JCM Proposed Methodology Form

Cover sheet of the Proposed Methodology Form	

Form for submitting the proposed methodology

Host Country	Lao PDR
Name of the methodology proponents submitting this form	Mitsubishi UFJ Research and Consulting
Sectoral scope(s) to which the Proposed Methodology applies	Reducing Emissions from Deforestation and Forest Degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD-plus) and afforestation and reforestation
Title of the proposed methodology, and version number	Title: Reducing GHG emission form deforestation and forest degradation in Southeast Asia Version number: 1.0
List of documents to be attached to this form (please check):	☐The attached draft JCM-PDD: ☒Additional information
Date of completion	13th January 2015

History of the proposed methodology

Version	Date	Contents revised
1.0	9th Oct. 2014	First Edition
1.1	13th Jan. 2015	Second Edition

A. Title of the methodology

Methodology for reducing GHG emission from deforestation and forest degradation in Southeast Asia

B. Terms and definitions

Terms	Definitions
Forest	Forest definitions according to the Forest Strategy 2020 of Lao PDR; Minimum crown cover (30%); Minimum area (0.25ha); and Minimum tree height (5 m)
Fallow area	Fallow area is classified as forests. Fallow area has enough potential to recover to forest
Slash-and-burn area	Slash-and-burn area is classified as cropland. These are used for cultivation in constant.
Peat soil	Peatland is an area with an accumulation of partly decomposed organic matter, with ash content equal to or less than 35%, peat depth equal to deeper than 50 cm, and organic carbon content (by weight) of at least 12%

C. Summary of the methodology

Items	Summary
GHG emission reduction measures	Activities for avoiding land conversion and/or activities which result in forest degradation.
Calculation of reference emissions	Reference levels are calculated on the basis of the average net GHG emissions in the past, and the reference levels does not exceed the average of annual historical net GHG emissions over the reference period.
Calculation of project emissions	Project net emissions are calculated on the basis of the actually monitored land-use change and emission factors over the project period.
Monitoring parameters	Change of forest area, which should be stratified according to applied forest types.

D. Eligibility criteria

This methodology is applicable to projects that satisfy all of the following criteria.

Criterion 1	Drivers of deforestation and forest degradation are slash-and-burn (shifting to rich forests) and/or illegal logging.
Criterion 2	There are no peat soil in project area
Criterion 3	Data on population and number of livestock are to be available.
Criterion 4	Accuracy of land and forest classification is over 80% by using satellite imagery analysis during reference period.
Criterion 5	All of project activities are implemented by ownership of rural people's group

E. Boundary

E1. Project area

The project location is specified in the project description in terms of its project area. The project location description includes the following information:

(a) Name of the project area;
(b) Physical boundary of each discrete area of land included in the project area (using appropriate GIS software formats);
(c) Total size of the project area;
(d) Description of current land-tenure and ownership, including any legal arrangement related to land ownership and all of activities;

E2. Reference area

The project proponents demonstrate that the project area is similar or expected to become similar to the reference area, from several points of view, such as:

(a) Landscape configuration and ecological conditions, including forest/vegetation classes, elevation, slope, rainfall, and temperature,
(b) Socio-economic and cultural conditions, including legal status of the land, land tenure, land use, and enforced policies and regulations,
(c) Drivers of deforestation and/or forest degradation.

E3. Emission Sources and GHG types

The project proponents demonstrate that the project area is similar or expected to become similar to the reference area, from several points of view, such as:

Reference levels		
Carbon pools and Emission sources		Justification / Explanation of choice and GHG types
Carbon pools	Above-ground biomass	Carbon stock change in this pool is always significant
	Below-ground biomass	Optional and recommended but not mandatory
	Soil organic carbon	Carbon stock change in this pool is always significant
Emission sources	Biomass burning	CH_4 and N_2O, if significant
	Livestock emissions	CH_4 and N_2O, if significant
Project net emissions		
Carbon pools and Emission sources		GHG types
Carbon pools	Above-ground biomass	Carbon stock change in this pool is always significant
	Below-ground biomass	Optional and recommended but not mandatory
	Soil organic carbon	Carbon stock change in this pool is always significant
Emission sources	Biomass burning	CH_4 and N_2O, if significant
	Livestock emissions	CH_4 and N_2O, if significant

F. Establishment and calculation of reference emissions

F.1. Establishment of reference emissions

Reference levels (in case of REDD+ project, we used reference levels instead of reference emissions) are calculated on the basis of the average net GHG emissions in the past.

