy Assessment); and (2) the estimates of Emission Factors C/ha for forest classes have increased significantly due to use of East Kalimantan inventory data, which show that C stocks in East Kalimantan are significantly higher than the average stocks across all Indonesia.**

Table 8.18 The average historical emission from deforestation (tonnes CO₂e)

YEAR	Emission from Deforestation				
	Living Biomass	Peat Decomposition	Peat fire in deforested area	Mangrove Soil	TOTAL
2007	43,396,286	-	-	672,743	44,069,029
2008	43,396,286	-	-	672,743	44,069,029
2009	43,396,286	-	-	672,743	44,069,029
2010	21,556,233	-	-	66,581	21,622,814
2011	21,556,233	-	-	66,581	21,622,814
2012	70,593,757	-	-	1,005,930	71,599,687
2013	54,378,877	21,613	279,483	1,722,072	56,402,045
2014	20,658,408	22,780	-	-	20,681,188
2015	50,330,859	55,667	38,569	4,183,783	54,608,879
2016	140,706,807	97,131	17,505	2,129,481	142,950,924
Average	50,997,003	19,719	33,556	1,119,266	52,169,544

8.5.6.3 Emissions from forest degradation

The emission from degradation of natural forest include:

1. Emissions due to the degradation of primary forest into secondary forest
2. Emissions due to further degradation of secondary forest caused by fire
3. Emissions from peat decomposition in secondary forests
4. Emissions due to logging practices within production forest area (HP, HPT, HPK)

A. Emissions from degradation of primary forest to secondary forest

The estimation of emission from forest degradation from the loss of living biomass (change of primary to secondary forest) between two years (period) used the land use transition matrix only in conservation and protection forests (non-production forests). Separation of the accounting area for the calculation of historical emission from degradation is to avoid double counting with the degradation due to logging as describe above. The logging concessions mostly operate in production forests.

The emissions from the change of primary to secondary used the equation 1. For example the emission from degradation (Primary dryland to Secondary dryland forests; 2001-2002) occurred in the period 2006 and 2009 is calculated as follow:

$$E_{2001-2002} = A * (EF_{BC} - EF_{AC}) * 44/12$$

$$E_{2001-2002} = 39,800.89 * (281.318 - 147.293) * 44/12 = 19,559,089.56 \text{ ton CO}_2$$

Where EF_{BC} and EF_{AC} are emission factors before and after being degraded respectively. Total emission for degradation in this period is $(19,559,089.56 + 194,935.16) = 19,754,024.72 \text{ ton CO}_2$

B. Emissions due to further degradation of secondary forest caused by fire

The loss of carbon due to fire of the secondary forest will result in further degradation of this forest and result in more emissions. Using the MRI method, we can estimate the area affected by fire by overlying the hotspot and land cover maps. However, observations by forest type and by forest/non-forest exist only in the years of forest cover mapping, e.g. 2006, 2009, and 2011-2016. There are no estimates of forest cover for 2007, 2008, and 2010. Therefore we only able to estimate the emission from fire in the secondary forest for the available years. For the missing years, we estimated the fire emission from total area affected by fires based on total burnt area (A) using simple regression equation.

The area the secondary forests affected by fire based on MRI method in 2006 was about 26,059 ha, i.e. 24,940 ha for secondary dryland (2001), 700 ha for secondary swamp forest (20051) and 418 ha for secondary mangrove forest which is responsible for the total emission of 4,267,554 ton CO_2e (using equation 16). Using estimates of fire emission of other years, the relationship between the fire emission and the total burnt area can be constructed as presented in Figure 8.6 below. Using this regression equation, we can estimate the fire emission for year 2007, 2008 and 2010.

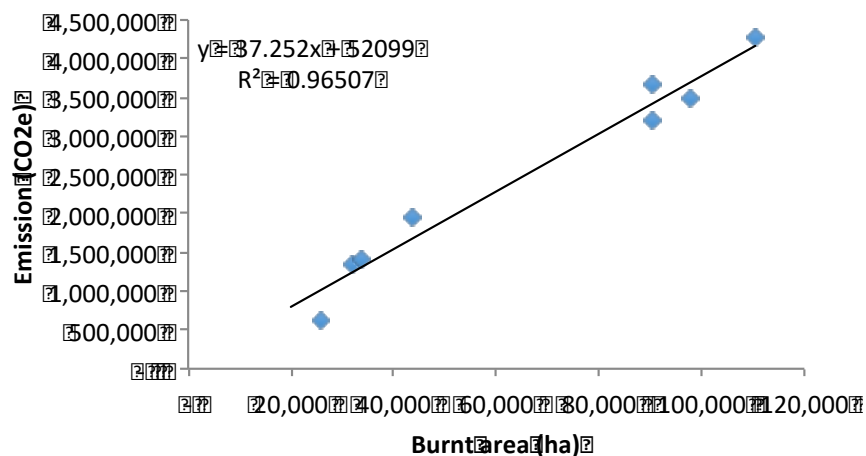


Figure 8.6 . Relationship between total burnt area and emission from fire of the secondary forest, used to estimate emissions for years without forest cover map data.

C. Emissions from peat decomposition in secondary forests

The loss of carbon from the decomposition of organic soil occurs in secondary forest (IPCC, 2014). From the transition matrix 2006-2009 (Table 8.18), area 51,038 ha of secondary peat dryland, secondary peat swamp forest, and secondary mangrove forests remain as secondary forest until 2009, i.e. 146.57 ha secondary peat dry forest, 4,486.98 secondary mangrove and 46,405.05 ha secondary peat swamp forest. These lands are considered to be ‘degraded’ (since they are secondary), and collectively are the source of the 969,733 tCO₂e of inherited peat decomposition emissions starting in 2006 (Table 8.19). These are considered to be inherited emissions because the disturbance (which changed the forest from primary to secondary) occurred prior to 2006. The estimation of the emission from peat decomposition uses equation 15.

Table 8.19 Land cover transition matrix 2006-2009 on peat

Year	2009				
	LC Code	2002	2004	2005	20041 20051
2006	2002	146.57			
	2004		1,330.07		
	2005			6,669.90	

	20041	4,486.98
	20051	46,405.05

Table 8.20 CO₂ emission of peat decomposition in the secondary peat forests in the period 2006-2009

Year = 2009						
Non-forest Land Cover Class						
Year = 2006	Forest Cover Class	2002	2004	2005	20041	20051
	2002	2,784.88	0	0	0	0
	2004	0	0	0	0	0
	2005	0	0	0	0	0
	20041	0	0	0	85,252.67	0
	20051	0	0	0	0	881,695.91
Total						969,733

D. Emissions due to logging practices within production forest area (HP, HPT, HPK)

Emission from logging of the secondary forest is estimated using Equation 18. Actual logged area (A_{log}) is taken from the logging data collected from Provincial Forest Office from 2006-2016, For example the total logged area (A_{log}) in 2007 was 23,157 ha. By multiplying this area with the EF for logging, the estimate emission from logging (loss of biomass of waste during the logging activities) was about 2,995,209.75 ton CO₂. The summary of the estimated emission from forest degradation during the reference period can be seen in Table 8.19.

$$E_{log} = A_{log} \times 0.69 \times EF_{log} \quad (Equation 18)$$

A_{log} is actual logged area multiplied by correction factor 0.69 is correction factor (Ellis et al, 2016), EF_{log} is emission factor of selective logging activities as a result of felling, skidding, and hauling operations, 51.12 t C/ha (Griscom et al., 2014).

8.5.6.4 Summary: average historical emissions from forest degradation

Emissions from forest degradation is calculated based on the emissions associated with loss of living forest biomass (AGB and BGB) due to transition of primary forest to secondary forest, fires in secondary forest, and from selective logging practices. In addition, the emissions associated with soil carbon on peat secondary forest is also included. The Emission calculation from peat soil on secondary forest follows the method of peat decomposition process. Total historical emission from forest degradation during the reference period is about 10,761,341 tCO₂-e/year. The summary of the estimated emission from deforestation during the reference period can be seen in Table 8.17. NOTE: As noted above for deforestation, estimates of emission from degradation have also increased substantially compared to the August 2018 draft ERPD due to (1) increased area of degradation resulting from application of the sample based estimation, and (2) increased emission factors resulting from the use of East Kalimantan inventory data.

Table 8.21 The average historical emission from forest degradation (ton CO₂e)

Emission from Forest Degradation					
	Living Biomass PF-SF	Peat Decomposition	Fire-AGB_SF	Logging in SF	TOTAL
2007	<u>6,584,675</u>	969,733	1,195,106	2,995,210	<u>11,744,724</u>
2008	<u>6,584,675</u>	969,733	796,915	3,169,916	<u>11,621,240</u>
2009	<u>6,584,675</u>	969,733	3,476,389	3,180,660	<u>14,211,458</u>
2010	454,971	969,733	1,037,549	3,687,428	6,149,681
2011	454,971	969,733	1,356,964	3,644,761	6,426,430
2012	197,705	969,733	1,968,273	4,059,621	7,195,333
2013	915,809	948,121	1,410,229	3,056,031	6,330,190
2014	1,255,914	947,487	3,652,732	5,988,496	11,844,629
2015	12,567,817	929,893	3,185,506	5,458,427	22,141,644
2016	4,280,905	915,136	632,755	4,219,287	10,048,082
Average	<u>3,988,212</u>	955,904	1,871,242	3,945,984	<u>10,761,341</u>

8.5.7 Estimated Reference Emission Level

The average historical emission during the reference period from deforestation and forest degradation reached **52,169,544 and 10,761,341** ton CO₂e per year respectively (Table 8.18 and 8.20; Figure 8.7). The emission from deforestation is relatively constant between 2007 and 2015, and it increased significantly in 2016 (Figure 8.8). With the exclusion of emission in 2016 from the reference period, the average historical emission from deforestation will decrease to 29,561,636 ton CO₂e per year or about 20%. This suggests that the emission from the 2016 deforestation alone contribute to one fifth of average emission over the 10 years reference period.

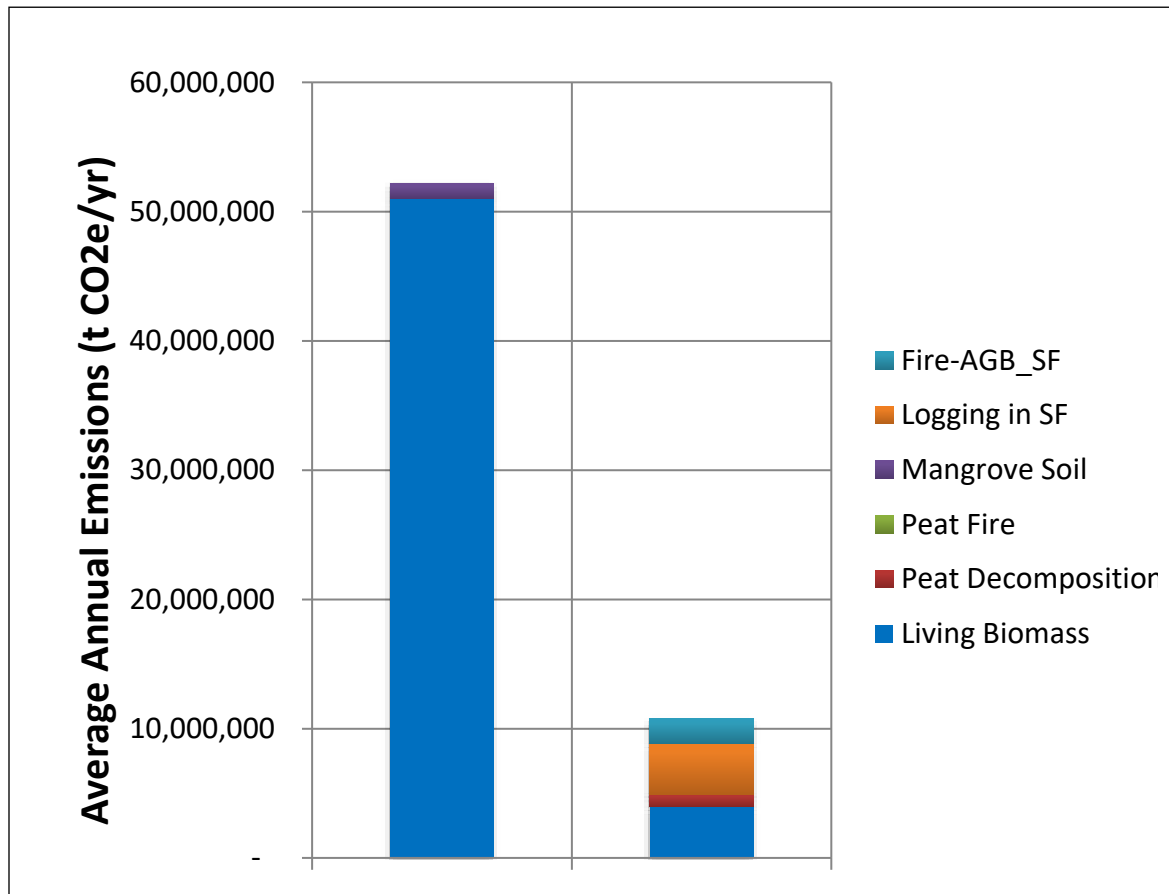


Figure 8.7 Estimated average annual CO₂ emission from deforestation and forest degradation during the reference period (2006-2016)

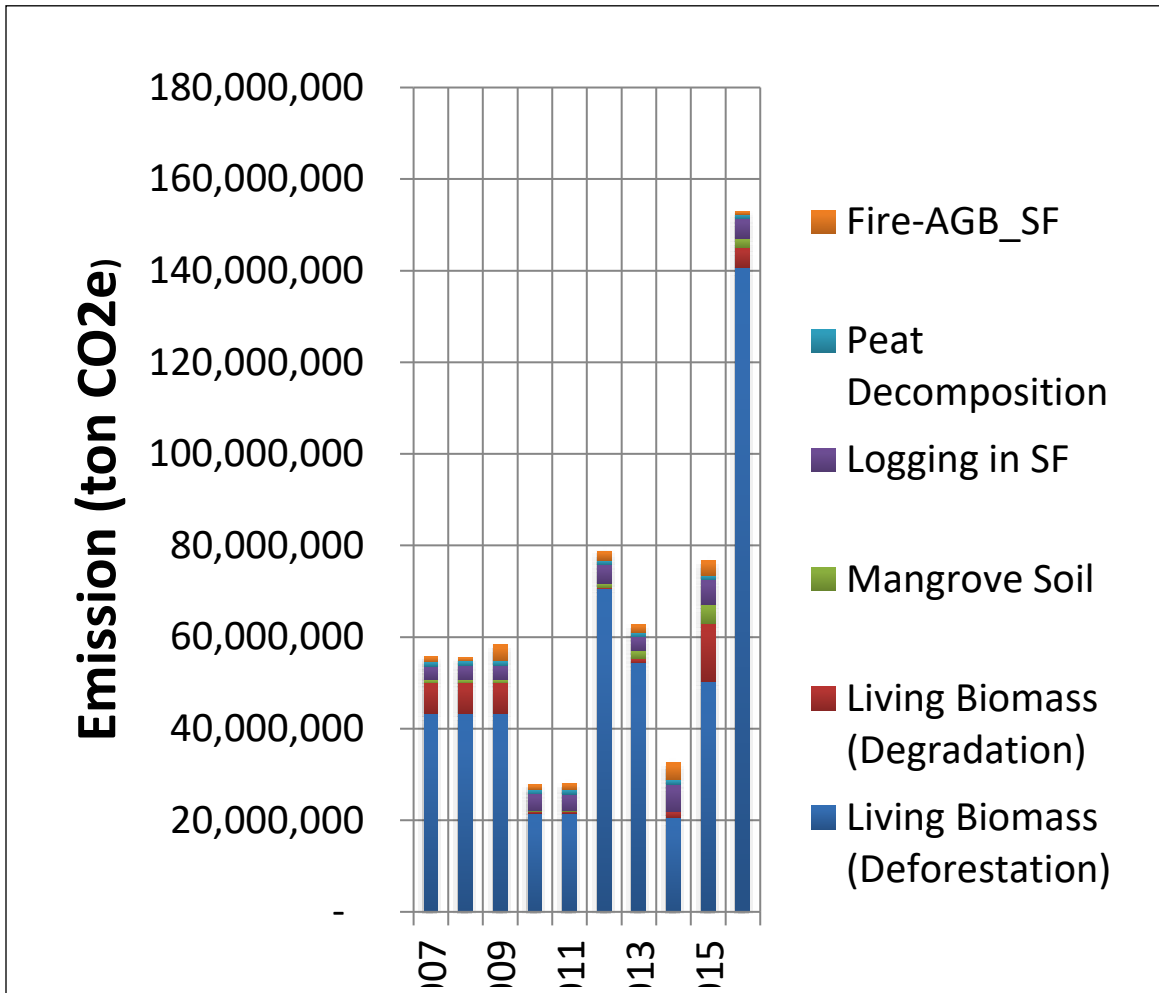


Figure 8.8 Estimated annual CO2 emission from deforestation and forest degradation by source of emission during the reference period (2006-2016)

Table 8.22 Estimated historical emission from deforestation and forest degradation during the reference period

	Deforestation (LB)	Degradation (LB)	Mangrove Soil	Logging	Peat Decomposition	Fire	TOTAL
2007	43,396,286	<u>6,548,675</u>	672,743	2,995,210	969,733	1,195,106	<u>55,813,753</u>
2008	43,396,286	<u>6,548,675</u>	672,743	3,169,916	969,733	796,915	<u>55,590,268</u>
2009	43,396,286	<u>6,548,675</u>	672,743	3,180,660	969,733	3,476,389	<u>58,280,487</u>
2010	21,556,233	454,971	66,581	3,687,428	969,733	1,037,549	27,772,495
2011	21,556,233	454,971	66,581	3,644,761	969,733	1,356,964	28,049,244
2012	70,593,757	197,705	1,005,930	4,059,621	969,733	1,968,273	78,795,020
2013	54,378,877	915,809	1,722,072	3,056,031	969,733	1,689,712	62,732,235
2014	20,658,408	1,255,914	-	5,988,496	970,267	3,652,732	32,525,817
2015	50,330,859	12,567,817	4,183,783	5,458,427	985,560	3,224,075	76,750,523
2016	140,706,807	4,280,905	2,129,481	4,219,287	1,012,266	650,260	152,999,006
Average 2007- 2016	50,997,003	<u>3,988,212</u>	1,119,266	3,945,984	975,623	1,904,797	<u>62,930,885</u>

8.6 Upward or downward adjustments to the average annual historical emissions over the reference period

Indonesia proposes to include a slight upward adjustment above average annual historical emissions over the reference period, to account for the unique case of cumulative emissions from peat soil over time. The justification for this proposal follows below.

Most C emissions are considered to be ‘instantaneous’, with 100% of the emission occurring in the year where the Activity (deforestation, degradation, logging, etc.) occurs. In this case, emissions may go up or down each year, depending on the level of Activity, so it is appropriate to take an average of total emissions per year over a reference period to calculate an average emission to serve as a basis for future ‘business as usual’ projection.

Emissions from peat soil are not instantaneous; they occur repeatedly on a given hectare of land for many years following an Activity (e.g. conversion of peat forest to nonforest). This is because the process of carbon oxidization in deforested peat soils occurs at the surface of the soil, resulting in repeated emissions over many years for a given hectare of land. In Indonesia, peat soils average 2 to 3 meters in depth, and will oxidize at an average rate of 5 cm/year (CITE STUDY). This means that peat emissions in East Kalimantan on a given hectare will occur for 20 to 30 years following deforestation.

Like forest growth, peat soil emissions are therefore cumulative over time. The total emission for an area in year (n+1) will be equal to the total emission in year n (reflecting all past deforestation and degradation activities in the area) plus an additional increment of emissions reflecting the current year new deforestation or degradation. Emissions over the short to medium term will therefore be monotonic – they will only increase, never decrease, as additional land is deforested. Only after long periods, 40 to 60 years, will the emissions finally terminate.

So for purposes of estimating a baseline for future emissions from peat soil, calculation of an average emission over the Reference Period is not relevant; expected baseline emissions in years after the end of the Reference Period will be at least as high as the last year of the Reference Period (reflecting cumulative past Activities), plus additional emissions reflecting future Activities. This is the rationale for seeking an upward adjustment: to reflect the cumulative (not instantaneous) nature of peat emissions resulting from past disturbances. This special case of cumulative peat emissions was not considered in the Methodological Framework, but it is a significant issue for Indonesia which has extensive carbon-rich peat soils. And peat forests are very carbon –rich, so there is a benefit to recognizing these special circumstances.

Considering this information, the baseline for future peat soil emissions for a Reference Level under a ‘business as usual’ scenario is therefore calculated as follows:

- An initial estimate of 1,012,266 tCO₂e/ha/yr reflecting peat emissions occurring in E Kalimantan in the final year 2016 of the reference period serves as the baseline for projecting future emissions. In the absence of any future deforestation or

degradation, this would be the estimate of annual emissions in the near term. i.e. over the ER Performance Period

- An additional increase of 3,008 tCO₂/ha/yr reflecting the likely continuation of a low level of deforestation in the future. This estimate is based on a simple linear regression estimate (Figure 8.10) of average 'new' emissions over the 10 year historical Reference Period, associated with additional peat deforestation occurring in that time. This reflects an average rate of deforestation over the historical period.

Therefore the total proposed Reference Level for future peat soil emissions, based on historical data plus understanding of peat decomposition dynamics, is 1,012,266 + 3,008 = 1,015,274 tCO₂e/ha/yr in 2017, increasing annually after that by 3,008 tCO₂e/ha/yr afterwards.

Historical average annual inherited emissions from deforestation and degradation during the Reference Period (i.e. ignoring the cumulative nature of peat emissions) (Table 8.21) are 975,623 tCO₂e/year. By adopting the proposed approach, the upward adjustment requested is about 39,651 tCO₂e/year in 2017, which is approximately 0.06% of the total annual projected emissions from all sources.

The Government of Indonesia is not so much concerned over the (admittedly small) amount of additional emissions above the historical emissions that want to include in the RL. The issue is one of precedent and consistency with the rest of Indonesia – inherited emissions are a small issue in East Kalimantan, but are potentially a much larger issue in the rest of the country. The concern is that failing to include an adjustment for likely increased future inherited emissions under a BAU scenario may set a precedent – if there is no adjustment made in East Kalimantan, then donors or cooperators on projects in the rest of Indonesia may use this as a precedent to argue that no such adjustment should be made elsewhere, which will make projects in other peat areas impractical.

The projected reference level of this ERP is presented in Figure 8.9.

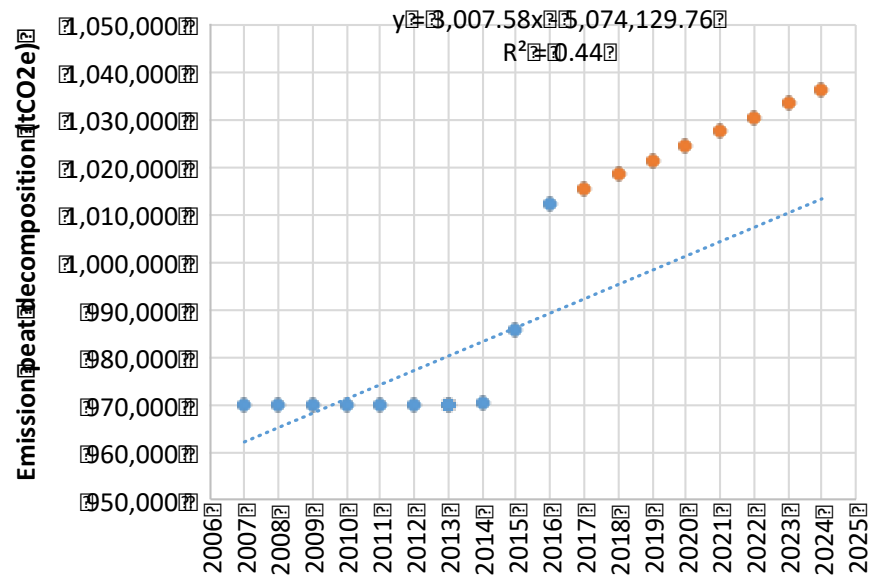


Figure 8.9 Projected emission from peat decomposition to 2025 taking into account the inherited emission

8.7 Estimated Reference Emission Level

Table 8.23 Estimated Reference Emission Level

Year	Deforestation	Degradation	Mangrove	Logging	Peat decomposition	Fire (53% of historical)	Total
2017	50,997,003	<u>3,988,212</u>	1,119,266	3,945,984	1,015,274	1,904,797	<u>62,970,536</u>
2018	50,997,003	<u>3,988,212</u>	1,119,266	3,945,984	1,018,282	1,904,797	<u>62,973,543</u>
2019	50,997,003	<u>3,988,212</u>	1,119,266	3,945,984	1,021,289	1,904,797	<u>62,976,551</u>
2020	50,997,003	<u>3,988,212</u>	1,119,266	3,945,984	1,024,297	1,904,797	<u>62,979,559</u>
2021	50,997,003	<u>3,988,212</u>	1,119,266	3,945,984	1,027,304	1,904,797	<u>62,982,566</u>
2022	50,997,003	<u>3,988,212</u>	1,119,266	3,945,984	1,030,312	1,904,797	<u>62,985,574</u>
2023	50,997,003	<u>3,988,212</u>	1,119,266	3,945,984	1,033,319	1,904,797	<u>62,988,581</u>
2024	50,997,003	<u>3,988,212</u>	1,119,266	3,945,984	1,036,327	1,904,797	<u>62,991,589</u>

8.8 Relation between the Reference Level, the development of a FREL/FRL for the UNFCCC and the country's existing or emerging greenhouse gas inventory

The RL for the ER Program was developed using the same approach as that used for the national FREL which Indonesia submitted to the UNFCCC in 2016 (<http://unfccc.int/resource/docs/2016/tar/idn.pdf>), with some enhancements, notably (1) application of sample based area estimation for Activity Data, and (2) use of region-specific forest inventory data rather than national averages. The National FREL is the result of a process involving a series of initial technical analyses followed by public multi-stakeholder consultation. The procedure follows FCCC guidelines as detailed in the annex of [FCCC/CP/2013/10/Add.1](#). The two REDD+ activities included in the national FREL were *Deforestation* and *Forest Degradation*, consistent with Decision 1/CP.16, paragraph 70 and covering national forest. The reference period used in the National FREL is 1990 to 2012 (22 years; MoEF, 2015). The use of this long reference period is to better capture the dynamic land policies in Indonesia²².

The ERP's RL uses a reference period of 10 years (2006-2016) in order to conformity with the Carbon Funds Methodological Framework. The activity data used in the development of the reference level begin with the same data used in the National assessment but have been enhanced by application of the sample based approach (Olofsson) to improve accuracy in estimation of AD. The RL also includes activities which are not included in the national REL, namely reduced impact logging activity (RIL) and the inclusion of below ground biomass and soil carbon for mangroves. The estimation of emission from peat soil is also consistent with the national GHG gas inventory and national FREL. This consistency would be enhanced by CFP agreement to allow a small upward adjustment to the historical emission level, to account for the unusual National Circumstance of inherited emissions from peat deforestation and degradation.

The emission factors (AGB) used for the estimation of historical emission do not use the national data as GHG Inventory and national FREL. This ERP used local data based on measurement in a number of permanent sampling plots developed by the FCPF. Thus, this ERP used higher tier of emission factor as suggested by the IPCC. In addition, the ERP's RL take into account the carbon stock after the conversion in the calculation of emission from deforestation. It is expected that the ER Program will generate lessons that will contribute to the next submission of the national FRL/FREL, e.g. the addition of REDD+ activities, or the improvement of activity data and emission factors.

Indonesia's GHG Inventory is managed by the Directorate for GHG Inventory and MRV, which also maintains the national registry system. The ER Program (through the local Environmental Agency) will report on the emission reductions generated by the implementation of the ER Program to the

²² MoEF, 2015, National Forest Reference Emission Level for REDD+ In the Context of Decision 1/CP.16 Paragraph 70, Directorate General of Climate Change. The Ministry of Environment and Forestry. Indonesia

national registry system (see Section 9 for details). The implementation of the ER Program will also provide inputs to the development of the national GHG Inventory.

At present, the estimation of the GHG emission from deforestation and forest degradation in the National GHG Inventory is not consistent with the ones used in the ERPD. In term of method, the GHG Inventory used gain and loss approach while the ERPD used the stock difference approach. In term of sources, the GHG Inventory also does not include soil-carbon emission from mangrove conversion as in the ERPD. The emission factors used in the GHG Inventory are also not similar to the ones in the ERPP, particularly for the above ground biomass. As mentioned above, the ERPD used local data, higher tier. While GHG Inventory and National FREL used national data. In addition, some of conversion factors are also not consistent. The GHG Inventory used the one conversion factor for all forest types and also one conversion factors for all non-forest covers. In the case of ERPD, the conversion factors differ between types of forest and non-forest. Most of sources of uncertainties of the AD and EF are included in the ERPD while in the National FREL and the National GHG Inventory only part of the uncertainty sources. The ERPD also used higher tier of method for estimating the uncertainty, i.e. Monte Carlo, while National GHG Inventory used Tier 1 (error propagation approach). The Directorate for GHG Inventory and MRV plans to change the method from Gain and Loss to Stock Difference methods and to apply best practices used in the ERPD for the development of GHG Inventory. These efforts are to increase the consistency between the ERPD and the National GHG Inventory.

9 APPROACH FOR MEASUREMENT, MONITORING AND REPORTING

The Ministry of Environment and Forestry regulation No.70/2017 includes guidance on MRV for REDD+. For example, the regulation states that measurement should take place at least twice a year (Article 10), that an independent verifier shall be used (Article 12), and that the system shall include a registry (Article 13). The ER Program's MRV design will conform to the regulation, and will involve an independent verifier in addition to verification by the Ministry of Environment and Forestry.

9.1 Measurement, monitoring and reporting approach for estimating emissions occurring under the ER Program within the Accounting Area

9.1.1 Method for monitoring activity data and emission factors

The ER Program will apply methods for monitoring activity data and for estimating emission factors that are aligned with the approach used in developing Indonesia's FREL and that comply with established standards for the measurement of satellite imagery (LANDSAT) interpretation to estimate forest cover changes (SNI 8033:2014).²³ These standards have been defined in the annex of the Regulation of the Director General of Forest Planology Number P.1/VII- IPSDH/2015²⁴.

²³ Standar Nasional Indonesia (Indonesia National Standard) No. 8033 year 2014 regarding Method for Estimation of Forest Cover Changes based on Result of Visual Interpretation of Optical Remote Sensing Imagery.

²⁴ Perdirjen Planologi (2015). Pedoman pemantauan penutupan lahan (guidance for monitoring land cover change). http://appgis.dephut.go.id/appgis/download/Pemantauan%20Hutan%20Nasional/Perdirjen_Plano_2015_01_Pedoman_PSDH.pdf

Technical guidelines for field observation and ground check procedure for land cover accuracy assessment can be seen in Annex 9.1. and Annex 9.2., respectively.

Specifically:

1. Measurement of Activity Data for land cover change will continue to utilize the National Forest Monitoring System (NFMS) plus addition of the sample-based area estimation (i.e. Olofsson approach) to derive unbiased estimates of Activity Data when reporting during the ER program. This is the same process used for establishing the REL, with the addition of more sample locations in the future in order to ensure a minimum of 30 observations each for deforestation and degradation classes. Additionally the ER Program will collect Activity Data for fire and logging areas using the same procedures utilized in developing the REL. Activity data will improve in Forest classes, Forest will be divided into three classes for each ecosystem (dry land, swamp & mangrove): high density, medium density and low density. Shrubs will be divided into two classes forest re-growth (belukar tua) & shrubs (semak/belukar muda) for dry land & swamp ecosystem. The crop plantation will be divided into oil palm, rubber and mix garden. The improvement land cover classes in sub-national is in line with the national land cover classes, further information could see Annex 9.3. Activity Data (Forest/Land Cover Classes) Improvement.
2. Emission Factors for forest land classes will continue to be based on the forest inventory for East Kalimantan. There may be opportunity to increase sample sizes for purpose of increasing precision. Methods and biomass calculations will be the same. Emission factors for nonforest land classes will continue to be based on published literature. Additional literature will be added to the data base as it becomes available and where appropriate estimates of C stock will be updated. IPCC conversion factors will remain the same.

9.1.2 Parameters to be monitored

During the ERPA term (2020-2024), activity data (AD) and emission factors (EF) will be monitored in the Accounting Area to measure emissions from deforestation and forest degradation. Monitoring will follow the procedures defined in the NFMS (national forest monitoring system) and in the East Kalimantan forest inventory. For measuring degradation from logging, activity data (AD) and emission factors (EF) will be monitored following the procedures defined in the *Protocol on Auditing of Logging Performance (TNC, 2015)*.

Parameters to be monitored include the same parameters used to develop the REL, specifically:

Activity Data

- Forest cover change resulting in deforestation (all land which was forested in 2016) or forest degradation (all non production forest land which was forested in 2016)
- Areas of burned forest land
- Area of logging in production forest

Emission Factors

Emission factors for live biomass by land cover classes (forested and nonforested)

Emission factors for peat and mangrove soils

Emission factors for fires

Emission factors for logging damage and waste

The following tables provide information on the monitored parameters.

9.1.2.1 Deforestation and Degradation

Parameter:	Area of forest cover change to estimate emissions from deforestation and degradation
Description:	Applicable to all transitions, including forest remaining forest (degradation, i.e. from primary to secondary forest) and forest to non-forest (Deforestation)
Data unit:	Ha/yr
Source of data or measurement/calculation methods and procedures to be applied (e.g. field measurements, remote sensing data, national data, official statistics, IPCC Guidelines, commercial and scientific literature), including the spatial level of the data (local, regional, national, international) and if and how the data or methods will be approved during the Term of the ERPA	<p>Remote sensing data is processed by the National Forest Monitoring System (NFMS) named Simontana (<i>Sistem Monitoring Hutan Nasional</i>) (MoFor, 2014).</p> <p>It is available online at webGIS of MoEF http://webgis.menlhk.go.id:8080/nfms_simontana/ for display and viewing. The websites are part of the geospatial portal under the one map policy (http://tanahair.indonesia.go.id/portal-web). The detailed explanation of the methods for monitoring the forest resource can be seen in Margono et al. (2016; https://jurnal.ugm.ac.id/ijg/article/view/12496/9041)</p> <p>Field observations to check the accuracy of the interpretation of land cover change are also conducted as part of the NFMS, with the involvement of ER Program Entities that include local communities.</p>
Frequency of monitoring/recording:	<i>Annually</i>
Monitoring equipment:	National Forest Monitoring System (NFMS)
Quality Assurance/Quality Control procedures to be applied:	<i>Following the Standard Operating Procedure on QA/QC developed by the IPSDH (Inventory and Monitoring of Forest Resources) unit under the Directorate General of Forest Planology, Ministry of Environment and Forestry.</i>
Identification of sources of uncertainty for this parameter	Uncertainty comes from the quality of satellite images used, land cover map generation process, and the number of ground truth points.
Process for managing and reducing uncertainty associated with this parameter	<ul style="list-style-type: none"> - <i>Increase the number of ground checking</i> - <i>Provide additional training for the interpreters</i>

	- <i>Refine the selection of Landsat and other supported images (Hi-res)</i>
Any comment:	In the current NFMS, the system is still not capable of monitoring the different level of degradation of the natural forests. Level of degradation is only able to be divided into two categories, i.e. primary intact forest (called as primary forest), and degraded primary intact forest called as secondary forest. There is no category for shrubs as well. In fact some shrubs have regrowth and will be back into forest again (called as old shrubs). As the current NFM only recognize this as shrubs, this land considered as non-forest. Based on the study concocted in two districts of Kalimantan, i.e. Kutai Barat & Mahakam Ulu, the category of degradation of the natural forest and shrubs can be monitored using the current method. The result of accuracy assessment indicates that this improved method can be applied for East Kalimantan or even national. This improve method has been discussed with the national government, and it will be used for the improvement of the land cover data and also for the resubmission of the national FREL in 2020. Considering this, the ERP will apply this method for improving the AD before the first verification. The result of the assessment using this improved method in the two district is provided in Annex 9.1.

Parameter:	Above ground biomass (AGB)
Description:	The above ground biomass is estimated based on the DBH (Diameter at Breast Height) and wood density that is measured from trees in the permanent sampling plots (PSP) using local allometric equations of Basuki et al. (2009), Manuri et al. (2014) and Komiyama et al. (2005)
Data unit:	Tonne of carbon per hectare
Source of data or measurement/calculation methods and procedures to be applied (e.g. field measurements, remote sensing data, national data, official statistics, IPCC Guidelines, commercial and scientific literature), including the spatial	Field measurement from the permanent sampling plot (PSP) of the Kalimantan Timur established for the FCPF. New permanent sampling plots for East Kalimantan Province have been established by the National Government in 2016 and 2017 (319 PSPs). As the data from the new PSPs are available, these data will be used for the improvement of RL. The locations of the PSPs established for East Kalimantan

level of the data (local, regional, national, international) and if and how the data or methods will be approved during the Term of the ERPA	Province in 2016 and 2017 are provided in Annex A9.2.
Frequency of monitoring/recording:	<i>During the ERPA monitoring and recording will be carried out at minimum in 2022 and 2024. In the ER Program, the new data from the PSP will be used to improve the accuracy. In the case the improvement is significant, the recalculation of the Reference Level will be performed.</i>
Monitoring equipment:	
Quality Assurance/Quality Control procedures to be applied:	Following the standard methods that have been developed for the NFI (SNI 7724:2011)
Identification of sources of uncertainty for this parameter	Sources of uncertainty for this parameter are due to: 1. Limited number of permanent sampling plots 2. Allometric equations 3. Root:shoot ratio 4. Biomass density 5. Human error in measuring tree diameters
Process for managing and reducing uncertainty associated with this parameter	<i>Increasing number of PSP. It is planned that for 2018 there will be an additional 160 PSPs established for East Kalimantan Province. This additional PSPs is planned to be established in the forest types with less number of plots, namely swamp and mangrove forest. With the plan to increase the categorization of forest based on level of degradation, the establishment of the new PSPs will also be allocated to this area.</i>
Any comment:	

Emission Factors for peat decomposition and mangrove will continue to rely on the same published values used to calculate the REL. Above ground biomass of forest lands will be monitored as part of the NFI program in which the number of PSPs will be increased in East Kalimantan to reduce the uncertainties mentioned above, while for those of non-forest lands will not be monitored to maintain consistency with the EF used in the development of the Reference Level.

