

# **Workshop on GHG Inventories in Asia**

– Review the past, Proposal for the future of WGIA-activity –

**Junko Akagi**

WGIA Secretariat

Greenhouse Gas Inventory Office of Japan (GIO)

Center for Global Environmental Research (CGER)

National Institute for Environmental Studies (NIES)

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# Outline

1. Review of the WGIA activities and SNCs
2. Proposal for the future of WGIA-activity

1. Review of the WGIA activities and SNCs

## **HISTORY OF WGIA**

# Background information

- ❑ The UNFCCC's ultimate objective is “stabilization of GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”
- ❑ National GHG inventory is needed to know the status of GHG emissions/removals
- ❑ National GHG Inventory also forms the basis of rational policy development, as it ...
  - ✓ identifies major emission sources where abatement will have a real impact,
  - ✓ reveals the effectiveness of applied mitigation measures,
  - ✓ helps us choose cost-effective mitigation options.
- ❑ All Parties to the UNFCCC are required to compile national GHG inventories as part of their National Communications. (UNFCCC Article 4 and 12)
  - ✓ Reporting year of GHG inventory (Decision 17/CP.8)  
1994 or 1990 for NC1 / 2000 for NC2

# Launch of WGIA



Many NAI Parties submitted NC1 around 2000.

- ✓ NAI Parties learnt many things through a national GHGI inventory preparation
- ✓ Transitional period to the NC2 preparation



It seems good to have a forum for efficiently improving inventory quality in Asia.



First “Workshop on GHG Inventories in Asia” in 2003

Submissions of 1<sup>st</sup> national communications

# Workshop on GHG Inventories in Asia (WGIA)

Objective:	To support countries in Asia to improve the quality of inventories via regional information exchange
Organizers:	Ministry of the Environment of Japan National Institute for Environmental Studies
Participating countries:	Cambodia, China, India, Indonesia, Japan, Republic of Korea, Lao P.D.R., Malaysia, Mongolia, Myanmar, Philippines, Singapore, Thailand, Vietnam (14 countries)
Participants:	One researcher and one government official from each participating country, UNFCCC Secretariat, IPCC, etc.
Style:	Annual workshop since 2003
Funds:	Ministry of the Environment of Japan

→ Current workshop style is still basically the same since WGIA1.

# WGIA 1-3 (2003-2006)

*Status: Transitional period (NC1 → NC2)*

## Agenda items

- ❑ How are the other countries doing?
  - ✓ Institutional arrangements
  - ✓ Estimation methodologies
  - ✓ Progress report on inventory preparation
- ❑ What have we learnt through the NC1 prep.?
  - ✓ Lessons learnt
  - ✓ Good practices
  - ✓ Problems, constraints
- ❑ What will we do next?
  - ✓ Future directions
  - ✓ Collaboration opportunities
- ❑ News from international organizations (e.g., UNFCCC and IPCC-NGGIP/TSU)
- ❑ Sector-specific discussions
  - ✓ Energy, Agriculture, LUCF, Waste (WGIA3)



WGIA1 in Thailand (2003)  
(30 from 11 countries and others)



WGIA2 in China (2005)  
(35 from 10 countries and others)



WGIA3 in Philippines (2006)  
(40 from 12 countries and others)

# WGIA 4-6 (2007-2008)

*Status: In a process of NC2 preparation*

## Agenda items

In addition to agenda items for WGIA1-3, ...

- ❑ Cross-cutting issues of GHG inventory
  - ✓ Uncertainty assessment
  - ✓ Time-series estimates
  - ✓ Awareness-raising
- ❑ Sector-specific discussions
  - ✓ Energy, Industrial Processes, Agriculture, LUCF, Waste
- ❑ Hands-on training
  - ✓ Key category analysis



WGIA4 in Indonesia (2007)  
(55 from 12 countries and others)



WGIA5 in Malaysia (2007)  
(55 from 13 countries and others)



WGIA6 in Japan  
(2008)  
(70 from 13  
countries and  
others)



# WGIA 7-9 (2009-2010)

*Status: Coming to the end of NC2 preparation process*

## Agenda items

In addition to agenda items for WGIA1-6, ...

