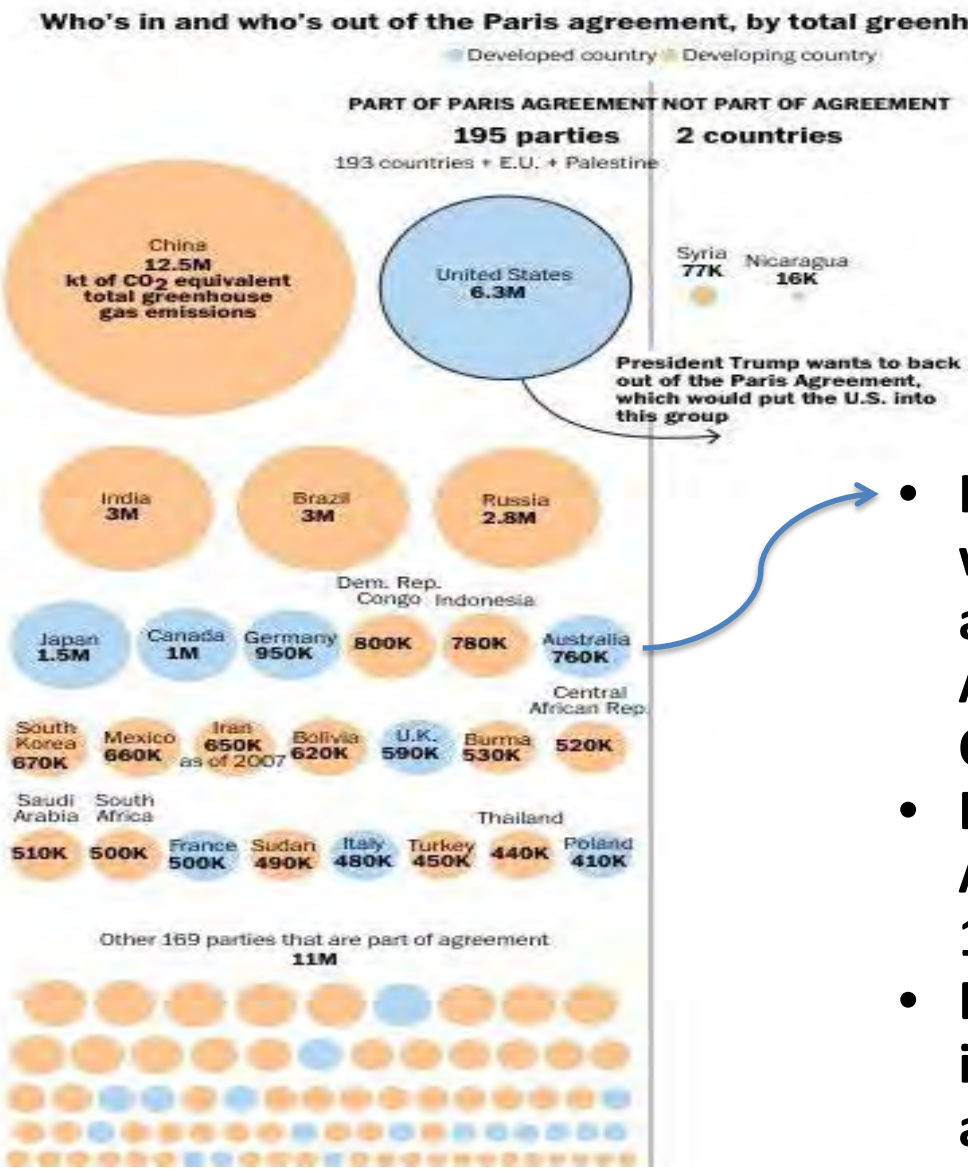
# *Indonesian NDC: State and Progress of Implementation of Mitigation*

**Rizaldi Boer**
HP: +62811117660, email: rizaldiboer@gmail.com
Centre for Climate Risk and Opportunity Management in South East Asia and Pacific (CCROM SEAP)
Bogor Agriculture University

# INDONESIAN POSITION IN GLOBAL EMISSION




- **Indonesia fall under country group with 3rd largest emitter countries along with Japan, Canada, Australia, Germany, Republic of Congo**
- **Indonesia ratify the Paris Agreement through Act number 16/2016.**
- **Emission reduction target by 2030 is 29% of the BAU unconditionally and up to 41% conditionally**

Source : UNFCCC (status 3 August 2017)

# Target NDC Indonesia

Table 1. Projected BAU and emissio uction from each sector category

| No | Sector | GHG Lev | GH on Le | GHG E sion Reduction | | | Annual Average Growth BAU (2010-2030) | Average Growth 2000-2012* |
|---|---|---|---|---|---|---|---|---|
| | | | | $CO_2e$) | % of Total BaU | | | |
| | | | | | CM1 | CM2 | | |
| 1 | Energy* | | | | 11% | 14% | 6.7% | 4.50% |
| 2 | Waste | | | | | 1% | 6.3% | 4.00% |
| 3 | IPPU | | | 3.25 | 0.10% | 0.11% | 3.4% | 0.10% |
| 4 | Agriculture | 1 | 11 0.39 | 9 | 4 | 0.32% | 0.13% | 0.4% | 1.30% |
| 5 | Forestry** | 647 | 7 217 | 4 497 | 6 0 | 17.2% | 23% | 0.5% | 2.70% |
| | **TOTAL** | 1,334 | 2,8 2,034 | 1,7 7 834 | 1,081 | 29% | 38% | 3.9% | 3.20% |

