The Republic of Indonesia
Ministry of Environment and Forestry

Capacity Development for Developing National GHG Inventories (Sub-Project 3) of Project of Capacity Development for Climate Change Strategies in Indonesia

Project Activity Completion Report

November 2015

Japan International Cooperation Agency

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SUURI-KEIKAKU Co., Ltd.

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Abbreviations

BAPPENAS	Ministry of National Development Planning
BAU	Business As Usual
BLH	Regency/City Environmental Bureau
BMKG	Agency for Meteorological, Climatological and Geophysics
BPS	Statistics Agency
BUR	Biennial Update Reports
CP	Counterpart
CTA	Chief Technical Advisor
DNPI	National Council on Climate Change
GHG	greenhouse gas
GIO	Greenhouse gas Inventory Office of Japan
INC	Initial National Communication
IPCC	International Panel on Climate Change
IPPU	Industrial Processes and Product Use
JCC	Joint Coordinating Committee
JICA	Japan International Cooperation Agency
KLHK	Ministry of Environment
LULUCF	Land Use, Land-Use Change and Forestry
M/M	Meeting of Minutes
MEMR	Ministry of Energy and Mineral Resources
MoA	Ministry of Agriculture
MoI	Ministry of Industry
MoT	Ministry of Transportation
MoU	Memorandum of Understanding
MRV	Measurement, Reporting, and Verification
NAMA	Nationally Appropriate Mitigation Action
NC	National Communication
NIR	National Inventory Report
PDM	Project Design Matrix
PO	Plan of Operation
QA/QC	Quality Assurance / Quality Control
R/D	Record of Discussions
RAD-GRK	National Action Plan on GHG reduction
RAN-API	Local Action Plan on GHG reduction
RPJMN	Medium-term, inclusive national development strategy
SNC	Second National Communication
UNFCCC	United Nations Framework Convention on Climate Change

Chapter 1. Overview of the Project

1．Background

The total national greenhouse gas emissions of Indonesia are one of the highest in the world when CO_2 emissions from forestry and peatland are included. With economic growth increasing in the future, energy consumption will also increase, leading to higher CO_2 emissions. Indonesia hosted the thirteenth meeting of the UNFCCC Conference of Parties (COP13) in December of 2007 and declared a national action plan for combating climate change as an comprehensive action plan for addressing the implementation of both mitigation and adaptation actions. Also, former president Yudhoyono declared in COP 15, held in December 2009, that it would unilaterally reduce GHG emissions by 26% in 2020 compared to the business as usual (BAU) and 41% with support, and has submitted to the UNFCCC secretariat seven actions to achieve the goal. The specific process for the mitigation actions and development of action plans for mitigation actions, in addition to the Measurement, Reporting and Verification (MRV) of the GHG emission reduction is the challenge. In the Durban package, agreed in COP17 in 2011, developing countries are required to compile and submit GHG inventories every two years.

Indonesia has prepared GHG inventories twice under the UNFCCC. The Ministry of Environment (currently the Ministry of Environment and Forestry, KLHK[1]), which is responsible for domestic climate change policy, compiled the GHG inventory, but it faces challenges regarding the institutional framework, institutional arrangements, and staff with the technical expertise. New staffs were assigned in the SIGN Center within KLHK in 2010.

With this as background, Indonesia requested Japan for technical assistance to strengthen their capacity to prepare GHG inventories using accurate and time-series consistent data and clear methodologies for estimating emissions and removals, and to utilize the inventory for developing climate change policies.

Indonesia requested Japan for the following technical assistance projects on climate change:

①Project to support the development of low carbon development strategies

②Project to enhance capacity for conducting vulnerability assessment

③Project to enhance the capacity for GHG inventory preparation

This project was implemented as the subproject 3 of the Project of Capacity Development for Climate Change Strategies in Indonesia. The Record of Discussion (R/D) and the Minutes of the Meeting (M/M) for the subproject3 were agreed and signed October 26, 2010, and began as a four year project from October 2010 to November 2014, but with the evolution of the national circumstances regarding the institutional setup and the needs of KLHK regarding the pilot project activities, the project implementation period was extended to October 2015.

[1] The Ministry of Environment (KLH) merged with the Ministry of Forestry in 2015 to become the Ministry of Environment and Forestry (KLHK). This report will use KLHK throughout the report.

2. Overview of Sub-Project 3

2.1 Sub-Project Title

Capacity Development for Developing National GHG Inventories (Sub-Project 3)

2.2 Sub- Project Purpose

The objective of SP3 is to enhance Indonesia's capacity to prepare GHG inventories using time series consistent and accurate data and methods to estimate GHG emissions and removals on a regular basis. In this regard, the SP3 will enhance capacities of KLHK and line ministries on data collection, compilation, and quality control for all inventory sectors (energy sector, industrial processes sector, agriculture sector, land use, land use change and forestry [LULUCF] sector, and waste sector) in addition to enhance the capacity of the SIGN Center staff who will manage the process.

In addition, the SP3 will, with a view to improve the accuracy and reliability of GHG estimation in the waste sector in North Sumatera, South Sumatera, and East Java, conduct measurement studies for parameters used in emission estimation in the waste sector (amount of solid waste produced, water content ratio, emission factors) develop a manual and software for estimating emissions, and enhance the capacity of the BLH staff, who are in charge of waste management at the local level.

2.3 Sub-Project Period

Sub-Project was conducted from March 2011 to November2015.

2.4 Objectives

2.4.1 Overall Goal

Mitigation and adaptation actions for climate change are promoted in Indonesia.

2.4.2 Project Objective

Capacities of Indonesian national and local governments for policy making and others related in climate change are enhanced.

2.4.3 Sub- Project 3 Purpose

National greenhouse gas (GHG) inventories come to be prepared in cooperation with the key ministries and local governments concerned of the Indonesian government.

2.5 Outputs and Activities

（1）Output 1：National system for preparing national GHG inventories is designed

＜Activities＞

1-1： Conduct workshops/trainings for acquiring general knowledge on preparation of national GHG inventories.

1-2： Examine the existing system for preparing national GHG inventories and assess current capacity of the KLHK and other relevant organizations involved in the preparation of the GHG inventories.

1-3： Consider methods for QA/QC on cross-cutting issues of national GHG inventories.

1-4： Examine a procedure for preparation of national GHG inventories.

1-5： Examine institutional arrangement for preparing national GHG inventories.

1-6： Document the national system for national GHG inventory preparation, including its institutional arrangement.

1-7： Conduct workshop for dissemination of the national system.

1-8： Facilitate discussions on functional improvement and institutional arrangement concerning environmental policy-oriented research activities.

1-9： Document and submit the result of the discussion in the activity above.

＜**Indicators**＞

1-1. Procedure for inventory compilation is documented

1-2. Procedure for quality assurance/ quality control (QA/QC) is documented.

1-3. Institutional arrangement for preparation of national GHG inventories is documented.

（2）Output 2：Capacity to periodically and systematically collect and compile data necessary for national GHG inventories is enhanced.

＜Activities＞

2-1： Support in collecting and compiling data necessary for national GHG inventories from relevant ministries, local governments and other concerned organizations.

2-2： Develop data flow including work sheets and a database, consisting of file systems, for national GHG inventories.

2-3： Compile national GHG inventories with time-series consistency.

2-4： Plan and implement QA/QC activities on cross-cutting issues for national GHG inventories.

2-5： Prepare the Annual Progress Report on National GHG inventory Development, including procedures of inventory compilation methodologies and QA/QC activities.

2-6： Develop a website for disseminating NIR.

2-7： Prepare and improve a national GHG inventory improvement plan.

＜**Indicators**＞

2-1. Data file for national GHG inventories is electronically and physically archived.

（3）Output 3 : Accuracy and reliability of GHG inventories are improved for each sector (energy; industrial processes; agriculture; land use, land-use change and forestry [LULUCF]; and waste).

＜Activities＞

3-1 : Conduct technical workshops/trainings on preparation and improvement (i.e. methods, data, assumptions and worksheets) for each sector of the national GHG inventories to improve the accuracy, transparency, and reliability of the national GHG inventories.

3-2 : Study methods for preparing activity data and emission factors as well as for implementing data compilation and QA/QC activities for each sector of national GHG inventories.

3-3 : Conduct key category analysis and identify categories which should be given priority in improving the accuracy and reliability of data.

3-4 : Identify measures for reducing uncertainties in order to improve accuracy and reliability of emission/removal estimates for prioritized key categories.

3-5 : Identify relevant information and emission factors and other relevant parameters that better reflect national or regional circumstances in prioritized key categories, specifically for the waste sector.

3-6 : Organize time-series consistent activity data for each sector based on data provided by line Ministries.

3-7 : Prepare manuals for developing parameters for the waste sector at the local level for eventual use in all provinces in Indonesia.

3-8 : Conduct studies at the local level to develop new or improved parameters for the waste sector for eventual use in the national GHG inventory.

3-9 : Develop a reporting system for waste parameters from the local level to the national level.

3-10 : Conduct technical workshops/training seminars at the local level to improve the emissions estimation of the waste sector.

＜Indicators＞

3-1. Improvement for estimating the Emissions from and removals by categories that have not been considered is documented.

3-2. Emission factors and other parameters are improved for the waste sector.

3． The implementation structure of Subproject 3

3.1 Overview

The implementation structure of the SP3 is as shown in Figure 1-1. In the subproject, capacity enhancement activities were implemented with the KLHK, the counterparts of the subproject, the SIGN Center staff within the KLHK, and the line ministries responsible for preparing the sectoral inventory (Ministry of Energy, Ministry of Transportation, Ministry of Industry, Ministry of Agriculture, Ministry of Forestry, etc.) in addition to the BLH staff in North Sumatera, South Sumatera, and East Java.

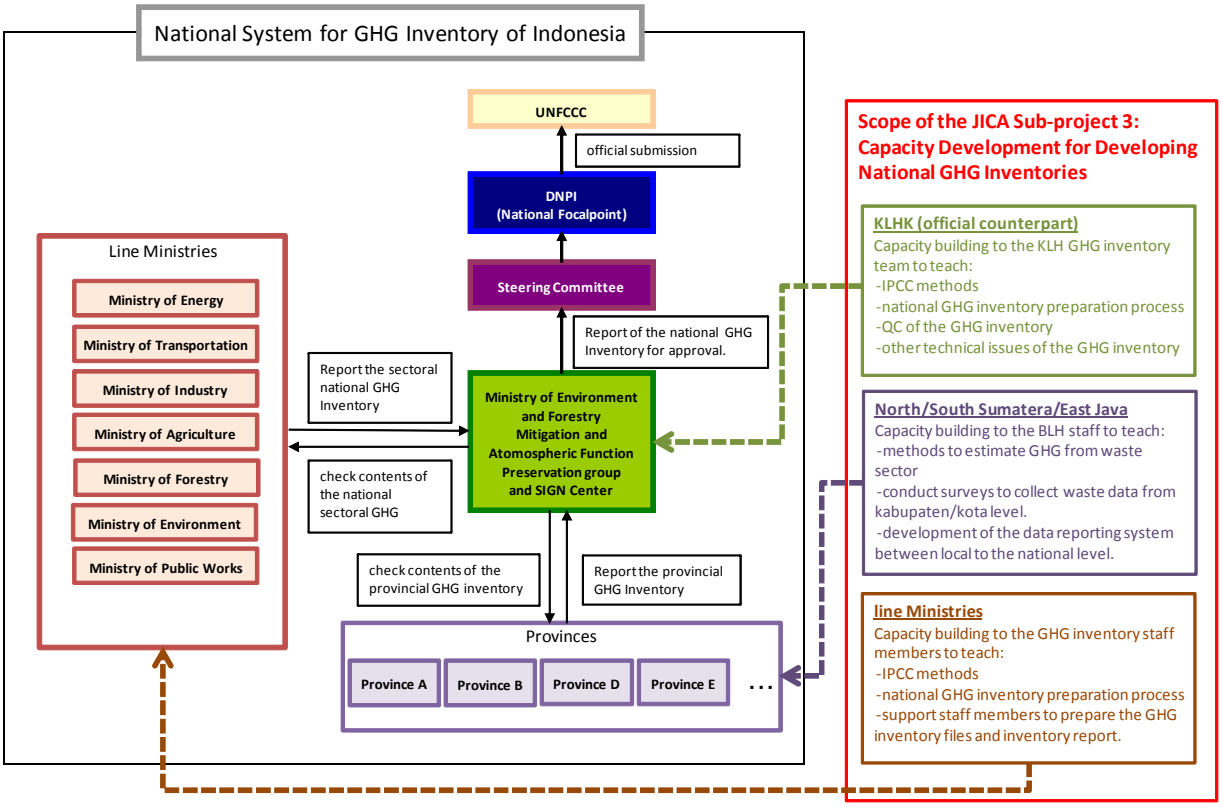

Figure 1-1 Implementation structure of SP3

The implementation structure of SP3 was revised, taking into account the Presidential Regulation No. 71 (2011) (PR71, see ANNEX 1) on the implementation of GHG inventories, which included some information on the institutional arrangements and process of preparing the annual GHG inventory in Indonesia.

PR71 includes provisions on the national as well as local regional level GHG inventory preparation. The KLHK is assigned as the responsible agency for the national GHG inventory preparation. In addition, KLHK will be responsible for the waste sector, specifically for the data collection, emission estimation, and reporting. For other sectors, the line Ministries will have this obligation (see Figure 1-2).

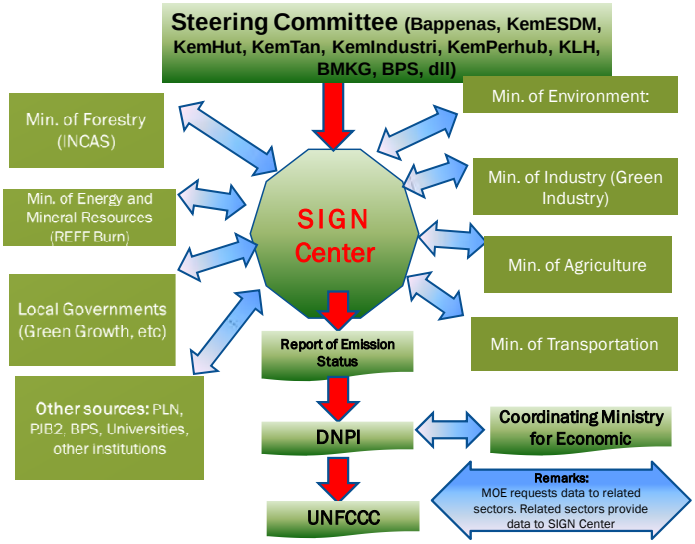

Figure 1-2 Institutional setup according to PR71

The assumption of the institutional setup at the beginning of SP3 was that KLHK would collect parameter data from all the line ministries and estimate and report on the national GHG inventory themselves. However, as PR71 stipulates that line ministries will report their inventory information to the SIGN Center, and KLHK only verify the values, the SP3 was forced to redesign the institutional setup for the project.

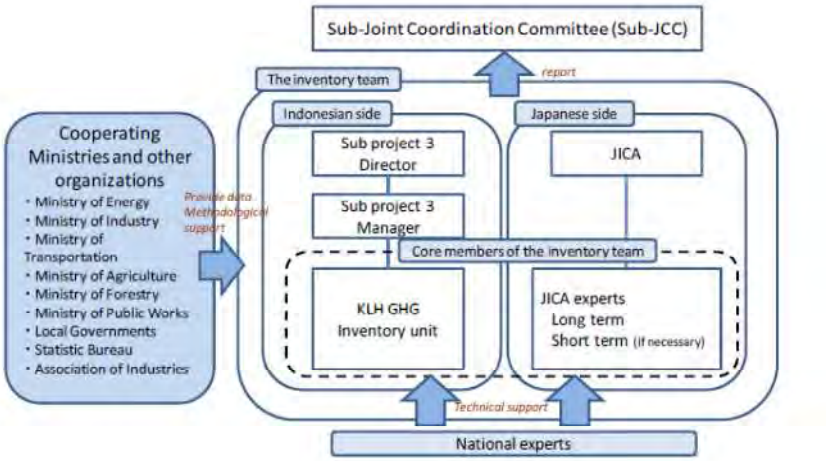

Figure 1-3 Institutional setup assumed by SP3

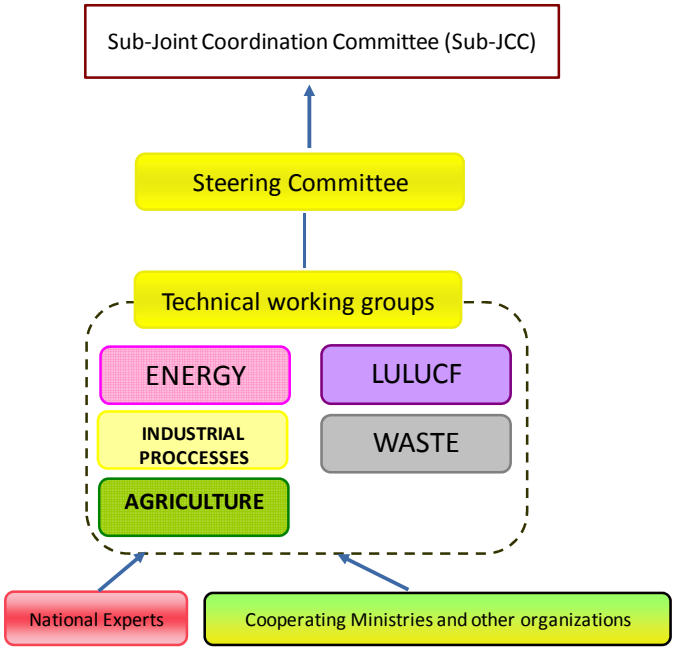

Figure 1-4 Institutional setup of SP3 after enforcement of PR71

PR71 has assigned local governments to prepare and report input into the province and city level GHG inventory in addition to the national level GHG inventory. The governor or mayor must report to the province governor once a year, who in turn has the responsibility to report the province level inventories to the minister of KLHK. As the PR71 requires local level and national level GHG inventories, the SP3 revised its scope of the pilot project to include the capacity enhancement of local level staff in addition to improving the data accuracy and collection of waste parameters in North Sumatera, South Sumatera, and West Java.

3.2 Roles and responsibilities

3.2.1 National GHG inventory

(1) KLHK

According to PR71, KLHK is in charge of the following tasks: ①prepare a GHG inventory preparation guideline; ②management of the national GHG inventory process; ③ the monitoring and evaluation of the GHG inventory process and results. It has a different role than as envisioned by the R/D of SP3, in which KLHK was assumed to implement the actual inventory activities such as to collect data, consider methods, carry out the estimation for all sectors. PR71 instead assigns KLHK to do only these tasks for the waste sector. In the beginning of the SP3, the team conducted general GHG inventory training to the KLHK staff and carried out a trial preparation of the 2008 inventory, but after 2013, the team focused its efforts to enhancing the capacity of the SIGN Center staff within the KLHK.

(2) Line Ministries

According to PR71, the line ministries are in charge of the following tasks: ① Inventory preparation of their sector; ② Preparation of a time series of emissions and removals; and ③ Development of emission factors and parameters in coordination with relevant stakeholders. Again, the assigned tasks are not in line with the assumption made by the R/D of SP3, which was data provision and quality control of the methods and results of KLHK's estimation. As line ministries were assigned a more central role in the GHG inventory preparation process, the SP3 team conducted training to the line Ministry staff.

The PR71 does not specify which ministry is in charge of which sector or subsector, but the ministries are working off the assumption as shown below.

table 1-1 Ministries responsible for the inventory sectors

Energy Sector	Ministry of Energy and Mineral Resources (MEMR), Ministry of Transportation (MoT), Ministry of Industry (MoI)
Industrial processes sector	MoI, Central Statistics Agency (BPS)
Agriculture sector	Ministry of Agriculture (MoA), BPS
LULUCF sector	Ministry of Forestry(currently KLHK), MoA
Waste sector	KLHK, Ministry of Public Work (PU), MoI

(3) DNPI

The National Council on Climate Change (DNPI) was established by presidential regulation 48 (2008) to coordinate efforts of all line ministries under the president. DNPI has the central role in Indonesia for the national policies, strategies, programs, and specific climate change measures such as mitigation, adaptation, technology transfer, and finance. In addition, DNPI is responsible for reporting the BUR and NC of Indonesia to the UNFCCC. Although DNPI participated in many of the SP3 workshops and technical

meetings, they are not involved in the technical aspect of the GHG inventory.

