

Proceedings of the 13th Workshop on Greenhouse Gas Inventories in Asia (WGIA13)

- Capacity Building for Measurement, Reporting and Verification -

4th-6th August 2015, Bali, Indonesia



Greenhouse Gas Inventory Office of Japan (GIO), CGER, NIES

Center for Global Environmental Research



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Foreword

The international community now recognizes increases in anthropogenic emissions of Greenhouse Gases (GHGs) as the primary cause of climate change and its impacts. The 5th Assessment Report published by the Intergovernmental Panel on Climate Change (IPCC) in 2013 stated that “the atmospheric concentrations of the greenhouse gases carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) have all increased since 1750 due to human activity.” Moreover, since 2012, many GHG observatories including Mauna Loa Observatory in Hawaii have noticed that the daily mean concentration or monthly mean concentration of CO₂ surpassed 400 parts per million (ppm) in May for the first time. In order to address mitigation and adaptation to climate change, all of us on the globe have been making more efforts than ever in both scientific and political fields.

Furthermore, “Measurement, Reporting and Verification”, abbreviated as MRV, are important for ensuring the transparency and accuracy of each country’s mitigation actions by quantifying anthropogenic GHG emissions. In this respect, national GHG inventories, which provide information on GHG emissions and their trends over time, play a critical role as a basis for decision makers to design and implement strategies of their countries’ mitigation actions for reducing GHG emissions.

In order to support the enhancement of capacities for national GHG inventories in Asian countries, the National Institute for Environmental Studies (NIES) has been organizing the “Workshop on GHG Inventories in Asia” (WGIA) annually since November 2003 with the support of the Ministry of the Environment of Japan (MOEJ). This workshop supports government officials, compilers, and researchers in the Asian countries to develop and improve their GHG inventories through enhancing regional information exchange. The Greenhouse Gas Inventory Office of Japan (GIO), affiliated with the Center for Global Environmental Research (CGER), NIES, has functioned as the Secretariat for this workshop since its first session.

This CGER report serves as the proceedings of the 13th WGIA, which was held from August 4th to August 6th 2015, in Bali, Indonesia. We hope that this report will be useful for all those who work in the field of GHG inventory as well as climate change, and will contribute to the further progress of inventory development in Asia.



Hitoshi Mukai

Director
Center for Global Environmental Research
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Preface

An important lesson that we have learned from experience in the history of the UNFCCC is the importance of “Measurement, Reporting and Verification” (MRV). This includes measuring the effects of emissions reduction initiatives; reporting the results of the measurement on the international stage; and verifying the status of reductions. MRV ensures the transparency and accuracy of reports on each country’s mitigation actions.

For steady implementation of MRV, it is essential to develop national systems for preparation of national greenhouse gas (GHG) inventories and to improve the accuracy of the inventories. While frequent reporting of national GHG inventories as stated in the Cancun Agreements and Durban Outcomes encourages all Parties to consider improving their inventory quality and developing appropriate institutional arrangements and inventory preparation processes, the GHG inventories are also being accepted more and more as being valuable because the inventories support transparency and accuracy of implementation of the national mitigation actions in a MRV manner. Furthermore, GHG inventories also help form the basis for Intended Nationally Determined Contributions.

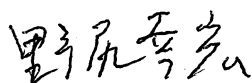
Since its first session in 2003, WGIA have been held thirteen times so far. WGIA have contributed significantly to the construction and consolidation of a network of officials involved in GHG inventory preparation in Asian countries and other institutes, and to the identification and solution of common issues of relevance to the inventories.

This time, the 13th WGIA (WGIA13) was held from August 4th to August 6th, 2015 in Bali, Indonesia, as a capacity building workshop for MRV. The items set out for this workshop by taking into consideration the current situation of the member countries were all essential for the improvement of their inventories.

The outcomes of the WGIA13 are summarized in this report as Proceedings. It is our hope that this report will be found useful and will contribute to the further improvement of the GHG inventories of the WGIA-member countries.

In conclusion, we would like to thank all the attendees for their participation and active contribution to the success of the workshop.

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List of Acronyms and Abbreviations

| | |
|-----------------|---|
| AD | Activity Data |
| AFOLU | Agriculture, Forestry and Other Land Use |
| BR | Biennial Report |
| BUR | Biennial Update Report |
| BUR1 | The first Biennial Updated Report |
| CDM | Clean Development Mechanism |
| CGE | Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention |
| CGER | Center for Global Environmental Research |
| CH ₄ | Methane |
| CO ₂ | Carbon dioxide |
| COP | Conference of the Parties |
| CS | Country-Specific |
| DMHCC | Department of Meteorology, Hydrology and Climate Change, Vietnam |
| EF | Emission Factor |
| ETS | Emission Trading Scheme |
| FAO | Food and Agriculture Organization of the United Nations |
| F gases | Fluorinated gases |
| FY | Fiscal year |
| GEF | Global Environmental Facility |
| GHG | Greenhouse Gas |
| Gg | Giga gram (10 ⁹ g) |
| GIO | Greenhouse Gas Inventory Office of Japan |
| GIR | Greenhouse Gas Inventory and Research Center of Korea |
| GIZ | The German Organization of International Cooperation |
| GPG | Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories |
| GPG-LULUCF | Good Practice Guidance for Land Use, Land-Use Change and Forestry |
| GSO | General Statistic Office, Vietnam |
| HFCs | Hydrofluorocarbons |
| IAR | International Assessment and Review |
| ICA | International Consultation and Analysis |
| ICSD | Intercooperation for Sustainable Development, India |
| IGES | Institute for Global Environmental Strategies, Japan |
| INC | Initial National Communication |
| INCCA | Indian Network for Climate Change Assessment |
| INDC | Intended Nationally Determined Contribution |
| IPCC | Intergovernmental Panel on Climate Change |
| IPCC TFI TSU | IPCC, Task Force on National Greenhouse Gas Inventories, Technical Support Unit |
| IP | Industrial Processes |
| IPPU | Industrial Processes and Product Use |
| JCM | Joint Crediting Mechanism |

| | |
|------------------|---|
| JICA | Japan International Cooperation Agency |
| KECO | Korea Environment Corporation |
| KLHK | Ministry of Environment and Forestry, Indonesia |
| LCS | Low-carbon Society |
| LULUCF | Land Use, Land-Use Change and Forestry |
| MA | Multilateral Assessment |
| ML | Mutual Learning |
| MONRE | Ministry of Natural Resources and Environment, Vietnam |
| MURC | Mitsubishi UFJ Research and Consulting Co., Ltd., Japan |
| MRV | Measurement, Reporting and Verification Measureable, Reportable, and Verifiable |
| NAMA | Nationally Appropriate Mitigation Action |
| N ₂ O | Nitrous oxide |
| NC | National Communication |
| NDA | Non-disclosure agreement |
| NDRC | National Development and Reform Commission, China |
| NIES | National Institute for Environmental Studies, Japan |
| NIR | National Inventory Report |
| NMVOC | Non-methane volatile organic compounds |
| ONEP | Office of Natural Resources and Environmental Policy and Planning, Thailand |
| QA | Quality Assurance |
| QC | Quality Control |
| REDD | Reducing Emissions from Deforestation and forest Degradation in developing countries |
| REDD+ | Reducing Emissions from Deforestation and forest Degradation, and the Role of Conservation, Sustainable Management of Forests, and Enhancement of Forest Carbon Stocks |
| SBI | Subsidiary Body for Implementation |
| SIGN center | Sistem Inventarisasi Gas Rumah Kaca Nasional (National Greenhouse Gas Inventory System) center, Indonesia |
| SNC | Second National Communication |
| TA | Technical Analysis |
| TACCC | Transparency, accuracy, completeness, consistency and comparability |
| TGO | Thailand Greenhouse Gas Management Organization (Public Organization) |
| TNC | Third National Communication |
| TTE | Team of Technical Experts |
| UN | United Nations |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UNDP | United Nations Development Programme |
| USEPA | United States Environmental Protection Agency |
| WGIA | Workshop on Greenhouse Gas Inventories in Asia |
| 1996 IPCC GLs | Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories |
| 2006 IPCC GLs | 2006 IPCC Guidelines for National Greenhouse Gas Inventories |

Photos of the Workshop

Welcome Address



Ms. Kirsfianti Linda Ginoga

Overall Chairperson



Dr. Yukihiro Nojiri

Closing Remarks



Mr. Dida Migfar Ridha

Chairpersons for Plenary Sessions
Opening Session



Ms. Emma Rachmawaty

Session I



Mr. Takahiko Hiraishi

Session II



Dr. Sirintornthep Towprayoon

Session III



Dr. Rizaldi Boer

Session IV



Dr. Sumana Bhattacharya

Mutual Learning Sessions
General



LULUCF



Agriculture



Waste



Discussions in the Plenary Sessions



Registration



Meeting Room for Plenary Sessions



Information Exchanges in Reception & Tea Breaks



1. Executive Summary of WGIA13

1. Executive Summary of WGIA13

Executive Summary of WGIA13

The Ministry of the Environment of Japan (MOEJ) and the National Institute for Environmental Studies (NIES) convened, together with the Ministry of Environment and Forestry of Indonesia, the “13th Workshop on Greenhouse Gas (GHG) Inventories in Asia (WGIA13)” from August 4th (Tuesday) to 6th (Thursday), 2015, in Bali, Indonesia.

The annual workshops have been held since 2003 in order to support non-Annex I (NAI) Parties in Asia to develop and improve their GHG inventories and to facilitate the enhancement of cooperative relationships towards improving the accuracy of national GHG inventories in the Asian region.

In this workshop, various themes related to GHG inventories, including Biennial Update Reports (BURs) to be submitted by NAI Parties every two years, and International Consultation and Analysis (ICA) activities were discussed and Mutual Learning sessions on GHG inventories were conducted. This workshop has succeeded in enhancing capacity building on Measurement, Reporting and Verification (MRV) to submit BURs including GHG inventories continuously and strengthening the network of Asian countries.

In total, 108 participants from thirteen countries (Brunei, Cambodia, China, India, Indonesia, Japan, Lao PDR., Malaysia, Mongolia, Myanmar, Republic of Korea, Thailand, and Vietnam), attended WGIA13, including government and research representatives in addition to representatives of the Technical Support Unit of the IPCC Task Force on National Greenhouse Gas Inventories, Technical Support Unit (IPCC TFI TSU), the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC), Food and Agriculture Organization of the United Nations (FAO), and others.

The WGIA13 this year was the first WGIA following BUR submissions by non-Annex I Parties and the first round of ICA process. Therefore, in this workshop, BUR and ICA were major topics of discussion. Through the discussions, participants shared the recognition that institutional arrangements were important for the continuous preparation of GHG inventories and submission of BURs. In addition, it was recognized that accurate GHG inventories contributed to planning each nation’s GHG emission mitigation strategies.

The objectives of the workshop were:

- To enhance sector-specific capacity for inventory compilation (mutual learning),
- To facilitate periodical national GHG inventory preparation for national communications (NCs) and BURs,
- To enhance the understanding about ICA of BUR,
- To explore good practices for further improvement of continuous GHG inventory compilation,
- To promote international activities related to GHG inventory preparation, mitigation actions and MRV.

The presentations and discussions on each session are summarized below.

Opening session

As host countries, the Japanese and Indonesian governments individually made welcome addresses and presentations. Japan presented its climate change policies including Intended Nationally Determined Contributions (INDCs), which indicates the GHG reduction target

after 2020 and which is required to be submitted well before the 21st Conference of the Parties (COP21), and expressed the current status in Japan. Then, Indonesian climate change policies including reduction plans were presented.

In the discussion, it was confirmed that cooperation among related ministries and inventory experts in the inventory compiling process was important. Participants shared the recognition that accurate GHG inventories in NCs and BURs led to a better understanding of the current national status and they contributed to the planning of mitigation strategies for INDCs.

Preparation of NCs and BURs by non-Annex I (NAI) Parties

COP decided that NAI should submit a BUR every two years, and that their first one should be submitted by December 2014. A representative of the UNFCCC secretariat presented the role of the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (CGE) for the first BUR and ICA, and explained what the CGE's role was. He also introduced training materials, developed by the CGE, to support the preparation BURs, including training program for the team technical experts (TTE) who undertake the technical analysis (TA) of BURs during the ICA process just launched in 2015. From this presentation, participants learned that the training of TTE members contributed to improving the capability of national experts. They recognized that it was important to increase the number of experts registered in the UNFCCC roster. In addition, India reported that its first BUR, which includes inter-annual GHG inventories, would be submitted shortly.

Progress made in BUR and the ICA process

Vietnam and the Republic of Korea talked about their BURs, which were submitted in December 2014. Following this, a member of IPCC TFI TSU, who is also a CGE member, explained how the TA for the ICA of BUR proceeds. The Ministry of the Environment of Japan presented its experience of the IAR process, which is an international assessment and review for Annex I countries, similar to the process of ICA for NAI. The presentation focused mainly on multilateral assessment (MA) which Japan has undertaken. In the session, participants discussed some mitigation actions that were described in the BURs of Korea and Vietnam. It was reported that direct communication between each nation and the TTE in the TA of ICA enabled identification of areas for capacity building.

Consistent and continuous inventory compilation

Japan presented its own experience of continuously compiling inventories, followed by China who introduced time-series of consistent inventory compilation. Then, Malaysia and Thailand reported their institutional arrangements to continuously prepare BUR which includes national GHG inventory. These arrangements are now being developed.

It was recognized that various methodologies had been used for data collection and calculation, depending on each nation's situation and its possibility to continuously compile inventory. The participants discussed how various errors in calculation could be avoided, and confirmed that it was important to set up various systems for quality control (QC) of inventories.

International Activities Contributing to GHG Inventories and Mitigation

JICA introduced the "Project of Capacity Development for Climate Change Strategy", including a pilot project for the waste sector, which is now being implemented in Indonesia. Following this was "JICA REDD+ Project", JICA's efforts to mitigate climate change in forest land. FAO reported FAO data which is useful for inventory compilation. Then, IPCC

TFI TSU introduced their recent activities which were conducted in light of improvement of the IPCC Guidelines.

NIES gave a presentation on the NMVOC emissions inventory which is encouraged to be reported in NC and BUR for NAI. After that, Institute for Global Environmental Strategies (IGES) introduced the development of NAMA and MRV Guidebooks which facilitate understanding of MRV. JICA presented support activities for the Joint Crediting Mechanism (JCM) projects in Indonesia.

Generally, a strong interest was shown by the participants in the details of what kind of support/resources were available and what kind of related activities were undertaken. It was noted by the participants that further information was welcomed especially with regard to NAMAs. It was also noted that non-mandatory gas emissions (e.g. F-gases, NO_x, CO, and NMVOC) from sources such as the electronics industry could be a possible topic for future discussions.