9.1.2.2 Forest Degradation (Logging)

Parameter:	Selective logging area to estimate emissions from logging
Description:	The selective logging area will be assessed in concessions implementing RIL. An adjustment factor of 69% of affected area will be applied to the reported logging area. This adjustment factor is used as, on average, the total area actually logged is less than the area reported.
Data unit:	Ha/yr
Source of data or measurement/calculation methods and procedures to be applied (e.g. field measurements, remote sensing data, national data, official statistics, IPCC Guidelines, commercial and scientific literature), including the spatial level of the data (local, regional, national, international) and if and how the data or methods will be approved during the Term of the ERPA	The annual logging plans reported by logging companies implementing RIL. These are accessible at the East Kalimantan province forestry agency.
Frequency of monitoring/recording:	<i>Annually</i>
Monitoring equipment:	<i>VCS methodology VMD0047, Protocol on Auditing of Logging Performance (TNC, 2015)</i>
Quality Assurance/Quality Control procedures to be applied:	Following the procedure defined in the <i>Protocol on Auditing of Logging Performance (TNC, 2015)</i> ²⁵
Identification of sources of uncertainty for this parameter	<p>Sources of uncertainty for this parameter are due to:</p> <ul style="list-style-type: none"> - Assumptions of the area affected by logging activities (69%; Ellis et al, 2016); - Human error in recognizing tree mortality and area affected due to logging practices such as felling, skidding, and hauling; and

²⁵ <https://verra.org/wp-content/uploads/2018/03/VMD0047-RIL-C-Performance-Method-for-East-and-North-Kalimantan-v1.0.pdf>

	<ul style="list-style-type: none"> - Process of data management in the forestry agency. The archiving data system is still manual (conventional) thus there are possibilities for loss of data.
Process for managing and reducing uncertainty associated with this parameter	<ul style="list-style-type: none"> - <i>Provide training for auditors to better recognize tree mortality and area affected due to logging practices</i> - Upgrade archiving in forestry agency into computerized system
Any comment:	

Parameter:	Impact of selective logging (FELL1)
Description:	Percent felled trees abandoned in annual harvest block from year t, as the number of felled trees from which no discernible volume has been extracted (i.e. , abandoned felled trees) divided by the total tally of all felled trees sampled or censused (i.e. , abandoned felled trees plus felled and harvested trees).
Data unit:	Percent
Source of data or measurement/calculation methods and procedures to be applied (e.g. field measurements, remote sensing data, national data, official statistics, IPCC Guidelines, commercial and scientific literature), including the spatial level of the data (local, regional, national, international) and if and how the data or methods will be approved during the Term of the ERPA	Monitored via random or systematic sampling, or census, of ≥ 200 felled trees within areas accessed by skid trail sections sampled for monitoring parameter <i>SKID</i>
Frequency of monitoring/recording:	Throughout the project crediting period, monitoring must be conducted within two years after each harvest
Monitoring equipment:	<i>VCS methodology VMD0047, Protocol on Auditing of Logging Performance (TNC, 2015):</i>

	https://verra.org/wp-content/uploads/2018/03/VMD0047-RIL-C-Performance-Method-for-East-and-North-Kalimantan-v1.0.pdf
Quality Assurance/Quality Control procedures to be applied:	Following the procedure defined in the <i>Protocol on Auditing of Logging Performance (TNC, 2015)</i>
Identification of sources of uncertainty for this parameter	Sources of uncertainty for this parameter are due to: <ul style="list-style-type: none"> - Skill of field staff to do the monitoring (human error) - Sampling error
Process for managing and reducing uncertainty associated with this parameter	<ul style="list-style-type: none"> - <i>Provide training for auditors to better recognize tree mortality and area affected due to logging practices</i> - Upgrade archiving in forestry agency into computerized system - Develop SOP
Any comment:	

Parameter:	Impact of selective logging (FELL2)
Description:	Average percentage of felled log length left in the forest from trees felled and harvested (with some volume extracted) in annual harvest block from year <i>t</i> (as average percent of harvested tree (felled trees with some discernible volume extracted) log length left in the forest in annual harvest block from year <i>t</i> is monitored via the same sampling of felled trees as for <i>FELL1</i>)
Data unit:	Percent
Source of data or measurement/calculation methods and procedures to be applied (e.g. field measurements, remote sensing data, national data, official statistics, IPCC Guidelines, commercial and scientific	Visual assessments of sampled felled trees with log section extracted.

literature), including the spatial level of the data (local, regional, national, international) and if and how the data or methods will be approved during the Term of the ERPA	
Frequency of monitoring/recording:	Throughout the project crediting period, monitoring must be conducted within two years after each harvest
Monitoring equipment:	<i>VCS methodology VMD0047, Protocol on Auditing of Logging Performance (TNC, 2015):</i> https://verra.org/wp-content/uploads/2018/03/VMD0047-RIL-C-Performance-Method-for-East-and-North-Kalimantan-v1.0.pdf
Quality Assurance/Quality Control procedures to be applied:	<i>Following the procedure defined in the Protocol on Auditing of Logging Performance (TNC, 2015)</i>
Identification of sources of uncertainty for this parameter	Sources of uncertainty for this parameter are due to: <ul style="list-style-type: none"> - Skill of field staff to do the monitoring (human error) - Sampling error
Process for managing and reducing uncertainty associated with this parameter	<ul style="list-style-type: none"> - <i>Provide training for auditors to better recognize tree mortality and area affected due to logging practices</i> - Upgrade archiving in forestry agency into computerized system - Develop SOP
Any comment:	

Parameter:	Impact of selective logging (<i>SKIDdens</i>)
Description:	Average meters length of skid trails per hectare in annual harvest block from year <i>t</i> (m/ha)
Data unit:	m/ha
Source of data or measurement/calculation methods	Field observation through GPS track of ≥ 5 km skid

and procedures to be applied (e.g. field measurements, remote sensing data, national data, official statistics, IPCC Guidelines, commercial and scientific literature), including the spatial level of the data (local, regional, national, international) and if and how the data or methods will be approved during the Term of the ERPA	trail length
Frequency of monitoring/recording:	Throughout the project crediting period, monitoring must be conducted within two years after each harvest
Monitoring equipment:	<i>VCS methodology VMD0047, Protocol on Auditing of Logging Performance (TNC, 2015):</i> https://verra.org/wp-content/uploads/2018/03/VMD0047-RIL-C-Performance-Method-for-East-and-North-Kalimantan-v1.0.pdf
Quality Assurance/Quality Control procedures to be applied:	Following the procedure defined in the <i>Protocol on Auditing of Logging Performance (TNC, 2015)</i>
Identification of sources of uncertainty for this parameter	Sources of uncertainty for this parameter are due to: <ul style="list-style-type: none"> - Skill of field staff to do the monitoring (human error) - Sampling error
Process for managing and reducing uncertainty associated with this parameter	<ul style="list-style-type: none"> - <i>Provide training for auditors to better recognize tree mortality and area affected due to logging practices</i> - Upgrade archiving in forestry agency into computerized system - Develop SOP
Any comment:	

Parameter:	Impact of selective logging (<i>SKIDdam</i>)
Description:	Average number of trees > 20 cm DBH killed trees per m skid trail in annual harvest block from year <i>t</i>

Data unit:	Number/m
Source of data or measurement/calculation methods and procedures to be applied (e.g. field measurements, remote sensing data, national data, official statistics, IPCC Guidelines, commercial and scientific literature), including the spatial level of the data (local, regional, national, international) and if and how the data or methods will be approved during the Term of the ERPA	Tally all trees ≥ 20 cm DBH killed along ≥ 5 km skid trail length
Frequency of monitoring/recording:	Throughout the project crediting period, monitoring must be conducted within two years after each harvest
Monitoring equipment:	VCS methodology VMD0047, Protocol on Auditing of Logging Performance (TNC, 2015): https://verra.org/wp-content/uploads/2018/03/VMD0047-RIL-C-Performance-Method-for-East-and-North-Kalimantan-v1.0.pdf
Quality Assurance/Quality Control procedures to be applied:	Following the procedure defined in the <i>Protocol on Auditing of Logging Performance (TNC, 2015)</i>
Identification of sources of uncertainty for this parameter	Sources of uncertainty for this parameter are due to: <ul style="list-style-type: none"> - Skill of field staff to do the monitoring (human error) - Sampling error
Process for managing and reducing uncertainty associated with this parameter	<ul style="list-style-type: none"> - Provide training for auditors to better recognize tree mortality and area affected due to logging practices - Upgrade archiving in forestry agency into computerized system - Develop SOP
Any comment:	

Parameter:	Impact of selective logging (<i>HAUL</i>)
Description:	Haul road corridor area (include log yard)
Data unit:	m² ha⁻¹
Source of data or measurement/calculation methods and procedures to be applied (e.g. field measurements, remote sensing data, national data, official statistics, IPCC Guidelines, commercial and scientific literature), including the spatial level of the data (local, regional, national, international) and if and how the data or methods will be approved during the Term of the ERPA	Haul road length: GPS tracts of centering of all haul road corridors within an annual cutting block; Haul road corridor width: 30 width measurement or alternatively remote sensing data to directly map haul road corridor area within annual cutting block
Frequency of monitoring/recording:	Throughout the project crediting period, monitoring must be conducted within two years after each harvest
Monitoring equipment:	<i>VCS methodology VMD0047, Protocol on Auditing of Logging Performance (TNC, 2015):</i> https://verra.org/wp-content/uploads/2018/03/VMD0047-RIL-C-Performance-Method-for-East-and-North-Kalimantan-v1.0.pdf
Quality Assurance/Quality Control procedures to be applied:	Following the procedure defined in the <i>Protocol on Auditing of Logging Performance (TNC, 2015)</i>
Identification of sources of uncertainty for this parameter	Sources of uncertainty for this parameter are due to: <ul style="list-style-type: none"> - Skill of field staff to do the monitoring (human error) - Sampling error
Process for managing and reducing uncertainty associated with this parameter	<ul style="list-style-type: none"> - <i>Provide training for auditors to better recognize tree mortality and area affected due to logging practices</i> - Upgrade archiving in forestry agency into computerized system - Develop SOP

Any comment:	
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9.1.2.3 Peat and Forest Fires

Parameter:	Area of secondary forest affected by fire
Description:	Secondary forest affected by fire is monitored based on hotspot data
Data unit:	Ha/yr
Source of data or measurement/calculation methods and procedures to be applied (e.g. field measurements, remote sensing data, national data, official statistics, IPCC Guidelines, commercial and scientific literature), including the spatial level of the data (local, regional, national, international) and if and how the data or methods will be approved during the Term of the ERPA	Hotspot data will be acquired from NASA FIRMS (https://nrt4.modaps.eosdis.nasa.gov/). The method for estimating the burnt area follows the method adapted from MRI (2013) where a peat gridded map at 1x1 km resolution is generated and overlaid with selected hotspots (those with more than 80% confidence level). The result is multiplied by a correction factor of 0.769 to generate an estimate of burnt area.
Frequency of monitoring/recording:	<i>Annually</i>
Monitoring equipment:	National Forest Monitoring System (NFMS)
Quality Assurance/Quality Control procedures to be applied:	QA/QC are directed to ensure the consistency of the method and approach adopted for estimating burnt area with the one used in the FREL development. Result of the estimation of burnt area will be verified by BAPLAN
Identification of sources of uncertainty for this parameter	Sources of uncertainty for this parameter are: (i) processing of Hotspot data; (ii) selection of confidence level of the Hotspot data for this analysis, which is >80%; and (iii) selection of correction factor of the burnt area for grid (1x1 km).
Process for managing and reducing uncertainty associated with this parameter	<i>Validation of the estimate of burnt area from hotspot with ground data that can be used to improve the correction factor</i>

Any comment:	At the moment, the Government of Indonesia is developing a new approach for the estimation of burnt area using satellite images (Landsat 7/8) in combination with hotspots and verified with observed burnt area data on the ground. This new approach might be adopted in the future as this approach will have higher certainty.
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Emission Factors for peat and forest fire will not be monitored to maintain consistency with the EF used in the development of RL (using the IPCC default values).

9.2 Organizational structure for measurement, monitoring and reporting

The ER Program has two sets of organizational structures for measurement, monitoring and reporting of emissions estimates as presented in Figure 9.2

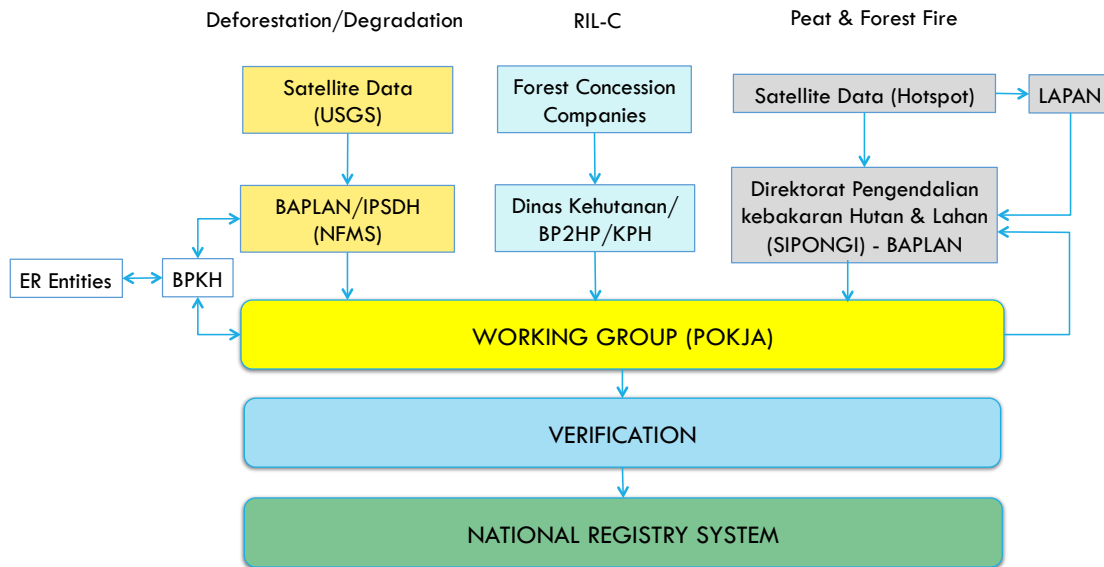


Figure 9.1 Organizational Structure for measurement, monitoring and reporting of the implementation of ER Program

The MMR system of the ER Program will be institutionally integrated with the national forest monitoring system (NFMS; Figure 9.3) as described in Regulation of Director General of Forest Planology Number P.1/VII- IPSDH/2015. The generation of national forest and land cover change data from satellite images is conducted by the Regional Office for the Management of Forest Area (BPKH) in East Kalimantan Province under the direction of the Directorate of Forest Resources Inventory and Monitoring (IPSDH), which is under the Directorate General of Forestry Planning and Environmental Arrangement (BAPLAN). The BPKH will receive satellite data from IPSDH. The satellite data are first acquired by LAPAN, which also does pre-processing of data up to mosaicking before sending the data to the respective institutions (including IPSDH). The visual interpretation is conducted by the BPKH using a standard methodology for land cover mapping (Margono *et al*, 2014, 2016). Results of the processing and ground check by BPKHs are sent back to IPSDH for validation by IPSDH including some necessary edge-matching as appropriate, as part of the QA/QC process. Finally, the accuracy of the interpretation is assessed by comparing the land cover maps to field data from the ground check using a contingency matrix (MoFor, 2012, Margono *et al*, 2012). There are about 300 points for ground checking in East Kalimantan (MoEF, 2017), which are determined randomly by land cover classes. All the data from the BPKH will be consolidated to generate data on forest cover change.

The ER Program (through the Working Group) will analyze the data from the BPKH to estimate emissions from deforestation and degradation, peat decomposition, and loss of mangrove soil

from the conversion of mangrove to aquaculture. Results of the estimation are then submitted to the Environmental Agency for internal verification. The Environmental Agency will then submit the results of the verified estimation to the national registry and verification system.

To facilitate the work of the Working Group, the Government of East Kalimantan has developed a web portal for the Sub-national MRV System for managing all the processed data from the national and also from local governments. The system can perform calculations of the emissions using the national data & sub-national data. The system is to be operated by the Provincial Environmental Office (DLH) as the East Kalimantan MRV Focal Point. The system at present is still using the temporary server of WWF Indonesia (<http://mims.wwf.id/kaltim/index.php>), Measurement (data input pages) and Verification (verification purpose pages) section need user account but Reporting section that publicly available to show the public related to Emission Factor (Faktor Emisi), Activity Data (Data Aktivitas) and Emission include Reference Emission Level (Tingkat Emisi Rujukan), Actual Emission after reference period (Emisi Aktual) and Performance of Emission Reduction (Kinerja Penurunan Emisi). This menus are available on the left as expandable menu. The Reporting section could access through this link http://mims.wwf.id/kaltim/carbon/dashboard_usr.php?menu=R. The MRV web portal have tested using national data and calculation method is the same with the national FREL. The system currently under adjustment with the data and method that used for ERPD development and also enhancement to meet all activities in ERPD document. The system will be migrated to East Kalimantan Province soon after the infrastructure for the server is ready. This MRV web portal will increase public participation of OPD to village communities or indigenous people to participate in monitoring the condition of forests and changes in the forest/land that occurs.

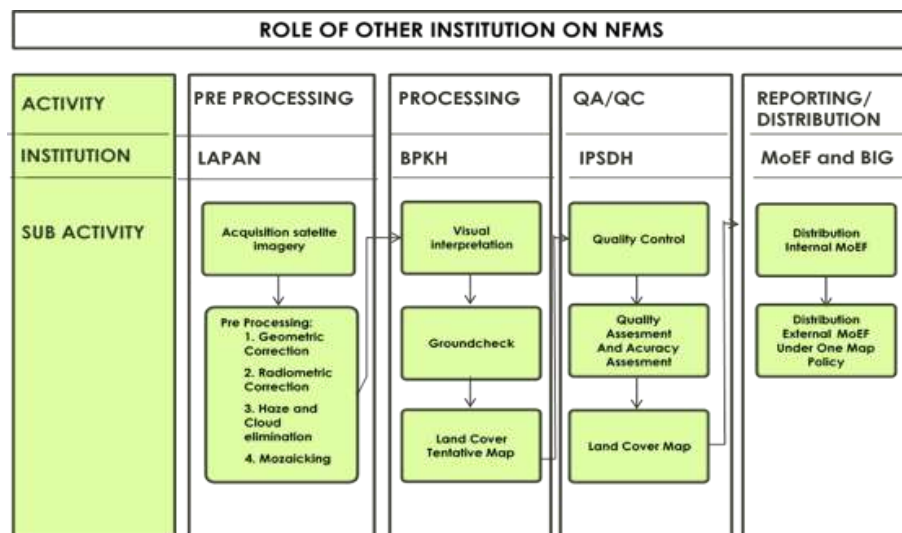


Figure 9.2 Related institutions on NFMS management (MoEF, 2017)

The process of the production of land cover maps will be on an annual basis as defined in the Regulation of the Director General of Forest Planology Number P.1/VII-IPSDH/2015. The timeline of the process is shown in Table 9.2. The collection of the LANDSAT images is conducted throughout the year by LAPAN and the pre-processing of the image is conducted as the data

becomes available for producing the mosaic. The mosaic will be available by June to be distributed to IPSDH and to BPKH. BPKH under the supervision of IPSDH will do manual interpretation of the image during the period July-October, while land cover data from field visit (with defined coordinate) are collected in the period March-September. In October, all the results of the interpretation conducted by BPKH will be compile to the national by IPSDH for QA/QC and accuracy assessment. By December the result of the interpretation is finalized and reported.

Table 9.1 Timeline of land cover change analysis under the current NFMS

No	Activity	Year (n-1)						Year (n)											
		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
A	LAPAN																		
	Collecting Landsat Satellite Image																		
	Finalization of Mozaik (M)													M					
B	IPSDH																		
	Technicail evaluation																		
	Supervision																		
	Quality Control																		
	Data finalization (DF)																		DF
	Reporting *																		R
C	IPSDH/BPKH																		
	Data distribution (DD)																		
	Interpretation																		
	Ground Checking																		
	National Compilation of results (NC)																NC		

As shown in Figure 9.2, the ER entities (village governments, community groups, concessions), will participate in monitoring deforestation (see section 4 for the entities in the accounting areas). The ER entities will be involved in conducting ground checking and in monitoring and reporting the occurrence of deforestation in the accounting area to the Working Group. The mobile application for this has been developed (Figure 9.4) which is connected to the MRV web-portal.



Figure 9.3 Mobile application for ER entities for supporting the MRV activities

9.2.1 *Organizational Structure for measurement, monitoring and reporting of emissions from logging activities*

As depicted in Figure 9.2, reports on logging area are submitted by the logging companies to the Province Forest Agency, and BP2HP (Agency for Production Forest Management) and also to the KPH (Forest Management Unit) as a unit responsible to manage forest at the site level. From these institutions, the ER Program (through the Working Group) will analyze data only from logging companies implementing RIL to estimate emission reductions from logging. Results of the estimation are then submitted to the Environmental Agency for internal verification. The Environmental Agency will then submit the results of the verified estimation to the national registry and verification system.

Most local agencies to be involved in the MRV process have not yet established procedures to implement their MRV tasks, thus the ER Program will also include assistance in capacity building for monitoring and reporting for these agencies.

9.2.2 *Organizational Structure for measurement, monitoring and reporting of emissions from peat and forest fires*

As seen in Figure 9.1, estimation of peat burnt area will use data derived from hotspots sourced from NASA. The processing of the hotspot data is conducted by LAPAN for the Directorate for Forest and Land Fire Control, of the Ministry of Environment and Forestry. The ER Program (through the Working Group) will access and analyze the hotspot data to estimate burnt area and greenhouse gas emission. Results of the estimation are then submitted to BAPLAN for internal verification. The Environmental Agency will then submit the results of the verified estimation to the national registry and verification system.

9.3 Relation and consistency with the National Forest Monitoring System

As mentioned above, the ER Program will use the data generated by the NFMS, and the East Kalimantan forest inventory data will be integrated to the National Forest Inventory (NFI). The system provides continuous information on activity data and emission factors that can ensure the sustainability of activity data supply needed for estimating emission reductions from the implementation of the ER Program, thus ensuring consistency. The ER Program will continue to apply the sample based area estimation for ER purposes, and will consider whether this approach is also applicable to the NFMS for national reporting purposes.

In addition, the ER Program will also include ground checking activities, as mentioned above, to increase the number of points required for the accuracy assessment. At present, due to limited budget BPKH can only do ground check in a small number of observation points. Through the ER Program, it is planned for ER Entities, as shown in Figure 9.2. This implies an urgent need for capacity building and technical assistance for ER entities.

With regard to logging, the activity data will be derived not from the NFMS but it is directly collected from the companies implementing RIL activity. However, the process of data acquisition is conducted through the existing institutional mechanism as shown in Figure 9.3. Consideration of logging is an enhancement within the ER program that is not currently part of the National forest monitoring program.

For the development of capacity of ER entities in the implementation of monitoring and evaluation activities, the ER program will implement a number of capacity building activities. The budget plan is 418,513 USD for the capacity building on monitoring and evaluation and 6,924,317 USD for measurement and reporting of the ER Program (Table 9.3).

Table 9.1 Cost for the implementation of capacity building for monitoring, evaluation, measurement and reporting activities

Year	Implementation of monitoring and evaluation for ER program implementation (USD)	Measurement and Reporting (USD)
2020	63,654	556,415
2021	62,060	593,774
2022	66,226	3,606,316
2023	70,673	676,187
2024	75,418	721,588
2025	80,482	770,037
Total	418,513	6,924,317

10 Displacement

10.1 Identification of risk of Displacement

Table 10. 1 Risks of displacement

Driver	Risk of Displacement	Explanation / justification of risk assessment
Conversion of natural forest to industrial timber plantations	Low	The Program will promote the protection of remaining HCV areas within existing industrial timber concessions, thereby reducing the potential planted area. While this may create demand for new plantation concession areas, the expansion of timber plantations, unlike palm oil plantations which are associated with small scale encroachment, is tightly regulated through the concession system. Some limited displacement to other regions is possible.
Conversion of forest to estate crops	Medium	The program aims to reduce conversion of forest to oil palm plantations by promoting the protection of HCV areas in concessions, and by preventing the allocation of further forested land to agricultural purposes. In the long term, more stringent policies linked to plantations and estate crops in East Kalimantan could lead industries to shift expansion to neighboring provinces. However, in that time frame, governance improvements in East Kalimantan, if successful, may well have spread to other provinces.
Forest clearing for mining	High	Successes in reducing the mining industry's impacts on forests in East Kalimantan could lead some actors to shift operations to other provinces. As long as the national governance framework on mining in forested areas remains weak, the risk of displacement is high.
Destruction of mangroves for aquaculture	High	A reduction in supply of aquaculture products from participating communities, without a commensurate reduction in market demand, may be substituted by supply from other regions, leading to increased pressure on mangroves there.
Forest clearing for subsistence agriculture	Low	Forest clearing for subsistence agriculture tends to be localized in the sense that forest clearing is linked to local livelihood demands. Where forest clearing in discrete areas is controlled through regulation or through enforcement, clearing can shift to neighboring areas. The focus of the program, however, is on province-wide governance so that the risk of displacement only

Driver	Risk of Displacement	Explanation / justification of risk assessment
		occurs along the province border. Also, the ERP's main approach to dealing with this driver is through the provision of alternative livelihoods, and through social forestry.
Fires	<i>Low</i>	Underlying causes of fires tend to be localized, and fires will be addressed mainly through fire prevention and control. There is no apparent risk of these activities leading to increased emissions elsewhere.
Unsustainable forest harvesting (incl. illegal logging)	<i>Medium</i>	Reducing unsustainable forest harvesting may lead to reduced timber supplies in the short term, and this could lead to illegal logging being displaced to other regions. However, the implementation of RIL and other SFM practices is expected to lead to increased harvests in the long term, with reduced damage to remaining stands and improved forest conditions.

10.2 ER Program design features to prevent and minimize potential Displacement

The Program's overall design minimizes the risk of displacement outside of the accounting area. The Program supports governance improvements related to land, which are expected to improve the land-based investment climate, especially for sustainable producers. Reduced social conflict and resolution of overlapping land claims is likely to open up non-forested areas to planting and mining which will partly offset any foregone production forested areas. In line with East Kalimantan's development goals, the Program supports sustainable production through certification in the oil palm and timber sectors, and RIL in natural forests. The social forestry program, for example, is expected to lead to increased timber production. These approaches will lead to long-term increases of production of the respective commodities on a sustainable basis.

Also, the Program is designed to support improvements beyond the accounting area, reducing the risk of displacement. As the first jurisdictional REDD+ program in Indonesia, the Program will provide important lessons to the national REDD+ framework and will support the extension of jurisdictional REDD+ programs to other provinces, including to East Kalimantan's neighboring forest-rich provinces. This is facilitated by the Program's management structure, which includes a prominent role for the central Ministry of Environment and Forestry which is managing the national REDD+ framework. Also, Component 4 includes activities aimed at disseminating lessons from the program.

Nonetheless, a number of drivers are believed to have a high or medium risk of displacement and the program design includes measures to mitigate these risks, as discussed below.

Forest clearing for mining (high risk of displacement). As noted, there is a risk of mining

operations shifting to other provinces if the ER Program leads them to be shut down in East Kalimantan. However, due to the types of licenses that will be revoked with support from the ER Program, such displacement is likely to be minimal. The ER Program will contribute to the implementation of policies to revoke non-clean-and-clear licenses, most of which were issued by district governments prior to Law No. 23/2014 on Local Government. With the new regulation in place nationally, these operations would not find it easier to receive licenses in other provinces. The ER Program also supports more stringent procedures for licensing of new mining activities in forest areas, which could lead new mining operations to shift to other provinces. However, these activities are closely aligned with national policy developments which decrease the likelihood of such a shift. For example, in April 2016, President Widodo issued a national moratorium on new coal mine licenses. Presidential Regulation No. 22/2017 requires the Ministry of Energy and Mineral Resources to follow up on the moratorium, and to evaluate the introduction of a coal production cap.

Destruction of mangrove for aquaculture (high risk of displacement). Should the ER Program lead to a reduction in supply of aquaculture products, it is possible that this would be substituted by supply from other regions, leading to increased pressure on mangroves there. While the market for aquaculture products is beyond the scope of the ER Program's influence, the Program includes activities aimed at minimizing the impact on supply. Component 3 includes capacity building for sustainable pond management and sustainable fisheries which are expected to contribute to local fish production. While some decrease in supply is likely, and this implies a risk of displacement, it should be noted that the emission reductions from mangrove protection are a very small part of the ER Program's total expected emission reductions.

Conversion of forest to estate crops (medium risk of displacement). The program aims to reduce conversion of forest to oil palm plantations by promoting the protection of HCV areas in concessions, and by preventing the allocation of further forested land to agricultural purposes. Since oil palm fruit needs to be processed within 48 hours of harvesting, reducing local supplies should not lead local oil palm mills to source from outside the accounting area, unless they are located close to a provincial boundary. In the long term, however, more stringent policies linked to plantations and estate crops in East Kalimantan could lead palm oil mills to shift expansion to neighboring provinces. This risk is partially addressed by the fact that the policies that the ER Program will support, are national policies. Thus, the moratorium on expansion and HCV policies will also apply in neighboring provinces. Importantly, the ER Program, by supporting companies in complying with these policies, should in fact make the province relatively more attractive for oil palm estates, possibly leading to the reverse of displacement. In addition, the private and public sector commitments that the ER Program is supporting, aim to increase plantation productivity as one of the principal means for reducing pressure on forests. The provincial regulation on sustainable plantations calls for increased productivity of plantations and better utilization of low carbon stock land for plantations. This, along with the support for smallholder estate crops, will ensure that the Program's impact on production will be minimized, and may even lead to production increases.

Unsustainable forest harvesting (medium risk of displacement). Reducing unsustainable forest harvesting may lead to reduced timber supplies in the short term, and this could lead to logging being displaced to other regions. The ER Program mitigates this risk largely through two design features. First, the Program is supporting companies to comply with national policies, such as the

RIL-C policy. To the extent that these policies are enforced in other provinces, the ER Program's support should lead to East Kalimantan being more attractive for forest management than neighboring regions. Also, in the medium to long term, the Program is expected to reduce costs associated with poor governance, such as the costs of insecure tenure and social conflict. Second, the ER Program will support production increases through the establishment of social forestry programs. These include potentially large areas of community timber plantations, which would lead to significantly increased timber supplies in the future. Also, the implementation of RIL and other SFM practices is expected to lead to increased harvests in the long term, with reduced damage to remaining stands and improved forest conditions.

11 REVERSALS

11.1 Identification of risk of Reversals

Risk Factor A: Lack of comprehensive and sustained support of the relevant stakeholders

The successful implementation and sustainability of emission reductions will depend on active contributions from the various levels of government, from the private sector, and from local communities. Much of the ER Program's sustainability will depend on the continued political will of the national, provincial, and district governments to implement the policies that the ER Program is supporting. These policies include the policy on sustainable estate crops, the HCV and RIL-C policies, social forestry, and other key policies linked to land governance.

Current support for these policies is strong at the national and provincial levels, and many of the policies are integrated into the medium-term development plan. However, a change in political will could hamper implementation and enforcement, and could, in the long-term, lead to a reversal in policies. District governments play an important role in the implementation of policies related to estate crop licensing, as this falls under their mandate. Several of East Kalimantan's seven districts benefit significantly from the expansion of oil palm and it will be important to avoid negative impacts on local development to ensure their continued support.

In addition to political will, the ER Program's long-term success in reducing emissions will depend on the continued support from companies and local communities. While the program will strengthen forest supervision, implementation of activities will also depend on the continued commitment of local actors to protect forests. For this reason, it will be important that the ER Program activities minimize economic tradeoffs and provide benefits beyond the program period.

There is some risk from issues related to benefit sharing. In East Kalimantan, benefit sharing has been implemented in several areas and standard procedures are being developed. However, there is little experience with performance-based benefits, and it will be important to manage the expectations of beneficiaries to avoid dissatisfaction with the Program, which could potentially lead to reversals.

Based on the above assessment, the risk of reversal due to a lack of comprehensive and sustained support of the relevant stakeholders is categorized as medium.

Risk Factor B: Lack of institutional capacities and/or ineffective vertical/inter-sectoral coordination

Poor coordination across sectors could hamper progress in improving land governance, which is an important part of the ER Program's sustainability strategy. Policy coordination, especially for the land-based sectors, is a challenge in Indonesia. Separate ministries are responsible for mining, agriculture, and forestry, and conflicts in the legal frameworks and overlapping mandates of each sector are a barrier to land governance. This is particularly the case for land administration which

distinguishes between forest and non-forest land, each with separate regulatory frameworks and institutional arrangements.

Vertical coordination between the levels of government will be important for the program's implementation and its sustainability. As noted under Risk Factor A, the district governments play an important role in implementing reforms related to estate crops. Continued district support for policy implementation will in part depend on the coordination of districts with the province. For issues related to land registration, efforts of multiple agencies in particular of the MoEF and the national land agency (BPN) will need to be coordinated.

Lack of institutional capacities has been identified as an underlying driver of deforestation and is being addressed through the activities in Component 1. Inadequate progress in this area, would mean that policies such as the RIL-C and HCV policies, as well as support for local communities, would be less effective, especially after support for policy implementation has ended.

Based on the above assessment, the risk of reversal due to a lack of institutional capacities and/or ineffective vertical/inter-sectoral coordination is categorized as medium.

Risk Factor C: Lack of long-term effectiveness in addressing the underlying causes

The expected long-term effectiveness in addressing the underlying causes of deforestation depends on the complexity of the driver and whether further support will be needed to address the driver after the program has ended. As discussed in the table, some drivers will require continued political will, while others require sustainable solutions to be in place. Based on the assessment provided in the table below, the overall risk of reversal due to a lack of long-term effectiveness in addressing the underlying causes is categorized as medium.

Underlying Driver	Long-term effectiveness in addressing driver
Poor land governance	Improvements are expected to be long-term, but may not be fully in place by the end of the ER Program.
Ineffective forest supervision and administration	Long-term effectiveness in addressing this driver depends on continued political will (see Risk Factor A), and on the ability of FMUs to generate sufficient revenue or to receive budgetary or external funding.
Weak policies for forest protection	Improvements in policies are expected to be long-term, but effectiveness depends also on enforcement (political will and forest supervision).
Lack of incentives for sustainable management practices	The Program is expected to contribute to an improved incentives framework, but direct support will stop when the program ends.

Underlying Driver	Long-term effectiveness in addressing driver
Limited alternative livelihood opportunities for local communities	Long-term effectiveness will depend partly on the level of benefits that the alternative livelihood opportunities can provide.
Lack of fire management capacity and lack of alternatives for land clearing	Long-term effectiveness will depend on continued support and the long-term attractiveness of alternative livelihood options.
Climate factors	Cannot be directly addressed. See discussion under Risk Factor D.

Risk Factor D: Exposure and vulnerability to natural phenomena

Extreme fire events in East Kalimantan are linked to prolonged periods of drought, which in turn are closely linked to El Nino Southern Oscillation events. These occur on average every 3-7 years with the last event occurring in 2016, so there is a high likelihood of an ENSO event occurring during the program period, and the accounting area will of course continue to be affected after the program ends. While the ER Program has no influence on the occurrence of ENSO events, the program includes a number of activities that should lead to a reduction in the scale of fires and their impact on forests. As noted in the table above, the long-term effectiveness of these measures will depend on continued support and on the long-term attractiveness of alternative livelihood options. The risk of future extreme fire impacting remaining forests contributes to the anticipated risk of reversal.

Based on the above assessment, the risk of reversal due to exposure and vulnerability to natural phenomena is categorized as medium.

11.2 ER Program design features to prevent and mitigate Reversals

Risk Factor A: Lack of comprehensive and sustained support of the relevant stakeholders

Risk Rating Medium

The ER program was developed through a participative process involving all relevant stakeholders as described in Section 5. Feedback from the stakeholders was properly addressed and ways to mitigate the potential impact of the ER program were also consulted and overall the participation of stakeholders during the process of the ER Program's development was high. Further consultations are planned to ensure continued buy-in from local participants. The benefit sharing system will be prepared through a participative process at the local level with inclusion of the owners and inhabitants of forest land. Also, consultative processes are a key part of ER Program implementation and these will help to build continued ownership of the program.

The sustained support of stakeholders, also beyond the program period, will be achieved through a number of features that are included in the ER Program design. The program will support changes that are aligned with the long-term interests of private investors and local communities. The Program supports long term improvements in governance, such as clearer spatial planning, and improved forest monitoring. These improvements are expected to benefit investors and communities by leading to improved legal certainty, and better forest access. While direct benefits through the ER Program's benefit sharing mechanism may cease, stakeholder are expected to continue to benefit from an improved incentives framework. Key benefits for communities include alternative livelihoods, improved access to forests through social forestry licenses, or through adat rights. By focusing on business plan development, the ER Program will ensure that only economically attractive alternative livelihoods are promoted.

As a government program, the ER Program follows and supports the implementation of national and provincial government priorities and policies. The Program is closely aligned with the government's green development agenda, with its long-term forestry strategy, and with the provincial medium-term development plan. Many of the policies that the program is supporting are codified in legal documents, such as the following:

- The Moratorium on the utilization of primary natural forest and peatlands is based on a Ministerial Decree Governor Regulation 1/2018
- Partnerships on forest conservation are regulated under Ministry Decree No P.83/2016
- Guidelines for the Identification and Recognition of Indigenous People in East Kalimantan are stipulated by Provincial Regulation no. 1/2015
- HCV requirements for plantation companies are included in Governor Regulation no. 1/2018
- East Kalimantan Provincial Regulation No 27/2018 on Sustainable Estate Crops
- Forest Management Unit development is mandated by national decrees and is included in Governor Regulation no. 19/2011 for the Long-term Forestry Plan and in Governor Regulation no. 101/2016 on the Implementing Unit of Forest Management Unit

The ER Program will support the development and finalization of a number of other decrees, including the following:

- Policy development for improving transparency and access to information related to licensing
- Governor regulations by the Governor to settle disputes.
- Legal recognition of adat rights through district regulations and decrees
- Inclusion of ER activities in the Provincial Kalimantan Medium Term Development Plan 2018-2023
- Integration of REDD+ programs in regional and district development planning at provincial, district/city and village levels.

Risk Factor B: Lack of institutional capacities and/or ineffective vertical/inter-sectoral coordination

Risk Rating: Medium

The ER Program's institutional design facilitates intersectoral and vertical coordination. The ER Program is governed by a steering committee comprised of representatives of key government agencies including from the relevant sectoral ministries (forestry, agriculture, mining, land). Implementation will be facilitated by a working group comprised of inter-sectoral and cross level (national and sub-national) components. A focal point for the ER Program will be established in each relevant sectoral agency to assist in coordinating inputs from all sectors.

The ER Program recognizes weak institutional capacity as an underlying driver of deforestation and includes activities to strengthen forest supervision and management within the state forest area and on non-forestry land (Component 1.1). To ensure long-term strengthening of FMUs, the ER Program will provide assistance in the planning stage of the institutions, including support for their management and financing strategies which will be recorded in FMU planning documents. An important part of this work will be to facilitate long-term financing for the FMU institutions through the identification of viable business opportunities.

Risk Factor C: Lack of long-term effectiveness in addressing the underlying causes

Risk Rating: Medium

Underlying Driver	ER Program design features to promote long-term effectiveness in addressing underlying driver
Poor land governance	The ER Program is aligned with ongoing policy reforms in this area, such as those linked to the implementation of constitutional court decisions MK45 and MK35, the national agrarian reform program, and with key government planning documents, such as the national and provincial forestry strategies, the provincial green development plan, and the East Kalimantan Mid-Term Development Plan. These plans support a fundamental and long-term shift to improved land governance.
Ineffective forest supervision and administration	Strengthened forest supervision and administration is also supported by long term government plans. In particular the launch and strengthening of FMUs is expected to lead to a substantial and long-term improvement in this area. The ER Program includes features to ensure long-term political will (see Risk Factor A), and strategies to develop strengthened forest management institutions with long term sustainable funding (see Risk Factor B).

Underlying Driver	ER Program design features to promote long-term effectiveness in addressing underlying driver
Weak policies for forest protection	Improvements in policies are expected to be long-term, but effectiveness depends also on enforcement (political will and forest supervision). The program will directly support the implementation of HCV and RIL-C policies, but further support for policy implementation comes from the cross-cutting improvements to forest governance and administration (Components 1 and 2). Improved land governance is expected to lead to greater accountability for forest areas and to a more level playing field for sustainable forest investments. Improved forest supervision is expected to improve the implementation not only of the HCV and RIL-C policies but also of other sustainability policies, including ISPO for oil palm, and PHPL for forestry concessions.
Lack of incentives for sustainable management practices	While the ER Program will also provide short-term incentives to companies through the benefit sharing mechanism, the more important and lasting impact on incentives will be achieved through improvements in forest governance through Component 1. Improvements in land governance and forest administration are expected to significantly improve the investment climate for sustainable investments; for example by improving legal certainty for licenses and land access, by reducing costs related to conflict, and by creating a more level-playing field through a reduction in illegal and unsustainable supplies.
Limited alternative livelihood opportunities for local communities	Long-term effectiveness in addressing this driver will be achieved by supporting business planning to identify economically viable opportunities, and by improving land access to local communities for sustainable practices through the social forestry program and through partnerships in conservation areas (Component 3).
Lack of fire management capacity and lack of alternatives for land clearing	In addition to addressing this driver through capacity building and training for fire management, the ER Program will build the capacity of the FMUs to monitor forest areas and to continue to support community fire programs in the long-term. Also, as noted above, the ER Program will support long-term economically viable alternative livelihood opportunities (that do not rely on fire for land clearing).
Climate factors	Cannot be directly addressed. See discussion under Risk Factor D.

