FREL and REDD+ in Indonesia

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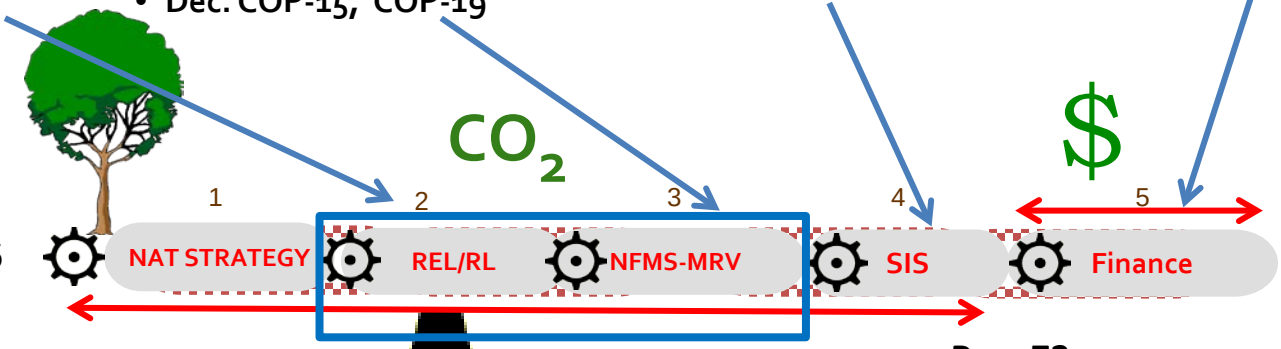
REDD+ ARCHITECTURE IN INDONESIA

Historical Emission/ Projected Emission Scenario (MoEF, Local Govt)
Dec. COP 15, COP-17, COP-19

- **Forest Land Cover Changes and Carbon Stock (MoEF, LAPAN, BIG, REDD+ Agency)**
- **Dec. COP-15, COP-19**

Providing Information on Safeguards Implementation (MoEF)
Dec. COP 17, 19

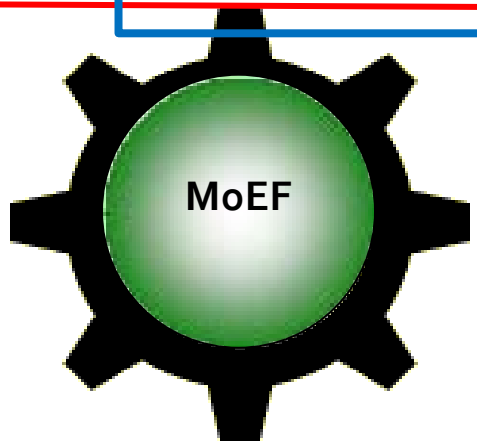
Financing Institution: (MoF)
Dec. COP 16, COP-17, COP 18, COP-19



Dec. 1 COP 16

Para 71

1. **Awareness raising, Capacity building, Access to data, Access to technology, Stakeholder communications/participations**
2. **Safeguards (governance, social and environmental)**
3. **Non-carbon benefits**



Para 72 :

- Addressing Drivers of Deforestation and Forest Degradation
- Addressing tenurial Issues, Governance, Gender, Safeguards, Stakeholder Involvement, customary and local people.

Warsaw REDD+ Framework (COP-19)

Source: Developed from IFCA study (2007)

Indonesia FREL Submission

Background :

Climate Change is an issue that based on ‘science’

Indonesia’s commitment in G-20 Pittsburg 2009: to decrease emission to **26 - 41%** by 2020 from the Business as Usual (BAU)

COP-16 Cancun Decision 1/CP.16 Paragraph 70: encourages developing country to contribute on mitigation action in forestry sector

COP-16 Cancun Decision 1/CP.16 Paragraph 71: encourages developing country to develop:

- REDD+ National Strategy or Action Plan
- ***Forest Reference Emission Level/Forest Reference Level (FREL/FRL)***
- A robust and transparent National Forest Monitoring System
- Safeguards Information System

Background

FREL submitted to UNFCCC has to complete the concept of TACCC - "**Transparency, Accuracy, Completeness, Consistency, Comparability"**, as well as concept of "practicability and cost-effectiveness" when implementing MRV

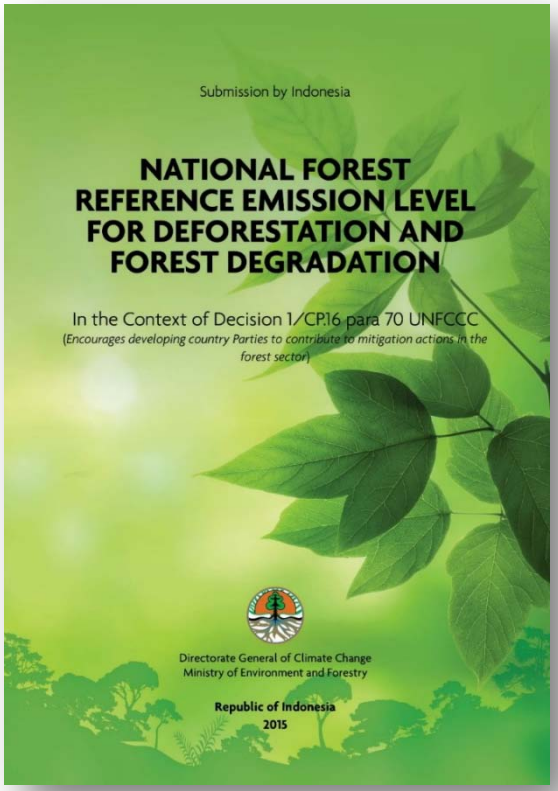
Three documents to be submitted by Indonesia to the UNFCCC Secretariat :

- Forest Reference Emission Level (FREL), specific for REDD+ (for RBPs),
- Biennial Update Report (BUR), covers 5 sectors
- Intended Nationally Determined Contributions (INDC) that covers all sectors for post 2020 (2021- 2030)