Mutual Learning of each sector's GHG inventories

The purpose of Mutual Learning is to improve GHG inventories by providing details of methods and data for GHG emission/removal estimations between two countries, and exchanging views on the methods and data. In this WGIA13 Mutual Learning sessions were held for cross-sectional sector (Vietnam and Japan), LULUCF sector (Cambodia and Mongolia), agricultural sector (Indonesia and Lao PDR), and waste sector (Myanmar and Republic of Korea).

The ML participants preliminarily exchanged their materials and questions to learn about the inventory and institutional arrangements of the counterpart country approximately two months before the workshop. They learned about specific issues and good practices in counterparty's inventory and clarified areas for improvement in their own inventory. They expressed interest to continue to participate in this programme in future WGIA's.

2. Workshop Report

2. Workshop Report

Please note that all presentation materials can be downloaded from the website of Greenhouse Gas Inventory Office of Japan (GIO):

<http://www-gio.nies.go.jp/wgia/wg13/wg13index-e.html>

2.1 Opening Session

The opening session was chaired by Ms. Emma Rachmawaty (Indonesia), and the rapporteur was Mr. Naofumi Kosaka (GIO).

The welcome address was delivered by Mr. Shigeyoshi Sato, officer of the Low-Carbon Society Promotion Office, Ministry of the Environment, Japan (MOEJ), followed by Dr. Kirsfianti Linda Ginoga, Director of GHG Inventory and MRV, Ministry of Environment and Forestry of Indonesia.

Mr. Hiroshi Ito (GIO) gave an overview of WGIA and introduced the organization of WGIA in progress, objectives, participants, and the agenda of WGIA13. The objectives of WGIA13 were:

- To enhance sector-specific capacity for inventory compilation;
- To facilitate periodical national GHG inventory preparation for NCs and BURs;
- To enhance the understanding about International Consultation and Analysis (ICA) of BUR;
- To explore good practices for further improvement of continuous GHG inventory compilation;
- To promote international activities related to GHG inventory preparation, mitigation actions and MRV.

He emphasized that enhancement of MRV activities using accurate inventories of NCs and BURs will contribute to planning and verifying NAMA.

Mr. Shigeyoshi Sato (MOEJ) made a presentation on Japan's climate change policies as well as the current situation of Japan. He reported on Japan's national GHG emissions based on the 2006 IPCC guidelines in fiscal year (FY) 2013; total emissions increased by 0.8% when compared to those of FY2005, and showed the reduction target of 26.0% by FY2030 compared to FY2013 (25.4% reduction compared to FY2005) (approximately 1.042 billion t-CO₂) in Intended Nationally Determined Contributions (INDC). Toward submission of INDC, it was approved by the Global Warming Prevention Headquarters' meeting on July 2, 2015, and public comments were called for. After the collection of public comments, INDC was approved by the Global Warming Prevention Headquarters, and submitted to the UNFCCC Secretariat on July 17, 2015.

Dr. Kirsfianti L. Ginoga (Indonesia) made a presentation on Indonesia's policies on climate change and the progress of the first BUR. She gave an overview of the roles of the Directorate General of Climate Change set by presidential and ministerial decree. She also showed the GHG emission reduction target of 26% by 2019 and the increase of resilience to climate change at the local level. Then, she reported on GHG emissions from 2000 to 2013, showed a vulnerability map and local action program in a village called Climate Village Program in Indonesia. Finally, she introduced the first BUR of Indonesia to be submitted by December 2015.

In the discussion, Japan's GHG emission trend and emission reduction target in INDC were raised. Mr. Sato described the impacts of the earthquake and nuclear accident in 2011. It was confirmed that Indonesia had the mechanism to facilitate communication with ministries and scientists. Participants shared the recognition that accurate GHG inventories in NCs and BURs led to a better understanding of the current national status and they contributed to the planning of mitigation strategies for INDCs.

2.2 Session I: Updates on the Preparation of the National Communications (NCs) and Biennial Update Reports (BURs) from non-Annex I Parties

This session was chaired by Mr. Takahiko Hiraishi, Institute for Global Environmental Strategies (IGES) and the rapporteur was Mr. Naofumi Kosaka (GIO).

Non-Annex I Parties shall, as per COP 16 decision, submit national GHG inventories as a part of their BURs or NCs every two years. An ICA process for the first BUR has begun in early 2015. Many participating countries have already started preparation for their BURs and/or NCs. In this session, a representative of the UNFCCC Secretariat presented the training materials developed by the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (CGE) for the preparation of BURs, and Team of Technical Experts (TTE) under the ICA. Additionally, India presented its current status of preparation for its first BUR.

Mr. Hiroshi Ito (GIO) made an introductory presentation of this session. He provided an overview of relevant articles of the Convention for NCs, first BUR and ICA of BURs. He also showed the submission status of NCs and BURs in Asian countries and a list of Global Environment Facility projects.

Mr. Dominique Revet (UNFCCC) gave his first presentation on the CGE Training Materials for the Preparation of BURs from non-Annex I Parties, which he explained in detail. He also mentioned that the CGE had organized three regional training workshops, between July 2014 and February 2015, where those training materials were used to support the preparation of the first BURs.

Mr. Dominique Revet (UNFCCC) gave his second presentation on the CGE Training Materials for the future TTE members. He explained that a training program for the technical experts who undertake the technical analysis (TA) of BURs was developed by the CGE. This first round of training was successfully conducted in April and May 2015.

Dr. Sumana Bhattacharya (India) gave a presentation on the Status of India's first Biennial Update Report (BUR). She gave an overview of the provisional BUR of India. She also showed their institutional arrangement, GHG inventory in 2010, mitigation actions and so on. She pointed out that approval to submit the first BUR by the Cabinet was awaited.

In the discussion, participants understood that joining the TTE training and experiencing the TA process as a member of TTE will help experts from each country to make GHG inventories. Since there are over 100 countries which have undertaken ICA, an increasing number of experts who have registered on the roster is important for conducting ICA.

Dr. Bhattacharya told that India's first BUR would include time-series estimates of GHG emissions and additional mitigation actions compared to the previous mitigation plan.

2.3 Session II: Progress Made in BUR and the ICA Process

This session was chaired by Dr. Sirintornthep Towprayoon (Advisory Board [AB]), King Mongkut's University of Technology Thonburi) and the rapporteur was Mr. Naofumi Kosaka (GIO).

Countries have started submitting BURs since December 2014. The first round of ICA process of these BURs started in May 2015. The topics of this session were similar to Session I: Updates on the preparation of the NCs and BURs from non-Annex I Parties, but the focus of this session was the progress after submission of the Technical Analysis (TA) of BURs.

Mr. Hiroshi Ito (GIO) made an introductory presentation of this session. He reported on the submission status from non-Annex I Parties in the world. He also gave an overview of the process of ICA for non-Annex I Parties and International Assessment and Review (IAR) for Annex I Parties.

Dr. Nguyen Phuong Nam (Vietnam) made a presentation on "Overview of the first BUR and Preparation for the Publishing of the National Inventory System in Vietnam". He overviewed Vietnam's first BUR submitted last December, including national circumstances, institutional arrangement, national GHG inventory 2010, GHG emission mitigation activities, and financial, technological and capacity needs and support received for mitigating climate change. He also pointed out that Vietnam was trying to establish a National GHG Inventory System through publishing a legal document.

Dr. Jongchul Bang (Republic of Korea) made a presentation on BUR of the Republic of Korea. He introduced the overall process to prepare national reports including institutional arrangement and the process of compilation of the third NC and the first BUR. Furthermore, he reported on the results of the questionnaire survey about mitigation actions during the TA under the ICA based on Korea's actual experience.

Mr. Kiyoto Tanabe (IPCC TFI TSU, member of the CGE) made a presentation on the Technical Analysis of BURs, as Part of the ICA Process. He introduced the experience of the first round of TA in May 2015, which he joined as a member of TTE. He gave the participants some pieces of advices on good practice which will facilitate successful ICA, such as indication of what is updated clearly, provision of basic information transparently, and preparation for Q&A sufficiently. Additionally, he stressed that it is advisable to take advantage of tele-conference with the TTE during the TA week in order to ensure good communication with the TTE which is crucial to identification of capacity building needs.

Lastly, Mr. Tsubasa Tomita (MOEJ) introduced Japan's experience of the IAR process. Japan submitted its 6th NCs and first BR in December 2013, and its IAR process has been completed. Although the objectives of ICA are different from that of IAR, NAIs could refer to the experience of IAR of Japan. He pointed out that cooperation and collaboration between the Ministry of the Environment and relevant ministries was enhanced through the IAR process.

In the first discussion, some mitigation actions, e.g. Emission Trading Scheme (ETS) and Target Management Scheme (TMS) in Republic of Korea were clarified. In the second discussion, the roles of TTE were confirmed. Mr. Tanabe pointed out that an analysis of the accuracy of EF and AD by the TTE is usually not easy. Therefore, it is important for concerned parties to improve transparency by explaining EF and AD in BURs. He also pointed out that identification of capacity building needs is one of the most important tasks of the TTE, for which direct communication between the TTE and countries (e.g. telephone conference, which is optional in the TA process) was helpful. Furthermore, follow-up activities after identifying capacity building needs were discussed. Support from international cooperative programmes such as the Global Support Programme funded by GEF, implemented jointly by UNDP and UNEP, and JICA projects may be considered as such activities.

2.4 Session III: Cross Cutting Issues (Institutional Arrangements for Consistency and Continuous Reporting)

This session was chaired by Dr. Rizaldi Boer (AB/ Bogor Agricultural University), and the rapporteur was Mr. Naofumi Kosaka (GIO).

First, Mr. Akira Osako (GIO) made an introductory presentation on this session. He explained the background of the session and expressed that in addition to the consistency within one inventory submission, consistency across submissions in different years has become important because the non-Annex I countries should now submit an inventory every two years since 2014. After the introductory presentation, based on the Japanese experience, he explained three key elements of the continuous reporting which are also effective for maintaining the consistency between each yearly inventory submission. These key elements are: 1) institutional arrangement; 2) inventory compilation schedule; and 3) inventory compilation procedures.

Prof. Mingshan Su (China) reported on the improvement of inventory preparation, especially consistency performance. China had paid special attention to consistency between the 1994 INC and 2005 SNC, and further attention is continuously paid to the TNC preparation. To improve the consistency, the GEF/UNDP capacity building project has been established and the basic statistics have been strengthening by National Bureau of Statistics of China. For example, China's energy and environment statistics have been improved during the last few years and they now provide a useful foundation for developing inventories. Also the National Center for Climate Change Strategy and International Corporation, which hosts the Department of Statistics and Assessment, has been established.

Dr. Yap Kok Seng (Malaysia) reported on the institutional arrangement for their national GHG inventory, which consists of sectoral working groups with an anchoring agency for each under the Ministry of Natural Resources and Environment. Although most of the required data are based on national statistics, a number of industrial process-related companies require non-disclosure agreements to be signed before the sensitive data are released. Data archiving is conducted based on flat files and these consist of three categories: raw data, calculation Excel sheets and inventory reports. Plans for improvement include use of the 2006 IPCC Guidelines for TNC and training of a larger pool of GHG inventory compilers.

Dr. Nattanich Asvapoositkul (Thailand) reported on their four-year improvement plan in the institutional arrangement based on experiences from previous inventories developed for INC and SNC. The first year's improvement activities were: 1) tracking all existing activity data related to GHG emissions; 2) exploring the data that have not been collected; 3) establishing a national coordinating entity with strong leadership at the national level to be leading institution for compiling all activity data from all sectors; 4) identifying leading agencies for each sector for compiling all activity data from the agencies under their command; 5) drafting an institutional structure for a national inventory system; 6) submitting the institutional structure to National Climate Change Committee; and 7) submitting institutional structure to the Cabinet.

After this report, questions and answers followed in this session. A notable question asked from the floor was regarding the use of experience of accurate, effective and efficient emission estimation systems. Several calculation systems were introduced by countries with advantages such as automatic calculation abilities and/or efficiency. Regarding the Japanese inventory, questions were asked as to: how to avoid human error in estimation files and how to assure the reliability of collected data QC checking procedures, automatic checking design in Excel files and collected data assuring processes.

Dr. Yukihiro Nojiri (GIO) mentioned that there were "centralized" and "decentralized" data collection systems. He said that the centralized data collection systems had benefits because the responsibility of each entity could be clearly assigned.

2.5 Session IV: International Activities Contributing to GHG Inventories and Mitigation

This session was chaired by Dr. Sumana Bhattacharya (AB/Climate Change and Environment Intercooperation) and the rapporteur was Mr. Naofumi Kosaka (GIO).

The topic of enhancing the network to support MRV at various levels was taken up in WGIA11 in Session V. In WGIA12, this topic was taken up again in Session IV.

In WGIA13, although under a different session name "International Activities Contributing to GHG Inventories and Mitigation," Session IV provided an overview of international activities contributing to GHG inventories and mitigation from the viewpoint of available support/resources and what kind of related activities that are undertaken, and explored what the challenges were and what might be done to deal with them. In this session, external experts gave presentations and participants exchanged views on various activities.

Ms. Elsa Hatanaka (GIO) introduced the background for the session, agenda, and possible points for discussion during the session.

Mr. Hiroyuki Ueda (MURC) started off the session with a presentation entitled "Overview of "Sub-project 3 of the Project of Capacity Development for Climate Change Strategies in Indonesia." He introduced how Sub-project 3 has supported Indonesia's efforts in enhancing capacity required to prepare a national GHG inventory. For example, a new "SIGN" center (national GHG inventory office) was established, with an Excel-based web software for direct data input from data providers. The JICA pilot project has also produced CSEFs from wastewater for some provinces in Indonesia.

Following this, Mr. Shigeru Takahara (JICA REDD+ Project) talked about JICA's efforts to mitigate climate change in the forest and land sector in Indonesia. The target provinces of the JICA REDD+ Project are West Kalimantan and Central Kalimantan, where in the former, a sub-national framework on REDD+ has been developed, and in the latter, the capacity for carbon monitoring has been enhanced at the provincial level. The Project findings will be referenced in the process of developing REDD+ implementation mechanisms at the national level.

Dr. Mirella Salvatore (FAO) presented capacity development activities in support of national GHG inventories implemented by FAO. She explained that through the provision of the FAOSTAT Emissions Database, with country-level estimates of GHG emissions based on FAOSTAT activity data and 2006 IPCC Tier 1 methodology, FAO has helped build knowledge on GHG emissions from the AFOLU sector across the globe. Regional and country level workshops/activities are undertaken to enhance their capacity in successfully addressing the reporting requirements of the UNFCCC. Several means have been produced to support countries: a manual to address data requirements, the E-learning courses to build a NGHGI, the AFOLU Emissions Analysis Tools, and the Learning tool on NAMAs in AFOLU sector.