* Including fugitive

**Including peat fire

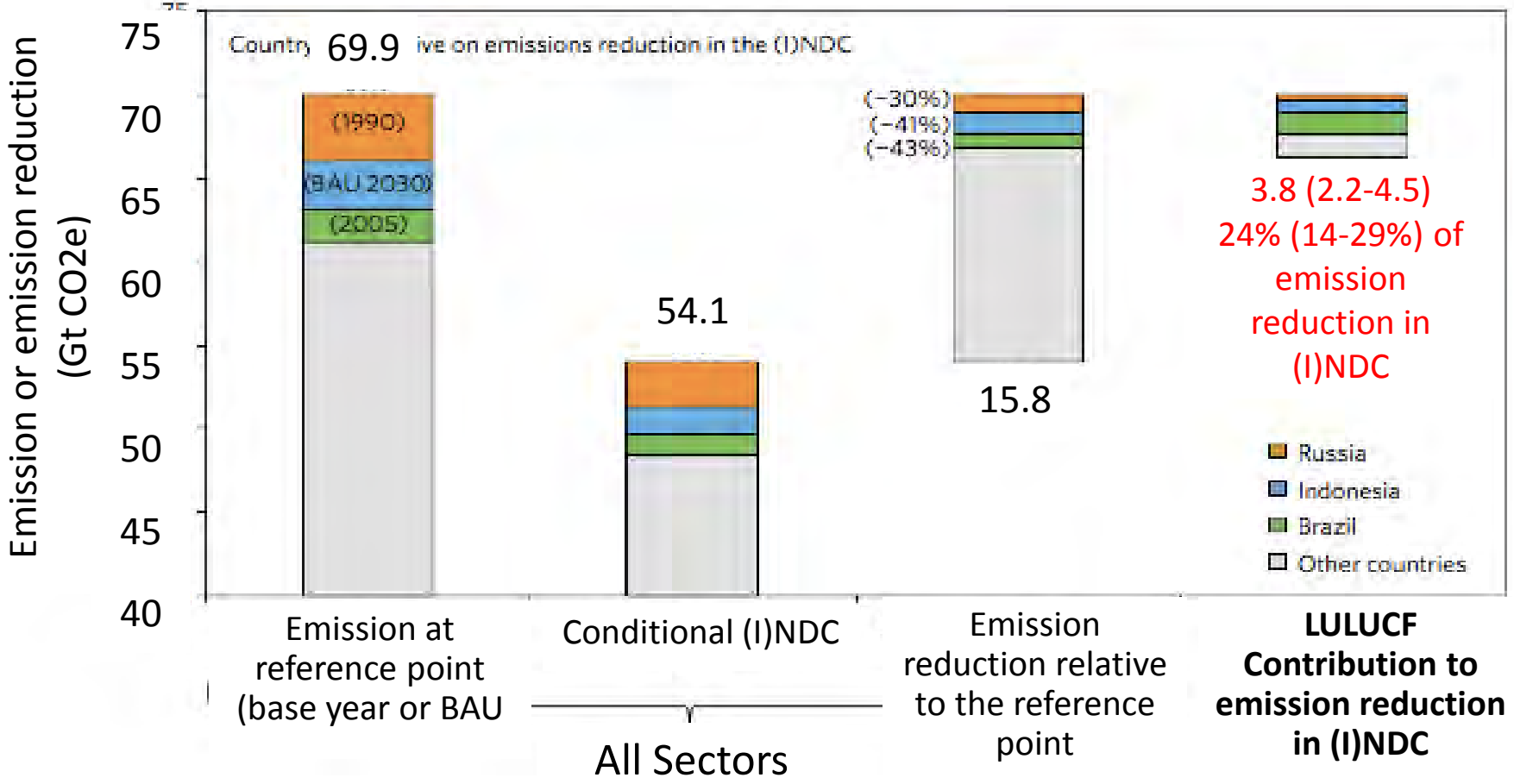
Notes: **CM1** = Counter Measure (*unconditional mitigation scenario*)

**CM2** = Counter Measure (*conditional mitigation scenario*)

Emission reduction target will reached mainly through 2 sectors: Land use, Land use change and forestry: ***60%;*** *and Energy sector:* ***38%***

# INDONESIAN CONTRIBUTION TO GLOBAL

Source: Grassi et al. (2017)




- From I(NDC) the contribution of Indonesia to Global Emission Reduction Target under conditional will be about 7-8% (about 60% of this will be from LULUCF sector)
- Globally, contribution of LULUCF will be about 24% of the global emission reduction target