Warsaw REDD+ Framework : the importance of consistency – need to use a consistent data for FREL and BUR (especially for the same activity)

Indonesia FREL Submission

The Objectives :



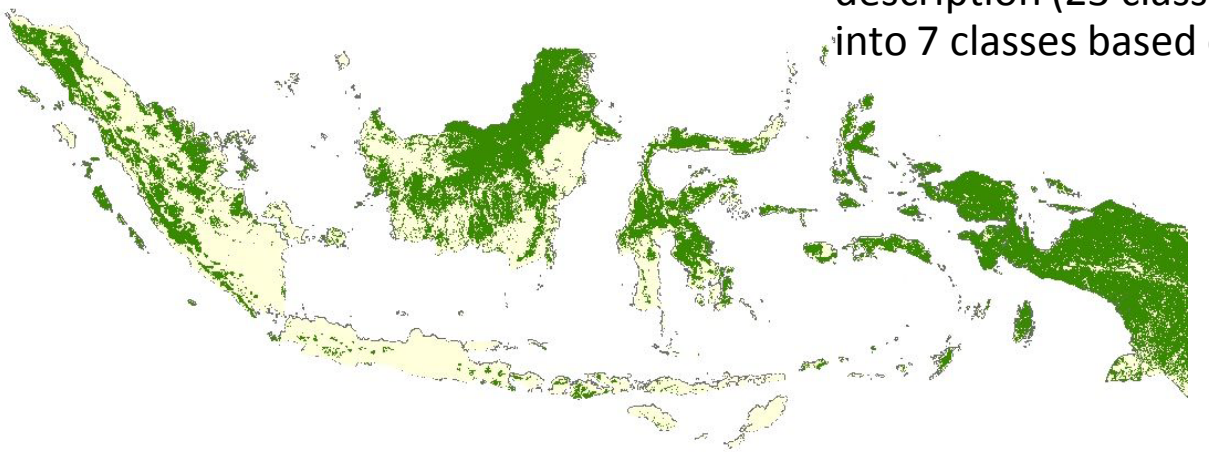
To present a national FREL figure for REDD+ implementation including step-by-step analysis that has been exercised for establishing FREL for Indonesia

To provide broader audience and stakeholders with clear, transparent, accurate, complete and consistence basis of emissions projection as a basis for further discussion with other agencies who have expressed an interest in supporting Indonesia in this undertaking

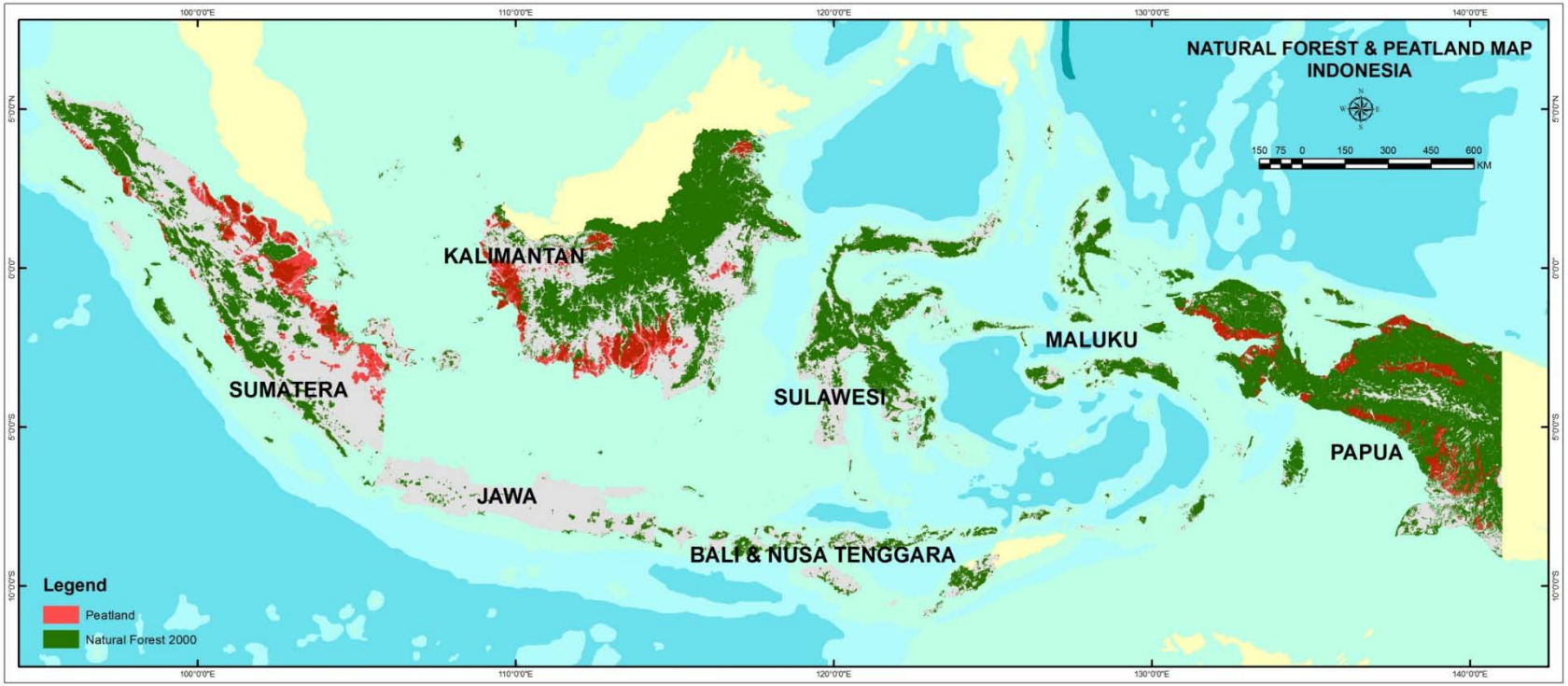
To share with many other countries interested in the REDD+ mechanism, the process that Indonesia has followed in approaching the entrance of full REDD+ implementation on the basis of result-based payment