Dr. Baasansuren Jamsranjav (IPCC TFI TSU) followed, by presenting recent activities of IPCC TFI. Among other activities, she explained about ongoing technical assessment work of TFI products including 2006 IPCC Guidelines. The 26th Meeting of the TFI Bureau convened in 2014 concluded that: 1) The 2006 IPCC Guidelines provide a technically sound methodological basis for national greenhouse gas inventories, and therefore fundamental revision is unnecessary; 2) To keep the validity of the 2006 IPCC Guidelines, certain refinements may be required, taking into account scientific and other technical advances that have matured sufficiently since 2006; and 3) More in-depth technical assessments should be undertaken. The technical assessment work has been undertaken through the combination of an on-line questionnaire survey and expert meetings.

Dr. Satoru Chatani (NIES) made a presentation on estimating NMVOC emissions in Japan, China, and India. He explained how precursors such as NMVOCs played an important role in the formation of tropospheric ozone and secondary aerosols in the atmosphere, and why they were important from the viewpoint of radiative forcing. He noted the difficulty of estimating NMVOC emissions, due to the necessity to consider the various fugitive sources, as well as combustion sources. Studies have revealed that NMVOC emissions from fugitive sources increased with economic growth whereas those from biomass combustion decreased.

Dr. Chisa Umemiya (IGES) introduced the development of NAMA and MRV Guidebooks by IGES and OECC in cooperation with various experts in the field. She also explained that a survey is ongoing to identify the state of NAMAs and MRV planning and implementation, the results of which will be reflected in future guidebooks.

Dr. Jun Ichihara (JICA CMEA Project) followed with a presentation entitled "The Current State of the Joint Crediting Mechanism and Relevant JICA Cooperation in Indonesia." He explained that the JCM aimed at contributing to sustainable development, by facilitating the diffusion of leading low carbon technologies and implementing mitigation actions. There are currently three JCM projects registered in Indonesia, and JICA's technical cooperation has helped establish the JCM Secretariat.

Following the above presentations, some comments were given and questions were raised. Mr. Takahiko Hiraishi (IGES) proposed that the wastewater CSEFs produced in the JICA pilot project be submitted to the IPCC TFI Emission Factor Database. Mr. Takahara noted that the issue of community land rights was a challenge in the JICA REDD+ project, and Dr. Nguyen Phuong Nam (Vietnam) shared the experience in Vietnam where forest owner associations have been formed to take part in CDM projects. The possible complexity of mixing peat land issues and REDD+ in the Project was also pointed out by Mr. Takahiko Hiraishi (IGES). Ms. Takako Ono (IGES) noted that FAO provided its E-learning and other support based on the 2006 IPCC Guidelines instead of the required Revised 1996 IPCC Guidelines or the GPGs, and Dr. Mirella Salvatore (FAO) explained that this was because the 2006 IPCC Guidelines represented the most recent and robust inventory knowledge. Dr. Seungdo Kim (Republic of Korea) stated that the post-2020 transparency framework will be important, and Dr. Chisa Umemiya (IGES) noted in response that institutional arrangements for GHG inventories that are currently starting up may be the base for domestic response to it. On NMVOC emission estimations, Dr. Satoru Chatani (NIES) acknowledged that the input from industry organizations are large in Japan's case, for example, through the provision of EFs, and Dr. Sumana Bhattacharya (AB/Climate Change and Environment Intercooperation) noted that this may be a challenge for developing countries. Regarding JCM, interest was expressed in how post-2020 JCM might look like.

Generally, a strong interest was shown by the participants in the details of what kind of support/resources were available and what kind of related activities were undertaken. It was noted by the participants that further information was welcomed especially with regard to NAMAs. It was also noted that non-mandatory gas emissions (e.g. F-gases, NO_x, CO, and NMVOC) from sources such as the electronics industry could be a possible topic for future discussions.

2.6 Wrap-up Session

This session was chaired by Dr. Yukihiko Nojiri (GIO). In this session, the rapporteurs from the Mutual Learning session and plenary sessions provided summaries of the discussions including findings and recommendations, which were followed by the final discussion to conclude the workshop.

Summary of the Plenary Sessions

Mr. Naofumi Kosaka (GIO), the rapporteur of the plenary sessions, reported a summary of the presentations and discussions during the sessions.

Themes of the next WGIA were discussed after his report.

Mr. Atsushi Sato (MURC) raised the idea that it was useful for the participants to be informed of the changes in the MRV systems following COP21 held in December 2015.

The chair explained the purpose of including NMVOC inventories in the agenda of this WGIA as follows: he assumed that the personnel of GHG inventories might also be in charge of air pollutant inventories in some countries. Dr. Satoru Chatani (NIES) said that it would be appreciated if participants shared information on NMVOC inventories of their countries in future WGIA. Dr. Sirintornthep Towprayoon (AB) supported the statement that improvement of GHG inventories was also beneficial to air pollutant inventories: for example, activity data for GHG inventories could be shared with air pollutant inventories. She said that it would be

good to encompass air pollutant inventories in BUR.

The chair pointed out that several types of data collection system had been presented during this WGIA. Mr. Mone Nouansyvong (Lao PDR) emphasized the importance of discussing how effective institutional arrangements worked. Dr. Swapan Mehra (India) said that robust data systems that effectively collect, process and archive data should be discussed.

Mr. Takahiko Hiraishi (IGES) proposed an expansion of the scope of WGIA by considering how inventory compilers can contribute to related area such as NAMAs, BURs, NCs and INDCs.

Generally, participants recognized the importance of applying knowledge such as NMVOC inventories to GHG inventory and the importance of institutional arrangement.

Summary of the Mutual Learning

Dr. Takefumi Oda (GIO) presented the background and objectives of the mutual learning (ML) programme as well as the outcomes of past MLs. He also summarized the ML held in WGIA13. He concluded that the participants of the ML had clarified issues to be improved in their own inventories and that they showed interest to continue to participate in ML in future WGIAs.

The discussion after his report is summarized as follows.

Mr. Dominique Revet (UNFCCC Secretariat) explained a workshop plan in accordance with FCCC/SBI/2015/L.8. The planned workshop will deal with the use of the 2006 IPCC Guidelines, institutional arrangements and domestic MRV. The workshop will be held in three regions including Asia.

Mr. Kiyoto Tanabe (IPCC TFI TSU) proposed that the WGIA Secretariat made a summary report on the ML in order to follow up the outcomes of the ML conducted through the past several years. He suggested that the WGIA Secretariat conduct a survey regarding how each participating country addressed issues identified in the ML after the participants had returned to their countries and compile success stories.

Closing Remarks

The closing remarks were delivered by Mr. Dida Migfar Ridha, on behalf of the Director of GHG inventory and MRV, Indonesia and Dr. Yukihiro Nojiri, Manager of GIO, Japan. They thanked all for active participation. They believed that everyone renewed their determination to improve GHG inventories through participation in this WGIA.

3. Abstracts

3. Abstracts

3.1 Opening Session

Overview of WGIA 13

Hiroshi Ito

Greenhouse Gas Inventory Office of Japan (GIO/CGER/NIES), Japan

Abstract

The 5th Assessment Report published by the Intergovernmental Panel on Climate Change (IPCC) in 2013 stated that “the atmospheric concentrations of the greenhouse gases carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) have all increased since 1750 due to human activity. Under this situation, non-Annex I (NAI) Parties under the United Nations Framework Convention on Climate Change (UNFCCC) are also required to prepare Greenhouse Gas (GHG) inventories as a part of National Communications (NCs) and Biennial Update Reports (BURs) to be periodically submitted to the Conference of the Parties (COP) under the UNFCCC. Under the international circumstances, it becomes important to develop reliable GHG inventory of NAI countries and to enhance its further improvement.

To support developing and improving GHG Inventories of NAI Parties in Asia, the Workshop on GHG Inventories in Asia (WGIA) was organized by the Ministry of the Environment of Japan (MOEJ) and the National Institute for Environmental Studies (NIES), and has been held on annually since 2003. The participating countries are 14 countries (Cambodia, China, India, Indonesia, Japan, Republic of Korea, Lao PDR., Malaysia, Mongolia, Myanmar, Philippines, Singapore, Thailand and Vietnam). So far, WGIA achieved to strengthen a network of regional government officials and experts and to make website and proceedings.

The upcoming 13th Workshop on GHG Inventories in Asia (WGIA13) is to be held 4th-6th August 2015 in Bali, Indonesia. The WGIA13 aims:

- 1) to enhance sector-specific capacity for inventory compilation,
- 2) to facilitate national GHG inventory preparation for NCs and BURs,
- 3) to enhance understandings about International Consultation and Analysis (ICA) of BUR,
- 4) to explore good practice for further improvement of continuous GHG inventory compilation, and
- 5) to promote international activities related with GHG inventory preparation, mitigation actions and Measurement, Reporting and Verification (MRV).

Over 100 participants are expected to be present in this 13th workshop. Participants are government officials and researchers from 13 countries in Asia (the participating countries (excluding Philippines and Singapore) and Brunei) and are experts from international organizations (UNFCCC, the Technical Support Unit of the IPCC Task Force on National GHG Inventories (IPCC TFI TSUTFI TSU), the Food and Agriculture Organization of the United Nations (FAO)) and others.

Access to relevant information

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

Japan's Climate Change Policies

Shigeyoshi Sato

Ministry of the Environment, Japan

Abstract

The Ministry of the Environment, Japan (MOEJ), with the cooperation of relevant ministries, agencies and organizations, prepares Japan's national inventory and compiles supplementary information required under Article 7.1, which is annually submitted to the Conference of the Parties through the UNFCCC Secretariat in accordance with the UNFCCC and the Kyoto Protocol.

Last April, Japan has submitted its National Greenhouse Gas Emissions in fiscal year (FY) 2012 in accordance with the Act on Promotion of Global Warming Countermeasures. Total emissions in FY2012 were 1,343 million tonnes of carbon dioxide equivalents (Mt CO₂ eq.), a 6.5% increase compared to those of the base year under the Kyoto Protocol. The five-year average for total emissions during the first commitment period of the Kyoto Protocol (FY2008-FY2012) was 1,278 Mt CO₂ eq. (1.4% increase from base year), and the five-year average for removals by forest and other carbon sinks that can be used toward achieving the target was 48.7 Mt CO₂ eq. (3.9% of base year) Consequently, if the Kyoto mechanisms credits are taken into account, the five-year average shows an 8.4% decrease compared to the base year; therefore, Japan will have achieved its target for the first commitment period of the Kyoto Protocol (-6 % below base year level).

Last November, Japan has submitted its quantified economy-wide emission reduction target for 2020; 3.8% emission reduction in 2020 compared to the 2005 level. This was a target at that point, which had not yet taken into account the emission reduction effect resulting from nuclear power, given that the energy policy and energy mix, including the utilization of nuclear power, were still under consideration. A firm target, based on further review of the energy policy and energy mix will eventually be set.

In accordance with the Cancun Accord and the Durban Decision under the UNFCCC, last December, Japan has submitted its first Biennial Report (BR1) and 6th National Communication (NC6) based on its new greenhouse gas emission reduction target.

My presentation will show the outline of Japan's greenhouse gas emissions trends, policies and measures toward sustainable low-carbon society.

References

Ministry of the Environment, Government of Japan

Access to relevant information

<http://www.env.go.jp/en/index.html>

3.2 Session I

CGE Training Materials for the Preparation of Biennial Update Reports from non-Annex I Parties

Mr. Dominique Revet
UNFCCC Secretariat

Abstract

The Conference of the Parties (COP) at its 17th session adopted the guidelines for the preparation of biennial update reports (BURs) from non-Annex I Parties. These guidelines, contained in decision 2/CP.17 and its annex III, outline the objectives and scope of the information to be reported. The COP decided that non-Annex I Parties, consistent with their capabilities and the level of support provided for reporting, should submit their first BUR by December 2014, and that the least developed country Parties and small island developing States may submit BURs at their discretion.

COP 17 also decided that non-Annex I Parties shall submit a BUR 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.

The Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (CGE) developed in 2014, as per its 2014-2018 work programme, a set of training materials to facilitate the preparation of BURs. The CGE also organized three regional training workshops, between July 2014 and February 2015, where those training materials were used.

References

UNFCCC website
CGE web pages

Access to relevant information

http://unfccc.int/national_reports/non-annex_i_natcom/training_material/methodological_documents/items/7915.php

http://unfccc.int/national_reports/non-annex_i_natcom/training_material/methodological_documents/items/349.php

<http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf#page=39>

Updates on the preparation of Biennial Update Reports from non-Annex I Parties and relevant requirements and available resources

Mr. Dominique Revet
UNFCCC Secretariat

Abstract

The process of international consultation and analysis (ICA) consists of two steps: (1) the technical analysis of BURs and (2) a facilitative sharing of views among Parties. The process aims to enhance the transparency and accountability of information reported in BURs by non-Annex I Parties. The technical analysis of BURs will be conducted by a team of technical experts (TTE) and will be initiated within six months of submission to the secretariat.

COP 17 adopted the modalities and guidelines for ICA.

- (a) The first rounds of ICA will be conducted for developing country Parties, commencing within six months of the submission of the first round of BURs by developing country Parties;
- (b) The frequency of participation in subsequent rounds of ICA by developing country Parties, based on their respective capabilities and national circumstances, and special flexibility for small island developing States and the least developed country Parties, will be determined by the frequency of the submission of BURs;
- (c) To revise the modalities and guidelines prescribed herein based on experiences gained in the first round of ICA, no later than 2017;
- (d) That small island developing States and the least developed country Parties may undergo ICA as a group of Parties at their discretion.

Pursuant to decision 20/CP.19, paragraph 4, the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (CGE), developed a training programme for the technical experts nominated to the UNFCCC roster of experts who, upon successful completion of this training, shall be eligible to be part of the team of technical experts, to undertake the technical analysis of submitted biennial update reports (BURs).

This first round of training was successfully conducted in April and May 2015.

The training programme covers three clusters of training materials: (1) provisions on reporting information in the BURs and conducting technical analysis of BURs under the international consultation and analysis (ICA) process; (2) background materials covering methods and science on key themes addressed in BURs, and (3) provisions relevant to the technical analysis of a technical annex containing information on results-based actions relating to REDD-plus activities.