# MITIGATION ACTIONS TO MEET THE NDC EMISSION REDUCTION TARGET

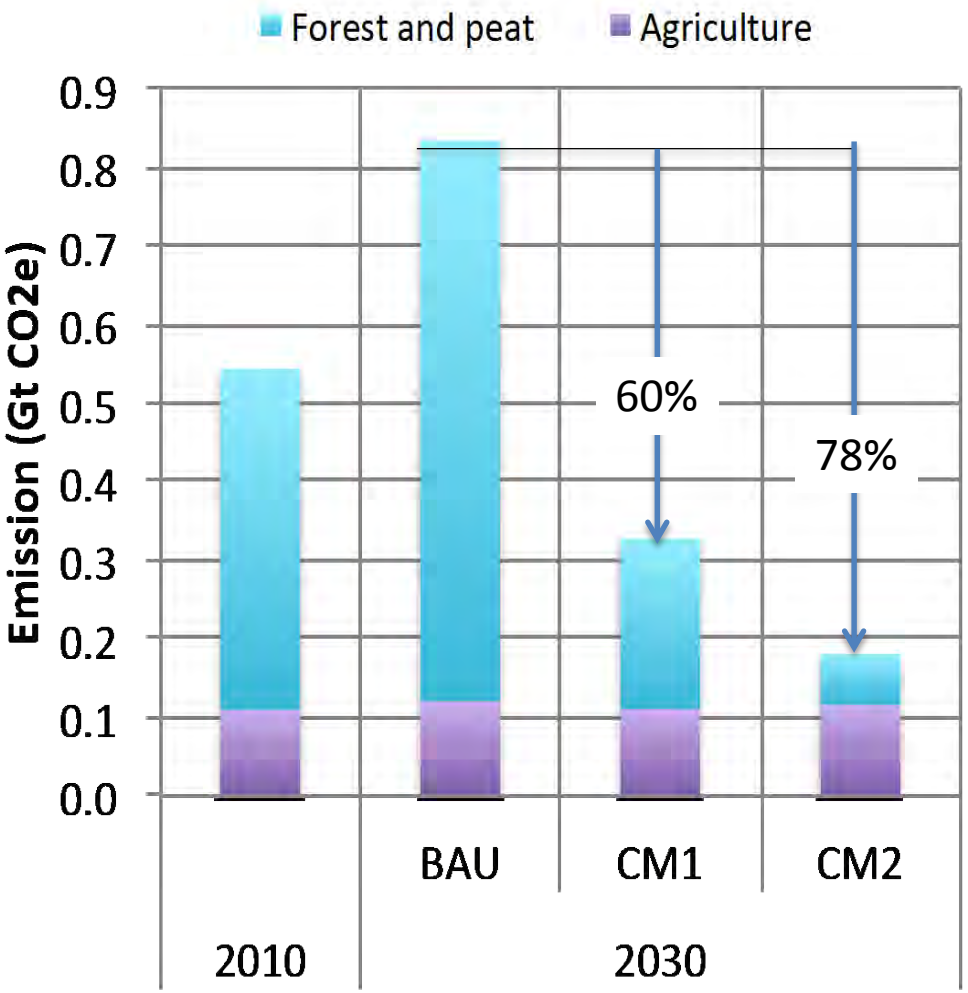
## ENERGY

- Efficiency in final energy consumption (75-100 % implemented)
- Application of clean coal technology in power plant (75 % implemented)
- Electricity generation using renewable sources (22.5% of energy mix)
- Use of biofuel in transportation sector (90-100 % implemented)
- Additional gas distribution lines (100 %)
- Additional compressed natural gas fuel stations (100%)

## LAND USE CHANGE AND FORESTRY

- Reducing deforestation down to 0,45 ha-0,25 Mha/year)*
- Applying SFM principle (Mandatory for RIL)*.
- Land rehabilitation reached 12 million ha by 2030 about 800,000 ha/year with survival rate of 90% .
- Peat restoration 2 million ha by 2030 with

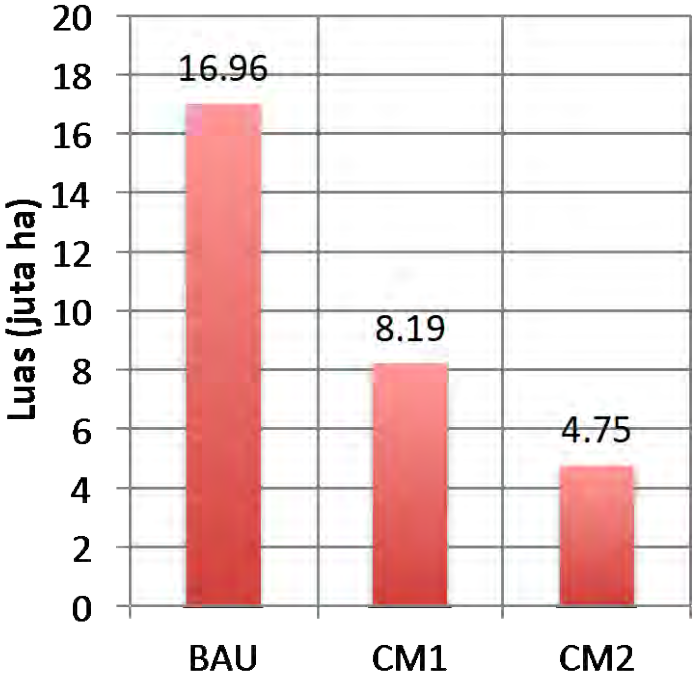
# Main action is to reduce emission from deforestation and peat land




CM1: unconditional

Moving away from forest and peatland for agriculture development

**2011-2030**




CM2: Conditional

# PROGRESS

- Detail mapping of REDD and non-REDD area by island and by province on peat and non-peat lands
- Consolidation and coordination across sectors to follow up the NDC commitment
- Policy discussion with high level policy makers to follow up the NDC commitment
- Development of Governance Structure for National Agency for Environmental Funding Management (BPDLH) that include climate finance (Drafting the Government Regulation and President Regulation on BPDLH) and also financing for REDD+
- Review of regulation related to REDD+ and finalization of Minister of Environment and Forest Regulation on REDD+ implementation
- Development guidance for sub-national (provincial government such as FREL/FRL, MRV protocol) for REDD and Forestry NDC
- National Registry System (SRN)
- One data and one map policy ~ one GHG Inventory Data Policy

# GHG Inventory in the implementation of NDC
## (MoEF, 2017)

I. DEVELOPMENT OF OWNERSHIP AND COMMITMENT
- Government, private, community, financial agencies

II. CAPACITY DEVELOPMENT
- Institutional and human capacity in elaborating NDC, GHGI, MRV, SRN, NDC implementation)

III. ENABLING CONDITION
- Issuance of supporting Policies and regulations (Act Number 16/2016, PP 46/2016, Financing Instrument etc)

