### Introductory Presentation; Result of the survey for waste sector inventory status of each country

WGIA8, Session III, WG 4 14 July 2010, Vientiane, Lao PDR

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# Agenda for Waste Sector WG

WG 4: Waste Sector Plaza III

Theme: Information Exchange on the Current Status of the Inventory Preparation for Waste Sector in each Asian Country

Chair: Tomonori Ishigaki Rapporteur: Gao Qingxian

Current status and /or problem of Waste Sector Inventory preparation of Asian countries

Takefumi Oda Introductory presentation (GIO); result of the survey for waste sector inventory status

of each country

Mya Thein GHG emissions from waste sector of INC, Myanmar

Dorjpurev Jargal Mongolia's GHG Inventory - Waste sector

Retno Gumilang Dewi Indonesia's progress in Waste inventory

Gao Qingxian The Study Progress on Waste Sector

Discussion

Proposal for the Waste Sector WG in future WGIA; information sharing for the mitigation actions in waste sector and the inventory improvement

Kosuke Kawai Accuracy of municipal solid waste data in Vietnam

Wonseok Baek Improvements in the process of estimating GHG emission for waste sector in Republic

of Korea

Sirintornthep Towprayoon Linkage of Greenhouse Gas Invenotry in Waste Sector to Mitigation Option

Hiroyuki Ueda Continuous Improvement of Inventory for MRV Mitigation Action in Waste Sector

# Agenda for Waste Sector WG of the past WGIA

- Objective of WGIA
  - to enhance the capacity building of GHG inventories in Asian countries
- Themes for the past Waste Sector WGs in WGIA
  - data collection, waste streams, waste water handling, and some others.

### Past Agenda

- WGIA (Nov. 2003) & WGIA 2 (Feb. 2005):
  - No Waste WG
- WGIA 3 (Feb. 2006):
  - discussed about Activity data estimation, Waste streams, Uncertainty analysis and so on.
- WGIA 4 (Feb. 2007):
  - focused on important activity data to improve GHG inventory; wastewater flow and solid waste streams in Asian countries
- WGIA 5 (Sep. 2007):
  - No Waste WG
- WGIA 6 (Jul. 2008) :
  - mainly focused on AD related issues and how to improve the reliability of waste data
- WGIA 7 (Jul. 2009):
  - Theme 1: Improvement of the data collection scheme for the waste sector
  - Theme 2: Information exchange on waste water handling.

# The survey for waste sector inventory status of each country

- How improved have been the Participating countries' inventory?
- In WGIA8, we planned
  - to confirm the current inventory status of each country
  - to detect the problems ,
  - to discuss the improvement for future inventory.
- The secretariat conducted the survey by the questionnaire in advance for waste sector inventory status of each country.
- Respondent countries are followings;
  - Cambodia, China, Indonesia, Japan, Korea, Malaysia,
    Mongolia, Myanmar, Philippines, Thailand, Vietnam

## Items of the Survey

- Inventory compilation system
- 2. Transparency;
  - ✓ Preparation of documentation for explanations
- 3. Comparability;
  - ✓ Estimation for Source category in line with IPCC Guidelines
- 4. Completeness;
  - ✓ Estimation for all sources by gas
- 5. Consistency;
  - ✓ Time series, Methodology and Recalculations
- 6. Accuracy;
  - ✓ Methodology, Emission Factors and Parameters
- 7. Key Category Analysis

# **Inventory Compilation System (1)**

- Specific agency compile the inventory in waste sector in most country.
  - For continuous preparation of inventory, permanent compilation agency is necessary.
- Every country has established the compilation system supporting confirmation for methodology.

Table 1 Responsible agency

Countries	R	tesponsible Agenc	cy .	Compilation
	Government or	University or	Temporarily	system
	relevant agency	Research	project team	
		institute		
Cambodia	0			0
China		0		0
India	NA	NA	NA	NA
Indonesia	NA	NA	NA	NA
Japan		0		0
Korea	0			0
Lao	NA	NA	NA	NA
Malaysia	0			0
Mongolia	0		0	0
Myanmar	NA	NA	NA	NA
Philippines		0		0
Singapore	NA	NA	NA	NA
Thailand		0		0
Vietnam	0		0	0

# **Inventory Compilation System (2)**

- Continuous preparation of annual inventory
  - Japan, Korea, Malaysia, Philippines and Thailand
- The other countries have following problems in the continuous preparation.
  - No legal obligation to compile the inventory
  - Lack of human resources
  - Lack of budget
  - Lack of inventory calculation system
  - Lack of time
- What solution do we have for the problems?