References

UNFCCC website

International Consultation and Analysis web pages

Access to relevant information

http://unfccc.int/national_reports/non-annex_i_natcom/reporting_on_climate_change/items/8722.php

http://unfccc.int/national_reports/non-annex_i_natcom/cge/items/8621.php

<http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf#page=43>

Status of India's first Biennial Update Report (BUR)

Sumana Bhattacharya
ICSD, India

Abstract

India is a Party to the UNFCCC. Towards fulfilment of its obligations under UNFCCC, India has submitted its 2 National communications, namely 1 and 2 in 2004 and 2012 respectively. It is in the process of finalizing its first Biennial Update Report. The reporting is being done as per paragraph 60 of decision 1/CP.16. The BUR is being prepared by Ministry of Environment and Forests and Climate Change. The first BUR will contain information on:

- National circumstances;
- GHG inventory
- Mitigation Actions
- Financial, Technology and Capacity Building Needs and support received
- Domestic measurements, reporting and verification arrangements and
- Additional information.

About 27 institutions who are also part of the Indian Network for Climate Change Assessment (INCCA) have contributed towards the various elements being reported. The report has gone through various steps of review, including peer review by participating experts, third party review, review by the different line ministries, review by the steering committee. Currently it is in the final stages of approval by the government before its submitted to UNFCCC. Cycle for developing the 2nd BUR and 3rd NATCOM already has started. The continuous engagement towards preparation of NATCOM and now BUR have provided India the opportunity for enhancing the quality of information provided and building capacity to address climate change.

References

India's Initial National Communication to UNFCCC
India's 2nd National Communication to UNFCCC

Access to relevant information

unfccc.int/resource/docs/natc/indnc1.pdf
unfccc.int/resource/docs/natc/indnc2.pdf

3.3 Session II

Overviewing of the first BUR and the preparation for publishing of National GHG Inventory System in Vietnam

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Ministry of Natural Resources and Environment*

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Abstract

Vietnam is a non-Annex I country, but we are showing our effort to contribute to solving the global challenges in Climate Change. The first Biennial Updated Report (BUR1) was submitted to UNFCCC in the December 9th, 2014 and that submission of Vietnam seemed to be one of the first countries in the world. The BUR1 has been conducted by Ministry of Natural Resources and Environment (MONRE), under the light of governmental policies issued to respond to climate change at national level. Decision No. 44/QĐ-TTg dated January 8th, 2014 by the Prime Minister expressed our strong will when approving the 2014 Policy Matrix under the Support Program to Respond to Climate Change (SP-RCC) to implement the BUR1 as one of the urgent activity last year. In general, the BUR1 contains four chapters with mainly reporting of the Greenhouse Gas (GHG) emission inventory of Vietnam for the base year of 2010. Besides, mitigation activities which were supported by international organizations in term of financial and technical support, and capacity building for Vietnam, were also mentioned in highlight.

Methodology for GHG inventory of BUR1 was including the revised 1996 Guidelines of Intergovernmental Panel on Climate Change (IPCC), the Good Practices Guidance (GPG) 2000 and GPG-LULUCF 2003. Activity data was collected from General Statistic Office (GSO), related Ministries and agencies, research institutes, entrepreneur. Institutional arrangements for GHG Inventory for the base years 2005 and 2010 was created by Department of Meteorology, Hydrology and Climate Change (DMHCC) under MONRE which ran by the projected mechanism with Technical Assistance (TA) support of JICA. Emission factors (EFs) for almost all sectors and sub-sectors were based on the IPCC default values. Only for rice cultivation sub-sectors, we used the country specific EFs.

The 2010 GHG Inventory resulted in the total of 246 millions tons CO₂-eq (including LULUCF) and 266 millions tons CO₂-eq (excluding LULUCF) showed that GHG emission from energy sector took the largest share (53.1%), and agriculture sector took the second largest (33.2%). The IP sector and waste sector took 8.0% and 5.7%, respectively. In a comparison with the GHG emission in the base years 1994, the total amount increased rapidly from 103.8 millions tons CO₂-eq to 246.8 millions tons CO₂-eq, with energy sector claimed the first place when increasing by 5.5 times higher. With the same tendency, the increase of total GHG emission is predicted by the projection and it shows that, for the year 2020 and 2030 the total amount of GHG emission would be 381 millions tons CO₂-eq and 648 millions tons CO₂-eq respectively.

The BUR1 also reported existing GHG mitigation activities in Vietnam. 253 CDM projects have been registered by the Executive Board (EB) with total GHG emission reduction of 137 million tons CO₂-eq (rank 4th in the world). 11 PoAs have been registered by EB from which received more than 10 million of CERs issued by EB (rank 11th in the world). On the other hand, gaps and constraints of Vietnam were given in the last chapter with the issues of financial,

technology and capacity needs and support received for climate change activities. The largest gap is the National GHG Inventory System (NIS) has not been officially established and a legal foundation for responsibilities of ministries and stakeholders in GHG Inventory was insufficient. Consequently, a research of DMHCC under Decision No. 1579 of MONRE Minister dated September 5th 2013 has tried to propose a suitable NIS for implementation of GHG inventory annually. Moreover, the preparation of Vietnam to publish the NIS is allocated by a policy action in the Policy Matrix of 2015 approving by the Decision No. 1277/QD-TTg dated July 8th, 2014 by the Prime Minister. The published NIS in 2016 will strengthen the implementation of GHG inventory in recent.

BUR of the Republic of Korea

Jongchul Bang

Greenhouse Gas Inventory & Research Center of Korea

Abstract

According to the decision taken by the 17th Conference of the Parties in Durban, non-Annex I Parties are requested to prepare and submit Biennial Update Report (BUR) every 2 years. Submission of the first BUR was expected by Dec 2014. Only 13 countries, however, have submitted their first BURs to the UNFCCC as of Mar 2015, which implies that still many developing countries seem to face difficulty in preparing the report.

This presentation will introduce the overall process for preparing national reports by the Republic of Korea for the purpose of sharing Korea's experience with other non-Annex I Parties that are planning to produce their own BURs. Several experts from government ministries and research institutes had participated in drawing up the report, and Greenhouse Gas Inventory and Research Center of Korea (GIR) played a central role in coordinating the whole process. Moreover, issues and questions raised by international experts concerning the BUR will also be discussed in the presentation. Up to now, Korea has received two questionnaires during the technical analysis process from experts of the UNFCCC, and the answers to the first questionnaire have submitted as of Jul 2015.

BUR contains several topics including national GHG inventory, mitigation actions and effects, financial assistance, technology transfer and so forth. However it should be noted that the content will mainly describe mitigation actions and effects providing the latest information including relevant key policies such as Target Management Scheme (TMS) and Emission Trading Scheme (ETS), and National GHG Mitigation Roadmap.

Access to relevant information

<http://www.gir.go.kr/eng/>

Technical Analysis of BURs, as Part of the International Consultation and Analysis (ICA) Process

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Abstract

International consultation and analysis (ICA) of biennial update reports (BURs) is an important process aiming to increase the transparency of mitigation actions and their effects by the Parties not included in Annex I to the UNFCCC (non-Annex I Parties). It should be conducted in a manner that is nonintrusive, non-punitive and respectful of national sovereignty, through technical analysis by teams of technical experts (TTEs) in consultation with the Party concerned and through a facilitative sharing of views.

The first round of technical analysis took place in May 2015, where 11 BURs were analyzed by 4 TTEs. This presentation explains the basics of technical analysis process, and gives some pieces of advice from a viewpoint of technical expert to the WGIA participants, based on the experience gained through the first round of technical analysis.

- It is important to clarify in the BUR what have been updated and what will be updated in the next submission. In particular, the information on what need to be improved is important for identification of capacity building needs and for continuous improvement.
- It is necessary to provide basic information transparently in BUR (preferably in NIR). A national GHG inventory which is not transparent will result in superficial technical analysis which is not useful to the Party itself.
- It is important to be well prepared for questions and answers before and during the week of technical analysis. Availability of relevant players (data providers, etc.) should be ensured so as to enable timely answers to questions from the TTE.
- It is advisable to take advantage of tele-conference with the TTE during the TA week. Good communication with the TTE is crucial to identification of capacity building needs, which will enable continuous and efficient improvement of national GHG inventory.

References

Decision 17/CP.8 “Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention”

Decision 2/CP.17 “Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention”

Access to relevant information

http://unfccc.int/national_reports/non-annex_i_natcom/items/2716.php

Japan's Experience : The International Assessment and Review (IAR), with a Focus on Multilateral Assessment (MA)

Tsubasa Tomita
Ministry of the Environment, Japan

Abstract

Biennial Reports (BR) submitted by Annex I Parties are subject to the International Assessment and Review (IAR) in accordance with the Decision 2/CP.17. The IAR consists of two processes which are Technical Review (TR) and Multilateral Assessment (MA).

The objectives of the IAR are, with a view to promoting comparability and building confidence, review of the progress made in achieving emission reductions, assessment of the provision of financial, technical and capacity-building support to developing countries, and assessment of emissions and removals related to quantified economy-wide emission reduction targets under the SBI.

Japan submitted its 6th National Communication (NC6) and first Biennial Report (BR1) to the UNFCCC at 27th December, 2013. The TR for BR1 and in-depth review for NC6 were conducted from 6 to 10 Oct, 2014, in Tokyo, Japan (in-country review). At MA Q&A stage, during between 1 and 31 March 2015, Japan received 32 questions from 10 Parties. And, the MA session for Japan was held at 4 June 2015 during the SBI42 in Bonn, Germany. Japan's MA session was about 50 minutes. Japan received a lot of questions from 10 Parties.

Japan could obtain useful suggestions on the quality improvement of BR2 which will be submitted by the end of 2015 through communication with the ERT and other Parties during the IAR process. Also, Japan could explain Japan's climate change policies to the international society through the presentation and Q&As at MA. MA is a valuable opportunity that a Party can explain its climate change policy and national circumstances at an official and open place under the UNFCCC. Japan's institutional arrangement such as the cooperation and collaboration between MOEJ and relevant ministries for the reporting and policy development was enhanced, too.

Party could gain various fruitful learning from the IAR process by trying to utilize this opportunity positively. The objective of ICA for developing countries is different from that of IAR. However, developing countries could gain useful experiences through the ICA process in the same way as Japan since the process of both are similar.

It is preferable that each country aim to introduce its actions to tackle climate change to international society as much as possible, enhances its institutional arrangement and capacity related to the reporting, and improves the quality of the future BUR and NC using this valuable opportunity.

Access to relevant information

<http://www.env.go.jp/en/index.html>

http://unfccc.int/national_reports/biennial_reports_and_iar/items/8825.php

3.4 Session III

“Towards continuous annual reporting of National Inventory” --- Japan’s Experience ---

Akira Osako
GIO, Japan

Abstract

Consistency is one of five important elements in preparation of the national GHG inventory. The objectives of consistency required are usually internal consistency for all reported years in all its elements across sectors, categories and gasses within one submission of the inventory. However the consistency between each submission year has also become important, because the biennial update report became mandate for the Non-annex I countries. In this presentation, based on the experience that the continuous annual reporting of the inventory in these several years was effective for the consistency between each yearly submission, Japan explains which elements in inventory compilation procedures were effective for the continuous annual reporting.

Based on the experience in the past, Japan considers that the major elements effective for continuous annual reporting of the inventory are; (1) Institutional arrangements, (2) Inventory submission schedule, and (3) Inventory compilation procedures.

- (1) In developing the institutional arrangement, all related organizations and persons and their roles should be clearly identified without omission or duplication, and all persons involved should understand their roles.
- (2) In developing the inventory submission schedule, all major works should be initially listed up in sequence, and each progress of the actual work should be checked against the initial schedule. If there was big difference, the schedule should be revised for next submission.
- (3) In developing the inventory compilation procedures, the information on all necessary data, the owners of the data, each data requesting work, etc. should be obtained and summarized by the entity in charge, and the various rules for emission estimation files should be set so that every inventory related personnel can easily understand the estimation. Also all the related documents made and used for the inventory compilation should be collected and archived concentratedly in one place, where the related staffs can easily access at any time.

Japan believes that the above information obtained by Japanese experience is also effective for the continuous annual reporting of national inventories by WGIA attending countries.

Access to relevant information

“*National Greenhouse Gas Inventory Report of Japan, April, 2015*” by Ministry of the environment, Japan and Greenhouse Gas Inventory Office of Japan (GIO), CGER, NIES (http://www-gio.nies.go.jp/aboutghg/nir/2015/NIR-JPN-2015-v3.0_web.pdf)

For consistence in China Greenhouse Gas Inventory

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Abstract

The national inventory of anthropogenic emissions by sources and removal by sinks of all GHGs is the main part of BUR. Decision 2/CP.17 adopted by the seventeenth session of the Conference of the Parties (COP) of the UNFCCC stipulates that “non-Annex I Parties, consistent with their capabilities and the level of support provided for reporting, should submit their first biennial update report by December 2014. In using the Guidelines, non-Annex I Parties should take into account their development priorities, objectives, capacities and national circumstances. Non-Annex I Parties shall 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. The first biennial update report submitted by non-Annex I Parties shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available, and that subsequent biennial update reports shall cover a calendar year that does not precede the submission date by more than four years”. Decision 2/CP.17 provides guideline for preparation of the biennial update reports from Parties not included in Annex I to the Convention. One objective of the guideline is to encourage the presentation of information in a consistent, transparent, complete, accurate and timely manner, taking into account specific national and domestic circumstances.

China greenhouse gas inventory team pays attention to it in the 2005 inventory in second national communication. We applied same methodology to that in 1994 inventory in first national communication. On the other hand, we have built a stable national inventory team to prepare China GHG inventory.

The team pays attention to it in the 2010 and 2012 inventory in third national communication capacity building project also. To prepare biennial update report NDRC of China applied to GEF for support in 2014. Prepare of 2010 GHG Inventory and 2012 GHG Inventory is the main work scopes in the project. According the experience in INC and SNC, inventory prepare for TNC will be done by a team comprised of experts in different fields. Therefore, 6 subcontracts are designed related to inventory preparation. According the UNDP procedure, Inventory for Energy Activity is subcontracted to NCSC. Inventory for IPPU is subcontracted to Tsinghua University. Inventory for Agriculture is subcontracted to China Academy of Agriculture Science and Institute of Atmospheric Physics of Chinese Academy of Sciences. Inventory for LUCF is subcontracted to Forest Ecology & Environment Institute of Chinese Academy of Forestry. Inventory for Waste Management is subcontracted to Chinese Research Academy of Environmental Sciences. Inventory database update is subcontracted to NCSC. Consistency and recalculation are project activities of energy inventory, industrial process inventory, agriculture inventory, land use, land use change and forestry inventory, waste management inventory.

Strengthen China basic statistics to better measure greenhouse gas emissions will improve consistency. The establishment of NCSC will improve stability and capacity of China inventory team and, as a result, will improve consistency of inventory.

References

ERI/NCSC, China 973 Program Report on climate change statistics, 2012.