3.2.2 Pilot project

(1) North Sumatera BLH (Bureau of Environment)

BLH is one of department in the North Sumatra provincial government and is responsible for all environmental issues at the provincial level. As there is no team for GHG related activity in BLH, a taskforce team, which was assigned by the head of BLH, took responsibility of GHG inventory activity. Since there are 33 Kabupaten/Kota in the North Sumatra province, team members carefully establish communications with each of them to collect data and estimate emissions from waste and other sectors of the inventory (the SP3 supported only the waste sector at the province level). In Indonesia, usually local university supports BLH's activity. But there was no specialist for environment in USU (North Sumatra University), the target person for capacity building was mainly BLH staff.

(2) South Sumatera BLH

BLH is one of department in the South Sumatra provincial government and is responsible for all environmental issues at the provincial level. As there is no team for GHG related activity in BLH, two representatives in South Sumatera BLH took responsibility of GHG inventory activity. Surividjaya University (UNSRI) provided support to BLH's GHG inventory as experts. As there are 17 Kabupaten/Kota in the South Sumatra province, GHG inventory activity and data collection were conducted by each region (high land area, middle land area and low land area). During the project, the head of BLH changed twice, but the activities of SP3 were not affected as the other representative continued to work with the SP3 throughout the project duration.

(3) East Java BLH

BLH is one of department in the East Java provincial government and is responsible for all environmental issues at the provincial level. As there is no team for GHG related activity in BLH, two staffs under head of division for environmental monitoring conducted main work for GHG inventory activity. Brabidjaya University (UNBRA) cooperated with BLH for conducting GHG inventory as experts and consultants. There are 38 Kabupaten/Kota in East Java and the team members set practical goals for the one year of activities in the region, mainly focusing on the improvement of data collection and lectures.

Chapter 2. Revision of the PDM

After the signing of the R/D of SP3 in September 2010, the R/D was revised and agreed in July 2013 taking into consideration the roles and responsibilities of the KLHK and line Ministries as outlined in PR71. The summary of revisions to the PDM is as below.

table 2-1 Summary of revisions to PDM and PO

PDM& PO	Summary of revisions	
	Before revision	After revision
PDM	<Means of verification of project> 1. NIR in 2008 and 2010	< Means of verification of project > 1. Inventory report and inventory improvement report
	<means of verification for output 1> 1.1. Inventory report 1.2. Inventory report 1.3. Inventory report	< means of verification for output 1> 1.1. QA/QC Plan 1.2. QA/QC Plan 1.3. QA/QC Plan
	＜Project term＞ ～November 2014	＜Project term＞ ～October 2015
	No mention	SIGN Center staff and IT support staff added as input from the Japan side.
PO	No mention	＜Additional activities listed for the waste sector＞ 3-7: Prepare manuals for developing parameters for the waste sector at the local level for eventual use in all provinces in Indonesia. 3-8: Conduct studies at the local level to develop new or improved parameters for the waste sector for eventual use in the national GHG inventory. 3-9: Develop a reporting system for waste parameters from the local level to the national level. 3-10: Conduct technical workshops/training seminars at the local level to improve the emissions estimation of the waste sector.
	No mention	Pilot project activities and activities regarding web site development was added
	No mention	Project term was extended 11 months

The new PDM is as shown in Table 2-2.

Annex I-1: Amended PDM (version 1.0)

Project Title：Sub-Project 3: Capacity Development for Developing National GHG Inventories

Project Period：April 2011 – October 2015 (Four years and six months)

Target Area：Nationwide, pilot provinces including North Sumatra and South Sumatra

Target Group：KLHK, key ministries, local governments and other concerned organizations　　Date：July 11, 2013

Table 2-2　New PDM

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal Mitigation and adaptation actions for climate change are promoted in Indonesia.	1. GHG emission is reduced by 26% by 2020 relative to BAU in Indonesia. 2. The number of development strategies integrating adaptation in local governments is increased.	1. National GHG Inventory report 2. Development plans produced by local governments	
Project Purpose National greenhouse gas (GHG) inventories are compiled by SIGN Center on a regular basis in cooperation with the key ministries and local governments concerned of the Indonesian government.	1. National GHG Inventory Development is annually prepared by KLHK. 2. The improvement of estimation method (from lower tier to higher tier, e.g. by improving emission factor and/or activity data or by reporting with appropriate notation key) ia documented.	- Annual Progress Report on National GHG Inventory Development - A national GHG inventory improvement plan	Projects, programmes, domestic laws regarding national GHG inventories and climate change mitigation in Indonesia are steadily carried out by development partners and Indonesian government.
Outputs 1. National system for preparing national GHG inventories is designed. 2. Capacity to periodically and systematically manage data necessary for national GHG inventories is enhanced. 3. Developing the improvement of Accuracy, transparency and reliability of GHG inventories for each sector (energy; industrial processes; agriculture; land use, land-use change and forestry [LULUCF]; and waste) in cooperation with the key ministries and local governments.	1-1. Procedure for inventory compilation is documented 1-2. Procedure for quality assurance/ quality control (QA/QC) is documented. 1-3. Institutional arrangement for preparation of national GHG inventories is documented. 2-1. National GHG inventories data are properly archived and maintained. 3-1. Improvement for estimating the Emissions from and removals by categories is documented 3-2. Emission factors and other parameters are improved for the waste sector.	- QA/QC Plan included in the Annual Progress Report on National GHG Inventory Development - - Data file for national GHG inventory improvement plan - A national GHG inventory improvement plan - Project reports	Indonesian government secures sufficient budget and human resources to prepare national GHG inventories on a periodical basis.

Activities	**Inputs**		
1-1 Conduct workshops/trainings for acquiring general knowledge on preparation of national GHG inventories. 1-2 Examine the existing system for preparing national GHG inventories and assess current capacity of the KLHK and other relevant organizations involved in the preparation of the GHG inventories. 1-3 Consider methods for QA/QC on cross-cutting issues of national GHG inventories. 1-4 Examine a procedure for preparation of national GHG inventories. 1-5 Examine institutional arrangement for preparing national GHG inventories. 1-6 Document the improvements of national system for national GHG inventory preparation, including its institutional arrangement. 1-7 Conduct workshop for dissemination of the national system. 1-8 Facilitate discussions on functional improvement and institutional arrangement concerning environmental policy-oriented research activities. 1-9 Document and submit the result of the discussion in the activity above. 2-1 Support in collecting and compiling data necessary for national GHG inventories from relevant ministries, local governments and other concerned organizations. 2-2 Develop data flow including work sheets and a database, consisting of file systems, for national GHG inventories. 2-3 Compile national GHG inventories with time-series consistency. 2-4 Plan and implement QA/QC activities on cross-cutting issues for national GHG inventories. 2-5 Prepare the Annual Progress Report on National GHG inventory Development, including procedures of inventory compilation methodologies and QA/QC activities. 2-6 Develop a website for disseminating inventory reports. 2-7 Prepare a national GHG inventory improvement plan. 3-1 Conduct technical workshops/trainings on preparation and improvement (i.e. methods, data, assumptions and worksheets) for each sector to improve the accuracy, transparency, and reliability of the national GHG inventories. 3-2 Study methods for preparing activity data and emission factors as well as for implementing data compilation and QA/QC activities for each sector of national GHG inventories. 3-3 Conduct key category analysis and identify categories which should be given priority in improving the accuracy and reliability of data. 3-4 Identify measures for reducing uncertainties in order to improve accuracy and reliability of emission/removal estimates for prioritized key categories.	Japanese side 1. Personnel Long-term experts Chief Advisor Project Coordinator Sub-Chief Advisor/GHG Inventory Short-term experts Short-term experts will be dispatched in accordance with the needs for the effective implementation of the Project. Local resources -Project Assistants As necessary 2. Short-term training of counterpart personnel in Japan and/or third countries 3. In-country training 4. Provision of equipment 5. Local expenses for the project activities including promotional materials of the Project	Indonesian side 1. Personnel Project Director Project Manager Counterparts 2. Provision of the project offices and facilities necessary for the project implementation 3. Others Administrative and operational expenses Running costs for electricity, water, etc.	Majority of the counterpart personnel trained by the Project are retained in their respective positions. **Pre-condition** Understanding and cooperation for preparing the national GHG inventories are obtained among the key ministries and local governments concerned of the Indonesian government.

3-5 Identify relevant information and emission factors and other relevant parameters that better reflect national or regional circumstances in prioritized key categories, specifically for the waste sector. 3-6 Organize time-series consistent activity data for each sector based on data provided by line Ministries. 3-7 Prepare manuals for developing parameters for the waste sector at the local level for eventual use in all provinces in Indonesia. 3-8 Conduct studies at the local level to develop new or improved parameters for the waste sector for eventual use in the national GHG inventory. 3-9 Develop a reporting system for waste parameters from the local level to the national level. 3-10 Conduct technical workshops/training seminars at the local level to improve the emissions estimation of the waste sector.		

Chapter 3. Schedule of Implemented activities

Below is a table of the SP3 activities as implemented and as provided in the new PO.

table 3-1 New PO

	Activity	Responsible Section/ Position	2011												2012												2013												2014												2015									
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10
Output 1																																																										
1.1	Conduct workshops/trainings for acquiring general knowledge on preparation of national GHG inventories.	KLHK																																																						
1.2	Examine the existing system for preparing national GHG inventories and assess current capacity of the KLHK and other relevant organizations involved in the preparation of the GHG inventories.	KLHK																																																					
1.3	Consider methods for QA/QC on cross-cutting issues of national GHG inventories.	KLHK																																																				
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1-9	Document and submit the result of the discussion in the activity above	KLHK																																																		
Output 2																																																							
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	Activity	Responsible Section/ Position	2011												2012												2013												2014												2015									
			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10
2.3	Compile national GHG inventories with time-series consistency.	KLHK																																																								
2.4	Plan and implement QA/QC activities on cross-cutting issues for national GHG inventories.	KLHK																																																							
2.5	Prepare the Annual Progress Report on National GHG inventory Development, including procedures of inventory compilation methodologies and QA/QC activities.	KLHK																																																						
2.6	Develop a website for disseminating NIR.	KLHK																																																					
2.7	Prepare a national GHG inventory improvement plan.	KLHK																																																					
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3.2	Study methods for preparing activity data and emission factors as well as for implementing data compilation and QA/QC activities for each sector of national GHG inventories.	KLHK and Key Ministries																																																					
3.3	Conduct key category analysis and identify categories which should be given priority in improving the accuracy and reliability of data.	KLHK and Key Ministries																																																				
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3.7	Prepare manuals for developing parameters for the waste sector at the local level for eventual use in all provinces in Indonesia.																																																				
3.8	Conduct studies at the local level to develop new or	KLHK/BLH																																																			

Activity	Responsible Section/ Position	2011								2012												2013												2014												2015									
		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10
improved parameters for the waste sector for eventual use in the national GHG inventory																																																							
3.9 Develop a reporting system for waste parameters from the local level to the national level.	KLHK/BLH																																																					
3.10 Conduct technical workshops/training seminars at the local level to improve the emissions estimation of the waste sector.	KLHK/BLH																																																					
Sub-JCC Meeting (as project management activity)	KLHK																																																				
Mid-term Evaluation																																																					

Chapter 4. Activities and outputs of SP3

1. Overview

In the SP3, the members worked towards the goal of, "GHG inventories are compiled by SIGN Center on a regular basis in cooperation with the key ministries and local governments concerned of the Indonesian government" through the three outputs of the subproject. Most of the activities were concluded by the time the termination review was conducted in May~June of 2015. The section below provides a brief overview of the activities implemented for the national GHG inventory and the pilot activities.

2. Activities and Results of national GHG inventories

2.1 SNC review (Activity 1-2, 3-2, 3-3, 3-4, 3-5)

2.1.1 Principles of the review

The UNFCCC inventory reporting guidelines requires parties to prepare their inventories in accordance with the five principles shown in Table 3-1. These five principles will be followed to prepared inventories.

The SP3 members also used the same principles to review the national GHG inventory.

Table 4-1 Five principles of the GHG inventory for the UNFCCC

Principle	Description
Transparency	The assumptions and methodologies used for an inventory should be clearly explained to facilitate replication and assessment of the inventory by users of the reported information.
Consistency	An inventory should be internally consistent in all its elements with inventories of other years. An inventory is consistent if the same methodologies are used for the base and all subsequent years and if consistent data sets are used to estimate emissions or removals from sources or sinks.
Comparability	Estimates of emissions and removals reported by Annex I Parties in inventories should be comparable among Annex I parties. For this purpose, Annex I Parties should use methodologies and formats agreed by the COP for estimating and reporting inventories.
Completeness	An inventory covers all sources and sinks, as well as all gases, included in the IPCC Guidelines as well as other existing relevant source/sink categories which are specific to individual Annex I Parties and, therefore, may not be included in the IPCC Guidelines. Completeness also means full geographic coverage of sources and sinks of an Annex I Party.
Accuracy	A relative measure of the exactness of an emission or removal estimate. Estimates should be accurate in the sense that they are systematically neither over nor under true emissions or removals, as far as can be judged, and that uncertainties are reduced as far as practicable.

Source : *UNFCCC reporting guidelines on annual inventories*

The GHG emission and removal estimations methods are described in the 2006 IPCC Guidelines. In these IPCC guidelines, primarily three estimation methodologies (see table3-2) are described and the GPG (2000) and GPG-LULUCF (2003) provide decision trees that guide the user on which method

should be used. Generally higher tier generates more accurate emissions estimation, but it is also more data intensive. It should be noted that accurate estimation is possible also using even Tier1 depending on the category. Therefore, it is necessary to choose the tier, taking into consideration the availability of data and the required estimation accuracy.

Table 4-2 description of tiers

methodology	General description of methodology
Tier 1	Simple estimation method so that can be applied by all countries. Generally, emissions or removals can be estimated by multiplying activity data by default emission factors provided in the IPCC guidelines.
Tier 2	Estimation method using country-specific emission factors.
Tier 3	Use of country-specific emission method and actual measured values.

2.1.2 Overview of SNC inventory

Indonesia has submitted its national GHG inventory to the UNFCCC in 1999 and in 2011, as part of their Initial National Communications (INC) and Second National Communications (SNC), respectively. The figures in this section are from the Indonesian SNC, which includes emissions/removals estimates for years 2000 to 2004 for all sectors, and emissions for 2005 without LULUCF (tables 3-3and 3-4).

In 2004, total GHG emissions were 663,770 gigagrams (1,000 tons) (Gg) CO_2 equivalent (eq) without LULUCF and 1,721,193 Gg CO_2 eq. with LULUCF (including peat fire). This represents a significant emission increase of 19.3% compared to 2000 without LULUCF and 24.9% with LULUCF.

In 2004, GHG emissions from the energy sector amounted to 372,123 Gg CO_2 eq., which represents 56.1% of total GHG emissions without LULUCF, followed by waste sector (165,799 Gg CO_2, 25.0%), agriculture sector (77,863 Gg CO_2 eq., 11.7%), and industrial processes and product use sector (47,9585 Gg CO_2 eq., 7.2%). Emissions from the LULUCF sector amounted to 1,057,423 Gg CO_2 eq., the most dominant sector in the Indonesian GHG inventory. In terms of gases, CO_2 was the main GHG emitted with 391,648 Gg CO_2 eq., followed by CH_4 of 240,151Gg CO_2 eq. and N_2O of 31,825 Gg CO_2 eq. representing 59.0%, 36.2%, and 4.8% of total GHG emissions respectively, without LULUCF.

Table 4-3 Trend of GHG emissions in Indonesia by sector

Unit: Gg CO_2 equivalent

	2000	2001	2002	2003	2004	2005
Energy	280,938	306,774	327,911	333,950	372,123	369,800
Industrial Processes	42,814	49,810	43,716	46,118	47,985	48,733
Agriculture	75,420	77,501	77,030	79,829	77,863	80,179
LULUCF (land use, land use change, and forestry)	821,254	754,546	1,965,495	591,489	1,057,423	-
Waste	157,328	160,818	162,800	164,074	165,799	166,831
Total GHG emissions (without LULUCF)	556,499	594,903	611,457	623,971	663,770	665,544
Total GHG emissions (with LULUCF)	1,377,753	1,349,449	2,576,952	1,215,460	1,721,193	-

source: *the Second National Communications*, Indonesia, 2013

table 4-4　Trend of GHG emissions in Indonesia by gas

	2000	2001	2002	2003	2004	2005
GHG emissions without LULUCF	**556,354**	**594,758**	**611,312**	**623,826**	**663,625**	**665,399**
CO_2	291,705	326,111	343,526	351,171	391,648	390,478
CH_4	236,332	238,815	238,167	241,981	240,151	242,299
N_2O	28,317	29,831	29,618	30,674	31,825	32,622
PFCs	145	145	145	145	145	145
GHG emissions with LULUCF	**1,377,608**	**1,349,304**	**2,576,807**	**1,215,315**	**1,721,048**	-
CO_2	1,112,879	1,080,518	2,309,001	942,642	1,449,040	-
CH_4	236,388	238,955	238,181	241,994	240,173	-
N_2O	28,341	29,832	29,624	30,679	31,835	-
PFCs	145	145	145	145	145	-

source: *the Second National Communications*, Indonesia, 2013

2.1.3 Review results of the sectors

（1）Energy Sector

1) Methods and data used

The energy sector seems to be estimated using annually published energy balance data and the tier 1 method.

table 4-5　Overview of data and methods used in the Energy Sector

IPCC Category	Tier	Activity Data (AD)	AD source	Emission Factor (EF)	EF data source
1A1 Energy Industries	Tier 1	Amount of fuel consumption	Energy Balance Table (MEMR)	IPCC default values	2006 IPCC Guidelines
1A2 Manufacturing Industries and Construction	Tier 1	Amount of fuel consumption	Energy Balance Table (MEMR)	IPCC default values	2006 IPCC Guidelines
1A3 Transport	Tier 1	Amount of fuel consumption	Energy Balance Table (MEMR)	IPCC default values	2006 IPCC Guidelines
1A4 Commercial/Institutional	Tier 1	Amount of fuel consumption	Energy Balance Table (MEMR)	IPCC default values	2006 IPCC Guidelines
1A4 Residential	Tier 1	Amount of fuel consumption	Energy Balance Table (MEMR)	IPCC default values	2006 IPCC Guidelines
1A4 Non specified	Tier 1	Amount of fuel consumption	Energy Balance Table (MEMR)	IPCC default values	2006 IPCC Guidelines
1B1 Solid Fuels	Tier 1	Amount of coal production	Energy Balance Table (MEMR)	IPCC default values	2006 IPCC Guidelines
1B2 Oil and Natural Gas	Tier 1	Amount of oil and natural gas production	Energy Balance Table (MEMR)	IPCC default values	2006 IPCC Guidelines

2) Non estimated categories

- Bunker fuel from civil aviation and water-borne navigation
- Non-energy use

3) Review results

table 4-6 Review findings of the energy sector (5 principles)

Principle	Description
Transparency	Data sources of activity data, emission factors and parameters used for estimating GHG emissions from energy sector are not sufficiently included in this report.
Consistency	The same methodologies have been used for the base and all subsequent years. Consistent data sets have been used to estimate emissions from sources in accordance with IPCC guidelines.
Comparability	The source categories has followed the split of the IPCC Guidelines, the level of its summary and sectoral tables.
Completeness	It should estimate CO_2, CH_4 and N_2O emissions of all categories in the energy sector according 2006 IPCC guideline
Accuracy	The methodologies has been used appropriate methodologies in accordance with the IPCC good practice guidance. However, it is difficult to review as information is limited. There is a possibility of overestimation as bunker fuels are not estimated.

