



# **Overview of “Sub-project 3 of Project of Capacity Development for Climate Change Strategies in Indonesia”**

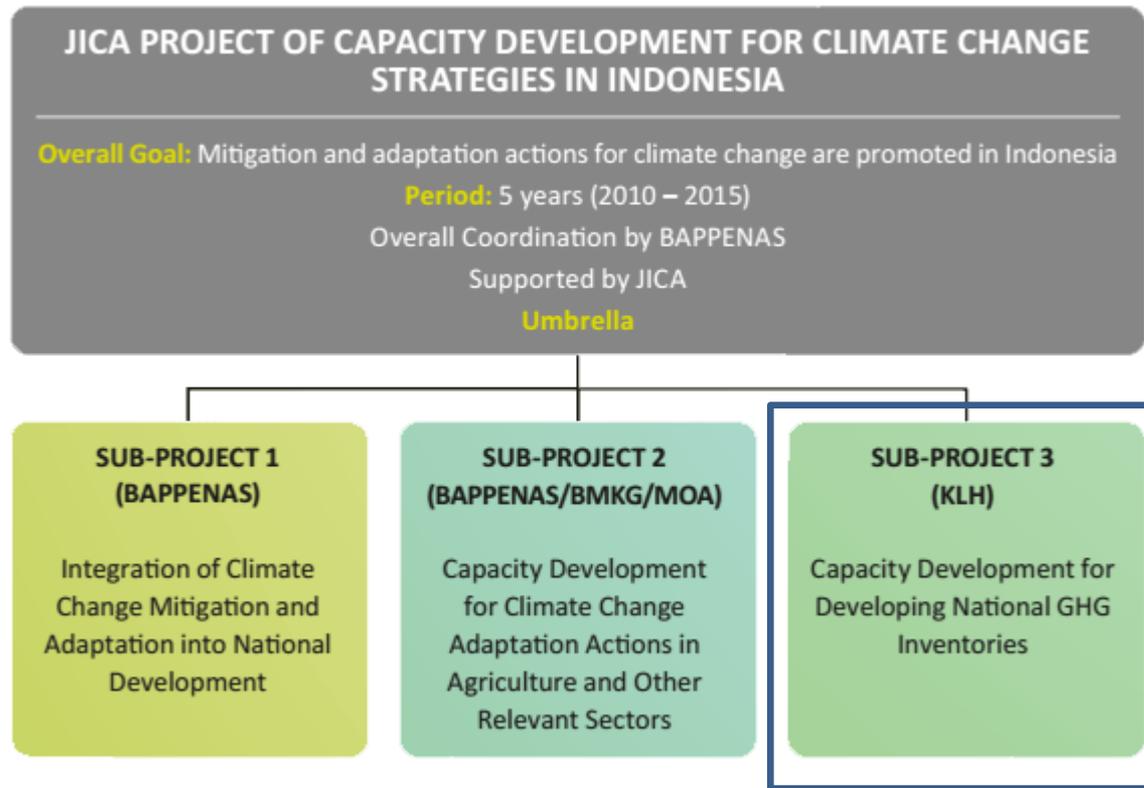
13<sup>th</sup> workshop on GHG Inventories in Asia (WGIA13)

**6<sup>th</sup> August 2015**

**Japan International Cooperation Agency (JICA)**

# Introduction of JICA Project of Capacity Development for Climate Change Strategies in Indonesia

- In order to support Indonesia's effort and challenge to tackle the issues of climate change, JICA is conducting a technical cooperation, "Project of Capacity Development for Climate Change Strategies in Indonesia" from 2010 to 2015 with Indonesian counterparts.