Risk Factor D: Exposure and vulnerability to natural phenomena

Risk Rating: Medium

While the ER Program has no influence on the occurrence of ENSO events or on droughts, it includes a number of activities that should lead to a reduction in the scale of fires and their impact on forests. These includes activities that directly address fire management, and activities that improve forest governance and forest management. Activities that directly address fire monitoring and control are found within Components 1 to 3 and include the following:

- Expansion and empowerment of community fire brigades
- Capacity building of farmers for land clearing without the use of fire
- Provision of alternative livelihoods, including swidden cultivation without fire
- Increasing the capacity of local government for utilizing fire early warning systems
- Support for monitoring of fires by FMUs and communities
- Support for partnerships between communities and companies for controlling forest and land fires

In addition to these activities, support for improved governance (Component 1) is expected to lead to greater accountability over forested areas and greater incentives to protect them from fire damage. Also, improved forest management (Component 2) is expected to reduce forest degradation which is associated with an increased likelihood of fires. Specifically support for reduced impact logging should reduce residual damage from logging activities decreasing the accumulation of dead biomass. This is expected to reduce the risk of catastrophic fires.

11.3 Reversal management mechanism*11.3.1 Selection of Reversal management mechanism*

Reversal management mechanism	Selected (Yes/No)
Option 1: The ER Program has in place a Reversal management mechanism that is substantially equivalent to the Reversal risk mitigation assurance provided by the ER Program CF Buffer approach	No
Option 2: ERs from the ER Program are deposited in an ER Program -specific buffer, managed by the Carbon Fund (ER Program CF Buffer), based on a Reversal risk assessment.	Yes

The ER Program will deposit 26% of the emissions reductions generated by the Emissions Reduction Program in the buffer reserve managed by the Carbon Fund (Table 11.2).

Table 11. 2 Estimation of the required ER buffer

Risk Factors	Risk Assessment	Reversal Risk Set-Aside
Default Risk		10%
A. Lack of broad and sustained stakeholder support	Medium	5%
B. Lack of Institutional Capacities and/or ineffective vertical/cross sectoral coordination	Medium	5%
C. Lack of long term effectiveness in addressing underlying drivers	Medium	3%
D. Exposure and vulnerability to natural disturbances	Medium	3%
Total Reversal Risk Set-Aside		26%

11.4 Monitoring and reporting of major emissions that could lead to Reversals of ERs

The ER Program's MMR system, as described in Section 9, will continue to operate beyond the lifetime of the ER Program as part of the national REDD+ framework. The MMR system will thus be able to monitor and report reversals of ERs. In the event that reversals are detected, the Carbon Fund will be notified within a time period of no greater than ninety days.

The detection of the reversals will be monitored through the MRV Web portal. The forest areas that have been protected by the ER Program in the Accounting Area will be delineated and monitored by the Working Group and by ER Entities. The Working Group will develop a standard operating procedure for the detection of reversals.

12 UNCERTAINTIES OF THE CALCULATION OF EMISSION REDUCTIONS

The process for addressing uncertainty related to the REL and the calculation of emission reductions follows a stepwise process. The process involves the identification of sources of uncertainty, the minimization of uncertainty where feasible and cost effective, and the quantification of the remaining uncertainty through application of Monte Carlo analysis. The ER Program uses the 2006 IPCC Guideline for estimating average annual GHG emissions in the reference period, i.e. multiplication of Activity Data with Emission Factors (AD x EF) as described in Section 8.3.1. Therefore, uncertainty in the emission estimates is linked to the uncertainties of the AD and EF inputs.

12.1 Identification of sources of uncertainty of AD

The activity data used to estimate the emissions of deforestation, forest degradation, peat decomposition, and mangrove soil came from the national land cover maps produced by MoEF. The land cover map consists of 23 land cover classes derived by remote sensing data analysis (Landsat at 30-meter spatial resolution). The object identification is purely based on the appearance on the images. Manual-visual classification through an on-screen digitizing technique based on key elements of image/photo-interpretation was applied as the interpretation/classification method. Several ancillary data sets (including concession boundaries of logging and plantation, forest area boundaries) were utilized during the process of delineation, to integrate additional information valuable for classification. The detail explanation on the method for generating the activity data can be accessed from http://webgis.menlhk.go.id:8080/nfms_simontana/ and <https://jurnal.ugm.ac.id/iig/article/view/12496/9041>

Manual classification is time-consuming and labor intensive (Margono et al., 2012, Margono et al., 2014). It involves staff from district and provincial levels to manually interpret and digitize the satellite images, to exploit their local knowledge. Data validation was carried out by comparing the land cover maps with field data. Stratified random sampling is the selected approach to verify the classification map to the field reality. Compilation of several field visit data within a specific year interval was exercised for accuracy assessment. Comparison of results was performed on a table of accuracy (contingency matrix MoFor, 2012, Margono et al., 2012).

Emissions from peat decomposition are estimated using the activity data derived from the peatland map, which is separated from land cover maps produced by MoEF. The development of the peatland map in Indonesia is closely related to soil mapping projects for agricultural development programs, conducted by the Ministry of Agriculture. Indonesia has developed a procedure for peatland mapping based on remote sensing at a scale of 1:50,000 (SNI 7925:2013). The map of Indonesia's peat land has been updated and released several times due to the dynamics of data availability. The latest Peatland Map version 2011 at a scale of 1:250,000 (national scale) is used for the emission estimation.

Estimation of activity data from logging is limited to logging data reported by the government. Logging concessions submit annual work plans to the provincial forestry service and to BPHP. These documents report the actual logged area of the previous years. To define the annual logged

area in East Kalimantan, 41 concession documents were used. The annual logging numbers were adjusted, to reflect actual areas affected by logging practice. Ellis (2016) found that only 69% of reported logged forests are affected by logging practices.

Based on the above practices, there are a number of main sources of uncertainty for the Activity Data used for estimating the emission from deforestation, degradation, peat decomposition, mangrove soil, and logging. The AD for forest cover and forest cover changes used in the estimation of emissions from deforestation, degradation, peat decomposition and mangrove soils have at least three sources of uncertainty, namely quality of the satellite images, interpretation procedure, and sampling error that is related to the process of ground truthing. While for the logging area, the main source of uncertainty is related to the selection of correction factors for deriving the activity data from the reported and processed data. The description of sources of uncertainty is presented in Table 12.1.

Table 12.1 Source of uncertainty of Activity Data

No	Source of uncertainty	Descriptions
1	Quality of the satellite images	The national forest monitoring system (NFMS) in Indonesia is managed by Ministry of Environment and Forestry (MoEF). This monitoring system provides the land cover maps periodically by processing Landsat satellite images. The Landsat satellite images are suitable for land cover and land cover change interpretation in terms of spatial, spectral and temporal resolution. However, there are two sources of error related to the Landsat images. First stripping problem that leads to a loss of some data from the images and the need for manipulation using different images. Second, Indonesia almost always has a lot of cloud cover. The cloud's shadows and cloud coverage will affect the quality of the images as it generates data gaps. These constraints affect the image interpretation process.
2	Cartographic, image interpretation processes, and land cover maps generation. (Knowledge and capacity for satellite interpretation)	Interpretation of satellite images to produce land cover maps is done by trained interpreters who use manual or visual interpretation digitization technique. Standard Operating Procedures (SOPs) and manuals are provided to guide the interpreters do the satellite image interpretation. Manual interpretation is time-consuming and labor intensive. It involves the staff from district and provincial levels. They are expected to be able to use their local knowledge. Validation of the data is conducted through comparison of land cover types from the interpretation with ground truthing. The ground truthing uses stratified random sampling. Compilation of several ground truthing results within a specific year interval was used for accuracy assessment that will provide level of accuracy of the land cover classes interpretation.
3	Ground truth points (sampling error)	The number of points to represent land cover categories will determine the level of accuracy of the assessment. Ground truthing will reflect the accuracy of the interpretation with real condition. It

No	Source of uncertainty	Descriptions
		helps to determine the accuracy of the satellite interpretation results. Therefore, the number of points of ground check will significantly affect the level of uncertainty.
4	Actual selective logging area	The selective logging area is derived from the annual logging plan document of natural logging concessions. These documents can be accessed from East Kalimantan provincial forestry agencies, but the data is managed conventionally. Currently, there is no good database management system in place. The data often gets lost therefore the logging data reported may be underestimation. In addition, the use of assumption on real affected logging area of 69% may not be accurate as this factor is generated from a limited number of study areas (small sampling). Thus the number of sampling contributes to the uncertainty of these data.

12.2 Steps to minimize uncertainty

The minimization of error of interpretation that normally results in systematic error, as required by Indicator 8.1 of MF of the FCPF, is through the implementation of a consistent and comprehensive set of standard operating procedures (SOP), including a set of quality assessment and quality control processes, and that of sampling error is through increased sampling. The implementation of QA/QC procedure will be enhanced, through the consistent use of the SOPs for the interpretation and training procedures. The consistency checks will be conducted by interpreters that were not involved in the original classification. Following the provisions on verification provided in Chapter 3 – Volume 1 of the 2006 IPCC GL, QA/QC measures will be complemented with verification, i.e. through an accuracy assessment. The verification will be conducted by a third party, which will serve to confirm the acceptable quality of the estimates and will enable the correction of biases and respective uncertainties. Following the TAP review, the accuracy assessment is conducted using a modified approach developed by Olofsson *et al.* (2014). The assessment is not only to assess accuracy but to also calculate the sample based estimates of areas and to quantify the degree of uncertainty for analysis purposes.

In applying the modified Olofsson *et al.* (2014) for the estimation of the accuracy of land cover change and the calculation of the sample based estimates of areas, Indonesia used an existing reference data set of 639 observations rather than collecting a new stratified reference sample (Annex 12.1). One limitation of the existing reference data set was that it was a simple random sample which was post stratified, rather than pre stratified, and so yielded a relatively small number of observations (n=18) in the “degradation” forest cover change class. Another difference is that the reference sample unit size (30x30m) does not coincide with the original cover mapping unit size (6.25 ha), so some of the difference in accuracy likely has to do with the difference in unit size. This limitation is expected as the 639 samples is taken from a 10,000 national samples which is designed not for assessing the accuracy of land cover change, but it is for the assessment the calculation of the uncertainty of the land cover changes, but it is for the assessment of land cover accuracy and identification of deforestation drivers. In the future MMR program, the application of the Olofsson *et al.* method will require increasing number of reference samples,

using the cover map to allocate samples in a stratified manner, and consideration of the size of the sample unit. and distribution of the sample in each stratum that exists in East Kalimantan as the Olofsson et al. approach works well in area with good stratification. The improvement is expected to be completed before the first verification. This may affect the current sample-based estimation (SBE) of the Activity Data thereby potentially changing the Reference Level.

12.3 Identification of sources of uncertainty of EF

As described in Section 8.3.1, the emission factors used for the estimation of emissions from deforestation and forest degradation are (1) the average estimates of carbon density/ha for each of the 24 land cover classes; estimates of emissions/ha for organic (peat and mangrove) soils; estimates of emissions from fire in secondary forest and on deforested peat lands; and estimates of emissions associated with damage from logging. Section 8 includes details on the sources of information and estimation methods for Emission Factors.

Based on the practices used in deriving the carbon stock data, uncertainty for the EF on carbon density of forest types will come from tree measurement, allometric model error, sampling error, and conversion factor (e.g. biomass to carbon and root:shoot ratio) (see Section 8 for details of sampling and C estimation).

Source of uncertainty of emission factors for logging may be linked to the skill of the field staff in recognizing the mortality of trees that have been impacted by felling and skidding practices, in measuring the area of haul roads and log yards, and also the variation of tree hollowness. Analysis of the sources of uncertainty for the emission factors is presented in Table 12.2.

Table 12.2 Source of uncertainty of Emission Factors (EF)

No	Source of uncertainty	Descriptions
1	Tree Measurement errors	The tree is measured by measuring its Diameter at Breast Height (DBH). The measurement can contain systematic and random errors. The systematic error commonly occurs when the SOP is not appropriate for measuring the DBH. The random error may occur due to human error which may vary from one individual to another.
2	Allometric model error	To estimate total tree biomass (carbon), allometric equations Basuki et al. (2009), Manuri et al. (2014) and Komiyama et al. (2015) were applied using field measurement data (DBH and tree species). The error of the allometric models are estimated using (Chave et al., 2004): $U = ((CF^2) - 1)^{0.5}$, where CF is correction factor of the allometric equations provided by the papers
3	Sampling error	A sampling error might occur when the analyst does not select a sample that represents the entire population of data. In the case of forest classification, sampling is an analysis performed by selecting

No	Source of uncertainty	Descriptions
		<p>specific forest area of observations from a larger forest area, and this work can produce sampling errors. From the NFI, it is indicated that number of samples for mangrove forest is very low.</p> <p>This source of error is also considered to be dominant for soil carbon for mangrove and for emission factors for peat decomposition. The soil carbon for mangrove is limited to only 10 samples, similarly also soil carbon for mangrove forest converted to aquaculture. Emission factors for peat decomposition are derived from a number of limited locations in Indonesia.</p>
4	Biomass conversion factor to carbon	To estimate the amount of carbon (C) in each forest type, information on the carbon fractions is needed. The carbon fraction of biomass (dry weight) was assumed to be 47% (1 ton biomass = 0.47 tons C) following IPCC 2006 Guideline. Conversion of C-stock into carbon dioxide equivalent (CO ₂ e) was then obtained by multiplying C-stock with a factor of 3.67 = (44/12), i.e. the ratio of the molecular weights of CO ₂ and Carbon.
5	Root:Shoot ratio	Factor to estimate the below ground biomass. IPCC default values were used taken from Table 3A.1.8 of IPCC GPG LULUCF. When local data were available, the local data was used.
6	Skill and knowledge to recognize the mortality of trees that suffered by felling and skidding practice, and measure the area of haul roads and log yards.	The emission factor for the logging emission was derived from field measurements in 9 forest concessions in East Kalimantan and North Kalimantan. The key source of errors might be coming from the human error when assessor measures the suffered trees and area by logging activities. The assessor should have a good skill in recognizing tree mortality due to skidding process, and measure the remaining felled trees in the forest.
7	Mangrove soil Measurement	Analysis of carbon stock on mangrove soil requires more effort compare to mineral soil. The conditions on mangrove soil are relatively challenging because of the soil characteristic, this creates potential for measurement errors. The quality/type of equipment used to take the belowground soil sample can also produce measurement errors. Using quality/certified equipment will reduce the error.
8	Peat soil Measurement	Estimates of emission factors for peat soils are based on limited published data which may not be fully representative of the spatial variation in East Kalimantan
9	Fire emissions	Estimates of emission factors for fires are based on limited published data which may not be fully representative of the variation in

No	Source of uncertainty	Descriptions
		different forest types across East Kalimantan

Steps to minimize uncertainty

Similar to activity data, the uncertainty in Emission Factors is reduced through strengthening the consistency in the use of SOP including through trainings, and through increasing the number of samples. For EF for logging, which is not included in the national forest inventory system, efforts to reduce uncertainty will include the following activities:

- Developing and improving the monitoring audit protocol;
- integrating the monitoring audit protocol into the curriculum of the national forest training center to produce skilled auditors within KPH units in east Kalimantan. The training should be conducted periodically by inviting key related field staff from KPH Units; and
- providing proper supporting tools/equipment to make the monitoring/auditing processes more efficient.

12.4 Quantification of Uncertainty in the Reference Emission Level

Uncertainty in the REL was quantified using a Monte Carlo method (IPCC 2006). Using normal distribution of all sources, 10,000 random AD and EF were generated and aggregated to estimate the average uncertainty of annual GHG emissions from deforestation and degradation. The uncertainty of the AD was calculated based on the method proposed by Olofsson et al. (2014) with a modified poststratification variance estimator (Olofsson 2019, pers. comm, see Annex 12.1). The result of the estimate of uncertainty is presented in Table 12.3.

Table 12.3 Result of uncertainty of land cover change 2006-2016 using the Olofsson et al. method

Stratum	U (%)
Deforestation	23.48
Forest Degradation	52.08
Forest Gain	0
Stable Forest	5.57
Stable Non-Forest	6.12
Total	8.3

In generating the AD from the normal distribution, the standard error (SE) of the data was derived using this equation:

$$SE = ((U/100)*AD)/1.96 \dots\dots\dots 12.1$$

For the EF, as there is more than one source of uncertainty, uncertainty was aggregated from all

error sources using the following equations:

$$U_{\text{Total}} = \sqrt{(U_1 + U_2 + \dots + U_n)} \quad \dots\dots\dots 12.2$$

and

$$U_{\text{total}} = \frac{\sqrt{(U_1 \cdot x_1)^2 + (U_2 \cdot x_2)^2 + \dots + (U_n \cdot x_n)^2}}{|x_1 + x_2 + \dots + x_n|} \quad \dots\dots\dots 12.3$$

Equation 12.2 is used for estimating total uncertainty for the additive factors as suggested by the IPCC GPG LULUCF (equation 5.2.2), and equation 12.3 is used for the multiplied factors. U_1, U_2, \dots, U_n are uncertainty of the error type-1, 2, .. n. To convert the value of uncertainty to standard error used in the Monte Carlo simulation, Equation 12.1 is used. The summary of the uncertainties of EF related to REDD+ activities are presented in Table 12.3 (details are provided Annex 12.1).

Data for AGB of non-forest cover are not available from the PSP. Data was collected from available studies. Where studies did not provide uncertainty values, expert judgment was used. Where information on range of data was available, the uncertainty was estimated using the following general approach:

$$U (\%) = ((X_{\text{max}} - X_{\text{min}})/5)/X_{\text{mean}} * 100 \quad \dots\dots\dots 12.4$$

The summary of the total uncertainty (U_{Total}) for the EF is presented in Table 12.4.

Sources of information regarding uncertainty estimates for each of these items are included in the various parameter tables in Chapter 8.

Table 12.4. Emission Factors and uncertainty for each land cover type

No	Land cover	Code	EF (tC/ha)	U(%)
Living biomass (AGB+BGB)				
1	Primary Dryland Forest	2001	281.32	38.2
2	Secondary dryland forest	2002	168.67	34.5
3	Swamp primary forest	2005	344.24	46.0
4	Swamp secondary forest	20051	233.50	41.7
5	Mangrove primary forest	2004	160.79	37.4
6	Mangrove secondary forest	20041	126.77	39.5
7	Plantation forest	2006	82.58	22.46
8	Dry shrub	2007	29.93	41.00
9	Wet shrub	20071	26.72	41.00
10	Savanna and Grasses	3000	7.22	41.00
11	Pure dry agriculture	20091	19.35	35.47
12	Mixed dry agriculture	20092	33.31	41.00
13	Estate crop	2010	65.61	23.32
14	Paddy field	20093	11.35	35.47
15	Transmigration areas	20122	14.80	41.00
16	Bare ground	2014	6.45	35.47
17	Settlement	2012	10.32	35.47
Soil Carbon Mangrove				
18	Mangrove	2004, 20041	902.91	21.48
19	Abandoned pond	20094	487.31	25.64
Peat decomposition				

No	Land cover	Code	EF (tC/ha)	U(%)
20	Secondary forest	2002, 20041, 20051	19	84.21
21	Plantation forest	2006	73	20.55
22	Estate crop	2010	40	55.00
23	Pure dry agriculture	20091	51	86.27
24	Mixed dry agriculture	20092	51	86.27
25	Dry shrubs	2007	19	84.21
26	Wet shrubs	20071	19	84.21
27	Savanna and grasses	3000	35	108.57
28	Paddy field	20093	35	108.57
29	Open swamp	5001	0	0.00
30	Fish pond/aquaculture	20094	0	0.00
31	Transmigration area	20122	51	86.27
32	Settlement	2012	35	108.57
33	Port and harbor	20121	0	0.00
34	Mining area	20141	51	86.27
35	Bare ground	2014	51	86.27
Logging				
36	Secondary forests	2002, 20041, 20051	35.28	68.30
Biomass Fires				

For fire, the IPCC default EF and uncertainty values were used.

With the use of the data in Tables 12.3 and 12.4, the result of Monte Carlo simulation suggests that the uncertainty of the estimate of historical emissions ranged from 20.2% to 29.5% with a mean of about 25.8%. The highest uncertainty is for the emission of year 2016 (Figure 12.2).

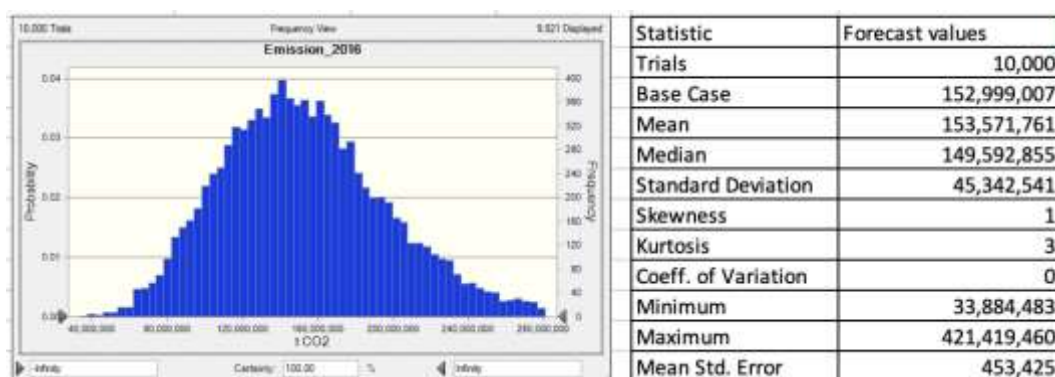


Figure 12.1 Results of Monte Carlo Simulation for the Emission of 2016

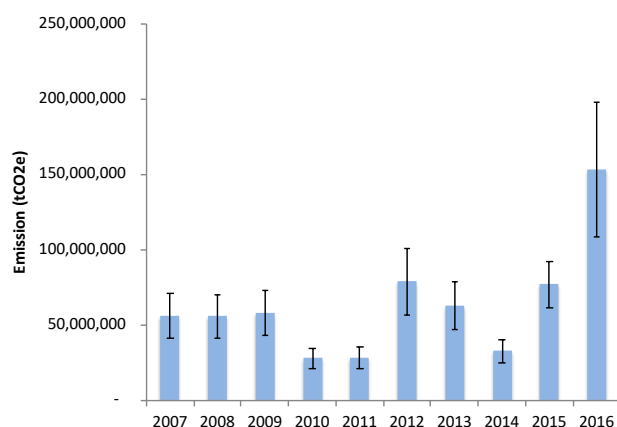


Figure 12.2 Historical emission and uncertainty of REDD activities

13 Calculation of Emission Reductions

13.1 Ex-ante estimation of the Emission Reductions

The reference level of emissions for the 2020-2024 ERPA period is 315 m tCO₂e, of which 81% is caused by deforestation, 6% by degradation of primary to secondary forest, 2% by mangrove loss, 6% by degradation from logging, 2% by peat decomposition, and 3% by fire.

Table 13.1. Breakdown of reference level emissions for the ERPA Period (tCO₂e)

Year	Deforestation	Degradation	Mangrove	Logging	Peat decomposition	Fire (53% of historical)	Total
2020	50,997,003	3,988,212	1,119,266	3,945,984	1,024,297	1,904,797	62,979,559
2021	50,997,003	3,988,212	1,119,266	3,945,984	1,027,304	1,904,797	62,982,566
2022	50,997,003	3,988,212	1,119,266	3,945,984	1,030,312	1,904,797	62,985,574
2023	50,997,003	3,988,212	1,119,266	3,945,984	1,033,319	1,904,797	62,988,581
2024	50,997,003	3,988,212	1,119,266	3,945,984	1,036,327	1,904,797	62,991,589
2020-2024	254,985,015	19,941,060	5,596,330	19,729,920	5,151,559	9,523,985	314,927,869
% of total 2020-2024	81%	6%	2%	6%	2%	3%	100%

Emission Reductions from deforestation

As discussed in Section 4, deforestation can be roughly attributed to a discrete set of proximate causes, as recapitulated in the table below. It is possible to estimate the share of emissions contributed by each of the drivers and to link the expected emission reductions for each driver to the ER Program components that address the driver. It is expected that improvements in governance will lead a reduction in emissions from all the proximate causes. For most of the drivers, program activities are expected to lead to a 20% reduction of emissions. For oil palm plantations, timber plantations, and forestry concessions the expected emission reduction is estimated at 30%. Concessions tend to have clearly defined management entities that can participate in the ER Program, and whose actions can be influenced through policies, regulations and incentives. This is less so for the areas allocated to mining, as much of this area is not managed and a key activity involves revoking those mining permits. Overall it is estimated that the ER Program will lead to a 27% emission reduction from deforestation, equivalent to 69.6 million t CO₂ over the ERPA period (Table 13.2).

Table 13.2. Ex-ante estimation of the ERs expected from reduced deforestation (tCO₂e)

Driver	Share of total deforestation	RL Emissions (2020-2024)	ERP Component	Expected ER %	Expected Emissions under the program (2020-2024)
Oil Palm	51%	130,042,358	C1, C2, C3	30%	91,029,650
Timber plantation/ Poor Concession Management	14%	35,697,902	C1, C2, C3	30%	24,988,531
Mining	10%	25,498,502	C1, C2, C3	20%	20,398,801
Overlogging/Poor Concession Management	8%	20,398,801	C1, C2, C3	30%	14,279,161
Illegal Logging	7%	17,848,951	C1, C2	20%	14,279,161
Agriculture	6%	15,299,101	C1, C2, C4	20%	12,239,281
Unlicensed land clearing	3%	7,649,550	C1, C2, C4	20%	6,119,640
Aquaculture	1%	2,549,850	C1, C2, C4	20%	2,039,880
Total	100%	254,985,015		27%	185,374,106

Reduction of Emissions from Primary Forest Degradation

The emissions associated with the degradation of primary forests contribute 6% of the total RL emissions, and the ER Program recognizes the important non-carbon benefits associated with primary forests and includes a number of activities that will reduce the loss of primary forest. These include activities within protection forest areas and conservation areas, where around half of the remaining primary forest is found, as well as policies that will lead to improved forest governance. It is expected that the ER Program will lead to a reduction of emissions from primary forest degradation of 30% by the end of the accounting period, leading to ERs of 4 million tCO₂e over the ERPA period (Table 13.3).

Table 13.3. Ex-ante estimation of the ERs expected from the ER Program addressing primary forest degradation

	RL Primary to Secondary Forest (tCO ₂ e/yr)	Avoided Emissions as % of RL	Expected Emission Reductions (tCO ₂ e/yr)	Emissions under the Project (tCO ₂ e/yr)
2020	3,988,212	10%	398,821	3,589,391
2021	3,988,212	15%	598,232	3,389,980
2022	3,988,212	20%	797,642	3,190,570
2023	3,988,212	25%	997,053	2,991,159
2024	3,988,212	30%	1,196,464	2,791,748
Total	19,941,060	20%	3,988,212	15,952,848

Reduction of Emissions from Peat Decomposition

The ER Program includes a number of activities that will prevent further conversion of peatlands and help restore already degraded peatland areas. This includes support for the licensing moratorium on peat as well as for the policy to restore 50,000 ha of peatlands within estate crop concessions by 2030. For the ex-ante ER estimate, it is assumed that the program will lead to a 30% reduction of emissions from peat decomposition by the end of the ERPA. Over the ERPA period, it is expected that 20% of emissions from peat degradation, equivalent to 1 million tCO₂e, will be avoided (Table 13.4).

Table 13.4. Ex-ante estimation of the ERs expected from the ER Program addressing peat decomposition

Year	RL Peat Decomposition (tCO ₂ e/yr)	Avoided Emissions as % of RL	Ex-ante ER Estimate (tCO ₂ e/yr)	Emissions under the ERP (tCO ₂ e/yr)
2020	1,024,297	10%	102,430	921,867
2021	1,027,304	15%	154,096	873,208
2022	1,030,312	20%	206,062	824,250
2023	1,033,319	25%	258,330	774,989
2024	1,036,327	30%	310,898	725,429
Total	5,151,559	20%	1,031,816	4,119,743

Reduction of Emissions from Mangrove soil

The ER Program, in particular Component 4, includes a number of activities related to the drivers of mangrove conversion and it is expected that emissions from this source can be reduced by 25% by the 5th year of program implementation. Total Emission Reductions over the ERPA period from protection of mangroves are expected to be 0.8 million tCO₂e (Table 13.5).

Table 13.5. Ex-ante estimation of the ERs expected from the ER Program addressing mangrove loss

Year	RL Mangrove Emissions (tCO ₂ e/yr)	Avoided Emissions as % of RL	Avoided Emissions (tCO ₂ e/yr)	Emissions under the Project (tCO ₂ e/yr)
2020	1,119,266	5%	55,963	1,063,303
2021	1,119,266	10%	111,927	1,007,339
2022	1,119,266	15%	167,890	951,376
2023	1,119,266	20%	223,853	895,413
2024	1,119,266	25%	279,817	839,450
Total	5,596,330	15%	839,450	4,756,881

Reduction of Emissions from Logging

Estimation of reduction of emissions from logging takes into account that not all forest management concessions in East Kalimantan will participate in the ER Program, and that the adoption of RIL-C practices will increase gradually. In the initial year of the ERPA Term, the number of concessions implementing the RIL-C is expected to reach 11 concessions, increasing to 17 concessions by the end of the ERPA term. Overall it is expected that 12% of emissions linked to logging over the ERPA term, equivalent to 17.4 million tCO₂e can be avoided (Table 13.6).

Table 13.6. Ex-ante estimation of the ERs expected from the ER Program addressing unsustainable logging

	RL Logging (tCO ₂ e/yr)	Avoided Emissions as % of RL	Expected Emission Reductions (tCO ₂ e/yr)	Emissions under the Project (tCO ₂ e/yr)
2020	3,945,984	10%	394,598	3,551,386
2021	3,945,984	11%	434,058	3,511,926
2022	3,945,984	12%	473,518	3,472,466
2023	3,945,984	13%	512,978	3,433,006
2024	3,945,984	14%	552,438	3,393,546

	RL Logging (tCO ₂ e/yr)	Avoided Emissions as % of RL	Expected Emission Reductions (tCO ₂ e/yr)	Emissions under the Project (tCO ₂ e/yr)
Total	19,729,920	12%	2,367,590	17,362,330

Reduction of emissions from forest fire

Most of the emissions associated with fire occur on lands that are not defined as forest under the ER Program. Nonetheless, the ER Program includes a number of activities to address land fires and these are expected to lead to reduced fires both within and outside of the area defined as forest. For the calculation of ERs only the reference level emissions and reduced emissions within forests are included. It is expected that the ER activities will lead to an average 20% reduction in fire, leading to ERs of 1.9 million tCO₂e over the ERPA period (Table 13.7).

Table 13.7. Ex-ante estimation of the ERs expected from the ER Program addressing fire

	RL Fire (tCO ₂ e/yr)	Avoided Emissions as % of RL	Expected Emission Reductions (tCO ₂ e/yr)	Emissions under the Project (tCO ₂ e/yr)
2020	1,904,797	10%	190,480	1,714,317
2021	1,904,797	15%	285,720	1,619,077
2022	1,904,797	20%	380,959	1,523,838
2023	1,904,797	25%	476,199	1,428,598
2024	1,904,797	30%	571,439	1,333,358
Total	9,523,985	20%	1,904,797	7,619,188

Total Expected Emission Reductions

Total expected ER under the program are 97.1 million tCO₂e, which is equivalent to a 31% reduction from the reference level emissions (Table 13.8).

Table 13.8. Total expected gross Emission Reductions (tCO₂e)

Year	Deforestation emissions	Degradation emissions	Mangrove emission	Peat Decomp	Fire emissions	Total expected emissions	RL Emissions	ER
2020	37,074,821	3,589,391	1,063,303	921,867	1,714,317	44,363,699	62,979,559	18,615,860
2021	37,074,821	3,389,980	1,007,339	873,208	1,619,077	43,964,427	62,982,566	19,018,139
2022	37,074,821	3,190,570	951,376	824,250	1,523,838	43,564,854	62,985,574	19,420,720
2023	37,074,821	2,991,159	895,413	774,989	1,428,598	43,164,980	62,988,581	19,823,601
2024	37,074,821	2,791,748	839,450	725,429	1,333,358	42,764,806	62,991,589	20,226,783
ERPA Period	185,374,106	15,952,848	4,756,881	4,119,743	7,619,188	217,822,766	314,927,869	97,105,103

Net Emission Reductions after accounting for uncertainty and buffer

The level of uncertainty of the REL estimate, has a mean of around 25% based on a Monte Carlo analysis of uncertainty for calculating the REL (see Section 12), requiring a conservativeness factor of 4% to be applied to the ex-ante ER estimate. After subtracting the buffer set-aside for reversals of 26%, the net expected ER are 67.5 million t CO₂e.

Table 13.9. Total expected net Emission Reductions (tCO₂e)

Year	Gross ER	ER after 4% Uncertainty Set-Aside	26% Buffer	Net ER
2020	18,615,860	17,498,908	4,549,716	12,949,192
2021	19,018,139	17,877,051	4,648,033	13,229,018
2022	19,420,720	18,255,477	4,746,424	13,509,053
2023	19,823,601	18,634,185	4,844,888	13,789,297
2024	20,226,783	19,013,176	4,943,426	14,069,750
ERPA Period	97,105,103	91,278,797	23,732,487	67,546,310

14 SAFEGUARDS

14.1 Description of how the ER Program meets the World Bank environmental and social safeguards (WB-SESA) and promotes and supports the safeguards included in UNFCCC guidance related to REDD+

14.1.1 Indonesia's REDD+ Safeguards processes

The following section provides a description of the key processes that the Government of Indonesia (GoI) has undertaken to strengthen the country's safeguards systems in preparation for the ER Program implementation. An analysis of potential risks and impacts, as well as their respective mitigation measures is presented in section 14.1.2.

The Government of Indonesia (GoI) has mainstreamed environmental and social risk mitigation measures into the ER program development through an interlinked process for the development of key safeguards instruments specific for REDD+. These instruments include:

- a) the REDD+ Safeguards Information System (known as SIS-REDD+)
- b) the national safeguards framework (known as PRISAI (*Prinsip Kriteria Indikator Safeguards Indonesia*))
- c) the REDD+ Social and Environmental Standards for East Kalimantan Province (known as SES-REDD+ Kaltim)
- d) the Strategic Environmental and Social Assessment (SESA), subsequent Environmental and Social Management Framework (ESMF), Indigenous Peoples Planning Framework (IPPF), Resettlement Planning Framework (RPF) and Process Framework (PF); and
- e) the Feedback, and Grievance Redress Mechanism (FGRM).

The advanced drafts of the SESA, ESMF, IPPF, RPF, and PF as well as FGRM have been prepared in line with the World Bank's safeguards policy requirements. Each of these instruments has been developed with the following objectives:

- a) Strategic Environmental and Social Assessment (SESA): The SESA is intended to provide further context-specific information on environmental and social risks and impacts in East Kalimantan. The assessment has also considered local institutional capacity to address the identified risks and will inform the preparation of the ESMF to ensure the risks are minimized and impacts avoided or mitigated appropriately. Furthermore, the SESA is also expected to support further refinement as well as operationalization of the existing safeguards instruments that Indonesia has developed.²⁶

²⁶ The SIS-REDD+ consultation process, as an example, was intensively carried out from 2011 to 2012. Prior to this, two influential analytical works were carried out by Daemeter Consulting, which were further consulted in the stakeholders meeting for further feedback (Centre for Standardization and Environment. 2013. Principles, Criteria and Indicators for a System for Providing Information on REDD+ Safeguards Implementation (SIS-REDD+) in Indonesia. Centre for Standardization and Environment, Ministry of

- b) Environmental and Social Management Framework (ESMF): An ESMF has been prepared under the ERP as an instrument to assess potential E&S risks and impacts under the ER Program operation. The ESMF sets out the principles, rules, guidelines, and procedures for screening, assessment, and follow-up on the anticipated environmental and social impacts of program activities.
- c) Indigenous Peoples Planning Framework (IPPF): An IPPF has been prepared to provide operational guidance in line with OP 4.10 to the ERP implementing agencies to engage in an inclusive and participatory process to ensure that the rights and aspirations of Indigenous Peoples affected by the ERP implementation are respected. In conjunction with the PF, the IPPF has also been prepared to address risks associated with access restrictions and claims on land and natural resources as a result of improved forest management.
- d) Resettlement Planning Framework (RPF) and Process Framework (PF): The RPF serves as a precautionary measure to address resettlement risks associated with the Program implementation. The RPF also includes a PF. The purpose of the PF is to establish a process by which communities potentially affected by restrictions on land and natural resources for conservation and protection purposes can engage in informed and meaningful consultations and negotiations to identify and implement means to mitigate impacts resulting from access restrictions. These frameworks have been developed to address the key requirements under the World Bank's OP 4.12 on Involuntary Resettlement and OP 4.10 on Indigenous Peoples
- e) Feedback and Grievance Redress Mechanism (FGRM): a FGRM has been prepared for the ERP with the objective to provide a clear institutional set-up and coordination platform for receiving, recording, screening, investigating, verifying and resolving grievances. The FGRM also sets out measures in the event of impasse and/or unresolved cases (i.e. mediation, court appeal, etc.)

Further refinement of the above instruments and consultations are currently ongoing. The GoI commits to ensuring implementation of the safeguards frameworks prepared under the ERP across the Program's life cycle.

To date, substantial efforts have been mobilized by MoEF and East Kalimantan Government to meet the World Bank and UNFCCC safeguards requirements. These include (a) various consultations with a broad range of stakeholders, including government agencies, private sector entities, universities, research institutes, civil society organizations, as well as potentially affected community groups, (b) relevant analytical work and policy development processes pertaining to REDD+ development, taking into account possible social and environmental risks and adverse impacts and (c) development of required safeguard framework to minimize and/or offset identified environmental and social risks and impacts, such as those on biodiversity, livelihoods and land titling.²⁷ A compilation of background information for the development of REDD+ in Indonesia, covering more than 400 identified materials and documentation of earlier processes has been compiled in 2016 with support from the FCPF-World Bank (see Annex 14.1.). These materials are incorporated with spatial baseline data and spatial data analysis in developing the

Forestry, and Forest and Climate Change Programmed, Deutsche Gesellschaft für Internationale Zusammenarbeit.)

²⁷ FCPF. TAP review of the R-Package Submitted by Indonesia, September 2017, p.19

SESA and ESMF documents. Safeguards capacity building on World Bank's safeguards was conducted in 2017, targeting key stakeholders in East Kalimantan.

Earlier and on-going safeguards preparation processes have been instrumental in bringing together international good practices for adoption in the country's safeguards systems, and particularly, the relevant REDD+ system. The processes have been led by the GoI and supported by various development partners, including NGOs and CSOs²⁸ working in East Kalimantan. Stakeholders' inputs and concerns have been collected in a participatory manner, involving a series of national and sub-national consultative workshops, Focus Group Discussions (FGDs), informal discussions with target communities and document reviews. The SIS-REDD+ consultation process, for instance, was intensively carried out in 2011 and 2012, involving multiple stakeholders, including community representatives²⁹. The SIS development represents the earlier process for safeguards preparation under REDD+.

The SIS-REDD+ has been established as a web-based platform to monitor safeguards performance across program interventions. The PRISAI and SES-REDD+ Kaltim outline safeguards compliance standards consistent with World Bank safeguards principles and include safeguards performance indicators that will need to be achieved by program entities. The ESMF and its associated frameworks, including FGRM serve as reference safeguards instruments that will bring together earlier safeguards initiatives into a more comprehensive framework. Further, these instruments provide recommendations for institutional arrangements at national, provincial and district levels to ensure that relevant safeguards provisions and requirements are properly implemented and monitored according to the safeguards principles. An interactive web portal for SIS-REDD+ administered by the Directorate General of Climate Change (DG of CC) of MoEF, was developed to enable accessible and direct reporting of safeguards performance across implementing entities.

In compliance with the UNFCCC safeguards, PRISAI was formulated to further elaborate the Cancun safeguards and integrate these into the national contexts. The national PCIs were further reviewed and summarized in the PRISAI document, which outlines 10 principles, 27 criteria and 99 indicators, with an expanded focus on finance and fiduciary aspects.³⁰ PRISAI is built on a set of jurisdictional and project-level safeguards standards³¹ developed by the GoI through the (now defunct) REDD+ Task Force, whose work was carried over to the REDD+ Agency. PRISAI was initially designed as a framework to filter, monitor, and evaluate REDD+ activities at the project and jurisdiction levels. PRISAI has been tested in several sites in East Kalimantan, Central Kalimantan, and Jambi provinces, and mainstreamed into the SIS-REDD+. PRISAI does not

²⁸ Among others are TNC, GGGI, BIOMA, WWF.

²⁹ Centre for Standardization and Environment. 2013. Principles, Criteria and Indicators for a System for Providing Information on REDD+ Safeguards Implementation (SIS-REDD+) in Indonesia. Centre for Standardization and Environment, Ministry of Forestry, and Forest and Climate Change Programmed, Deutsche Gesellschaft für Internationale Zusammenarbeit.