- ❑ GHG inventory & mitigation
- ❑ Cross-cutting issues of GHG inventory
  - ✓ Data collection
- ❑ Sector-specific discussions
  - ✓ Energy, Agriculture, LUCF, Waste
- ❑ Hands-on training
  - ✓ Techniques how to fill data gaps
  - ✓ Simulation of Mutual learning
- ❑ Introduction of inventory-related activities in Asia
  - ✓ JICA
  - ✓ SEA GHG Project
  - ✓ Others
- ❑ Mutual learning (since WGIA9)
  - ✓ Energy, LUCF, Waste



WGIA7 in Republic of Korea (2009)  
(120 from 11 countries and others)



WGIA8 in Lao P.D.R. (2010)  
(90 from 13 countries and others)



WGIA9 in Cambodia (2011)  
(75 from 14 countries and others) 9

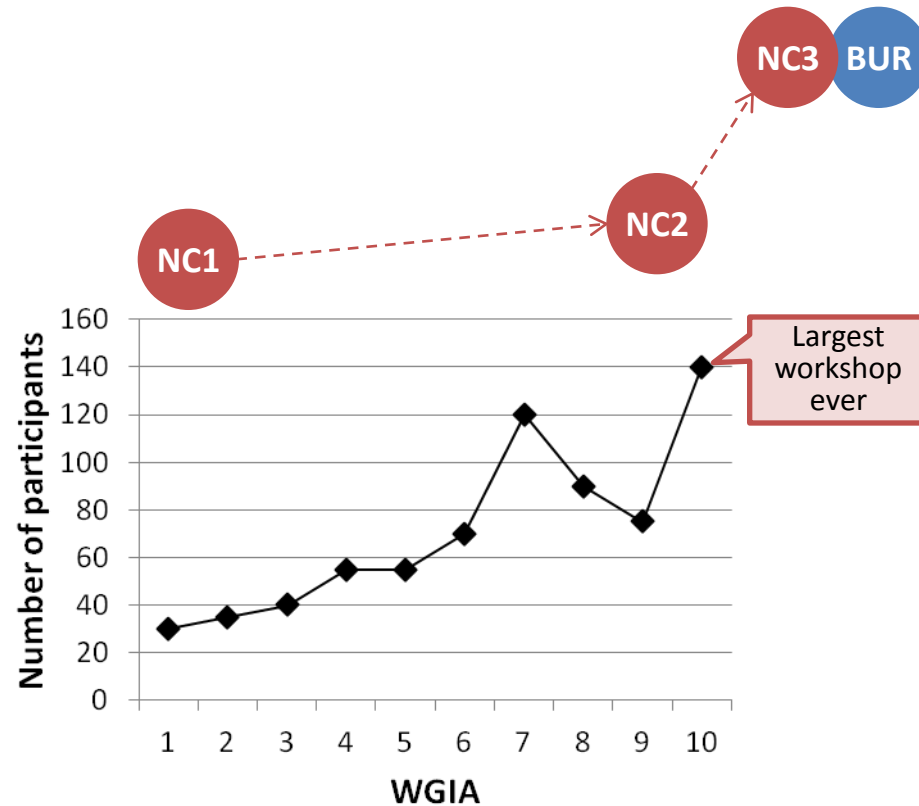
# WGIA 10 (2012)

*Status: Transitional period (NC2 → NC3 and also BUR)*

## Agenda items

In addition to agenda items for WGIA1-9,

- ❑ Proposal for the future
  - ✓ Review of WGIA activities
- ❑ Introduction of inventory-related activities in Asia
  - ✓ JICA
  - ✓ SEA GHG Project
  - ✓ US LEAD Program
  - ✓ Australia
- ❑ Mutual learning
  - ✓ Energy, Industrial Processes, Agriculture, Waste



# Achievements of WGIA

## ☐ Strengthened a network of regional experts

- ✓ Holding annual workshop
- ✓ Running a mailing list
- ✓ Creating a roster of regional experts\*
- ✓ Creating a WGIA emission factor database\*

**Extensive** information exchange among all participants (WGIA sessions)

**Intensive** information exchange among inventory compilers, etc. (Mutual learning)

## ☐ Dissemination

- ✓ WGIA website

<http://www-gio.nies.go.jp/wgia/wgiaindex-e.html>

- Presentations at each workshop
- Executive summary
- Workshop proceedings
- Activity report of WGIA (2006)

- ✓ Press release by MoEJ post workshop
- ✓ Organizing a side-event at SB24
- ✓ National/international conferences