<http://www.greenclimateproject.org/>

**Project for GHG inventory**

# Introduction of JICA Project of Capacity Development for Climate Change Strategies in Indonesia

## JICA PROJECT OF CAPACITY DEVELOPMENT FOR CLIMATE CHANGE STRATEGIES IN INDONESIA

### SUB-PROJECT 1

#### Integration of Climate Change Mitigation and Adaptation into National Development Planning

- **Counterpart:** Ministry of National Development Planning / National Development Planning Agency (KemenPPN / BAPPENAS)
- **Sub Project Outputs:**
  - Capacity to formulate mitigation actions in a monitored, evaluated, and reported manner in the pilot sector(s) or sub-sector(s) is enhanced
  - Capacity to formulate the adaptation action plans, to integrate adaptation into development planning, and to monitor, evaluate and report on the progress of adaptation is enhanced
  - Background study for the Mid-Term National Development Plan (RPJMN) 2015-2019 for the relevant sectors is conducted and its reports are utilized for the formulation of RPJMN 2015-2019
- **Pilot Site:** North Sumatra, South Sumatra, and West Kalimantan

### SUB-PROJECT 2

#### Capacity Development for Climate Change Adaptation Actions in Agriculture and Other Relevant Sectors

- **Counterpart:** Ministry of National Development Planning / National Development Planning Agency (KemenPPN / BAPPENAS); Meteorology, Climatology and Geophysics Agency (BMKG) and Ministry of Agriculture (Kementan / MOA)
- **Sub Project Outputs:**
  - Capacity of analysis on climate variability and change and of its communication is enhanced at BMKG
  - Climate change adaptation by farmer communities is practiced to secure rice production
  - Comprehension of the importance of crop insurance in agricultural protection is improved among stakeholders
- **Pilot Site:** West Java, Central Java, East Java, and Bali

### SUB-PROJECT 3

#### Capacity Development for Developing National GHG Inventories

- **Counterpart:** Ministry of Environment (KLH)
- **Sub Project Outputs:**
  - National system for preparing national GHG inventories are compiled by KLH on a regular basis in cooperation with key ministries and local governments concerned of the Indonesian government
  - Capacity to periodically and systematically manage data necessary for national GHG inventories is enhanced
  - Understanding on accuracy, transparency and reliability of GHG inventories is enhanced for each sector
- **Pilot Site:** North Sumatra and South Sumatra

**GIO member and Japanese inventory experts were dispatched to implement the sub-project3 (SP3).**

## Required Capacity for National GHG Inventory

Technical skills on data collection, selection of EFs and methodologies, activity data compilation, QA/QC, uncertainty, etc.

Management structure to systematize process.

Communication skills on inter-ministerial and multi-stakeholder cooperation.

## Expected Outcome

- Establish national system for National GHG Inventory
- Increase capacity in the periodic and systematic data collection and data compilation for national GHG inventories
- Increase accuracy and reliability of GHG inventory for each sector (energy, IPPU, agriculture, LULUCF, waste)