# **Transparency**

- Disclose of detailed explanation for the inventory is important to keep its transparency.
- Many countries prepare such detailed documentations.
  - Are the prepared current documents enough transparent?
- No preparation of the document
  - Cambodia and Mongolia
  - lack of clear obligation, budget, human sources and time
  - What solution do we have for the problems?
  - Once we prepare such document, we only have to update it with partly change.

Table 2 Preparation of documentation for explanation

Countries	Documentation
	for explanation
Cambodia	×
China	0
India	NA
Indonesia	NA
Japan	0
Korea	0
Lao	NA
Malaysia	0
Mongolia	×
Myanmar	NA
Philippines	0
Singapore	NA
Thailand	0
Vietnam	0

# Comparability

- Most countries estimate the emissions for the categories in line with IPCC Guidelines.
- Preparation of CRF tables is better solution to make comparability.
- CRF tables become
  - guiding means to comparison of inventories
  - tool to verify the completeness of estimations

### Generation of CRF Tables

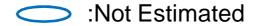
- Japan, Korea and Thailand
- Other countries have not generated the CRF tables.
  - No obligation of IPCC Guide lines
  - Lack of experiences

Table 4 Generation of CRF tables

Countries	CRF tables
Cambodia	×
China	×
India	NA
Indonesia	NA
Japan	0
Korea	0
Lao	NA
Malaysia	×
Mongolia	×
Myanmar	NA
Philippines	×
Singapore	NA
Thailand	0
Vietnam	×

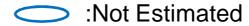
# Completeness (CO2)

CO2		Cambodia	China	India	Indonesia	Japan	Korea	Lao	Malaysia	Mongolia	Myanmar	Philipines	Singapore	Thailand	Vietnam
	Solid Waste Disposal														
A1	Managed Waste Disposal on Land	E (full)	NO			NO	NA		NA	(E)	-	NA			NA
A2	Unmanaged Waste Disposal Site	E (full)	NO			NO	NA		NA	(E)	-				NA
	Deep (>5m)	E (full)	NO			NO	NA		NA	-	-	NA			NA
	Shallow (<5m)	E (full)	NO			NO	NA		NA	-	-	NA			NA
A3	Other (please specify)					NO	NA		NA	-	-				NA
	Waste Water Handling														
B1	Industrial Waste Water														
	Waste Water											NA			
	Sludge											NA			
B2	Domestic and Commercial Wastewater														
	Waste Water											NA			
	Sludge											NA			
	N2O from human sewage											NA			
В3	Other (please specify)											NA			
	Waste incineration														
C1	Biogenic	NA	NE			E(full)	NA		NA	-	-	NE			NA
C2	Other (please specify)	NA	E(part)			E(full)	E(full)		NA	_	-	NA			NA
						Industrial	Municiple								
	Other (please specify)					Solid Waste	solid waste								
						E(full)	E(full)			-	-				
						Municiple	Industrial								
	Other (please specify)					Solid Waste	waste								
						E(full)	E(full)			-	-				
						Specially	Designated								
	Other (please specify)					controlled	waste								
	Other (piease speerly)					ISW									
						E(full)	E(full)			-	-				
	Other (please specify)														
						Decomposition									
						n of	Biological								
6D	Other					Petroleum-	Treatment of								
JD.	Ouici					Derived	Solid Waste								
						Surfactants									
		NA		1		E(full)	NA		NA	-	-	NA			