4) Challenges

- Improvement of reports transparency for estimation methods and data source information
- Subdivision to “by sub-category” from “by category”
  - Fuel consumption breakdown of 1A2 Manufacturing Industries and Construction, specifically Iron and Steel, Chemical and Petroleum, Cement & Building Materials, Textile and Leather, Paper, Pulp and Printing, Other
  - Fuel consumption breakdown of 1A3 Transportation, specifically Airway, Road, Rail, River and Seaway
- Investigate more detailed data and parameters (emission factors, calorific values).
- If fuel consumption by mobile types are available, the methodology for estimating GHG emissions from transportation can be selected by mobile types.

(2) Industrial processes sector

1) Methods and data used

Almost all categories were estimated under Tier 1 methodologies provided in the 2006 IPCC Guidelines. Carbon dioxide emissions from cement production and PFC emissions from aluminium production were estimated by using country-specific EF data. BPS data seem to be used for activity data.

2) Non estimated categories

- Chemical
  - Ammonia production (CH_4, N_2O)
  - Nitric acid production (CO_2, CH_4)

- Caprolactam, Glyoxal and Glyoxylic acid (CO_2, CH_4)
- Petrochemical and carbon black production (N_2O)

・ Metal
- Iron and steel production (N_2O)
- Ferroalloys production (CH_4, N_2O)
- Alumunium production (N_2O)
- Lead production (N_2O)
- Zinc production (N_2O)

・ Others
- Lubricant Use (CH_4, N_2O)
- Paraffin wax use (CH_4, N_2O)

・ HFC categories

・ PFC categories (except “Alumunium production”)

・ SF_6 categories

3) Review results

table 4-7 Review findings of the industrial processes sector (5 principles)

Principle	Description
Transparency	Information relating to the planning, preparation and management of inventory activities was not provided in the SNC.
Consistency	No issues
Comparability	No issues
Completeness	Some categories in chemical, metal, and other subcategories are not estimated. Fgases are mostly not estimated.
Accuracy	One technical staff estimated GHG emissions for the IPPU sector and QA/QC activities were not implemented.

4) Challenges

- Source for activity data should be included in the report
- For the non estimated categories, notation keys[2] should be reported, in addition to the plans to conduct studies in the future.
- Develop a QA/QC plan and include all relevant line ministries, corporations, industry group that have data for the industrial processes sector.

[2] Notation keys are keys to be reported when emissions/removals are not estimated. “NO (Not Occurring),” “NE (not estimated),” “NA (Not Applicable),” “IE (Included Elsewhere),” and “C (Confidential)”

（3）Agriculture sector

1）Methods and data use

Methane from rice cultivation is estimated using the tier 2 method, and other categories are all estimated using the tier 1 method. The MOA and the Agriculture Institute collected the activity data and the default emission factors are used from the IPCC.

table 4-8 Overview of data and methods used in the agriculture sector

IPCC Category	Tier	Activity Data (AD)	AD source	Emission Factor (EF)	EF data source
Enteric Fermentation	Tier 1	Population (by livestock type)	MoA/BPS	IPCC default values	1996 IPCC Guidelines/ GPG
Manure Management	Tier 1	Population, AWMS	MoA/BPS	IPCC default values	2006 IPCC Guidelines/ expert judgment
Biomass burning	Tier 1	Area, mass	MoA/expert judgment	IPCC default values	2006 IPCC Guidelines/ expert judgment
Liming and Urea	Tier 1	Quantity consumed	MoA/expert judgment	IPCC default values	2006 IPCC Guidelines
Direct N_2O emissions	Tier 1	N applied to soil	MoA/expert judgment	IPCC default values	2006 IPCC Guidelines
Indirect N_2O emissions	Tier 1	N applied to soil	MoA/expert judgment	IPCC default values	2006 IPCC Guidelines
Rice Cultivation	Tier 2	Soil type, irrigation regime, correction and scaling factors	MoA/BPS	Country specific	Agriculture Institute

2）Non estimated categories

- Not all elements of nitrogen flow (e.g. Fprp not carried through to direct and indirect N_2O emissions; Fcr and Fsom for both managed soil and for flooded rice; Fsn and Fon for flooded rice; and N leaching and runoff)

3）Review results

table 4-9 Review findings of the agriculture sector (5 principles)

Principle	Description
Transparency	Limited discussion on emission trends by gas and by category, and drivers of the trend IPCC defaults predominantly used hence limited scope for commentary on selection of methods and emission factors apart from rice cultivation No commentary on correction factors applied by Indonesia to IPCC default enteric fermentation emission factors No commentary on the expert judgment that is used widely in the agriculture sector in regards to activity data, emission factors and other parameters Tier 2 for rice cultivation – some commentary on development of country-specific EFs and the correction and scaling factors and rationale for their use, but this needs to be improved to enhance understanding No significant discussion on improvements in the GHG inventory with a view to improve the certainty of the agriculture inventory No information on how cross-sectoral emissions are managed (i.e. with energy and LULUCF experts) No information on the uncertainty analysis nor key category analysis

Consistency	2000 – 2005 inventory is internally consistent Not congruent with 1NC, but this could be a result of inventory improvement
Comparability	Tier 1 (default) OK Tier 2 rice cultivation is within approaches used elsewhere
Completeness	Fprp is estimated in manure management, but is not carried through the inventory
Accuracy	IPCC defaults predominantly used hence inventory could be highly uncertain Under-estimates (e.g. elements of the nitrogen flow and CSC associated with BB) No uncertainty estimates No evidence of QA/QC and/or verification, especially in regards to activity data, emission factors used, expert judgment and country-specific emission factors and other parameters

4) Challenges

- Higher-tier methods for other key categories
- Need enhanced arrangements with line Ministries and/or agencies and/or industry associations to ensure the supply of specific activity data (AWMS, fertilizer / urea consumption, nitrogen applied to soil)
- Surveys / census data
- Improving data management

（4）LULUCF sector

1) Methods and data used

National statistics or international data sets are used in the tier 1 method for the LULUCF sector.

table 4-10 Overview of data and methods used in the LULUCF Sector

IPCC Category	Tier	Activity Data source (AD)	EF data source
Changes in forest and other woody biomass stocks	Tier 1	National statistics or international data sets	2006 IPCC Guidelines default
Forest and grassland conversion	Tier 1	National statistics or international data sets	2006 IPCC Guidelines default
Abandonment of croplands, pastures, plantation forests, or other marginal lands	Tier 1	National statistics or international data sets	2006 IPCC Guidelines default
CO_2 emissions and removals from soils (except peat fires)	Tier 1	National statistics or international data sets	2006 IPCC Guidelines default
CO_2 emissions and removals from soils (peat fires)	Tier 3	National statistics or international data sets	Scientific article (van der Warf, 2007)

2) Non estimated categories

・ Emissions from biomass burning in converted forests and plantation forests

- Soil carbon stock changes and N_2O emissions due to land-use conversions
- Non-CO_2 emissions from peat fires

3) Review results

table 4-11 Review findings of the LULUCF sector (5 principles)

Principle	Description
Transparency	Information relating to the planning, preparation and management of inventory activities was not provided in the SNC. Especially information on activity data is missing
Consistency	No issues
Comparability	No issues
Completeness	Emissions from biomass burning in converted forests and plantation forests, Soil carbon stock changes and N_2O emissions due to land-use conversions, and Non-CO_2 emissions from peat fires are not estimated.
Accuracy	The LULUCF sector has a significant influence on the total GHG emissions. However, almost all categories were estimated under the Tier 1 and the uncertainty is high.

4) Challenges

- Data sources for activity data should be documented in the report.
- For non estimated categories, notation keys should be used in addition to a plan to improve on the data collection in the future.
- A QA/QC plan should be developed, involving line ministries, corporations, industry groups that may have data for the LULUCF sector.
- Development of higher tier methods for the key categories is recommended. A plan to revise and reconsider the methods should be developed, starting with the data collection improvement plan.

(5) Waste sector

1) Methods and data used

GHG emissions in the waste sector were estimated based on population data with Tier 1 methodologies in each category.

2) Non estimated categories

- N_2O emissions from industrial waste water

3) Review results

table 4-12 Review findings of the waste sector (5 principles)

Principle	Description
Transparency	Explanation for sources of activity data and parameters, methodologies, result of GHG estimations are well described in the report.
Consistency	In each category, same activity data estimation methods are applied in the base year and all subsequent years.
Comparability	Methodologies in 2006 IPCC Guidelines are totally used for all categories in the waste sector.
Completeness	N_2O emissions from industrial waste water.
Accuracy	Country specific waste composition data and dry matter content data based on survey are applied instead of IPCC default parameters for CH_4 emissions from solid waste disposal sites (SWDS).

4) Challenges

- Fraction of waste goes to landfill site is set as 60% in all inventory years. However, this parameter is different in each inventory year and each province or Kabupaten/Kota. In some provinces, since the amount of land filled waste are already available, activity data input sheet needs to be revised.
- ADIPRA data is used for activity data of CH_4 emissions from SWDS. However, coverage of ADIPRA data is not complete and data estimation method is unclear. The amount of land filled waste based on monitoring record needs to be adopted for activity data in the future.
- DOC data for sewage sludge and industrial waste are set as zero and CH_4 emissions from both waste are not estimated. In this case, IPCC default DOC value needs to be used in terms of completeness.
- N_2O emissions from industrial wastewater treatment are not yet estimated and need to be estimated.
- CH_4 emissions from wastewater treatment in pulp and paper industry are around 120,000 $GgCO_2$ and significantly higher than other countries. CH_4 estimation methods, applied EF and parameters, activity data estimation methods need to be checked.

（6）Crosscutting Issues

1）Review results

table 4-13　Summary of the SNC inventory

Principle	Description
Transparency	There is a limited information available regarding the process, the institutions involved, the methods and data used, assumptions, etc.
Consistency	Emissions and removals are primarily estimated using the tier 1 method, and there seems to be consistent time series. There are estimations that do not match the results as presented in the INC, but this may be due to improvements in the methodology.
Comparability	Comparability is high as the estimates use primarily tier 1 methods. However, comparability is not high in the energy sector as it is estimated at the subsector level instead of the category level.
Completeness	The inventory seems to be mostly complete, but F gases are not covered in the inventory and there are also not estimated categories for which there are no notation keys reported, making it impossible to understand the reasons for omission.
Accuracy	Uncertainty is high as the inventory mostly uses tier 1 methods. There is also a possibility that QA/QC activities have not been implemented for the SNC preparation.

2）National System

There is limited information in the SNC on the parties involved, the estimation process, data sources, or approval process. Judging from the estimation files, there seems to be a use of different methodologies used and different results produced by different guidelines, leading to a conclusion that the inventory process and/or rules were not planned or implemented.

3）Uncertainty assessment, Key category analysis

The SP3 members reviewed the SNC and the estimation file for the key category analysis and concluded that the analysis was correctly undertaken using the tier 1 method. In addition, the uncertainty assessment was estimated using the tier 1 method. Most activity data and emission factors seem to be set by expert judgment but as there is only limited information available in the SNC, there is a potential for improving the transparency of the assessment in the future. The results of the key category analysis and uncertainty assessment are shown in the figures below.

table 4-14　Key categories according to the SNC inventory

Sector	Source Categories to be Assessed in Key Source Category Analysis	Gases	Cumulative Contribution (%)
	Without LUCF	2,266	2,302
Energy	Energy production (electricity, heat, oil & gas refining)	CO_2	19.8
Waste	Industrial Wastewater Treatment and Discharge	CH_4	38.5
Energy	Manufacturing Industries and Construction	CH_4	50.9
Energy	Transportation	CO_2	61.8
Agriculture	Rice Cultivation	CO_2	66.9
Industrial Process	Cement Production	CH_4	71.4
Energy	Residential	CO_2	75.6
Agriculture	Direct N2O Soils	CO_2	78.2
Energy	Oil and Natural Gas	N_2O	80.6
Waste	Unmanaged Waste Disposal Sites	CH_4	82.6
Energy	Non Specified	CH_4	84.6
Agriculture	Enteric Fermentation	CO_2	86.5
Waste	Domestic Wastewater Treatment and Discharge	CH_4	88.0
Waste	Unmanaged Dumpsite	CH_4	89.5
Energy	Residential	CH_4	91.0
Energy	Commercial/Institutional	CH_4	92.3
Industrial Process	Ammonia Production	CH_4	93.5
Agriculture	Indirect N2O Soils	CO_2	94.4
Energy	Oil and Natural Gas	CO_2	95.3
	With LUCF		
LUCF	Forest and grassland conversion	CO_2	39.6
LUCF	Peat Fire	CO_2	65.2
LUCF	CO2 emissions and removals from soils	CO_2	79.3
Energy	Energy production (electricity, heat, oil & gas refining)	CO_2	86.9
Waste	Industrial Wastewater Treatment and Discharge	CH_4	94.1
Energy	Manufacturing Industries and Construction	CO_2	98.9

table 4-15　Results of the uncertainty assessment in the SNC inventory

Sectors	Year	Uncertainty	
		Current	Improved
Without LUCF	2000	16.3	NA
	2004	13.9	NA
	Trend	16.9	NA
With LUCF	2000	47.0	23.0
	2004	38.5	20.0
	Trend	32.2	20.3

※ Improved indicates the uncertainty value when improved data for the LUCF sector (such as satellite data and National Forest Inventory) are used. Such data is still being processed and not available for use.

2.2 Consideration of the National system including QA/QC (activities 1-3, 1-4, 1-5, 1-6, 1-7)

2.2.1 National system proposal by SP 3

While the PR71 outlined the major responsibility among line ministries, the detailed tasks and schedule was not included in the regulation. Therefore, the SP3 considered the appropriate national system for GHG inventory preparation in Indonesia.

During the interministerial coordination meeting for national systems held in June and July of 2012, KLHK proposed a Memorandum of Understanding (MoU) for Institutional arrangements for all relevant ministries, but was not able to reach agreement on the roles and responsibilities and the inventory preparation process. Below is the summary of the institutional arrangement proposal.

Project of Capacity Development for Climate Change Strategies in Indonesia

Sub-project 3: Capacity Development for Developing National GHG Inventories

National system for GHG Inventories in Indonesia

June 14, 2012

Coordination meeting

KLH, JICA

Contents

Legal basis

The legal basis for national GHG inventory preparation

- Non-Annex I Parties have an international commitment to periodically prepare and report national GHG inventories as part of its national communications (UNFCCC Article 4.1 and 12).
- Non-Annex I Parties have an international commitment to submit a biennial update report every two years, either as a summary of parts of their national communication in the year in which the national communication is submitted or as a stand-alone update report (decision 2/CP.17).
- Indonesia has a domestic commitment to comply with the national communication and biennial update report reporting requirements. Relevant agencies will submit their GHG inventories to KLH on an annual basis (Presidential Regulation 71).

3/20

National System

Foundation for GHG inventory preparation

- In order to comply with the BUR reporting requirements, Indonesia needs to develop a national system.
- The national system includes all institutional, legal and procedural arrangements made within a Party for estimating GHG emissions/removals and for reporting and archiving information.
- The objectives of the national system are
  - To enable Parties to properly estimate and report GHG emissions/removals;
  - To assist Parties check progress on meeting their commitments;
  - To facilitate the review of GHG inventories can be made;
  - To assist Parties to ensure and improve the quality of their inventories.

5/20

Status of Indonesia: the national system

- What components of the national system exist in Indonesia?
  - Institutional arrangement: none
  - Legal arrangement: the Presidential Regulation 71
  - Procedural arrangement: none
- The next slides will present an assessment of the existing legal arrangement showing what functions the national system is adequately addressed and identify the gaps.
- The goal for this Coordinating Meeting is to discuss how Indonesia can address the gaps so that it can strengthen the foundation for regular inventory preparation.

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The status of Indonesia: general requirements

- The PR 71 designates KLH as the coordinator for the national GHG inventory.
- However, there are no arrangements between agencies for inventory preparation. Capacity for inventory preparation is not ensured by PR 71.

General requirements of a national system	Presidential Regulation 71
Establish and maintain arrangements necessary to prepare GHG inventories between relevant agencies and other entities	*Somewhat*
Ensure sufficient capacity for timely performance of GHG inventory preparation, including data collection and arrangements for technical competence of the staff involved in inventory development process	*No*
Designate single national entity with overall responsibility for the national inventory	*Yes*

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The status of Indonesia: Inventory planning

- PR 71 allocates general responsibilities but does not elaborate the specifics.
- There is no QA/QC plan or an official consideration/approval process.

National system requirements for inventory planning	Presidential Regulation 71
Designate a single national entity with overall responsibility for the national inventory	*Yes*
Define and allocate specific responsibilities in the inventory development process	*Somewhat*
Elaborate an inventory QA/QC plan	*No*
Establish processes for the official consideration and approval of the inventory	*No*

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The status of Indonesia: Inventory preparation

- PR 71 does not specifically mention the IPCC Guidelines, which should be used for national GHG inventories.
- QC is mentioned but not explained in PR 71.

National system requirements for inventory preparation	Presidential Regulation 71
Identify key source categories	*Yes*
in accordance with the methods described in the IPCC Guidelines	*No*
Collect sufficient activity data, process information and emission factors	*Somewhat*
estimate of inventory uncertainty	*Yes*
Implement general inventory QC procedures	*somewhat*

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The status of Indonesia: Inventory management

- PR 71 mentions the need for archiving, but the information may not be accessible by the coordinating agency.

National system requirements for inventory management	Presidential Regulation 71
Archive inventory information for each year	*somewhat*
Access to all archived information	*No*

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Assessment of the national system of Indonesia

- PR 71 provides the legal basis at the domestic level for preparing GHG inventories on a regular basis and assigns KLH as the coordinator of national GHG inventories.
- However, the PR 71 does not provide arrangements between the stakeholders or the specific roles and responsibilities of the line Ministries.
- PR 71 mentions some national system requirements at the planning, preparation, management levels but more specificity is necessary.
- Line Ministries and KLH need to agree to an institutional agreement that addresses the gaps identified above.
- The following slides will show KLH's proposal for the institutional arrangement, assigning specific roles and responsibilities.

  (procedural arrangement proposal on next presentation)

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Institutional Arrangement proposal

Institutional arrangement proposal

- Objective of the institutional arrangement proposal: to clearly establish the roles and responsibilities of the parties involved in the national GHG inventory preparation.

- Goal for today: to discuss the specific roles and responsibilities and agree to the institutional arrangement.

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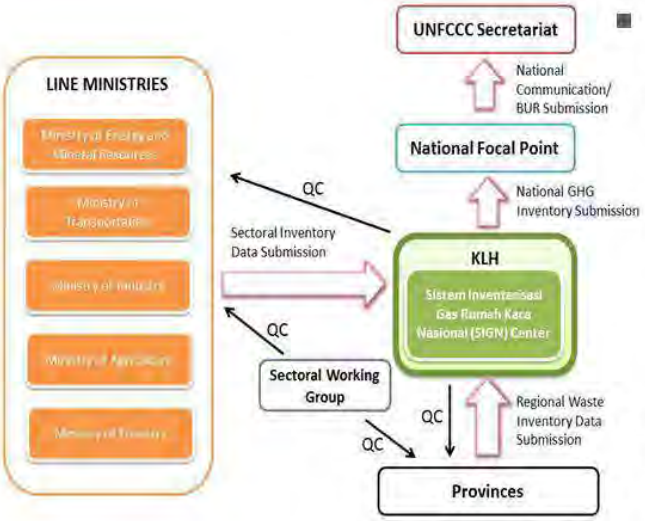
Institutional Arrangement: KLH



- KLH is the single national entity responsible for preparing and submitting the inventory.
- KLH's roles are of the following:
  - manage the inventory compilation process;
  - preparation of activity data, emission factor data, and emissions/removal data for the waste sector;
  - Compile the sectoral inventory and the regional waste inventory into the national inventory;
  - QC the methods, data of the line Ministries by organizing Sectoral Working Group meetings to check the quality of the inventory and to propose improvements;
  - Coordinate the crosscutting issues together with the relevant line Ministries and sectoral working groups;
  - prepare the inventory report;
  - Submit the national GHG inventory to national focal point;
  - archive and make public the information and data.
  - Respond to questions from the ICA process.