Forest

Formal definition (*formal definition*)	Practical definition (*working definition*)
Ministry Regulation 14/2004 on A/R CDM : "*Land spanning more than 0.25 hectares with trees higher than 5 meters at maturity and a canopy cover of more than 30 percent, or trees able to reach these thresholds in situ*".	SNI (Indonesia National Standard) 8033:2014 – on method for calculating land cover change that based on visual interpretation of optical remote sensing imagery --- to produce land-cover maps through visual interpretation of satellite images in a scale that min.area for polygon deliniation is 0.25 cm2 at 1;50,000 of scale which equals to 6.25
	SNI 7644:2010 on land cover classes and its description (23 classes, forests were classified into 7 classes based on forest types)



Area Coverage & Activities



Area of calculation

NATIONAL FREL : All land (**mineral and peat lands**) area that was covered by **natural forest** in year 1990, accounted for 113.2 million ha or 60% of the country land area (187 mill.ha). This includes **primary and secondary forests**, regardless forest status under national forest area defined by MoFor (2013).

(the non-natural-forested peatland was excluded fro this FREL, but will be included in the BuR)

Activities considered for the FREL submission	**(1) Deforestation** – a conversion of natural forest cover into other land-cover categories that has only occured one time in particular areas *(Ref. MoF Decree No. 30/2009 : permanent alteration from forested area into a non-forested area as a result of human activities)* **(2) Forest degradation** - a change of primary forest classes, to secondary forest classes *(Ref. MoF Decree No. 30/2009 : a deterioration of forest cover quantity and carbon stock during a certain period of time as a result of human activities)*
Reasons	1) Major contribution to the total emission from land-use, change and forestry (LULUCF –accounted for 37.7% from total nat. Emissions in 2005, SNC) 2) Availability of the data in the context of Transparency, reliability/Accuracy, Completeness, Consistency and Comparability; *practicality and cost effectiveness in MRV*
Constraints	1) Wall-to-wall monitoring for various level of forest degradation is still problematic (very wide range of bioregion over natural Indonesia's forests – 3 eco zones), high uncertainty of the estimates. 2) Limited reliable data related to carbon sequestration. ▪ Other activities (forest degradation at more detail level, conservation of carbon stocks, sustainable management of forests, enhancement of forest carbon stocks) were excluded in the current FREL construction ▪ Use of model and assumption are not preferable during the process of review (*Technical Assessment*)

Pool

1. **Aboveground biomass (AGB)**
   - AGB is the most important carbon pool LULUCF emission since AGB is the dominant element (71.2%) to the other four carbon pools (i.e. below ground biomass, debris, litter and soil organic).
   - The current record (data) in Indonesia regarding other non-AGB carbon pool is very limited.
2. **Soil carbon in peatland** area experiencing deforestation and forest degradation
   1. Emissions from peat decomposition are calculated not only at the time of deforestation occurred, but it continues to the future for a certain period of time (inherited emission).
   2. Soil carbon in peat forest is included because of their significant contribution to the overall the emissions from peat decomposition.
   3. Emission from peat fire was excluded because of the uncertainty estimates remain high. However, the current methodology and results were proposed in the annex.

   (emission from the loss of AGB due to fires was taken into account when deforestation and forest degradation were calculated)

Gases

Carbondioxide (CO_2)

- CO_2 is the dominant constituent element of the GHG emissions from LULUCF, contributing to more than 99.9% of the total GHGs (Indonesia's Second National Communication, 2011).

Approach for Indonesia's FREL

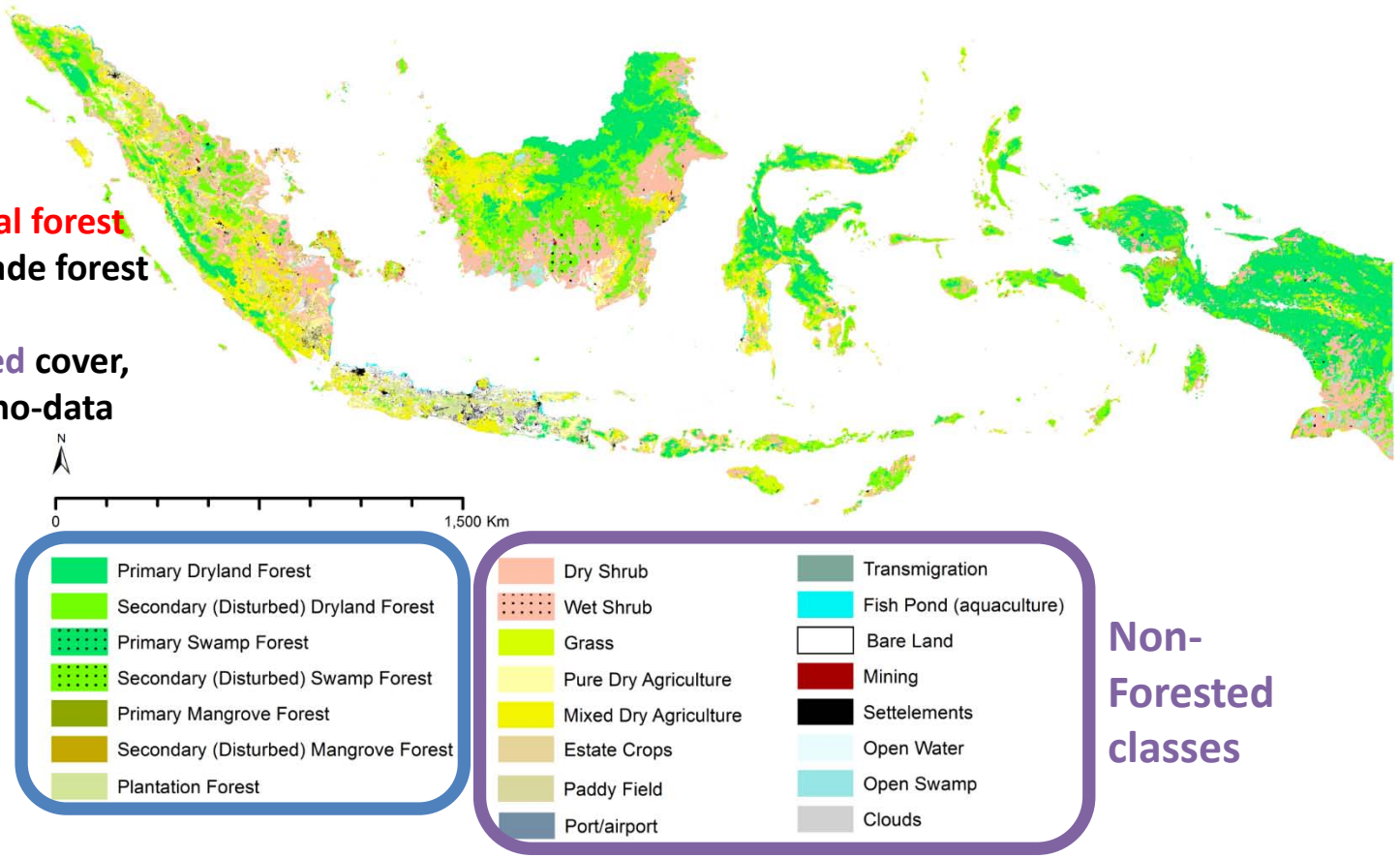
Reference period	**1990 – 2012**
Reasons	(1) Availability of land-cover data that transparent, accurate, complete and consistent (2) Reflect the general condition of the forest transition in Indonesia, and (3) The length of time that describes the national circumstances and policy dynamics that may affect it (biophysical, social, economic growth, political and spatial planning).
Reference emission calculation	Historical emission from deforestation and forest degradation, i.e. **average annual emission** from 1990 to 2012
Emission calculation method	• Deforestation : carbon stock different (gross deforestation – *emission were derived from the total loss of forest biomass regardless biomass gain*) • Degradation : carbon stock different • Peat emission : emission from peat decomposition (adopted from IPCC, 2013) where deforestation or degradation occurred