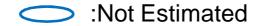
# **Completeness (CH4)**

H4		Cambodia	China	India	Indonesia	Japan	Korea	Lao	Malaysia	Mongolia	Myanmar	Philipines	Singapore	Thailand	Vietnam
	Solid Waste Disposal														
.1	Managed Waste Disposal on Land	E (full)	E(full)			E(full)	E(full)		E	(E)	-	E (full)		E(fulll)	L (part)
2	Unmanaged Waste Disposal Site	E (full)	E(full)			NA	E(full)		NE	(E)	-			E(fulll)	E (part)
	Deep (>5m)	E (full)	E(full)			NA	E(full)		NE	-	-	É (part)		E(fulll)	
	Shallow (<5m)	E (full)	E(full)			NA	E(full)		NE	-	-	E (part)		E(fulll)	
3	Other (please specify)					E(full)	-		NE	-	-	n/a			NA
						Inappropriate									
	Other (please specify)					Disposal									
						E(full)				-	-				
	Waste Water Handling														
1	Industrial Waste Water	E (full)	E(full)			E(full)IE	E(full), NE		£(part)	(E)	-				E (part)
	Waste Water	E (full)	E(full)			E(full)	E(full)		E(part)	-	-	E (part)		E(fulll)	
	Sludge	E (full)	E(full)			IE (	NE		E(part)	-	-	NE		E(fulll)	
2	Domestic and Commercial Wastewater	E (full)	E(full)			E(full)IE	E(full), IE		E(full)	(E)	-				E (part)
	Waste Water	E (full)	E(full)			E(full)	E(full)		E(full)	-	-	E (full)		E(fulll)	
	Sludge	E (full)	E(full)			ΙΕ	IE		E(full)	-	-	E (part)		E(fulll)	
	N2O from human sewage											NA			
3	Other (please specify)					NO	-		NO	-	-				NA
	Waste incineration														
1	Biogenic		No			E(full)	NA		NA	-	-	NA	1	NE	NA
2	Other (please specify)		No			E(full)	NE		NA	-	-	NA		E(fulll)	
						Industrial									
	Other (please specify)					Solid Waste									
						E(full)				-	-				
						Municiple									
	Other (please specify)					Solid Waste									
						E(full)				-	-				
						Specially									
						controlled									
	Other (please specify)					ISW									
						E(full)				-	-				
	Other (please specify)					` ´									
	- <del>4</del> - <del>1</del> - <del>2</del> /					composting	Biological								
_						of organic	Treatment of								
5D	Other (please specify)					waste	Solid Waste								
		NA				E(full)	E(full)		NA	-	-	NA		NE	



# Completeness (N2O)

20		Cambodia	China	India	Indonesia	Japan	Korea	Lao	Malaysia	Mongolia	Myanmar	Philipines	Singapore	Thailand	Vietnan
	Solid Waste Disposal														
.1	Managed Waste Disposal on Land											NA			
.2	Unmanaged Waste Disposal Site											NA			
	Deep (>5m)											NA			
	Shallow (<5m)											NA			
<b>A</b> 3	Other (please specify)											NA			
	Waste Water Handling														
31	Industrial Waste Water	E (full)	E(full)			E(full)IE	NE		NA	-	-				NA
	Waste Water	E (full)	E(full)			E(full)	NE		NA	-	-	NA		NE	
	Sludge	E (full)	E(full)			IE	NE		NA	-	-	NA		NE	
32	Domestic and Commercial Wastewater	E (full)	E(full)			E(full)IE	NE		NA	-	-				NA
	Waste Water	E (full)	E(full)			E(full)	NE		NA	-	-	NA		NE	
	Sludge	E (full)	E(full)			IE	NE		NA	-	-	NA	'	NE	
	2	E (full)				E(full)	E(full)		NA	-	-	E (full)		E(full)	(E (part
3	Other (please specify)					NO	-		NA	-	-	NA		NE	NA
	Waste incineration														
C1	Biogenic					E(full)	NA		NA	-	-	NA			NA
22	Other (please specify)					E(full)	E(full)		NA	-	-	NA			
						Industrial	Municiple								
	Other (please specify)					Solid Waste	solid waste								
						E(full)	E(full)			-	-				
						Municiple	Industrial								
	Other (please specify)					Solid Waste	waste								
						E(full)	E(full)			-	-				
						Specially	Designated								
	Other (please specify)					controlled	waste								
	outer (please speen)					ISW									
						E(full)	E(full)			-	-				
	Other (please specify)														
						composting	Biological								
6D	Other (please specify)					of organic	Treatment of								
CD.						waste	Solid Waste								
		NA				E(full)	E(full)		NA	-	-	NA			



# Consistency

#### Time Series

not completed the time series from 1990

Cambodia, China and Vietnam

partly completed the time series

- Malaysia and Philippines.
- specific solutions for problems are planned.

