GLOBAL RESEARCH ALLIANCE
ON AGRICULTURAL GREENHOUSE GASES

Inventory & Measurement Cross-Cutting Group Meeting
Hilton Lac-Leamy, Gatineau, Quebec, Canada
8-10 November 2011

Meeting Report

OVERVIEW

1. The Inventories and Measurements Cross-Cutting Group aims to facilitate collaborative work to improve the estimation of greenhouse gas (GHG) emissions and removals that involve multiple segments of agricultural production. This work is critical to quantifying the reductions in GHG emission intensity that is fundamental to fulfilling the goal of Alliance.

2. The inaugural meeting of the Inventory & Measurement (I&M) Cross-Cutting Group took place from 8-10 November 2011 at the Hilton Lac-Leamy in Gatineau, Quebec, Canada.

3. The meeting was attended by 29 delegates, representing 17 Alliance member countries (Argentina, Canada, Chile, China, Ghana, Indonesia, Ireland, Italy, Japan, Malaysia, Netherlands, New Zealand, Philippines, Republic of Korea, United Kingdom, Uruguay, Vietnam) and 2 invited guests (IISD, World Bank). See Appendix 1 for participant list.

4. Outcomes

DEFINITIONS OF INVENTORY AND MEASUREMENT:

- **Inventory** refers to science-based systematic estimation of the quantity and uncertainties of GHG emissions and removals. One type of inventory is a formal submission from a country of its overall national GHG emissions. More generally, inventory is a consistent method for GHG emission estimation applicable over number of similar sources or sinks. Identify and facilitate work to share and develop knowledge and expertise to build the capability of the countries the Alliance to adopt more accurate and situation-specific GHG estimation methods.
- **Measurement** is the foundation of estimation methods used for inventory. Measurements of GHG emission form the basis of empirical GHG emission methods and also form the basis for validation and parameterization model-based GHG estimation methods. Activity data also requires appropriate measurement.

ROLES OF INVENTORY AND MEASUREMENT CROSS CUTTING GROUP:

1) Identify and facilitate collaborative opportunities to improve GHG estimation for primary agricultural production systems to better include the inter-relationships among GHG and processes.

2) Identify and facilitate work to share and develop knowledge and expertise to build the capability of the countries of the Alliance to adopt more accurate and situation-specific GHG estimation methods.
3) Identify and facilitate collaborative opportunities to share knowledge and data to improve the ability of countries to improve the accuracy and transparency of their GHG emission/removal estimates.
4) On request from any of the Research Groups, work with the Research Groups to facilitate work to improve the transparency, consistency, comparability, and accuracy of measurement methods for GHG emissions/removals that benefit the work of more than one Research Group.
5) Identify and facilitate collaborative opportunities to improve capability to quantify GHG emissions and removals for future scenarios of farming systems and climates.

INITIAL AREAS OF WORK FOR THE INVENTORIES & MEASUREMENTS CROSS-CUTTING GROUP

Area of Work	Countries to Develop the Terms of Reference
Information Sharing	
1. To foster effective mechanisms of sharing emission factors and emission data	Canada
2. To produce an inventory and guidance on the use of tools and methods for Greenhouse Gas (GHG) estimation; Sharing approaches and lessons learned on application of Tier 3 methods.	not determined at meeting
3. To share methods and lessons learned on application of remote sensing to improve activity data.	United Kingdom, Philippines, Ireland Viet Nam
Networking	
4. To promote communication between inventory practitioners and research scientists working on specific inventory-relevant topics.	Ghana, Philippines, Malaysia
5. To identify opportunities to involve partners to further work on GHG inventory and measurements.	Canada, Netherlands, Uruguay, New Zealand, Japan
Guidance	
7. To produce best practice guidance on measurement techniques, harmonisation of approaches, and standardisation of technologies and methodologies for soil organic carbon (SOC), nitrous oxide (N_2O) and methane (CH_4).	New Zealand, Canada (SOC); United Kingdom, (N_2O); Japan, United Kingdom, (CH_4)
8. To produce the best practice guidance on development of activity data.	Netherlands, Canada
Methods and Capacity Development	
9. To increase our capability to estimate and communicate uncertainties of GHG emission/removals.	United Kingdom, Viet Nam, Canada, New Zealand
10. To build capacity to estimate and measure GHG emission and removals.	New Zealand, Netherlands, Ghana, Viet Nam, Indonesia, Uruguay, Argentina, Chile
11. To develop methods to evaluate the economic value of GHG mitigation.	Ghana, United Kingdom, Indonesia
12. To improve capability to quantify GHG emission and removals for further scenarios of farming systems and climates.	Uruguay, Netherlands, Canada, Viet Nam
13. To produce guidance on methodologies for determining emission intensity.	New Zealand, Netherlands, Canada, Canada, Viet Nam, United Kingdom

5. NEXT STEPS

The report from meeting and draft terms of reference template will be distributed to participants for comments in early December. Countries not attending will be invited to join in development of terms of reference. Completed draft terms of reference for areas of work are to be circulated by early January 2012. After further development over email, these terms of reference will be reported back at the next I&M Group meeting, which should occur in first half of 2012. Countries are encouraged to start activities, independently or cooperatively, to advance these areas of work before the next I&M meeting.