³⁰ Clarifying and translating Cancun safeguards into country contexts is also conducted by other countries such as Vietnam, Ecuador, Democratic Republic of Congo, Ghana, Malaysia, Mexico, Zambia (UN REDD Program, UN REDD Programmed. December 2015)

³¹ UN REDD Program. December 2015. Country Approaches to REDD+ Safeguards: A Global Review of Initial Experiences and Emerging Lessons.

explicitly address the sustainable palm oil approach. Therefore, PRISAI needs to be supported by other safeguards instruments adjusted to the local context in East Kalimantan Province (e.g., SES REDD Kaltim).

The above safeguards instruments, supported with analytical processes through the SESA, are expected to enhance the existing country systems for the management of environmental and social aspects of the ER program. Indonesia is equipped with a strong legal framework for the management of environmental and social impacts of development activities, which are applicable for activities under the ER program. Relevant mechanisms include: mandatory Environmental Impact Assessments (AMDAL, UKL/UPL), Strategic Environmental Assessments (KLHS) for policy development and spatial planning processes, and the Sustainable Production Forest Management (PHPL) system. In addition, there are a number of existing certification schemes that can be relied upon for specific ER activities, such as the Indonesian Ecolabel Institute (*Lembaga Ekolabel Indonesia/LEI*), the Forest Stewardship Council (FSC), and the Verification System of Timber Legality (SVLK) standards for ensuring sustainable forest management practices. In the oil palm sector, the Roundtable for Sustainable Palm Oil (RSPO) and the Indonesian Sustainable Palm Oil (ISPO) set out compliance standards for the management of environmental and social aspects along oil palm value chains. These safeguards instruments contain specific mechanisms for oversight of environmental and social aspects of specific programs, grievance redress mechanisms, and reporting compliance based on self-assessments and independent audits. This ESMF developed under the program builds on the existing country systems and ensure that any gaps against the World Bank's safeguards policies are addressed.


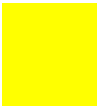

Analysis carried out during the SIS-REDD+ process, indicates that existing instruments in general provide adequate coverage for many of the Cancun Safeguards (Table 14.1). The analysis found that Cancun Safeguards 1 to 5 are well covered, with Safeguard 6 (permanence of carbon) and Safeguard 7 (leakage of carbon) requiring better coverage. Voluntary standards for sustainable forest management (SFM), for instance LEI and FSC standards, KLHS and HCV achieved relatively high scores with regards to their relevance with the Cancun Safeguards, followed by FPIC, AMDAL and PHPL/SVLK. In terms of regulatory/policy requirements, these instruments call for good governance, protection of Indigenous Peoples' rights, and effective stakeholder engagement. However, gaps were observed with regards to implementation practices and capacities on the ground. Law enforcement also represents an important area for improvement. Additional guidance for implementation, impact monitoring system(s), and capacity strengthening at the sub-national level, as well as an overarching framework for institutional coordination and reporting standards were identified as key areas for improvements.

Table 14.1. Overview of instrument relevance and coverage of safeguards against Cancun safeguards

Instrument ¹	Scoring of key relevant components to Cancun Safeguards ²							Mean Score	Rank
	NFP/conventions	Good governance sovereignty	Respect to Indigenous peoples	Stakeholders engagement	Biodiversity, forest, ecosystem services	Permanence of Carbon	Leakage Carbon		
PHPL/SVLK	2	2	2	2	2	1	1	1.7	6
SFM	3	3	3	3	2	2	1	2.4	1
KLHS	2	3	3	3	2	2	2	2.4	1
AMDAL	2	2	1	2	2	2	1	1.7	1
HCV	2	3	3	3	3	2	1	2.4	4
FPIC	3	1	3	3	2	1	1	2.0	4
SESA	2	1	2	3	3	1	1	1.9	5
Overall Coverage (mean score)	2.3	2.1	2.4	2.7	2.3	1.4	1.1		

1) PHPL/SVLK=*Pengelolaan Hutan Produksi Lestari/Sistim Verifikasi Legalitas Kayu* (Sustainable Production Forest Management/System for Verification of Timber Legality; SFM = Sustainable Forest Management, KLHS = *Kajian Lingkungan Hidup Strategis* (Strategic Environmental and Social Assessment/SESA, the Gol's version); AMDAL = *Analisis Mengenai Dampak Lingkungan* (Environmental and Social Impact Assessment); HCV = High Conservation Value, FPIC = Free, Prior and Informed Consultation; SESA = Strategic Environmental and Social Assessment (the WB version).

2) Every instrument was scored against each Cancun safeguards components. The mean score of each component is calculated to show overall coverage. The color coding corresponds to qualitative assessment of relevance and coverage of the instruments based on the scoring:

 : Good
  : Adequate
  : Weak

Source: Centre for Standardization and Environment (2013): Principles, Criteria and Indicators for a System for Providing Information on REDD+ Safeguards Implementation (SIS-REDD+) in Indonesia. Centre for Standardization and Environment, Ministry of Forestry, and Forests and Climate Change Programme, Deutsche Gesellschaft für Internationale Zusammenarbeit. P.6

As part of the SES-REDD+ development for East Kalimantan, a consultative process to assess institutional readiness at the provincial and district levels for the management of environmental and social aspects of the ER program was conducted. An institutional capacity assessment is presented in the REDD+ SES document. General findings are summarized as follows:

- The level of transparency and access to information and documentation to assess safeguards performance such as AMDAL, KLHS, HCVF, Forest Management Unit (FMU) annual plans, district medium term plans vary across districts. Communities often have the least access to such information.
- Environmental management responsibilities tend to be concentrated at the provincial and district environmental agencies and are not well institutionalized across relevant agencies under the ER program.
- Conflict and dispute mechanisms exist. However, such mechanisms are not fully supported by formal regulations/standardized protocols. Grievances are often handled on an ad-hoc basis by relevant agencies and/or parties in dispute.
- District-level regulatory frameworks to support operationalization of safeguards measures are not available in some districts. These include definition of carbon rights and benefit sharing, provisions of free, prior and informed consent (FPIC), etc.
- Understanding and awareness of REDD+ and more specifically safeguards still varies across key agencies, private entities, and community groups.

This assessment has been strengthened through the SESA process and relevant mitigation measures have been integrated into the ESMF.

SES-REDD+ in East Kalimantan has been developed to ensure that key issues in land and natural resource governance in the Province are captured in the safeguards monitoring systems.

Further work, being commissioned by the DG of CC, is underway to streamline the SIS-REDD+ with SES-REDD+ for East Kalimantan to ensure a harmonized system. There are eleven key issues identified in the SES-REDD+ East Kalimantan that have been taken into account in the ERP. These eleven key issues can be grouped into six major components:

- a) rights to land and territory, natural resources, and traditional knowledge;
- b) forest governance, leakage and reversals, biodiversity and ecosystem;
- c) transparency and accountability;
- d) community's welfare;
- e) gender equality and inclusiveness participation, particularly those of marginalized and vulnerable groups; and
- f) benefit sharing arrangements.

The issues above are expected to be addressed under East Kalimantan's ERP. The issues of land and territory, leakage and reversal prevention, biodiversity and ecosystem conservation, will be addressed in conjunction with support to community welfare and livelihoods, access rights to use of land and natural resources, protection of local wisdom, and gender equality and social inclusion (e.g. participation of Indigenous Peoples and *Adat* communities as well as marginalized and vulnerable groups). Addressing these issues is expected to feed into, and subsequently enhance the program's benefit sharing mechanisms, forest governance, including prevention of leakage and reversals, transparency and accountability. Interlinkages amongst these initiatives have been observed in the ERP design. Synergy and coordination between national, provincial and district levels for safeguards management will continue to be defined and strengthened as the ER Program is being prepared and implemented.

Table 14.2. Matrix of important issues in East Kalimantan with Principles and Criteria of each SG initiatives

Important issue in East Kalimantan	SES - REDD+	PRISAI	SIS-REDD+
1. Rights to land and territory	P1	P1	P3.C1
2. Rights to use of natural resources	P1	P1	P3.C1
3. Recognition and appreciation of wealth of traditional knowledge	P6.C2	P4	P3.C4
4. Forest Governance	P4	P3	P1, P2
5. Prevention of leakage	P5.C3	P8	P6, P7
6. Prevention of Reversals	P2	P7	P6
7. Transparency and accountability	P2.C2, P4	P10	P2
8. Conservation of biodiversity and ecosystem services	P5	P6	P5
9. Improving people's welfare	P3	N.A.	P2.C2-C3
10. Community participation of customary/local or vulnerable/marginalized groups including gender issues	P3.C2, P6	P5	P4, P2.C1
11. Benefit sharing	P2	P9	P3.C2-C3-C4

Source: REDD+ Working Group of East Kalimantan. 2015. pp.43-44.

Note: P=Principles, C=Criteria, N.A = Not Applicable

The aforementioned processes and consultations have guided the development of SESA, ESMF and other Safeguards instruments to meet the World Bank's safeguards requirements. Substantial work for the development of safeguards instruments to address the World Bank's policies for the ERP took place between the period of November 2016 to October 2018. The process was started with compiling relevant documents and desk review (November 2016), training and workshop on the respective issues of SESA and ESMF in Muara Siran, East Kalimantan Province (August 2017) and SESA and ESMF document writing (September and November 2017), consultant's recruitment for SESA and ESMF (August 2018), field work and public consultations for SESA and ESMF (October 2018), and public consultation on SESA findings and ESMF for further inputs from stakeholders. The SESA and ESMF training (August 2017) covers the following topics of the delivery of REDD+ and safeguards, REDD+ Implementation, Provincial REDD+ Strategy:

Policy, Regulation, and Governance, Development of East Kalimantan, SES REDD+ and REDD+ Experience in Jambi, and focused group discussions on the ESMF. The SESA and ESMF Writing workshops were conducted twice (September and November 2017) and aimed at preparing a draft document on the SESA and ESMF. Further consultations are currently on-going for the finalization of these instruments.

Table 14.3.SESA and ESMF Process

Time	Activities
November 2016	Compiling literature and desk review. A list of literature is made available in ERPD Annex 14.1
August 2017	Training on SESA in Muara Siran, Kutai Kartanegara District, East Kalimantan Province
September 2017:	The First SESA and ESMF writing workshop
November 2017	The Second SESA and ESMF writing workshop
August 2018	Procurement process and hiring consultant to develop SESA and ESMF documents for ERPD.
October 2018	Stakeholder consultations were done to align the development of the SESA and ESMF with existing achievements in developing the ERPD of East Kalimantan Province
October 2018	A public consultation was held to disseminate results of the SESA and ESMF, and to obtain input from stakeholders
November 2018 - TBD	Consultations for the finalization of the safeguards instruments prepared for the Program

The overall multi-stakeholder consultation process and results are well documented and made available to public access at the web SIS (ditjenppi.menlhk.go.id/sisredd). A summary of these consultations can be found in Annex 5.2.

Compatibility Analysis between Indonesian Safeguards and the World Bank Safeguard Policies

In addition, a compatibility analysis was conducted in September 2016 to identify possible gaps between the relevant World Bank's safeguards and GoI's framework for the management of environmental and social aspects of the ERP (described in Section 14.1.2.2). This is to ensure that the overall issues will be well addressed and managed. Included in the compatibility analysis are Indonesia's relevant regulatory frameworks at national and sub-national levels. Table 14.4. provides a summary of the compatibility analysis. This table needs to be read in conjunction with Table 14.8. on the summary of issues/risks/impacts:

Overall, there is no significant gap between Indonesian safeguards and the World Bank safeguards policies, except on the FGRM.

Table 14.4. Compatibility Analysis between Existing Indonesia Safeguards (Including relevant regulatory frameworks) with the World Bank Safeguards Policies

Summary of Risks / Impacts	Priority Level*	Indonesian Safeguards*				World Bank Safeguard Policies	Identified Gaps
		Key Relevant GOI Regulatory Frameworks**	SIS RED	PRI SAI	SES REDD Kaltim		
1. Tenurial Conflicts and Disputes	1	<p>On conflict handling: GR. No. 2/2015; Joint Regulation of . MOHA, MoEF, PWH, and Head of BPN No. 79/2014, 3/2014, 1/2014, and 8/2014 on Conflict Handling; MR of MoEF No. 83/2016 on Social Forestry</p> <p>On Tenurial conflict, esp. <i>adat</i> community: Law No 32/2009 on Environmental Protection and Management; Law No 19/2004 on Forestry; Law No 18/2013 on Prevention and Abolition of Forests Destruction; Law no 26/2007 on Spatial Planning; MR of MoHA No 52/2014 on the Guidelines for the Recognition and Protection of <i>Adat</i> Community, PR No. 88/2017 on Land Tenure Settlements in Forest Areas.</p>	P 3	P 1	P 1	OP/BP 4.01, 4.12, 4.10-	<p>Legal recognition from the GoI is required prior to recognition of further rights (i.e. land tenure, resource rights, etc.). This represents a gap.</p> <p>Once recognized, <i>Adat</i> communities' tenure rights are well protected by the existing legal frameworks. The conflict handling will be equipped further with an FGRM for ERP (Section 14.3).</p> <p>An IPPF has been developed to address this gap, especially on legal recognition. Under the BSM, all communities who are participating are eligible to access the ERP benefits and the Program provides support to strengthen tenure security among forest</p>

Summary of Risks / Impacts	Priority Level*	Indonesian Safeguards*				World Bank Safeguard Policies	Identified Gaps
		Key Relevant GOI Regulatory Frameworks**	SIS RED	PRI SAI	SES REDD Kaltim		
							<p>dependent communities, including <i>Adat communities</i>.</p> <p>Note: In addition other regulatory frameworks that are not key but relevant (such as GR No 14/2015 on the Master Plan for National Industry where IP is identified is key), will also be considered.</p>
2. Lack of Participation	5	Law No 25/2004 on National Planning Development System; MR of MoEF No. 17/2012 on Public Involvement into AMDAL; GR No. 3/2008 on FMU Planning	P 4	P 5	P 6	OP/BP 4.01, 4.04, 4.10; 4.12, 4.11, 4.36	<p>No gaps are identified</p> <p>Note: The IP participation is well recognized in the Law No 25/2004</p>
3. Access Restrictions and Impacts on Livelihoods Changes	3	<p>MR of MoEF No. 83/2016 on Social Forestry; Regulation of the Directorate General on the Conservation of the Ecosystem Resources No. P.6/2018 on Conservation Partnership.</p> <p>Tenure Settlement within the Forest Estates (Penyelesaian Penguasaan Tanah Dalam Kawasan Hutan/PPTKH) as governed by the Presidential</p>	P 3	P 4	P 3, 1	OP/BP 4.01, 4.04, 14.12, 4.36,	<p>Currently, under the Social Forestry Schemes the GoI is committed to facilitating access to land and natural resources amongst forest dependent communities.</p> <p>On resettlement risks associated with forest tenure settlements, PPTKH currently does not define the protocols and</p>

Summary of Risks / Impacts	Priority Level*	Indonesian Safeguards*				World Bank Safeguard Policies	Identified Gaps
		Key Relevant GOI Regulatory Frameworks**	SIS RED	PRI SAI	SES REDD Kaltim		
		Regulation No. 88/2017					entitlements of PAPs and therefore represents a gap. The ERP's RPF and PF have been developed as a gap filling measure to address access restrictions and resettlement risks associated with the Program.
4. Institutional Capacity Constraints to Manage Potential Environmental and Social Risks	2	Law no. 32/2009 on Environmental Protection; MR of MoEF No. P.94/2016 on Invasive Species; MR of MoEF No. 17/2012 on Public Involvement in AMDAL; MR of MA No. 11/2015 on ISPO; GR No. 46/2016 on SEA	P 1	P 2	P 4	OP/BP 4.01, 4.04, 4.10, 4.11, 4.12, 4.36,	No gaps are identified with regards to the institutional mandates. However, further capacity strengthening and institutional collaboration amongst key institutions e.g. Provincial Forestry Services, Estate Crops Services, Environmental Agency and FMUs will be needed to ensure adequate management of environmental and social risks

Summary of Risks / Impacts	Priority Level*	Indonesian Safeguards*				World Bank Safeguard Policies	Identified Gaps
		Key Relevant GOI Regulatory Frameworks**	SIS RED	PRI SAI	SES REDD Kaltim		
5. Lack of effective and accessible FGRM	7	GR. No. 2/2015; Joint Reg. between MOHA, MoEF, PWH, and Head of BPN No. 79/2014, 3/2014, 1/2014, and 8/2014 on Forest Land Conflict Handling; MoEF Reg. No. 84/2015 on Forest Tenurial Conflict Resolution Guidelines.	P 2 & 3	P 1, 9, 10	P 7, 2, 3	OP/BP 4.04, 4.10, 4.11, 4.12, 4.36	A gap has been identified with regards to the Program's level FGRM which is expected to consolidate and synchronize various FGRMs at the project and activity levels. An initial FGRM has been developed (section 14.3) and is subject for refinement upon completion of the current assessment on effective FGRM, being conducted in conjunction with SESA.
6. Gender Inequalities and Social Exclusion	6	PI no 9/2000 on Gender Mainstreaming MR on Gender Mainstreaming Implementation, such as MR of MOHA No. 15/2008 and No. 67/2011 and MR of MoEF No p.31/menlhk/setjen/s et.1/5/2017.	P 3	P 4, 5	P 3	OP/BP 4.10, 4.12, 36	No gaps are identified
7. Governance Risks	4	Forestry Law no. 41/1999 jo 19/2004; Law no. 32/2009 on Env. Protection; Law no. 6/1994, Law no. 17/2004, Law No.	P 2	P 3	P 4	OP/BP 4.04, 4.10, 4.11, 4.12, 4.36	No gaps are identified

Summary of Risks / Impacts	Priority Level*	Indonesian Safeguards*				World Bank Safeguard Policies	Identified Gaps
		Key Relevant GOI Regulatory Frameworks**	SIS RED	PRI SAI	SES REDD Kaltim		
		16/2016 on Climate Change; Law No 14/2008 on open Public Information; GR No. 46/2016 on SEA					

Notes:

* Priority Level is measured through assessing the following three indicators of: (a) The likeliness for the issue to happen due to ERP implementation, (b) The complexity and seriousness level, (c) The availability of existing mechanisms to respond to the risks/impact.

** List of Indonesian Regulations contain the most relevant one with the issues/risks. More regulations at the project implementation level are described in the SESA and ESMF. Between SES-REDD+, PRISAI, and SES-REDD+, SIS-REDD+ is the most recognized and nationally accepted and referred in Indonesia.

Abbreviation: MR=Ministerial Regulation, GR=Government Regulation, MoEF=Ministry of Environmental and Forestry, MA=Ministry of Agriculture, MOHA=Ministry of Home Affairs, FGRM=Feed Back Grievance Response Mechanism, IP= Indigenous People, IPPF= Indigenous People Planning Framework, SEA=Strategic Environmental Assessment; PI=Presidential Instruction; PR=Presidential Regulation.

The SESA process has informed the assessment of environmental, social risks and impacts in the jurisdictional context of East Kalimantan. In Indonesia, the selection of East Kalimantan province for the ER program location as well as the identification of ER priority interventions occurred while the SESA process was ongoing. This created a demand from the government side to undertake further SESA processes, particularly to better identify risks and impacts and strengthen local stakeholder engagement, including potentially affected communities. The SESA also aimed to look at potential opportunities and key challenges for the operationalization of the FGRM under the program, particularly with regards to people's access to information and ability to provide feedback as well as raise complaints and necessary resources and capacities for managing potential grievances.

The SESA takes stock of various existing environmental and social assessments for specific development activities as well as policy development processes at both the national and sub-national levels relevant to the Program. In 2011, the GoI issued the Ministerial Regulation of MoEF no. 9/2011 which mandates sub-national governments to conduct strategic environmental assessments (KLHS)³² for the purpose of the development of sub-national spatial plans. The

³² Whilst some, with reference to the WB's SESA, argue that KLHS cannot be considered as SESA, Law No 32/2009 stipulates that '*lingkungan hidup*' consists of all non-living and living things in a particular area, including human behaviour that affect the environment in both positive and negative manner. As such, KLHS is a GoI's version of SESA that deserves further supports in moving towards international compliance.

enactment of the regulation suggests that assessments of environmental aspects of policy and spatial planning processes have been mainstreamed in the country systems, in addition to earlier AMDAL (Environmental and Social Impact Assessments) for specific development activities. Such commitments have been translated in the National Long-Term Development Plan (*Rencana Pembangunan Jangka Panjang Nasional*) 2005 – 2025 and the current Mid Term Development Plan (*Rencana Pembangunan Jangka Menengah Nasional*) 2015- 2019, where the GoI has articulated deforestation and forest degradation as threats to development, which need to be addressed. Additionally, SESA combines the abovementioned stock with spatial data analysis to enrich the analysis with a geographical context.

Using the available information and consensus generated through the SESA and earlier safeguards processes, MoEF in close collaboration with East Kalimantan Government has developed an ESMF to manage environmental and social risks considered under ERP. A summary of potential risks and impacts is summarized in Section 14.1.2. Details of environmental and social key issues and considerations are provided in the SESA and ESMF documents. The ESMF seeks to consolidate existing safeguard instruments developed as part of ER readiness as well as capture emerging risks that evolve as the Program design is being further refined and finalized. The ESMF lays out the required environmental and social risk management procedures to address identified risks and impacts, by adopting a risk mitigation hierarchy to avoid potential impacts. The institutional arrangement section of the ESMF seeks to define roles and responsibilities of different stakeholders at various levels, acknowledging that activities under ERP will cover broad sector categories and involve multiple agencies both at national, provincial and district levels during implementation. A road-map for ESMF implementation, including safeguards capacity building, development of necessary guidelines and manuals, integration with the SIS-REDD+ for safeguards monitoring and the FGRM, IPPF, RPF, and PF as well as a requirement for an independent safeguards performance evaluation and participatory community monitoring will be established as part of the ESMF. The ESMF will be applicable to the parallel investments directly financed by the World Bank. The GoI attempts to ensure consistent ESMF application and compliance to PCIs for investments financed by the government budget (from both the national and sub-national allocation), private entities, as well as other financing partners.

The ESMF formulated the road-map for strengthening the ER safeguards systems at both national and sub-national levels with the following pertinent key actions:

- a. Developing the ESMF Implementation steps (Figure 14.1);
- b. Capacity Building on the followings:
 - i. Strengthening capacity on SESA: A training on SESA with resource persons from the WB was conducted for stakeholders from East Kalimantan and Jambi Provinces. In addition, a linking and learning session was also conducted between Indonesia and Thailand on SESA and ERPD on 18-20 September.
 - ii. Community Participation Approaches, particularly on free, prior, informed Consultation: An advanced consultation on FPIC, BSM, and other relevant instruments has been scheduled in between February to November 2019.

This is especially considering that KLHS is made obligatory for sub national government to feed into the sub national development plan (*Rencana Pembangunan Jangka Menengah Daerah/RPJMD*)

- iii. Identification of potential environmental and social issues, as well as mitigation action;
 - iv. Overview of policy and regulatory frameworks related to ERP and social and environmental management in Indonesia, procedures for obtaining environmental permits;
- c. Setting up institutional arrangements:
 - i. Design and development of ESMPs,
 - ii. Integrating provisions of land and resource management, pest management, PCRs, community participation, and free, prior and informed consultations
- d. Developing Environmental and Social Management Plan (ESMP) as safeguards implementation tool;
- e. Formulation of Environmental Code of Practice (ECOP);
- f. Safeguards staffing for the following:
 - i. Evaluation of action plans in accordance with ESMF;
 - ii. Supervision and monitoring the ESMF document preparation and ESMF implementation at site level;
 - iii. Training on preparation of ESMF documents and mitigation actions at both the projects' preparation and implementation;
 - iv. Facilitate the planning of, among others, ESMF and IPPF;
 - v. Reporting.
- g. Information disclosure using DGPPI, P3SEKPI, DDPI and/or World Bank web sites; and
- h. Stock-taking, Monitoring and Evaluation

There are two pathways identified for the ESMF. The first is when environmental permits (such as AMDAL, UKL/UPL and SPPL) are required and the second is when the environmental permits are not required in which case other instruments (HCV, PHPL, ISP, etc.) are applicable. In either case, compliance with WB Safeguards and its overall OP/BP are maintained. The following Figure 14.1. describes the general flowchart on the implementation of the safeguards mechanism. The process starts with assessing key activities under the ERP and conducting risk screening to determine whether or not environmental permits, as regulated in the regulations of the GoI (e.g., AMDAL, UKL-UPL, or SPPL), are required for ERP key activities. In the case where environmental permits are required, ERP's key activities will go through the process for obtaining the relevant environmental permits. Otherwise, the key activity will only require to compliance with various instruments as prescribed in the ESMF and in accordance with the WB Safeguards practices.

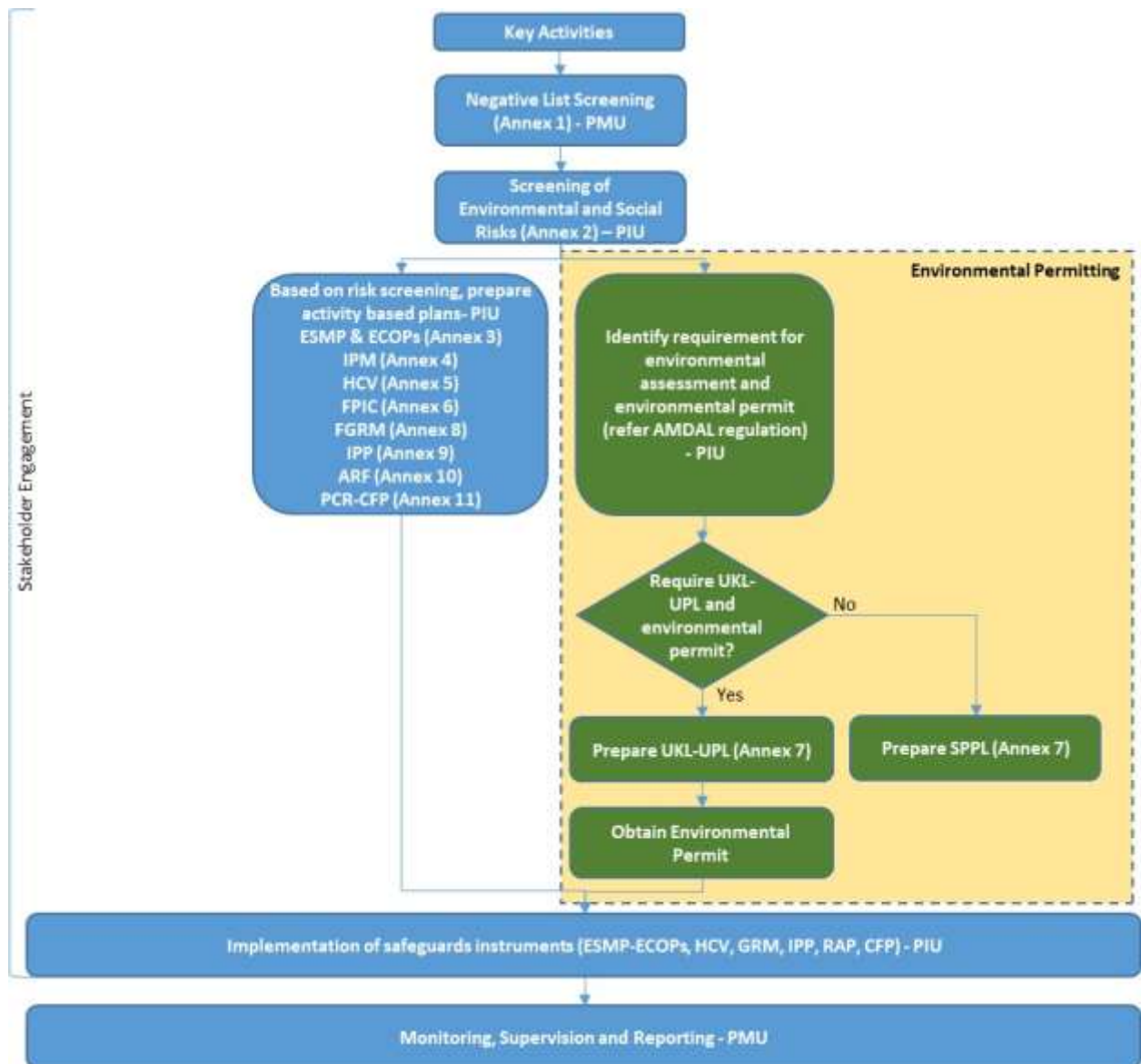


Figure 14.1 Safeguards Implementation Flow chart

The advanced draft of the SESA, ESMF, IPPF, FGRM, RPF, and PF report have been consulted and will be disclosed by the MoEF and the World Bank in both Bahasa Indonesia and English prior to the World Bank's appraisal of the program. Stakeholder engagement, including public consultations with affected communities, is on-going and will continue as part of the finalization of the above instruments. The following table (Table 14.5) outlines the expected milestones towards finalization of the SESA and ESMF.

Table 14.5. Milestones for SESA and ESMF

Time line	Milestone	Current Status (As of October 2018)
End of 2017	TOR for SESA and ESMF was revised and approved by the World Bank	<ul style="list-style-type: none"> The earlier version of the SESA/ESMF TOR has been adjusted following the selection of East Kalimantan and formulation of strategic options.
February – June 2018	Procurement process and appointment of a consulting company the finalization of SESA and ESMF.	<ul style="list-style-type: none"> Public announcement for calling of bidding has been completed. PT Hatfield was appointed from among the shortlisted of six companies identified during the selection processes.
August – October 2018	First draft of SESA and ESMF	<ul style="list-style-type: none"> Additional field work and series of stakeholders' consultations for the development of the SESA and drafting of the ESMF have been conducted in this period and final draft of SESA and ESMF have been made available Face-to-face public consultation on the 1st draft was performed on October 29, 2018 at Aston Balikpapan. A web-based consultation: the draft was disclosed at the MoEF website for public access.
October – December 2018	Second draft SESA and ESMF	<ul style="list-style-type: none"> Public validation consultations for SESA and ESMF at district level have been conducted in this period under the coordination of DDPI. Face-to-face and web-based public consultation on the 2nd draft of SESA and ESMF have been undertaken.
End of December 2018	Final SESA & ESMF	<ul style="list-style-type: none"> Consultations and public disclosure of final SESA & ESMF at both Government and WB website;
2019 onwards	ESMF building/training Capacity	<ul style="list-style-type: none"> ESMF dissemination and capacity building/training.

In parallel to these on-going efforts, the GoI has also issued Ministerial Regulation of MoEF no 9/2011 which requires sub-national governments to conduct strategic environmental and social assessments (KLHS)³³ during the development of sub-national spatial plans. This indicates GoI's

³³ Whilst some, with reference to the WB's SESA, argue that KLHS cannot be considered as SESA, Law No 32/2009 stipulates that '*lingkungan hidup*' consists of all non-living and living things in a particular area, including human behaviour that affect the environment in both positive and negative manner. As such, KLHS is a GoI's version of SESA that deserves further supports in moving towards international compliance.

commitments to mainstream environmental and social good practices in policy making processes, as relevant to the SESA. Such commitments have been translated in the National Long-Term Development Plan (*Rencana Pembangunan Jangka Panjang Nasional*) 2005 – 2025 and the current Mid Term Development Plan (*Rencana Pembangunan Jangka Menengah Nasional*) 2015-2019, where the GoI has articulated that deforestation and forest degradation are development issues and therefore, need to be addressed.

14.2 Environmental and social risks and impacts, and mitigation measures

This sub-section contains a summary of mitigation measures to the risks and impacts of the ERP referring to the triggered World Bank Safeguards Policies. This section contains two sub-sections. The first outlines the relevance of the triggered World Bank Safeguards Policies in the ERP, and the second provides a summary of environmental and social potential risks and impacts, and mitigation actions.

The ER Program triggers the following World Bank Operational Policies (OPs):

- Environmental assessment (OP 4.01)
- Natural Habitats (OP 4.04)
- Pest Management (OP 4.09)
- Indigenous Peoples (OP 4.10)
- Physical Cultural Resources (OP 4.11)
- Forests (OP 4.36)
- Involuntary Resettlement (OP 4.12)

In addition, the ERP also attempts to address gender and development and social inclusion for vulnerable groups as cross-cutting issues across ERP interventions.

Further explanation with regards to the rationale of triggering these policies and how gender concerns and social inclusion are being addressed in the ERP is presented in sub-section below.

14.2.1 The World Bank Safeguards Policies and their Relevance to the ERP

14.2.1.1 Environmental Assessment (OP 4.01)

In compliance with WB OP 4.01 on the environmental assessment, key assessments as outlined in this policy such as SESA, EIA, ESIA, regional or sectoral EA have been and will be conducted in the ERP insofar relevant. The use of country systems such as AMDAL, UKL/UPL in lieu of the assessments mentioned, will also be applicable as per-Gol's regulations on environmental management. Some preliminary assessments as part of SESA and ESMF processes have been conducted and will be refined further. Other program and/or activity-level environmental assessments will be part of the requirement for program activities in accord with the existing

This is especially considering that KLHS is made obligatory for sub national government to feed into the sub national development plan (*Rencana Pembangunan Jangka Menengah Daerah/RPJMD*)

Government regulatory frameworks on environmental management. These processes and documents have informed the development of the ERP supported by the World Bank.

An initial identification of potential risks, impacts, and proposed mitigation measures has been conducted. SESA and ESMF have been developed based on the risks identified from the initial SESA process and other earlier assessments and consultations. Relevant risks, impacts and mitigation measures as part of safeguards requirements are aligned with the analysis of the drivers of deforestation and degradation and subsequently, informed the design and selection of program components, sub components and activities included in the ERP. Capacity building on the SESA and ESMF has also been identified and budgeted as part of the ER program component activities under the program management. Some of the identified challenges that may impact on safeguards are related to capacity and resource constraints which affect oversight ability amongst program entities, incentives for compliance and reporting of safeguards performance to the SIS-REDD+, lack of awareness of the broader REDD+ program, and safeguards requirements at the local and community levels.

14.2.1.2 The Natural Habitat (OP 4.04)

The Natural Habitat (OP 4.04) is one of the major concerns of Indonesia's ERP with more positive than potential negative impacts on natural habitat. The overall ER Program aims at maintaining and restoring natural habitat since degradation and deforestation in areas with HCV are major contributors to emissions. These measures will facilitate positive impacts that include, among others: restored and better maintained biodiversity, environmental services and ecosystems; reduced deforestation and increased carbon uptake; reduced degraded land; better protected forest areas and wildlife habitats; decreased fire hotspots; enhanced ecosystems; reduced GHG emissions; reduced possible risks of changes in physical and chemical properties of the soil; more appropriate measures for post-mining reclamation and revegetation; better assurance for well qualified reclamation; and enhanced ecosystem sustainability. These are in line with the current Government regulatory frameworks on biodiversity, such as Law No 11/2013 on the ratification of the Nagoya Protocol of the Convention on Biological Diversity. Spatial analysis show that the proposed ER areas (forest and palm oil concessions) are overlapping with key biodiversity areas, and habitat of the endangered Orangutan (*Pongo Pygmaeus*).

The possible risks of lack of acceptance is anticipated from community members and companies on sustainable management practices and District Governments and/or businesses which could have a negative impact on natural habitats. The lack of buy-in may be due to lack of awareness and limited capacity of the local community on the pertinent issues of sustainable management practices, spatial planning, and low emission development planning. These issues will be addressed through IEC and capacity building. Intensive training, coaching and mentoring in the planning processes will be ensured throughout ERP implementation. Incentive schemes for companies and smallholders/farmers to adopt sustainable management practices will be envisaged for mitigating this issue.

14.2.1.3 Indigenous Peoples and Indonesia's Adat Communities (OP 4.10)

The policy is triggered since the activities under the ERP will be implemented in areas claimed by communities who can be categorized as Indigenous Peoples as per-OP 4.10 and therefore,

may have impact on their claims and access to land and natural resources. The Indonesian legal regulatory frameworks generally refer such communities as “*Masyarakat Hukum Adat*” or “*Masyarakat Adat*” (or *Adat Communities*)³⁴. Identification of such communities in the current country systems uses similar characteristics as described in OP 4.10 (see table 14.4). The Gol acknowledges the presence of *Adat Communities* and their rights, provided that groups meet these and other eligibility requirements (further elaborated in the Ministry of Home Affairs’ regulation no. 52/2014). Their existence must subsequently be legally recognized (i.e. through district regulations/decrees) before their land claims and rights can be processed for further legal recognition. This district recognition process sets the initial condition for subsequent recognition processes, including land rights.

Laws and regulations relevant to *adat* communities include Law No 32/2009 on Environmental Protection and Management; Law No 19/2004 on Forestry, Law No 18/2013 on Prevention and Abolition of Forests Destruction; Ministerial Regulation of the Ministry of Home Affairs No 52/2014 on the Guidelines for the Recognition and Protection of *Adat Community* and Presidential Regulation No. 88/2017 on Land Tenure Settlements in Forest Areas.

Table 14.6. The WB Criteria on Indigenous People (IP) and Gol’s Conformity

Characteristics of Indigenous Peoples based on OP 4.10	Gol’s <i>Masyarakat Adat</i> ¹	Note
<ul style="list-style-type: none"> Vulnerable due to distinct circumstances and dependence on land and natural resources 	Applies to a sub-set of <i>Masyarakat Adat</i> categorized as Isolated <i>Adat Communities</i> (or known as <i>KAT/Komunitas Adat Terpencil</i>)	Vulnerability is not a determining factor for land rights and other rights that follow, but rather serves one of the targeting criteria for social assistance and development programs.
<ul style="list-style-type: none"> Self-identification and recognized by others 	In the process of gaining legal recognition from the government, self-identification as <i>Adat</i> is subject to verification and validation by a verification team (<i>Tim IP4T/Tim Inventarisasi Penguasaan, Pemilikan, Penggunaan dan Pemanfaatan Tanah</i>) established by district heads. As part of such verification process, communities concerned need to be recognized	The current guideline is set out in the Ministerial Regulation of Home Affairs No. 55/2014 which governs recognition of <i>Adat</i> community existence. This process is often understood as the first step for subsequent land right recognition.

³⁴ Relevant regulatory frameworks include Law No. 32/2009 on Environmental Protection and Management, Law No.41/ 1999 (further revised to Law No 19/2004) on Forestry, Law no 18/2013 on Prevention and Abolition of Forests Destructions, Presidential Instruction No 88/2017 on Land Tenure Settlements in Forest Areas, and Ministerial Regulation of the Ministry of Home Affairs No 52/2014 on the Guidelines for the Recognition and Protection of *Adat Community* and most recently the Presidential Regulation No 88/2017 on Land Tenure Settlements in Forest Areas.

Characteristics of Indigenous Peoples based on OP 4.10	Gol's <i>Masyarakat Adat</i> ¹	Note
	by others backed with evidences for such recognition.	
<ul style="list-style-type: none"> • Collective attachment to geographically distinct habitats or ancestral territories and its natural resources 	<p>Collective attachment as per OP 4.10 is further defined into:</p> <ul style="list-style-type: none"> • living in groups, in the form of associations (<i>paguyuban/rechsgemeenschap</i>); • adherence to customary law that has a clear jurisdiction and specific customary law court/process; • maintenance of ancestral connection; • strong connection with land and environment, especially for daily life sustenance; • occupation in a certain territory for generations. 	Equivalent
<ul style="list-style-type: none"> • Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture. 	<ul style="list-style-type: none"> • specific/distinct economics, politics, social and cultural value systems that are still practiced and respected 	Equivalent
<ul style="list-style-type: none"> • An indigenous language, often different from the official language of the country or region 	Not specified/required for legal recognition	The widespread use of Bahasa Indonesia as a lingua franca has contributed to gradual erosion of local languages and dialects. Since Indigenous language is not a requirement, the current Gol's frameworks have a broad coverage for their application
<ul style="list-style-type: none"> • A group that has lost "collective attachment to geographically distinct habitats or ancestral territories in the project area due to forced severance. 	Not specified	The current frameworks for <i>Adat</i> communities are tied to land and resource claims, which may consequently present barriers for communities with no ancestral/territorial claims from being recognized as <i>Adat</i> communities.

Characteristics of Indigenous Peoples based on OP 4.10	Gol's <i>Masyarakat Adat</i> ¹	Note
¹ In accordance to the relevant Law that stipulates <i>adat</i> community: (a) Law No 32/2009 on Environmental Protection and Management; (b) Law No 19/2004 on Forestry, (c) Law No 18/2013 on Prevention and Abolition of Forests Destruction; (d) Ministerial Regulation of the Ministry of Home Affairs No 52/2014 on the Guidelines for the Recognition and Protection of <i>Adat</i> Community, (e) Presidential Regulation No. 88/2017 on Land Tenure Settlements in Forest Areas.		