### Methodology

 The estimation methods for GHG emissions are consistent in each country's inventory.

### Recalculations

The recalculations after the latest inventory submission

Japan, Korea, Malaysia and Philippines.

Continuous revision of the methodology are necessary for improvement of the inventory.

## **Accuracy**

- Next presentations will show you the accuracy of each inventory.
  - Methodology
  - EFs and Parameters
- Please find your interest on your hand-out materials!

## Accuracy (6A)

### ◆ Solid Waste Disposal on Land (6A)

- CO2
  - Cambodia and Mongolia : Tier 1 methods.
  - China: Tier 2 methods.

### CH4

### methodology

- Cambodia, Korea, Malaysia, Mongolia and Vietnam: Tire 1
- China, Japan, Philippines, Thailand: Tier 2 or Tier 3.

### parameters

- DOCs: Most countries use country-specific.
- k value: Japan and Thailand use country-specific
- MCFs: China and Thailand use country specific values.

# Accuracy (6B)

- ◆ Wastewater Handling (6B)
- CH4

### Methodology

- Cambodia, China, Malaysia, Mongolia and Vietnam: Tier 1
- Japan, Korea, Philippines and Thailand: Tier 2 or CS

### **Parameters**

- China and Malaysia use many country specific parameters.
- N2O

### Methodology

- Cambodia, China, Korea, Thailand and Vietnam: Tier 1.
- Japan and Philippines : Tier 2 or CS

# Accuracy (6C)

- **♦** Waste Incineration (6C)
- CO2

### Methodology

- Mongolia: Tire1
- Japan and Korea : Tier 2 or CS

#### **Parameters**

- Japan and Korea : many country specific parameters
- CH4

### Methodology

- China, Mongolia and Thailand: Tier 1
- Japan : CS
- N2O

### Methodology

Japan and Korea : Tier 2 or CS

### **Parameters**

Japan and Korea : many country specific parameters

# **Key Category Analysis**

- For most countries
  - CH4 emission from "Solid Waste Disposal on Land (6A)"
- For several countries
  - CH4 emission from "Wastewater Handling (6B)"
  - CO2 emissions from "Waste Incineration (6C)"
- Mongolia, Myanmar and Philippines did not report key category analysis.

			Cambodia	China	India	Indonesia	Japan	Korea	Lao	Malaysia	Mongolia	Myanmar	Philipines	Singapore	Thailand	Vietnam
	Solid Waste	CO2	L				-	-		-	NA	NA	NA		-	
6A		CH4	L	$\checkmark$			T	T		L	NA	NA	NA		L	L,T
	Disposar	N2O														
	Wasta Water	CO2													-	
6B	Waste Water Handling	CH4	L	V			-	-		L	NA	NA	NA		L	T
		N2O	L				-	-		-	NA	NA	NA		-	
	Waste	CO2	L				L	L, T		-	NA	NA	NA		-	
6C	incineration	CH4	L				-	-		-	NA	NA	NA		-	
	lichieration	N2O	L				-	-		-	NA	NA	NA		-	
	Other (please	CO2					-	-		-	NA	NA	NA		-	
6D		CH4					-	-		-	NA	NA	NA		-	
	specify)	N2O					-	-		-	NA	NA	NA		-	

L: Key category of level assessment

T: Key category of trend assessment

Q: Key category of qualitative assessment

 Based on the above results, let's discuss the improvement for our inventory in Waste Sector!

Thank you!

### Theme 2

# Proposal for the Waste Sector WG in future WGIA; information sharing for the mitigation actions in waste sector and the inventory improvement

- Topics
  - Progress of Inventory improvement and solution for its problems
  - Mitigation actions as incentive of inventory improvement
- Theme of mitigation actions is an option for agenda of future Waste Sector WG.