Institutional Arrangements for Making Continuous GHG Inventory of BUR

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Abstract

A national GHG inventory system incorporates all the elements necessary to estimate GHG emissions and sinks. This ranges from the need of a central coordination agency, arrangements between agency and institutions, identification of technical experts, procedures for inventory development, inventory reporting to inventory archiving. In Malaysia, the institutional arrangements for national GHG Inventory is based on sectoral working groups, these being for energy, industrial processes, agriculture, LULUCF and waste sectors. The central coordination agency is the Division for Environmental Management and Climate Change at the Ministry of Natural Resources and Environment, Malaysia. The sectoral leads are Institute of Energy Policy and Research of UNITEN (a university) for the energy and industrial processes sectors, Malaysian Agriculture Research and Development Institute (MARDI) for the agriculture sector, Forest Research Institute of Malaysia (FRIM) for the LULUCF sector and the Department of Environment for the waste sector.

Availability of the required data remains a challenge for the GHG estimation. While most of the required data are based on compiled and published national statistics, data for the industrial processes sectors have to be sourced from the individual companies. A number of the companies require non-disclosure agreements (NDA) to be signed before the sensitive data are released for the GHG estimation. Consistency of published national statistics and those published by international organisations is another area of concern.

The GHG reporting follows closely the transparency, accuracy, completeness, consistency and comparability (TACCC) principles. Apart from internal quality assurance and quality control, reviews by experts are also sought wherever possible. Documentation of the national GHG inventory system is based on the USEPA templates.

Archiving of the GHG data and GHG inventory reports are currently based on flat file structure and these consist of 3 categories, the raw data, calculation excel sheets based on the revised 1996 IPCC guidelines and the inventory reports. For the Third National Communication the 2006 IPCC Guidelines for National GHG Inventories and software will be used for the GHG inventory estimation.

Plans for improvement includes having NDAs with the required data provides, rationalizing of data inconsistencies between national and international data sets, training of a larger pool of GHG inventory compilers and exploring of a review process with WGIA experts.

Thailand Institutional Arrangement for GHG Inventory

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Abstract

Thailand had submitted the Initial National Communication (INC) and Second National Communication (SNC) in 2000 and 2011 respectively. The first National Inventory as part of INC was estimated the greenhouse gas (GHG) emission of Thailand in 1994 and the second National Inventory as part of SNC was estimated the GHG emission of Thailand in 2000 and also estimated the GHG emission trend from 2000 to 2004. The estimation of GHG inventory in the past based on the data we compiled from related agencies and then estimated the emission for each sector. Since most of related data using for GHG inventory estimation were not archiving and some of them were not collected continuously. Consequently, we encountered with some discrete and missing data in some years.

In accordance with Articles 4 and 12 of the Climate Change Convention, non-Annex I Parties and the decision 2/CP17 of the United Nations Framework Convention on Climate Change, non-Annex I Parties to the Convention have to submit the reporting of national communications and the biennial update report which are including the two main components, national GHG inventories and the nationally appropriate mitigation action implemented by the non-Annex I Parties, to the UNFCCC secretariat. Thailand recognizes the urgency need for national GHG inventory institutional arrangement, thus we start to establish the national GHG inventory database schema for compiling the data related to GHG inventory estimation. The office of Natural Resources and Environmental Policy and Planning (ONEP) who responsible for preparing NC and BUR is currently studying the status of existing activity data that will be utilized for GHG emission estimation, and identify the agencies who will be responsible for data collecting. Then we first establish the data flow diagram. As our plan ONEP will responsible for the data center archiving for all activities data from 5 leading agencies and do the calculation for GHG inventory. The leading agencies of 5 sectors from related ministries and departments are ministry of energy, ministry of industry, ministry of agriculture, royal forestry department and pollution control department (under the ministry of natural resources and environment).

Recently, this GHG database schema has been approved by the National Board on Climate Change Policy and will be submitted to the cabinet soon then we can proceed to the next processes.

3.5 Session IV

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

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Abstract

In order to support Indonesia’s effort and challenge to tackle the issues of climate change, Japan International Cooperation Agency (JICA) is conducting a technical cooperation, “Project of Capacity Development for Climate Change Strategies in Indonesia” from 2010 to 2015 with Indonesian counterparts. Under this project, “Sub-project 3 of Project of Capacity Development for Climate Change Strategies in Indonesia (SP3 project)” is implemented to support GHG inventory activity in Indonesia from 2011 to 2015.

Main focuses of the SP3 project are:

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

This presentation introduces progress and achievements of the SP3 project.

Access to relevant information

- Web page of JICA Project of Capacity Development for Climate Change Strategies in Indonesia (<http://www.greenclimateproject.org/>)

JICA Effort to Mitigate Climate Change in Forest and Land Sector in Indonesia - IJ-REDD+ Project -

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IJ-REDD+ Project, Japan International Cooperation Agency (JICA)

Abstract

1. Background

The area of tropical forests in Indonesia is the third largest in the world providing rich biodiversity and ecosystem services. JICA (Japan International Cooperation Agency) has a long history of cooperation in Indonesia in the field of forest management and biodiversity conservation.

Recently, forests and peat land in tropical regions draw global attention as one of major sources of GHG emission. Reducing emission from deforestation and forest degradation (REDD+) has emerged as a potential mechanism for tackling this issue and Indonesia is recognized as one of the leading countries for establishing REDD+.

2. Outline of IJ-REDD+ Project

“Indonesia-Japan Project for Development of REDD+ Implementation Mechanism (IJ-REDD+)” is a technical cooperation project between Ministry of Environment and Forestry, Republic of Indonesia, and Japan International Cooperation Agency (JICA) for 3 years starting June 2013. IJ-REDD+ is aiming to support development of REDD+ mechanism and its enabling conditions in Indonesia through integrated approach of national, sub-national and site levels.

Target provinces of IJ-REDD+ will be West Kalimantan and Central Kalimantan. Kalimantan island is characterized with rich forest resources and fast deforestation rate. Both provinces have significant area of peat land, and, therefore, sustainable management of forests and peat land is a key to reduce emission reduction. In West Kalimantan, four districts, i.e. Ketapang, Kayong Utara, Kubu Raya, and Mempawah, are targeted districts of IJ-REDD+. In site level, Gunung Palung National Park and its landscape are the pilot site for developing a REDD+ model.

3. Purpose and Output of IJ-REDD+

Project purpose of IJ-REDD+ is to develop REDD+ implementation mechanism in West and Central Kalimantan. There are five outputs of IJ-REDD+. Activities are conducted according to the following 5 outputs;

Output 1: To support establishing the provincial level REDD+ mechanism including base map making and REL analysis for 4 districts, support for socialization and implementation of Provincial REDD+ Strategy.

Output 2: To support developing a REDD+ model in national park (Gunung Palung National Park) and its landscape, including collaborative management with communities in terms of conservation and sustainable management of forest, carbon monitoring, social and environmental safeguards, formulation of REDD+ Project Design Document.

Output 3: To support developing REDD+ models in production forests, protection forest and non-forest land.

Output 4: Activities under output 4 are carried out in Central Kalimantan, particularly focused on peatland MRV, including formulation of manual and trial calculation of estimation of peatland emission, utilizing the model of JICA-JST Project on Wild Fire and Carbon Management in Peat Forest (Hokkaido University)

Output 5: Activities under output 5 are conducted in national level and aimed to make the findings of IJ-REDD+ be referred to in the development of national level REDD+ mechanism.

Capacity development activities in support of National Greenhouse Gas Inventory by FAO-

Mirella Salvatore, Rocío Dánica Córdor-Golec, Fred Snijders, Heather Jacobs *Monitoring and Assessment of GHG Emissions and Mitigation Potential in Agriculture, Climate, Energy and Tenure Division*
Food and Agriculture Organization of the United Nations

Abstract

Agriculture faces major challenges under climate change. Projected changes in environmental conditions will affect the growing conditions of crops, livestock, fish and trees and thereby the livelihood, the food security of people, often the poorest. At the same time, the agricultural sectors also contribute to the emissions of greenhouse gasses and offer opportunities to sequester carbon.

In recent years, FAO developed the climate-smart agriculture (CSA) approach to address these interlinkages between food security and climate change. It is based on three objectives: sustainably increasing agricultural productivity and incomes; adapting and building resilience to climate change; and reducing and/or removing greenhouse gases (GHG) emissions, where possible.

FAO has been actively engaged in enhancing the knowledge on GHG emissions in the agriculture, forestry and other land use (AFOLU) sector, and in better quantifying the contribution of the sector to overall global emissions. One achievement of these efforts is the FAOSTAT Emissions database, the first database that provides yearly a full set of national AFOLU emissions estimates at global level.

At national level, significant challenges in monitoring and reporting GHG emissions from the AFOLU sector continue to hinder progress in determining and refining these estimates, especially in countries where the AFOLU sector represents a key component of the national economy and a driver of economic development. Considerable support to enhance capacity is needed to help these countries successfully address the reporting requirements of the UNFCCC, plan effective climate change responses and access international funding.

Through the *Monitoring and Assessment of GHG Emissions and Mitigation Potential in Agriculture* project, FAO has been providing dedicated support at regional, sub-regional, and national level. These activities include: facilitating national processes for institutional arrangements; providing guidance on national statistical processes for advancing data collection; giving technical assistance for developing a tier-1 National GHG Gas Inventory; performing quality assurance processes; and supporting the process for the formulation, implementation and monitoring of INDCs and NAMAs. While implementing these activities, FAO promotes synergies and complementarity with relevant international agencies and initiatives, including UNFCCC, UN-REDD Programme, IPCC and UNDP.

FAO has generated guidance and tools that can support countries in improving their inventories. The Manual for developing the AFOLU components of a Tier 1 National GHG Inventory and the release of the upcoming *AFOLU Emissions Analysis Tools* and *E-learning Course on Building a National GHG Gas Inventory for Agriculture and Land Use* will further supplement this growing suite of support products.

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FAO, 2014. *Agriculture, forestry and other land use emissions by sources and removals by sink*, ESS Working Paper No. 2, Rome (<http://www.fao.org/3/a-i3671e.pdf>).

Tubiello, F. N., Salvatore, M., Rossi, S., Ferrara, A., Fitton, N., Smith, P., 2013. *The FAOSTAT database of greenhouse gas emissions from agriculture*, *Environmental Research Letters* 8 (<http://iopscience.iop.org/1748-9326/8/1/015009>).

Access to relevant information

Monitoring and Assessment of GHG Emissions and Mitigation Potential in Agriculture Project website: <http://www.fao.org/climatechange/micca/ghg/en/>

FAOSTAT Emissions database: http://faostat3.fao.org/browse/G1/*E

Greenhouse Gas Emissions from Agriculture, Forestry and Other Land Use in Asia Infographic: <http://www.fao.org/resources/infographics/infographics-details/en/c/271649/>

Climate-Smart Agriculture: <http://www.fao.org/climatechange/micca/ghg/en/>

IPCC TFI: Recent Activities

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Abstract

The IPCC Task Force on National Greenhouse Gas Inventories (TFI) develops and promotes the IPCC guidelines and relevant tools for estimation and reporting of national greenhouse gas emissions/removals.

The TFI developed two new methodological reports in response to the invitation from UNFCCC: “2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands” and “2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol”. These reports were adopted/ accepted at IPCC Plenary at its 37th Session in Batumi, Georgia in October 2013, and published.

The work on technical assessment of IPCC Inventory Guidelines is ongoing, and it aims to assess where science and data availability have developed sufficiently since the *2006 IPCC Guidelines* to support the refinement or development of methodological advice for specific categories and gases, with a view to identifying any specific areas or issues to be prioritized. Another aim of the work is to conduct technical assessment on cross-sectoral issues, including improvement of user-friendliness of IPCC inventory tools with a view to contributing to capacity development programmes.

The work to maintain and improve the IPCC Emission Factor Database (EFDB) and IPCC Inventory Software has been progressing (e.g. new data have been added to the EFDB, expert meetings have been organized).

The TFI is continuing its other activities supporting users of the IPCC Guidelines and contributing to inventory-related capacity building programmes providing technical expertise as well as inventory-related materials developed by the IPCC TFI.

Access to relevant information

<http://www.ipcc-nggip.iges.or.jp/>

Estimating NMVOC emissions in Japan, China, and India

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Abstract

Emissions of precursors (carbon monoxide (CO), nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOCs), and sulphur oxides (SO_x)) as well as greenhouse gases (GHGs) should be provided to the United Nations Framework Convention on Climate Change (UNFCCC). These precursors play important roles in the complex photochemical reaction cycle and the formation of tropospheric ozone and secondary aerosols in the atmosphere. Tropospheric ozone and aerosols are critical pollutants and also have positive or negative radiative forcing. Recently, tropospheric ozone has received attention as one of “Short-Lived Climate Pollutant (SLCP)”.

Various non-combustion (fugitive) sources should be considered to estimate NMVOC emissions. Therefore, separate estimations from combustion sources are necessary. In Japan, the committee for NMVOC emission inventory has been established by the Ministry of the Environment since 2006 to manage the NMVOC emission inventory for air pollution controls. Its outcomes have been utilized in the task force on NMVOC for the GHG emission inventory. The target sources of the NMVOC emission inventory are fugitive sources including manufacturing (chemicals, etc.), storage and shipping (evaporated fuel), solvent (paint, printing ink, adhesives, dry cleaning, etc.), and other agent. Combustion sources are not included.

NMVOC emissions from all the fugitive sources in Japan for years 2000 and 2005-2013 have been estimated. Emissions have been gradually decreased due to current legislations and voluntary actions to reduce NMVOC emissions. Paint and evaporated fuel are major sources. When they are combined with the emissions from combustion sources estimated by other studies, fugitive sources contribute to 72% of all the anthropogenic NMVOC emissions in Japan in 2010.

We have also estimated NMVOC emissions from all the combustion and fugitive sources in China and India (Wei et al., 2008; Sharma et al., 2015). Contributions of biomass combustion including biomass fuel combustion in the domestic sector and agricultural open burning are relatively higher in China and India than Japan. However, their contribution will be decreased due to future possible changes in infrastructure and energy structure, and emissions from fugitive sources will significantly increase due to economic growth (Wei et al., 2014).

That implies major sources of NMVOC emissions are different in each country reflecting various aspects including their economic growth, infrastructure, energy structure, etc.

References

Sharma et al.: Emission inventory of non-methane volatile organic compounds from anthropogenic sources in India, *Atmos. Environ.*, 102, 209-219, 2015.

Wei et al.: Emission and speciation of non-methane volatile organic compounds from anthropogenic sources in China, *Atmos. Environ.*, 42, 4976-4988, 2008.

Wei et al.: Trends of chemical speciation profiles of anthropogenic volatile organic compounds emissions in China, 2005-2020, *Front. Environ. Sci. Eng.*, 8, 27-41, 2014.