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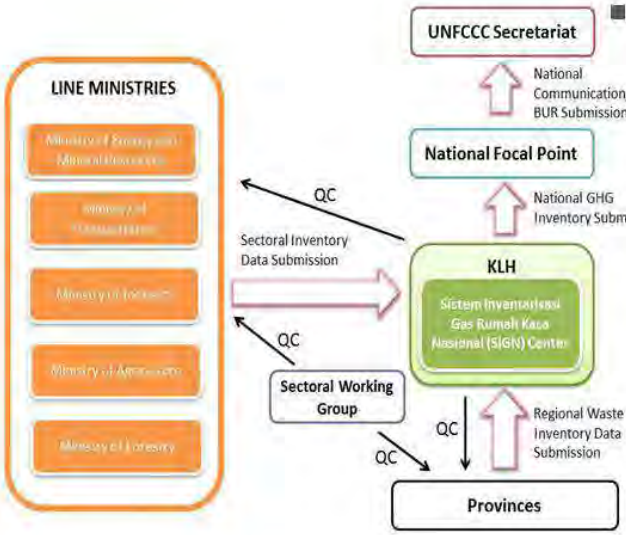
Institutional Arrangement: Line Ministries



- Line Ministries are responsible for their sectoral inventory.
- Their roles are of the following:
  - Preparation of activity data, emission factor data, and emissions/removal data
  - Quality control (QC) of the data used in the inventory.
  - Share information with the Sectoral Working Group to conduct QC of the methods and data.
  - crosscutting issues together with the sectoral working groups;
  - Submit activity data and emissions data to KLH by the submission deadline.
  - Confirmation and verification of the inventory (tables, national inventory report, and other information) prepared by KLH.
  - Prepare the sectoral inventory report;
  - Respond to questions from the ICA process.

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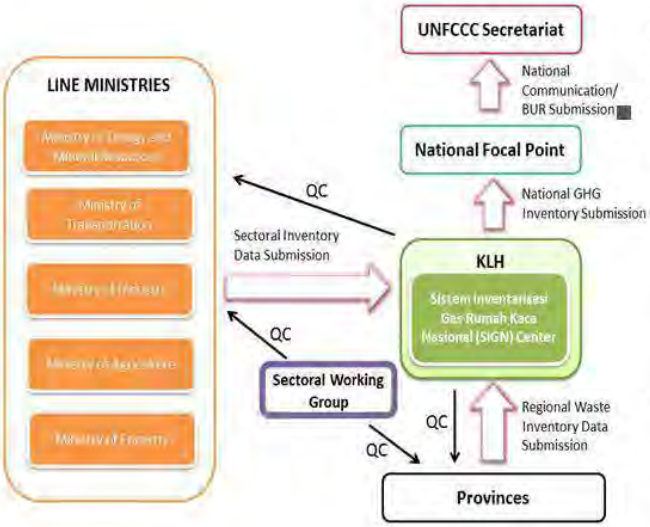
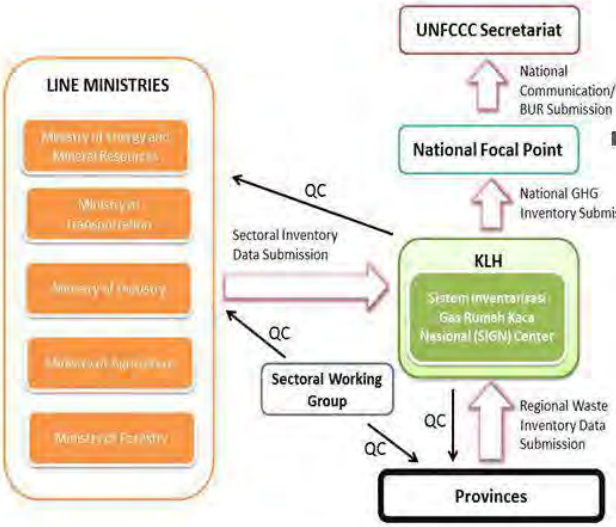
Institutional Arrangement: Sectoral Working Groups



- Sectoral Working Groups consist of the technical officers of KLH and line Ministry members with a good understanding of the IPCC methodologies.
- Their roles are of the following:
  - Provide technical guidance to the GHG inventory compilers of the line Ministries;
  - Meet with the relevant line Ministries on a regular basis to check on the progress, review the methods, activity data, emission factors, assumptions being used in during the inventory process;
  - Organize cross-sectoral meetings with the relevant line Ministries to discuss the methods;
  - Consider any improvements that can be made in the inventory in future submissions.

16/20

Institutional Arrangement: Provinces



- All provinces must prepare their own provincial GHG inventory. As a line Ministry, KLH will collect the data on the waste sector to prepare the national inventory on the waste sector.
- The provinces' roles are of the following:
  - prepare activity data, emission factor data, and emissions/removal data for the waste sector in their province.
  - Submit activity data and emissions data to KLH by the submission deadline.

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2.2.2 The institutional setup of the national GHG inventory

Because stakeholders could not agree at the interministerial coordination meetings on the roles and responsibilities between the line ministries and the inventory process, the SP3 members worked with individual line ministry to develop the necessary arrangements and the 2008 inventory for the different sectors independent of each other. The institutional setup discussed and developed for each sector is only one that was developed within the framework of SP3 and may be changed in the future.

Below is a description of the arrangements in place by sector.

(1) Energy sector

Emissions from the energy sector will be estimated by KLHK, MEMR, MOI, MOT according to the setup shown in the figure below.

- KLHK will implement QA/QC activities on the emissions data received by MEMR and also consider and tackle any crosscutting issues between the energy and other sectors.
- The Data Information Center of MEMR will estimate emissions from the energy sector and submit the results to KLHK.
- MOI will collect fuel consumption statistics from the industry subsector and provide it to MEMR.
- MOT will collect fuel consumption statistics from the transportation subsector and provide it to MEMR.

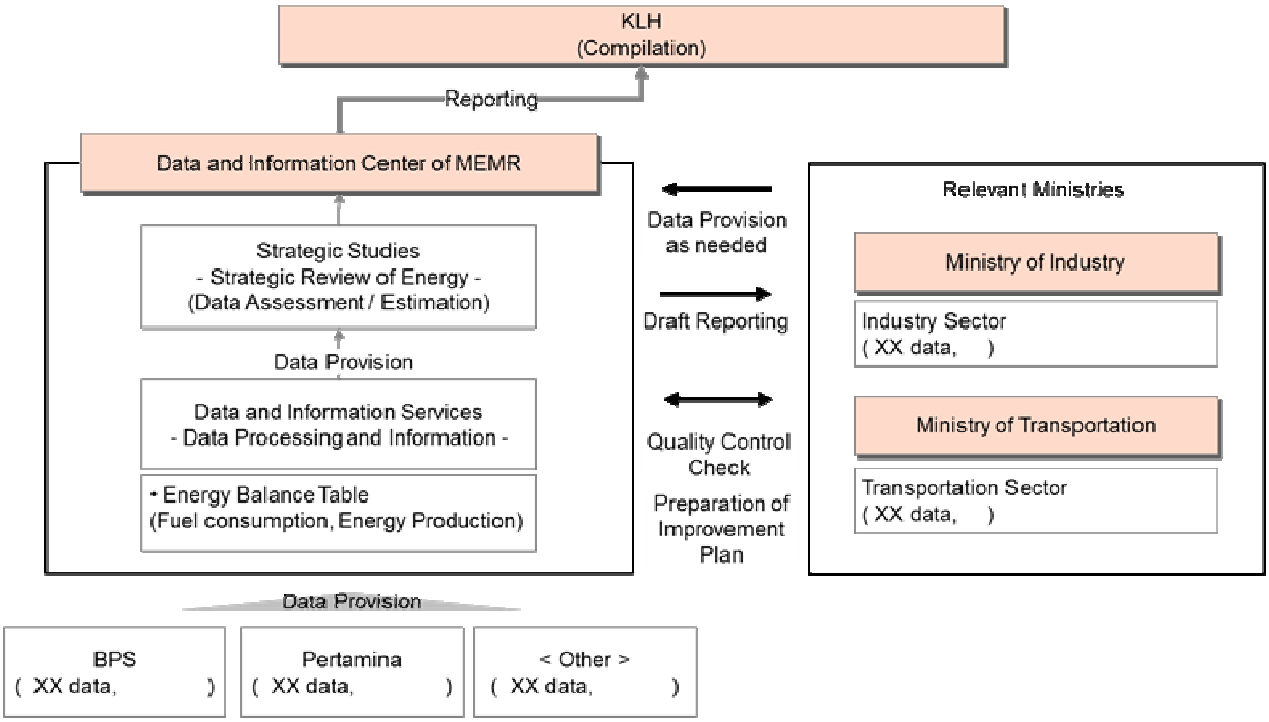

Figure 4-1 Institutional setup of the energy sector

（2）Industrial processes sector

For the industrial processes sector, each Directorate under MOI will collect the activity data from industry groups, corporations, and BPS, and estimate the emissions. The results will be submitted to KLHK, who will verify the results.

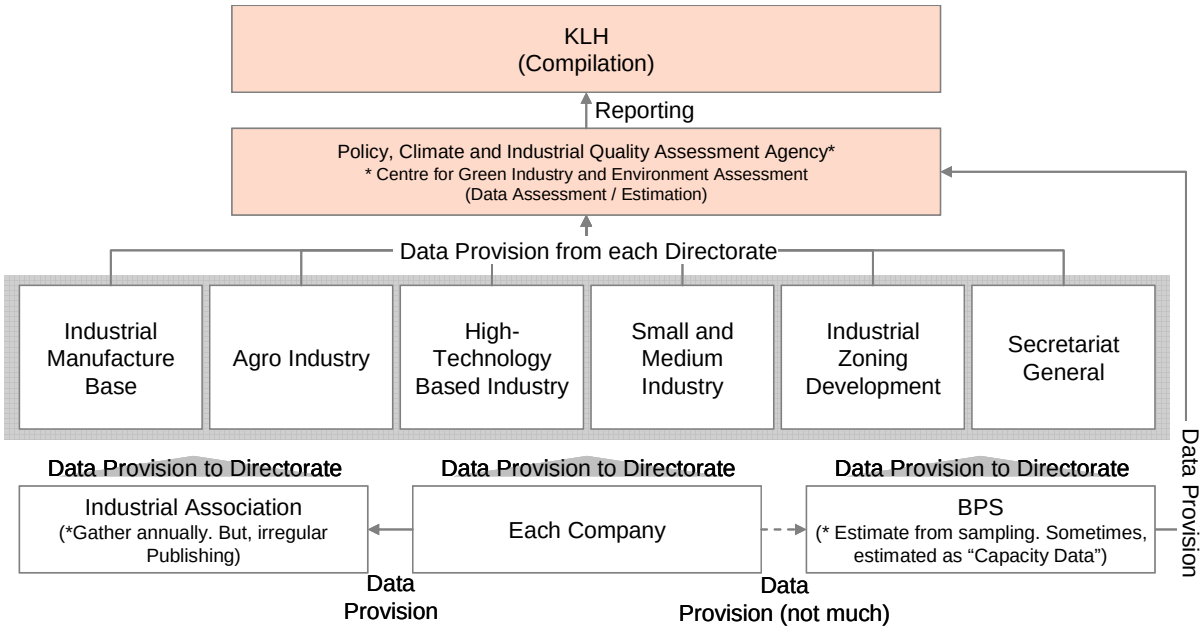

Figure 4-2 Institutional setup of the Industrial processes sector

（3）Agriculture sector

For the agriculture sector, the relevant departments within MOA will collect the activity data and submit them to Badan Penelitian Lingkungan Pertanian (Balingtan), who will estimate emissions from all categories. The MOA will submit the estimation results and an inventory report to KLHK.

（4）LULUCF sector

For the LULUCF sector, MOF will collect land data and biomass data from the 17 technical offices under the different departments of MOF. The inventory team will consider and estimate the emissions/removals and submit them to KLHK, who will implement QA/QC activities on the emissions/removal data received by MEMR and also consider and tackle any crosscutting issues between the LULUCF and other sectors.

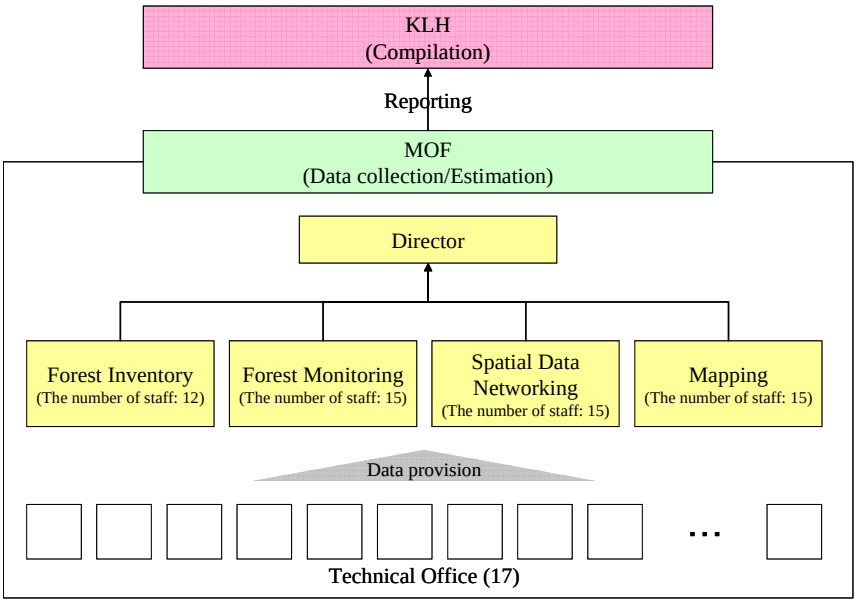

Figure 4-3　Institutional setup of the LULUCF sector

（5）Waste sector

For the waste sector, the department within KLHK responsible for waste management plans to collect all activity data and estimate emissions. The results will be reported to the SIGN Center, who will conduct QA/QC, and consider and tackle any crosscutting issues between the waste and other sectors.

2.3 Capacity enhancement of inventory preparation (Activities 2-1～2-7,3-6)

2.3.1 Developing the step by step manual

The SP3 team developed a step by step manual (in English and in Indonesian), which is based on the worksheets in the 2006 IPCC Guidelines, and provides detailed guidance on how to estimate emissions and removals for every category for each sector. See Figure 4-4.

Sector	Energy								
Category	Fuel combustion activities								
Category Code	1A [a]								
Sheet	1 of 4 (CO_2, CH_4 and N_2O from fuel combustion by source categories – Tier 1)								
	Energy consumption			CO_2		CH_4		N_2O	
	A Consumption (Mass, Volume or Energy unit)	B Conversion Factor[b] (TJ/unit)	C Consumption (TJ)	D CO_2 Emission Factor (kg CO_2/TJ)	E CO_2 Emissions (Gg CO_2)	F CH_4 Emission Factor (kg CH_4/TJ)	G CH_4 Emissions (Gg CH_4)	H N_2O Emission Factor (kg N_2O /TJ)	I N_2OEmissions (Gg N_2O)
			C=A*B		E=C*D/10^6		G=C*F/10^6		I=C*H/10^6
Liquid fuels									
Crude Oil									
Orimulsion									
Natural Gas Liquids									
Motor Gasoline									
Aviation Gasoline									
Jet Gasoline									
Jet Kerosene									

[a] Fill out a copy of this worksheet for each source category listed in Table 2.16 of the Stationary Combustion Chapter and insert the source category name next to the worksheet number.

[b] When the consumption is expressed in mass or volume units, the conversion factor is the net calorific value of the fuel.

Figure 4-4　Sample worksheet of the 2006 IPCC Guidelines

By using the manual which is in word format, and the tailored excel spreadsheets, the line ministries and local government staff will be able to easily estimate emissions and removals.

2.3.2 2008 GHG inventory preparation (activities 2-1～2-4)

In the original R/D, the plan was to develop a database and report for the 2008 and 2010 GHG inventory through the three outputs of the project, namely, (1) planning the national system for preparing national GHG inventories, (2) Enhancement of capacity to periodically and systematically collect and compile data necessary for national GHG inventories, and (3) improve the accuracy and reliability of GHG inventories for each of the sectors.　However, as the inventory arrangements could not be agreed upon, the team was unable to collect the official data necessary for estimating the national GHG inventory.

Therefore, the SP3 members met with the relevant line ministries separately and discussed the necessary arrangements and process, and through some capacity enhancement on the methods and data, managed to produce the GHG inventory for 2008 using publically available data and other data.　The inventory report for 2008 was completed in March 2013.

The meetings held between the members and the relevant ministries are shown below.

Table 4-16 Meetings with line ministries by sector

Energy			
1st meeting	23rd May, 2012	・ Scope of energy balance table in Indonesia	MEMR, JICA Experts
2nd meeting	30th January, 2013	・ Comparison of estimation results in MEMR and KLHK	KLHK, MEMR, JICA experts
IPPU			
1st meeting	August, 2012	・ To conduct the interview for identify data coverage and data set in MoI ・ To offer establishment of WG on IPPU with related parties	MoI, JICA Experts
2nd meeting	September, 2012	・ To discuss the next step such as, who should be involved as WG members, and who collect the data, assess the data, estimate it, etc in MoI internally ・ To offer to provide data list and data set itself to estimate the emission (not to be provided as a result)	MoI, JICA Experts
3rd meeting	November, 2012	・ To be agreed with Ibu Reni to conduct WG so that MoI could estimate the emission as hand-on training	MoI, JICA Experts
4th meeting	December, 2012	・ To discuss and clarify the estimation methodology, AD, EF, etc. by category ・ To offer MoI to provide the calculation sheet to analyze and consider improvement plan	MoI, JICA Experts
5th meeting	February, 2013	・ To clarify some issues occurred from the result of estimation at National Summit (such as, difference from SNC, the reason of use of estimation value, etc.)	MoI, JICA Experts
6th meeting	March, 2013	・ To review NIR draft ・ To confirm some issues and revises the draft	MoI , JICA Experts
Agriculture			
1st meeting	August, 2012	・ Methodologies and data ・ Next steps in relation to obtaining the necessary data from MoA and ZBALANTAN	KLHK, JICA experts
2nd meeting	September, 2012	・ Institutional arrangements, role of MoA, the MoA Planning Bureau and the new “Committee” ・ Planning Bureau and the new “Committee” and its working group on GHG inventory	MoA, JICA experts

3rd meeting	January, 2013	・ The draft 2009 GHG inventory and its coverage, methodologies, and data used ・ Institutional arrangements ・ Data issues, quality control	MoA, BALANTAN, JICA experts
LULUCF			
1st meeting	1st August, 2012	・ Availability of land area data	KLHK, MoF, JICA experts
2nd meeting	1st November, 2012	・ Availability of land area and biomass data	KLHK, MoF, JICA experts
3rd meeting	14th December, 2012	・ Method to estimate carbon stock changes	KLHK, MoF, JICA experts
4th meeting	8th February, 2013	・ Definition of land-use categories, Method to estimate carbon stock changes, Institutional arrangement in MoF	KLHK, MoF, JICA experts
Waste			
1st meeting	27-28th September, 2012	・ To identify data availability ・ To identify roles and responsibilities for data provider and emission estimator ・ To build the networking for data availability and data flow guarantee, applying Step by Step manual calculation for solid waste, ・ To identify type of industry that generate waste	KLHK, MoI, Ministry of Public Work, JICA experts
2nd meeting	7th November, 2012	・ To follow up filling CRF tables based on 2006 IPCC	KLHK, MoI, Pulslitbang Permukiman, Kementrian PU, JICA experts
3rd meeting	8th March, 2013	・ To conduct basic training for calculation of GHG emissions estimation in waste management activities ・ To discuss about availability of data on the activity of wastewater sector	

2.3.3 Capacity enhancement of SIGN Center and line Ministries (activities 2-1～2-7)

The SIGN Center was established within KLHK in December 2012 and tasked to have a secretariat role in preparing not only the national GHG inventory but also in compiling the emission/removal results of the provinces in Indonesia. Taking this into consideration, the expected output of SP3 also was revised from enhancing the capacity to prepare the inventory to improving the accuracy and reliability of the waste sector inventory at the local level, and this was reflected in the new R/D.

In the new R/D, the SP3 shifted its focus to the development of a QA/QC plan, inventory data files, and an improvement plan, through the achievement of outputs, (1) planning the national system for preparing national GHG inventories, (2) Enhancement of capacity to periodically and systematically collect and compile data necessary for national GHG inventories, and (3) improve the accuracy and reliability of GHG

inventories for each of the sectors by line ministries.