IV. DEVELOPMENT OF COMMUNICATION FRAMEWORK
- Coordination and synergy across sectors and region and actors

V. ONE GHGI DATA POLICY
- SIGN-SMART
- SRN & verification system): mitigation, adaptation, financing

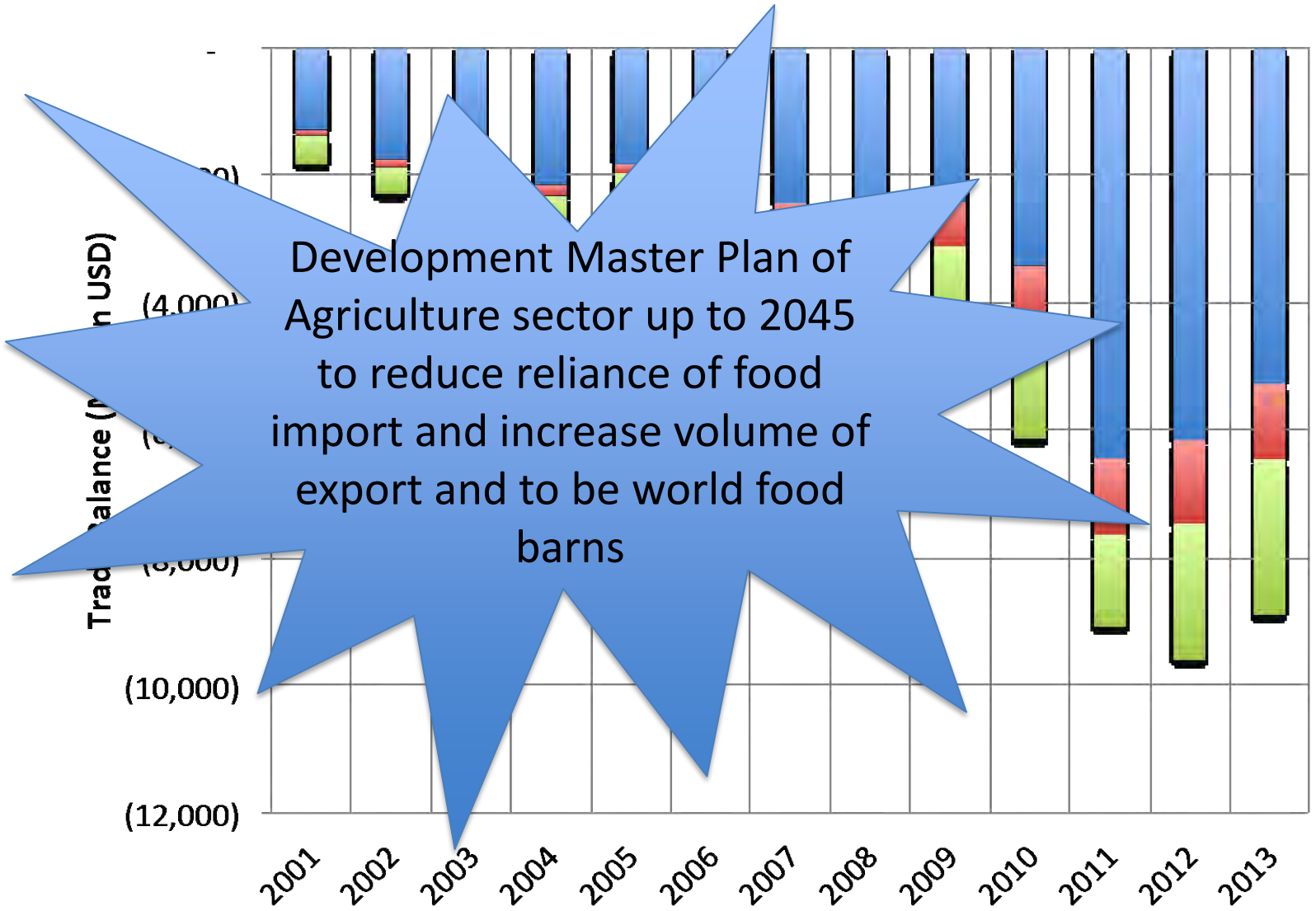
VI. DEVELOPMENT OF POLICY, PLAN & PROGRAM
- Mainstreaming CCM, CCA into RPJMD and resource mobilization

VII. DEVELOPMENT OF NDC GUIDELINE
- Guideline for planning, implementing, MRVing and reviewing NDC for governments & private

II. NDC IMPLEMENTATION
- Based on policy, plan and program (KRP) - BAPPENAS
- Coordinated by MoEF in term of ERT achievement