1. Review of the WGIA activities and SNCs

# **PROGRESS IN MEMBER COUNTRIES**

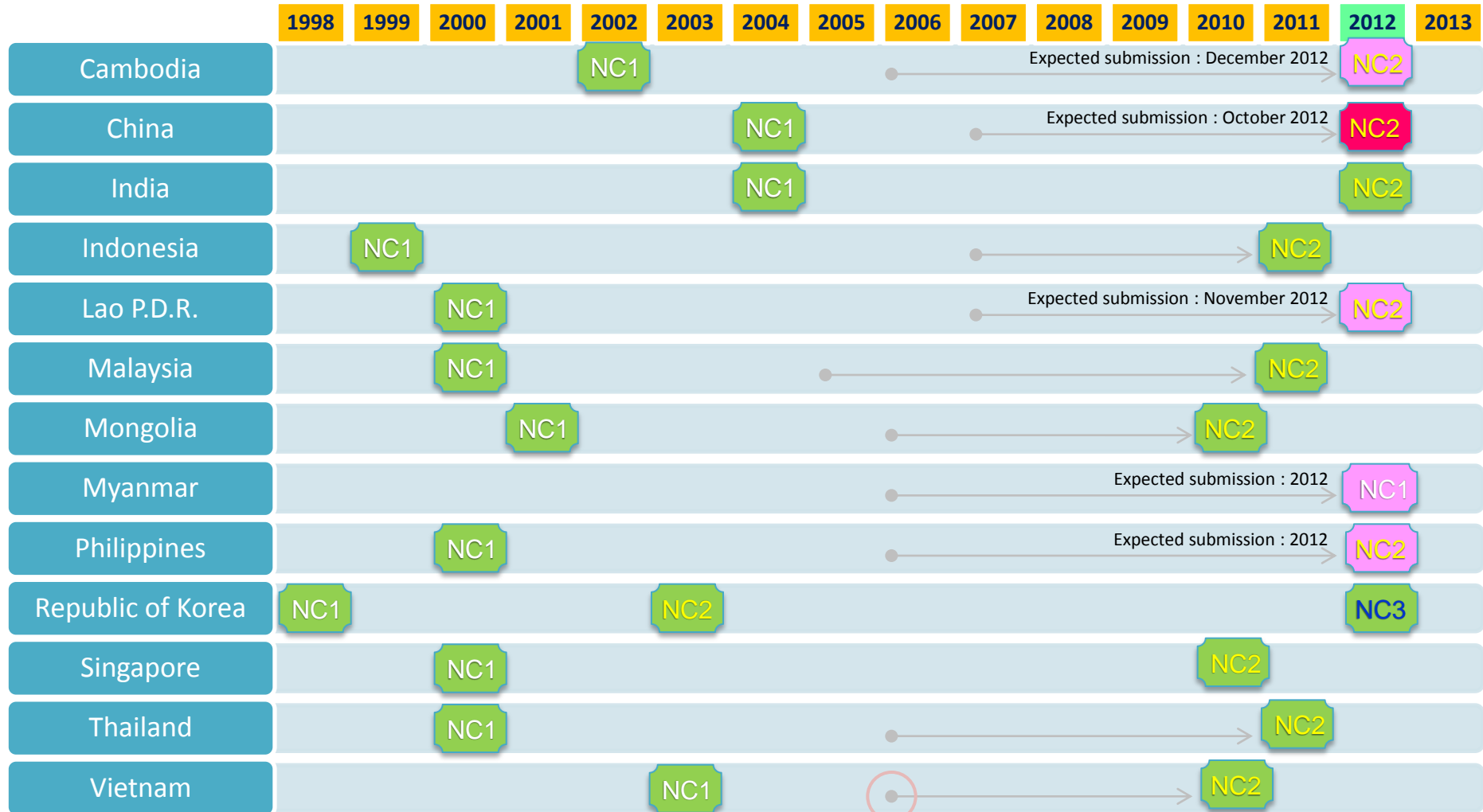
# NC\* Submission Status

Based on information provided in FCCC/SBI/2012/INF.7, etc.

NC submitted

Inventory: Completed

Inventory: Under prep.