The Gol acknowledges the presence of Adat Communities and their rights, provided that groups meet these and other eligibility requirements (further elaborated in the Ministry of Home Affairs' regulation no. 52/2014). Their existence must subsequently be legally recognized (i.e. through district regulations/decrees) before their land claims and rights can proceed further to legal recognition through a verification and validation processes conducted by the locally established Adat Committee, in coordination with other relevant entities such as the IP4T Tim (*Tim Inventarisasi Penguasaan, Pemilikan, Penggunaan dan Pemanfaatan Tanah*). In EK Province, the Adat Committee team is regulated under the Governor's Regulation No 1/2015. At the moment, there are 4 Adat communities already obtained their legal presence and received Adat land entitlement. These are Hemaq Beniung, Kekau, and Hemaq Pasoq in the district of Kutai Barat, through the issuance of Kutai Barat district regulation No 9/2014, and Mului in Paser District through the issuance of a Decision Letter No SK.413.3/2018 (see also Section 4.4).

The ESMF applies to all communities with Indigenous Peoples characteristics³⁵ regardless of the presence of legal recognition and therefore, the provisions of the OP 4.10 apply to address potential risks and protect the rights of these groups in the ERP implementation. The ESMF encompasses two inter-related processes to address OP 4.10 policy requirements. First, at the participation level, the application of the ESMF will not be conditional upon *Adat* recognition and therefore, will allow broader groups participating in the ER program, including other communities who possess characteristics as per-OP 4.10. Requirements for screening and free, prior and informed consultations to obtain broad community support will be applicable prior to implementation of ER activities where Indigenous Peoples' claims exist. At the benefit sharing level, eligibility requirements will be defined based on the types of ER activities and whether or not such activities are tied to land and resource claims. In addressing tenure settlements for Adat communities and other forest dependent people, the Gol's regulatory frameworks, particularly

³⁵ In conjunction with OP 4.10, the term Indigenous Peoples in this document is used in a generic sense to refer to a distinct, vulnerable, social and cultural groups with the following characteristics in varying degrees: a) self-identification as members of a distinct indigenous cultural group and recognition of this identity by others; b) collective attachment to geographically distinct habitats or ancestral territories in the project area(s) and to the natural resources in these habitats and territories; c) customary, cultural, economic, social or political institutions that are separate from those of the dominant society and culture; and d) an indigenous language, often different from the official language of the country or region.

the Presidential Regulation No 88/2017 on Land Tenure Settlements in Forest Areas (PPTKH), will prevail.

In the context of ERP, tenure recognition for *Adat* communities is critical not only to protect the rights of these communities but also to define benefit sharing entitlements. *Adat* communities who are not legally recognized or currently in the process of obtaining legal recognition may have limited access to participate in and benefit from the program. There are also potential risks that conservation efforts supported by the ER program may adversely impact on these communities' access to land use and natural resources in the absence of legal protection of tenurial claims. Furthermore, existing schemes for forest tenure settlements³⁶ e.g. social forestry and TORA (land distribution) may, in some cases, not be accessible to *Adat* communities due to the lack of legal personality and the absence of legal recognition by Gol.

Depending on where *Adat* claims are located (i.e. forest and non-forest areas), tenure settlements for *Adat* claims are handled by MoEF and the Ministry of Agrarian and Spatial Planning/Land Agency (ATR/BPN) as respective custodians of respective forest and non-forest lands. Recognition of communal land rights is currently regulated under the Ministerial Regulation of ATR/BPN No. 10/2016. Under the regulation, district land offices play an important role in determining the legal status of *Adat* communities concerned. *Adat* communities submit a preliminary application to the District Land Office following which the process for determining communal rights is triggered and procedures for determination of communal rights on customary land will be launched. On the basis of the report prepared by a team of government officials representing key ministries (known as IP4T teams) following their field verification, land tenure settlements will be handled depending on the status of the land claimed. If such claims are located within the Forest Areas³⁷, the IP4T will hand over the verification results to the MoEF in order for the claimed parcels to be released from the Forest Areas. If the land claimed is located within non-forestry concession areas (e.g. HGU), the IP4T will request the license holders to enclave the land parcels claimed and release them from the HGU areas. The granting of communal land titles by ATR/BPN will be subject to MoEF and HGU owners' willingness to release parts of their territories claimed by *Adat* communities from the Forest Areas. For *Adat* communities to be eligible to communal right titles, formal recognition of their existence as *Adat* (by district governments) is required as regulated in the Ministry of Home Affairs' regulation no. 52/2014.

Recognizing possible constraints that *Adat* communities may face in participating in the ER program, facilitation and engagement with *Adat* communities will need to be tailored to enable these communities to benefit from the program. Poverty and population pressures³⁸ amongst

³⁶ As currently governed in the Presidential Regulation No. 88/2017 on Land Tenure Settlements in Forest Areas (PPTKH)

³⁷ In May 2013 the Constitutional Court ruled that *Adat* forests are not part of the State forest (*Kawasan Hutan*). This Court decision modified the sub-classification of what was known as Forest Areas as: Titled Forests (*Hutan Hak*), and State Forests (including concessions, village forest programs as *Hutan Desa*, and *Hutan Hak*, those areas held by *Adat* communities). This decision further implied that *Adat* forests, wherever legally recognized, would be assumed to be the collectively owned forests of Indigenous Peoples and *Adat* communities i.e. part of the Titled Forests category

³⁸ Rural areas in Indonesia have a consistently higher rate of poverty than in urban areas (14.7% compared to 8.5% respectively). Six million of the 32 million people that live in and around forest areas are poor. The

forest-dependent communities are considered drivers for forest degradation due to unsustainable extraction of natural resources and encroachment. In response to these risks, the ER program seeks to facilitate social forestry schemes for forest dependent communities, including Adat communities as well as resolution of land tenure disputes through a participatory process (i.e. as guided by PPTKH). Enabling these communities to access secure land tenure, as well as facilitation and capacity building for sustainable forest-based livelihoods, is expected to relieve anthropogenic pressures on forest resources.

The ER Program concedes the possible risks of some parts of the Accounting Area to be subject to significant conflicts or disputes related to contested or competing claims or rights, and if critical may hamper the successful implementation of the ER Program. Such conflicts or disputes have been and are proposed to be addressed through adopting the tenurial conflict resolution mechanism as identified in the following section 14.3 on FGRM. There are several regulatory frameworks available for tenurial conflict resolutions at both national and provincial levels. These include the Joint Agreement of East Kalimantan Provincial Government, National Land Agency office at EK Province (BPN Kaltim), Forest Determination Section (*Balai Pemantapan Kawasan Hutan*) of MoEF, and East Kalimantan Regional Police for the Prevention and Handling of Overlapping Land Use Permits in East Kalimantan Province, issued on January 25, 2013, (No. 110/1317 / BPPWK.A / I / 2013, B / 02 / I / 2013, B6 / Memo-64 / I / 2013, and MCC.45 / BPKH / IV / 2013) and the joint regulation of the Ministry of Home Affairs (MoHA), MoEF, Ministry of Public Infrastructure, and the National Land Agency on the Procedures for The settlement of Land Ownership in Forest area (Nomor 79/2014, PB.3/MENHUT-II/2014, 17.PRT/M/2014, 8/SKB/X/2014; Permen ATR/BPN No. 10/2016).

The ESMF incorporates an Indigenous Peoples Planning Framework (IPPF), leading to an Indigenous Peoples Plan (IPP), to ensure that the ER activities follow the policy requirements including free-prior and informed consultation leading to broad community support and provide facilitation to assist tenure recognition. The IPPF acknowledges the right of forest-dependent communities to effectively participate in the Program and recognizes their potential contributions to emission reductions. To ensure this, at a minimum the framework requires ERP implementing agencies to consult forest-dependent communities in good faith regarding matters that affect them with a view to agreement. As required under OP 4.10, the ERP will ensure that the ER Program entities engage in a process of free, prior and informed consultations to secure broad community support if activities are being implemented and/or potentially affect forest dependent communities, including Indigenous Peoples and Masyarakat Adat. The IPPF provides a guideline for such consultations.

The free-prior and informed consultation will be conducted with the overall stakeholders in the ERP areas, including the IP and Adat Community. The GoI is committed to conduct the consultation in such a manner that demonstrates efforts, appropriate to the scale and intensity of activities, towards obtaining the free, prior and informed consent (FPIC) of IP and Adat

households in the forest areas have limited access to services and are heavily reliant on natural resources. In these regions and in Indonesia more broadly, forestry-based activities and industries (e.g., timber harvesting, pulp and paper processing, furniture making) are an important source of growth and employment. In addition, several million people are employed in managing small-scale agro-forestry systems (FIP-2 Program Appraisal Document).

Communities potentially affected by the ERP. Included in the consultations is, among others, the identification of ERP activities that have impacts on and/or need the involvement of IP and Adat Communities. The consultation process will also seek communities' understanding and aspirations with regards to their involvement in the ERP.

Recognizing that some of these groups are vulnerable and marginalized, the main objective of the IPPF is to help ensure that carbon emission reduction initiatives are designed and implemented in a manner that promotes meaningful participation of Indigenous and *Adat* communities as well as respecting their identity, human rights, dignity, livelihoods and belief systems. The IPPF will include provisions for the development of specific plans for activities within communities that are affected by the ER-Program, and will ensure that the potential benefits are considered along with risks and impacts that will be managed through avoidance and mitigation measures specific to the issues identified. The IPPF will require program entities to ensure that affected communities have complete understanding of the project impacts and receive a meaningful opportunity to participate in planning activities and decision making that affect them. Capacity-building components as well as M&E measures will be considered in the IPPF.

As informed by various analyses of risks as well as constraints due to lack of legal recognition, the ERP seeks to support tenure protection and recognition of *Adat* and other forest dependent communities to enable them to meaningfully participate in the Program. Such efforts will be mobilized at two levels. First, under policy reform and development of REDD+ enabling environments (Component 1), efforts will be mobilized by East Kalimantan Provincial and District Governments to expedite legal recognition processes of *Adat* communities and land dispute settlements. The ER program will support further development of regulatory frameworks relevant to *Adat* communities such as the current initiative on the development of cross-sectoral conflict resolution, mediation on tenurial conflicts in forest areas, and assessment of tenurial conflicts and community forestry. Second, at a specific intervention level, the ERP aims to strengthen forest-dependent communities to engage in sustainable forest management through community facilitation in social forestry schemes and forest partnership. Several schemes that will be supported under the ERP to strengthen community tenure and technical assistance in sustainable forest management include *hutan adat* (customary forest) as a form of ownership titles and a range of forest use permits including a) Village Forest (*hutan desa*), b) Community Forest (*Hutan Kemasyarakatan*), c) Community Forest Plantation (*Hutan Tanaman Rakyat*), and d) Partnership Forest (*Kemitraan*). As outlined in Subsection **Error! Reference source not found.** conflict handling mechanism processes will be created and adopted. As much as possible, conflicts should be resolved through mediation processes. Should a mutually agreed resolution not be achieved, a legal action may be opted. However, legal action should be the last resort and consensus approach should be prioritized.

The GoI has been proactive in identifying and documenting *Adat* communities, with support from Civil Society and Non-Government organizations, such as AMAN (Indigenous Peoples Alliance of the Archipelago). However, further efforts will still be needed to develop comprehensive documentation of *Adat* communities, including their claims and existing tenurial conflicts with other communities, companies (especially mining companies) and the Government, and subsequent recognition and protection of their rights. Such efforts are expected to be addressed with the implementation of Presidential Regulation No. 88/2017 on PPTKH and be conducted in tandem with the implementation of the FGRM and land dispute settlements (further

described in the following Subsection **Error! Reference source not found.**). Community engagement in the handling of forest tenure conflicts will be strengthened by: a) developing and adopting the minimum standards for gender mainstreaming and inclusive community participation, b) establishing community-based early warning mechanisms to identify and respond to conflicts and c) providing training to paralegals specializing on tenurial rights and local dispute mediators to facilitate community-based conflict resolution.

14.2.1.4 Involuntary Resettlement (OP/BP 4.12)

OP 4.12 is triggered when there is a possibility that the ER Program activities may restrict the access of forest dependent communities in nature reserves and/or other protected areas as a result of formalizing forest boundaries and zones within FMUs. The project will not require land acquisition, which would result in direct involuntary resettlement and/or livelihoods displacement. There is a risk that the ER program may exacerbate and affect existing disputes over land rights if no sufficient community participation and dispute mediation is in place during program implementation. The ER Program will seek to establish participatory approaches in forest boundary demarcation and tenure settlements. Under Component 2.1 (Strengthening administrative capacity of FMUs), the GoI is committed to providing support through FMUs to create alternative livelihoods such as social forestry schemes and forest-partnerships (*Kemitraan*) with forest-dependent communities within and surrounding FMU areas. Implementation of Presidential Regulation No. 88/2017 on PPTKH defines that the resettlement will be considered if forest area is less than 30% of the provincial area.

Increased land and forest tenurial conflicts have been and will continue to be a major concern for the success of the ER Program. Such conflicts often involve Adat communities who have claims before establishment of Forest Areas (*Kawasan Hutan*) and issuance of forest concessions. Since 2012, Indonesia has mobilized significant efforts to identify existing tenurial and other land use and forestry related conflicts, as well as develop relevant policies and regulatory frameworks. The ER program will take into account an indicative tenurial conflict map that the GoI has developed, with an inventory of around 201 conflicts, mostly in Sumatera (60.7%) and Kalimantan (16.4%).³⁹ Such identification is currently on-going to further identify tenurial conflicts in the forest areas through a joint assessment between the Government and communities, including *Adat* communities and identify ways forward to settle conflicts through consensus.

The ESMF developed under the ER Program will incorporate a Resettlement Policy Framework (RPF) and Process Framework (PF) to mitigate potential resettlement and access restriction risks resulting from forest tenure settlements and boundary demarcation supported by the ERP. The ESMF will be built on the current GoI's frameworks on forest tenure settlements,⁴⁰ and will seek

³⁹ MoEF power point presentation at the FGRM workshop for the development of ERPD, 8 March 2018

⁴⁰ The refinement of community based conflict handling mechanisms will be conducted with adherence to relevant regulatory frameworks for addressing tenurial conflict are, among others, Law no 7/2012 on social conflict management, MoEF Ministerial Regulation No P.32/Menhut-Setjen/2015 on Forestry Rights, MoEF Ministerial Regulation No 84/Menlhk-Setjen/2015 on Forestry Tenurial Conflict Handling, MoEF Ministerial Regulation No 83/Menlhk-Setjen/2016 on Social Forestry, MoEF Ministerial Regulation No 34/Menlhk-Setjen/2017 on the protection of local wisdom in natural resources and environmental management. MoEF Ministerial Regulation No 83/Menlhk-Setjen/2016 on Social Forestry.

to address any gaps, particularly with regards to free, prior and informed consultations with affected parties, compensation and livelihoods restoration.

The governing framework for the handling of tenure settlements in the Forest Areas (PPTKH) is set out in the Presidential Regulation No. 88/2017. The Presidential Regulation No. 88/2017 sets out several measures to address forest occupation and/or encroachments depending on the functions of the forest estates concerned (i.e. conservation, protection and production), as outlined in the following table (**Table 14.7**):

Table 14.7. Options for Land Tenure Settlements within the Forest Estates

Options	Conditions/requirements
Occupation and/or encroachment before the designation of forest estates (<i>penujukan</i>)	
Land parcels/part of parcels to be enclaved and excised from the forest estates	<ul style="list-style-type: none"> - Land in question has been occupied and/or titles have been granted prior to the designation of forest estates;
Occupation and/or encroachment following the designation of forest estates (<i>penujukan</i>)	
Land parcels/part of parcels to be enclaved and excised from the forest estates	<ul style="list-style-type: none"> - Occupation for settlement purposes and/or establishment of public and social facilities in areas no longer classified as protection or conservation zones. - Land in question has been utilized for agricultural purposes for more than 20 consecutive years <p>Note: Enclaved land parcels could be subject to the Land Distribution Schemes (TORA) and registration, including titling is to be processed through PTSL.</p>
Land swap	Occupation for settlement purposes and/or establishment of public and social facilities in areas no longer classified as protection or conservation zones (applies to provinces whose forest cover equals to or is less than 30% of the total size of watersheds and/or land masses within provincial administrative jurisdictions)
Social forestry schemes	Land in question has been utilized for agricultural purposes for less than 20 years. These schemes apply to provinces whose size of the forest estates equals to or is less than 30% of the total size of watersheds and/or land masses within provincial administrative jurisdictions regardless of the length of occupation.
Resettlement	<ul style="list-style-type: none"> - Land in question is classified within the conservation zone regardless of the use (e.g. settlements, agricultural purposes and other land uses);

Options	Conditions/requirements
	<ul style="list-style-type: none"> - Occupation for settlement purposes and/or establishment of public facilities in protection forests. <p>Note: In provinces whose size of forest estates equals to or is less than 30% of the total size of watersheds and/or land masses within provincial administrative jurisdictions, resettlement options can also be applied to forest occupation for settlement purposes and/or establishment of public and social facilities in production forests under the discretion of MoEF.</p>

Unlawful resettlement for informal settlements on State Lands is prohibited under the current laws. Under the PPTKH scheme described in Table 14.5, land in question must be free from any encumbrances and/or disputes with other parties. The schemes offered for tenure settlements can only be enforceable when land disputes have been settled through a separate process (e.g. mediation and/or court resolution). The government agencies involved are prohibited from enforcing evictions, criminalizing land claimants, closing access to land, and/or imposing any forms of access restrictions during the implementation of forest tenure settlements. These requirements would enable investments in community facilitation and engagement, to which the GoI is committed to providing further support and facilitation under the ERP. The ESMF will ensure that resettlement will only be enforced when other options have been exhausted, and the ERP will ensure that action plans that satisfies key requirements of OP 4.12, OP 4.11 as well as OP 4.10 for Indigenous Peoples are in place and consulted broadly with affected parties before any action with resettlement and/or access restriction impacts can be carried out.

Introduction of sustainable livelihood practices (e.g. settled cultivation, no burning practices) may have potential risks of restricting forest dependent communities' access to livelihoods. In addition to the requirements in the RPF and PF in the ESMF, the GoI is committed to putting in place enabling environments for these communities to effectively engage in sustainable NRM practices, including various capacity building and facilitation activities, access to inputs, technology, finance, and markets, and improvements in the regulatory frameworks to accelerate the implementation of social forestry schemes through sub-component 4.3. Over the longer term, the ER Program is expected to enhance local communities' access to sustainable livelihoods as well as tenure security, which serve as the building blocks to sustainable NRM. Mobilization of resources through corporate social responsibility (CSR) from companies will also be sought to leverage existing initiatives, in conjunction to incentive schemes for farmers and smallholders that will be established under the program.

14.2.1.5 Physical Cultural Resources (OP/BP 4.11)

This policy is triggered because it is possible that ER-P interventions may indirectly affect areas and/or access to areas/objects (both tangible and intangible) that are regarded as sacred sites by local communities. If these sacred sites are located in protected forest areas, this project may restrict local communities' access to the sacred sites and negatively impact their perception of ownership. Existing physical and cultural resources that may be affected will be further identified

and explained in the SESA and ESMF. In these cases, the local community will be engaged in seeking an agreement on the use and ownership of these physical and cultural resources.

The Indigenous Peoples policy and regulatory frameworks on *Adat* communities are strongly linked and provide assurances on the protection and restoration of both intangible and physical cultural resources. The existing mechanism for protecting and restoring cultural heritage will be maintained and if necessary, further strengthened to ensure the protection and avoidance of degradation of physical cultural resources that may include forests themselves. Necessary measures to meet the provisions of OP/BP 4.11 will be implemented through intensive engagement with potentially affected communities, including *Adat* communities. The GoI is committed to mainstreaming key principles of Free Prior Informed Consultation throughout the ER program, that will facilitate in maintaining physical cultural resources. Existing physical cultural resources in the program area and strategies to maintain them will be further identified in the SESA and ESMF. A Physical Cultural Resource Management Framework, which also covers intangible cultural resources will be prepared as part of the ESMF.

14.2.1.6 Forests (OP/BP 4.36)

The program supports reductions in deforestation and forest degradation, leading to positive impacts on the health and quality of forests in the program area. **This policy is triggered since the program may enforce protected forest boundaries that impact access of forest dependent communities. Potential impacts and proposed mitigation measures will be included in the ESMF.**

The Government of Indonesia clearly outlines the policy on pro-growth, pro-job, pro-poor, and pro-environment development (La no. 17/2007 on Long Term National Development Planning). **The management, conservation, and sustainable development of forest ecosystems and their associated resources are thus treated as essential for lasting poverty reduction and sustainable development. Indonesia's Constitution also ascertains the GoI's full mandate in natural resource management and utilization, with people's wellbeing at the core. GoI has put serious efforts into ensuring favorable results of development and investments to both people and the environment. Forestry relevant regulatory frameworks and measures have been developed for this purpose. Some examples include, among others, the development of Rencana Aksi Nasional penurunan Gas Rumah Kaca (RAN-GRK) or the National Action Plan on the reduction of carbon emission, Sistim Registrasi Nasional (SRN) or the National Registry System, which was developed in early 1990s and further developed into a GHG inventory system, as well Indonesia National Carbon Accounting System (INCA).** These frameworks were developed based on evidence and placed people-centered approaches at the core. The GHG inventory system, for instance, serves as a diagnostic tool by enabling the GoI to map emission sources and identify possible underlying causes that, among others, relate to poverty issues through which appropriate mitigation measures can be developed.

The policy on Forests (OP 4.36) requires that the REDD+ program interventions that are supported by the WB ER Program follow third-party certification standards for commercial forestry operations that may be involved while small-holder forestry is subject to development

of time-bound plans seeking to achieve the standards of the policy. Key requirements of OP 4.36 will be further elaborated in the ESMF.

The interim findings of SESA identify that limited access to livelihoods due to environmental degradation, climate change resulting in lack of predictability of seasonal changes, and tenure conflicts has encouraged communities to engage in unsustainable practices in the utilization of forest resources. Volatility in commodity prices, such as rubber, has also incentivized farmers to switch to oil palm. Furthermore, limited access to inputs and technology has also encouraged people to continue slash and burn practices. Illegal logging and other unsustainable harvesting of forest products have continued to be sustained due to a combination of factors, which include incentives for “quick cash”, existence of accessible markets/traders, lack of skills and workforce on sustainable based livelihoods, which are often associated with brain drains (i.e. outmigration of young people to urban centers). The GoI has continued to pursue law enforcement to crack down on illegal timber operations in various locations in East Kalimantan.

The ER Program, GoI seeks to support sustainable community livelihoods through a) provision of skills development on entrepreneurship and business opportunities for sustainable timber and non-timber forest products (NTFPs), b) facilitating networks building and business partnership and cooperation and c) social forestry schemes. The National Medium-Term Development Plan for 2015 – 2019 allocates 12.7 million hectares for social forestry purposes, where communities are granted use and management rights to government-owned protection and production forest areas. There are several government-sponsored or formal social forestry schemes, including community forest (*hutan kemasyarakatan*), village forest (*hutan desa*), and community plantation forest (*hutan tanaman rakyat*), as well as forests allocated for partnerships between state-owned companies and private communities (*kemitraan*). In addition, there are private forestry schemes in the forms of customary forests (*hutan adat*) and smallholder forests (*hutan rakyat*). Current progress in social forestry consists of establishing social forestry permits. From the total social forestry allocation of 239,972.64 ha, 132,308.101 ha (55%) has been licensed under various social forestry schemes

Under the social forestry schemes, the provisions of forest use rights to local communities represent the first step towards improvements in sustainable NRM. The GoI is committed to putting in place enabling environments for these communities to effectively engage in sustainable NRM practices, including various capacity building and facilitation activities, access to inputs, technology, finance, and markets, and improvements in the regulatory frameworks to accelerate the implementation of social forestry schemes through sub-component 4.3. Over the longer term, the ER Program is expected to enhance local communities’ access to sustainable livelihoods as well as tenure security, which serve as the building blocks to sustainable NRM. Mobilization of resources through corporate social responsibility (CSR) from companies will also be sought to leverage existing initiatives, in conjunction to incentive schemes for farmers and smallholders that will be established under the program.

Limited buy-in, capacity, awareness and trust, including from district government and private entities, may hamper the implementation the ER Program’s particular components of sustainable management practices, spatial planning and low emission development planning. This is perceived as a program governance risk that will need to be addressed prior and over the

course of ER-P implementation. Strengthening IEC activities and technical assistance to key agencies and village government in areas such as participatory village development, low emission spatial plan development, alternative livelihoods, etc. will be provided under the program. This will be coupled with intensive training, coaching and mentoring in the planning processes throughout ER-P implementation. Incentive schemes for companies and smallholders/farmers under the benefit sharing arrangements for those who have adopted sustainable management practices will be developed to attract participation and retain commitments.

14.2.1.7 Leakage and Displacement

Indirect E&S risks around leakage and reversal prevention will be addressed in conjunction with support to community welfare and livelihoods, access rights to use of land and natural resources, protection of local wisdom, and gender equality and social inclusion (e.g. participation of Indigenous Peoples and Adat communities as well as marginalized and vulnerable groups). Addressing these issues is expected to feed into, and subsequently enhance the program's benefit sharing mechanisms, forest governance, including prevention of leakage and reversals, transparency and accountability. Interlinkages amongst these initiatives have been observed in the ERP design. Synergy and coordination between national, provincial and district levels for safeguards management will continue to be defined and strengthened as the ER Program is being prepared and implemented.

Additionally, downstream risks such as displacement/leakages and reversals are considered:

Displacement/leakages: may emerge as risks attributed mainly to governance risks (i.e., regulatory aspects) that cannot restrict the expansion of timber/palm oil/mining concessions to compensate for HCV allocation. Conventional practices (rather than the sustainable ones) in expansion areas of forest or palm oil concessions may constitute the risk of leakages; and

Reversals: may be produced as the results of governance risks such as lack of regulation enforcement to ensure sustainable forestry or plantation management, and lack of regulations on benefit sharing mechanism. Other issues that may constitute reversals are lack of participation in controlling fire, and tenurial conflicts (e.g., overlapping land use)

14.2.1.8 Gender and Inclusive Development

Forest management and land tenure processes tend to be male-dominated and/or led in Indonesia. Key institutions that govern forest management in Indonesia tend to employ fewer women than men. This is despite the fact that women tend to be more dependent on forests and play a critical role in collecting and using forest products than men to meet their family's daily needs. In addition, although regulatory frameworks (such as in community participation, marital property and inheritance) in Indonesia are not discriminatory towards women, challenges with regards to local practices and access still persist. Limited women's participation is in part attributable to cultural factors and religious beliefs which do not enable/allow women to be outspoken, as well as household burdens which often restrict mobility and participation of women. There is widespread lack of understanding that has led to misunderstanding within communities, particularly women, and amongst village leaders regarding the possibility and

benefits of joint titling of land and property rights. This is coupled with the prevailing conservative attitude in the land offices and lack of field staff orientation, thus resulting low demand from women to register land titles under their names. Available data suggests that only close to one-third of the land titles are formally owned by women either individually or jointly with their spouses (Asian Development Bank, ADB, 2016). Excluding woman's names on the title renders women vulnerable to having their rights denied. In the case of divorce, abandonment, or separation, they may be left with nothing. Separated and divorced women for example cannot claim their husband's land, nor can widows and women-headed households apply for inheritance.

In the context of public participation, inclusive participation remains a challenge, with village development planning consultative meetings (*Musyawarah Perencanaan Pembangunan Desa/Musrenbangdes*) are often dominated by village elites and men, leaving marginalized and vulnerable group, including *Adat* community and women behind. Addressing this issue is vital, considering the current implementation of Village Law⁴¹ -- particularly on village funds -- presents an important opportunity for mainstreaming low carbon emission initiatives, conservation efforts and sustainable livelihoods at the village level. Village governments are responsible for administering village funds (*Dana Desa* and *Alokasi Dana Desa*) and accommodating community needs through democratic processes (hamlet and village deliberations). Under the framework of the Law, villages now have the autonomy to determine development based on their own understanding and needs through participatory process from the hamlet to the village level. *Musrenbangdes* (hamlet deliberation) was often perceived by villagers, especially women, to be more participatory and receptive to proposals from various community groups. This is, however, not the case of *Murenbangdes* (village deliberation) where men and village elites usually dominate the meeting. Through this deliberation process, a long list of proposed activities will be produced by each hamlet and subsequently short-listed and competed with other hamlets during *Musrenbangdes* (village deliberation). During village deliberations, women's interests and needs are often at risk of being disregarded due to lack of participation and voice. The winning proposals will form the basis for the development of the village government work plan (*Rencana Kerja Pembangunan Desa/RKPDDes*). Following the finalization of RKPDDes, APBDes (*Anggaran Pendapatan dan Belanja Desa*/village budget plans) will be developed once indicative ceilings of village funds have become known.

In addressing gender and inclusive development issues particularly for the vulnerable groups and *Adat* communities, the GoI acknowledges that mainstreaming gender and social inclusion are key to ensuring ER program sustainability. Such political commitments have been translated into legal and budget commitments with the issuance of relevant regulatory frameworks and adoption of gender responsive planning and budgeting, as stipulated in the joint decree

of the Ministry of Home Affairs (MoHA), Ministry of Finance (MoF), Ministry of Women's Empowerment and Child Protection (MoWE-CP), Ministry of National Planning/Bappenas on the National Strategy on Gender Responsive Planning and Budgeting (NOMOR: 270/M.PPN/11/2012 NOMOR: SE-33/MK.02/2012 NOMOR: 050/4379A/SJ NOMOR: SE 46/MPP-PA/11/2012) and MoF's Regulation on the guidance for the development and review of annual workplan and budget of line ministries (No 94/PMK.02/2017) the requires gender budget statement. Indonesia has adopted a twin track policy for gender mainstreaming and women's empowerment. Included in the relevant policies and legal frameworks include among others: gender budgeting, gender-

⁴¹ The new Village Law was issued in January 2014, replacing the previous Law No. 32 of 2004 on Regional Autonomy. The Village Law incorporates a number of key Community Driven Development (CDD) principles and institutions, including participatory village planning, implementation of village-level projects, inter-village collaboration, community facilitation and community oversight.

disaggregated data, and women empowerment program. Such a policy is to ensure that gender equality concerns are well integrated and addressed in the country development frameworks.

The ER Program seeks to mainstream gender-sensitive and inclusive development approaches to address gender and exclusion issues in the NRM. These include (a) ascertaining the equal participation and active engagement of women as well as vulnerable and marginalized groups in the process of consultations and overall ERP implementation, (b) ensuring that the design and implementation of the ERP seek to promote “better off” conditions for women as well as vulnerable and marginalized groups, (c) ensuring gender equality and social inclusion concerns are well addressed in the IPPF to address Indigenous Peoples concerns as well as RPF and PF to address resettlement and access restriction risks. A minimum standard for gender mainstreaming and social inclusion will be developed in consultation with all relevant stakeholders prior to ERP implementation.

14.2.2 Analysis of Potential Environmental and Social Risks and mitigation measures

14.2.2.1 Key Social and Environmental Risks and Mitigation Measures

The Strategic Environmental and Social Assessment (SESA) exercise has provided context-specific information on environmental and social risks, as well as the associated impacts, and mitigation actions for ERP in East Kalimantan Province.

Potential key environmental risks identified in the SESA include loss of natural habitats and key biodiversity species at areas designated as non-forest and/or through indirect introduction of invasive species, contamination of soil and water, and health risks associated with the use of pesticides and as result of poor waste management practices, successes in reducing impacts on forests could lead to displacements of these impacts to other areas.

Potential key social risks identified in the SESA include risks associated with activities conducted in areas under existing and potential conflicts and/or disputes or areas with overlapping boundaries and/or claims, between customary and common/formal laws and processes and in areas with competing claims especially with concessions, livelihoods impacts including displacement due to bans on timber logging, oil palm plantation and artisanal mining activities, community and health safety risks for fire prevention and suppression activities, lack of awareness, management capacity and participation of community in managing social forestry, institutional capacity constraints to manage potential environmental and social risks at field level, as well as gender inequalities and social exclusion. Further details on these risks and mitigation actions are provided in Section 14.1.2.2.

The SESA findings grouped potential environmental and social risks and impacts into nine categories, which include the following:

Environmental risks:

1. Loss of Natural Habitats and Biodiversity

2. Contamination and Pollution
3. Leakages or Displacements

Social Risks:

4. Conflicts and Disputes, especially tenurial conflict
5. Access Restrictions and Impacts on Livelihoods Changes and Displacement
6. Community Health and Safety Risks
7. Lack of Awareness, Management Capacity and Participation
8. Institutional Capacity Constraints to Manage Potential Environmental and Social Risks
9. Gender Inequalities and Social Exclusion

Analysis of Potential Environmental and Social Risks and mitigation measures

The interim SESA findings grouped potential environmental and social risks and impacts into seven categories, which include the following:

1. Conflicts and Disputes, especially tenurial conflict oil palm

Issues of conflict and dispute are potential as the SESA indicates that there are overlapping allocation and concessions for oil palm industries, forestry plantations, and mining operations. Land conflicts occur because of disparity in land tenure. There are overlaps between oil palm concessions (4,327 ha), between oil palm and HPH (179,165 ha), and overlaps in between HPH and HTI 1,708 ha. In 2017, there were 16 conflicts involving plantation land tenure between the private sector and the community that ranks East Kalimantan as having the fourth highest conflicts of all provinces in Indonesia. In 2016, there were 439 cases of oil palm land use conflicts. There are also tenurial conflicts occurring in several villages of Berau District involving the Forest Estate or Kawasan Budidaya Kehutana (KBK) due to unclear boundaries of the area and mismanagement of permits in forestry areas. Areas of potential conflict with forest concession (which includes access restriction) is anticipated in Berau, Mahakam Ulu and Paser Districts, while potential conflict areas with palm oil plantation in APL (land designated for other use) is anticipated in Berau, Kutai Kartanegara, Mahakam Ulu and Paser Districts.

There are also some implications on the potential discrepancies in spatial pattern (*pola ruang*) in the Spatial Plan, including administrative boundaries between districts. Conflict and dispute potentials are foreseen in here for mining and plantation concessions (data from ATR/BPN), discrepancies in district boundaries that may create confusion that requires resolution at provincial level.

This will be mitigated through among others enhancing the existing tenurial conflict resolution such as PSKL, capacity building on conflict prevention and management, and paralegals.

2. Access Restrictions and Impacts on Livelihoods Changes and Displacement

There is potential for access restriction as concession holder permits have the legal right to limit access of local communities and/or indigenous people entering the concession area. Access restriction may also imply on potential changes to the affected community's livelihood induced by economic displacement. Local communities in East Kalimantan are known to collect timber and non-timber products from the forest areas. The non-timber products, among others, include Gaharu (Agarwood), wild honey, rattan, and wild sap. Restricting access to forest under the concession rights, will certainly bring some changes to the livelihoods and economic displacement of the affected communities. At the moment, the Government is reviewing estate crop permits, led by the Provincial Estate Crop Service, of which results will be made public. There are 373 licenses for estate crops, some of which overlap with other existing licenses or are found inside areas that are off-limits due to the moratorium. Concessions found inside these areas will be reviewed and possibly amended by the Provincial Estate Crop Service.

East Kalimantan Province also faces the issue of overlapping the area of HTI and the opening of palm oil and coal mining, including small-scale mining operations, that is identified as one of the key drivers of deforestation. With regards the coal mining, the ER program is expected to accelerate and enforce the process of mining revocation being adopted by the Provincial Government. The Provincial Mine and Energy Service will revoke mining permits that are not "clean-and-clear". The total mining permits to be withdrawn are 809 out of 1404 permits. Up to now, 405 permits have been revoked, and the other 404 permits are being examined.

Mining is identified as a driver for deforestation in East Kalimantan, yet it is a significant economic sector for provincial economy. Mining and quarrying sector is the major contribution (46%) to the economy of East Kalimantan Province, followed by industry and processing (19%). Therefore, the context of mining as a driver of deforestation needs to be explored for further intervention in the ERP. Baseline data show the potential conflict between mining and biodiversity (HCV 1-3 and important biodiversity areas), as well as mining with customary rights.

Private companies may receive negative impacts as their production may decrease, or production cost may increase due to the implementation of sustainable plantation / forestry management. Operation may cease if licenses are revoked. Therefore, the ERP needs to design positive benefits to offset this loss. It is anticipated that the opportunity cost for the private sector will be relatively high in the ERP. Positive impacts may include implementation of ISO and increase of stock price stimulated by best management practices. Decreased production and income may also be part of negative impacts felt by small-scale mining operations (see also Sections 10 and 11).

Some mitigation actions include training on alternative sustainable livelihood, access to finance and access to market.

3. Impacts to Indigenous Peoples

East Kalimantan has a population of about 3.5 million (2016) that includes ethnic groups such as indigenous Dayak and Kutai, as well as Javanese, Chinese, Banjarese, Bugis, and Malay descendants (see also Section 3). Kalimantan is rich with forest natural resources, which has long been a source of livelihoods for the indigenous ethnic groups. A study on conflict within the FMU in Berau District^[1] is used as reference that represents protected forest, production forest and limited production forest designations. This study shows a general trend in the typology of conflicts and disputes involving primary/main actors such as companies, local communities and indigenous people.

The same study shows secondary or supporting actors that include NGOs and district offices. The capacity and availability of local mediators reside mainly with NGOs. This may reflect the condition in East Kalimantan. Object of the dispute is the forest areas utilized by local communities/indigenous peoples.

4. Loss and/or damage to Physical and Cultural Resources

Physical cultural resources include movable and immovable objects, sites, buildings, and a group of buildings, natural facilities and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic significance or other cultural properties. Studies of East Kalimantan reports several important physical and cultural sites and/or kingdoms such as the caves of Sangkulirang-Mangkalihat, Kutai Lama Kingdom, Sambaliuang Kingdom, Colonial Sites in Loa Kulu, Oil Wells of Mathilda, Colonial Sites in Gemuhan Asa, Kutai Kertanagara Palace, Rebellion of Sanga-Sanga, and Memorial of NICA in Balikpapan. Given the monarchy and colonial history of East Kalimantan, undiscovered cultural sites are anticipated and as such it is considered that the ER efforts of improving spatial planning and sustainable alternatives for communities may have potential impacts to the physical and cultural resources in East Kalimantan.

5. Community Health and Safety Risks

The ERP may have no significant negative impact on community health and safety. The ERP may enhance community health and safety through the introduction of sustainable livelihood practices such as sustainable forestry, agriculture and fisheries. This will be further enhanced with the adoption of Law No. 6 of 2014 on Villages, in which villages are granted with authority to manage their own assets and natural resources, revenue and administration. The Capacity building on participatory village development planning will bring ample opportunities for community in managing village development budget and allocate dedicated budget for enhancing their health and safety, especially regarding possible risks that the community may expose to in fire control, prevention and management related activities of ERP. In addition, there is also risks of the community to

continue their unsustainable livelihood practices, such as mining, that may continually expose them to health and safety risk.

This risk will be mitigated through capacity building and other supporting facilities for sustainable livelihood practices such as sustainable forestry and agriculture, access to finance, and access to market.

6. Lack of Awareness, Management Capacity and Participation

Lack of awareness, management capacity and participation, particularly from among stakeholders at field level, was apparent in SESA exercises at the site-level. This becomes an important risk to address especially considering that most of ERP components require strong support from the field level such as Component 1 and 2 of the ERP that aim to improve land governance and increase the capacity of government institutions and Component 3 that specifically aims to work with stakeholders in the oil palm plantation sector. To implement activities in Component 1 of the ERP, as an example, it is important for the FMU (as the management authority in production forest under Agrarian Reform) to increase its capacity to support licensing restructuring, including license revocation, and conflict/dispute mediation. Agrarian Reform aims to re-structure the licenses of unproductive production forest, and allow use by local communities. Map of Agrarian Reform released by MoEF in 2017 indicates the presence of such land allocation in Berau (2,092 ha), Bontang (98 ha), Kutai Barat (10,491), Kutai Kartanegara (11,860 ha), Kutai Timur (27,930 ha), Mahakam Ulu (245 ha), and Paser (633 ha). These data show that the largest allocation is identified in Kutai Timur District. The presence of these allocations offers an opportunity for strengthening tenurial rights of indigenous people through social forestry (Component 4 of the ERP). Additionally, license restructuring through Agrarian Reform can also be used to improve land and forest governance (Component 1 of the ERP).