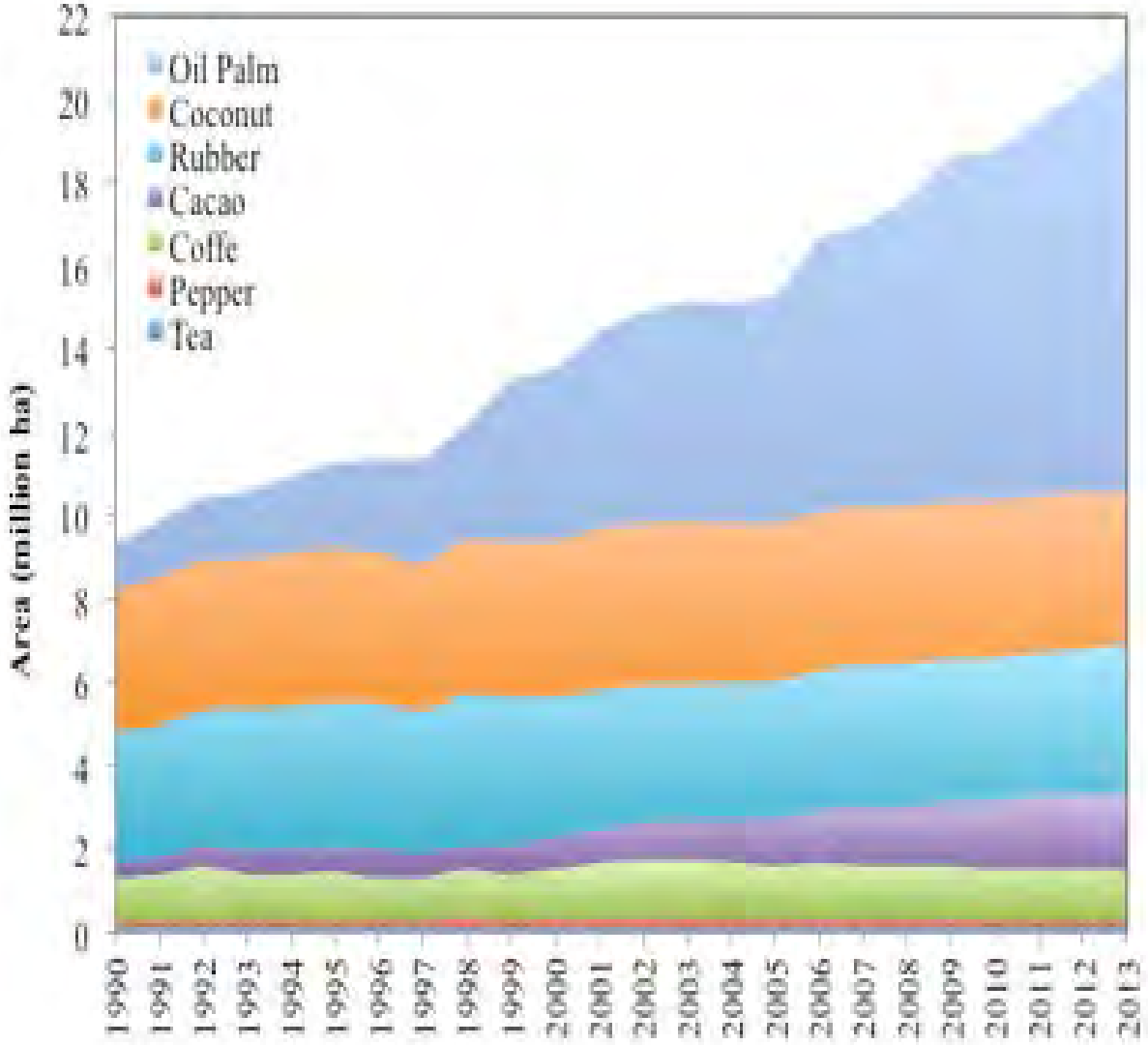
IX. NDC MONITORING & EVALUATION
- Monitoring progress
- Review for adjustment of Emission reduction target