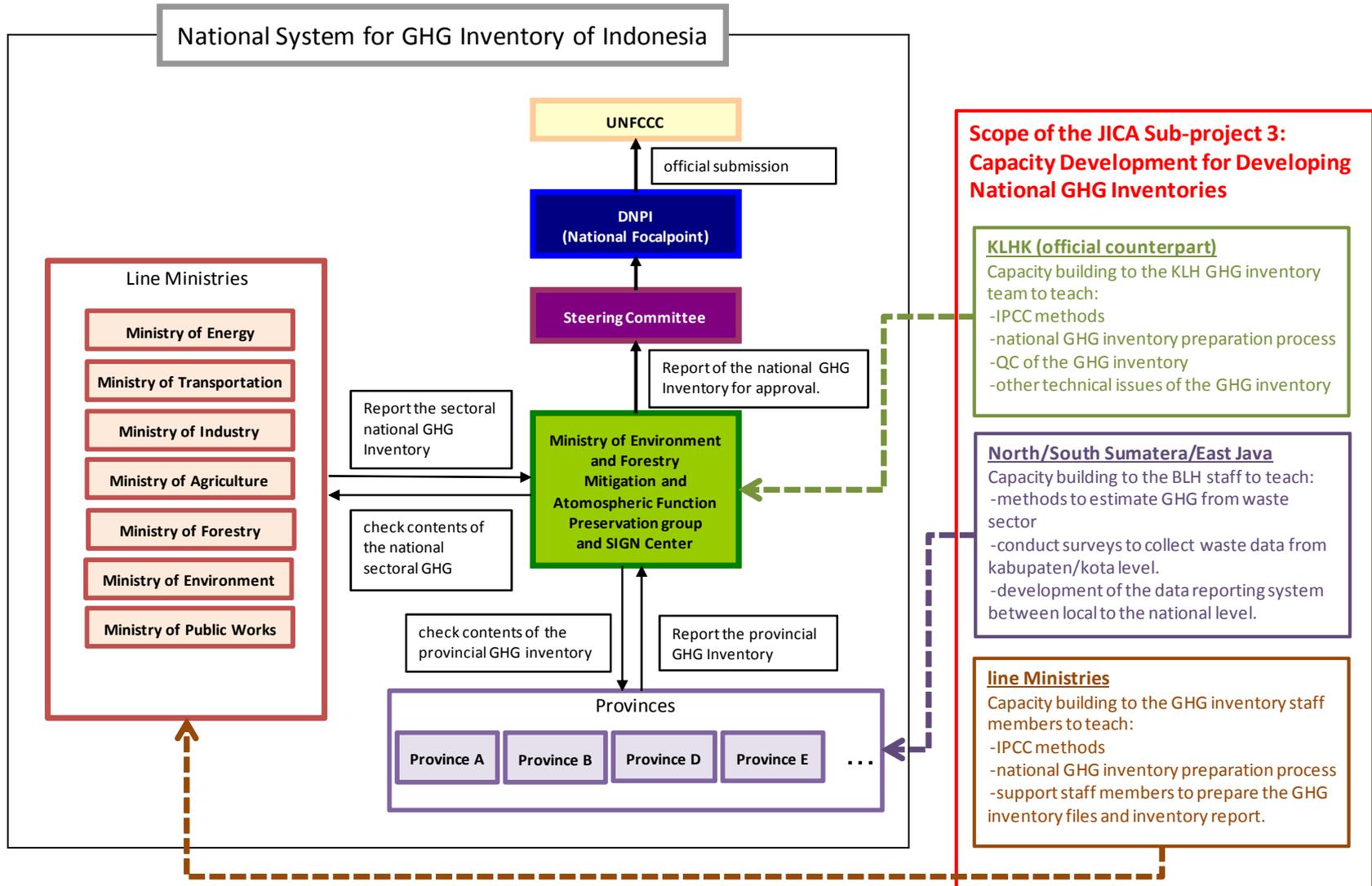
**BUR, INDC, NC, etc.**

# SP3 activities

- The SP3 team worked with the KLHK counterparts to:
  - Understand the IPCC Guidelines and its principles, methods, and other guidance.
  - Consider the ideal national system for Indonesia.
  - Develop a draft document for establishing the national system.
  - Held meetings with line Ministries to discuss GHG inventory preparation.
- The SP3 team also held several workshops and meetings with the KLHK and line Ministries to discuss:
  - The institutional arrangement proposal by KLHK.
  - The methods, data, constraints, and other technical issues.