Activity Data: NFMS (National Forest Monitoring System) – the 23 land cover classes – KLHK on the SNI 7645-2010

7 classes on Forest:

- **6 classes of natural forest**
- **1 class of man-made forest (plantation)**

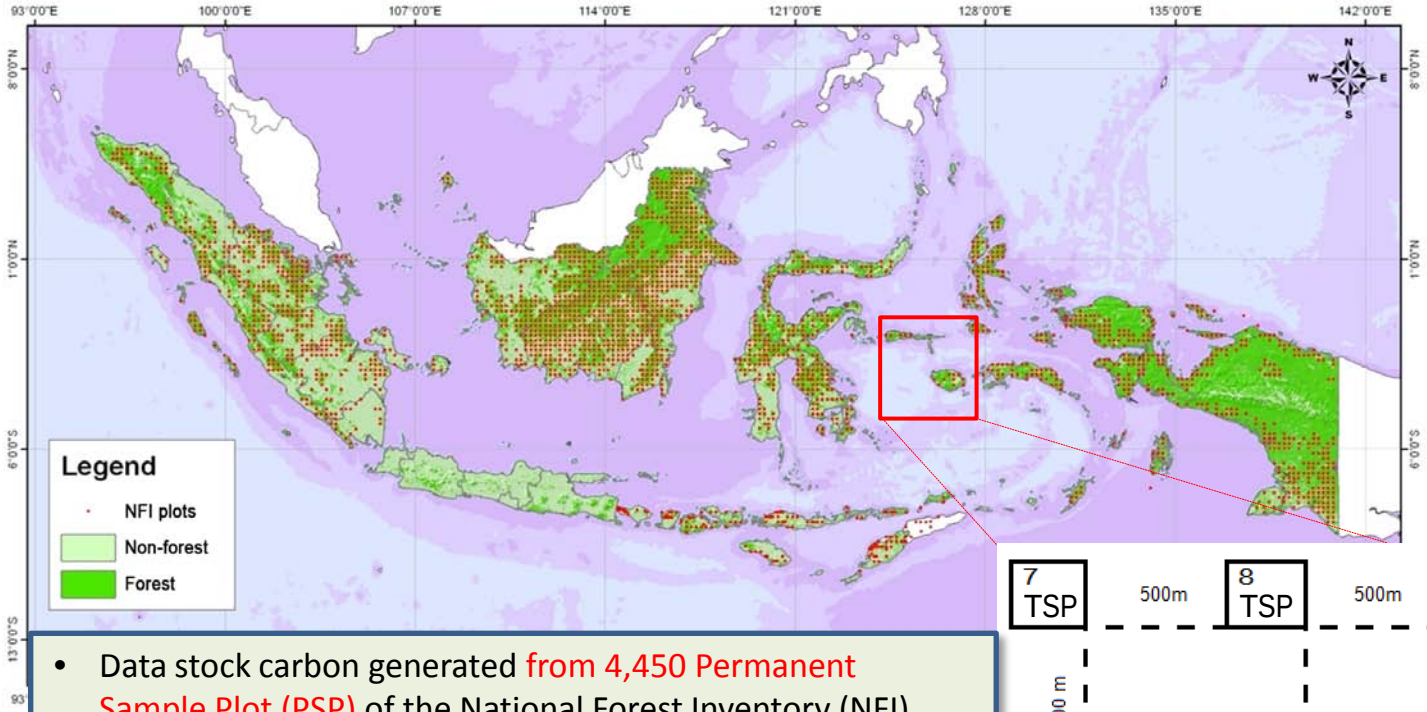
16 classes of Non-forested cover, including class of cloud/no-data



Official data, describes land cover classes and forest cover change over years, have been developed and updated regularly since 2000, +1990s data – data set of 1990, 1996, 2000, 2003, 2006, 2009, 2011 and 2012 were used to capture historical land cover data