The ERP also necessitates government capacity in strategic engagement with key stakeholders to ensure that the GHG emission reduction consideration outweighs the economic consideration. This strategy is relevant for Components 1 and 2 of the ERP that aim to improve land governance and increase the capacity of government institutions as well as Component 3 that specifically aims to work with stakeholders in the oil palm plantation sector. Strategic engagement with relevant key stakeholders that pay attention to the emission reduction in their activities will need to be also strengthened as part of the mitigation actions. These organizations are, among others WWF, TNC, Bioma, Forclime, GGGI, Kerimapuri, Kawal Borneo, Prakarsa Borneo, Yayasan Bumi and AMAN. The university of Mulawarman can also be a strong ally. These stakeholders may also support the implementation and monitoring of environmental and social safeguards.

7. Institutional Capacity Constraints to Manage Potential Environmental and Social Risks

The following SESA findings suggest a lack of institutional capacity, especially at FMUs, in managing potential environmental and social risks:

- The lack of FMU understanding on the regulations and policies in forestry-related aspects, will hinder FMUs in selecting options and resolving problems.
- The lack of FMU understanding on the mechanisms to solve conflicts both in regulations aspect and implementation.
- Limited human resources and technical capacity, especially with regards to operational procedures and reporting protocols of REDD+ safeguards.
- The lack of understating on the implementation of the licensing moratorium.

A study from WRI suggests that in relation to the type of land protected by the moratorium, 60% of the officials had an understanding of the issue. Approximately 37% of the officials had an understanding of the issue related to protected areas.

Recent changes in forestry regulations (e.g., social forestry, indigenous people/customary access, environmental partnerships) and ER Program requirements such as FPIC, FREL and MRV require new approaches at the national and sub-national levels. These new regulations and requirements may not be familiar to government officials at national and sub-national levels. As such, there is a risk of limited capacity to manage potential environmental and social risks.

Therefore, the implication of this may include the need to conduct relevant capacity building. However, the most important aspect in light of the new development is the need to establish collaboration with NGOs. Such collaboration would allow knowledge sharing between government and non-government organizations.

SESA also identifies capacity gaps including the lack of capacity for FGRM, conflict resolution, FREL MRV, and HCV assessment and management, institutional capacity supporting provincial policies on FGRM, conflict resolution, and HCV assessment and management.

8. Gender Inequalities and Social Exclusion

Livelihood changes may impact the gender relations within households and require women to be more active in contributing to household income. In addition, women and other vulnerable and marginalized group may also experience limited participation in village planning development. This requires special attention to ensure that their voice, interests and needs are well addressed.

9. Loss of Natural Habitats and Biodiversity

The ERP activities of improving land governance through strengthening licenses, dispute settlements and developing sustainable alternatives for communities may have impacts

on natural habitats. There is a possible loss of natural habitats and/or key biodiversity species located in areas designated as non-forest areas (APL) as result of strengthening licenses, dispute settlements, and recognizing adat land, as well as possible loss of natural habitats through agroforestry/social forestry, Non-Timber Forest Product (NTFP) harvesting, timber sub-projects, ecotourism and aquaculture initiatives.

10. Contamination and Pollution

The use of pesticides in oil palm estates, production forest and/or social forestry (agroforestry) initiatives may potentially cause contamination of harmful substances to the environment that may lead to pollution of soil and ground/surface water. Likewise, there are possible adverse impacts from small scale civil/construction works causing potential pollution to soil and water bodies as result of poor waste management practices of ER activities (poor waste management handling, waste oil and other hazardous wastes)

11. Leakages or Displacements and reversals

Leakages or displacements may emerge as risks are attributed mainly to governance risks (i.e., regulatory aspects) that cannot restrict the expansion of timber/palm oil/mining concessions to compensate for HCV allocation. Conventional practices (rather than the sustainable ones) in expansion areas of forest or palm oil concessions may constitute the risk of leakages. Successes in reducing the mining and plantation industries' impacts on forests in East Kalimantan could lead to shifting carbon emissions to other provinces. The risk of reversals describes the possibility of reversing climate benefits through the loss of forest carbon biomass, through a fire or pest outbreak that releases carbon back into the atmosphere. Reversals are sometimes categorized as "intentional vs. unintentional" referring to whether it was anthropogenic (i.e. induced by human activity, such as harvesting) or a natural disturbance (e.g. a hurricane). reversals may be produced as the results of governance risks such as lack of regulation enforcement to ensure sustainable forestry or plantation management, and lack of regulations on benefit sharing mechanism. Other issues that may constitute reversals are lack of participation in controlling fire, and tenurial conflicts (e.g., overlapping land use) (see also Section 11).

A summary of environmental and social potential risks and impacts, along with their proposed mitigation measures are provided in Table 14.8. Additional details and analysis are provided in the SESA document.

Table 14.8. Matrix Summary of Environmental and Social Impacts, Mitigation Actions, and the corresponding activity and OP/BP

Key Potential Environmental & Social Risks	Mitigation Actions (Corresponding Activity)	Corresponding ERP Activity and WB's Operational Policies (OP)	
		ERP Activity	WB - OP
1.Conflicts and Disputes, especially tenurial conflict	• Strengthening the management of social issues at the program level, including screening of risks as guided by the ESMF, IPPF, Resettlement Planning Framework (RPF) and Process Framework (PF) for access restrictions and potential livelihoods displacement;	1.1	4.01
		1.2	4.10
		1.3	4.11
		1.4	4.12
	• Strengthening the operationalization of Feedback and Grievance Redress Mechanism (FGRM) to enable timely identification of emerging risks and systemic issues	2.1	4.36
	• Strengthening community engagement and consultations including FPIC mechanism;		
	• Strengthening the ERP's communication and information dissemination strategy;		
	• Ensuring accessibility of the FGRM as well as other appropriate/ trusted local channels for filing complaints and/or grievances;		
	• Community economic development program (through skills training, social forestry etc.).		
2.Access Restrictions and Impacts on Livelihoods	• Strengthening Capacity of the government and private sectors on community engagement, dispute settlement and consultations;		
	• Training on community engagement and participatory mapping for forestry offices and surveyors;		
	• Capacity building for village governments and facilitators in participatory village planning processes;		
	• Regulatory support for the use of village funds (<i>Dana Desa</i> and <i>Alokasi Dana Desa</i>) to support the ERP;		
	• Strengthening the management of social issues at the program level, including screening of risks as guided by the ESMF, including the IPPF, Resettlement Planning Framework (RPF) and Process Framework (PF) for access restrictions and potential livelihoods displacement;	1.3	4.01
		2.1	4.10
		3.2	4.12
			4.36

Key Potential Environmental & Social Risks	Mitigation Actions (Corresponding Activity)	Corresponding ERP Activity and WB's Operational Policies (OP)	
		ERP Activity	WB - OP
Changes and Displacement	<ul style="list-style-type: none"> • Strengthening community engagement and consultations; • Strengthening the ERP's communication and information dissemination strategy; • Ensuring accessibility of the FGRM as well as other appropriate/ trusted local channels for filing complaints and/or grievances; • Development of participatory community mapping processes; • Capacity strengthening to government as well as private sector entities on community engagement, dispute settlement and consultations; • Training and coaching to community mediators and paralegals; • Ensuring accessibility of the FGRM as well as other appropriate/ trusted local channels for filing complaints and/or grievances; 		
3.Impacts to Indigenous Peoples	<ul style="list-style-type: none"> • Strengthening the management of social issues at the program level, including screening of risks as guided by the ESMF and Indigenous Peoples Planning Framework (IPPF); • Strengthening community engagement and consultations; • Strengthening the ERP's communication and information dissemination strategy; • Ensuring accessibility of the FGRM as well as other appropriate/ trusted local channels for filing complaints and/or grievances; • Development of participatory community mapping processes; • Capacity strengthening to government as well as private sector entities on community engagement, dispute settlement and consultations; • Training and coaching to community mediators and paralegals; 	1.1	4.01
		1.2	4.10
		1.3	
		1.4	

Key Potential Environmental & Social Risks	Mitigation Actions (Corresponding Activity)	Corresponding ERP Activity and WB's Operational Policies (OP)	
		ERP Activity	WB - OP
4. Loss and/or damage to Physical and Cultural Resources	• Strengthening the capacity of the licensing process by inclusion of HCV results to protect physical cultural heritage	1.1	4.01
		1.2	4.11
	• Strengthening the capacity of the licensing process by inclusion of Physical Cultural Resources Management Plan of the ESMF	1.3	
		2.1	
		2.2	
	• Strengthening dispute settlement by inclusion of biodiversity management framework/HCV and/or physical cultural resources management plan into the process	4.1	
		4.3	
5. Community Health and Safety Risks	• Community Health and Safety training and provisions of Personal Protective Equipment (PPE)	3.2	4.01
	• Implementation of Environmental Code of Practices (ECOPs) on Health and Safety aspects		
6. Lack of Awareness, Management Capacity and Participation	• Capacity building for village governments and facilitators in participatory village planning processes;	1.4	4.01
		2.1	4.10
	• Regulatory support for the use of village funds (<i>Dana Desa</i> and <i>Alokasi Dana Desa</i>) to support the ERP;	2.2	4.11
		3.3	4.12
	• Facilitating participatory mapping of village boundaries (especially in areas with history of conflicts and/or disputes)	4.2	4.36
		4.3	
	• Community capacity building (led by FMUs) on good agricultural practices, provisions of affordable technology, and technical support for sustainable business development;		
	• Strengthening community engagement and consultations;		
	• Tailoring delivery and approach for training based on local contexts;		
	• Technical facilitation for conservation partnership, including simplifying requirements for legal documentation;		

Key Potential Environmental & Social Risks	Mitigation Actions (Corresponding Activity)	Corresponding ERP Activity and WB's Operational Policies (OP)	
		ERP Activity	WB - OP
	<ul style="list-style-type: none"> Provisions of technical support for good agricultural practices, access to inputs and financing, and post harvesting processes, and market development 		
7. Institutional Capacity Constraints to Manage Potential Environmental and Social Risks	<ul style="list-style-type: none"> Assessment of institutional capacity to develop capacity building programs 	1.1	4.01
		1.2	4.10
	<ul style="list-style-type: none"> Capacity strengthening to government on ESMF and safeguards tools, community engagement, dispute settlement and consultations; 	1.3	4.11
		3.1	4.12
	<ul style="list-style-type: none"> Capacity building for village governments and facilitators in participatory village planning processes; 	3.2	4.36
		3.3	
	<ul style="list-style-type: none"> Capacity strengthening for FMUs to manage forest areas and supervise concession companies in accordance with ESMF; 	4.1	
		4.2	
	<ul style="list-style-type: none"> Facilitation and technical support, including capacity building on ESMF implementation 	4.3	
8. Gender Inequalities and Social Exclusion			Gender
9. Loss of Natural Habitats and Biodiversity	<ul style="list-style-type: none"> Development of a management framework for biodiversity through HCV studies developed by FSC (Annex 5 of ESMF) to identify natural habitats and key biodiversity areas 	1.1	4.01
		1.2	4.04
		1.3	
	<ul style="list-style-type: none"> Implementation and close supervision of HCV management plan at non-forest designated areas 	1.4	
		2.1	
	<ul style="list-style-type: none"> Strengthening licensing process and dispute settlement by inclusion of biodiversity management framework/HCV into the process 	2.2	
		4.1	
	<ul style="list-style-type: none"> Strengthening capacity of government supervision of HCV implementation. 	4.3	
10. Contamination and Pollution	<ul style="list-style-type: none"> Implementation of Environmental Code of Practices (ECOPs) on integrated waste management at the village level through capacity building programs 	1.4	4.01
		3.1	4.04
		4.1	

Key Potential Environmental & Social Risks	Mitigation Actions (Corresponding Activity)	Corresponding ERP Activity and WB's Operational Policies (OP)	
		ERP Activity	WB - OP
	<ul style="list-style-type: none"> Implementation of Environmental Code of Practices (ECOPs) on waste management through technical assistance programs 	4.3	
11. Leakage s or Displacements	<ul style="list-style-type: none"> Enforcement of the existing policies such as forest and peat moratorium policies and also more stringent procedure for licensing of activities in forest areas, especially for mining and estate crops 	2.1	4.01
		3.3	4.04
		See also Sections 10 and 11.	

14.2.2.2 ESMF: Key Social and Environmental Considerations

Risks identified in the SESA were used as the basis for developing the Environmental and Social Management Framework (ESMF). This document addresses the following environmental and social key considerations for the ESMF.

Key Environmental Considerations

- Development of Biodiversity Management Framework** for the Project or biodiversity management under HCV 1 to 4;
- Addressing the risk of access restriction** due to protected area and HCV designations;
- Introduction of sustainable management of forest and oil palm** to ensure best practices (including encouraging the use of organic/biodegradable pesticides); and
- Mitigating the risk of deforestation and environmental (water) degradation** due to alternative livelihoods provided in the ER Program (e.g., aquaculture).

Key social considerations

- Community economic development (livelihood) program** to substitute for the restriction to forest resources due to boundary strengthening.
- Enforcing FGRM and establishing a project contact person** to facilitate any complaint and to use the existing mechanism as the main conflict resolution platform. This may include the development of a one-roof FGRM mechanism (possibly under the Communication & Information Agency) to allow for a cross-sector FGRM (e.g., plantation, forestry and mining sectors).
- Establish a social mapping database with regular updates** to reflect the dynamics of social issues.

- d. **Address the risk of access restriction** due to protected areas and HCV allocations; through, among others, alternative community economic development programs that can substitute the livelihood derived from logging. In the ERP, Component 4 will address this issue with several programs.
- e. **Regular monitoring of the Social Forestry program** to avoid failures that could trigger more deforestation.
- f. **Develop an indigenous peoples planning framework (IPPF) and conduct training to relevant stakeholders on this.**
- g. **Develop effective scheduling and planning** to minimize the risk of delay in capacity building activities.
- h. **Properly identify credible trainers and/or training institutions** to deliver the required capacity building sessions.
- i. **Encourage participation of local farmer groups** in the forest and land fire management program/community based forest and fire management.
- j. **Encourage participation from the private sector** on the land and forest fire management; and
- k. **Develop a Gender Action Plan for the ER Program.**

14.2.2.3 Capacity Building

Lack of capacity, especially at field level, is one of the key findings from SESA and considered as the major concern for smooth and effective ERP implementation, particularly at the community and FMU levels. Capacity building becomes crucial for not only ensuring readiness of local communities, district and provincial government, as well as private sector, but also for ensuring that the ERP successfully meets its objectives and goals of reducing emissions.

There are at least six areas that require special attention. These are non-timber forest product business development and management, sustainable crop farming, access to finance and market, sustainable agriculture (particularly on post harvesting technology for value added), conflict management and resolution, as well as ESMF and Monitoring and Evaluation. Table 14.9 provides details of capacity building needs by types of training needs and target entities:

Table 14.9. Capacity building needs for SESA

Training	Entities in Need			
	Community	FMU	Government (Provincial, District and Village level)	Private Sector
1. Sustainable Business development and Management on non-timber forest products	x	x		

Training	Entities in Need			
	Community	FMU	Government (Provincial, District and Village level)	Private Sector
2. Sustainable crop farming and good agricultural practices	X (small holders)	x	x	x
3. Access to finance and market	x	x		
4. Sustainable agriculture (especially on post harvesting technology for value added);	x	x		x
5. Forest area management and concession supervision		x		
6. Conflict management and resolution	X (community based conflict management resolution)	x	x	x
7. Community Engagement & participatory mapping (including on community mediators and paralegals)		x	x	x
8. Community health and safety	x	x	x	x
9. Participatory Village Planning Processes		X (facilitators)	X (village government)	
10. ESMF		x	x	
11. M & E		x	x	

Source: Field Work, 2018

14.2.2.4 Engagement Strategy

Engagement strategies recommended to strengthen ER Program implementation are:

- a. **Enforcement and strengthening of the existing safeguards including the ESMF** for relevant stakeholders especially private sector stakeholders and government institutions. This will be done through provincial and district governments.
- b. **Strengthening the FGRM** for the project level and linking it to the national FGRM. This will be under the MoEF (DG of PSKL, DGPPI, P3SEKPI and DDPI).
- c. **Providing transparent information on social forestry licensing processes** to enable effective monitoring and identification of any violations of permit and concession boundaries. This will be done with local communities and FMU s through outreach and FPIC consultations.
- d. **Development of the IPPF** by using the three approaches for identifying IP and adat communities as mentioned in Section 14.1.2.1. Serious attention will be paid to customary (adat) law and its contribution to social forestry schemes. This will be done in collaboration with relevant existing customary bodies/councils in East Kalimantan Province.

14.2.2.5 Additional Regulatory Framework.

SESA also found that additional regulatory frameworks are required, particularly for the following:

- a. Designation of SES REDD+ Kaltim as the main reference for the ESMF; and
- b. Development and validation of an agreed benefit sharing mechanism from national to sub-national and grassroots levels

14.3 Description of arrangements to provide information on safeguards during ER Program implementation

14.3.1 *The development of the Safeguards Information System (SIS) and its application to the ER Program*

This section describes how the institutionalized mechanisms of SIS-REDD+ linked to the ERP will be managed and made available to local and international institutions, as well as to individuals.

14.3.1.1 Development of Principle, Criteria, Indicator (PCI) and Assessment Tools for SIS-REDD+

The PCI provided a strong and reliable basis for the SIS-REDD+, which serves as an umbrella reporting and monitoring platform for safeguards compliance for the overall ER Program implementation. The SIS-REDD+ consists of 7 principles, 17 criteria and 32 indicators, that aim at reflecting provincial characteristics. SIS-REDD+ is currently being piloted in East Kalimantan and necessary improvements are being sought by the Province to further operationalize the SIS-REDD+.

Under the SES-REDD+ process, which is a provincial initiative, the East Kalimantan Taskforce, under the leadership of DDPI, undertook a participatory multi-stakeholder process to adjust the

national-level PCIs to fit into the province specific context.⁴² The draft SES-REDD+ was tested in the Districts of Berau, Kutai Barat, and Paser between 2015 and 2016. The result of this field testing suggests that SES-REDD+ is applicable throughout the Province. The safeguards system also recognizes the national Rights Based Standard (RBS). Further details of SES-REDD+ are provided in section 14.2.

Effective implementation of the Cancun REDD+ safeguards requires translating these safeguards into the national context, developing policies and regulatory frameworks, making resources available and building institutional capacity. Indonesia's policies, regulations and practices on forest management serve as a foundation to develop the SIS-REDD+, with a country-specific context at the national and sub-national levels. Safeguards policies are not new in Indonesia's forest management. The past body of work on safeguards allows the Ministry of Forestry of the Republic of Indonesia to report on progress to date regarding the COP 16 decision on REDD+ safeguards.

A comprehensive and multi-stakeholder process began in 2011 to create a national SIS- REDD+, by undertaking an analytical review of the existing Cancun-Safeguards relevant policies and regulatory frameworks and translating the results of this analysis into the national principles, criteria and indicators (PCI), identifying the best structure and mechanism for Indonesia SIS-REDD+ and developing assessment tools to implement the SIS-REDD+. The existing policies and regulatory frameworks under review include: Law no 32/2009 on the Management and Protection of the Environment that stipulates key instruments of the Environmental Impact Assessment (AMDAL), Strategic Environmental and Social Assessment (KLHS), Sustainable Production Forest Management (PHPL), certification for sustainable forest management such as the certification by *Lembaga Ekolabel Indonesia* (LEI) or the Indonesian Ecolabel Institute, Forest Stewardship Council (FSC) certification, and the Verification System of Timber Legality (SVLK).

These instruments have been reviewed and verified at different scales linked to REDD+ activities in Indonesia, and have become valuable assets for SIS-REDD+. The review and verification process included an evaluation on the appropriateness of these instruments to relevant mandatory and voluntary instruments of REDD+ safeguards as stipulated in the COP 16 Safeguards decision. This review assessed the relative strengths and weaknesses, stakeholders' acceptance, challenges for effective implementation, as well as interrelatedness between instruments for a comprehensive and integrated approach. These instruments contain mechanisms for oversight of specific requirements of good environmental and social practices. They also define specific arrangements for project proponents to report compliance based on self-assessments and independent audits.

The SIS-REDD+ PCI formulation was conducted through extensive stakeholders' consultation at both national and sub-national levels. The long consultative process resulted in several revisions to the initial design, which led to the reframing of the PCI framework. Eventually, there were 7 principles, 17 criteria and 32 indicators formulated as the basis of SIS-REDD+ as noted in Ministerial Decree of MoF No. P70/MENLHK/SETJEN/KUM.1/12/2017 on the procedure for REDD+ Implementation. PRISAI, Indonesia's PCI of REDD+ Safeguards, was developed by the

⁴² Pambudhi et al., 2015

REDD+ Task Force, and was handed over to the REDD+ Agency. PRISAI was initially designed as a framework to filter, monitor, and evaluate REDD+ activities at the project and jurisdictional levels. In elaborating the Cancun safeguards, PRISAI added three more principles to fit the Indonesian context to reach a total of 10 principles, 27 criteria, and 97 indicators. PRISAI has been tested in several sites in East Kalimantan, Central Kalimantan, and Jambi provinces. The overall multi-stakeholder consultations process and results are well documented and made available for public access at the WEB-SIS (ditjenppi.menlhk.go.id/sisredd/).

Another initiative that has made significant progress is the REDD+ Social and Environmental Standards⁴³ (SES-REDD+). SES-REDD+ was adapted and piloted in East Kalimantan and Central Kalimantan provinces. The development of SES-REDD+ was commissioned by Clinton Climate Initiative and developed by the Climate, Community & Biodiversity Alliance (CCBA) and CARE International, in collaboration with the REDD+ Working Group of East Kalimantan Province in Indonesia and LEI, the national certification agency. SES was developed as part of the participatory and multi-stakeholder initiative (launched in May 2009) and field tested in 17 jurisdictions within 12 countries. Under SES REDD+, safeguards are based on the key forest governance issues faced by the provincial government. SES outputs contribute to the implementation of SIS-REDD+, particularly in providing support at the sub-national level and linkages to SIS-REDD+ at the national level.

The Participatory Governance Assessment (PGA) is another multi-stakeholder safeguards-related initiative led by the UN-REDD Program. PGA aims to inform policy-making by providing regularly updated and robust governance information accompanied by recommendations. The framework consists of 4 aspects/principles, 3 criteria/variables, and 32 indicators and was piloted in 2012 and 2014 at the national level as well as in several provinces and districts.

The fact that the existing safeguard frameworks vary in Indonesia is inevitable since activities, governance frameworks and on the ground conditions relevant to ER vary across the country. The development of existing frameworks has enabled the GoI and REDD+ implementers to refine approaches and management of relevant risks, including addressing capacity gaps. This is particularly relevant for the sub-national and project levels, where PRISAI, SES, and PGA are expected to be applied consistently across ER interventions. The linkages of the existing safeguards instruments, including the applicability of SIS-REDD+ across ER interventions are currently being tested to enable improved synergy and coordination.

Stakeholder engagement and community consultations remain an iterative exercise and will be regularly revisited to ensure ERP legitimacy and to promote broad participation. Engagement promotes transparency and participation and increases the confidence of the diverse stakeholders in the program, which in turn engenders a stronger sense of ownership and acceptance. This approach enables the outputs from sub-national perspectives and therefore is expected to enhance the ERP implementation.

⁴³ <http://www.redd-standards.org/>

14.3.2 *Safeguards Information System (SIS) REDD+ as a Form of Gol's Commitments for Promoting Transparency and Effectiveness*

SIS-REDD+ requires REDD+ implementers to independently assess and report on safeguards implementation. The system is intended to promote transparency and accountability from the site level. For this purpose, the MoEF has formulated APPS, a Safeguards Implementation Assessment Tool. The tool was developed on the principles of simplicity, transparency, accountability, completeness, and comparability. APPS provides a checklist of supporting documents required as evidence of REDD+ safeguards implementation. It is provided along with the complete PCI under SIS-REDD+ in the Annex and can be downloaded on the SIS- REDD+ website (<http://ditjenppi.menlhk.go.id/sisredd/>).

SIS-REDD+ aims to gather, process, analyze, and present the necessary information on how safeguards are managed and respected in REDD+ activities, ranging from the project sites to district, provincial and national SIS management units. To ensure efficiency, an institutional structure and distribution of tasks and responsibilities for the information system from the site to national level have been established. Further refinement is currently underway to achieve a well-established Safeguard system. **Error! Reference source not found. The responsibility to further develop, implement, and manage SIS-REDD+ is currently under the REDD+ Division of MoEF.⁴⁴ Two components were created to promote transparency and ease access to safeguards information provided in SIS-REDD+:**

1. A database, to manage data and information on safeguards implementation; and
2. A website, tracking progress on safeguards implementation

The SIS-REDD+ website provides public access to REDD+ implementers or users to report their activities by filling in the checklists and uploading necessary documents as required by the APPS. Stakeholders can find a summary of both general REDD+ activity data and specific information on REDD+ safeguards. The REDD+ Division at MoEF is also considering several options to link the web-platforms to other forestry instruments with REDD+ relevant safeguards elements.

SIS-REDD+ has been designed to receive inputs from various stakeholders and allow SIS management units at the sub-national and national levels to work with independent third parties through the establishment of a Multi-Stakeholder Forum or Institution (L/FMP). The L/FMP can be established as necessary with members including representatives from the government, indigenous peoples, the private sector, NGOs, universities, and community leaders. L/FMP serves as a point of communication and coordination between related agencies, provides regulatory recommendations, becomes the contact center for complaints related to the implementation of REDD+ safeguards, and conducts information, education and communication programs and activities for awareness-raising and capacity building.

As a relatively well-developed framework in systematic data collection and information presentation, SIS-REDD+ has the potential to assist other frameworks in collecting data and

⁴⁴ The responsibilities were previously under Pustanling of the former Ministry of Forestry, which changed to the Ministry of Environment and Forestry (MoEF).

documents through a similar platform. Examples of the current relevant frameworks that SIS-REDD+ may draw from is the FLEGT (Forest Law Enforcement, Governance and Trade) and the Information System for Forest Product Management (SI-PUHH).

14.3.2.1 Institutional Structure and Information Flow in SIS-REDD+

The SIS-REDD+ website is designed to provide comprehensive and up to date information on safeguards implementation under REDD+, as well as other details of REDD+ (project names, locations, implementers, partners, duration, scope of activities, key achievements as well as challenges and supporting factors). As more data arrives, the website will eventually be able to provide a summary of REDD+ activities in Indonesia in a more precise manner, for both general and detailed information. Further user-friendly and more integrated data and information presentation, such as maps and graphics can be generated.

The National SIS Management Agency (PSIS-Nas), placed under the MoEF's REDD+ Division, is assigned as the administrator and manager and is mandated to maintain and further refine the system as well as providing guidance to PSIS at sub-national levels. Included in PSIS-Nas' roles and responsibilities are data and information verification, periodical data updating, data storage,

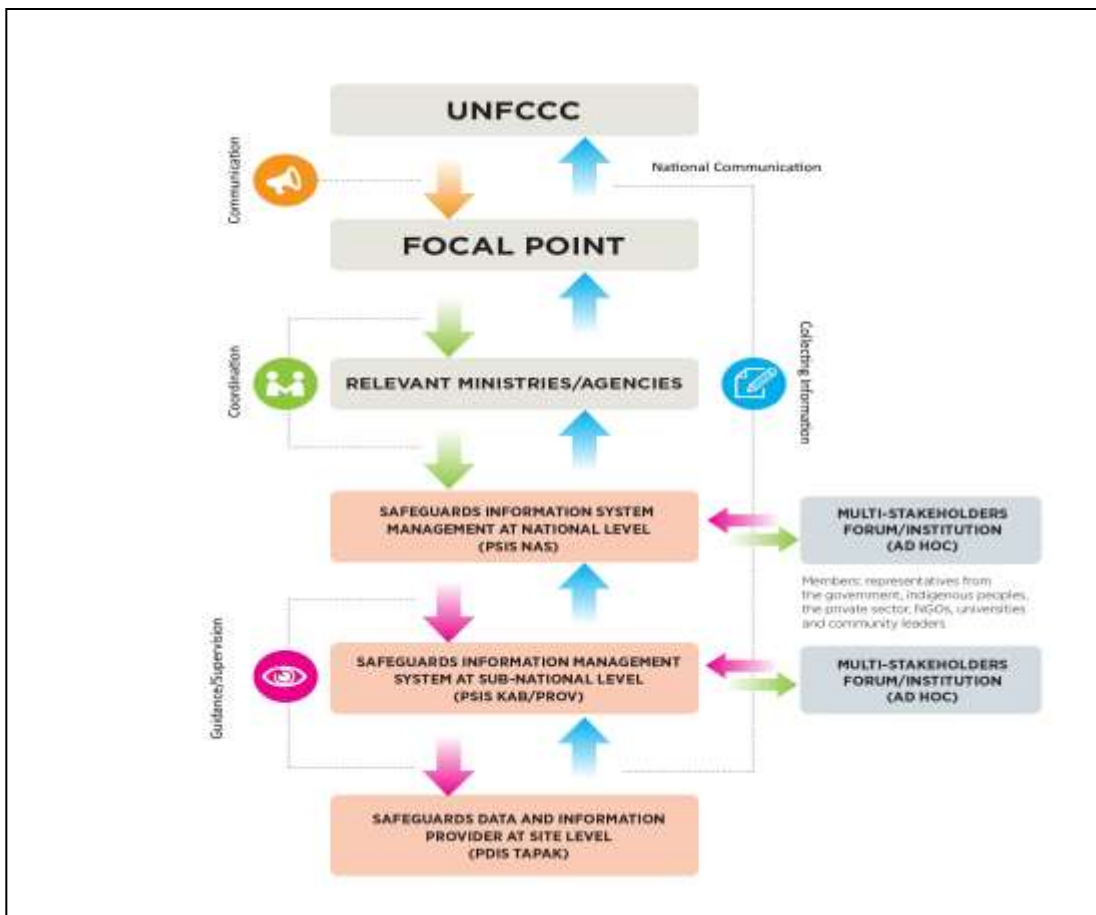


Figure 14.2. Institutional structure and information flow in SIS-REDD+

and generating analytical information (such as maps and graphics) on safeguards implementation. PSIS Nas, serving as the national information focal point, is responsible for preparing information for the MoEF, to be integrated into the National Communication and/or Biennial Update Report for submission to the UNFCCC.

PSIS Province and PSIS District act as clearing houses that collect, verify, consolidate, process, store data from PDIS Tapak (the smallest institutional unit), and provide consolidated periodical reports to the national level that will be made public. In this regard, PSIS Sub-Nas is tasked to provide guidance and facilitation for the development of information systems and databases at provincial and district levels. Included in the guidance are standards, operational procedures, reporting mechanisms and other technical guidelines for SIS implementation. The administrator of data and information at PDIS Tapak is the REDD+ activity implementer, who will be responsible for conducting a periodical self-assessment on project implementation. Upon completion of the self-assessment, the PDIS Tapak data and information administrator will fill in the aforementioned checklist prepared by the REDD+ Division, under the DG for Climate Change of MoEF, and submit it to the SIS management at the district or province (District/Provincial PSIS or PSIS Kab/ Prov, also called PSIS Sub-Nas) together with the required supporting documents. The PDIS Tapak, or ‘user’,

is also in charge of preparing user-friendly information on safeguards implementation to the public about their respective site, establishment of a grievance mechanism, as well as opening communication channels with stakeholders and disseminating information.

This platform will also be used for information on the grievances and redress actions. FMUs are the key responsible entities at the field level to maintain the information flow and updates, both electronically and manually, to the upper level of District, Provincial and Central SIS-REDD.

14.3.2.2 Overview of instrument relevance and coverage of safeguards against Cancun Safeguards of the SIS-REDD+ at Sub National Level

To date, SIS-REDD+ Indonesia has been consistently operationalized in accordance with its initial design at the national, provincial and district levels. The PCI and assessment tools and institutional structure are followed, and awareness raising on REDD+ safeguards is systematically conducted. At the moment, there are several sub-national jurisdictions working with the central management (DGCC – MoEF), including East Kalimantan, Jambi, and South Sumatra Provinces. These provinces are home to relatively vast forest areas with incredible biodiversity and environmental services, but are also facing tremendous population and economic growth pressures, for example in the agriculture and mining sectors. The Provincial Government of Jambi and East Kalimantan are both committed to implementing REDD+ activities, proven by the development of Provincial REDD+ Strategy and Action Plans (SRAPs). According to the latest data from the Ministry of Environment and Forestry, there are at least six ongoing REDD+ Demonstration Activities in Jambi and East Kalimantan.

A number of initiatives have been conducted in collaboration with partners and local governments since 2013 to gain feedback from various stakeholders, particularly on developing SIS-REDD+ at the sub-national levels, installing pilot systems, and improving the capacity of regional technical staff.

The following are lessons learned from these activities at the sub-national level:

1. **A permanent formal institution at the district/provincial levels is necessary for SIS management.** This is to ensure clear distribution of roles and responsibilities to enhance sustainability of the information system. Such arrangements do not necessarily require establishment of a new institution, but can capitalize on existing agencies while strengthening their institutional capacity.
2. **Enhancing human resources capacity and infrastructure is key to allow effective data collection and reporting.** This applies both for the data managers at the provincial and district levels (PSIS Provinsi/Kabupaten), who are responsible for consolidating and verifying data, as well as REDD+ implementers (PDIS Tapak), who are expected to supply the information and necessary documents.

3. **The sub-national SIS shows potential to be a key element of a broader Forest Management Information System (FMIS).** The sub-national SIS is currently addressing sustainable forest management (SFM), good forest governance (through FLEGT), and biodiversity conservation. A combined approach of human capacity development and procurement of sufficient technical infrastructure is essential to strengthen the SIS at the district and provincial levels.

14.3.2.3 Further Development and Improvement

Indonesia has become one of the leading countries in building REDD+, including safeguards, with the SIS-REDD+ as one of the most important building blocks for REDD+ governance. Yet, some improvements and preparation are required to ensure a sound information system on safeguards that can support full implementation of REDD+ efficiently. These measures comprise efforts for (a) improving the institutional and legal mandate and (b) capacity building.

14.3.3 Institutional and legal mandate

The necessary steps may include:

1. Operationalization of SIS-REDD+ in Indonesia based on Ministerial Decree No. 70/2017 on REDD+ Implementation. It will serve as a formal guideline for implementers of REDD+ activities in Indonesia on the provision and reporting of information on how REDD+ safeguards are addressed and respected. The regulation defines how data and information will be managed in accordance with relevant COP decisions;
2. Encouraging use of SIS- REDD+ to support the REDD+ National Registry System for Climate Change (SRN PPI) on SRN PPI website (<http://ditjenppi.menlhk.go.id/srn/>);
3. Identifying and assessing institutions and individuals as potential members of the Multi-Stakeholder Forum (MSF) at provincial and district levels; and
4. Identifying needs at the national, provincial, and district levels to develop and maintain SIS- REDD+.

14.3.4 Capacity building on SIS-REDD+

The necessary steps may include:

1. Continuing the implementation of SIS-REDD+, PCI, and APPS in Jambi and East Kalimantan provinces after successful consultation processes with stakeholders and several trials.
2. Evaluating and continuously improving the SIS-REDD+ web-platform, keeping in mind the wide disparity of infrastructure and technical capacities in various forested areas across Indonesia.

3. Rolling out SIS-REDD+ in other provinces and districts, emphasizing the benefits and importance of a REDD+ safeguards information system and securing support from the local government, including commitment and resources for the necessary human resources and infrastructure.
4. Identifying ways to utilize other emissions reduction initiatives, such as the Forest Management Unit (FMU, or KPH in Indonesian), and integrate SIS into their activities at field level and feed this information into the national system. Related activities may include defining standard operating procedures (SOPs) and reporting mechanisms for SIS-REDD+ at the district and/or provincial levels.
5. Developing models for local capacity building based on identified safeguards as well as existing infrastructure and capacity in the respective areas.
6. Fostering further understanding about the relationship and the importance of coherence between SIS-REDD+ and other safeguards frameworks that have been introduced and developed in Indonesia. SIS-REDD+ will function as a clearing house (see Figure 6), to which other, often CSO-led, frameworks could feed complementary information and improve the data available, as well as the main platform to share the information with stakeholders in Indonesia and globally. Lessons learned from the piloting and implementation of these safeguards frameworks will also inform the iterative improvement of SIS-REDD+, particularly at the provincial and district levels.

14.4 Description of the Feedback and Grievance Redress Mechanism (FGRM) in place and possible actions to improve it

Acknowledging that the ERP is built on multiple initiatives across relevant sectors and involves multiple agencies at both national and sub-national levels, the FGRM is currently being developed to coordinate across existing mechanisms to address grievances and disputes. Under the ERP, a Program Management Unit (PMU) at the national level and provincial REDD+ Taskforce, with extension units at the district level will be established to monitor and report grievances and conflicts to relevant stakeholders in a coordinated and timely manner. The FGRM institutional arrangements will be nested in the ERP institutional arrangements, which are currently being finalized. Under the existing internal MoEF's FGRM systems, the Directorate General of Law Enforcement on Environment and Forestry (Ditjen PHLHK or also well-known as Ditjen GAKUM) and the Directorate General of Social Forestry and Environmental Partnership (*Perhutanan Sosial dan Kemitraan Lingkungan/Ditjen PSKL*)⁴⁵ are key departments within MoEF who are mandated

⁴⁵ The Ditjen GAKUM and Ditjen PSKL were identified for the reasons that both indicates a readiness that can be equipped further for an FGRM for ERP. The Ditjen GAKUM has the following relevant Directorates on (a) complaints, surveillance and administrative sanctions, (b) dispute resolution, (c) forest prevention and protection, and (d) criminal law enforcement. Whilst Ditjen PSKL has a specific Directorate on Complaints on Conflict, Tenurial, and Customary Forest, which is strongly relevant with ERP.

to address forestry related disputes. Specific coordination mechanisms, including definition roles and responsibilities are currently being developed and will be finalized as part of the development of ERP institutional arrangements.

The Project's Grievances Redress Mechanisms (GRM) comprises of four-tier system of village, district/municipality, provincial and national GRM. Various agencies at each of these levels are responsible to handle the complaint and conflict resolution. FGRM at the lower level may hierarchically relate to the higher levels (and vice versa), depending on the nature of the complaints and at what level the follow-up, decision or solution to the complaints can and need to take place. Any unresolved grievances at sub-national levels will be transferred to the relevant GRM unit in MoEF at national level, that has a dedicated function in addressing grievances and a cross-sectoral coordination mandate. Objective, transparent, and fair principles will need to be adopted. The ER Project Implementing Unit will be responsible for the information system (compiling, classifying, uploading, and updating), awareness raising, disseminating and disclosing information on the GRM and the associated procedure at district, provincial or national level.