Development of NAMA and MRV Guidebooks

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Abstract

Since the 2007 Bali Action Plan, Nationally Appropriate Mitigation Actions (NAMAs) have been developed and, to a lesser extent, implemented by developing countries. NAMAs are delivered in a measurable, reportable, and verifiable (MRV) manner. There are currently no international standards as to how to develop NAMAs and MRV systems for the NAMAs. This allows for countries to design diverse NAMAs and practice MRV in different ways. With the financial support from the Ministry of the Environment, Japan, IGES, together with OECC, started the development of NAMA and MRV Guidebooks in 2013, with the aim to collect information on existing NAMAs and MRV systems so that developing countries can enhance their understanding of NAMAs and MRV and adopt best practices. The NAMA Guidebook consists of technical and case-study parts: the former describes issues related to NAMAs in the context of latest UNFCCC negotiations; while the latter shows cases for the efforts of NAMA development and implementation in Asia and other regions. The MRV Guidebook takes a question-and-answer form to provide an easy-to-understand guide on existing MRV schemes, such as national greenhouse gas inventories and MRV for the Clean Development Mechanism (CDM) and the Joint Crediting Mechanism (JCM). The MRV Guidebook has been translated into Indonesian and Vietnamese for local use. Over the last two years since their start, both NAMA and MRV Guidebooks received good responses from various stakeholders. International organizations, such as the Food and Agriculture Organization of the United Nations (FAO) and the International Partnership for Mitigation and MRV decided to use the Guidebooks as supporting materials for their capacity-building activities. The development of the Guidebooks also resulted in creating a network of experts and policy makers in this field. In 2015, the Guidebooks continue to provide updated information on NAMAs and MRV. In addition, a survey will be conducted in cooperation with policy makers of selected developing countries to identify the state of NAMAs and MRV planning and implementation. A webinar and other events are also planned this year so that the Guidebooks can be used more interactively.

References

UNFCCC (2007) 1/CP.13 Bali Action Plan. FCCC/CP/2007/6/Add.1.

Access to relevant information

NAMA Guidebook: <http://www.oecc.or.jp/english/index.htm>

MRV Guidebook: <http://www.iges.or.jp/en/climate-energy/mm/201309mrv.html>

Current State of Joint Crediting Mechanism (JCM) and relevant JICA Cooperation in Indonesia

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Abstract

The Joint Crediting Mechanism (JCM) scheme aims to promote investment and deployment of low carbon technologies, products, systems, services and infrastructure in order to achieve low-carbon growth in developing countries such as Indonesia. As a climate change mitigation mechanism, JCM also aims to support fulfilment of the greenhouse gas (GHG) emissions reduction targets of both countries. Carbon credits are issued based on the amount of GHG emission reductions with MRV under the JCM projects.

After three years of discussion, the governments of Japan and Indonesia finally agreed to establish a low carbon growth partnership under the JCM scheme by signing the bilateral agreement in August 2013. To make the JCM work effectively, relevant JCM institutions and policy, rules and guidelines in Indonesia have been developed. On institutional aspect, the governments of Japan and Indonesia have established a Joint Committee, as a decision-making body with relevant tasks to development of JCM rules and guidelines, registration of JCM projects and credit issuance. Also, Indonesia JCM secretarial was established to support the JCM Joint Committee and work for smooth implementation for JCM. The Joint Committee has developed basic rules and guidelines such as rules of implementation, project cycle procedure, PDD for JCM projects and validation and verification with third party entity.

In Indonesia, JCM projects have been actively prepared. So far three JCM projects have been registered as of June 2015. And more registered projects are expected to increase from around 15 projects with JCM financing support from the Government of Japan. In addition, from 2010 to 2015, there have been 96 JCM feasibility studies conducted in Indonesia. 8 methodologies have been adopted and approved by the joint committee.

However, challenges for implementation of JCM in Indonesia faced and remains including further institutionalization of JCM in then Government of Indonesia, limited awareness of JCM in relevant stakeholders in Indonesia, addressing key policy issues and etc.

JICA has implemented technical cooperation which provides support for JCM in Indonesia for addressing those issues to aim to assist smooth implementation of JCM in Indonesia. On-going JICA technical cooperation project (Project of Capacity Development Assistance for Low Carbon Development in the Republic of Indonesia) started with the Coordination Ministry of Economic Affairs since 2014. JICA cooperation with Government of Indonesia will continue working for policy assessments and necessary capacity building activities to further enhancing implementation of JCM in Indonesia.

4. Report on Mutual Learning Session

4. Report on Mutual Learning Session

4.1 Overview of the Mutual Learning

Mutual Learning (ML) is an activity to improve the individual countries' inventories through a series of processes: 1) exchanging inventories between two countries; 2) learning from a partner's inventory; and 3) exchanging comments on each other's inventories. The primary purpose of the ML is to improve GHG inventories by providing details of methods and data for GHG emission/removal estimation to each other and exchanging comments on the methods and data between two countries. The ML is also expected to foster and strengthen a cooperative relationship among GHG inventory experts. Since the aim of the ML is not criticism or audit, participants can conduct a two-way communication in a constructive manner, not a one-way communication like an examiner versus an examinee.

The first ML session was held on the waste sector between GIO and Korea Environment Corporation (KECO) in the annual workshop in 2008. The Secretariat of WGIA introduced this activity in WGIA8 in 2010. With the participants' agreement, the ML has been held in the following WGIA8 as one of the sessions.

Table 1 History of Mutual Learning

| | 2008-2010 | 2010 WGIA8 | 2011 WGIA9 | 2012 WGIA10 | 2013 WGIA11 | 2014 WGIA12 | 2015 WGIA13 |
|--------------------|---|--|---|--------------------------------|----------------------|-----------------------|----------------------------------|
| General | Trial implementation Japan- Republic of Korea | Introduction to ML (with hands on training) | - | - | - | - | Japan- Vietnam |
| Energy | | | Indonesia- Mongolia | Cambodia- Thailand | Lao PDR- Thailand | Indonesia- Myanmar | - |
| IP | | | - | Indonesia- Japan | - | - | - |
| Agriculture | | | - | Indonesia- Vietnam | China- Myanmar | China- Mongolia | Indonesia- Lao PDR |
| LULUCF | | | Japan- Lao PDR | - | - | Vietnam | Cambodia- Mongolia |
| Waste | | | Indonesia- Cambodia- Republic of Korea | China- Republic of Korea | Malaysia- Vietnam | - | Republic of Korea- Myanmar |

Participants

In December 2014, the WGIA Secretariat advertised the ML to the participants of WGIA, and received applications from 25 teams from 8 countries. Considering the requirements of the applicants, and an appropriate balance among sectors and the feasibility of implementation, the WGIA Secretariat set up four two pairs (Japan and Vietnam on general (cross-cutting) issues, Indonesia and Lao PDR on agriculture sector, Cambodia and Mongolia on LULUCF sector, and Republic of Korea and Myanmar on waste sector) in April 2015.

Preparation

A few months before WGIA13, the selected participants in the ML provided materials of their inventories to the WGIA Secretariat, including worksheets used for estimating emissions and reports describing details of methodologies, and exchanged the materials with partner countries through the Secretariat. Through studying the materials provided by each partner country, the participants found strong points as well as shortcomings of each other's inventory. They also found issues to clarify by questions. Thus, participants wrote such comments and questions to their partner countries into "Question and Answer Sheets". After that, the

“Question and Answer Sheets” were shared with the partner countries through the Secretariat. The partner countries responded to these comments and questions before the WGIA13 took place.

Table 2 Preparation process of Mutual Learning

| Process | Schedule |
|-------------------------|------------------------|
| Submission of materials | Late April – Late May |
| Material exchange | Early June |
| Studying the materials | During June |
| Comment exchange | July |
| Answers to comments | July |
| Sessions | 4 th August |

Discussions

In the WGIA13, the ML participants were split into four sessions (General, Agriculture, LULUCF and Waste) and discussed sector-specific issues based on preliminary comment exchanges. In order to encourage a frank discussion, these sessions were closed.

In these sessions, the participants discussed the counterparts’ inventories and their national systems, shared their own technical issues (e.g. data collection, adoption of emission factors, national system, etc.) with the partners to overcome the obstacles, and clarified the matters in their own inventory to be improved. Due to the adequate preparation over two months, they could deeply learn about issues on each other’s inventory.

Since the ML programme provides a good opportunity to study both the counterpart’s and the participants’ own inventory, participants have shown interest to participate in this programme in future WGIA. The points of discussion and the outcomes of each individual ML session are summarized in the following sections (4.2 – 4.5).

4.2 General (Cross-cutting) Issues

Sector Overview

Vietnam and Japan participated in a ML session on general (cross-cutting) issues. General information of the two countries is shown in Table 3 below.

Table 3 Sector Overview for the ML on General (Cross-cutting) Issues

| | Vietnam | Japan |
|---|---|---|
| National total GHG emissions (kt-CO ₂ eq.) | 266,049 (in 2010, without LULUCF) | 1,407,775 (in 2013, without LULUCF) |
| Responsible agency for the inventory | Ministry of Natural Resources and Environment | Ministry of the Environment |
| Estimation methodology | Revised 1996 IPCC Guidelines, GPG 2000, and GPG-LULUCF | 2006 IPCC Guidelines, and country-specific guidelines |
| Sources of emission factors | IPCC Guidelines default values and a few country-specific values in the rice cultivation sub-sector | Country-specific values and 2006 IPCC Guidelines default values |
| Sources of activity data | National Statistics and experts' sources | National Statistics and provided data |

Materials Used

In order to prepare for the ML session in WGIA13, both countries exchanged their documents relevant to general (cross-cutting) issues two to three months before the workshop. The exchanged documents were as follows:

Vietnam

- Second National Communication, 2010
- Initial Biennial Updated Report, 2014

Japan

- National Greenhouse Gas Inventory Report of Japan, April, 2015

Questions and Answers

After receiving the materials described above, both countries studied them and provided questions and comments to their partner country approximately one month before the workshop. The classification and the number of questions were in Table 4.

Table 4 Classification of questions in the ML on General (Cross-cutting) Issues

| Classification of questions | Number of questions | |
|-----------------------------|-----------------------|-----------------------|
| | from Vietnam to Japan | from Japan to Vietnam |
| Legal mandate | 1 | 0 |
| Work assignment | 1 | 4 |
| Data collection | 5 | 2 |
| QC/QA | 1 | 3 |
| Data archiving | 0 | 1 |
| Key category analysis | 0 | 2 |
| Uncertainty analysis | 1 | 0 |
| Budget | 1 | 0 |
| Other | 1 | 2 |

Outcomes of the Mutual Learning Session

Through the ML session, several issues and good practices in the participating countries' preparation of GHG inventory have been identified.

➤ Issues and Solutions

Vietnam

Vietnam is currently in the process of developing a post-BUR1 National Inventory System (NIS). A framework for the NIS has been proposed, but details such as assignment of work inside each entity still need to be determined. In addition, a legal mandate for the NIS is crucial (first by the Prime Minister's decision, but ultimately by law), and is expected to be granted in 2016.

Japan

It was noted that some estimations relied on the voluntary provision of data from private companies, which could lead to a time-series inconsistency of data in the future.

➤ Good Practices

Vietnam

The good practices identified for Vietnam were as follows: 1) A pathway is set to finalize the NIS – learning from countries such as the Philippines, Thailand, Korea, UK, US, Japan, etc.; 2) The NIS is considered to be developed step-by-step, with improvement of data provision as first priority, followed by assignment of work and establishment of a QC/QA system; and 3) The NIS is developed through continuous consultations with relevant ministries, which helps build a realistic and reasonable system.

Japan

The good practices identified for Japan were as follows: 1) A relatively stable system is in place, as a result of trial and error in the past; 2) Flexibility is built in regarding calculation files by using Excel efficiently.

Also, the Vietnamese participants showed a strong interest in understanding how the voluntary data provision from industrial organizations worked in Japan, and what would be the benefits for the industrial organizations to cooperate. The Japanese participants explained that it probably works because it is in the interest of the organizations to have a consistency

between what is used as national inventory data and what they use, and that the amount of emissions they reduced matches what is reflected in the inventory. Furthermore, a question was raised on what would be done if cooperation failed. The Japanese participants explained that it would be a rare case because data availability is also checked in the process of determining the estimation methodology.

➤ Suggestions for Future MLs

It was noted by the participants that mutual learning on general (cross-cutting) issues, a new attempt in addition to sectoral mutual learning, is a valuable exercise as well. Enthusiasm was expressed to hold a ML session again on general (cross-cutting) issues regarding details such as AD collection, emissions estimation, QA/QC, database management, and archiving, when Vietnam's NIS is further developed.

Table 5 Participants in the ML on General (Cross-cutting) Issues

| Country | Name | Organization | Title |
|-----------|---------------------------|--|--|
| Vietnam | Dr. Nguyen Phuong Nam | Vietnam Center for Technology Responding to Climate Change (CliTech); Department of Meteorology, Hydrology and Climate Change (DMHCC), Ministry of Natural Resources and Environment (MONRE) | Head of Division, Climate Change Mitigation Technology |
| | Mr. Nguyen Trong Nghia | Vietnam Institute for Industrial Policies & Strategies, Ministry of Industries & Trade (MOIT) | Researcher, Environment and Sustainable Development |
| | Ms. Nguyen Hong Hanh | Ministry of Natural Resources and Environment (MONRE) | Environmental Database Inspector, Red River Delta Regional Hydro-Meteorological Center, National Hydro-Meteorological Service of Vietnam |
| Japan | Ms. Elsa Hatanaka (Chair) | Greenhouse Gas Inventory Office of Japan (GIO), National Institute for Environmental Studies, Japan (NIES) | GHG Inventory Expert |
| | Mr. Akira Osako | | |
| | Mr. Takashi Morimoto | Environment and Energy Dept., Mitsubishi UFJ Research and Consulting Co., Ltd. (MURC) | Chief Analyst |
| Observers | Mr. Shigeyoshi Sato | Ministry of the Environment, Japan (MOEJ) | Chief Official |
| | Mr. Tsubasa Tomita | | Technical Officer |

4.3 Land Use, Land-Use Change and Forestry Sector

Sector Overview

Cambodia and Mongolia participated in the ML session for the Land Use, Land-Use Change and Forestry (LULUCF) sector. General information of the two countries is shown in table 6 below.