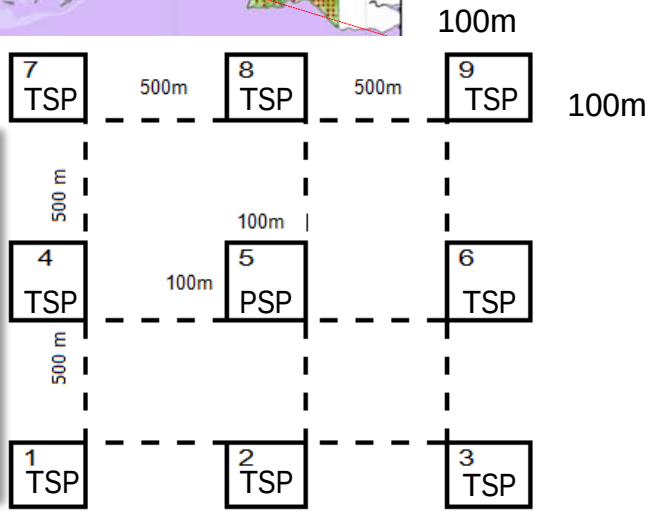
(the land-cover data has been stored in NFMS webite : http://nfms.dephut.go.id; linked to the One Map Web GIS, http://tanah air.indonesia.go.id)

Emission factor:
NFI-Cluster Plot Distribution



- Data stock carbon generated from 4,450 Permanent Sample Plot (PSP) of the National Forest Inventory (NFI) year 1989 – 2013 (MoF, FAO and WB)
- PSP for mangrove forest has not yet sufficient for measuring the stock carbon, so that the stock carbon from mangrove forest (primary and secondary) taken from available researches (e.g. Krisnawati *et al*., 2012; Donato., *et al*., 2011; Murdiyarso *et al*., 2009)

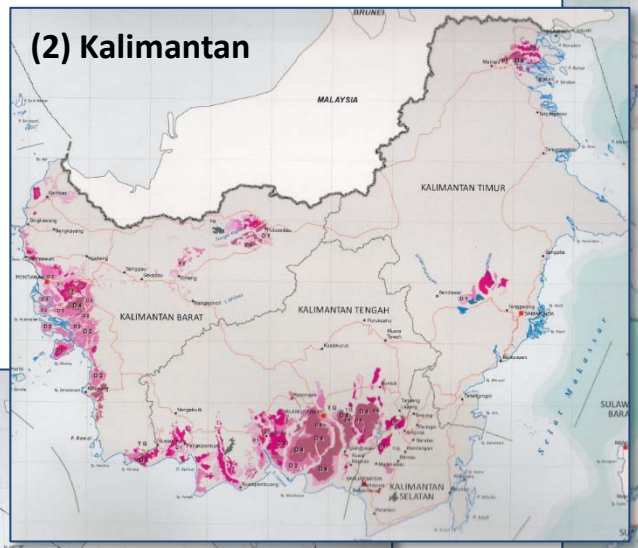
❖Systematic Stratified Sampling 20 km x 20 km
❖Grid UTM
❖Forest state area
❖Seven (7) forest classifications

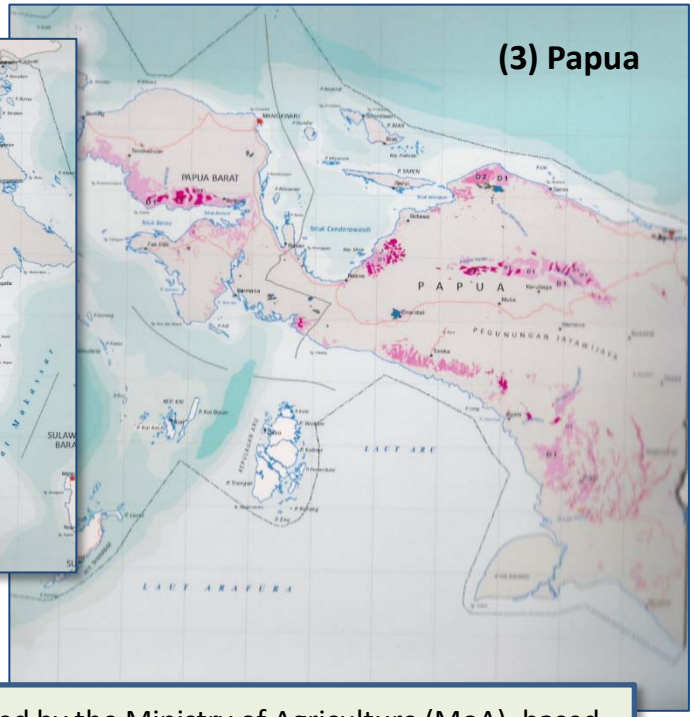


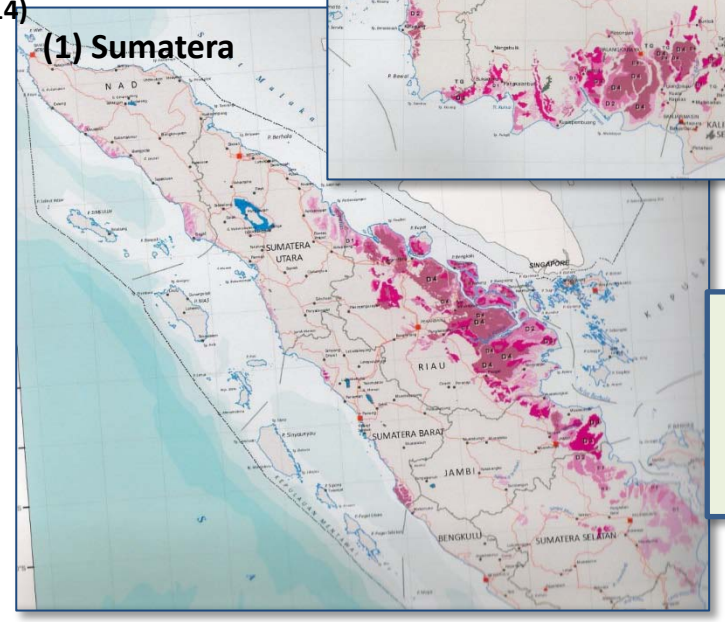
Peat Spatial Data

Emission factor for peat decomposition

(adopted from 'the 2013 Supplement to the 2006 IPCC Guidelines for national GHG Inventory : Wetlands (Hiraishi et al., 2014)