\*NC: National Communication

Date of approval by Implementing Agency (IA) of most recent NC project

# Improvements & Good Practices (NC1 vs. NC2)

Viewpoint	Fact
Documentation & Transparency	<ul style="list-style-type: none"> <li>◆ More information is provided in the inventory chapter of NC2               <ul style="list-style-type: none"> <li>✓ <i>Description of institutional arrangements (incl. process and management of inventory preparation)</i></li> <li>✓ <i>Brief description of applied methodologies (incl. applied guidelines, AD, EF)</i></li> <li>✓ <i>Results of estimation (incl. comparison of NC1 and NC2 data, trends of emissions/removals (time-series data))</i></li> <li>✓ <i>Results of uncertainty assessment</i></li> <li>✓ <i>Results of key category analysis</i></li> <li>✓ <i>Brief description of QAQC</i></li> <li>✓ <i>Areas which have been improved compared to NC1 inventories</i></li> <li>✓ <i>Areas for further improvements in future inventories</i></li> <li>✓ <i>Possible ways to address constraints are indicated</i></li> </ul> </li>   <li>◆ Besides NCs, inventory reports are available for some countries.</li> </ul>

→ *Archiving more information helps next inventory team prepare new inventory.*

(Source of information)

- ✓ Initial and Second National Communications of WGIA member countries ([http://unfccc.int/national\\_reports/non-annex\\_i\\_natcom/items/2979.php](http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php))
- ✓ Technical reports provided by WGIA member countries
- ✓ Presentations at WGIA1-9

# Improvements & Good Practices (NC1 vs. NC2)

Viewpoint	Fact
Accuracy & Consistency	<ul style="list-style-type: none"> <li>◆ GPGs and 2006 GLs are applied in addition to 1996 Rev. GLs.               <ul style="list-style-type: none"> <li>✓ <i>Application of new or updated default EFs</i></li> <li>✓ <i>Higher tier methodologies are applied, especially to the major emission sources/ removal sinks of NC1</i></li> <li>✓ <i>Collection or development of country-specific EFs, etc.</i></li> </ul> </li> <li>◆ Key category analysis, uncertainty assessment, QA/QC are conducted.               <ul style="list-style-type: none"> <li>✓ <i>Implementation of internal peer reviews (technical and administrative)</i></li> </ul> </li> </ul>
Completeness & Comparability	<ul style="list-style-type: none"> <li>◆ Coverage of estimation has been increased;               <ul style="list-style-type: none"> <li>✓ <i>Sector / Categories / Sub-categories</i></li> <li>✓ <i>Geographical coverage</i></li> <li>✓ <i>Gases (especially IP sector CH<sub>4</sub>, N<sub>2</sub>O, F-gases and Waste sector N<sub>2</sub>O)</i></li> </ul> </li> </ul>

→ *Obviously extensive efforts were made for data collection.*

(Source of information)

- ✓ Initial and Second National Communications of WGIA member countries ([http://unfccc.int/national\\_reports/non-annex\\_i\\_natcom/items/2979.php](http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php))
- ✓ Technical reports provided by WGIA member countries
- ✓ Presentations at WGIA1-9

# Improvements & Good Practices (NC1 vs. NC2)

Viewpoint	Fact
Institutional arrangements	<ul style="list-style-type: none"><li>◆ Involvement of more people with different expertise</li><li>◆ Exercise of leadership and coordination by a governmental institution</li><li>◆ Definition of roles and responsibilities of each stakeholder</li><li>◆ Planning (e.g., selection of prioritizing categories, timeline)</li><li>◆ Management (e.g., holding stock-taking meetings on a regular basis)</li></ul>

→ *Establishment of an appropriate institutional arrangement for respective countries is essential for improving the quality of inventories.*

- ✓ If the preparation of inventory is needed on a regular basis (e.g., for BUR), systematic data collection flow and sufficient and timely funding are also needed.
- ✓ Use of standardized data collection forms would also enhance the compilation process.

(Source of information)

- ✓ Initial and Second National Communications of WGIA member countries ([http://unfccc.int/national\\_reports/non-annex\\_i\\_natcom/items/2979.php](http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php))
- ✓ Technical reports provided by WGIA member countries
- ✓ Presentations at WGIA1-9