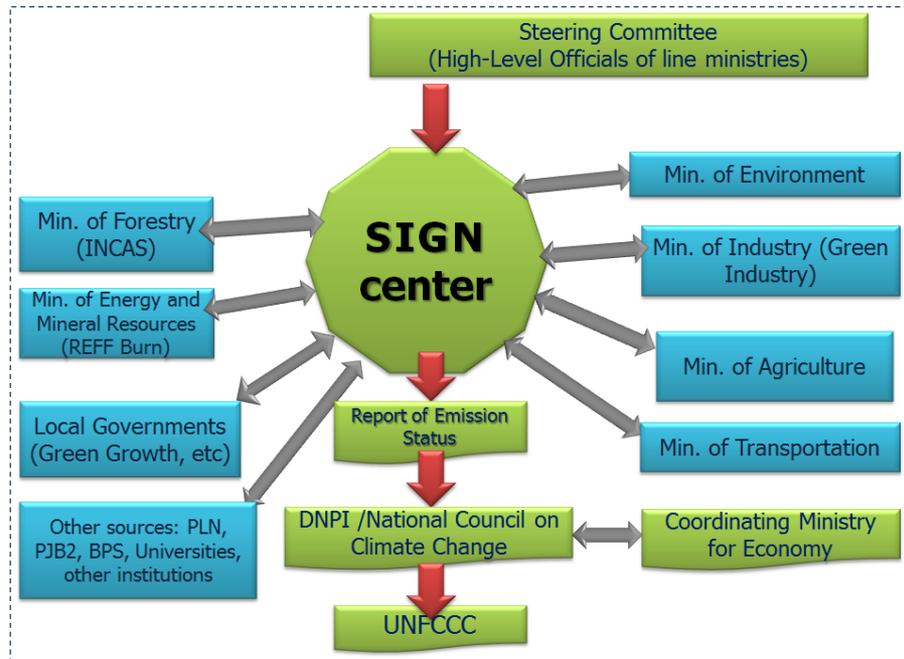


# Implementation structure of SP3



# SIGN center

- “SIGN” center is the national GHG inventory office in Indonesia established in 2013 under KLHK.
  - SIGN: SISTEM INVENTARISASI GRK NASIONAL
- Main task of SIGN is to coordinate GHG inventory related activities (national and regional scale) and compile GHG inventory in cooperation with line ministries.



# SIGN SMART

- “SIGN SMART” is MS-Excel basis and web basis software for supporting national and regional GHG inventory activity.
  - SMART: Simple, Measurable, Accurate, Reliable, Transparent
- SIGN SMART is developed by SIGN center in 2014.



## Main function of SIGN SMART

- Direct data input from data providers (mainly private companies and local governments)
- Data archiving
- Automatic GHG estimation (EFs and parameters are stored in the software)
- Output (graph, table, csv)
- Comparison among provinces

## Pilot project for the waste sector

### ● Reasons for selection of waste sector:

- Before the project, waste sector in Indonesia had large uncertainties. Especially, missing emissions from illegal treatment of solid waste was assumed to be one of big GHG emission sources in waste sector.
- Waste sector is responsible sector of KLHK and regional (provincial) environmental agency (BLH) and should be a leading sector in terms of improvement of TACCC.
- There was no statistics for activity data for waste sector and needed to establish new bottom-up data collection system.
- GHG emissions in the waste sector in Indonesia was 166.831 Gg CO<sub>2</sub> in 2005 (SNC). This is the largest GHG emissions in the waste sector among Annex I and Non Annex I countries.



## Pilot project for the waste sector

- Period: 2011 – 2015
- Locations: North Sumatra, South Sumatra and East Java province
- Participants: provincial BLH, Kabupaten/Kota, KLHK, JICA, ITB, UNSRI, USU, UNBRA, Local experts, NGO etc.

### Data Improvement

- Local waste composition data
- Local dry matter content data
- Local bulk density data (volume – weight conversion factor)
- Waste stream data
- Local EF for domestic wastewater treatment
- Local EF for Industrial wastewater treatment

### Capacity Development

- GHG inventory training for provincial staff and stakeholders (university, NGO, private company, etc.)
- Annual GHG inventory workshop for Kabupaten/Kota
- Data collection scheme between Kabupaten/Kota and province through SIGN software
- Study in Japan for better understanding of inventory

## Waste composition and dry matter content



Moisture content of waste on Landfill in Indonesia is different with IPCC 2006GL because of influence of rain water during waste collection. Also, waste composition is different with IPCC 2006GL, especially fraction of food waste is larger than IPCC default value.



Original moisture content and waste composition data were developed and CH<sub>4</sub> estimation methodology based on dry basis activity data were applied.

### Waste composition data

MSW component	Waste composition (wet basis %)			
	Default GL2006	JICA SP3 Activity		
		North Sumatera	South Sumatera	Average
Paper/cardboard	12.9	9.36	10.49	9.93
Textiles	2.7	3.20	1.79	2.50
Food waste	43.5	50.04	58.85	54.44
Garden and Park waste	9.9	14.02	3.36	8.69
Nappies		4.01	4.50	4.25
Rubber and Leather	0.9	0.52	0.34	0.43
Plastics	7.2	10.45	18.79	14.62
Metal	3.3	0.34	0.40	0.37
Glass	4.0	1.48	1.05	1.27
Other, Inert waste	16.3	6.57	0.42	3.49