The ERP FGRM has been consulted with relevant stakeholders at all levels. Stakeholders include local communities, private companies, local government such as the sub-national government apparatus organization (Organisasi Perangkat Daerah, OPD), and FCPF Carbon Fund program secretariat office in Samarinda, East Kalimantan, represented by the Regional Council on Climate Change (DDPI). Table 14. 10 provides detailed information on the FGRM consultations that were conducted with key stakeholders:

Table 14.10. Summary of stakeholder consultations in East Kalimantan

Date, place	Topic & key Issues	Relevance to REDD+	Participants	Recommendations
10 October 2018 DDPI office	Introduction of SESA to DDPI – East Kalimantan (EK) Province Key issue: <ul style="list-style-type: none"> Planned SESA, ESMF, and FGRM process for EK Province 	Contribute to the REDD+ coordination, particularly on SESA & ESMF	DDPI, NGOs,	<ul style="list-style-type: none"> To conduct public consultation for disseminating the results of SESA & ESMF
11 October 2018 Amaris	Discussion on Indigenous people (IP) and FGRM Key Issues:	IP is one of the key issues of REDD+ Safeguards	Bioma staff	<ul style="list-style-type: none"> To refer to Perda no 1/205 in developing the IPPF To build

Date, place	Topic & key Issues	Relevance to REDD+	Participants	Recommendations
Hotel, East Kalimantan	<ul style="list-style-type: none"> • Definition of IP • Existing regulations in EK Province to supports IP (Perda No. 1/2015) 			consensus with IP, on BSM
12 October 2018 DDPI office	<p>Discussion with Safeguards team – East Kalimantan Province</p> <p>Key Issues:</p> <ul style="list-style-type: none"> • The interlink between SES REDD+ Kaltim, SESA &ESMF, • Results and lessons learned from the testing of REDD SES Kaltim and PRISAI. 	Contribute to REDD+ coordination, particularly on SESA & ESMF and in compliance with SES REDD+ and SIS REDD+ in EK Province.	DDPI, NGOs, (WWF, GGGI, TNC, Bioma), University of Mulawarman, Forestry Office of EK Province	<ul style="list-style-type: none"> • To maintain the link of FGRM and SES REDD+ of East Kalimantan Province with SESA &ESMF
13 October 2018 Selyca Mulia	<p>Discussion on FGRM</p> <p>Key Issues:</p> <ul style="list-style-type: none"> • The lack of comprehensive and integrated FGRM due to the current sectoral approach (Each sector has an FGRM in place that does not necessarily linked to each other, such as plantation, forestry) • Accessible FGRM 	ER Program requires definitive FGRM	The Economic Bureau, EK Provincial Government; EK Safeguards Team	<ul style="list-style-type: none"> • To adopt inputs from the team in the FGRM • To consider a centralized / one-roof FGRM administration for the ERP
29 September 2018 Aston Balikpapan	<p>Public Consultation on SESA, ESMF, FGRM, and IPPF</p> <p>Key issues:</p> <ul style="list-style-type: none"> • Regulatory framework 	ER Program requires definitive safeguard mechanism	MoEF (P3SEKPI, PPI), MoE, Provincial Planning Bureau, Forestry and Plantation Offices of EK	<ul style="list-style-type: none"> • Establish / strengthen regulatory framework for Safeguard, as well as for Benefit

Date, place	Topic & key Issues	Relevance to REDD+	Participants	Recommendations
n	for SES REDD East Kalimantan as the safeguard		Province, DLH, DPMD, Legal Bureau, Economic Bureau, DDPI, Mulawarman University UWG, NGOs	Sharing Mechanism <ul style="list-style-type: none"> Establish plan for district consultation with DDPI

Provincial government organizations generally assign the Section Head of the respective agencies to monitor and update information on program implementation and can also be appointed to play the role of complaint handling mechanism with the core responsibilities of receiving and following up on complaints with relevant agencies. In this regard, the Section Head may link the complainer such as village governments, with relevant district government organizations. The main hub for environmental related complaint handling and conflict resolution are usually the District and Provincial Environmental Agencies.

The complaint handling processes and results must be made public and easily accessed, especially for the affected communities. There are several arrangements in place for making the process and results open for public access, ranging from conventional (including the village offices announcement board and village halls, telephone, letters) to non-conventional media such as web-based social media (whatsapp, sms, and email). The Government arranged this through a range of efforts from designating specific device for maintaining the social media to placing a complaints box in the respective Environmental Offices at national, provincial and district levels.

The ER program will assign a team or individual focal point, which will ensure that all the submitted complaints from stakeholders have been resolved by the relevant working units, and ensure complaint monitoring. The focal point will manage the grievance mechanism by providing resources for correspondence, coordinating internal resolution, managing records, and reports (both internal and external). The focal point will work with other working groups in order to formulate solutions and responses. The approval process for external correspondence and reporting will be important to ensure consistent communication, corporate strategy, and key messages are approved. This detailed approval process will be planned.

14.4.1 Existing FGRM Processes under ERP

The ERP FGRM is currently placed under the SIS-REDD+ system, set up by the Ministry of Environment and Forestry, that is being developed further into a web-based FGRM. The Government is in the process of refining the FGRM to best address ERP, including an internal and cross-sectoral coordination mechanism and referral system (Figure 14.2). The FGRM unit for

the ERPD will be established under and operated through the existing mechanism that goes up to the TAPAK level. Several options are available for hosting the FGRM: the Directorate General of Law Enforcement on Environment & Forestry (Ditjen PHLHK or also well-known as Ditjen GAKUM), the Directorate General of Social Forestry and Environmental Partnership (Perhutanan Sosial dan Kemitraan Lingkungan/Ditjen PSKL), or a new established unit for ERP-FGRM under Ditjen PPI, in which the SIS is placed. Ditjen GAKUM has the institutional readiness for complaint handling with its four directorates of (1) complaint, surveillance and administrative sanctions, (2) dispute resolution, (3) forest prevention and protection, and (4) criminal law enforcement. Ditjen KLHS, with its Directorate on Complaints on Conflict, Tenurial, and Customary Forest, will also be relevant considering that addressing tenurial conflict is crucial for the success of ERP implementation.

The following are identified processes of the FGRM: a) receive and record grievance; b) screen and categorize grievances; c) acknowledge receipt and its follow up action; d) refer to the relevant ministries, for non-ERP grievances, e) investigate, for ERP grievances, which includes field visits for verifying and validating grievances ; f) act/follow up and g) conclude. An appeal to the court might take place, in the case of not reaching a mutually agreed resolution. Appeal mechanisms are identified in the aforementioned Law No 32/2009. This law is further translated in the Government Regulation no 27/2012 and MoEF ministerial regulation no P.22/MENKLHK/SETJEN/SET.1/3/2017 on the complaint handling mechanisms. A monitoring and reporting system will be established/put in place.

Issues addressed through the complaints procedure based on the MoEF regulation are environmental pollution, forest destruction, and tenure conflict as well as issues related to the Benefit Sharing Plan. Claimants can be individuals, groups of people, legal entities, or government agencies.

In general, the process of the grievance mechanism is described in the below figure:

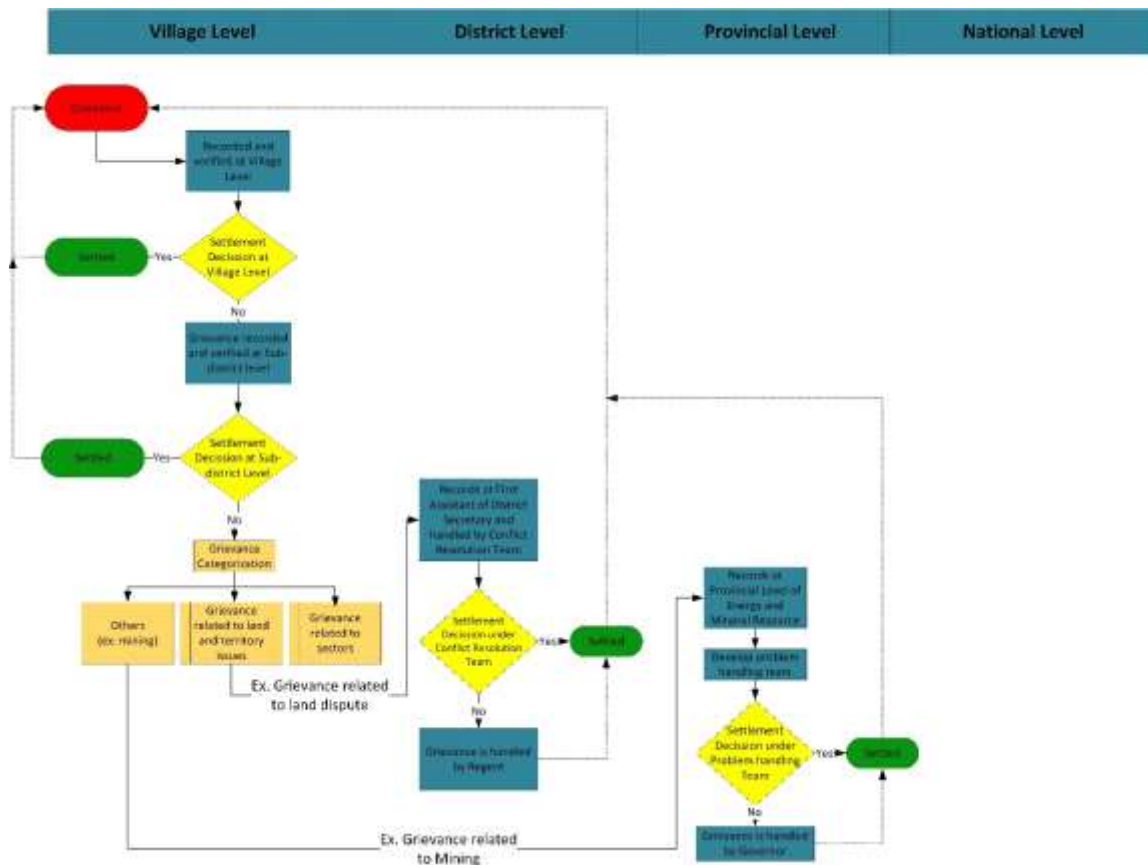


Figure 14.3. ERP FGRM Processes (source: MoEF)

The FGRM for the ERP will adopt the following principles: a) accommodate existing systems to the extent possible; b) fully integrate the FGRM system into the existing mechanisms within MoEF; and c) enhance other GoI grievance mechanisms at both national and sub-national levels insofar as they are relevant.

The FGRM units will seek to enhance coordination with the existing units under MoEF and the East Kalimantan Government as well as with other channels. As such, the unit will work closely with the other grievance mechanisms in MoEF (such as under FIP) and grievance mechanisms of the Government (such as the existing mechanisms within MoEF), and will ensure that grievances are directed to the right responsible unit within KLHK, or other relevant ministries or government agencies for proper response.

The mechanism and institutional structure will: (a) reflect existing capacity within potential entities and/or structures with mandates or authorities to manage grievances, (b) include a roadmap for GRM pilot/model at sub-national level that takes into account the available capacity and resources, and (c) pays serious attention to the tenurial conflicts and the latest relevant

regulatory frameworks, especially at sub-national levels. The best mechanism is currently being defined.

The ERP identifies the following key areas of support for Provincial and District Governments in operationalizing and enhancing the existing FGRM process in their respective jurisdictional area. Law No 32/2009 on Environmental Protection and Management stipulates the authority, roles and responsibilities of sub-national governments with regards to addressing tenurial issues and handling of conflicts. Some of the areas to strengthen FGRM processes under the ERP include:

- a. Regulatory development: the current conflict resolution frameworks at the provincial and district levels will still need to be enhanced to ensure that they are operational and clear with regards to roles and responsibilities;
- b. Development of well-defined monitoring, verification and reporting protocols for FGRM that directly feed into corrective actions (e.g. amendment of workplans and mitigation measures);
- c. Enforcement mechanisms for administrative and legal sanctions in the event of infringement and lack of compliance;
- d. Promoting citizen participation and accountability in FGRM (checks and balances), which also encompass addressing access issues for vulnerable groups;
- e. Development of incentive mechanisms for reporting cases and legal protection for “whistleblowers”;
- f. Translating the existing national and sub-national FGRM mechanisms (such as ones for AMDAL and KLHS) in a more practical and responsive manner. This will need to factor in accessibility of such mechanisms, public access and disclosure of information, engagement from planning to implementation, etc.
- g. Litigation support for vulnerable groups and/or communities (e.g. community disputes with private companies);
- h. Institutional capacity strengthening at individual agency level to enhance impartiality, transparency, and capacity to respond grievances in a timely fashion;
- i. Availability of qualified and credible community mediators and paralegals to assist conflicting parties to settle disputes through consensus.

The GoI considers the importance of an operational FGRM under the ERP to provide assurance for communities to raise their concerns, objections and complaints, thus enabling their rights to be fully respected. By doing so, it is expected that the ERP legitimacy and credibility can be enhanced to ensure sustained participation. The GoI is taking serious measures to enhance monitoring, reviewing and reporting capacity of the current FGRM in order to enable corrective actions, adjustment of mitigation measures as well as law enforcement in a more responsive manner. Such efforts are crucial to ensure regulatory compliance and institutional credibility.

14.4.2 Relevant Regulatory Frameworks for FGRM under the Social and Environmental Management

An initial analysis and identification of the relevant regulatory frameworks and their roles in FGRM, especially with regards to conflict handling, has been conducted and will feed into the

current initiative on FRGM refinement. This analysis further signifies the importance of law enforcement mechanisms, especially in addressing the potential risks of criminalization due to legal disputes and infringements of environmental management of ERP activities. The FGRM of AMDAL has been well recognized by Provincial and District Government, but more needs to be done in translating them further at a more practical level and in a more comprehensive and appropriate manner, especially on KLHS. This becomes more relevant with the development of space for a community to raise their concerns, complain and to obtain access for full engagement in the entire ERP programmatic cycle.

Law No. 32/2009 on the Environmental Protection and Management and Law No 26/2007 serve as the primary regulatory frameworks in the environmental management which governs which communities' engagement and complaint-handling mechanisms as well as sanctions for noncompliance are stipulated. Law No 32/2009 requires a social and environmental impact assessment by the Government prior to the development of mid-term and other relevant development planning and programs, and by businesses prior to the development of the business plan. Law No. 26 /2007 on Land Use Planning provides guidance in spatial planning for commercial activities, natural resource conservation and environmental protection. Sanctions are applied for the issuance of concession licenses that do not comply with the guidance. Relevant other regulatory frameworks include Government Regulation no 27/2012 on the Environmental Permit and Ministerial Regulation No 17/2012 on the Guidance for Involving Communities in Analyzing Environmental Impacts and Permits.

Table 14.11. Initial analysis of the relevant regulatory frameworks of KLHS, AMDAL and GAKKUM

Aspect	Regulatory Frameworks		
	KLHS	AMDAL	Gakkum
Object	Policy, planning and program (at provincial and district level)	Project planning at FMU	Specific case
Mechanisms	Mechanisms are not stipulated in detail	Detailing in accordance to activity classification and authority of Commission on AMDAL Evaluation	Mechanisms follow the existing arrangement of Ministries, Governor, head of district
Institutions	No detailing, following the existing authority and mechanism of KRP (<i>Kebijakan, rencana, Program / Policy, Planning,</i>	Detailing in accordance to activity classification and authority of Commission on AMDAL Evaluation	Hierarchical arrangement in accordance to the authority of Ministers, Governor, and Head of District/Municipality

Aspect	Regulatory Frameworks		
	KLHS	AMDAL	Gakkum
	Program) technocratic		
Time table	No details are provided for the time table for the conflict handling	No details are provided for the time table for the conflict handling	No details are provided for the time table for the conflict handling
Follow up	Recommendation of KRP refinement in accordance to the technocratic mechanisms of KRP	Changes in environmental permit, environmental audit, and law enforcement by Gakkum	Administrative and legal sanctions
Potential Conflicts	Political and economic conflict, that can be extended to legal dispute, and possible risk of criminalization	Legal dispute, and possible risk of criminalization	Summation, legal dispute for compensation.

Source: KLHK presentation of the FGRM workshop for ERPD, 8 March 2018

This regulatory framework, particularly Law No 32/2009, requires the engagement of the affected community, environmentalists and/or other affected parties starting from the planning processes through public announcement on business and/or activity plan and a public consultation. A business plan has to be made public and within a period of ten working days after the announcement, the public is allowed to raise their written concerns, propose suggestions, opinions and other responses to the plan. These are to be submitted to the proponent and the minister, governor, or head of district/mayor. Attention is paid to the environmental/forest degradation, where the Ministry of Environment and Forestry issued the Ministerial Regulation No. 22/2017 on the Mechanism for Managing Complaints on Suspected Polluting and Environmental and/or Forest Degrading Actions.

Nonetheless, Indonesia still needs to work more on the social conflict resolution mechanism, which often is interlinked with environmental disputes. An example is on the tenurial conflict that often occurs within the social forestry program. The Ministerial Regulation No. 83/2016 on Social Forestry issued by the Ministry of Environmental and Forestry articulates an aim to solve tenurial and legal issues of local, indigenous and tribal communities living within or surrounding forest areas for the sake of improving community welfare and preserving forest function. This Social Forestry scheme is implemented through 5 different programs, namely community forest, customary forest, community plantation forest, village forest and forestry partnership. However, this regulation and other relevant regulatory frameworks have been lacking conflict handling mechanisms, such as impartial mediators and/or paralegals to help in mitigating conflicts before

they escalate into serious legal disputes or to provide assistance to the affected communities should conflicts intensify and become legal disputes.

14.4.3 REDD+ Environmental and Social Conflict Resolution

REDD+ may have negative impacts on communities, as identified in the previous section of this chapter, by limiting communities' access to REDD+ forest areas, leading to loss of community forest-based livelihoods. The REDD+ complaint handling mechanism can make use of the existing relevant policies and regulatory frameworks, such as the MoEF Ministerial Regulation No. 22/2017, that provide mechanisms to resolve tenurial conflict, illegal logging, forest and land burning, encroachment, and wildlife hunting. This regulation stipulates the responsible Government agencies for managing complaints at national and subnational levels. The Ministry of Environment and Forestry is the responsible Ministry at the national level. At the subnational levels the responsible agencies include the Provincial Law Enforcement Agency, the Post for Complaints at the Provincial and District/Municipal Environmental Agency, and the Forest Management Unit at site level.

As stipulated in the Ministerial Regulation No 22/2017, there are five steps for complaint handling, i.e. grievance receiving, review, verification, reporting, and follow-up action. For verified complaints, follow up actions would include sanctions. There are five types of sanctions identified in the Regulation: (1) administrative sanctions, (2) mediation for off-court dispute resolution, (3) criminal law enforcement, (4) ordering the respective sections/units to address the issue, and (5) requesting relevant agencies to address complaints. The Ministerial Regulation also stipulates that communities' engagement in complaints handling should be based on the basic principles of (1) transparent and complete information, (2) equality, (3) fair and wise problem solving, and (4) coordination, communication and cooperation among concerned parties.

Unattended grievances may develop into social conflicts such as tenurial conflict, limited community's access to natural resources and land, and inequitable benefit-sharing, which could eventually lead to the failure of REDD+ programs in reaching emission reduction targets. Hence, identification of factors that can lead to the occurrence of social conflict at various stages of the implementation of REDD+ activities are necessary. Law No 7/2012 regarding the Management of Social Conflict, only considers hostile and/or physically violent clashes between two or more groups of people which take place in a certain period of time and with a broad impact that leads to insecurity and disintegration that disturbs social stability and hinders national development.

As outlined in the Law, included in the social conflict handling mechanisms are (1) conflict prevention, (2) cessation of conflict/hostility, and (3) post-conflict recovery. Conflict prevention is conducted through maintaining peace in society, developing a system of peaceful dispute settlement, reducing potential conflict, and establishing early warning systems. Conflict termination is done through the cessation of physical violence, determination of the status of emergency, protection of victims and deployment of authorized officers. Post-conflict recovery includes reconciliation, rehabilitation, and reconstruction.

The Government pays serious attention to land tenure conflict and its resolution, also through the issuance of MoEF Ministerial Regulation No. 84/2015 on Environment and Forestry, in which tenurial conflict resolution consists of mediation, social forestry, and law enforcement.

14.4.4 REDD+ Environmental and Social Conflict Resolution

The Government pays serious attention to guaranteeing communities' rights to be fully engaged in environmental management and to raise their concerns/objections/complaints through the development of a high quality FGRM that meets international standards. The following are the current efforts of the Government that deserve further technical assistance for a well-developed FGRM:

- a) Well defined measures for monitoring, reviewing and reporting the FGRM to feed into the corrective actions such as revisiting KRP, changing mitigation plans.
- b) Enforcement mechanisms of administrative and legal sanctions. This is particularly true with mining companies that do not comply with their obligation to restore and conserve their former mining area.
- c) The President Office's LAPOR, a web-based FGRM initiative
- d) Community consultative meetings for development planning and implementation (*Musyawarah Perencanaan Pembangunan/Musrenbang*), available at all levels, including the village level. This can be further utilized for ascertaining the need and interests of women, children as well as marginalized and vulnerable group through organizing a special Musrenbang for them (such as in the Municipality of Banda Aceh and in Central Java Province, where a women and/or children *Musrenbang* is/are also made available).
- e) Better defined incentives and disincentives to be used as part of a grievance handling mechanism (like incentives for the community to provide accurate reports)
- f) Conflict handling desk
- g) Legal mitigation and litigation technical support: These are often required especially for the communities who are in dispute with companies.
- h) Better community engagement in the development and refinement of FGRM through providing checks and balances.
- i) Further developing the second line enforcement in the current FGRM and conflict handling mechanism.
- j) Translating further the national FGRM regulatory frameworks (such as on AMDAL and KLHS) in a more practical, comprehensive and appropriate manner. This is especially true with respect to the space where communities can raise their concerns and/or complain, and the guarantee for open access through which communities can be fully engaged from the initial stage of planning to the social monitoring at implementation stage.
- k) Well qualified and impartial FGRM personnel such as web-based FGRM operators and officers for a quick and qualified response mechanism
- l) Well qualified paralegals at field levels, with skills and experience as mediators and facilitators.

15 BENEFIT-SHARING ARRANGEMENTS

15.1 Description of benefit-sharing arrangements

The ER Program's benefit-sharing arrangements will address a number of challenges, some of which may be unique to the Indonesian context. Benefits need to reach a diverse group of beneficiaries, which includes four levels of government, companies, as well as communities that are often located in remote villages and that may not have official titles to land. The eligibility criteria for beneficiaries have been designed to ensure that all relevant contributors to emission reductions can benefit from the program, with the village governments playing a central role in channeling benefits to local people. To further ensure that the benefits flow to these beneficiaries in a way that avoids bureaucratic delays, while fulfilling principles of good financial governance, ERPA funding at the central level will be managed by the Environmental Fund Management Agency (BLU-BPDLH) while key decisions for disbursement at the subnational level will be made by the provincial government. Furthermore, benefits cannot be allocated purely on the basis of reduced emissions from a historical baseline, as that would ignore site-specific factors, including the significant contributions of local communities, and especially adat communities, that have sustainably managed forests for centuries. Thus, the allocation of benefits also takes into account investment costs, and a portion of funding will be set aside for rewarding past sustainable practices.

The arrangements described in this Section are the result of a long process that has involved numerous consultations, ministerial decrees, and presidential regulations. The next steps toward finalizing the arrangements involve stakeholder consultations at the district level, the finalization of the Benefit Sharing Plan, and the establishment of the BLU-BPDLH.

15.1.1 Categories of potential Beneficiaries, eligibility and the types and scale of potential Monetary and Non-Monetary Benefits

Categories of potential beneficiaries

The ER Program's benefit sharing arrangements recognize and reward the following three types of entitlements to benefits: (i) policy development, implementation and administration by government institutions; (ii) the implementation of activities in the field; and (iii) rights to benefits due to rights to land where emission reductions take place. Based on this, the following categories of beneficiaries can be identified:

- **Government institutions** involved in policy development, and program management at the central government level, and at the subnational levels; as well as conservation agencies (UPT KLHK), FMUs, and village governments that are more directly involved in implementing ER activities.
- **Private Sector.** Companies that implement ER activities are estate crop companies, and owners of mining concessions, and of the various types of forestry concessions (IUPHHK-HA, IUPHHK-HT, IUPHHK-RE, IUPHHK, IUPJL).

- **Local communities including adat communities** that live in or near program areas where ER activities take place, or that implement activities that lead to ERs such as alternative livelihoods, fire protection, or forest monitoring. For the purpose of the benefit sharing arrangements, communities will be grouped based on the types of activities and types of members. Types of groups include farmer groups and Adat Law Communities.

Table 15.1 Categories of beneficiaries

Beneficiaries	Key ER Roles
Government institutions	
National Government	<ul style="list-style-type: none"> - Issuance, implementation, and enforcement of relevant national policies - Administration of the national REDD+ system - Administration of the BLU-BPDLH (see more information below) - ER Program administration, including national registry, Monitoring, Reporting, and Verification (MRV), coordination of ER interventions at Central level (with relevant Ministries). - Implementation of ER interventions related to capacity building for licensing management (forest certification, plantation certification, forest and ecosystem restoration, fire prevention and control, facilitation of social forestry)
MoEF Technical Implementation Units (National Parks, Nature Reserves)⁴⁶	<ul style="list-style-type: none"> - Responsibility for conservation areas in East Kalimantan - Development of conservation partnerships with local communities - Forest and Wildlife Protection and Monitoring - Fire Management and Prevention - Partnerships with local communities on Sustainable Livelihood in buffer zone areas.
East Kalimantan Government	<ul style="list-style-type: none"> - Prepare, implement, and enforce regional regulations (and enforcement of national regulations, where appropriate), improve land management plans, increase forestry administration capacity, reduce deforestation related to overlogging and HTI, reduce deforestation

⁴⁶ MoEF technical units and FMUs are under the national and Provincial Government respectively, but given their roles in the ER program they are considered beneficiaries in their own right.

Beneficiaries	Key ER Roles
	<p>related to mining, and support activities for emission reduction</p> <ul style="list-style-type: none"> - Facilitating coordination of ER interventions initiated by relevant provincial government services (Forestry Service, Plantation Service, Mining Agency, Environmental Service, etc.) - Responsibility to conduct MMR (Measurement, Monitoring, and Reporting) at provincial level including the web-based platform for HCV - Implementation of ER interventions related to capacity building through FMUs for fire prevention and control, facilitation of social forestry, and climate/green villages - Facilitating the process of proposing or permitting social forestry in the Working Group on the Acceleration of Social Forestry (Pokja PPS). - Facilitating FMUs in improving management capacity, technical capacity in implementing sustainable forest management (RIL), community empowerment, and business plan development.
FMUs¹	<ul style="list-style-type: none"> - Conflict resolution - Support for social forestry - Forest management, protection, and monitoring - Fire management and prevention - Coordination with communities and other entities in the FMU
District Governments	<ul style="list-style-type: none"> - Prepare, implement, and enforce regional regulations (and enforcement of national regulations, where appropriate), improve land management reduce deforestation related to oil palm plantation expansion, reduce encroachment with sustainable alternatives program plans and support activities for emission reduction. - Implementation of ER interventions related to capacity building for fire prevention and control, facilitation of sustainable agriculture and estate crops, climate/green villages.

Beneficiaries	Key ER Roles
Village Governments	<ul style="list-style-type: none"> - Develop ER activity plans with communities and land rights holder groups - Develop benefit sharing plans and agreements for community and land rights holder groups
Private Sector	
Estate crop concessions	<ul style="list-style-type: none"> - Implementation of HCV policies - Partnerships with local communities - Fire management and control
Timber plantation concessions	<ul style="list-style-type: none"> - Implementation of HCV policies - Partnerships with local communities - Fire management programs
Forest management concessions (natural forest)	<ul style="list-style-type: none"> - Implementation of RIL-C policies - Partnerships with local communities - Fire management programs
Local Communities Including Adat Communities	
Community groups	<ul style="list-style-type: none"> - Reduction of land clearing - Adoption of alternative livelihoods - Adoption of fire management and control practices - Continuation of sustainable management practices

Eligibility for receiving monetary and non-monetary benefits

Fund distribution from the BLU-BPDLH will require that the beneficiaries have a significant role in REDD+ implementation. In addition, private companies and government institutions will also have to have a legal status, allowing them to enter into contractual agreements (ER Contracts discussed below). Such legal status is conferred to government agencies through laws and decrees, while companies qualify through possessing valid land use licenses. Local communities, including adat communities, will need to be recognized by their village governments. This does not require that communities have formal land titles issued by BPN, or that their adat claims are recognized by the district. Since the entire province is subdivided into villages, communities fall under a village's jurisdiction. In few cases, adat communities are under multiple villages.

Scale and types of benefits

The value of benefits to be shared by the ER Program's benefit sharing mechanism will be determined by the value of the sale of verified ERs to the Carbon fund, which is anticipated to be up to USD 110 million. Funding for the Program's ER activities will be covered by the Gol's budget, private sector, and by development partners (see Section 6.2) leaving the entire value of the ER payments for distribution as monetary and non-monetary benefits. Thus, monetary benefits are defined as cash, funded with ER payments, that is received by beneficiaries; and non-monetary benefits are goods, services, or other benefits funded with ER payments.

It is expected that the ER Program will also generate significant levels of benefits that will not be distributed through the benefit sharing mechanism. These include substantial non-carbon benefits (described in Section 16), including benefits from participating in ER activities, such as increased capacity, and improved livelihoods; and benefits derived from improvements in governance, such as greater legal certainty, and reduced costs associated with conflict.

All beneficiaries, except for private companies will be eligible for receiving monetary benefits. Non-monetary benefits will be in addition to benefits associated with the Program activities (non-carbon benefits), as these are already funded by the ER Program budget. The use of monetary benefits will be determined through contracts, as discussed below under the distribution process. The types of benefits for each category of beneficiary are outlined in table 15.2 below. These benefits were discussed in previous consultations, but will be further discussed in consultations in early 2019 and finalized in the Benefit Sharing Plan (expected August 2019). The national, provincial, and district governments will primarily receive monetary benefits for operational costs, but they play a role in channeling benefits to other beneficiaries.

Table 15.2 Types of benefits

Beneficiaries	Types of benefits
Government institutions	
National Government	- Monetary benefits for covering operational costs, defined as expenditures related to the technical support (e.g., MRV, safeguards) and administrative and financial management of the ER Program
East Kalimantan Government	- Monetary benefits for covering operational costs
District Governments	- Monetary benefits for covering operational costs
Village Governments	- Monetary benefits for covering operational costs - Non-monetary benefits for:

Beneficiaries	Types of benefits
	<ul style="list-style-type: none"> ○ Support for forest and fire management, including patrolling and mapping ○ Support for sustainable agriculture, including agricultural inputs and training
FMUs	<ul style="list-style-type: none"> - Monetary benefits for covering operational costs - Non-monetary benefits for: <ul style="list-style-type: none"> ○ Capacity building, including for facilitation with communities (e.g., awareness, conflict resolution, etc.) ○ Capacity building/training and equipment for RIL-C, HCV, forest and fire management, social forestry, and livelihoods opportunities for communities
Private Companies	
Estate crop concessions	<ul style="list-style-type: none"> - Non-monetary benefits in the form of capacity building/training on sustainable plantations, HCV protection, certifications (e.g., FSC/PHPL, RSPO/ISPO), sustainable forest management (e.g., RIL-C), fire management, and tenure conflicts/public complaints
Timber plantation concessions	<ul style="list-style-type: none"> - Non-monetary benefits for equipment and inputs (e.g., planting stock) to support sustainable practices
Forest management concessions	
Local Communities Including Adat Communities	
Community groups	<ul style="list-style-type: none"> - Monetary benefits for: <ul style="list-style-type: none"> ○ Revolving funds for micro credit to women and businesses (e.g., crafts/agricultural products) - Non-monetary benefits for: <ul style="list-style-type: none"> ○ Forest and fire management, including patrolling, equipment, and capacity building/training

-
- Development projects (e.g., health, education) that do not contribute to deforestation and forest degradation
 - Additional livelihood support for community businesses, including capacity building/training, equipment, market access, or agricultural inputs
-

Criteria for the distribution of benefits

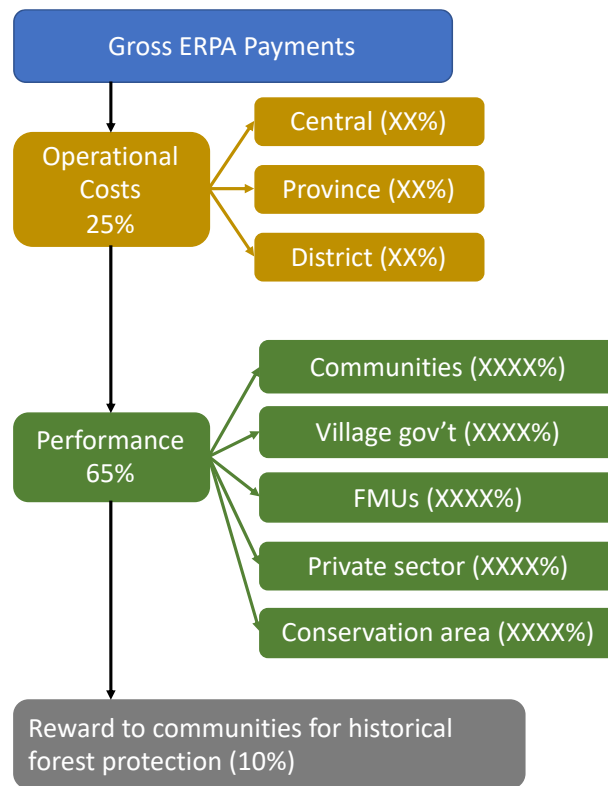


Figure 15. 1 Distribution of Benefits

While the funding from ER payments will be purely performance-based, the distribution of benefits will take into account other considerations, such as policy relevance, investment cost, and opportunity cost. While the proportions have not been finalized, Figure 15.1 provides an indication of the relative scale of benefits accruing to each beneficiary group, which was discussed during consultations in October 2018. The final proportions will be discussed in future consultations in early 2019 and agreed upon in the Benefit Sharing Plan prior to the ERPA signing.

Around 25% of the gross ERPA Payments will be allocated to the operational costs of government institutions. This portion of funding is not performance based, but will be allocated to government institutions based on their roles in policy development, program development, program management, and monitoring. The rationale for this allocation is that it provides an incentive for government institutions to continue supporting ER policies that contribute to program sustainability and that reduce the risk of reversals. The justification for this proportion for operational costs is due to high costs of accessing sites in the ER Program Area, the size of the jurisdiction, the large number of stakeholders in the ER Program, the costs of facilitating between the four levels of government (national, provincial, district, and village), and the costs supporting communities in preparing Concept Notes (see more below).

Most of the ERPA payments (approximately 65%) will be used to reward performance in reducing emissions. Beneficiaries under this funding modality will be communities, including adat communities, village governments, FMUs, Conservation Units, and the private sector. The performance of beneficiaries will be measured against historical emission baselines using appropriate proxy approaches, where full accounting of emissions is not feasible. As a proxy for emissions from deforestation, forest cover may be used. As discussed in Section 9 on MMR, degradation within logging concessions will be measured using logging data. While benefit allocation will be mainly based on performance in emission reductions, allocations will also consider the investment costs of beneficiaries to accommodate different types of ER opportunities and to ensure that benefits are distributed equitably. It is expected that communities will receive a higher share of benefits and the benefits to the private sector will be relatively limited given their respective roles in managing forests and ER Program implementation. Private companies have an obligation to implement good practices and the benefit sharing arrangements are not intended to reward them for simply carrying out this obligation.

Approximately 10% of ERPA payments will be reserved for rewarding beneficiaries who have had net-zero or low deforestation rates in the past⁴⁷ and who can demonstrate continued protection of forests. This portion of funding is to ensure that communities that implemented past good practices are recognized and to provide an incentive for continuing such good practices. This could also encourage other communities to adopt good practices. It is expected that this funding will apply only to communities, including adat communities, whose forests have remained protected.

Benefit distribution process for communities and private sector companies

Benefits for the private sector and communities will be based on Concept Notes that report on performance and include proposals for the use of benefits. The process for this is described below and will be further consulted on and finalized in the Benefit Sharing Plan.

- Village governments, on behalf communities, must be recorded in both the Sub-National and National Registry Systems. The private sector companies must hold valid land use licenses.
- Village governments, on behalf of communities, submit Concept Notes to Community Empowerment Services (DPMPD), and private sector companies submit Concept Notes to the Forestry Service or Plantation Service depending on the type of license. This submission will be at the district and/or provincial levels as appropriate.
- The DPMPD and Forestry and Estate Crop Services report to the Provincial Environment Service (DLH), which coordinates the data for the ER Program and validates the Concept Notes (in coordination with the national government and the Provincial Climate Change Council (DDPI), which includes representatives of relevant local government organizations, professional staff, and ad hoc technical specialists).and determines the level of funding for each Concept Note.
- After validation and acceptance by the DMPD or the Forestry or Estate Crop Service, Concept Notes are sent to the Governor for approval.

⁴⁷ Land cover maps are available since 2006, which will be the basis of this measurement.

- The Governor requests funding for these Concept Notes from BLU-BPDLH.
- Village governments, on behalf of communities, will receive benefits directly from BLU-BPDLH through a custodian bank.
- Benefits for private sector companies will be provided through the Forestry or Estate Crop Service. BLU-BPDLH will transfer funding directly to these Services for this purpose.
- ER Contracts will be signed between the BLU-BPDLH and the village government or Services, with the Governor as a witness, specifying the plan for use of benefits.
- DLH monitors the use of these benefits and reports on this to the Governor.

Intermediaries will be used to support communities that lack technical capacity to develop Concept Notes. Intermediaries could include NGOs, government institutions and universities. These intermediaries will be funded by the provincial government under their operational costs.

15.1.2 Criteria, process and timelines for the distribution of Monetary and Non-Monetary Benefits

Process for the distribution of benefits

Funding from the Carbon Fund will be managed by the Environmental Fund Management Agency (*Badan Layanan Umum - Badan Pengelola Dana Lingkungan Hidup/BLU-BPDLH*). The BLU-BPDLH is still under development but is expected to be operational at least by the time of the first ERPA payment. It will adopt international standards for fund management and distribution, and it will use a custodian bank as trustee.

At the national level, BLU-BPDLH will transfer funds to MoEF's Directorate Generals that are involved in the ER Program, including the DG of Climate Change, and the Research Development and Innovation Agency (FORDIA). The transfer mechanism to central government institutions will be through non-tax revenue (PNBP) and its utilization will be included in MoEF's budget (DIPA) in accordance with activities in the Benefit Sharing Plan. Transfers will be regulated through Ministry of Finance Regulations (PMK). As noted above, the scale of funding that will be allocated to central government institutions will be a fixed percentage of the total funding available for operational costs. This percentage will be determined prior to the signing of the ERPA and is expected to be around 5-10% of total ERPA payments.

The fund flow to the provincial level, including FMUs, will be based on contracts between BLU-BPDLH and the East Kalimantan Provincial Government. Transfer to district governments and to other recipients (e.g., village governments and Services) will be based on contracts between BLU-BPDLH and the recipients, with the East Kalimantan Provincial Government (Governor) as witness. The funds will flow directly from BLU-BPDLH to the recipient's bank account. Village governments will be responsible for transferring funds/benefits to local and adat communities within their jurisdiction. The recipients will utilize the funds in accordance with the Benefit Sharing Plan. The province and district governments will detail the intended use of their funds in their budget documents (DPA).

At the provincial level, the Environment Service (DLH) will be responsible for consolidating the report on the implementation of the Benefit Sharing Plan to BLU-BPDLH, which will then consolidate this with the same reports from the local and central governments. The fiduciary arrangement of the mechanism will be described in detail in the Benefit Sharing Plan.

Timing and flow of benefit distribution

The ER Program will have two reporting periods (2022 and 2024), each followed by an ER payment from the Carbon Fund roughly one-year after (2023 and 2025). Benefits will be distributed following these two payments.

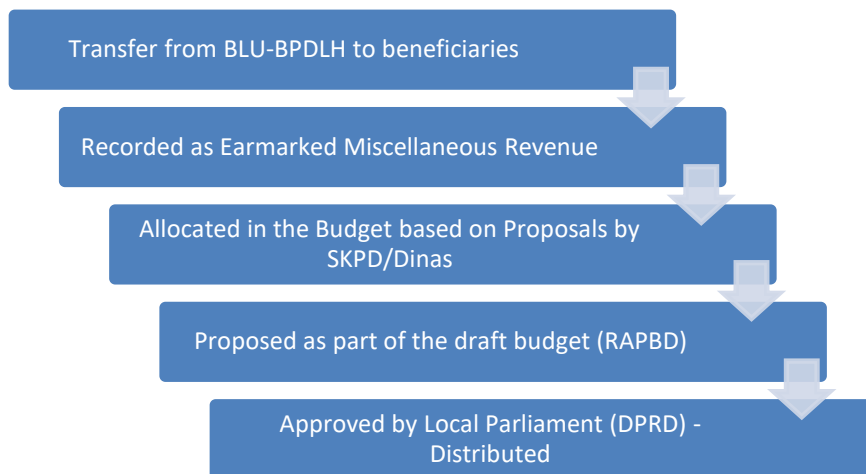


Figure 15.2 Budgeting Process in Provincial and District Governments

The flow of funds (and process for the government for receiving benefits) begins with the ER payment being received by the BLU-BPDLH and transferred to the central, provincial, and district governments. For the provincial and district governments, these funds will be recorded as 'Earmarked Miscellaneous Revenue' – this will ensure that revenue will be reallocated as benefits as specified in the Benefit Sharing Plan. The access to this Earmarked Miscellaneous Revenue will have to follow regular budgeting processes. SKPD will have to present budget proposals (beginning in March of every year) to the Provincial Planning Agency (BAPPEDA) for allocation in the budget prior to parliamentary (DPRD) budget review. The draft budget (RAPBD) will have to be approved in December of every year for disbursement the following year. The process may take from three months to one year, depending on the timing of the received payment.