# NDC and Food Soverignty




Source: Ministry of Agriculture, 2014

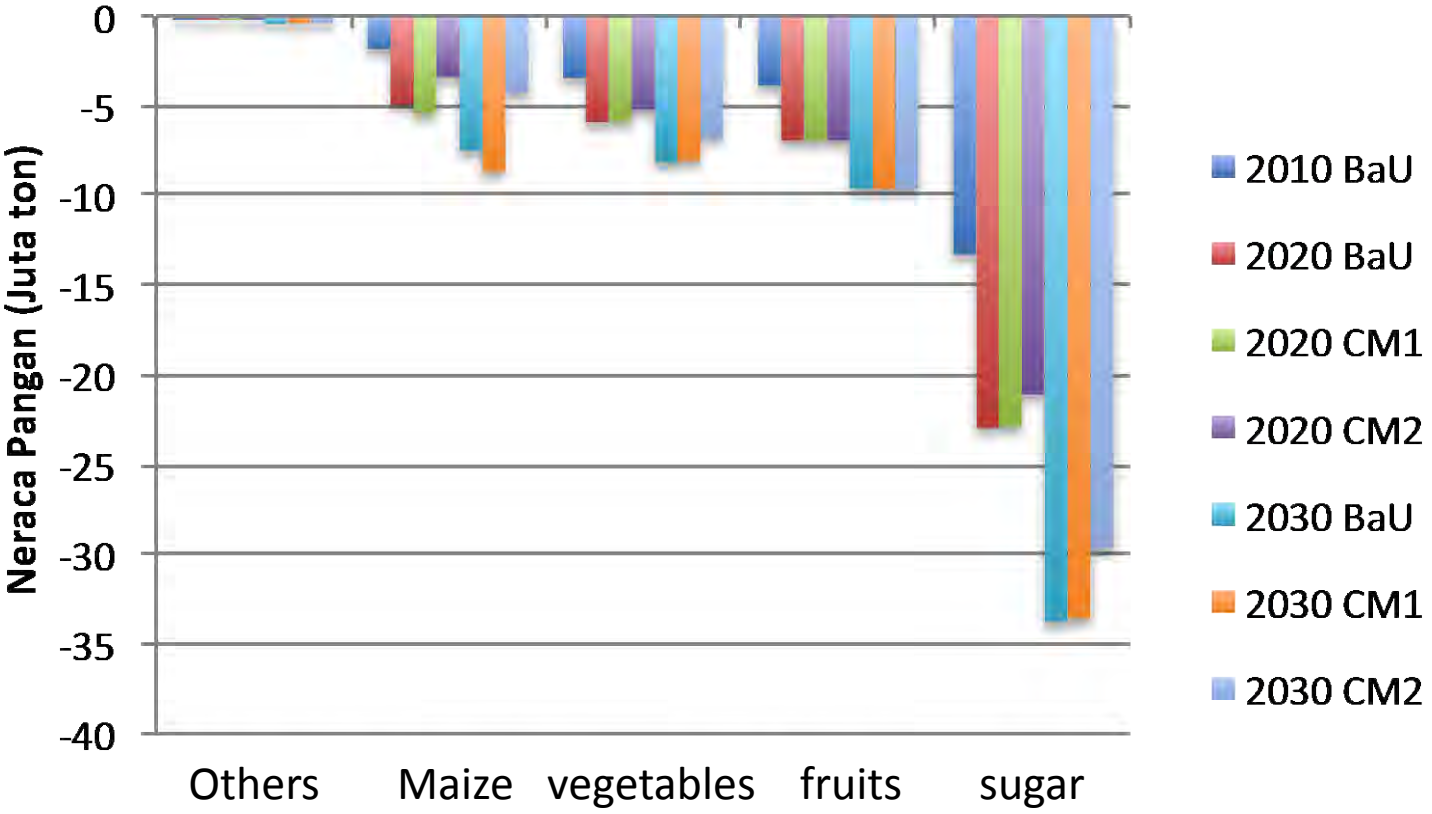
# Agriculture development




Source: MoEF, 2016

- Growth of alm oil plantation 0.571 million ha/year, while other relative constant except for cacao
- Palm oil is the main contribution to national GDP: 70% of national earning from agriculture plantation commodity export
- Production target of CPO:
  - 2020: 40 Mton
  - 2030: 60 Mton
  - 2050: 160 Mton

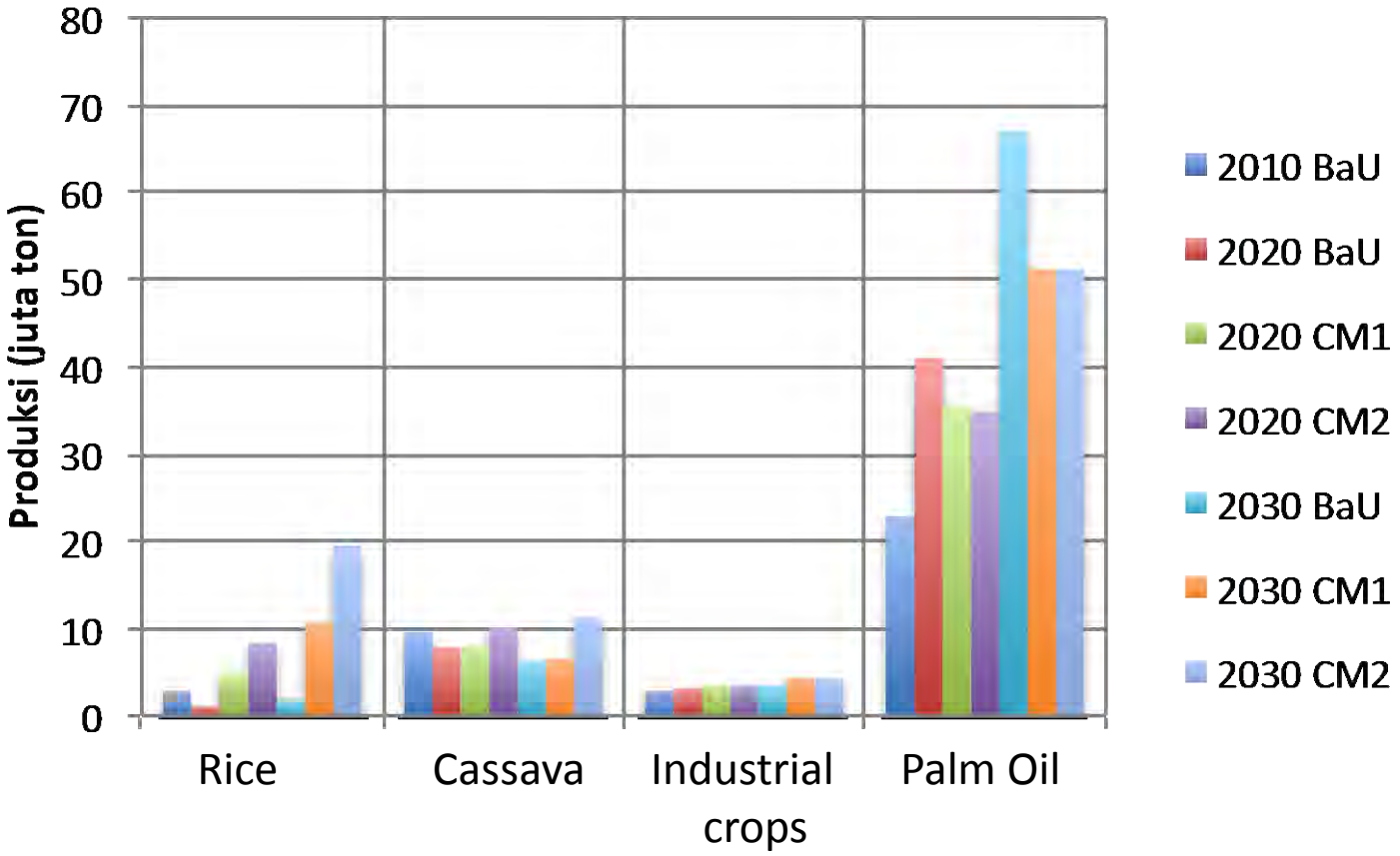
# Food Balanced in NDC




In NDC Volume of food import continue to increase until 2030 (assumption growth rate of crop productivity follows historical trend and government target

Source: MoEF (2016)