The SP3 team supported and enhanced the capacity of the SIGN Center staff and line Ministries and local governments in implementing the activities above and producing reliable GHG inventories. Specifically, the SP3 held sectoral technical workshops to discuss the GHG inventory preparation method, development of an inventory arrangement, development of emission factors and other parameters, development of QA/QC plans, and inventory approval process, introducing the experiences in developed countries and discussing the elements taking the Indonesian circumstances in consideration.

3. Pilot activities

3.1 Overview

Under the pilot project, in order to enhance accuracy and reliability of GHG estimation in the waste sector in North Sumatra, South Sumatra and East Java province, waste survey, such as waste composition survey, dry matter content survey, and emission factor development survey, were conducted. Also, GHG inventory supporting materials, such as GHG emission estimation software, GHG inventory manual were developed. Based on these data and materials, capacity development for BLH staff was conducted through GHG inventory training and workshop. In the end of May 2015, all scheduled activities were completed and all indicators were fulfilled.

In the following chapter, contents of each pilot activity are explained except for confidential data.

3.2 Preparation of Inventory development manual for the waste sector (activity 3-7)

There are four emission sources in the waste sector as follows: CH_4 emissions from solid waste disposal sites; CH_4 and N_2O emissions from biological treatment of organic waste; CO_2, CH_4 and N_2O emissions from waste incineration and open burning; and CH_4 and N_2O emissions from wastewater treatment and discharge. At the provincial level or kabupaten/kota level, the dominant emission sources are CH_4 emissions from municipal solid waste.

<Dominant sources in the kapubaten/kota level >

- CH_4 emissions from land filled municipal solid waste (MSW) in "CH_4 emissions from solid waste disposal sites"
- CH_4 and N_2O emissions from domestic wastewater treatment and discharge in "CH_4 and N_2O emissions from wastewater treatment and discharge"
- CO_2 emissions from open burning of waste in "CO_2, CH_4 and N_2O emissions from waste incineration and open burning"

In addition, in some areas, other sources may be significant also. However, they are rarely emit more GHGs than the list above.

- CH_4 from household waste in "CH_4 emissions from solid waste disposal sites"
- CH_4 and N_2O from composting in "CH_4 and N_2O from biological treatment of solid waste"

To estimate GHG emissions from these categories exactly, developing country specific emission factors, which are mentioned in the next section 3.3, and collecting statistical data of activity data are important. In Indonesia, since there is no statistics for the amount of waste treatment, activity data should be estimated by appropriate drivers.

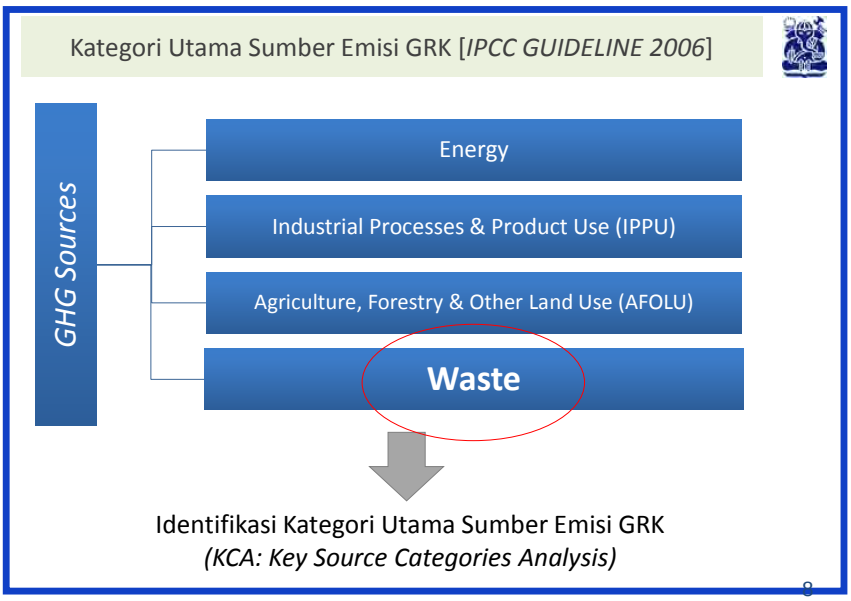

Figure 4-5 Overview of sectors

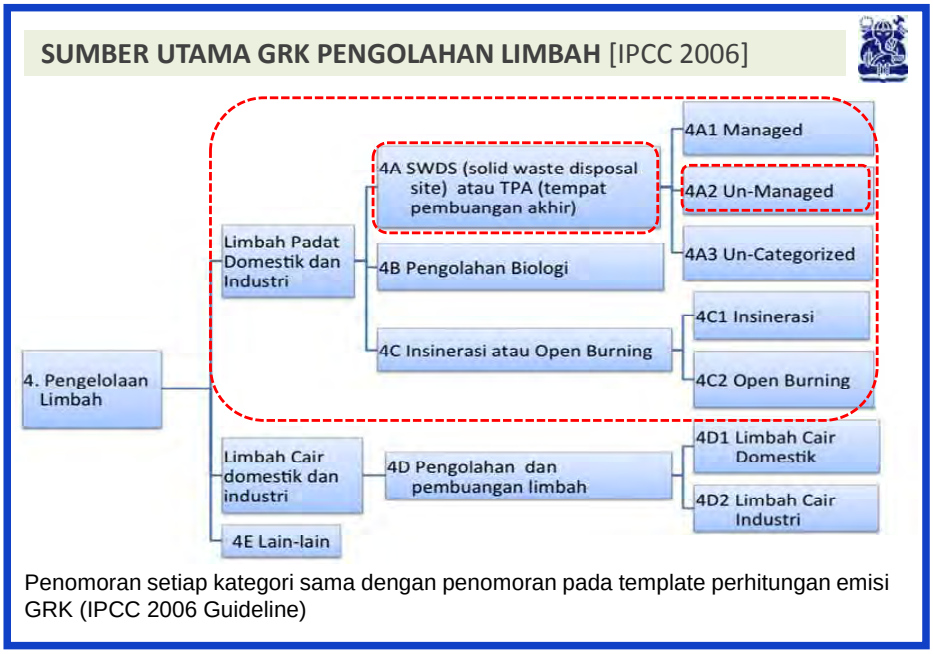

Figure 4-6 Overview of emission sources in the waste sector

3.3 Study to develop emission factors at the regional level (activity 3-8)

3.3.1 Solid waste treatment category (landfill, biological treatment, incineration)

In the solid waste treatment category, emission factors are calculated using the following parameters:

- The amount of treated waste by waste treatment method (combination of the amount of waste generation and waste stream data)
- Waste composition data and dry matter content data
- Bulk density of waste on waste collection vehicle

1) Waste stream data

Waste stream data means fraction of the amount of waste divided by total amount of waste by waste treatment method. Waste stream data can be obtained thorough waste stream survey. Waste stream survey is conducted by questionnaire for household about daily waste treatment method.

Stream	Tebing Tinggi	Lahat	Prabumulih	IPCC Default
SWDS	65%	45%	23%	59%
Compost	0%	0%	1%	5%
Open Burning	29%	15%	38%	9% (incinerated)
Untreated/open dump	4%	36%	20%	
Unknown / Other: animals feed, etc	1%	1%	8%	27% (unspecified)
3R, biogas	1%	3%	11%	

Figure 4-7 sample of data results from waste stream data from a pilot site

2) Waste composition data and dry matter content data

Waste composition data is the fraction of amount of waste by waste composition by wet basis. Waste composition data is estimated taking into consideration the characteristics of waste at the site, as explained by the 2006 IPCC Guidelines. For estimating CH_4 emission from solid waste disposal sites, waste composition data at landfill site should be used. For CH_4 and N_2O emissions from biological treatment of solid waste and GHG emissions from waste incineration, waste composition data at waste generation should be used.

Table 4-17 comparison of dry matter content data results and the 2006 IPCC Guidelines default values

Composition	Aount of waste (%)			
	South Sumatra	North Sumatra	Average	IPCC2006
Food	59	50	54	43.5
Paper, Nappy	15	13	14	12.9
Garden	3	14	9	9.9
Textile	2	3	2	2.7
Rubber	0	1	0	0.9
Plastic	19	10	15	7.2
Metal	0	0	0	3.3
Glass	1	1	1	4.0
Other	0	7	3	16.3
Total	100	100	100	100

Dry matter content data is fraction of the amount of dry basis waste. Usually dry matter content survey is conducted with waste composition survey. Dry matter content data is calculated to compare the amount of waste before drying and after drying waste.

3) Bulk density of waste on waste collection vehicles

Activity data in solid waste treatment category is the amount of waste. However, only since landfill site with weighbridge can measure actual weight of waste, landfill site without weighbridge have to estimate the amount of waste by the combination of bulk of waste and bulk density data. As bulk density data depends on waste collection method, all Kabupaten/Kota is encouraged to develop their bulk density data.

The pilot project developed the bulk density data in Palembang, South Sumatra. (The data is not disclosed)

3.3.2 Wastewater treatment category

1) Definition of emission factor

In the wastewater treatment category, emission factor is estimated as the amount of BOD in wastewater for CH_4 and Nitrogen for N_2O. Emission factor is different based on wastewater treatment method and condition of wastewater, emission factor for domestic wastewater and industrial wastewater are needs to be set separately.

For industrial wastewater, it is desirable to set emission factor by treatment method. However, since there is a wide range of wastewater treatment methods, it is unrealistic to set emission factor for each method. For industrial wastewater treatment category, emission factor needs to be developed by industry for more exact estimation. According to 2006 IPCC Guidelines, large GHG producer from wastewater treatment facilities are chemical industry, paper and pulp industry, food industry, textile industry and tobacco industry.

2) Calculation methods of emission factor

CH_4 and N_2O emission factor needs to analyze concentration of gas in chamber. For analysis of gas concentration, gas chromatography is used.

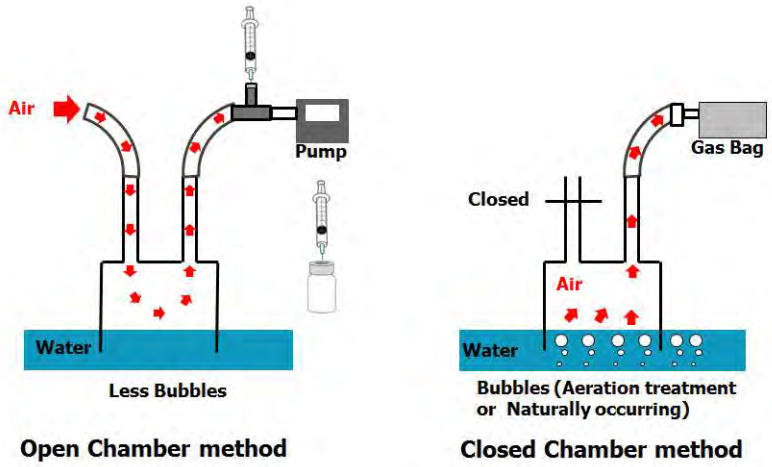

Figure 4-8 overview of collecting gas by chamber

Figure 4-9 example of gas collection by chamber

As gas generation status varies even in the same treatment pond of wastewater treatment facility, at least, 2 sampling points on 1 treatment pond are necessary to consider CH_4 and N_2O producing potential in each wastewater treatment pond and the average value is regarded as the emission factor of the treatment pond. Gas chromatography is used for concentration analysis of obtained generated gas in the vial bottle. For gas chromatography, FID detector is used for CH_4 and ECD detector is used for N_2O. Also, COD, BOD and TN data obtained from wastewater flowing into each treatment pond is necessary for emission factor development. (The data for emission factor is not disclosed)

3.4 Development of data reporting system from regional scale to national scale (Activity3-9)

In cooperation with SIGN center in KLHK, the pilot project developed the software for GHG estimation in the waste sector based on pilot project parameters. Based on pilot project software, KLHK developed online basis web basis application with factions of data storage and aggregation(SIGN-SMART). Through KLHK software, each Kabupaten/Kota and provinces can save their data. This software has function of data reporting to KLHK.

3.5 Conduct technical workshops/training seminars at the local level (Activity3-9)

From 2011 to 2015, workshops and training for GHG inventory were conducted in North Sumatra and South Sumatra. In East Java, same workshop and training were conducted from 2014 to 2015.

During workshop for provincial staff, outline of GHG inventory in the waste sector, emission factor and activity data developing method, data reporting method, software operation were transferred. For Kabupaten/Kota staff, software operation and data collection method were intensively trained.

The results of the meetings are showed in SP3 workshops and meetings regarding the national GHG inventory.

4． List of the SP3 outputs (reports including datasets)

The following outputs (reports including datasets) were produced during the SP3 implementation.

table 4-18　List of SP3 outputs (reports including datasets)

Output (Reports datasets)	Content	Note
National GHG inventory data system and report	National GHG inventory for 2008 using publicly available and other data.	file_①2008 NIR
Training material for capacity enhancement of all sectors of the national GHG inventory	General presentations from workshops and meetings on methodologies to estimate emissions and removals	file_② inventory overview 1～8
Improvement plan for the national GHG inventory	The review and improvement recommendations based on the BUR draft produced by KLHK in 2015	file_ ③ Review and recommendations
Manual for QA/QC activities	Manual and worksheets explaining the actual estimation of emissions and removals based on the IPCC worksheets with some country specific factors included as default.	file_①2008NIR and ④Step by step manual
Manual for developing emission factors for solid and liquid waste	Manual explaining the survey method of developing emission factors for solid and liquid waste.	file_pilot 01_01～05
Other training material, presentation files, etc.	The results of the GHG emissions of the waste sector in North/South Sumatera and East Java	file_pilot02～04

table 4-19　List of SP3 outputs (reports including datasets)

Output (Reports datasets)	Content	Note
Recommendations to an MRV Agency	Functions of MRV of GHG emissions and mitigation and elements of a national system to ensure MRV	fiile _other①
Recommendations to KLHK from the pilot project	The outputs of the pilot project and the policy implications of its outcomes	fiile _other②
Training materials from the final training workshop at the pilot sites	Training materials used in North Sumatera, South Sumatera, and East Java	fiile _other③
Presentation files from the final pilot wrapup workshop	Final wrapup presentations on the activities and outputs of the pilot project	fiile _other④

5． Summary of workshops and meetings

Several workshops, meetings, training seminars, etc. were held for the project. The following is a summary and overview of the different meetings.

table 4-20　SP3 workshops and meetings regarding the national GHG inventory

meeting	date	place	participants (approximate number of participants)	Summary
Kick off workshop on the national GHG inventories in Indonesia	27-28th June, 2011	Jakarta	KLHK, line ministries (30)	Explanation of the objectives of the SP3, the activities, institutional setup, the schedule, in addition to an introduction to the IPCC Guidelines
2nd workshop on the national GHG inventories in Indonesia	19-20th October, 2011	Jakarta	KLHK, line ministries, North/South Sumatera (30)	Introduction of the national systems indifferent developed countries, and discussion on the Indonesian national circumstances
Technical meeting on GHG inventories	2nd March, 2012	Jakarta	KLHK, line ministries (20)	Discussion on the institutional arrangements and processes set by PR71, and update on the data collection for SP3
1st Interministerial coordination meeting on the national system for GHG inventories	14th June, 2012	Jakarta	KLHK, line ministries (20)	Discussion on the institutional setup as described in the PR71, the framework for Indonesia in enhancing the institutional setup
2nd Interministerial coordination meeting on the national system for GHG inventories	16th July, 2012	Jakarta	KLHK, line ministries (20)	Report on the line ministries' progress in preparing the inventory, a presentation of the MoU proposal by KLHK, and discussion on the national system. Participants did not agree on a common institutional setup but agreed to proceed with inventory preparation as required by PR71.
Follow up meeting on Institutional arrangements for GHG inventories	31st July, 2012	Jakarta	KLHK, line ministries (20)	Report on institutional setup and process as described by PR71, update on the data collection, in addition to discussion on the sectoral working group format for SP3.
1st technical workshop for the IPPU sector	30th September, 2013	Jakarta	KLHK, MOI (20)	Explanation of the methods as described in the IPCC Guidelines, data collection and data management.
1st technical workshop for the LULUCF sector	2nd October, 2013	Jakarta	KLHK, MOF、(20)	Explanation of the stock difference and gain loss methods. Data collection and management in the LULUCF sector
JICA side event on GHG inventory support at COP 19	12th November, 2013	Warsaw, Poland	Participants (40)	Presentation on the overview of SP3 activities in Indonesia
1st technical workshop for the Agriculture sector	11th December, 2013	Jakarta	KLHK,MOA (20)	Explanation of the inventory process in Japan, the roles and responsibilities, the methodology development process
2nd technical workshop for the IPPU sector	23rd January, 2014	Jakarta	KLHK, MOI (20)	Methods to estimate emissions from the IPPU sector, specifically from the chemical industry, in addition to the national system in Japan for the IP sector,
2nd technical workshop for the LULUCF sector	24th January, 2014	Jakarta	KLHK, MOF (20)	Pros and cons of the gain loss method and the stock change method, the implications of using the different approaches

table 4-21 SP3 workshops and meetings regarding the pilot project

meeting	date	place	participants	Summary
Workshop for data development for GHG inventory	28th February, 2012	Medan, North Sumatra	Kabupaten/Kota staff, BLH staff	Introduction of data collection method for GHG inventory
Workshop for data development for GHG inventory	6th March, 2012	Palembang, South Sumatra	Kabupaten/Kota staff, BLH staff	Introduction of data collection method for GHG inventory
Workshop for development of GHG inventory in the waste sector	27-28th February, 2013	Medan, North Sumatra	Kabupaten/Kota staff, BLH staff	Methods for developing GHG inventory in the waste sector
Workshop for development of GHG inventory in the waste sector	7-8th March, 2013	Palembang, South Sumatra	Kabupaten/Kota staff, BLH staff	Methods for developing GHG inventory in the waste sector
Emission factor developing survey for domestic and industrial wastewater	28th October-1st November, 2013	North Sumatra	BLH staff, Kabupaten / Kota staff, local university staff	Emission factor developing survey
Emission factor developing survey for domestic and industrial wastewater	25-29th November, 2013	South Sumatra	BLH staff, Kabupaten / Kota staff, local university staff	Emission factor developing survey
Waste stream survey	21-27th January, 2014	Lahat, South Sumatra	BLH staff, Kabupaten / Kota staff, local university staff	Waste stream survey
Waste stream survey	28th January-1st February, 2014	Tebing Tinggi, North Sumatra	BLH staff, Kabupaten / Kota staff, local university staff	Waste stream survey
Workshop for development of accurate GHG inventory in the waste sector	25-27th February, 2014	Medan, North Sumatra	Kabupaten/Kota staff, BLH staff	Methods for developing accurate GHG inventory in the waste sector
Workshop for development of accurate GHG inventory in the waste sector	3-5th March, 2014	Palembang, South Sumatra	Kabupaten/Kota staff, BLH staff	Methods for developing accurate GHG inventory in the waste sector
Waste stream survey for advanced data development	22-27th August, 2014	Prabumulih, South Sumatra	BLH staff, Kabupaten / Kota staff, local university staff	Advanced waste stream survey
Final workshop for GHG inventory in the waste sector	22-23th January, 2015	Medan, North Sumatra	Kabupaten/Kota staff, BLH staff	Finalization of GHG inventory in the waste sector
Final workshop for GHG inventory in the waste sector	4-6th March, 2015	Palembang, South Sumatra	Kabupaten/Kota staff, BLH staff	Finalization of GHG inventory in the waste sector
Final workshop for GHG inventory in the waste sector	15-17th April, 2015	Malang, East Java	Kabupaten/Kota staff, BLH staff	Finalization of GHG inventory in the waste sector
Final workshop for pilot project activities in SP3	27th May, 2015	Bandung, West Java	KLHK, North/South Sumatera and East Java BLH	Final reporting of result of pilot project activities

6. Challenges and lessons learned though the implementation of the project

6.1 Ways to deal with operational challenges

○ There were many instances where much flexibility was required to take into consideration the shift in KLHK's needs, new domestic laws and regulations, and developments in the UNFCCC decisions. For example, in the beginning of the project, the team had planned to prepare a general summary of the IPCC Guidelines together with the counterparts, but the SP3 team was instead requested to develop a step by step manual for inventory preparation, which was assigned to KLHK as part of their task by PR71. In addition, the SIGN Center within the KLHK, hired new staff members in 2012, and the target of capacity building shifted from KLHK staff to the new SIGN Center staff, which was a change in an assumption of the project.