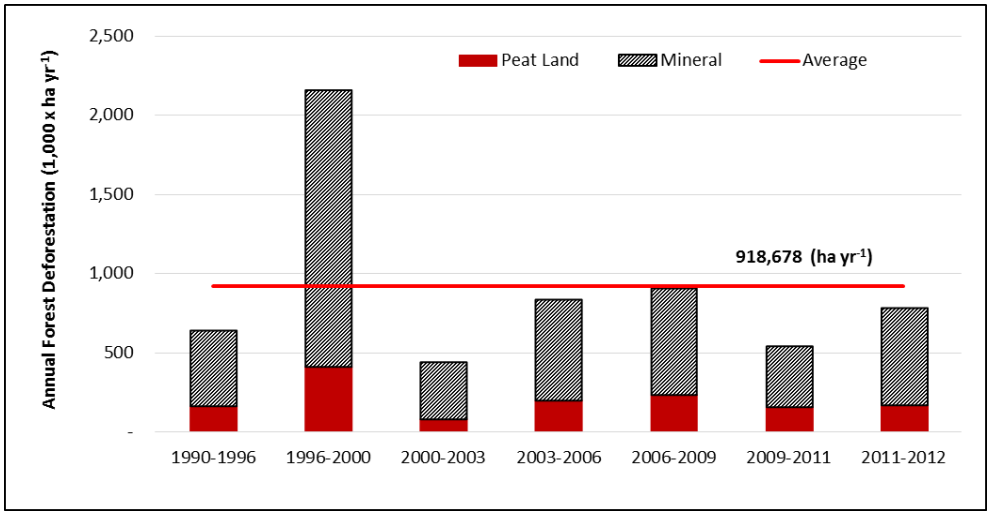




- Produced by the Ministry of Agriculture (MoA), based on several related maps, field survey and verified by ground check (Ritung *et al.* 2011)
- The map is published in the One Map WebGIS, at http://tanahair.indonesia.go.id

Result :