# Lessons learnt

Viewpoint	Lessons
Process	<ul style="list-style-type: none"> <li>◆ Inventory preparation process is a continuous process of improving the reliability and consistency of inventory assessments.</li> </ul>
Data collection	<ul style="list-style-type: none"> <li>◆ Coordination and leadership by a governmental institution is needed;</li> <li>◆ Extensive efforts and resources are needed for adopting higher tier methodologies;</li> <li>◆ Systematic and centralized data collection flow is needed;</li> <li>◆ Security needs to be concerned by handling a confidential data;</li> <li>◆ QC is needed for the collected data, since provided data may not ...               <ul style="list-style-type: none"> <li>✓ fully match the inventory category;</li> <li>✓ be consistent due to revisions of classification, coverage, etc., even if provided by the same source;</li> </ul> </li> <li>◆ Data from different ministries may not be consistent due to different definition</li> </ul>
Institutional memory	<ul style="list-style-type: none"> <li>◆ Archiving is needed;</li> <li>◆ Different team produces different results, which means that lack of consistency, inefficient capacity development, etc. (but unavoidable?);</li> </ul>
Reporting	<ul style="list-style-type: none"> <li>◆ Use of different guidelines lowers the comparability of data among countries due to different presentation of categories;</li> <li>◆ Data of NC1 and NC2 are not readily comparable due to difference in coverage.</li> </ul>

(Source of information)

- ✓ Initial and Second National Communications of WGIA member countries
- ✓ Technical reports provided by WGIA member countries
- ✓ Presentations at WGIA1-9

# Constraints, limitations, challenges (General)

Viewpoint	Fact
Data availability	<ul style="list-style-type: none"> <li>◆ Data do not exist or not being collected in an organized manner</li> <li>◆ Data needed for a higher tier method are not easy to access due to confidentiality (need to ensure security to prevent disclosure of data)</li> </ul>
Data collection	<ul style="list-style-type: none"> <li>◆ Lengthy process of data collection due to lack of organized collection system</li> <li>◆ Hard to obtain organized data in desired formats for inventory</li> </ul>
EF development	<ul style="list-style-type: none"> <li>◆ Time and budgetary resources may not be sufficient for in situ measurements</li> <li>◆ Technical capacity is needed for the measurements</li> </ul>
Data management	<ul style="list-style-type: none"> <li>◆ Database is needed for data collection and archiving</li> </ul>
Sustainability	<ul style="list-style-type: none"> <li>◆ Institutional networking and coordination is needed</li> </ul>
Capacity	<ul style="list-style-type: none"> <li>◆ Institutional capacity: Awareness in climate change issues needs to be raised</li> <li>◆ Individual personnel capacity: Training is needed</li> </ul>
Policy and finance	<ul style="list-style-type: none"> <li>◆ Political support is needed</li> <li>◆ Timely support in finance</li> </ul>

*Taking into account the upcoming biennial update reports (BUR), “sustainability” may be considered as prioritized issues from now on.*

(Source of information)

- ✓ Initial and Second National Communications of WGIA member countries
- ✓ Technical reports provided by WGIA member countries
- ✓ Presentations at WGIA1-9

# Key categories of WGIA member countries

- NC1<sup>1</sup> (1990 or 1994): LUCF, Energy, Agriculture (Hardly any IP and Waste)
- NC2<sup>2</sup> (2000) : Almost same as NC1 but more IP and Waste

	India		Indonesia		Korea		Malaysia		Mongolia		Singapore		Thailand		Viet Nam	
	1994	2000	1994	2000	1990	2000	1994	2000	1990	2000	1994	2000	1994	2000	1994	2000
#1	1A1	1A1	5D	5B	1A2	1A2	5A	5A	1A1	1A1	1A1	1A1	5B	1A1	5B	5A
#2	4A	1A2	5B	5D	1A4	1A4	1A3	1A1	5C	4A	1A2	1A2	1A1	1A3	5A	5B
#3	1A2	4A	5A	5A	1A3	1A3	1A1	1A3	4A	5C	1A3	1A3	4C	5B	4C	4C
#4	4C	5A	5C	5E	1A1	1A1	6A ●	1A2	5B	1A3			1A3	5C	5C	5D
#5	1A3	1A4	1A1	6B ●	5A	5A	1B2	6A ●	5A	1A4			1A2	1A2	5D	1A2
#6	1A5	1A3	1A2	1A1	2A ●	2A ●	1A4	5B		5A			2A ●	4C	4D	4D
#7	1A4	4C	4C	5C	4C	2F ●	5B	1B2		4D			4A	2A ●	1A2	1A3
#8	2C ●	4D	1A3	1A2	6B ●	6A ●	4C	2A ●		1A2			4D	5A	1A4	1A1
#9	4D	2A ●	1B2	1A3		2B ●	2A ●	1A4		5B			1A4	1A4	4A	1A4
#10	2A ●	6B ●	1A4	1A4		4C		2C ●					4B	4A	5E	4A
#11	4B	2B ●	4A	4C										4D	1A1	2A ●
#12	5D		4D	2A ●										4B	1A3	5C
#13	5B			1B2										6A ●	2A ●	6A ●
#14	2B ●			4D											4B	4B
#15	5A			6A ●											1A5	1A2
#16				4A											4F	2C ●
#17				1A5												6B ●