○ Pilot sites are far from Jakarta and frequent visits are difficult. To prevent miscommunication and collect information timely, local assistants were contracted to be stationed in the pilot site, provide the information from Japan and obtain local information to establish communication with the pilot site.

6.2 Lessons learned

○ The KLHK counterparts and line ministries did not necessarily have the same position toward the goals and activities of SP3. The expected outcomes from the project were also not necessarily the same, in addition to their capacities. Furthermore, the different position between line ministries on the idea of data sharing was not the same. By PR71, the roles and responsibilities had become somewhat clearer and more mandated, but sharing important data that can be used to monitor the progress of mitigation actions is not necessarily welcomed, highlighting the importance and need for coordinating among all stakeholders before conducting any technical training.

○ On the other hand, the local governments, mandated to compile their own GHG inventory by the PR71, welcomed JICA's support, and the pilot activities conducted smoothly. However, the initiative of KLHK to institutionalize and coordinate the local government outputs is not high, highlighting the importance of the central government to take successful achievements at pilot sites to strategically spread them throughout the country.

○ For dissemination of GHG inventory activity to Kabupaten/Kota staff, continuous training for GHG inventory is necessary.

○ Provinces have responsibility to facilitate Kabupaten/Kota in terms of GHG inventory activity. For effective local GHG inventory activity, capacity of provincial staff should be enhanced. For their capacity development, continuous training from KLHK or information sharing is necessary.

○ For promoting GHG inventory activity, advanced knowledge is sometimes required. Promoting inventory activity only by local governments is extremely difficult. This means local expert, like university staff or research institute staff, is necessary for local GHG inventory activity as adviser.

Chapter 5. Input to the project

1. Experts of sub project 3

Table 5-1 JICA experts

	Name	Assigned tasks	Working period	Organaization
【Long-term experts】				
1	Hiroshi Ito	Pilot Project	2011/6～2014/6	Japan International Cooperation Agency
【Short-term experts】				
1	Takeshi Enoki	Project leader/Institutional arrangements /key category assessment	2011/3～2015/10	Mitsubishi UFJ Research and Consulting Co., Ltd.
2	Akeo Fukayama	GHG Inventory Compilation(1)	2011/4～2012/8	SUURI-KEIKAKU Co., Ltd.
3	Hiroyuki Maeda	GHG Inventory Compilation(2)	2012/5～2013/1	SUURI-KEIKAKU Co., Ltd.
4	Takashi Morimoto	QA/QC	2011/6～2012/8	Mitsubishi UFJ Research and Consulting Co., Ltd.
5	Masakazu Okada	GHG Inventory(Energy)	2011/3～2015/10	SUURI-KEIKAKU Co., Ltd.
6	Takeshi Nakashima	GHG Inventory(Industrial Process)	2011/6～2013/3	Mitsubishi UFJ Research and Consulting Co., Ltd.
7	Matthew Dudley	GHG Inventory(Agriculture)	2011/3～2015/10	Individual consultant
8	Kazumasa Kawashima	GHG Inventory(Agriculture)	2013/12～2014/1	Mitsubishi UFJ Research and Consulting Co., Ltd.
9	Masato Yano	GHG Inventory(LULUCF1)	2011/3～2015/10	Mitsubishi UFJ Research and Consulting Co., Ltd.
10	Motoshi Hiratsuka	GHG Inventory(LULUCF2)	2011/12～2012/6	Mitsubishi UFJ Research and Consulting Co., Ltd.
11	Hiroyuki Ueda	GHG Inventory(Waste 1)	2011/3～2015/10	Mitsubishi UFJ Research and Consulting Co., Ltd.
12	Toru Tabata	GHG Inventory(Waste 2)	2011/7～2012/2	SUURI-KEIKAKU Co., Ltd.
13	Jun Marukawa	Pilot Project(Waste 1)	2011/10～2015/4	SUURI-KEIKAKU Co., Ltd.
14	Katsutoshi Fuchino	Pilot Project(Waste 2)	2012/6～2012/11	SUURI-KEIKAKU Co., Ltd.
15	Natsuko Matsuoka	Pilot Project(Waste 2)	2013/11～2015/5	Mitsubishi UFJ Research and Consulting Co., Ltd.
16	Tomoki Takahashi	Pilot Project(Waste 3)	2014/2～2014/3	Mitsubishi UFJ Research and Consulting Co., Ltd.
17	Yoko Asada	Project coordination/Capacity Development Plan	2011/3～2015/10	Mitsubishi UFJ Research and Consulting Co., Ltd.

table 5-2 mission schedule

Months shown — 2011: 1–12; 2012: 1, 2, 3, 5–12; 2013: 1, 2, 3, 7–12; 2014: 1, 2, 3, 6–12; 2015: 1–11.

Assigned tasks	Name	Organaization	Year	2011	2012	2013	2014	2015
Project leader/Institutional arrangements /key category assessment	Takeshi Enoki	MURC	Planned	4; 14; 14; 14; 7	7; 7; 14		8 (8); 9 (9); 7 (7)	9 (9); 7 (7)
			Actual	4 3/13-3/16; 6 4/17-4/22; 7 5/22-5/28; 14 6/26-7/9; 17 10/9-10/25; 7 11/13-11/19	12 1/23-2/3; 14 2/26-3/10; 14 3-16; 10 9-18; 10 7/25-8/3; 16 3-18; 11 5-15; 11 5-15	11 9-19; 26 /12-3/; 7 17-23; 16 8/20-9/4; 7 9/25-10/1; 15 4-18	11 15-25; 11 2/26-3/8; 6/18~24 7 (7); 11/20~28 9 (9)	4/9~15 7 (7); 5/10~14 5 (5)
GHG Inventory Compilation	Akeo Fukayama	SUR	Planned	14; 28; 14; 14; 7				
			Actual	6 4/17-4/22; 7 5/22-5/28; 21 6/26-7/16; 7 8/7-8/13; 7 9/25-10/1; 7 10/16-10/22; 7 12/11-12/17	15 2/18-3/3; 7 20-26; 12 7/24-8/4			
GHG Inventory Compilation(2)	Hiroyuki Maeda		Planned					
			Actual		7 20-26; 12 7/24-8/4; 15 10/28-11/1; 12 11/27-12.	7 /20-26		
QA/QC	Takashi Morimoto	MURC	Planned	7; 7	7			
			Actual	7 6/26-7/2; 7 10/16-10/22	7 2/26-3/3; 6 7/29-8/3			
GHG Inventory(Energy)	Masakazu Okada	SUR	Planned	14; 7; 7; 7	7		7 (7)	7 (7)
			Actual	14 6/26-7/9; 7 8/7-8/13; 7 10/16-10/22; 7 12/11-12/17	3 2/26-2/28; 7 20-26; 7 7/29-8/4; 7 10/28-11/; 6 2-7	7 /27-2/; 7 3-9	11/23-28 6 (6)	
GHG Inventory(Industrial Process)	Takeshi Nakashima	MURC	Planned	7; 7; 7; 7	7	Other project 2/5-9		
			Actual	7 6/26-7/2; 7 8/7-8/13; 7 10/16-10/22; 7 12/18-12/24	7 12/26-3/3; 7 7/29-8/4; 7 2-8; 7 13-19	14 /13-26; 7 10-16; 7 3-9		
GHG Inventory(Agriculture)	Matthew Dudley		Planned	7; 7; 7; 7	7		7 (7)	7 (7)
			Actual	7 6/26-7/2; 7 8/7-8/13; 7 10/16-10/22	7 1/29-2/4; 7 2/26-3/3; 7 7/29-8/4	7 13-19; 7 3-9	11/23-28 6 (6)	
GHG Inventory(Agriculture)	Kazumasa Kawashima	MURC	Planned					
			Actual			7 8-14	7 19-25	
GHG Inventory(Waste)	Hiroyuki Ueda	SUR	Planned	14; 14; 10; 7; 15; 11; 10	13; 14	Other project 2/20-22; Out of pocket 3/9-10	7 (7); 7 (7); 14 (14); 14 (14)	14 (14); 7 (7); 7 (7); 7 (7); 7 (7)
			Actual	6 4/17-4/22; 7 5/22-5/28; 14 6/26-7/9; 11 8/7-8/17; 7 9/11-9/17; 15 10/9-10/23; 12 11/21-12/2; 11 12/11-1	9 1/23-1/31; 4 2/20-2/23; 14 2/26-3/10; 9 21-29; 7 10-16; 7 2-8; 4; 12 7/29-8/; 4 16-29; 5; 15 24-28 /30-10/1; 6 11-1; 10 9-18	5 6-10; 7 3-9; 14 2/23-3/8; 14-16 7 17-23; 6 8/28-9/2; 8 15-2; 4 22-25; 10/27-11/3 8, 6; 8 5-10 /24-12.; 14-18 5	4 11-1; 5-7 17, 4 1/19-2/; 13 12-1 /24-3/; 6/15~21 7 (7); 7/13~19 7 (7); 8/11~3 20 (20); 9/20~30 10/1 12 (12); 11/9~16 8 (8)	1/18~27 # (10); 2/14-20 7 (7); 3/1-3/11 11 (11); 12~18,19~28 7 (7), # (10); 5/24~6/1 9 (9)
GHG Inventory(Waste 2)	Toru Tabata	SUR	Planned	14; 6; 7; 7	14			
			Actual	10 7/3-7/12; 7 7/24-7/30; 9 8/15-8/23; 7 9/11-9/17	8 2/18-2/25			
Pilot Project(Waste)	Jun Marukawa	SUR	Planned	14; 11; 9	14; 16		7 (7); 14 (14); 14 (14); 7 (7)	7 (7); 14 (14); 7 (7); 7 (7)
			Actual	14 10/9-10/22; 12 11/21-12/2; 10 12/11-12/2	10 1/22-1/3; 18 2/20-3/8; 9 6/30-7/8; 7 5-11; 15 /30-10/1; 22 10/27-11.; 15 11/25-12.	7 /3-9; 21 /17-3/; 8 15-22; 6 8-13; 16 0/27-11/1; 8 1/24-12/; 6 14-19	5 14-18; 19 /11-3/	1/18-25 8 (8); 3/2~8 7 (7); 4/13~27 15 (15)
Pilot Project(Waste 2)	Katsutoshi Fuchino	SUR	Planned					
			Actual		7 -16; 7 6/30-7/6; 16 10/27-11; 7 18-24			
GHG Inventory(LULUCF1)	Masato Yano	MURC	Planned	14; 7; 7; 7			7 (7)	7 (7)
			Actual	14 6/26-7/9; 7 8/7-8/13; 7 10/16-10/22; 7 12/11-12/17	6 1-6; 4 7/30-8/2; 7 0/28-11/; 5 11-15	6 4-9; 6 3-8; 6 5-30; 6 9/28-1	7 19-25; 8 2/27-3/6; 11/23-28 6 (6)	
GHG Inventory(LULUCF2)	Motoshi Hiratsuka	MURC	Planned	5	7; Other project 6/26-28			
			Actual	5 12/11-12/15	6 2/19-2/24; 2 29-30			
Pilot Project(Waste 3)	Natsuko Matsuoka	MURC	Planned				7 (7); 14 (14); 7 (7); 7 (7)	7 (7)
			Actual			1/28-12/ 5 6-10; 9; 5 19-23	5-7 17 1/19-2/4; 7/14~19 6 (6); 8/6~10 5 (5); 18~30 13 (13); 9/22~25 4 (4); 11/17-20 4 (4)	1/19~22 4 (4); 5/10~14 5 (5)
Project coordination/Capacity Development Plan	Yoko Asad	MURC	Planned	14; 7	7			
			Actual	14 6/26-7/9; 7 10/16-10/22	7 12/26-3/3; 5 7/29-8/2	7 3-9		
Project coordination/Capacity Development Plan	Tomoki Takahash	MURC	Planned					
			Actual				13 /24-3/	

2. Study tour and technical visit to Japan

2.1 Overview and Purpose

This study tour and technical visit is a counterpart training program under the Sub-project 3 of Project of Capacity Development for Climate Change Strategies in Indonesia (hereinafter called as “the project”).

The overall goal of Project of Capacity Development for Climate Change Strategies in Indonesia is that mitigation and adaptation actions for climate change are promoted in Indonesia. For this goal, the purpose of the project is that national GHG Inventory comes to be prepared in cooperation with the key ministries and local governments concerned of the Indonesian government.

The purpose of this study tour and technical visit to Japan is to obtain information for considering development of national and local Greenhouse Inventory, specifically addressing the following issues: strengthening the national system; improving the capacity to collect and compile data periodically and systematically; and improving the accuracy and reliability estimating emissions and removals.

2.2 Date

- Executive group: 3rd (Monday) to 5th (Wednesday) September, 2012 (3 study days)
- Technical group: 3rd (Monday) to 10th (Monday) September, 2012 (8 study days)

2.3 Participants list

Table 5-3 Participants list

Group	Name	Organization and Title
Executive Group (7 persons)	Mr. Arief Yuwono	Deputy Minister for the Environmental Degradation Control and Climate Change, Ministry of the Environment
	Mr. Gatot Pujo Nugroho**	Acting Governor of North Sumatra Province
	Mrs. Sulistyowati	Director of Climate Change Mitigation and Atmospheric Function Preservation, Ministry of the Environment
	Mr. Sudirman	Assistant Deputy for Waste Management, Ministry of the Environment
	Mr. Akhmad Najib	Staff of Secretariat of Provincial Government of South Sumatra (former Head of South Sumatra BLH)
	Mr. Fadjar Arifianto**	Head of Governor's Household, Provincial Government of North Sumatera
	Mrs. Endah Ambarwati	Secretariat of Deputy Ministry Degradation control and climate change, Ministry of the Environment
Technical Group (7 persons)	Mr. Dida Migfar Ridha	Head of GHG Inventory Division, Ministry of the Environment
	Mr. Hadenli Ugihan*	Head of South Sumatra BLH
	Mr. Much. Andhy	Head of Sub Division Pollution Control, South Sumatra BLH
	Mrs. Siti Bayu Nasution	Head of Quality Control at Environment Laboratory, North Sumatra BLH
	Mr. Fernando Sitanggang	Member of Climate Change Council of North Sumatera Province
	Mr. Mulkan Gani	Head of Subdivision for GHG Inventory on Non- Energy Sector, Ministry of the Environment
	Mrs. Wukir A. Rukmi	Head of Subdivision for GHG Inventory on Energy Sector, Ministry of the Environment

2.4 Main items for the study tour and technical visit

Table 5-4 Main items for the study tour and technical visit

Items	Contents	Presenter / Visiting sites
Climate change policy in Japan	Outline of national climate change policy in Japan	Ministry of Environment of Japan (MOEJ)
	GHG reduction strategy at local community in Japan	
	Discussion on cooperation for low carbon society between Indonesia and Japan	
	(Courtesy call)	Ministry of Foreign Affairs (MOFA)
	(Courtesy call)	Japan International Cooperation Agency (JICA)
GHG Inventory	GHG Inventory in Annex I countries and Japan	Greenhouse gas Inventory office of Japan (GIO) and AIM modeling team in NIES
	Japan's GHG Inventory development program in Asian countries	
	Climate change policy and low carbon scenario in Asian countries (application of AIM model)	
	Japan's history of developing National system for GHG Inventory	
	Practical work for preparing GHG Inventory	
	Data collection scheme for activity data in GHG Inventory	
	Software and hardware for supporting GHG Inventory activities	
	International negotiation on GHG Inventory of non-Annex I countries	
	Introduction of progress of GHG Inventory project in Indonesia	JICA long-term expert in Indonesia
	Emission factor development for small-scale domestic wastewater treatment equipment	Iwate prefecture *Johkasou* center
	Discussion for developing institutional arrangement for GHG Inventory in Indonesia	Greenhouse gas inventory office of Japan (GIO)
Mitigation actions	Site visit for waste treatment plant (landfill, incinerator with power generation, food waste treatment plant)	Tokyo metropolitan government
	Site visit for centralized domestic wastewater treatment plant	Lake Kasumigaura
	Outline of research output in waste sector	National institute for environmental studies (NIES)

2.5 Places of training

Table 5-5 Time table of Training in Japan

Group		Date		Time	Contents	Lecturer or Facilitator		Place	Accommodation
						Name	organization		
Executive Group	Technical Group	1-Sep	Sat	PM	Depart from Jakarta airport to Tokyo airport				
		2-Sep	Sun	AM	Move from Tokyo airport to JICA Tokyo				Tokyo
				PM	Preparation, etc.				
		3-Sep	Mon	9:30 - 10:30	Briefing from JICA Tokyo	(TBD)	JICA Tokyo	JICA Tokyo	Tokyo
				10:30 - 11:00	Move from JICA Tokyo to JICA HQ				
				11:00 - 12:50	Courtesy call and lunch with JICA Headquarter	(TBD)	JICA Headquarter	JICA Headquarter	
				12:50 - 13:30	Move from JICA headquarter to MOE				
				13:30 - 17:00	Courtesy call and lecture from MOE and discussion	(TBD)	MOE	MOE	
				17:30 - 18:30	Courtesy call to Ministry of foreign affairs	(TBD)	MOFA	MOFA	
		4-Sep	Tue	8:30 - 10:00	Moving from JICA Tokyo to GIO (Tsukuba)				Tsukuba
				10:00 - 12:00	Lecture from GIO and AIM team	Dr. Yukihiro Nojiri	GIO	GIO	
				12:00 - 13:30	Lunch				
				13:30 - 17:00	Lecture from GIO and discussion	Dr. Yukihiro Nojiri	GIO	GIO	
		5-Sep	Wed	9:00 - 11:00	Site visit to centralized domestic wastewater treatment plant at Lake Kasumigaura	(TBD)	(TBD)	Lake Kasumigaura	Tokyo
				11:00 - 13:00	Moving and lunch				
				13:00 - 14:30	Lecture from NIES, Center for Material Cycles and Waste Management Research	(TBD)	NIES	NIES	
				15:00 - 17:00	Moving from GIO to Tokyo				
		6-Sep	Thu	AM, PM	Depart from Tokyo airport to Jakarta (only executive group)				
				9:00 - 10:30	Site visit to sanitary landfill	(TBD)	Tokyo metropolitan Govt.	Tokyo	Tokyo
				11:00 - 12:00	Site visit to waste incineration plant equipped with power generation system	(TBD)	(TBD)	Tokyo	
				12:00 - 13:30	Lunch				
				13:30 - 14:30	Site visit to food waste bio-gasification plant	(TBD)	(TBD)	Tokyo	
				15:00 - 16:00	Site visit to waste recycle plant for construction and demolition waste	(TBD)	(TBD)	Tokyo	
		7-Sep	Fri	8:30 - 13:00	Moving from Tokyo to Iwate prefecture and lunch				Iwate
				13:00 - 14:30	Site visit to emission factor development sites	Mr. Shigeaki Inamura	Iwate prefecture *Johkasou* center	Iwate prefecture *Johkasou* center	
				14:30 - 17:00	Lecture about emission factor development and domestic wastewater treatment system	Dr. Yoshitaka Ebie	NIES	Iwate prefecture *Johkasou* center	
		8-Sep	Sat	9:00 - 13:00	Moving from Iwate prefecture to Tokyo				Tokyo
				PM	Day off (preparation for report)				
		9-Sep	Sun	AM, PM	Day off (preparation for report)				Tokyo
		10-Sep	Mon	9:30 - 12:00	Wrap-up meeting	Mr. Takeshi Enoki	JICA Expert	JICA Tokyo	Tokyo
				PM	Lunch, etc.				
		11-Sep	Tue	AM, PM	Depart from Tokyo airport to Jakarta				

2.6 Achievement

It is expected that the participants obtain knowledge of information for considering development of national and local Greenhouse Inventory, through discussion and information exchange with Japanese relevant organizations in charge of GHG Inventory and/or mitigation action.