F.2. Calculation of reference emissions

The reference levels are to be calculated as follows;

$RL_y = (\Delta CS_{ref} \times 44/12 + L_{fire\_ref} \times GWP)$

RL_y	Reference levels in year y [tCO_2/y]
ΔCS_{ref}	Carbon stock change per year [tC/y]
L_{fire_ref}	Amount of GHG emissions from forest fires [t]
GWP	Global Warming Potential, 25 for CH_4, 298 for N_2O

$\Delta CS_{ref} = |C_{y2} - C_{y1}| / (y2 - y1)$

$C_{i,y} = \Sigma i \ (A_{i,y} \times EF_i)$

$C_{i,y}$	Carbon stock of strata i in year y [tC]
$A_{i,y}$	Total area of strata i in year y [ha]
EF_i	The Emission Factors of strata i [tC/ha]

For CH_4 and N_2O emissions from forest fires, the equation below is used;

$L_{fire\_ref} = A \times MB \times Cf \times Gef \times 10^{-3}$

L_{fire_ref}	Amount of net GHG emissions from forest fires [t]
A	Burnt Area [ha]
MB	Mass of fuel available for combustion [t/ha]
Cf	Combustion factor
Gef	Emission factor for forest fire [g/kg-dm burnt]

G. Calculation of project emissions

Project net emissions are calculated on the basis of monitored land-use change and forest fires.

The project net emissions are to be calculated as follows;

$PE_y = \Delta CSPJ \times 44/12 + L_{fire\_PJ} \times GWP$

PE_y	Project net emissions during the period of year y [tCO_2/y]
$\Delta CSPJ$	Carbon stock change per year [tC/y]
L_{fire_PJ}	Amount of net GHG emissions from fires [t]
GWP	Global Warming Potential, 25 for CH_4, 298 for N_2O

$\Delta CSPJ = |C_{y2} - C_{y1}| / (y2 - yt1)$

$C_{i,y} = \Sigma i \, (A_{i,y} \times EF_i)$

$C_{i,y}$	Carbon stock of strata i in year y [tC]
$A_{i,y}$	Total area of strata i in year y [ha]
EF_i	The Emission Factors of strata i [tC/ha]

For CH_4 and N_2O emissions from forest fires, the equation below is used;

$L_{fire\_PJ} = A \times MB \times Cf \times Gef \times 10^{-3}$

L_{fire_PJ}	Amount of net GHG emissions from fires [t]
A	Area burnt [ha]
MB	Mass of fuel available for combustion [t/ha]
Cf	Combustion factor
Gef	Emission factor for forest fire [g/kg-dm burnt]

H. Calculation of emissions reductions

Net emission reductions are calculated as the difference between the reference levels and project net emissions, as follows;

$ER_y = (RL_y – PE_y – DE_y) \times (1\text{-BR})$

ER_y	Net GHG emission reductions in year y [tCO_2e]
RL_y	Reference levels in year y [tCO_2e/y]
PE_y	Project emissions in year y [tCO_2e/y]
DE_y	Displacement of emissions in year y [tCO_2/y]
BR	Rate of Buffer Reserve, default as 0.3

Displacement of emissions is to be calculated as follow;

$DE_y = DEM_y + DEA_y$

DE_y	Displacement of emissions in year y [tCO_2/y]
DEM_y	Displacement of emissions by market in year y [tCO_2/y]
DEA_y	Displacement of emissions by activity shipting in year y [tCO_2/y]

I. Safeguards

Safeguards are promoted and supported according to the Cancun Agreements (1/CP.16, paragraph 2 of appendix I).

J. Data and parameters fixed *ex ante*

The source of each data and parameter fixed *ex ante* is listed as below.

Parameter	Description of data	Source
$EF_{i,j,t}$	The Emission Factors of strata *i*	2006 IPCC Guidelines
MB	Mass of fuel available for combustion	2006 IPCC Guidelines
Cf	Combustion factor	2006 IPCC Guidelines
Gef	Emission factor for fire	2006 IPCC Guidelines