*Energy, Agriculture and LULUCF are still prioritized categories for improvement*

■ : Energy, ■ : IP, ■ : Agriculture, ■ : LUCF, ■ : Waste

Reference:

<sup>1</sup> Chisa Umemiya & Tomoyuki Aizawa, Identification of regionally-significant source/sink categories in Asia, 2<sup>nd</sup> Workshop on GHG Inventories in Asia, 7-8 Feb 2005, Shanghai, China. ([http://www-gio.nies.go.jp/wgia/wg2/pdf/2\\_13\\_1610.pdf](http://www-gio.nies.go.jp/wgia/wg2/pdf/2_13_1610.pdf))

<sup>2</sup> Initial and Second National Communications of each country

## 2. Proposal for the future of WGIA-activity

# **POSSIBLE FUTURE ACTIVITIES**

# WGIA activities beyond the 10<sup>th</sup> anniversary

- ❑ Based on the review, priority areas are:
    - Energy / Agriculture / LULUCF *Note: IP and Waste may be matter of data availability*
    - Institutional arrangements for sustainable inventory development
    - QA/QC
  - ❑ WGIA continues supporting the WGIA member countries to improve the quality of inventories through the following approaches:
    - Information exchange
    - hands-on training
    - mutual learning
- The WGIA Secretariat would like to define our activity clearly and propose Terms of Reference of WGIA (draft) on the occasion of its 10<sup>th</sup> anniversary, in order to make the workshop more meaningful for all participants and run it more efficient manner.

*Development of regional database\* may be considered again upon requests by participants (but need time for considerations)*

# WGIA Terms of Reference (Draft)

## Background

1.-5. Please see handouts

## Objective

6. This workshop aims at assisting countries in Asia to improve the quality of their greenhouse gas inventories and build capacity for the inventory preparation by promoting the exchange of information and experiences obtained in the region.

## Scope

7. This workshop deals with matters related to greenhouse gas inventories - specifically, information on methodologies for estimating greenhouse gas emissions and/or removals; matters related to emission factors and activity data utilized for the estimation; and the development of institutional arrangements that make it possible to prepare accurate inventories in a sustainable manner.
8. The participating countries are Cambodia, China, India, Indonesia, Republic of Korea, Japan, Lao People's Democratic Republic, Malaysia, Mongolia, Myanmar, Philippines, Singapore, Thailand and Viet Nam.