3．Provision of the Equipment

N/A

4．Local costs

（1）Inputs from Japanese side

Table 5-6　Inputs from Japanese side (Short-term experts based on Consultancy agreement)

	FY2011	FY2012	FY2013	FY2014	FY2015
Air tickets	JPY15,262,000	JPY 15,070,000	JPY 8,334,000	JPY 4,564,000	JPY 1,687,000
Travel expenses(Excluding Air tickets)	JPY8,346,000	JPY 8,327,000	JPY 4,622,000	JPY 2,325,000	JPY 777,000
General operating expenses	JPY 13,632,000	JPY 23,753,000	JPY 22,114,000	JPY 18,295,000	JPY 4,534,000
Local subcontracting	JPY 7,893,000	JPY 9,095,000	JPY 11,630,000	JPY 2,550,000	JPY 1,850,000
Japanese subcontracting			JPY 3,276,000		

（2）Description and achievement of subcontractor

Table 5-7　Description and achievement of subcontractor

	Subcontractor	Description and achievement
FY2011	PT Ganesha Energy and Environmental Services	· Implementation of survey and review and development of manual for improving accuracy of waste data for local governments in North Sumatra and South Sumatra · Implementation of survey and review and development of manual for waste composition survey and dry matter content survey in North Sumatra and South Sumatra · Implementation of review based on the knowledge obtained from North Sumatra and South Sumatra and development of manual for data collection from local governments
	Jaya Arjuna	· Implementation of waste composition survey and dry matter content survey in two final disposal sites in North Sumatra · Measurement of the ratio of dry matter content by waste composition
	Sriwijaya University	· Implementation of waste composition survey and dry matter content survey in two final disposal sites in North Sumatra · Measurement of the ratio of dry matter content by waste composition
FY2012	Rona Alam Konsultan	· Implementation of the following services in North Sumatra · Implementation of field study using manuals for survey and calculation in Waste sector prepared in the project. · Operation of local workshops and trainings for implementation of calculation using manuals · Documentation for local workshops and training
	Sriwijaya University	· Implementation of the following services in South Sumatra · Implementation of field study using manuals for survey and calculation in Waste sector prepared in the project. · Operation of local workshops and trainings for implementation of calculation using manuals · Documentation for local workshops and training
	PT. Ganesha EES	· Developing GHG(Waste sector) inventory manual · Supporting the implementation of solid waste treatment and

		discharge pathway survey · EF developing survey in North Sumatra and South Sumatra · Supporting TOT in Bandung to develop trainers who provide training locally based on manuals and sub‐workshop in North Sumatra and South Sumatra · Holding the workshop for people involved in Pilot project in Bandung
FY2013	DDPI	· Implementation of the following services in North Sumatra · Information collection about regulation for wastewater discharge · Wastewater quality survey for industries and household · Data collection for estimation of activity data for GHG emissions calculation on wastewater discharge
	Dian Apriadi	· Supporting TOT in Bandung and training for BLH staff in South Sumatra · Supporting the implementation of solid waste treatment and discharge pathway survey · EF developing survey in South Sumatra · Holding the workshop for people involved in Pilot project in Bandung
	Febrian Hadinata	· Developing GHG inventory (Waste sector) software and operation manual · Supporting TOT in Bandung for software operation and Training for BLH staff in North Sumatra and South Sumatra · Supporting the implementation of solid waste treatment and discharge pathway survey · EF developing survey in South Sumatra · Holding the workshop for people involved in Pilot project in Bandung
	PT. Ganesha EES	· Developing GHG inventory (Waste sector) manual · Supporting the implementation of solid waste treatment and discharge pathway survey · Supporting TOT in Bandung for developing trainers who provide training based on manuals and sub‐workshop in North Sumatra and South Sumatra · Holding the workshop for people involved in Pilot project in Bandung
	Rona Alam Konsultan	· Supporting the implementation of solid waste treatment and discharge pathway survey in North Sumatra
FY2014	LEMBAGA	· Developing software for GHG inventory in the waste sector · Software training · Compiling activity report in North Sumatra · Reporting the results of GHG emissions calculation in the final workshop
	Department of Civil Engineering of Sriwijaya University	· Supporting GHG inventory workshops in South and North Sumatra province · Contribution to EF developing survey in South and North Sumatra
FY2015	PT. Ganesha EES	· Developing GHG inventory manual · Conducting the emission factor developing survey in South Sumatra · Supporting GHG inventory workshops

Chapter 6. Level of achievement of the subproject 3 objectives

1. Summary of Mid-Term Review

The Mid-Term Review on the Project of Capacity Development for Climate Change Strategy in Indonesia was conducted in February 2013. Below is an outline of the findings on the achievement of outputs for subproject3.

- The Presidential Regulation 71/2011 on the Implementation of National Greenhouse Gas Inventory which was enacted in 2011 clearly defined the role of KLHK on GHG Inventory System. Since data collection and calculation are under the responsibilities of each line ministry, KLHK started coordination among line ministries as well as setting up working group for each sector. Institutional arrangements for GHG inventory process are being discussed and documented.
- A draft National GHG Inventory for the year 2008 is expected to complete by March 2013.
- SIGN center has been set in KLHK in order to implement data collection, calculation, Quality Assurance / Quality Control for GHG Inventory as well as functioning as archives. The Project has supported the SIGN center by capacity development among personnel concerned as well as technical advice on function and role of the SIGN center.
- The project has conducted capacity development through formulation of GHG Inventory for the year 2008. Accuracy of GHG inventories is expected to be improved. There are approximately 239 subsectors/categories of the GHG inventory according to the 2006 IPCC Guidelines. Among the 103 subsectors/categories that had been estimated in the Second National Communication (SNC), estimation of 21 categories could potentially be improved in this Project. The other 136 categories would potentially be newly estimated or reported with appropriate notation key (*) (see Annex 9).

  * The coverage of categories of GHG inventory is to be done not only by collecting data/parameters but also by other appropriate clarifications that include provision of necessary notation key such as NO “Not occurring,” NE “not estimated,” NA “not applicable,” IE “included elsewhere,” and C “confidential”.
- Pilot activities have been conducted in North and South Sumatra Provinces as well as Kabupaten/ Kota in waste sector. Lack of data such as waste generation, waste composition may be one of the reasons that GHG emission from waste sector is over-estimated. Accuracy data and improved emission factors to be obtained in pilot activities would play a significant role in Measuring, Evaluation and Reporting (MER) of RAN-GRK and RAD-GRK, as well as evidence-based policy planning and evaluation in waste management.

The Mid-Term Review recommended that the PDM indicators for SP 3 be revised. It concluded that for SP-3, the Team proposed the modification of PDM indicators for SP-3 as shown in the PDM version no.2 as Annex 2. Further discussions will be needed with regard to the orientation for the next activities of SP-3 directed to the implementation of capacity development which will focus on supporting the SIGN Center in implementing the coordination of GHG inventory at national level, and in monitoring /evaluation of the process and results of GHG inventory.

2．Summary of Termination Evaluation

The Termination Evaluation for the Project of Capacity Devewlopment for Climate Change Strategies in Indonesia was carried out from May to June, 2015. The summary of sub-project 3 outputs and achievements of the project according to the M/M of the Termination Evaluation are described below.

Output 1: The institutional arrangement for preparing national GHG inventories is designed.

The indicator for Output1 was accomplished. The summary of the 2006 IPCC Guidelines for GHG inventory preparation, Step by step manual and GHG inventories manual in the waste sector in the pilot area were formulated as supporting documents for GHG inventories compilation. The methods for QA/QC were documented in the manual above by KLHK. In addition, the institutional arrangements for GHG inventories formulation were organized in GHG inventories manual and will be described in Biennial update report (BUR).

Output 2: The capacities to manage necessary data for national GHG inventories reporting regularly and systematically are enhanced.

The indicator for Output 2 was accomplished. The capacities of KLHK and SIGN center on data management by coordinating work among major ministries were enhanced.

Output 3: The understanding for accuracy, transparency and credibility of GHG inventories in each sector (energy, industrial process, agriculture, land use, land use change and forestry and waste) is enhanced among major ministries and local governments.

The indicator for Output 3 was accomplished. Through the pilot activities in South and North Sumatra, the understanding for accuracy, transparency and credibility of GHG inventories in the waste sector was enhanced. In the pilot area of South Sumatra, BLH officials at State and city level stated that their capabilities for estimation of GHG emissions in the waste sector and GHG inventories compilation were enhanced. Also, the estimation tier level was improved for the waste sector in the BUR compared to the Second National Communication submitted in 2012.

SP-3: GHG inventories for 2008 were developed in 2013. 2010 GHG inventories for BUR was finalized by KLHK utilizing the experience and skill acquired through the first round of inventory preparation. In addition, the improvement of estimation method in the waste sector was documented as GHG inventories manual.

Indicator		Status of achievement
SP-3	1. National GHG inventories development is prepared annually.	· 2008 GHG inventories were developed in March, 2013. Subsequently, the inventories for BUR are developed and currently in a stage of final confirmation.
	2. Enhancement of estimation method (ex. enhancement of emission factor and activity data or reporting by appropriate notation key) is documented.	· Improved estimation method was documented in GHG inventories manual of the waste sector.

Chapter 7. Recommendations in achieving the Overall goal

（1）Enhancement of coordination between the climate change relevant institutions

GHG inventories requires crosssectoral datasets which need to be collected from line ministries and other institutions, and coordination of this effort is a critical task for the KLHK who is responsible for preparing the GHG inventory, who need to show strong leadership. By the enactment of PR71, a broad framework for the institutions was established, but the specific roles and responsibilities, and the procedure need to be discussed among all stakeholders. Sustaining the enhanced relationships and consideration for strengthening this is important in achieving the overall goal in the future.

（2）Spreading the pilot project outputs to other areas

The pilot project was implemented to develop tools that can be used for policies and policy making. As a result, guidelines and manuals were prepared, including information on the implication of the use of the tools developed. By spreading the outputs of the pilot project to other areas and other parts of Indonesia, a mainstreaming of climate change policies and green economy can be enhanced.

Annex 1 Presidential Regulation of Number 71

PRESIDENTIAL REGULATION OF THE REPUBLIC OF INDONESIA
NUMBER 71 YEAR 2011
ON
THE IMPLEMENTATION OF
NATIONAL GREENHOUSE GAS INVENTORY
BY THE GRACE OF GOD ALMIGHTY
PRESIDENT OF THE REPUBLIC OF INDONESIA,

Considering :

a. that increased concentrations of greenhouse gases in the atmosphere has caused global warming that triggered global climate change which can degrade the quality of the environment;
b. that by ratifying the United Nations Framework Convention on Climate Change, Indonesia participated actively together with other members of the international community in an effort to prevent the rising concentrations of greenhouse gases in the atmosphere;
c. that in accordance with Article 63 paragraph (1), paragraph (2), and paragraph (3) of Law No. 32 Year 2009 on the Environmental Protection and Management, the central government, provincial and district / city has a duty and authority to conduct a greenhouse gas inventory;
d. that based on the considerations as specified in the points of letter a, b, and c it is necessary to enact the Presidential Regulation on the Implementation of the National Greenhouse Gas Inventory;

In view of :

1. Article 4 paragraph (1) of the 1945 Constitution of the Republic of Indonesia;
2. Law No. 6 Year 1994 on the Ratification of the United Nations Frameworks Convention on Climate Change (State Gazette of the Republic of Indonesia of the Year 1994 under No. 42, Supplement to the State Gazette of the Republic of Indonesia under No. 3557);
3. Law No. 17 Year 2004 on the Ratification of Kyoto Protocol to the United Nations Frameworks Convention on Climate Change (State Gazette of the Republic of Indonesia of the Year 2004 under No. 72, Supplement to the State Gazette of the Republic of Indonesia under No. 4403);
4. Law No. 32 Year 2004 on the Local Government (State Gazette of the Republic of Indonesia of the Year 2004 under No. 125, Supplement to the State Gazette of the Republic of Indonesia under No. 4437) as amended several times, lastly by Law No. 12 Year 2008 (State Gazette of the Republic of Indonesia of the Year 2008 under No. 59, Supplement to the State Gazette of the Republic of Indonesia under No. 4844)
5. Law No. 31 Year 2009 on Meteorology, Climatology and Geophysics (State Gazette of the Republic of Indonesia of the Year 2009 under No. 139, Supplement to the State Gazette of the Republic of

Indonesia under No. 5058);

6. Law No. 32 Year 2009 on Environmental Protection and Management (State Gazette of the Republic of Indonesia of the Year 2009 under No. 140, Supplement to the State Gazette of the Republic of Indonesia under No. 5059);

HAS DECIDED:

To enact : THE PRESIDENTIAL REGULATION ON THE IMPLEMENTATION OF NATIONAL GREENHOUSE GAS INVENTORY.

CHAPTER I
GENERAL PROVISIONS
Article 1

In this Presidential regulation, meant by:

1. Climate change is the change in the climate caused either directly or indirectly by human activities so as to cause global change in the atmospheric composition and in the natural climatic variability observed in a certain comparable period of time.
2. The Greenhouse Gasses hereinafter referred to as GHG are the gasses contained in the atmosphere both naturally and anthropogenically which absorb and re-emit infrared radiation.
3. GHG Inventory is an activity to obtain data and information about the level, status and trend of change of GHG emissions periodically from various emissions by sources (source) and removal by sinks (sink) including carbon stock.
4. GHG emissions are the discharge of GHGs into the atmosphere in a certain area at a certain period of time.
5. GHG removals are the removal of GHGs in a certain area at a certain period of time.
6. Carbon stock is the amount of carbon that accumulated in carbon pools on land and sea in a certain period of time.
7. Activity data is the amount of quantitative activity or human activity which can release and/or absorb GHGs.
8. Emission factor is the amount of GHG emission released into the atmosphere per unit of certain activity.
9. Removal factor is the amount of GHG in the atmosphere removed per unit of certain activity.
10. The level of GHG emissions is the amount of annual GHG emissions.
11. The level of GHG removals is the amount of annual GHG removals.
12. The GHG emission status is the condition of GHG emission in a certain comparable period of time based on the GHGs calculation using consistent method and emission factor/removal.
13. The Report for National Communication on Climate Change (National Communication) is the report prepared by the Government of Indonesia as the obligation of States Parties that

ratified the United Nations Framework Convention on Climate Change.

14. Mitigation of Climate Change is the effort to control and to reduce the risks of the impacts of climate change through activities that may reduce the emissions and/or increase the removal of GHGs from various emissions sources.

15. Minister is the Minister who performs government affairs in the field of environmental protection and management.

16. Related Minister and/or Head of Non-Ministry Government Institution are the Head of Ministry and/or Institution which scope, duties and responsibilities in accordance with the legislation regulation.

CHAPTER II
OBJECTIVES
Article 2

Implementation of the National GHG inventory aims to provide:

a. Periodic information about the level, status and trend of change of emission and removal of GHGs including carbon stock at national, provincial and district/city level.

b. Information on GHG emissions reduction achievement from national climate change mitigation activities.

CHAPTER III
PROCESS AND CALCULATION PROCEDURE OF GHG INVENTORY
ARTICLE 3

(1) GHG inventory conducted by way:

a. Monitoring and data collection of emissions sources and removal of GHG including carbon stock, as well as determination of emission and removal factor of GHGs.

b. Calculation of emission and removal of GHGs including carbon stock

(2) The calculation of emission and removal of GHGs including carbon stock is reported in the form of the level and status of GHG emissions.

(3) GHG inventory as specified in the paragraph (1) is conducted at the emission source and removal including carbon stock that includes:

a. Agriculture, Forestry, Peat land and other Land Use.

b. Production and Use of energy comprise the following matters:

1. energy generation;
2. industry;
3. transportation;
4. household;
5. commercial; and
6. agriculture, construction and mining.

c. Industrial Process and Product Use

d. Waste Management.

(4) The Minister may determine other source other than as specified in the paragraph (3) after coordinating with relevant Minister and/or Head of Non-Ministry Government Institutions.

(5) GHGs as specified in paragraph (1), paragraph (2) and paragraph (3) comprise the following compounds:

a. carbon dioxide (CO_2).
b. methane (CH_4).
c. dinitro oxide (N_2O)
d. hidrofluorocarbon (HFCs).
e. perfluorocarbon (PFCs)
f. sulfur hexafluoride (SF6).

Article 4

(1) The calculation of emission and removal of GHGs including carbon stock is conducted by way:
   a. Using activity data at each of the emissions sources and its removal including carbon stock;
   b. Using activity data in the same year;
   c. Using local emission factor and removal factor.

(2) In the case of unavailability of local emission factor and removal factor as specified in the paragraph (1) letter c, the calculation of emission and removal of GHGs including carbon stock could use the emission factor and removal factor from the international agreement.

(3) The result of emission and/or removal of GHGs calculation as specified in the paragraph (1) are used to calculate the GHG emissions reduction achievement from national climate change mitigation activities.

Article 5

Toward the activity data, emission factor and removal factor, calculation of GHGs emission and removal level conducted by way:

a. Uncertainty analysis.
b. The selection of methodology used.
c. Quality control to ensure the accuracy and completeness of data.
d. Quality assurance by reviewing GHG inventory application procedure.
e. Data documentation and information including archiving.
f. Determination of the most significant sources to assist the allocation of resources to improve the implementation inventory.

CHAPTER IV

VERIFICATION

Article 6

(1) Toward the GHG inventory process and result, including GHG emissions reduction achievement from national climate change mitigation activities is verified.

(2) The regulation about verification as specified in the paragraph (1) is further regulated by Minister

Regulation.

CHAPTER V
DUTY AND AUTHORITY

Article 7

(1) The Minister responsible for:

a. Establishing guidelines for the implementation of GHG inventory.

b. Coordinating the implementation of GHG inventory and emission and removal of GHG trend of change including carbon stock at national level.

c. Implementing the monitoring and evaluation towards GHG inventory processes and results.

(2) The Minister conducts coordination in the preparation of reports for National Communication on Climate Change.

(3) The Minister submits reports for National Communication to the government representative assigned as National Focal Point at the United Nations framework Convention on Climate Change.

Article 8

(1) Related Minister and/or of Non-Ministry Government Institutions related to the scope of GHG inventory as specified in Article 3 paragraph (3), responsible for:

a. Conducting the GHG inventory

b. Arranging a trend of change of emission and removal of GHGs including carbon stock in accordance with the scope of duties and authority.

c. Developing inventory methodologies and emission factor or removal of GHG in coordination with the stakeholders.

(2) In performing the duties as specified in paragraph (1), Related Minister and/or Head of Non-Ministry Government Institution assign the responsible party to conduct the GHG inventory in the institution work unit in accordance with its authority.

Article 9

(1) The Governor responsible for:

a. Performing GHG inventory at the provincial level; and

b. Coordinating the implementation of GHG inventory at the district and city.

(2) In performing the duties as specified in paragraph (1), Governor appoint a local technical implementation unit which scope of duties in the field of environment.

Article 10

(1) Regent and Mayor are responsible for GHG inventory implementation at the district and city.

(2) In performing duties as specified in paragraph (1), Regent and Mayor appoint a local technical implementation unit which scope of duties in the field of environment.

Article 11

Implementation of GHG inventory conducted by related Minister and/or Head of Non-Ministry Government Institutions, Governor, Regent, and Mayor based on guidelines established by the Minister as specified in Article 7 paragraph (1) letter a.

CHAPTER VI
REPORTING

Article 12

(1) Regent and/or Mayor report the result of GHG inventory to the Governor periodically, once (one time) a year.

(2) Governor reports the result of GHG inventory from district and/or city to the Minister once (one time) a year.

Article 13

(1) Related Minister and/or Head of Non-Ministry Government Institutions reports the result of GHG inventory to the Minister once (one time) a year.

(2) Minister reports the result of GHG inventory to the Coordinating Minister for People's Welfare.

Article 14

(1) GHG inventory report is published periodically in accordance with national needs, international needs, and the need for preparation of National Communication on Climate Change Report as specified in the Article 7 paragraph (2) which is coordinated by the Minister.

(2) The report as specified in paragraph (1) is used as policy formulation materials and national climate change mitigation activities evaluation including National Action Plan for Greenhouse Gas Emissions Reduction (RAN-GRK).