National FREL of Indonesia

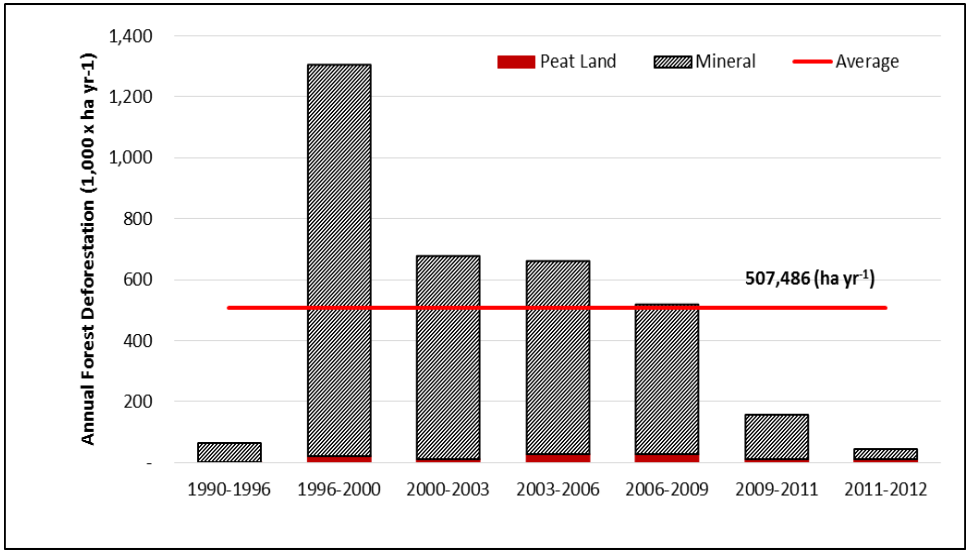


DEFORESTATION

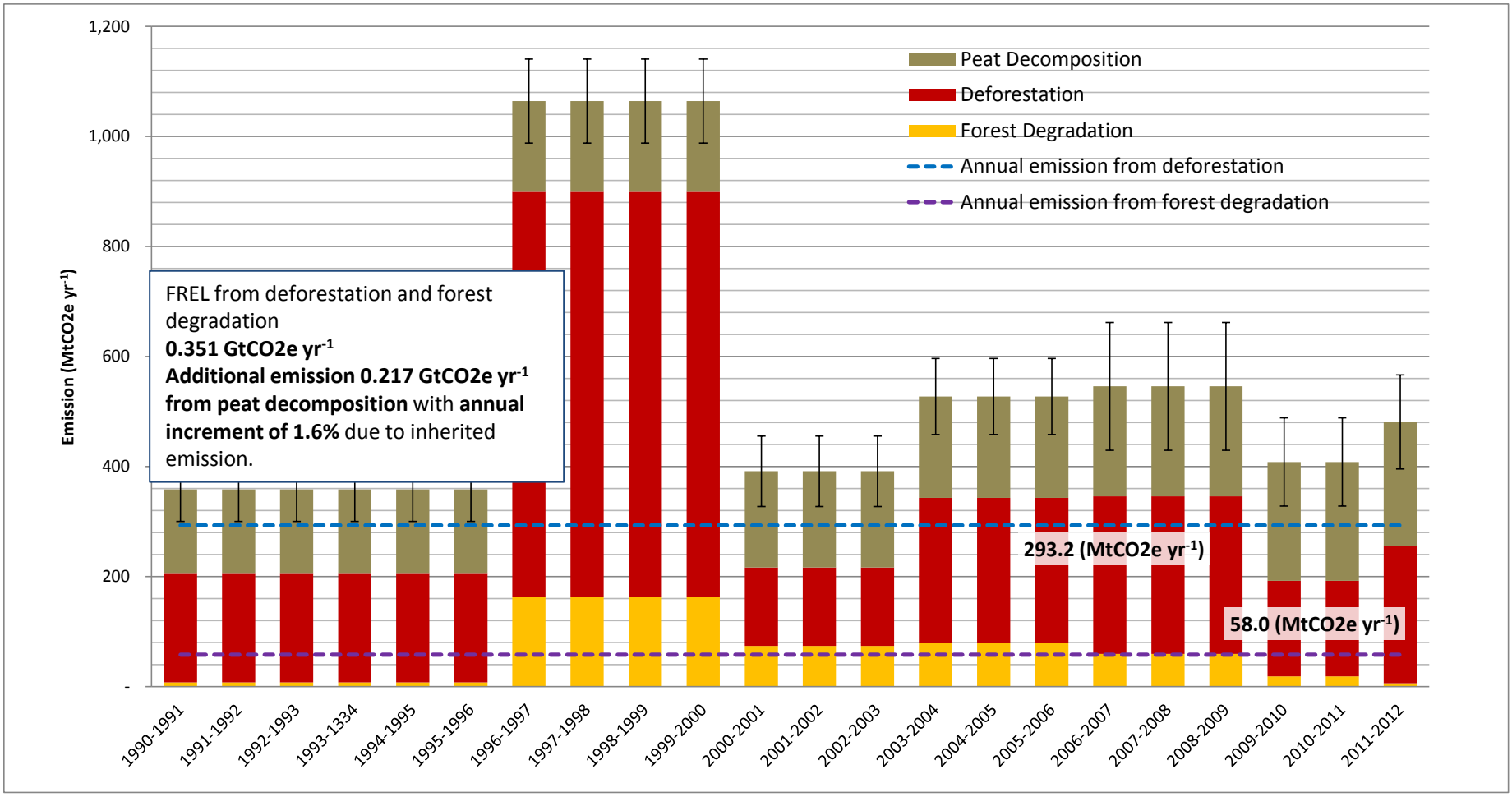
- annual rate of deforestation in the period of 1990 – 2012 : 918,678 ha
- 723,628 ha from mineral soil and 195,050 ha from peat (organic) soil
- 78% deforestation in Sumatra and Kalimantan, 8% Sulawesi and Papua
- High rate (1996-2000) : caused by large fire events (El Nino), IL, HTI, palm oil expansion
- Low rate (2000-223) : soft landing policy (reduction of AAC – from 200m3 /thn to 70m3/thn); Gerhan, OMOT
- The average of historical **emission** from AGB due to **DEFORESTATION** in period 1990-2012 acc.for approx. 293 MtCO2/yr (238 + 55)

FOREST DEGRADATION

- Annual rate 1990-2012 : about 507,486 ha
- 490,329 Ha on mineral soil, and 17,157 ha on peat soil
- Very high rate (1996-2000) : 1.3 million ha, and reduced gradually to 44 thousands ha (2012)
- The proportion at island level varied dynamically
- The average of historical **emission** from AGB due to **FOREST DEGRADATION** in period 1990-2012 acc.for approx. 58 MtCO2/yr (56 + 2)



National FREL of Indonesia



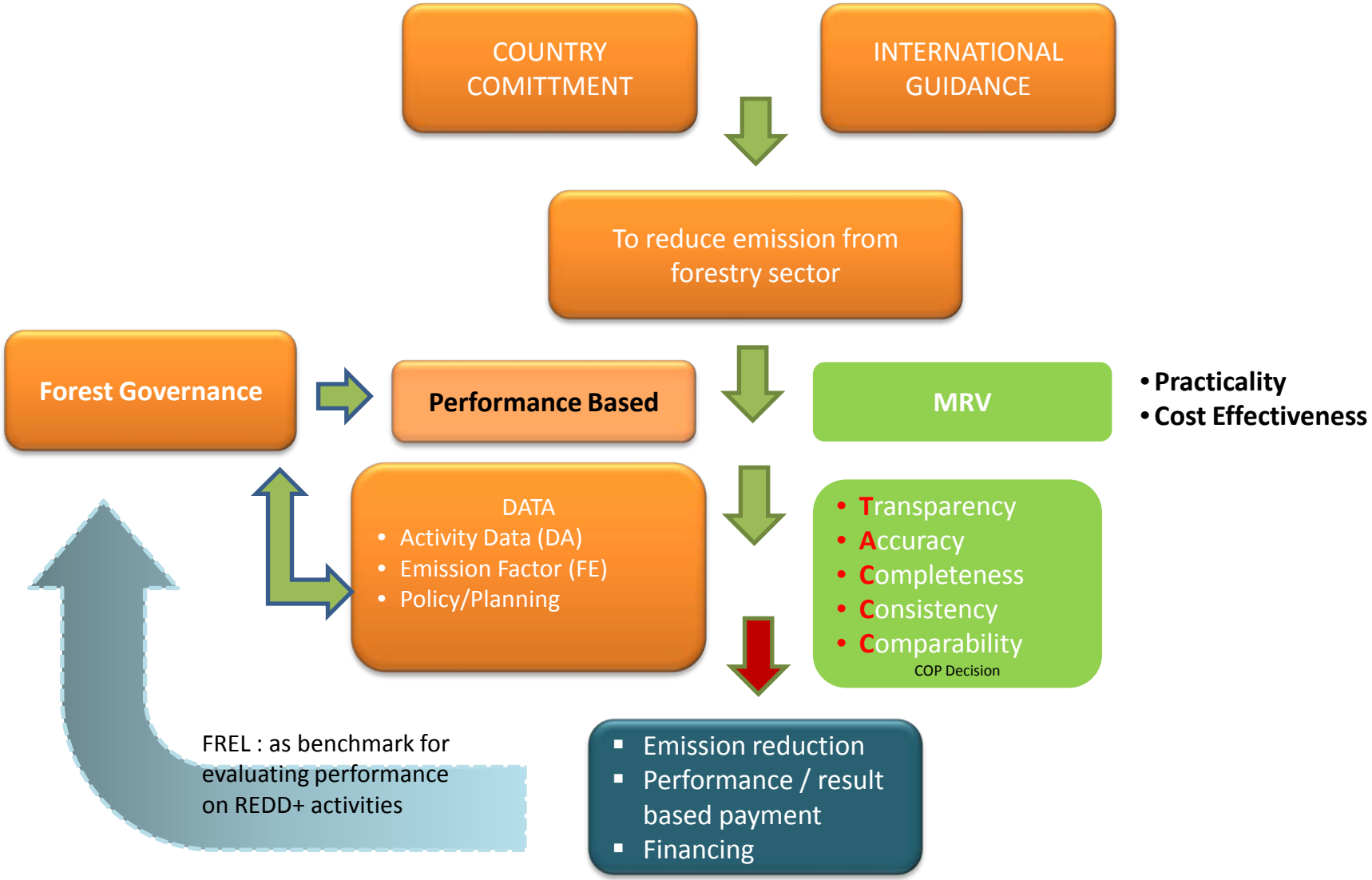
Contribution in general, the emissions : from deforestation (51%), from peat decomposition (39%), from forest degradation(10%)