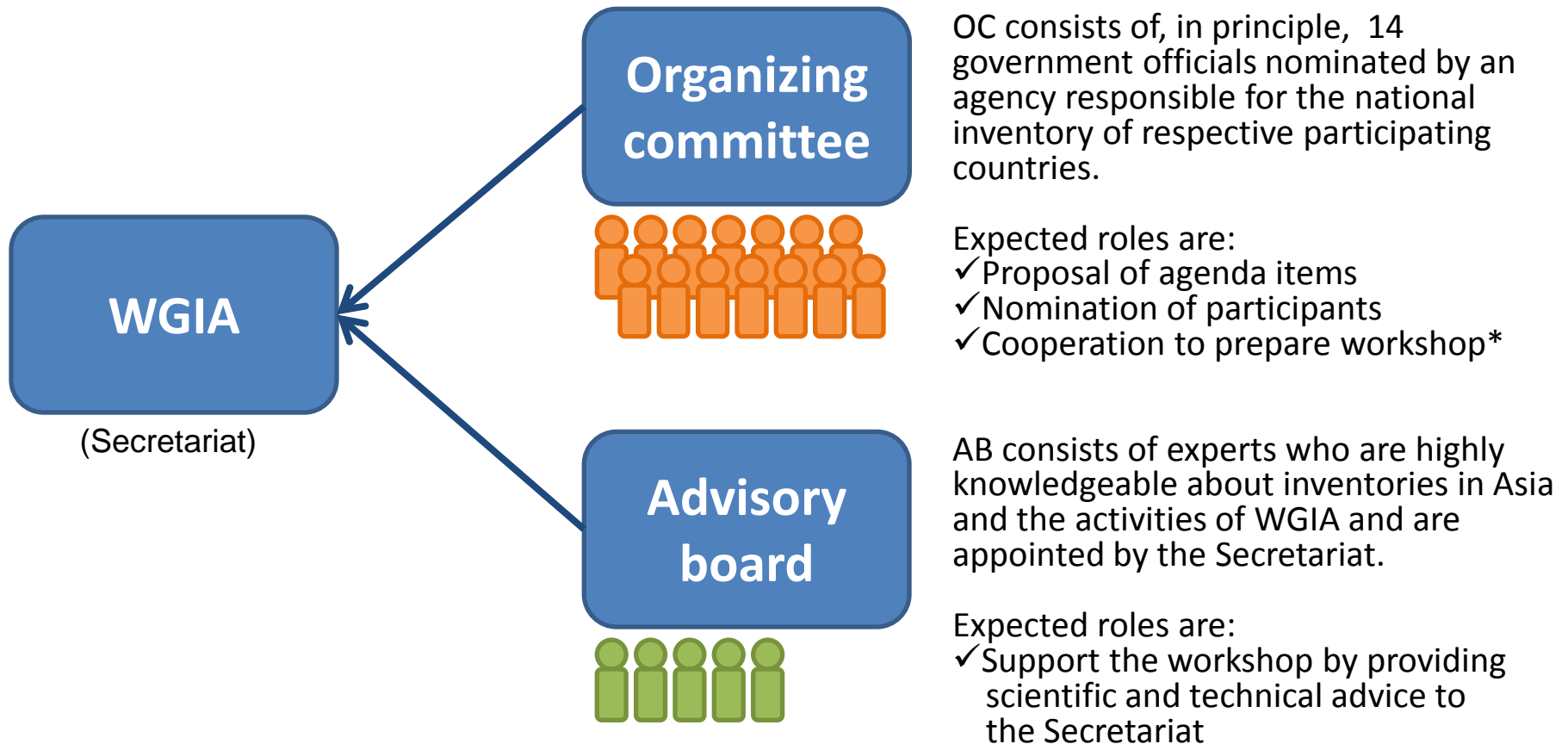
# WGIA Terms of Reference (Cont.)

## Approach

1. Under the auspices of the Ministry of the Environment of Japan and the National Institute for Environmental Studies, the Greenhouse Gas Inventory Office of Japan serves as the Secretariat, organizes the workshop - in principle every year - and registers participants.
2. In principle, participants are government officials and inventory compilers or researchers, who are directly involved with inventory preparation in the participating countries.
3. In cases where persons from countries other than those listed in paragraph 8 are interested in participating in the workshop, the Secretariat can accommodate such person's attendance in the capacity of observers.
4. The workshop venues rotate among the participating countries in order to raise awareness of persons involved in the inventory preparation in the countries.
5. The Secretariat prepares the agenda, which contributes to inventory improvements in Asia, through consultation with [the Organizing Committee \(OC\)](#) and [the Advisory Board \(AB\)](#) members, and runs the workshop. The OC consists of, in principle, one government official nominated by an agency responsible for the national inventory of respective participating countries, and acts in the role of liaison between the Secretariat and respective countries. The OC considers and proposes agenda items to the Secretariat, and coordinates the nomination of participants from respective countries. When it is the turn of a particular country to act as the venue for a workshop, the OC cooperates with the Secretariat to prepare for the workshop. The AB consists of experts who are highly knowledgeable about inventories in Asia and the activities of WGIA and are appointed by the Secretariat. The AB supports the workshop by providing scientific and technical advice to the Secretariat.

New  
proposal

# WGIA Organizing committee & Advisory board



- To set workshop agenda taking into account opinions from wide range of stakeholders
- To organize workshop more smoothly