For beneficiaries receiving funds directly from BLU-BPDLH (village governments on behalf of communities and Services on behalf of the private sector), funds can be accessed after recommendation from the Provincial Government. Processes can be completed in the same year.

To summarize the timeline, the Government of Indonesia will report on ERs to the World Bank and it may take up to one year to verify these ERs and make payment. Following this, it may take

three months to one year, depending on budget cycles, for benefits to be distributed to beneficiaries.

Safeguards for benefit distribution and Use

The use of benefits under the BSP (both monetary and non-monetary) will be subject to safeguards requirements as stipulated in the ERP's ESMF, IPPF, RPF, PF and FGRM. Screening against environmental and social risks and the negative list will be carried out at the concept note stage submitted by the private sector and communities through their respective agencies (i.e. forestry and estate crops agencies for the former and DPMPD for the latter). For FMUs, such screening and due diligence process will be carried out by the Provincial Forestry Service. Proposed activities or financing under the negative list will be excluded from the proposals. Legal covenants for safeguards compliance will be included in the ER contracts signed by the BLU-BPDLH and village governments and forestry and estate crop services. Upon signing these contracts, these entities will be mandated to provide oversight and technical facilitation for the implementation of the ESMF, IPPF, RPF, PF and FGRM.

Consistent with the benefit distribution process under the BSM, respective agencies who are responsible for oversight (DPMPD, Forestry and Estate Crop Services as well as Provincial Forestry Service) will report to the Provincial Environmental Service (DLH) and SEKDA for the overall implementation of safeguards under the BSP. Such reporting will complement the ERP's FGRM, which is being developed to address future BSP implementation. Program-level oversight for this oversight and grievance management will be under coordination from a Program Management Unit (PMU) at the national level and provincial REDD+ Taskforce.

ER Program entities and benefit recipients are required to monitor and report safeguards compliance over the duration of the ER Program unless agreed otherwise or there is a dedicated resource allocation for such monitoring and reporting to continue following the Program's closure.

15.1.3 Monitoring provisions

The Government of Indonesia will report on the implementation of the Benefit Sharing Plan in the ER monitoring reports.

All transfers will be verified by the Ministry of Environment and Forestry to ensure that they are based on performance, and meet the principles and criteria of REDD+ and the Carbon Fund. Monetary benefits received by the governments and implementers will be monitored by the DG for Climate Change of the MoEF and by the Environment Agency. Spending of funding by the beneficiaries will

be regulated through the ER Contracts, or through the budgetary process for government institutions, and will be reported on in the ER monitoring report.

Any grievances regarding the carbon fund payment transfer and its mechanism will be addressed through the FGRM (see Section 14.3).

15.2 Summary of the process of designing the benefit-sharing arrangements

An initial workshop was held in December 2015 in Jakarta to discuss the channeling of funding from the Ministry of Finance to the province. This workshop included representatives from MoEF, MOF, the East Kalimantan Government, development partners and national NGOs. The meeting helped to identify the on-granting mechanism as a potential component of the benefit-sharing arrangements. A study on the Benefit Sharing Mechanism in East Kalimantan was conducted in 2016.

Benefit sharing arrangements were discussed further between the Ministry of Environment and Forestry and the Provincial Treasury Agency. In November 2017, the Provincial Treasury Agency (BKAD) and provincial development planning agency (BAPPEDA) discussed the appropriate benefit sharing arrangement for East Kalimantan. It was suggested that the FCPF might use the on-budget off-treasury mechanism for benefit-sharing arrangements so that it will avoid bureaucratic procedures from the central to province and/or district governments. However, Presidential Decree No. 77/2018 for the establishment of BLU-BPDLH, stipulated an on-budget on-treasury system, but with a number of provisions to reduce the bureaucracy associated with this process.

As mandated in Act No 32/2009 on Environmental Protection and Management, the Government should provide a policy for an environmental economic instrument. Referring to this mandate, the Government issued Government Regulation No. 46/2017 which regulates development planning and economic activities, environmental funding, and incentives/disincentives. As an umbrella regulation, PP 46/2017 regulates that the government applies the public service agency (BLU) approach to managing the environmental fund. The development of Government Regulation no 46/2017 involved discussions with stakeholders, including other line ministries, local governments, NGOs, the private sector, and academia. Further, a public consultation process was held in selected areas to gain input from local government and other local stakeholders.

A consultation between the national and provincial government was held in October 2018 and the discussion included:

- A proposal that the Provincial Government would have exclusive authority to manage and disburse the Carbon Fund from the provincial level to the field level (village level).
- A discussion of the allocation of benefits between central and provincial governments with a proposal that the majority of the funds will be disbursed to the province.
- The BLU-BPDLH was confirmed as the national agency for channeling benefits to the Provincial Government once ER performance reports have been verified by the MoEF.

Further benefit sharing arrangements will be designed through a consultative process involving the key stakeholders. Specifically, consultations will be held in early 2019 as part of the FPIC process. As a part of FPIC process, ER program will be introduced to relevant stakeholders at

district level. The process will be continually extended to village levels. It is expected that the FPIC process will be finalized in May 2019.

The roadmap for the completion of the Benefit Sharing Mechanism is envisioned as follows:

January-February 2019	Stakeholder Consultations covering Districts level completed
January-February 2019	The structure organization of BLU-BPDLH established (MoF decree issued)
January-February 2019	Selection of intermediary institutions
February – May 2019	Public consultation of proportion of benefit sharing, back to back FPIC process
By June 2019 By September 2019	Governor Regulation on Provincial BSM Arrangements issued Ministry of Regulations (PMK) that become basis for BLU to implement the benefit sharing mechanism is issued
By August 2019	BSP Advance Draft disclosed
By December 2019	ERPA signed
2022-2025	Implementation of performance-based funding
• 2022	First reporting period
• 2023	First ERPA payment
• 2024	Second reporting period
• 2025	Second ERPA payment

15.3 Description of the legal context of the benefit-sharing arrangements

Key regulations related to the benefit sharing arrangements /mechanism are as follows:

- The legal basis for the distribution of funding in benefit sharing began with law number 1 of 2004 concerning the legal basis for funding disbursement. In this Law the Public Service Agency (BLU) was established to improve services to the community in order promote public welfare. Law No.1 / 2004 ordered government regulations to be established regarding the management of the Public Service Agency (BLU).
- Under the order of Law No.1 / 2004 the government issued Government Regulation No. 23 of 2005. The objective of establishing the BLU was to improve services to the community in order to advance public welfare by providing flexibility in financial management based on economic principles and productivity, and applying sound business practices. BLU organizes its activities without prioritizing profit seeking. One of the conditions for the establishment of BLU is the management of special funds in order to improve the economy and / or services to the community.
- Law 32 of 2009 concerning Protection and Management of the Environment. tasks the government with developing economic instruments, including planning economic activities, environmental funding and the application of incentives and disincentives. This law mandates the establishment of a Government Regulation on Economic Instruments.

- Government Regulation No. 10/2011 on the Procurement of Foreign Loans and Receipt of Grant regulates on how loans and grant works. Loans and grants can be classified into “planned” and “direct” loans and grants. Planned loans or grants should be a part of national development planning and all ministries who will access loans or grants should propose the program/activities funding by loans or grants. Meanwhile, direct loans or grants that goes directly to ministries should be consulted with Ministry of Finance, Ministry of Bappenas, and related Ministries before loans or grants agreement signed. After that Ministry who will get direct loans or grants can ask BLU to manage the funds.
- Regulation of Minister of Finance No. 191 of 2011 on the Mechanism for Grant Management. The regulation provides more detail about grant account management.
- Regulation of the Minister of National Development Planning/Head of Bappenas No. 4 of 2011 on the Procedures for Planning, Proposal Submission, Assessment, Monitoring and Evaluation of activities financed by Foreign Loans and Grants
- Regulation of the Minister of Home Affairs No. 32 of 2011 and its amendments
- Government Regulation No. 74 year 2012 on changing the regulation of government regulation No. 23 of 2015 on financial management of the BLU.
- Regulation of the Minister of Home Affairs No. 39 of 2012 on Guidelines for Grants and Social Assistance derived from APBD. This stipulates that grants expenditure from APBD covers individuals/ families, communities, and NGOs. The local government can allocate grants and social assistance if the local government has established a Regional Head Regulation (PerGub/PerBup) related to those issues. The local government can then provide fiscal incentives to beneficiaries consisting of private companies, communities/villages and NGOs.
- Government Regulation No. 45/2013 on Procedure of State Budget Implementation regulates that grant, as one of government revenue sources, can be distributed as a grant to local government, Indonesian Stated Owned Enterprises and Regional Owned Enterprises. Further, as one of government revenue sources, grants also can be distributed through social assistance mechanism to communities intending to protect the communities from social risk, to enhance social welfare as well as to enhance economic ability. Government can also distribute the grant through non energy subsidize mechanism to fulfil people live. In terms of this matter, Ministry of Finance, as Budget User of the Government Revenue, can designate an official at a ministry or an institution (i.e. BLU) as Proxy of Budget User.
- The basis for the establishment of the BLU-BPDLH was finalized in 2017 with Government Regulation No. 46/ 2017 on the Economic Instrument for the Environment.
- Environment and Forestry Ministerial Regulation No. 70 of 2017 regulates that the distribution of REDD+ financing consist of two approach covering input based payment for enabling environment activities and result based payment for emission reduction achievement. The input-based payment will be distributed based on the enabling environment program/activities proposed. The results-based payment mechanism will be based on verified emission reductions.
- Regulation of the Minister of Finance No. 224 of 2017 on Grants from the National Government to the Regional Governments. The regulation mentions that in central government the KPA for grant (authorized budget holder) is under the DG of Fiscal Balance.
- Under Presidential Regulation number 77 of 2018 concerning Management of Environmental Funds, the management of environmental funds is carried out through

contracts / agreements. In addition, it is mandated to establish a non-echelon organization that carries out fund management functions, and this organization is formed by the finance minister, and appoints and assigns Custodian Banks as trustees. According to Presidential Regulation No.77/2018, the BLU-BPDLH will be operated as a public service agency (*Badan Layanan Umum/BLU*). It means that the BLU-BPDLH as a government agency is able to receive and manage funds.

16 Non-carbon benefits

16.1 Outline of potential Non-Carbon Benefits and identification of Priority Non-Carbon Benefits

Actions and investments to reduce deforestation and degradation in East Kalimantan will result in important benefits in addition to emission reductions. Such non-carbon benefits include above all the improvement of livelihoods of forest-dependent communities, and the protection of ecosystem services, including: biodiversity, improved water quality, soil fertility, flooding and erosion control, and habitats of game and fish. Another key expected benefit of the ER Program is improved forest governance which will lead to reduced land conflict, and to an improved investment climate. Priority non-carbon benefits, are those that are a direct outcome of reduced deforestation, such as the preservation of ecosystem services; and those that are aligned with government and local priorities and are therefore integral to the program design, such as those linked to improved forest governance and livelihoods.

Potential non-carbon benefits were identified with stakeholders during meetings related to the development of the ERPD since April 2016 (Annex 5.2). Further consultations with district stakeholders will be conducted between February and May 2019.

The expected non-carbon benefits and priority non-carbon benefits are described in Table 16.1 below.

Table 16. 1. Expected non-carbon benefits

Type of Benefit	Explanation	Relevant ERP Activities
Improved access to forest resources for local communities, leading to improved livelihoods (Priority NCB)	<p>Social forestry licenses and livelihood programs will protect and enhance livelihood opportunities for participating communities. Income from SF can include income from timber or from NTFPs such as <i>gaharu</i>, rattan and forest honey. Besides improving income, such activities often provide an important economic safety net to local people.</p>	<ul style="list-style-type: none"> • Facilitating FMU in supervising and technical support of SFM and Social Forestry • Facilitating Social Forestry licenses • Capacity Building of Social Forestry for Community • Facilitating the implementation of Social Forestry Management • Building community commitment and partnership in conservation forest area management • Capacity building for communities in conservation forest • Facilitating the implementation of conservation forests by community • Technical support on Village Low Emission Development Planning • Enhancing sustainable mangrove practices • Developing new-model swidden-agriculture with community

Type of Benefit	Explanation	Relevant ERP Activities
		<ul style="list-style-type: none"> • Utilizing riparian lands for development of paddy's field with community • Developing alternative fresh-water fishery • Enhancing sustainable agriculture practices with community
Natural disaster reduction/prevention	Deforestation has been shown to lead to increased flooding, fires, and landslides. Reducing deforestation should lead to a reduction in frequency and intensity of these events.	Overall program.
Reduced health impacts from smoke and haze	A reduction in land fires, besides reducing emissions, will also lead to a reduction in smoke and haze which will have significant health benefits for local populations and will contribute to a decrease in cross-border pollution.	<ul style="list-style-type: none"> • Facilitating FMU and Community in Forest Fire Protection and Control • Ensuring Implementation of Fire Prevention and control and Forest Protection by forest concessions • Implementation of Forest Fire Prevention and Suppression by estate crops and community • Implementation of Land Fire Prevention and Suppression by smallholders
Protection of biodiversity (Priority NCB)	By protecting remaining forests, the ER Program will contribute significantly to both national and global efforts to protect	Overall program

Type of Benefit	Explanation	Relevant ERP Activities
	biodiversity. This includes the protection of habitat for key species such as the orangutan or the Borneo clouded leopard.	
Reduced conflict over land (Priority NCB)	Improved forest management, delineation of land use boundaries, settlement of disputes and an improved licensing regime will lead to reduced conflict over land.	<ul style="list-style-type: none"> • Increasing policy on transparency and access to information about licensing • Strengthening spatial planning policies and village development plans that support the emission reduction program • Reviewing overlapped permits and enforcing policy implementation on licensing moratorium and RIL • Acceleration of land tenure settlement for community • Strengthening community participation to reduce conflict in forested area • Improving the capacity of FMUs • Ensuring demarcation of boundary and forest utilization block of FMU • Technical support for Village Low Emission Development Planning

Type of Benefit	Explanation	Relevant ERP Activities
Improved recognition of customary land claims	Increasing the recognition of customary areas (wilayah adat) and customary forests (hutan adat) is an important part of Gol's agrarian reform program and will support improved land governance and more equity for East Kalimantan's customary/indigenous people.	<ul style="list-style-type: none"> • Facilitating FMU in supervising and technical support of SFM and Social Forestry • Facilitating Social Forestry licenses • Capacity Building of Social Forestry for Community • Facilitating implementation of Social Forestry Management • Acceleration of land tenure settlement for communities
More effective local participation in government planning processes and strengthened negotiating capacity.	Enhanced access and participation of local people (including women, indigenous people, marginalized and vulnerable groups), in forest management and in spatial planning will be achieved through capacity building activities and through support for the sustainable village planning.	<ul style="list-style-type: none"> • Building community commitment and partnership in conservation forest area management • Capacity Building for Community in conservation forest • Technical support on Village Low Emission Development Planning

16.2 Approach for providing information on Priority Non-Carbon Benefits

Besides monitoring emissions reductions, the MRV system will also cover non-carbon benefits, including social and environmental benefits, as well as governance indicators. The SIS REDD+ will include evidence-based information on non-carbon benefits and will include both quantitative and qualitative data collection, and will be based on consultations with target stakeholders. Information can be compared to the baseline information collected as part of the SESA. Information on non-carbon benefits will be collected on a regular basis, will be presented in regular progress reports, and will be made available to the public. An initial list of indicators is presented in Table 16.2 below.

Table 16.2 Initial list of indicators for non carbon benefits

Type of Benefit	Indicators
Improved access to forest resources for local communities, leading to improved livelihoods (Priority NCB)	<ul style="list-style-type: none"> • Increase in the social forestry area • Increased production of NTFPs • Increased income of participating communities • Increased food security
Natural disaster reduction/prevention	<ul style="list-style-type: none"> • Reduced deforestation and degradation • Reduced frequency and intensity of floods, fires and landslides
Reduced health impacts from smoke and haze	<ul style="list-style-type: none"> • Reduction of fire hotspots • Improved air quality in affected areas
Protection of biodiversity (Priority NCB)	<ul style="list-style-type: none"> • Reduced decline in habitat for key species, such as HCV forests and primary forests • Reduced decline in populations of key species
Reduced conflict over land (Priority NCB)	<ul style="list-style-type: none"> • Records of settlement achieved • Reduced number of conflicts reported
Improved recognition of customary land claims	<ul style="list-style-type: none"> • Area of adat land registered.
More effective local participation in government planning processes and strengthened negotiating capacity	<ul style="list-style-type: none"> • Degree of local participation in governance platforms.
Improved accountability, transparency and participation in forest management	<ul style="list-style-type: none"> • Improvement in transparency and accountability indices

17 TITLE TO EMISSION REDUCTIONS

17.1 Authorization of the ER Program

Based on Law No. 24 of 2000 on International Law Making, the Ministry of Foreign Affairs is the main institution to represent the Government of Indonesia (“GoI”) in agreements with a foreign entity. However, there are some exceptions. For agreements concerning foreign loans or grants, Article 32 of Government Regulation No. 10 of 2011 on the Foreign Loan and Grant Procedure assigns the role of signatory to the Ministry of Finance (“MoF”). Further, Constitutional Court Decision of No. 20/PUU-V/2007 makes it possible for any relevant technical ministry to sign an agreement with a foreign party, as long as the nature and scope of the agreement is governed by private law. As the ERPA is considered an agreement under contract law, either MoF or the Program Entity has the authority to sign. After a series of consultations conducted by the Program Entity and relevant key stakeholders, GoI decided that the Program Entity will sign ERPA.

Name of entity	Ministry of Environment and Forestry
Main contact person	Dr. Bambang Hendroyono
Title	Secretary General
Address	Gedung Manggala Wanabakti, Jl. Jenderal Gatot Subroto, Jakarta (12070)
Telephone	+62 21 5730191
Email	Banghen_11@yahoo.co.id
Website	http://menlhk.go.id
Reference to the decree, law or other type of decision that identified this entity as the national authority on REDD+ that can approve ER Programs	<p>The position of the Program Entity as the national authority to sign ERPA is explained in several laws and regulations under Indonesian law, as follows:</p> <ul style="list-style-type: none"> (i) the Law No. 41 of 1999 stipulates the position of Program Entity as the main authority on forestry, which has the mandate from the President to conduct legal actions as follows: <ul style="list-style-type: none"> a. regulate and manage any subject matter related to forest, forest area, and forest products; b. determine and define the legal status of forest area and non-forest area within the territory of Indonesia;

	<p>c. have a right to regulate and define: the legal connection between any legal subject under Indonesian law and forest; and any legal act related to the management, utilization and preservation of forest under Indonesian law;</p> <p>(ii) The Decision of Constitutional Court No. 20/PUU-V/2007 implicates the opportunity of any relevant technical ministry (including Program Entity) to sign an agreement with a foreign party in so far as the nature and scope of the agreement is governed by private law;</p> <p>(iii) As mentioned earlier in Section 15, the funding mechanism for the implementation of the National REDD+ Strategy in Indonesia will be mainly managed by the Environmental Fund Management Agency (“BLU-BPDLH”), a Public Service Agency, which was established specifically for environmental issues including climate change and REDD+. Article 10 of Presidential Regulation No. 77 of 2018 on BLU-BPDLH outlines some key authorities of the Program Entity including to provide technical support and supervision to the performance of the management board of BPDLH;</p> <p>(iv) In line with the authorities of the Program Entity provided by the Article 10 of Presidential Regulation No. 77 of 2018 on BLU-BPDLH, Article 6 (1) letter (a) the Government Regulation No. 23 of 2005 on Public Service Agency provides a right to the Program Entity to submit a request to MoF on the disbandment of BLU-BPDLH in case of a lack of technical performance</p> <p>(v) Article 1 (36) of the Minister Environment and Forestry Decree No. 70 of 2017 on REDD+ Procedures determines that the Program Entity is the principal government agency which leads and oversees the development and implementation of REDD+ projects in Indonesia</p>
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17.2 Transfer of Title to ERs

Legal context

As mentioned earlier in Section 4.4. on the Assessment of Land and Resource Tenure in the Accounting Area of ER Program and in Chapter 15 on Benefit Sharing Arrangements, land owners

and natural resource license holders in the program area include mining concessions, forestry concessions, social forestry concessions, estate crop permit holders, indigenous people and groups of landowners. Based on the typology of land ownership and license holders, there are at least four legal regimes which are relevant to the legal concept of Title to ERs: agrarian law, forestry law, regional autonomy law, and contract law. Under Indonesian law, any application of these regimes should conform with the doctrine of “the State Ownership on Natural Resources,” which is incorporated in Article 33 of the 1945 Constitution.

In the context of agrarian law, there is no regulation which governs carbon rights attached to land or to natural resources holders. Nevertheless, there is also no regulation which prohibits them from receiving or claiming benefits beyond the scope of their ownership or license under private law, unless such claim or benefit is prohibited by other specific law regime.

In the context of forestry law, the Forestry Law No. 41 of 1999 defines the authority of the Minister of Environment and Forestry (the Program Entity) to conduct some legal actions as follows:

- (vi) regulate and manage any subject matter related to forest, forest area, and forest products;
- (vii) determine and define the legal status of forest area and non-forest area within the territory of Indonesia;
- (viii) have a right to regulate and define: legal connection between any legal subject under Indonesian law and forest; and any legal act related to the management, utilization and preservation of forest under Indonesian law.

Previous GoI efforts relevant to the definition of Carbon Rights

There have been some attempts by GoI to implement the mandates of the Minister of Environment and Forestry, as mentioned above, in the context of carbon rights .

In 2009, the Decree of Minister of Forestry No. 36 of 2009 (“**P 36**”) on the Carbon Stock and Sequestration Licensing Procedure within the Production and Protected Forest and its two amendments (Decrees of Ministry of Forestry No. 11 of 2013 and No. 8 of 2015) provide some basic legal elements of carbon rights, including the authority of the Minister of Environment and Forestry to approve or disapprove any transfer of carbon credits generated by the voluntary market scheme-related ER Program under carbon stock or sequestration activities. However, these regulations do not address the ownership of the Program Entity or any ramification of generation of carbon right to the land tenure holdings and natural resources. In addition, these regulations clearly state that the carbon credits generated by an ER program under a REDD+ scheme is beyond their scope and mandate as it will be governed by a specific minister of forestry decree. It is noteworthy that the Director General of Sustainable Production Forest Management of MoEF issued the Circular Letter of Director General of Sustainable Production Forest Management of MoEF No. SE.3/MenLHK-PHPL/SET/SET.1/7/2017 dated 17th of July 2017 to some forest license holders including the holders of Ecosystem Restoration Licenses (IUPHHKRE). With this letter, the Director General prohibits any voluntary market scheme-related agreements on

carbon credits generated under carbon stock or sequestration activities (pursuant to P 36 as mentioned earlier) after Indonesia's ratification of the Paris Agreement. This prohibition will be lifted until MoEF issues a new regulation which governs the allocated carbon credits for carbon trading based on the Indonesia's submitted NDC. The legal implication of this letter toward the FCPF ER Program in East Kalimantan is that the existing IUPHHKRE holders within the accounting area of ER Program (PT Global Green and Orangutan Habitat Restoration Program) cannot claim or sell any potential carbon credits through for example voluntary market schemes. Unless, a new regulation, such as that mentioned in the circulation letter permits them to do so.

In 2014, GoI also issued the Minister Forestry Decree No. 50 of 2014 on carbon trading procedure. However, there was no further implementation of this regulation either from mechanism or institutional aspects.

On December 29th 2017, GoI finally issued the long-awaited Minister Environment and Forestry Decree No. 70 of 2017 on REDD+ Procedures. Despite being very specific and comprehensive on technical matters related to REDD+ implementation, this regulation does not address any legal aspects of carbon rights.

Title to ERs under the ER Program

From a statutory legal perspective, a robust legal basis for carbon rights (including Title to ER) in Indonesia, which governs clear relationships/implication between the generation of such right with the land tenure holdings (including customary land tenure holdings) and natural resources licensing along with the authority of Program Entity to own and transfer such right, does not exist yet. The Program Entity is aware of this legal gap on Title to ERs under Indonesian Law. It is considering incorporating legal principles and a scope of carbon rights (including associated rights and obligations of all parties associated with tenure rights and natural resources licensing) in the upcoming Presidential Regulation on the Implementation of Nationally Determined Contribution (NDC). Nevertheless, the timeline for the drafting and issuance of this regulation remains unclear.

Indonesian law, however, provides the opportunity to the Program Entity to establish such ability through the combination of two legal bases: (1) sub-arrangements between the Program Entity and the Provincial Government of East Kalimantan under the regional autonomy law; and (2) the incorporation of a clause on Title to ER transfer in the benefit sharing agreements under contract law.

From the perspective of regional autonomy law, Government Regulation No. 50 of 2007 (and its amendment – Government Regulation No. 28 of 2018) on Regional Cooperation provides an opportunity for the Program Entity to create agreements with provincial and district governments on their cooperation to ensure an effective joint implementation of specific programs which are in line with their long-term development plans. These government regulations are further implemented by the Minister of Environment and Forestry Decree No. 78 of 2015 regarding Guidelines on the Cooperation of Ministry of Environment and Forestry with Third Party. In the context of the ER Program, the Program Entity plans to have agreements with two different regional governments, which serve as sub-arrangements, pursuant these regulations.

The first sub-arrangement is a series of agreements between the Program Entity and the Provincial Government of East Kalimantan. Since October 2018, these two government institutions have begun formulating a series of agreements on the Implementation of ER Program in East Kalimantan Province. These upcoming agreements, are expected to designate the Provincial Government of East Kalimantan as, *inter alia*:

- a. the leading institution to conduct and ensure free, prior, informed consent (FPIC) processes related to the ER Program, including the issues of authorization of those stakeholders to Program Entity to own and transfer ERs title to the Carbon Fund. This process aims to obtain consent from both recognized and unrecognized indigenous people groups on ER activities (as mentioned in Chapter 15 on the Benefit Sharing Mechanism, indigenous people will be represented by their relevant village governments);
- b. the intermediary of BLU-BPDLH for channeling benefits to local beneficiaries, at least until a robust design of benefit sharing mechanism of BLU-BPDLH is in place.

The second sub-arrangement is a renewal of the MoU between the Program Entity and the District Government of Berau on the Incorporation of the Berau Forest Carbon Program under the FCPF CF in East Kalimantan. Prior to GOI's ratification of the Paris Agreement, the first submission of GOI on NDC, and engagement of the Program Entity with the FCPF program, MoEF and the District Government of Berau signed a Memorandum of Understanding to implement the voluntary market scheme-related ER Program based on a REDD+ juridical approach (known as the Berau Forest Carbon Program, BFCP). As the ongoing activities of the BFCP are implemented within the accounting area of the ER Program, both the Program Entity and the District Government of Berau need to ensure that any carbon credits generated by the BFCP shall be in line with the ER Program including the authority of the Program Entity to own and transfer such credits to the Carbon Fund through the renewal of the MoU.

The roadmap for the completion of the incorporation of Title to ERs under Sub-Arrangements is as follows:

By February 2019	Series of Agreements between the Program Entity and the Provincial Government of East Kalimantan signed
By March 2019	Series of Agreements between the Program Entity and the District Government of Berau on the incorporation of the BCPF into the ER Program
By April 2019	Preparation of FPIC design and documents which cover the issues of authorization of those stakeholders to Program Entity to own and transfer Title to ERs to the Carbon Fund
By May 2019	Completion of FPIC process

As follow up, the consent of all relevant stakeholders on authorization of those stakeholders to Program Entity to own and transfer Title to ERs to the Carbon Fund under the FPIC process, these consents are further formalized under the Benefit Sharing Agreement. In addition to the scope of benefit sharing agreement as outlined earlier in the Chapter 15 on the Benefit Sharing Arrangements, GoI will add an additional clause into these agreement that require the beneficiaries to acknowledge the authorization of the Program Entity to own and transfer Title to ERs generated by the ER Program in return for benefit and rewards which they will receive (“Title to ERs clause”).

The additional Title to ERs clause as mentioned above fully conforms with Indonesian contract law. Article 1338 of the Indonesian Civil Code stipulates that when any party enters into agreement of its own free will and volition and was not coerced to do so, that agreement is binding for such a party. Thus, the incorporation of Title to ERs under Benefit Sharing Agreements is expected to provide a robust legal basis for the ability of Program Entity to transfer Title to ERs generated by ER Program to the Carbon Fund.

The roadmap for the completion of the incorporation of Title to ERs under Benefit Sharing Agreements is as follows:

January – February 2019	Stakeholder Consultations on the Title to ERs Clause under Benefit Sharing Agreements covering Provincial and Districts level completed
February – May 2019	Public consultation of Title to ERs Clause under Benefit Sharing Agreements. FPIC process
May 2019	Formulation of Title to ERs Clause in the Benefit Sharing Agreements issued by BPDH and Provincial Government of East Kalimantan completed
By June 2019	Governor Regulation on Provincial BSM Arrangements and Decree of Head of BPDH on Title to ERs Clause issued
2019-2024	Benefit Sharing Agreement including Title to ERs Clause signed by all relevant REDD+ Implementers

18 DATA MANAGEMENT AND REGISTRY SYSTEMS

18.1 Participation under other GHG initiatives

The GoI is currently discussing options for any excess tonnes of ERs generated by the ER Program. Up to now, the ER Program, or any part of the ER Program has not transferred and is not planning to transfer Emission Reductions to any other GHG Mitigation Initiative. It is expected that the final decision on whether to use excess ERs for domestic compliance or to engage with other GHG initiatives will be finalized by the signing of the ERPA.

18.2 Data management and Registry systems to avoid multiple claims to ERs

The Government of Indonesia has appointed the Ministry of Environment and Forestry (MoEF) as National Focal Point for climate change mitigation and adaptation. MoEF has developed the National Registry System (SRN-PPI), as part of the management of transparency framework of Article 13 of the Paris Agreement in the national context. MoEF has issued MoEF Regulation no. P.71/MENLHK/SETJEN/KUM.1/12/2017 on the Implementation of the National Registry System on Climate Change Control, MoEF Regulation no. P.73/MENLHK/SETJEN/KUM.1/12/2017 on Guidelines on the Implementation and Reporting of National Greenhouse Gas Inventories and MoEF Regulations P.72/MENLHK/SETJEN/KUM.1/12/2017 on Guidelines for Implementation of Measurement, Reporting and Verification of Climate Change Action and Resources.

The SRN-PPI is a system for collecting data on actions and resources related to adaptation and mitigation of climate change. The SRN-PPI follows rules of clarity, transparency and understanding (CTU). The SRN-PPI acknowledges the contribution made by stakeholders in the efforts to resolve climate change in Indonesia, and is designed to avoid duplication, overlapping, double reporting, and double counting of ER activities, while supporting the synchronization of actions and the support needed for those actions. The types of actions that are recorded include adaptation actions, mitigation actions, joint adaptation and mitigation actions, and other support activities.

The SRN-PPI can be accessed via the URL <http://ditjenpppi.menlhk.go.id/srn/>. The Director General of Climate Change appoints a Technical Team to administer the SRN-PPI. SRN-PPI's reporting is done twice a year, and the reports are made available to the public. SRN-PPI is also connected to the National MRV System, the National GHG Inventory System (SIGN-SMART), the Social and Environmental Safeguards Information System (SIS-REDD), and the National Forest Monitoring System (NFMS) to avoid double counting. At the national level the system is managed by MoEF through the DGCC and by the Environment Office at the provincial level.

The SRN-PPI is designed as a web platform to accommodate all users and multi-platform devices that can be accessed by individuals/entities who want to register activities or search for information related to climate change (Figure 18.1.). Information is provided through graphics and tables as well through detailed explanations of actions and support. The SRN-PPI will act as an action and resource database, it will support the submission of reports for national and international needs. From the beginning, SRN-PPI was designed for a spatial approach, but there were problems in identifying the implementers of REDD+ since the Government did not have

sufficient spatial data and geo-coordinate information. However, the National Registry System for REDD+ would be refined continuously.

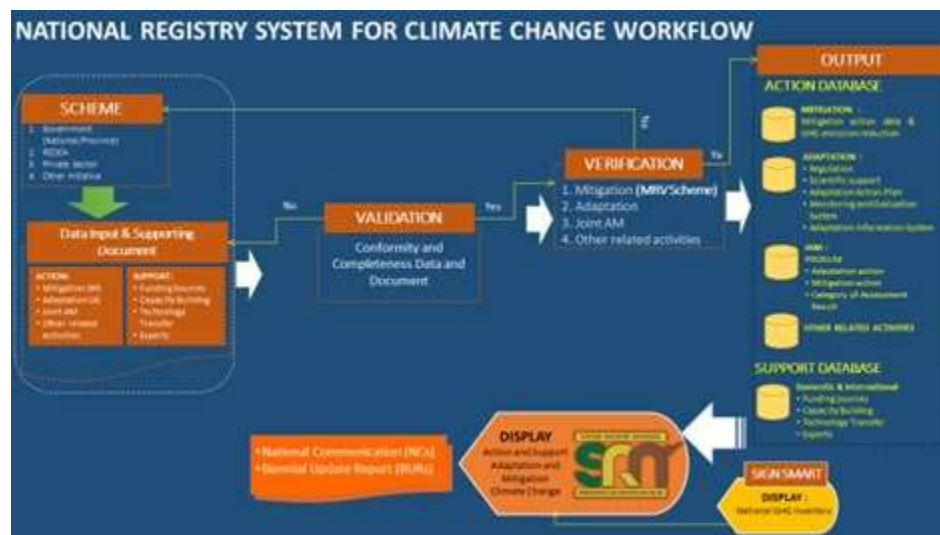


Figure 18.1 National Registry System for Climate Change (SRN-PPI) Workflow

The SRN-PPI provides data management for: FREL/FRL, MRV reporting, implementation of Social and Environmental Safeguards (integrated with the Safeguards Information System/SIS-REDD+), implementation costs and source of costs, supporting activities, and contribution to the NDC. The SRN manager is responsible for maintaining consistency between data and information on REDD+ implementation at the national and sub-national levels and avoidance of double counting. The SRN-PPI is implemented in stages: registration, technical data validation, and verification of actions and resources. Types of the data required for registry into the system are as follows (Figure 18.2):

- general data – information related to the actor. It can be a private or public entity
- technical data – information related to the mitigation or adaptation conducted by the actor
- achievement - information related to progress achieved by the actor in mitigation or adaptation.
- data related to village climate change programs
- data related to financial progress (if the mitigation effort is funded by MoEF).

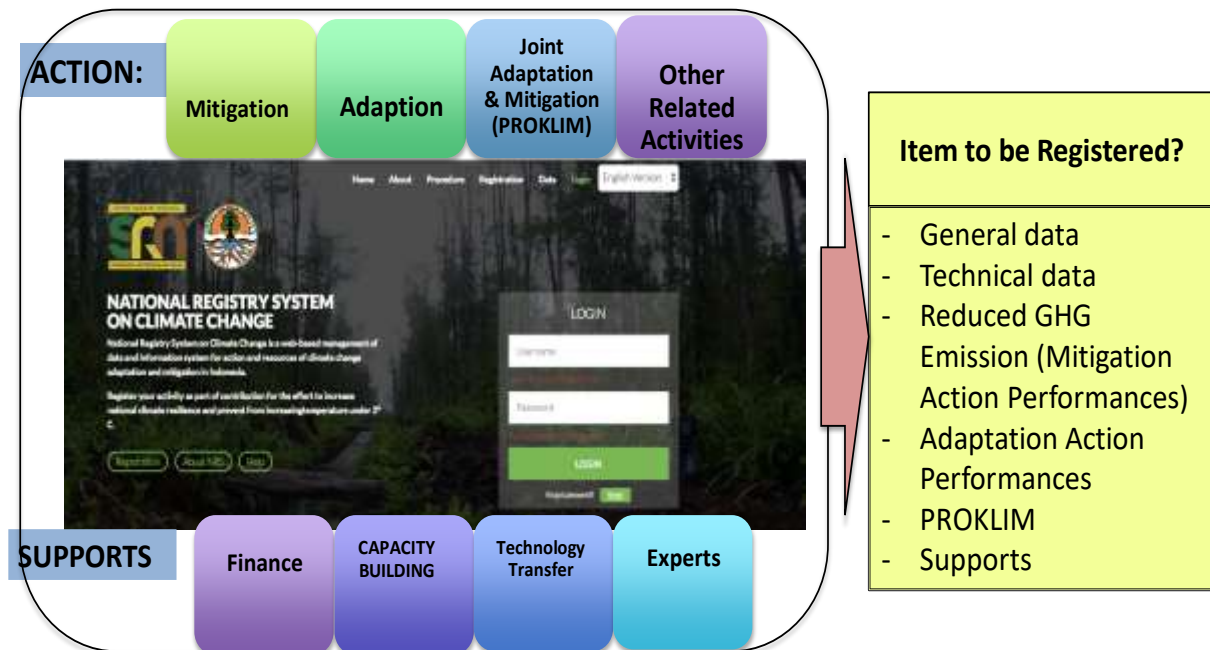


Figure 18. 2. Flow of information within the SRN

There are 4 steps in the SRN-PPI as follows:

Step 1:

1. Person in Charge (PIC) fills the registration form by filling in data that consists of 3 sub-steps which are (a) PIC of Climate Change Activities, (b) Contact Person, (c) PIC Account.
2. PIC will then obtain a verification email in their email account. PIC will verify his account by clicking the link provided in the verification email.
3. PIC will receive a notification email to indicate that their registration has been accepted
4. The Secretariat will do a background check on the registration data
5. The National Registry System (NRS) will send the registration number through email. With this the PIC will be able to login to the system using the username and password that was submitted.

Step 2:

1. PIC fills the general data form for their climate change activities. Filling in the data can be done gradually, and PIC will be able to save the semi-filled form as a draft or directly send it once filled.
2. The NRS Secretariat will crosscheck the general data submitted.
3. The NRS Secretariat will approve the form once the data is fully checked
4. The National Registry System will award an account number for the activity to the PIC through email.

Step 3:

1. PIC fills the technical data form for their climate change activities in accordance with the activity type that was selected on the general data form. Possible activity types are adaptation, mitigation, joint adaptation mitigation, and others.
2. The NRS Secretariat will check and validate the data. If there are data that cannot be verified or that are missing, the Secretariat will return the form to the PIC to correct.
3. The National Registry System will award a registration number for the activity to the PIC through email.

Step 4:

1. The Secretariat fills in the data verification form for each of the activity's components according to the selected activity.
2. The Secretariat conducts a verification of the reported detail on the emission reduction achieved and of the support used by the activities. If there are data that cannot be verified or that are missing, the Secretariat will return the form to the PIC to correct it.
3. Verified activities will be given a "verified" status and a verification number for the activity will be sent to the PIC through email.

Implementing agencies of the ER Program, will register their activities with the SRN-PPI. After an activity has been verified by an independent verifier, the verification result is recorded in the SRN-PPI. Each registration includes information on the general data of the implementer, details of the activity, and technical implementation data.

East Kalimantan has appointed the Provincial Environmental Office (DLH) as the focal point and administrator for the sub-national MRV and sub-national registry systems. East Kalimantan Province is developing a sub-national MRV System for REDD + which be integrated with the sub-national Registry System that is under development. The sub-national registry system will be linked to the SRN-PPI and will register the ER activities in the province.

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ANNEXES

To complement the contents of the document, herewith attached the supporting attachments are mainly for stakeholder consultation, emission reduction calculation, fire emission, and uncertainty. The composition of the annexes is presented as follows:

Annex 4.1. FCPF results chain in East Kalimantan

Annex 4.2. Summary of ER Activities and sub-activities

Annex 4.2a. Timeline ER Activities and sub-activities

Annex 4.3. Regulations and Policies related REDD+ implementation and HCV inside concessions (timber industry plantation and oil palm plantation)

Annex 4.4. Recognition of Indigenous Peoples in East Kalimantan

Annex 5.1 Stakeholder consultation on Sustainable Oil Palm within Province and Districts

Annex 5.2. Summaries Related to the Consultation Process

Annex 8.1. Adjusted activity data

Annex 8.2. References for Technical Assessment Related to Carbon Accounting

Annex 8.3. Carbon Stocks for Non Forest & References

Annex 9.1. Technical guidelines of field observation

Annex 9.2. Ground check procedure for land cover accuracy assessment

Annex 9.3. Activity data on Landcover improvement

Annex 12.1. Accuracy assesment of Area Change

Annex 14.1. Bibliografi for SESA REDD+