Projection of FREL up to 2020

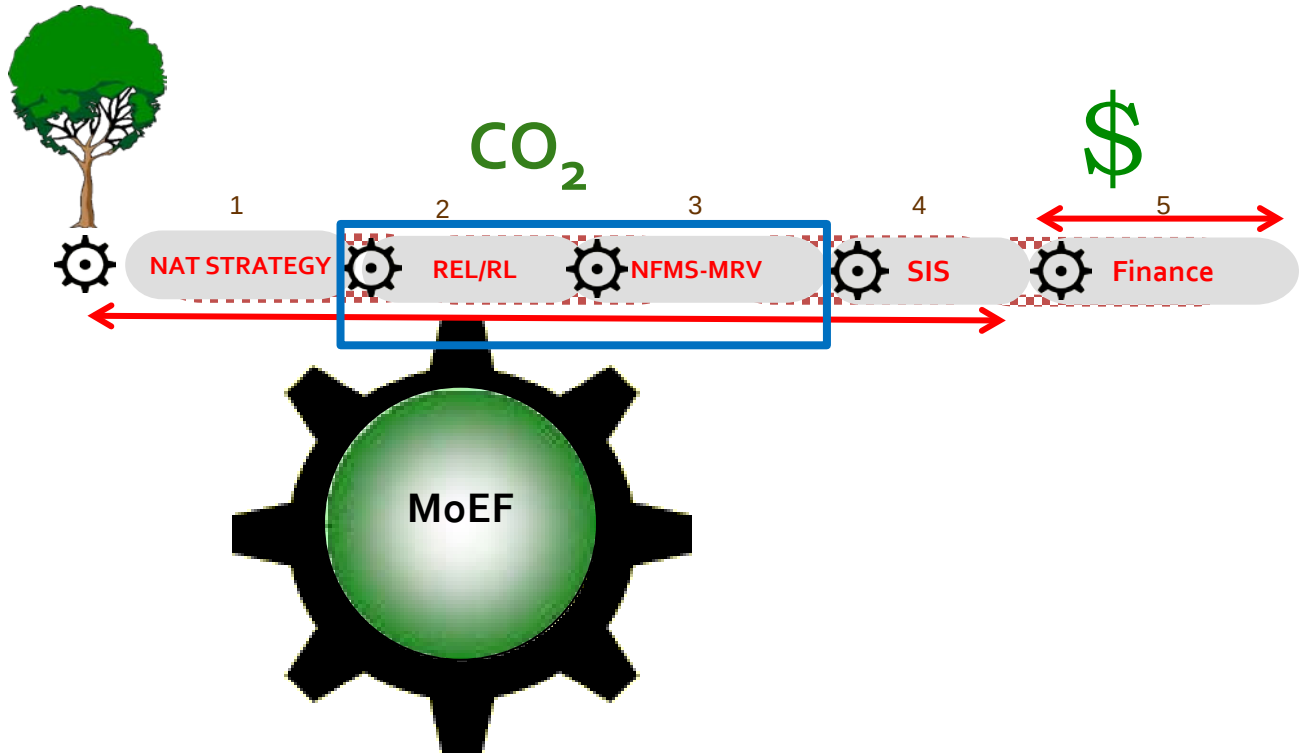
calculated using linear projection based on conservative historical data of 1990-2012

Year	Deforestation ($MtCO_2e\ yr^{-1}$)	Forest Degradation ($MtCO_2e\ yr^{-1}$)	Peat Decomposition ($MtCO_2e\ yr^{-1}$)	Total annual emission ($MtCO_2e\ yr^{-1}$)
2013	293,208,910	58,002,762	217,648,209	568,859,881
2014	293,208,910	58,002,762	221,143,831	572,355,503
2015	293,208,910	58,002,762	224,639,453	575,851,125
2016	293,208,910	58,002,762	228,135,075	579,346,747
2017	293,208,910	58,002,762	231,630,697	582,842,369
2018	293,208,910	58,002,762	235,126,319	586,337,991
2019	293,208,910	58,002,762	238,621,941	589,833,613
2020	293,208,910	58,002,762	242,117,562	593,329,235

How FREL is required for REDD+?



How FREL is linked to other REDD+ instruments/elements



Source: Developed from IFCA study (2007)

(Pustanling, Min.of Environment and Forestry, Indonesia, 2014)

Acknowledgement/sources :

- Document of Indonesia National Strategy of REDD+
- Document of Indonesia FREL Submission
- Technical Team of Indonesia National FREL
- Document (draft) of Strategic Plan 2015-2019, DGCC – MoEF, Indonesia
- Directorate General of Climate Change, Ministry of Environment and Forestry - Indonesia
- Directorate of Forestry Planning and Environment Governance, Ministry of Environment and Forestry – Indonesia
- Division of REDD+, Directorate of Climate Change Mitigation, DGCC, MoEF - Indonesia

terima kasih