### Dry matter content data

MSW component	Dry matter content ( %)			
	Default GL2006	JICA SP3 Activity		
		North Sumatera	South Sumatera	Average
Paper/cardboard	90	44.2	52.3	48.2
Textiles	80	73.1	55.5	64.3
Food waste	40	59.2	32.5	45.9
Garden and Park waste	40	56.7	53.8	55.2
Nappies	40	44.2	52.3	48.2
Rubber and Leather	84	88.7	90.5	89.6
Plastics	100	57.0	78.3	67.6
Metal	100	97.1		97.1
Glass	100	65.7	93.3	79.5
Other, Inert waste	90	94.8	88.5	91.6

## Waste stream survey (survey for waste treatment pathway)



Waste stream (waste treatment pathway) is different in each area. For example, 15 - 28% of domestic waste is treated by open-burning by inhabitant in their backyard. Also, in some area in South Sumatra, 43% of domestic waste is untreated (open dumping). GHG emissions from these activities are to be included in GHG inventory.



Waste stream data is used to estimate GHG emissions from waste sector based on TACCC principle.

### Waste stream data

Waste Stream	North Sumatra	South Sumatra1	South Sumatra2	IPCC Default
SWDS	64%	36%	44%	59%
Compost	0%	0%	6%	5%
Open Burning	28%	18%	15%	9% (incinerated)
Untreated/open dump	5%	43%	12%	
Unknown, Other	3%	2%	16%	27% (unspecified)
3R, biogas	1%	2%	6%	

## EF developing survey for domestic wastewater



Domestic wastewater treatment category is one of dominant GHG emission sources in the waste sector. Definition of wastewater treatment system is different in each country. In Indonesia, septic tank is major domestic wastewater treatment method in household.



As a result of EF survey for domestic wastewater, Indonesian country specific EF was developed as 0.082 kgCH<sub>4</sub>/kgBOD for septic tank. This value is around 1/3 of IPCC 2006GL default value (IPCC -> B<sub>0</sub>: 0.6 kgCH<sub>4</sub>/kgBOD, MCF: 0.5 as septic tank).

### Result of EF survey for domestic wastewater (septic tank)

CH <sub>4</sub> EF (kgCH <sub>4</sub> /kgBOD)	
Measurement	0.082
IPCC 2006GL	0.3

## EF developing survey for industrial wastewater



Wastewater treatment facility in CPO (crude palm oil) industry produces large amount of CH<sub>4</sub>. Country specific EF for CPO is necessary for Indonesia because IPCC 2006GL provides no EF for CPO and CPO is one of the most important industries in Indonesia. For considering adequate mitigation action in CPO industry, country specific EF is to be developed.



As a result of EF survey for industrial wastewater, Indonesian country specific EF was developed as 0.38 kgCH<sub>4</sub>/kgCOD for CPO. This value is around double of IPCC 2006GL default value (IPCC -> B<sub>0</sub>: 0.25 kgCH<sub>4</sub>/kgCOD, MCF: 0.8 as anaerobic deep lagoon).

### Result of EF survey for industrial wastewater (CPO)

CH <sub>4</sub> EF (kgCH <sub>4</sub> /kgCOD)	
Measurement	0.38
IPCC 2006GL	0.20

# Achievements

- Achievements of SP3:
  - The SIGN Center was established within the KLHK.
  - SIGN center staff members trained in the basics of the IPCC Guidelines.
  - A draft national GHG inventory report was produced, with detailed description of the methods, data, improvements, gaps, etc.
  - The line Ministries have more capacity to produce their sectoral GHG inventories.
  - Provinces have more capacity to collect accurate waste statistics and region specific parameters.
  - Manuals were developed for KLHK and BLH to collect waste statistics and develop region specific parameters.

# Challenges

- National system for promoting national and regional GHG inventory activity is still being developed. Role of line ministries and KLHK need to be definitely separated.
- Function, human resources and financial background of SIGN center needs to be reinforced.
- Methodologies for GHG estimation are still mainly tier 1. country specific parameters and EFs are expected to be developed.

## Indonesia:

- Directorate of GHG Inventory and MRV, Climate Change Directorate General, Ministry of Environment and Forestry

## JICA:

- JICA Project of Capacity Development for Climate Change Strategies in Indonesia
- TEL: +62-(0)21-5277246
- WEB: <http://www.greenclimateproject.org>