Table 6 Sector Overview for the ML on the LULUCF sector

| | Cambodia | Mongolia |
|---|---|--|
| National total GHG emissions (Gg-CO ₂ eq., without LULUCF) | Not provided | 18,868(in 2006) |
| GHG emissions/removals in the LULUCF sector (Gg-CO ₂ eq.) | Not provided | -2,083 (in 2006) |
| Responsible agency for the inventory | Climate Change Department, Ministry of Environment | The Ministry of Environment, Green Development and Tourism (MEGDT) |
| Estimation methodology | Revised 1996 IPCC Guidelines ,GPG (2000)* and GPG-LULUCF** Tier 1 | Revised 1996 IPCC Guidelines Tier 1 |
| Source of emission factors | Country-specific parameters and IPCC default values | Country-specific parameters and IPCC default values |
| Source of activity data | Mainly from national statistics | Mainly from national statistics |

* GPG (2000): IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories

** GPG-LULUCF: IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry

Materials Used

In order to prepare for the mutual learning session in the WGIA13, both countries exchanged their documents relevant to GHG emission/removal estimation for the sector to the Secretariat two months before the workshop. The exchanged documents were as follows:

Cambodia

- Cambodia's Second National Communication under the UNFCCC (Technical Report) (Draft) (PDF)
- Review GHG emission- LUCF (by Mr. Kamal) (Word Office)
- Overview –GHG inventory (reported inventory year: 2000) (Excel Office)

Mongolia

- Mongolia's Second National Communication (SNC) under the UNFCCC (PDF)
- Mongolia's Assessment Report on Climate Change 2009 (PDF)
- Mongolia's Second Assessment Report on Climate Change 2014 (PDF)
- Mongolia's Second Assessment Report on Climate Change 2014 (Executive summary) (PDF)
- Completed IPCC Worksheet- Mongolia (1990-2030) (Excel)

Questions and Answers

After receiving the estimation documents, both countries studied them and submitted

questions and comments to the partner country through the Secretariat approximately one month before the workshop. The classification and the number of questions are as follows.

Table 7 Classification of questions in the ML on the LULUCF sector

| Classification of questions | Number of questions | |
|--|---------------------------|---------------------------|
| | from Cambodia to Mongolia | from Mongolia to Cambodia |
| Acquisition of activity data | 0 | 1 |
| Adoption of emission factors or parameters | 0 | 2 |
| Estimation method | 2 | 1 |
| Institutional arrangement | 1 | 4 |
| Others | 5 | 0 |

Outcomes of the Mutual Learning Session

Through the mutual learning, several issues and good practices in the participating countries' preparation of GHG inventory were identified.

➤Issues and Solutions

The issues raised for both countries were as follows: 1) Some categories (such as CO₂ emissions/ removals from soil) are not estimated; 2) The gain-loss method has been used for forest, but the stock change method based on National Forest Inventory (NFI) information will be used in the future; 3) Defining anthropogenic and /or natural forest fires is difficult.

Cambodia

The issues raised for Cambodia were as follows: 1) Land classification is needed to be checked to align with IPCC categories; 2) Cambodia may choose the option to make an agreement with line ministries in case simpler options do not work; 3) Up to now the system to make the GHG inventory has been temporary project-based, but Cambodia is now making a permanent system.

Mongolia

The issues raised for Mongolia were as follows: 1) Key category analysis was not conducted, but it will be done in the future; 2) Definition of forest by the national law does not directly represent forest land cover; 3) Occasional GHG emissions from forest fires (now treated as an information item) have a huge impact on the national total emissions and potentially the accounting aspect.

➤Good Practices

Cambodia

The good practices identified for Cambodia were as follows: 1) In accordance with IPCC GPG LULUCF, key category analysis (level and trend assessment) were conducted for both data of 1994 and of 2000; 2) Uncertainty analysis was conducted qualitatively and step-by-step improvements were made.

Mongolia

The good practices identified for Mongolia were as follows: 1) Institutional arrangement for GHG inventory has been established since 2012 (amendment of Law on Air); 2) Time series (1990-2006) estimation and recalculation of whole time series were conducted; 3) Emissions between 2006 and 2030 were calculated on the basis of previous trends, taking into

account social and economic changes and currently implemented or adopted policies and measures; 4) Template tables of the Revised 1996 IPCC Guidelines were applied for the calculation of GHG emissions and removals (making it easy to track the calculation process); 5) A Memorandum of Understanding (MoU) has been signed with line ministries on cooperation for data provision.

➤ Possible Follow-up Activities

Both countries agreed that collection of activity data was the first priority followed by the development of county-specific emissions factors.

Table 8 Participants in the ML on the LULUCF Sector

| Country | Name | Organization | Title |
|-------------|--------------------------------|--|--|
| Cambodia | Mr. Kamal Uy | Climate Change Department, Ministry of Environment | Deputy Director |
| | Mr. Chivin Leng | Climate Change Department, Ministry of Environment | Deputy Director |
| | Ms. Vichet Ratha Khlok | Climate Change Department, Ministry of Environment | Chief Officer |
| Mongolia | Mr. Gerelt-Od Tsogbaatar | International Cooperation Division, Ministry of Environment, Green Development and Tourism | Head of CDM National Bureau |
| | Ms. Tegshjargal Bumtsend | Climate Change Project Implementing Unit, Nature Conservation Fund, Ministry of Environment, Green Development and Tourism | Project Manager for the INDCs of Mongolia |
| | Ms. Sanaa Enkhtavian | Climate Change Project Implementing Unit, Nature Conservation Fund, Ministry of Environment, Green Development and Tourism | GHG Inventory Expert |
| Facilitator | Dr. Midori Yanagawa (Chair) | GIO, NIES | GHG Inventory Expert |
| | Mr. Hiroshi Ito | | |
| | Mr. Naofumi Kosaka | | |
| | Mr. Atsushi Sato | Environment and Energy Dept., MURC | Senior Researcher |

4.4 Agriculture Sector

Sector Overview

Lao PDR and Indonesia participated in the Mutual Learning session for the agriculture sector. General information of the two countries is in Table 9.

Table 9 Sector Overview for the ML on the Agriculture Sector

| | Lao PDR | Indonesia |
|---|--|--|
| National total GHG emissions (Gg-CO ₂ eq., without LUCF) | 43,811 (in 2000 by SNC) | 556,499 (in 2000 by SNC*) |
| GHG emissions in the Agriculture Sector (Gg-CO ₂ eq.) | 7,606 (in 2000 by SNC) | 75,420 (in 2000 by SNC*) |
| Responsible agency for the inventory | Ministry of National Resources and Environment | Ministry of Environment and Forestry (MOEF) |
| Organization in charge of GHG emission calculation | Department of National Disaster Management and Climate Change (DNDMCC) | Centre for National GHG Inventory System (SIGN Centre), MOEF |
| Estimation methodology | - Revised 1996 IPCC Guidelines - Tier 1 method | - 2006 IPCC Guidelines - Tier 2 method for rice cultivation - Tier 1 method for other categories |
| Source of emission factors | Mainly default EFs described in Revised 1996 IPCC Guidelines | Mainly default EFs described in 2006 IPCC Guidelines. In rice cultivation, some CS-parameters were used. |
| Source of activity data | National sources | National sources |

*: Because information on the Agriculture sector in the draft BURs was used in the Mutual Learning session, data of SNC was input alternatively in this table.

Materials Used

In order to prepare for the Mutual Learning, both countries submitted their estimation documents of the sector and exchanged their documents with each other three months before the session in the WGIA13. The exchanged documents were as follows.

Indonesia

- Estimation Methodology of Agriculture Inventory
- Agriculture Inventory 2000-2012 (MS Excel spreadsheet, calculation files)

Lao PDR

- Second National Communications
- Module 4 Agriculture sector spreadsheet in the Revised 1996 Guidelines (MS Excel spreadsheet, calculation files)

Questions and Answers

After receiving the estimation documents, both countries studied them and submitted questions and comments to the partner country approximately two months before the session. The answers to the questions were provided prior to the session. The classification and the number of questions are as follows.

Table 10 Classification of questions in the ML on the Agriculture Sector

| Classification of questions | Number of questions | |
|--|---------------------------|---------------------------|
| | from Lao PDR to Indonesia | from Indonesia to Lao PDR |
| Acquisition of activity data | 1 | 4 |
| Adoption of emission factors or parameters | 4 | 2 |
| Estimation method | 1 | 1 |
| Institutional arrangement | 1 | 5 |
| Others | 0 | 0 |

Outcomes of Mutual Learning

In the ML session on the Agriculture Sector of WGIA13, Indonesia made a short presentation for the estimation method for their inventory. Through the ML, several issues and good practices of the GHG inventory were pointed out for both countries.

➤ Issues and Solutions/Other Points for Discussion

In the question and answer sheets and discussion in the session, a lot of information was exchanged. Key discussion points for issues and solutions, and other points for discussion are as follows:

- 1) As a key discussion point, institutional arrangement was discussed deeply in a substantial length of time (e.g. decision process, experts and staff preparing inventory, expert committee, data collection system, and QA/QC system).
- 2) Relating to the point above, the issue of expert judgment was discussed. Lao PDR and Indonesia used expert judgment for some parameters in the agriculture sector. How to judge by experts is interesting and informative for other countries as well, because the decision-making system based on expert judgment is different in each country, and also because expert judgment is the final decision system and thus important. Expert judgment is used when a country does not have data for a certain parameter, but they cannot use default data because of a lack of default data in the Guidelines or because of a significant difference of country status from the default data. Experts induce likely data that reflect nation's circumstance.
- 3) Lao PDR may estimate N₂O from N fixing crops, which cannot be estimated otherwise due to by lack of data in the SNC.
- 4) Indonesia will check the possibility to estimate N leaching and loss considering the particular situation for the country.
- 5) To estimate CH₄ emissions from enteric fermentation, Indonesia uses Correction Factors considering the age composition of livestock, and will check the primary purpose of the survey on Correction Factors in order to encourage relevant agency to update their survey.
- 6) For Lao PDR, some AD are provided in national statistics, however, other AD are not. Therefore, data collection is not very successful in Lao PDR, and Lao PDR

considers that data improvement is needed.

- 7) For Indonesia, CH₄ from rice cultivation was estimated by using the Tier 2 method with CS parameters. Therefore, a detailed estimation method was discussed in the session in Q&A format.
- 8) The following comment was made by an expert, as a general comment. Tier 2 method reflecting country status may be used in some Asian countries in certain category in the near future, because studies and surveys have been improved gradually in some country. In addition, these data, which is closer in Asia than default data in Guidelines, may be applied to neighboring countries as well.
- 9) As another general idea, if application of Tier 2 method with upgrading from Tier 1 method is difficult, a country may use Tier 1.5 method by combining Tier 1 and Tier 2. It means combining country-specific and default parameters to make use of country-specific data.

➤ **Good Practices**

Some good practices were pointed out through the ML as follows:

- 1) Lao PDR prepared inventory by using the 1996 GLs template. Using a common format makes it easier for everyone to understand.
- 2) Indonesia prepared time series data from 2000 to 2012.
- 3) Indonesia conducted a recalculation from 2000 to 2005 updated from SNC with an update of estimation methods.

➤ **Possible Follow-up Activities**

Some possible follow-up activities were considered by both countries.

- 1) Lao PDR and Indonesia will address outstanding issues described above.
- 2) Lao PDR will improve their institutional arrangement by referring to the partner country's experiences.
- 3) Lao PDR and Indonesia will improve their data collection systems and surveys.

➤ **Suggestions and Comments for Future MLs and WGIA**

The participants' suggestions for future ML were as follows:

- 1) ML is a good opportunity for each country to share experiences and build a good network.
- 2) Adding an "Institutional Arrangement" section in the Q&A sheet in next ML was proposed.
- 3) Deciding a theme and discussion points in the beginning of the session may help conduct a fruitful discussion. (e.g. expert judgment)
- 4) Adding a commentator from a third party was proposed by a participant.
A commentator would check both countries' and give advice for an alternative solution in case there is an issue that needs to be solved.

Table 11 List of Participants in the Mutual Learning on the Agriculture Sector

| Country | Name | Organization | Title |
|--------------|---------------------------|---|-----------------------------|
| Lao PDR | Mr. Mone Nouansyvong | Department of Disaster Management and Climate Change (DDMCC), Ministry of Natural Resources and Environment (MoNRE) | Consultant |
| | Mr. Bounthee Saythongvanh | DDMCC, MoNRE | Technical officer |
| | Mr. Immala Inthaboualy | DDMCC, MoNRE | Director |
| Indonesia | Mr. Prasetyadi Utomo | SIGN Centre, Ministry of Environment and Forestry (MOEF) | Staff |
| | Ms. Miranti Ariani | Indonesian Agricultural Environment Research Institute (IAERI), Ministry of Agriculture | Staff |
| | Mr. Ardi Chandra Yuniato | SIGN Centre, MOEF | Staff |
| | Mr. Anak Agung Gede Putra | Sub-Directorate of Land Based GHG Inventory, MOEF | Head |
| | Mr. Mamay Maesaroh | GHG Inventory on Agriculture Sector, MOEF | Section Head |
| | Ms. Vinna Prescylia | MRV on Agriculture Sector, MOEF | Section Head |
| Facilitators | Mr. Kohei Sakai (Chair) | GIO, NIES | GHG Inventory Expert |
| | Mr. Naofumi Kosaka | GIO, NIES | GHG Inventory Expert |
| | Mr. Takashi Morimoto | Mitsubishi UFJ Research and Consulting Co., Ltd.(MURC) | Chief Analyst |
| | Prof. Mitsuru Osaki | Research Faculty of Agriculture, Hokkaido University | Special Appointed Professor |

Table 12 Participants in the Q&A sheet exchange phase (not attending in the session in WGIA)

| Country | Name | Organization | Title |
|-----------|-------------------------|---|--|
| Indonesia | Mr. Prihasto Setyanto | IAERI, Ministry of Agriculture | Head |
| | Mr. Muhammad Ardiansyah | Centre for Climate Risk and Opportunity Management (CCROM), Bogor Agricultural University (IPB) | Expert of GHG Inventory on Agriculture |

4.5 Waste Sector

Sector Overview

Republic of Korea and Myanmar participated in a ML session for the waste sector. General information of the two countries was is shown in table 13:

Table 13 Sector Overview for the ML on the Waste Sector

| | Republic of Korea | Myanmar |
|--|--|--|
| National total GHG emissions (Gg-CO ₂ eq.) | 688,341.56 (in 2012, without LULUCF) | 33,996.4 (in 2000, without LULUCF) |
| GHG emissions in the waste sector (Gg-CO ₂ eq.) | 14,810.85 (in 2012) | 2,825.97 (in 2000) |
| Responsible agency for the inventory | Ministry of Environment (MOE) | Ministry of Environmental Conservation and Forestry (MOECAF) |
| Organization in charge of waste sector | Korea Environmental Corporation (KECO) | Ministry of Electric Power (MOEP) |
| Estimation methodology | <ul style="list-style-type: none"> - Revised 1996 Guidelines, Good Practice Guidance (2000), and 2006 IPCC Guidelines - Tier 2 method of IPCC Guidelines for key categories - Tier 1 method for some minor categories | Tier 1 method of Revised 1996 IPCC Guidelines |
| Source of emission factors | Country specific emission factors and default values of IPCC Guidelines | Default values of Revised 1996 IPCC Guidelines |
| Source of activity data | National statistics (e.g., Nationwide waste generation and treatment status, Sewerage statistics, etc.) | Estimation based on population statistics |

Materials Used

In order to prepare for the ML session in WGIA13, both countries exchanged their documents relevant to GHG emission estimation of the sector with each other two months before the workshop. The exchanged documents were as follows:

Korea:

- National inventory report 2014
- CRF tables (Excel)

Myanmar:

- Initial National Communication 2012
- UNFCCC software module 6 (Excel)
- Background materials

Questions and Answers

After receiving the materials described above, both countries studied them and provided questions and comments to their partner country approximately one month before the workshop. The classification and the number of the questions were as follows.