# Food Production Surplus

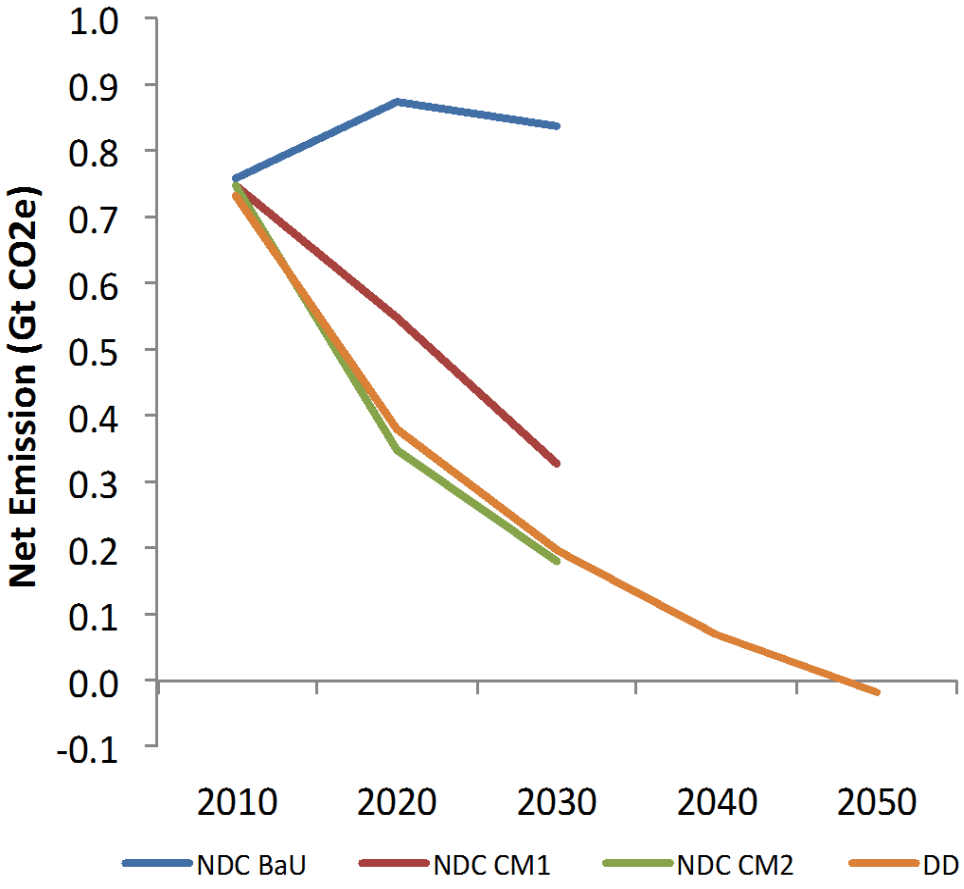



Surplus of production for some commodities tend to increase, and production surplus for CPO nearly meet government target, i.e. 60 million ton CPO

Source: MoEF (2016)

# Development of alternative scenarios for NDC toward food sovereignty

- There is a possibility to develop alternative scenario to NDC that can reduce reliance on food import and potential to reduce the emission further beyond 2030 and become net sink by 2050
- Mitigation rate should be more intensified than that NDC
- Crops productivity improvement and planting intensity should be further increase from the those of NDC scenarios and production target for CPO in 2050 should revisited and reduce to about half of the initial target




Source: Boer et al. 2017

# Key mitigation actions in NDC and Alternative scenario (DD)

**Mitigation Actions (000 HA)**

| Year | Scenarios | Peat Restoration | Peat Water manage-ment | Land rehabili-tation |
|---|---|---|---|---|
| 2020 | BAU | 0 | 0 | 2,070 |
| | CM2 | 698 | 792 | 2,769 |
| | DD | 1,564 | 864 | 3,288 |
| | CM2 | 1,528 | 824 | 3,593 |
| 2030 | BAU | 0 | 0 | 4,140 |
| | CM1 | 1,396 | 864 | 5,537 |
| | CM2 | 2,542 | 864 | 6,576 |
| | DD | 2,629 | 887 | 7,187 |

- Rate of mitigation actions should be increased particularly in peatland restoration and management as well as land rehabilitation. Additional investment **2.5 billion USD (until 2030)**

# Crop Productivity Improvement (Boer et al., 2017)

| Commodities | Current Yield[1] | Yield Target DD (2050) | Attainable Yield |
|---|---|---|---|
| | t/ha | | |
| Rice in Java | 5.80 | 6.50 | 8.80 |
| Rice outside Java | 4.20 | 5.60 | 5.57 |
| Upland rice | 3.04 | 3.50 | 5.00 |
| Maize | 4.40 | 7.00 | 10.60 |
| Cassava | 20.22 | 35.00 | 40.00 |
| Sugarcane (*cane bar*) | 47.89 | 80.00 | 100.00 |
| Palm oil (CPO) | 4.02 | 9.00 | 10.00 |
| Vegetables[3] | | | |
| - Red Chilli | 8.37 | 11.13 | 11.65 |
| - Red Onion | 9.57 | 12.72 | 12.23 |
| Other Industrial crops[3] | | | |
| - Rubber | 0.94 | 1.55 | 1.90 |
| - Coffee | 0.70 | 1.16 | 2.00 |
| - Cacao | 0.42 | 0.70 | 2.00 |
| - Tea | 1.19 | 1.90 | 2.00 |