Article 15

(1) All business actors that are potentially cause emission and/or removal of GHGs, obligate to report data related to GHG inventory to the Governor and Regent/Mayor in accordance with their authority once a year.

(2) Limitation of business actors that obligate to report data related to GHG inventory as specified in the paragraph (1) are regulated by Minister Regulation.

Article 16

Further provisions regarding the reporting of the GHG inventory implementation as specified in the Article 12, Article 13, Article 14, and Article 15 are regulated by Minister Regulation.

CHAPTER VII
GUIDANCE

Article 17

(1) The Minister and related Minister and/or Head of Non-Ministry Government Institution to

provide guidance in order to the GHG inventory implementation to the provincial and district/city government and stakeholders.

(2) The Governor provides guidance in order to coordinate the GHG inventory implementation to district/city local government and stakeholders.

(3) Further regulation about guidance as specified in the paragraph (1) and paragraph (2) is regulated by Minister Regulation.

Article 18

(1) Each GHG inventory implementer must meet the criteria and standard of competency of GHG inventory

(2) The criteria and standard competency as specified in the paragraph (1) is regulated by Minister Regulation

CHAPTER VIII

FINANCING

Article 19

All necessary expenses for the implementation of this Presidential regulation are charged to the State Revenues and Expenditures Budget (APBN), Regional Revenues and Expenditures Budget (APBD) and/or other legal and unbinding sources in accordance with the prevailing laws and regulations.

CHAPTER IX

CLOSING

Article 20

This Presidential Regulation comes into force as of the date of enactment.

Enacted in Jakarta

On October 5, 2011

PRESIDENT OF THE REPUBLIC OF INDONESIA

[Signed]

DR. H. SUSILO BAMBANG YUDHOYONO

True copy of the original
Deputy Minister for People's Welfare
Secretariat of the Cabinet of RI

[Signed]

Agus Sumartono, S.H., M.H

Annex 2 Record of SP3 Sub-JCC

KEMENTERIAN LINGKUNGAN HIDUP

MEMORANDUM

Nomor: M- 112 /Asdep 4-III/LH/05/2011
Tanggal: 25 Mei 2011

Kepada Yth.	:	1. Mr. Masato Kawanishi (Senior Advisor for Climate Change, JICA) 2. Mr. Takeshi Enoki (Team Leader of JICA GHG Inventory) 3. Ms. Masako Ogawa (JICA Expert dispatched in the Ministry of Environment)
Dari		Asdep Mitigasi dan Pelestarian Fungsi Atmosfir
Tembusan	:	Deputi III MENLH
Hal		**Butir-Butir untuk Minutes of Meeting**

Sehubungan dengan diselenggarakannya Pertemuan *First Sub Joint Coordination Coommitte Meeting - Capacity Development for Developing National GHG Inventories*, pada 24 Mei 2011, bersama ini dengan hormat kami sampaikan bahan untuk dapat dimasukkan pada Minutes of Meeting sebagaimana terlampir.

Demikian disampaikan, atas perhatian dan kerjasama Saudara, kami ucapkan terima kasih.

Sulistyowati

- The First Sub Joint Coordination Committee Meeting of Sub Component 3 (Capacity Development for Developing National GHG Inventories) was held on May 24, 2011.

- The Meeting was attended by representatives of line ministries, such as Bappenas, Ministry of Industry, Ministry of Public Works, Ministry of Energy and Mineral Resources, Ministry of Agriculture, BMKG, DNPI, Ministry of Transportation.

- The Ministry of Environment intends to include these points into Minutes of Meeting:
  a. The National Green House Gases (GHG) Inventories aim to provide regular information on level of, status of, and projection of GHG emissions and its removal at national, provincial and municipal/regency levels, including the information of achievement of GHG emission reduction coming from national climate change mitigation activities.
  b. The 1st Sub JCC Meeting noted that, in general, the representatives of line ministries have a positive view in responding the ultimate goal in strengthening the national system of GHG Inventories referred as "Sistem Inventarisasi Gas Rumah Kaca Nasional a.k.a SIGN" . In particular, they support the idea of Steering Committee of SIGN Centre which will consist of the II echelons officials of line ministries and be chaired by Mr. Arief Yuwono as Deputy to the Minister for Enviromental Degradation Control and Climate Change.
  c. The Ministry of Environment mentioned that baseline is the important thing and highly relates to the GHG Inventory. Therefore, the determining of GHG inventory baseline will be a subject to be assisted by JICA.
  d. For the follow-up of the Sub-JCC Meeting, the Meeting acknowledged that the Ministry of Enviroment will form the Steering Committee of SIGN as stated at the above mentioned.
  e. The Ministry of Environment urges JICA to deliver the real (concrete) actions promptly in order to speed up the implementation of Sub-Project 3.
  f. Regarding the Pilot Projects, the Ministry of Environment agrees to have a pilot of waste sector for the initial stage in Year of 2011 located in the Province of South Sumatra and the Province of North Sumatra. The Ministry of Environment will provide data as the main resource and it will be supported by relevant line ministries such as Ministry of Public Works. For the next phase, the Ministry of Environment proposes a pilot of energy sector which will be located in the Province of East Java and the Province of East Kalimantan.
  g. The next Sub-Joint Coordination Committee Meeting of Sub-Project 3 requires to discuss technical issues and the Ministry of Environment calls JICA for a presentation of related GHG inventory technical issues such as compiling data.

Annex 3 Minutes of Meeting May, 27, 2011

MINUTES OF MEETING

ON
THE INCEPTION REPORT
FOR
CAPACITY DEVELOPMENT FOR DEVELOPING NATIONAL GHG INVENTORIES
(SUB-PROJECT 3)
OF
PROJECT OF CAPACITY DEVELOPMENT FOR CLIMATE CHANGE
STRATEGIES IN INDONESIA

Agreed upon between
MINISTRY OF ENVIRONMENT (KLH)
and
JICA EXPERT TEAM

Jakarta, 27, May, 2011

Ms. Sulistyowati
Assistant to the Deputy for the Mitigation
and Atmospheric Function Preservation
Ministry of Environment (KLH)
The Republic of Indonesia

Mr. Masato Kawanishi
Project Chief Advisor/ Senior Advisor
(Climate Change)
Japan International Cooperation
Agency (JICA)

Mr. Takeshi Enoki
Team Leader for Sub-Project 3
JICA Expert team

1

Based on the Record of Discussions (hereinafter referred to as "R/D") signed between Japan International Cooperation Agency (hereinafter referred to as "JICA") and the authorities concerned of the Government of the Republic of Indonesia, JICA dispatched the JICA Expert Team members, headed by Mr. Takeshi Enoki, to Jakarta, Indonesia to commence the "Capacity Development Project For Developing National GHG Inventories (Sub-Project 3)" (hereinafter referred to as the "the Sub-Project") on March 13, 2011.

In order to build a consensus about the details of implementation plan and schedule of the Sub-Project, the JICA Expert Team exchanged views and had a series of discussions with the Ministry of Environment (hereinafter referred to as "KLH") based on the draft Inception Report (IC/R), submitted by the JICA Expert Team. As a result of the discussions, KLH agreed on the IC/R as attached (see attachment 1).

The 1st Sub-Joint Coordination Committee (hereinafter referred to as "Sub-JCC") was held on May 24, 2011 to reach common understanding among KLH and JICA Expert Team regarding the Sub-Project's background, purpose, contents, activities, expected outputs, implementation structure and implementation schedule.

Prior to the Sub-JCC, KLH held a meeting with other line ministries to discuss the initiative of GHG national Inventory preparation and the relevance of the Sub-Project. KLH informed the JICA Expert Team that they obtained the support by other line ministries for their initiative (see attachment 2). KLH agreed to identify and notify the JICA Expert Team of the responsible contact person/department accordingly.

The JICA Expert Team submitted the Indonesian side twenty copies of the Inception Report of the Sub-Project. KLH officially received the Inception Report.

Through meetings between KLH and the JICA Expert Team, the following were confirmed and/or agreed:

1. Cooperating ministries and other organizations

KLH explained that a Presidential decree on GHG inventories has been drafted and is in the process of finalization for the signature by the president. As shown in the table below, KLH and JICA Expert Team identified the ministries and other organizations with potential to provide information to be used as the basis for estimating GHG emissions and removals. Based on this list, KLH agreed to make the necessary arrangements to nominate the contact personnel/relevant department of each ministry/organization to ensure cooperation in this Sub-Project, as soon as possible and by October 2011 at the latest. When the contact personnel/relevant department is identified, KLH and the JICA Expert Team will hold a meeting with the relevant stakeholders and examine the status of GHG national inventory reporting in Indonesia and its implication to the Sub-Project.

The relevant line ministries and organizations are as follows:

1	Energy	Ministry of Energy and Mineral Resources Ministry of Transportation, Ministry of Industry
2	Industrial Processes	Ministry of Industry
3	Agriculture	Ministry of Agriculture
4	LULUCF	Ministry of Forestry
5	Waste	KLH Ministry of Public Works
6	other	BAPPENAS, DNPI, BPS, BMKG, Ministry of Home Affairs, local governments, Universities, and other institutions

2. Pilot project sites

The KLH and the JICA Expert Team agreed to conduct pilot projects on the waste sector in North Sumatra and South Sumatra from the first year of implementation of the Sub-Project. For the following years, KLH expressed interest in conducting a pilot project on the Energy sector in East Java and East Kalimantan. This was taken note by the JICA Expert Team. The JICA Expert Team will collect information, during the first year, on the needs and the possibility/feasibility of implementing a pilot project proposed by KLH and/or other possible alternatives.

3. Equipment/computer

The KLH expressed concerns regarding the necessary equipment to carry out the activities

TE

of Sub-Project. The JICA Expert Team explained that all files developed for the Greenhouse Gas inventory, including databases, can be stored in a single computer. KLH and the JICA Expert Team agreed that the equipment listed in the Inception Report will be sufficient for the implementation of the Sub-Project.

Attachment

1. Inception Report of "Capacity Development for Developing National GHG Inventories (Sub-Project 3) of Project of Capacity Development for Climate Change Strategies in Indonesia"
2. Note prepared by KLH on the meeting held May 25, 2011 between KLH and other line ministries regarding national GHG inventory preparation

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Annex 4 Miniutes of Meeting July 2012

MINUTES OF MEETING

ON
ACTIVITIES FOR YEAR 2012
FOR
CAPACITY DEVELOPMENT FOR DEVELOPING NATIONAL GHG INVENTORIES
(SUB-PROJECT 3)
OF
PROJECT OF CAPACITY DEVELOPMENT FOR CLIMATE CHANGE
STRATEGIES IN INDONESIA

Agreed upon between
MINISTRY OF ENVIRONMENT (KLH)
and
JICA EXPERT TEAM

Jakarta, 16 July, 2012

Ms. Sulistyowati
Assistant Deputy for the Mitigation
And Atmospheric Function Preservation
Ministry of Environment (KLH)
The Republic of Indonesia

Mr. Masato Kawanishi
Project Chief Advisor/Senior Advisor
(Climate Change)

Mr. Takeshi Enoki
Team Leader for Sub-Project 3
JICA Expert team

1

Based on Record of Discussions signed between Japan International Cooperation Agency (hereinafter referred to as "JICA") and the authorities concerned of the Government of the Republic of Indonesia, and the Minute of Minutes signed between the JICA Expert team and the Ministry of Environment (hereinafter referred to as "KLH"), the JICA Expert Team and KLH members began implementing the activities in the "Inception Report for Capacity Development for Developing National GHG Inventories (Sub-Project 3) of Project of Capacity Development for Climate Change Strategies in Indonesia" (hereinafter referred to as "Inception Report") from June, 2011.

In order to review the progress made in 2011 and agree on the plan for fiscal year 2012, the JICA Expert Team began a series of discussions with the KLH starting February 2012.

The KLH and JICA Expert Team took note of the progress made in SP3 during the year 2011. Given the developments in Indonesia relating to GHG inventory preparation, namely the issuance of Presidential Regulation 71, both sides recalled that members were not able to make progress as planned in the Inception Report. Both sides also noted that the KLH members were often not available during the JICA Expert Team mission to Jakarta, adding to the challenge of this capacity building project. Both sides agreed that the ultimate goal of strengthening the capacity of KLH hinges upon the active participation of each of the KLH GHG inventory team members. Both sides also agreed that preparing two inventories by the end of the SP3 was an important one.

Through meetings with KLH and the JICA Expert Team agreed to the following:

1. Activities related to the national system

Both sides agreed that they would continue to work on the basis of the Inception Report. However, some activities regarding the national system need to be revised given the Presidential Regulation 71, which went into effect, October 2011. Bot h sides agreed that the JICA Expert team will continue to provide technical assistance to design and build the national system for preparation of GHG inventories in Indonesia, taking any regulations relevant to Presidential Regulation 71 in consideration. Bot h sides also agreed that KLH will intensify their effort to coordinate the line Ministries' work with JICA support. Specifically, KLH will organize a high level Ministerial meeting in June and July to lay the foundation for the national system in KLH and allow the monthly sectoral meetings to commence starting late July.

2. Inventory manual

KLH requested the JICA expert team to develop an inventory manual for the kota/kabupaten for the regional GHG inventory for all sectors by December 2012. The manual will describe the steps to fill out the worksheets provided in the 2006 IPCC Guidelines. The JICA expert team agreed to develop the manuals.

3. 2010 GHG Inventory

Both sides recognized that the schedule of GHG inventory preparation according to the Inception Report is to complete the 2008 inventory by March 2013 and the 2010 inventory by November 2014. The JICA Expert team and KLH agreed to make efforts to produce the 2010 GHG inventory together with the 2008 inventory for categories where data is available and report the progress in December, 2012.

4. Workshop for regions

KLH requested that a workshop for the local governments be held in Jakarta to present the results of the pilot project activities in the waste sector in North and South Sumatera. The JICA Expert team agreed to consider this workshop provided that the pilot projects are ready to present the most useful information to the other stakeholders and JICA has the sufficient funds to host such a workshop.

5. Scope of the pilot projects

Both sides agreed to continue the pilot project in the waste sector in North and South Sumatera to improve the manuals developed in the previous year and conduct training to the local waste management staff to improve the quality of data reported to the BLH and ultimately, to KLH. In addition, the JICA Expert team will include liquid waste in its scope for 2012. KLH pointed out the difficulty of setting boundaries for kota/kabupaten reporting, and the JICA Expert team agreed to provide guidance in defining the reporting boundaries.

6. Develop website

Both sides agreed to upload materials relevant to the national GHG inventory in Indonesia to a website.

7. Study tour of Japanese GHG inventory preparation

Both sides agreed that members of KLH, and BLH from North and South Sumatera will take part in a study tour in Japan to understand the GHG inventory preparation system in the Greenhouse gas Inventory Office, Ministry of Environment, and other relevant organizations to get a hands on experience with GHG inventory preparation in Japan.

Annex 5 Minutes of Meeting August, 30, 2013

MINUTES OF MEETING

ON

ACTIVITIES FOR YEAR 2013

FOR

CAPACITY DEVELOPMENT FOR DEVELOPING NATIONAL GHG INVENTORIES

(SUB-PROJECT 3)

OF

PROJECT OF CAPACITY DEVELOPMENT FOR CLIMATE CHANGE STRATEGIES IN INDONESIA

Agreed upon between

MINISTRY OF ENVIRONMENT (KLH)

and

JICA EXPERT TEAM

draft

Jakarta, 30 August, 2013

Ms. Emma Rachmawaty
Assistant Deputy for the Mitigation
And Atmospheric Function Preservation
Ministry of Environment (KLH)
The Republic of Indonesia

Mr. Masato Kawanishi
Project Chief Advisor/Senior Advisor
(Climate Change)

Mr. Takeshi Enoki
Team Leader for Sub-Project 3
JICA short term expert team

1

Based on Record of Discussions signed between Japan International Cooperation Agency (hereinafter referred to as "JICA") and the authorities concerned of the Government of the Republic of Indonesia, and the Minute of Minutes signed between the JICA Expert team and the Ministry of Environment (hereinafter referred to as "KLH"), the JICA Expert Team and KLH members began implementing the activities in the "Inception Report for Capacity Development for Developing National GHG Inventories (Sub-Project 3) of Project of Capacity Development for Climate Change Strategies in Indonesia" (hereinafter referred to as "SP3") from June, 2011.

In order to review the progress made in 2012 and agree on the plan for fiscal year 2013, the JICA Expert Team began a series of discussions with the KLH starting July 2013.

The KLH and JICA Expert Team took note of the progress of SP3 during fiscal year 2012. Two major outputs were achieved as follows:

- A draft GHG inventory report for the 2008 inventory was completed, using national statistics and unauthorized/unofficial data collected from the line Ministries. The KLH and JICA Expert Team noted the critical challenges in institutional arrangements and Ministerial coordination for preparing the national GHG inventory.
- A step by step GHG inventory manual, describing the steps to fill out the worksheets provided in the 2006 IPCC Guidelines, was completed for all sectors, both in English and Bahasa Indonesian. This should facilitate the reporting from all relevant parties in Indonesia.

As was the case in FY 2011, both sides noted the challenges in time management between the SP3 short term experts and KLH members, adding to the challenge of this capacity building project. Still, because the goal of FY 2012 was to produce the GHG inventory for 2008, the SP3 short term experts made efforts to meet with line Ministries after consultation with KLH. Both sides agreed that in the future, KLH will take the lead in all coordination with line Ministries.

Both sides also noted the revisions made to the Record of Discussions and Project Design Matrix (PDM) of SP3, signed July 31, 2013.

Given the experiences in FY 2011 and FY 2012, both sides agreed that the SP3 short term expert members will carry out capacity building activities to not only KLH but also line Ministries. Both sides also agreed that given the increasing importance of the SIGN Center staff members in GHG inventory preparation in Indonesia, capacity building should also target the staff members in FY 2013.

Through meetings with KLH and the JICA Expert Team agreed to implement the following activities in FY 2013:

1. Sector workshops

Both sides agreed that the focus of the SP3 work for FY 2013 will be on holding technical sectoral workshops. These meetings will cover all aspects of national GHG inventory preparation, including the methodological aspects, institutional arrangements, and procedural arrangements for preparing the inventory. Both sides agreed that in FY 2013, the SP3 project will hold three workshops for the IPPU and agriculture sectors, one workshop for energy, one or two workshops for LULUCF and waste sectors, and one crosscutting workshop, if necessary.

Both sides noted that no SP3 meetings/workshop could be held in August because there was no agreement on the scope of the workshop, which led to coordination issues. Both sides agreed that for FY 2013, the scope of the workshops will be technical in nature, allowing the members to plan the workshops in an efficient manner.

The KLH and JICA agreed that both sides will agree on dates for the technical workshops at least one month in advance and the invitation letters to the line Ministries can be sent out by KLH two weeks before the agreed date. The technical workshop will be planned and arranged by the SP3 team in consultation with KLH in a timely manner. Both sides noted that effective communication between KLH and JICA is crucial in planning any event or activity.

2. Capacity development of the SIGN Center staff members

Both sides noted that the SIGN Center staff members will play a critical role in preparing the GHG inventory in the future. The staff members will be collecting, assessing, and compiling the information provided to them by the line Ministries to prepare the inventory. Both sides noted the need for human resources in the SIGN Center and agreed that the JICA will strengthen its efforts to hire staff in a timely manner. The SP3 short term expert members will focus on training the SIGN Center staff members during their missions to Jakarta.

3. Scope of the pilot projects

Both sides agreed to continue the pilot project activities in the waste sector in North and South Sumatera. The pilot project activities will consist of the following: Development of country-specific emission factors for the waste water subsector; GHG Inventory training for Kabupaten/Kota for all categories in the waste sector; development of new consolidated GHG Inventory manual for the waste sector; and support to KLH to train other provinces in Indonesia.

Annex: schedule for technical sectoral workshops

Time period the technical sectoral workshops will be held (tentative)

	9	10	11	12	1	2	3
Energy					1/6-1/31		
IPPU	9/23-9/26			12/2-12/27		2/3-2/28	
Agriculture		9/30-10/11		12/2-12/20		2/3-2/28	
LULUCF		9/30-10/11			1/6-1/31		
Waste				12/2-12/27		2/3-2/28	