Table 14 Classification of questions in the ML on the Waste Sector

| Classification of question | Number of questions | |
|----------------------------|-----------------------------------|-----------------------------------|
| | from Myanmar to Republic of Korea | from Republic of Korea to Myanmar |
| Estimation method | 2 | 3 |
| Emission factors | 2 | 2 |
| Activity data | 0 | 1 |
| Other | 3 | 5 |

Outcomes of the Mutual Learning Session

Through the mutual learning, several issues and good practices in the participating countries' preparation of GHG inventory were identified.

➤Issues and Solutions/ Outstanding Issues

Myanmar does not have a permanent national system for GHG inventory because of a lack of human resources, budget, and legal framework. Now they are coordinating the institutional arrangement for the Second National Communication (SNC).

Republic of Korea has a well-organized national system to prepare their GHG inventory. For example, in data acquisition, Korea obtains activity data of solid waste disposal from national statistics compiled by the Ministry of Environment, which are based on actual measurements at landfill sites. Korea has also established good relationships with private companies and got permission from them for an effluent survey. Under such circumstances Korea has developed country specific EFs for industrial wastewater treatment in order to improve their GHG inventory.

In this session, participants shared the awareness that such a national system, which includes a data collection system for solid waste disposal and cooperation from private industries for effluent measurements, is very important for the development of Myanmar's inventory, too.

As for detailed GHG estimations, Myanmar currently does not estimate N₂O emissions from human waste. In the SNC, these emissions will be estimated by using protein consumption data from FAO. This idea was suggested by Korea during the discussion.

➤Good Practices

Korea:

One of the good practices identified for Korea is that in their inventory report it is easy to follow the GHG estimation method as well as regulations related to background information, legal framework, and statistical system for waste and wastewater management.

Myanmar:

A good practice identified for Myanmar is that the use of IPCC spreadsheets in Myanmar's inventory compilation ensures comparability of GHG emissions and transparency in their estimation methodologies.

➤Possible Follow-up Activities

More detailed information about the data collection system for solid waste disposal in Korea will be shared with Myanmar by email.

➤ **Suggestions for Future MLs and WGIAs**

- In this year, preparation for ML started in May. In this regards, some participants suggested that the preparation should start earlier (for example, in February) to allow ample time to study exchanged materials and discuss by email.
- Myanmar has participated in the ML on three sectors (agriculture in WGIA11, energy in WGIA12, and waste in WGIA13) and obtained information to upgrade their GHG inventory. Participants from Myanmar showed interest in participating in other ML sectors (IPPU, LULUCF) in future WGIAs.

Table 15 Participants in the ML on the Waste Sector

| Country | Name | Organization | Title |
|-------------------|---------------------------|--|----------------------|
| Republic of Korea | Mr. Seung Ju Moon | Korea Environment Corporation (KECO) | Assistant Manager |
| | Mr. Sung Ho Shin | | Assistant Manager |
| | Mr. Chnag Hoon Lee | | Assistant Manager |
| Myanmar | Mr. Than Aye | Ministry of Environment Conservation and Forestry (MOECAF) | Director |
| | Mr. Myint Soe | Ministry of Industry (MOI) | Environmental Expert |
| | Ms. Hnin Hnin Aye | Ministry of Electric Power (MOEP) | Environmental Expert |
| Facilitators | Mr. Hiroyuki Ueda (Chair) | Environment and Energy Dept., MURC | Senior analyst |
| | Ms. Sumiko Harasawa | GIO | GHG Inventory Expert |
| | Dr. Takefumi Oda | | GHG Inventory Expert |

Annex I: Agenda

Annex I: Agenda

The 13th Workshop on GHG Inventories in Asia (WGIA13)
- Capacity Building for Measurement, Reporting and Verification -

Period: 4th – 6th August, 2015,

Venue: Ramada Bintang Bali Resort, Jl. Kartika Plaza, Kuta, Bali, Indonesia

| Day 1: Morning, 4th August 2015 (Tuesday) | | |
|--|---|-----------------------------|
| 08:30-12:00 | Mutual Learning (Closed sessions: only the countries participating in the session, chairs, facilitators, rapporteurs and the WGIA Secretariat can enter conference rooms for the sessions) | |
| Sector | General | LULUCF |
| Combination of Participating Countries | Vietnam – Japan | Cambodia - Mongolia |
| Room | Nias | Sawu |
| Chair | Ms. Elsa Hatanaka (GIO) | Dr. Midori Yanagawa (GIO) |
| Rapporteur | Dr. Takefumi Oda (GIO) | |
| Note: Mutual learning sessions are closed sessions in order to secure confidentiality of information so that countries participating in each mutual learning session can provide unpublished information therefore, only participating countries in each session, chairs, facilitators, rapporteur and the WGIA Secretariat can enter each of the rooms. In addition, facilitators will be registered in advance and receive confirmation of participation from the countries engaging in mutual learning and the WGIA Secretariat. | | |
| 12:00-14:00 | Lunch | |
| Day 1: Afternoon, 4th August (Tuesday) | | |
| 14:00-17:30 | Mutual Learning (Closed sessions: only the countries participating in the session, chairs, facilitators, rapporteurs and the WGIA Secretariat can enter conference rooms for the sessions) | |
| Sector | Agriculture | Waste |
| Combination of Participating Countries | Lao PDR - Indonesia | Myanmar – Republic of Korea |
| Room | Nias | Sawu |
| Chair | Mr. Kohei Sakai (GIO) | Mr. Hiroyuki Ueda (MURC) |
| Rapporteur | Dr. Takefumi Oda (GIO) | |
| 18:00-19:00 | Participants Registration | |

| Day 2: Morning, 5th August, 2015 (Wednesday) | | | |
|--|---|---|---|
| 8:30-9:00 | Participants Registration | | |
| 9:00 – 10:15 | Opening Session | | |
| | Room: Ballroom | Chair: Ms. Emma Rachmawaty (Indonesia) | Rapporteur: Mr. Naofumi Kosaka (GIO) |
| 9:00 – 9:10 | Welcome Address | | Mr. Shigeyoshi Sato (MOEJ) |
| 9:10 – 9:20 | Welcome Address | | Ms. Kirsfianti Linda Ginoga (Indonesia) |
| 9:20 – 9:30 | Overview of WGIA13 | | Mr. Hiroshi Ito (GIO) |
| 9:30 – 9:45 | Japan's Climate Change Policies | | Mr. Shigeyoshi Sato (MOEJ) |
| 9:45 – 10:00 | Indonesia's Policy on Climate Change Adaptation and Mitigation & first BUR Progress | | Ms. Kirsfianti Linda Ginoga (Indonesia) |
| 10:00 – 10:15 | Questions and Answers | | All |
| 10:15 – 10:45 | Group Photo & Tea Break | | |
| 10:45 – 12:15 | Session I: Updates on the preparation of the National Communications (NCs) and Biennial Update Reports (BURs) from non-Annex I Parties | | |
| | Room: Ballroom | Chair: Mr. Takahiko Hiraishi (IGES) | Rapporteur: Mr. Naofumi Kosaka (GIO) |
| 10:45 – 10:50 | Introduction to the Session | | Mr. Hiroshi Ito (GIO) |
| 10:50 – 11:05 | CGE Training Materials for the Preparation of Biennial Update Reports from non-Annex I Parties | | Mr. Dominique Revet (UNFCCC) |
| 11:05 – 11:25 | Updates on the Preparation of BURs from non-Annex I Parties and Relevant Requirements and Available Resources | | Mr. Dominique Revet (UNFCCC) |
| 11:25 – 11:45 | Status of India's first Biennial Update Report (BUR) | | Dr. Sumana Bhattacharya (India) |
| 11:45 – 12:15 | Questions and Answers | | All |
| 12:15 – 13:45 | Lunch | | |
| | | | |

| Day 2 Afternoon, 5th August (Wednesday) | | |
|---|---|--|
| 13:45 – 15:40 | Session II: Progress made in BUR and the ICA process | |
| | Room: Ballroom | Chair: Dr. Sirintornthep Towprayoon (AB/ King Mongkut's University of Technology Thonburi) |
| | | Rapporteur: Mr. Naofumi Kosaka (GIO) |
| 13:45 – 13:50 | Progress of non-Annex I BUR | Mr. Hiroshi Ito (GIO) |
| 13:50 – 14:10 | Overview of the first BUR and the Preparation for Publishing of National Inventory System in Vietnam | Dr. Nguyen Phuong Nam (Vietnam) |
| 14:10 – 14:30 | BUR of the Republic of Korea | Dr. Jongchul Bang (Republic of Korea) |
| 14:30 – 14:50 | Questions and Answers, Discussion | All |
| 14:50 – 15:05 | The Technical Analysis of BURs, as Part of the International Consultation and Analysis (ICA) Process | Mr. Kiyoto Tanabe (IPCC TFI TSUTFI TSU, member of the CGE) |
| 15:05 – 15:20 | Japan's Experience: The International Assessment and Review (IAR) Process, with a Focus on Multilateral Assessment (MA) | Mr. Tsubasa Tomita (MOEJ) |
| 15:20 – 15:40 | Questions and Answers, Discussion | All |
| 15:40 – 16:00 | Tea Break | |
| 16:00 – 17:30 | Session III: Cross Cutting Issues (Institutional Arrangements for Consistency and Continuous Reporting) | |
| | Room: Ballroom | Chair: Dr. Rizaldi Boer (AB/ Bogor Agricultural University) |
| | | Rapporteur: Mr. Naofumi Kosaka (GIO) |
| 16:00 – 16:15 | Introduction to the Session and Japan's Experience | Mr. Akira Osako (GIO) |
| 16:15 – 16:30 | For Consistence in China Greenhouse Gas Inventory | Prof. Mingshan Su (China) |
| 16:30 – 16:45 | Institutional Arrangements for Making Continuous GHG Inventory of BUR | Dr. Yap Kok Seng (Malaysia) |
| 16:45 – 17:00 | Thailand Institutional Arrangement for GHG Inventory | Dr. Nattanich Asvapoositkul (Thailand) |
| 17:00 – 17:30 | Questions and Answers, Discussion | All |
| 19:00 – 21:00 | Welcome Reception (hosted by the Government of Indonesia) | |

| Day 3 Morning, 6th August 2015 (Thursday) | | |
|---|---|---|
| 9:00 – 12:30 | Session IV: International Activities Contributing to GHG Inventories and Mitigation | |
| | Room: Ballroom | Chair: Dr. Sumana Bhattacharya (AB/ Climate Change and Environment Intercooperation) |
| | | Rapporteur: Mr. Naofumi Kosaka (GIO) |
| 9:00 – 9:05 | Introduction to the Session | Ms. Elsa Hatanaka (GIO) |
| 9:05 – 9:25 | Overview of “Sub-project 3 of Project of Capacity Development for Climate Change Strategies in Indonesia” | Mr. Hiroyuki Ueda (JICA project) |
| 9:25 – 9:45 | JICA Effort to Mitigate Climate Change in Forest and Land Sector in Indonesia –IJ-REDD+ Project- | Mr. Shigeru Takahara (JICA) |
| 9:45 - 10:00 | <u>Questions and Answers, Discussion</u> | All |
| 10:00 – 10:20 | Capacity Development Activities in Support of National Greenhouse Gas Inventory by FAO | Dr. Mirella Salvatore (FAO) |
| 10:20 – 10:40 | IPCC TFI: Recent Activities | Dr. Baasansuren Jamsranjav (IPCC TFI TSUTFI TSU) |
| 10:40 – 10:55 | <u>Questions and Answers, Discussion</u> | All |
| 10:55– 11:15 | <i>Tea Break</i> | |
| 11:15 – 11:30 | Estimating NMVOC Emissions in Japan, China, and India | Dr. Satoru Chatani (NIES) |
| 11:30 – 11:45 | Development of NAMA and MRV Guidebooks | Dr. Chisa Umemiya (IGES) |
| 11:45 – 12:00 | Current State of Joint Crediting Mechanism (JCM) and Relevant JICA Cooperation in Indonesia | Dr. Jun Ichihara (JICA) |
| 12:00 – 12:30 | <u>Questions and Answers, Discussion</u> | All |
| 12:30 – 14:00 | <i>Lunch</i> | |

| Day 3 Afternoon, 6th August (Thursday) | | |
|--|---|---|
| 14:30 – 16:00 | Wrap-up Session | |
| | Room: Ballroom | Chair: Dr. Yukihiro Nojiri (GIO) |
| 14:30 – 14:35 | Introduction to the Study Tour | KHLK, Indonesia |
| 14:35 – 14:55 | Summary of the Mutual Learning Sessions | Dr. Takefumi Oda (GIO) |
| 14:55 – 15:05 | <u>Discussion</u> | All |
| 15:05– 15:15 | <i>Tea Break</i> | |
| 15:15 – 15:30 | Summary of the Plenary Sessions | Mr. Naofumi Kosaka (GIO) |
| 15:30 – 15:40 | <u>Discussion</u> | All |
| <u>Closing Remarks</u> | | |
| 15:40 – 15:50 | Closing Remarks | KLHK, Indonesia |
| 15:50 – 16:00 | Closing Remarks | Dr. Yukihiro Nojiri (GIO) |

| Day 3 Evening, 6th August (Thursday) | | |
|--|---|-------------------------------------|
| 17:00 – 18:00 | Joint Meeting of the WGIA Organizing Committee and Advisory Board (members of the OC and AB, the WGIA Secretariat) | |
| | Room: Sawu | Chair: Mr. Hiroshi Ito (GIO) |
| 17:00 – 17:30 | Review of Activities in WGIA13 | All |
| 17:30 – 18:00 | Discussion on Topics for WGIA14 | All |
| | | |
| 18:30 – 21:00 | <i>Farewell Reception (hosted by the MOEJ and GIO)</i> | |

| Study Tour, 7th August (Friday) | |
|---|---|
| 8:00 – 14:00 | Study Tour (Visiting a village -Local Initiatives on Climate Change Adaptation- Mitigation-, Desa Sibang) |

Annex II: List of Participants

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