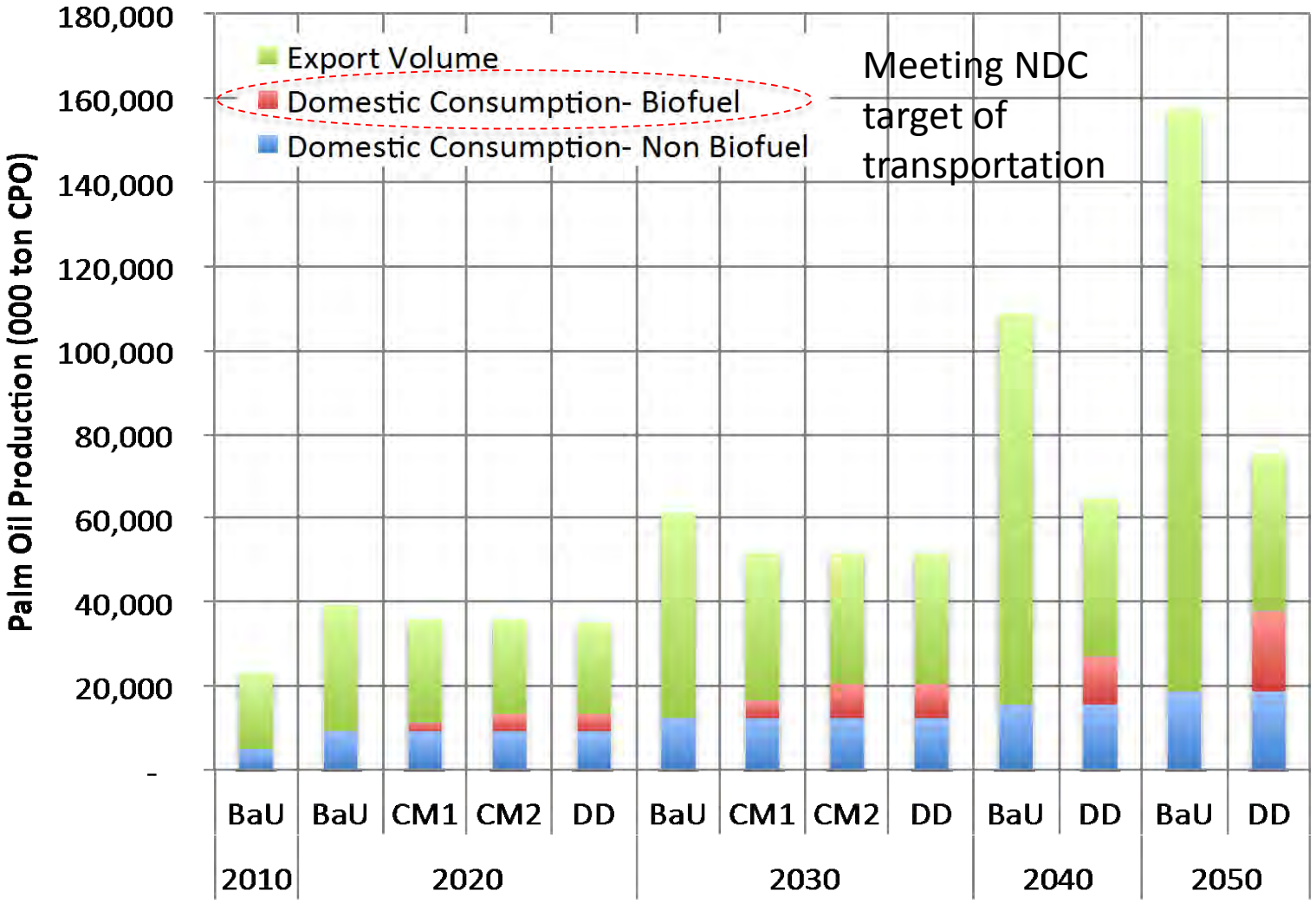
About 14 million ha of agriculture land located in forest area

# Planting Intensity Improvement

| Commodity | Skenario | 2010 | 2020 | 2030 |
|---|---|---|---|---|
| Rice in Java | BaU | 1.80 | 1.97 | 2.20 |
| | CM1 | 1.80 | 1.99 | 1.80 |
| | CM2 | 1.80 | 1.90 | 1.99 |
| | DD | 1.85 | 2.15 | 2.20 |
| Rice Outside Java | BaU | 1.45 | 1.59 | 1.90 |
| | CM1 | 1.45 | 1.66 | 1.45 |
| | CM2 | 1.45 | 1.59 | 1.66 |
| | DD | 1.52 | 1.73 | 1.90 |
| Upland rice | BaU | 0.90 | 0.94 | 1.00 |
| | CM1 | 0.90 | 0.95 | 0.90 |
| | CM2 | 0.90 | 0.92 | 0.95 |
| | DD | 0.91 | 0.97 | 1.00 |
| Maize | BaU | 0.63 | 0.63 | 0.66 |
| | CM1 | 0.63 | 0.64 | 0.65 |
| | CM2 | 0.63 | 0.63 | 0.67 |
| | DD | 0.63 | 0.63 | 0.68 |
| Vegetables | BaU | 0.63 | 0.63 | 0.65 |
| | CM1 | 0.63 | 0.64 | 0.65 |
| | CM2 | 0.63 | 0.63 | 0.66 |
| | DD | 0.63 | 0.63 | 0.67 |

Sumber: Boer et al., 2017)

# Palm Oil Production




Sumber: Boer et al. 2017

# Land Demand for Development under NDC and Alternative Scenario

Source: Boer et al. 2017

| Land use category | Commodities | 2011-2030 | | | 2011-2050 |
|---|---|---|---|---|---|
| | | CM1 | CM2 | DD | DD |
| Croplands | Rice | 487,131 | 579,786 | 655,183 | 1,423,557 |
| | Other Annual Crops | 1,945,045 | 556,908 | 2,980,614 | 8,580,614 |
| | Palm Oil | 2,760,015 | 2,760,015 | 2,563,543 | 2,854,656 |
| | Rubber | 533,910 | 533,910 | 523,232 | 1,138,945 |
| | Other Perennial crops | - | - | - | 407,883 |
| Settlement | Housing and commercial | 522,272 | 190,486 | 237,645 | 738,561 |
| **Total** | | **6,248,373** | **4,621,105** | **6,960,217** | **15,144,216** |

Area of Convertible Production Forest in 2013: 15.52 million ha meaning that forest area allocated for the development is enough until 2050

# Concluding Remark

- Indonesian pledge is very progressive (contribution to the global emission reduction target of (I)NDC reach between 7% and 8% and about 60% of it will be contributed by LULUCF
- Improvement of crop productivity and cropping intensity will be main key activities to realize the target including the restoration of peatland and limit the use of peatland for development
- Target of palm oil expansion should be revisited and reduced to preserve expansion opportunities for other crops and avoid the risk of deforestation while allowing the domestic demand for biofuel of the NDC target to be met