# WGIA Terms of Reference (Draft)

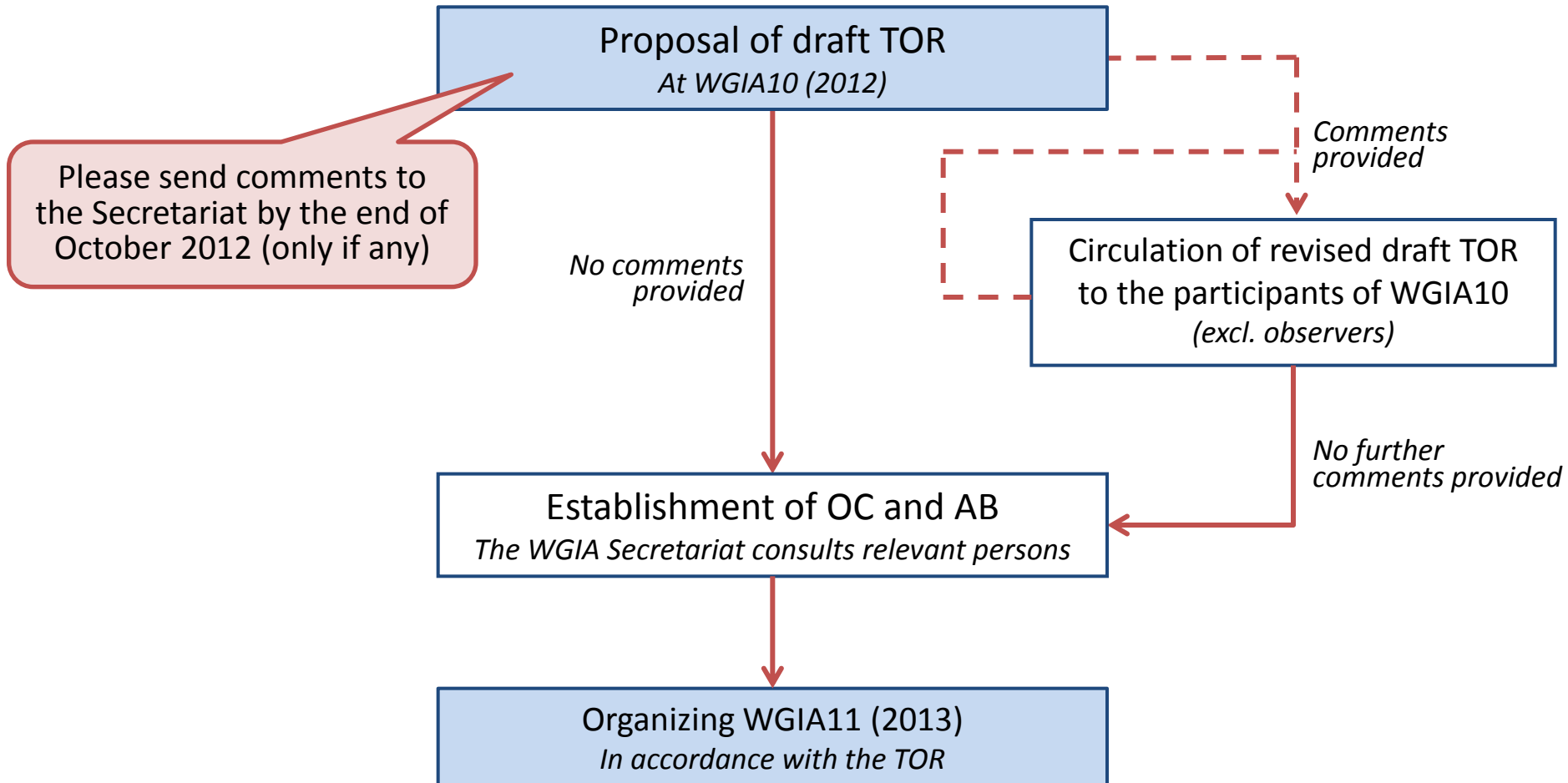
## Outputs

14. After closing the workshop, the executive summary of the workshop is published on the WGIA website. In addition, the Secretariat summarizes the outcomes in the form of workshop proceedings and publishes them on the WGIA website.

## Revision

15. If the necessity to revise the TOR arises, it will be revised after proposal of revised TOR prepared by the Secretariat is shared to a workshop.

# Schedule until WGIA11



# Summary

- ✓ WGIA contributed to improve inventory quality in Asia through enhancing communication among experts and dealing with various inventory related topics;
- ✓ Based on the SNCs, each country has significantly improved the quality of inventory especially from the point of view of completeness;
- ✓ Energy, LULUCF and Agriculture sectors are still the key categories in the region;
- ✓ Taking into account the BUR, topics related to the institutional arrangements for the sustainable inventory preparation may need to be focused;
- ✓ WGIA will be held continuously by basically keeping the present style;
- ✓ Draft TOR including new two bodies (OC and AB) is proposed for setting agenda items relevant for participating countries and for smooth running of the workshop;
- ✓ If you have comments, please contact the WGIA Secretariat by the end of October 2012. The next WGIA is planned to be held in accordance with the TOR.

**Thank you**