DISCUSSIONS

TUESDAY 8 NOVEMBER

OPENING REMARKS

6. Jamshed Merchant (Assistant Deputy Minister, Agri-Environment Services Branch, Agriculture & Agri-Food Canada) opened the inaugural meeting of the Inventory and Measurement (I&M) Cross-cutting Group by welcoming participants and giving a brief overview of Canada's involvement in the Alliance. He noted that he saw the ultimate purpose of the Alliance as helping farmers understand climate change issues and how to mitigate them. He encouraged everyone to strive for this outcome and commented that it was a key area where the I&M Group can help. Inventories set out what our emissions are and where we stand and measurements address how to quantify this. The group was asked to think about how globally they want to develop relationships outside of the Alliance and to come up with an action plan. In order to be successful it is important to recognise that the activities of the group are voluntary, and to focus on solutions rather than why we cannot do something.

7. The floor was then handed to the co-chairs, working with an independent meeting facilitator (Warren Wilson, Intersol).

8. The co-chairs welcomed country representatives and thanked them for their patience in bringing the group together. This meeting had been delayed until the Alliance's other groups had met so that the I&M Group could then complement their activities, e.g. determining where the gaps were between the groups and therefore where the I&M Group could best add value. The co-chairs presented a brief overview of the Alliance and proposed some draft objectives for the group as follows:

- Identify initial work items of the I&M Group and how it would be structured.
- Identify and facilitate collaborative opportunities to better address the interaction among gases, processes, and systems (livestock, croplands, and paddy rice) to improve the estimation of GHG emissions from agricultural production systems.
- To build the GHG estimation capability of the Alliance countries by identifying, facilitating, sharing and coordinating work to enhance knowledge and expertise.

9. Refer separate presentation for further details.

UPDATE FROM THE SECRETARIAT

10. The Secretariat gave a brief overview of the Alliance, including its formation and launch, the signing of the Charter, the current membership, the structure including recent Council activities, and an update from the other Research and Cross-cutting Groups (see separate presentation).

Communications Policy

11. The Secretariat also provided detail on the draft Communications Policy for the Alliance. This is included in the Charter and is currently being developed by the Council. Although a large number of Council members are in support of the draft Communications Policy, there are still some divergent views. Key issues to resolve include the extent to which Council is involved in approving Alliance communications. This will be addressed at the next Council meeting, in Canada in mid-2012.

12. It was noted that the absence of a Communications Policy was not preventing the Research and Cross-Cutting Groups from sharing their work publicly, or countries discussing their involvement in the Alliance. However, it was clarified that where an Alliance country was presenting *on behalf of the Alliance*, then Council guidance/approval would be required and this would be covered by the Communications Policy. Where presentations were *about the Alliance* (e.g. Research Groups reporting on their activities) this did not need Council input at this stage.

Partners

13. The Secretariat also updated on the process underway for inviting Partners to the Alliance. The Charter provides for Partners at a Council level, for the Alliance as a whole. Separately, the Charter also enables Research Groups to establish partnerships and scientific collaborations with outside organisations relevant to their work.

14. At its meeting in Rome in June, the Council agreed an initial list of potential Partner organisations. This included the FAO, the World Bank, regional development banks, international research institutions (e.g. CGIAR, CATIE, etc). Other organisations can be invited later as the Council approves them. The Secretariat has drafted an invitation letter, which has been approved by the Council and will soon be sent to organisations. Once the terms of the letter have been agreed too by the organisation, they will be granted partnership status and a discussion between the Council and Partners initiated.

SHARE KNOWLEDGE AND EXPERTISE ON INVENTORIES

Definition and Purposes of Inventory Quantification

15. The co-chairs presented the definition and purpose of inventory quantification (refer to separate presentation). It was noted that there is a need to understand net emissions, i.e. to take into account the entire system to get a true measure of emissions and also the possible cost and benefits of appropriate mitigation technologies. Inventories provide a “big picture” of a country’s emissions, and inform a wide range of end users including scientists, policy makers, regulatory makers and the public.

16. Understanding different farming practices and how they change over time is the most difficult part of an agricultural GHG inventory. But it is important that information can be scaled up from the farm to the national level. The Alliance provides an opportunity to work at these various levels by promoting collaboration among farmers, researchers and policy makers. It is important to remember that developing an inventory is not just about providing information to the United Nations

Framework on Climate Change Convention (UNFCCC) but also about providing researchers with concrete information and developing mitigation opportunities. It is therefore important that the group remembers not to become locked into the UNFCCC terms and categories as this would restrict the groups work.

Summary of Approaches used by the Alliance Members for their National Inventories

17. A summary of information from Alliance member countries' National Inventories and the approaches they use was presented (see separate presentation). National Inventories submitted in 2010 (2008 reporting year) were used for Annex 1 countries, but the year varied for Non-Annex 1 countries due to their reporting requirements.

18. The percentage that agriculture made up of a country's total emissions varied greatly among Alliance member countries, with Uruguay with the highest percentage and Japan with the lowest. The make-up of agricultural emissions (e.g. the split between methane, nitrous oxide, etc) was diverse among countries, but generally enteric fermentation contributed the most. The methods used by individual countries were also different but all countries used Tier 1 methods to varying degrees. Tier 3 methods are generally uncommon but there were a few countries that use this level of estimation. All countries noted a high degree of uncertainty in their estimations, with estimates of nitrous oxide (N_2O) emissions from agricultural soils being the category with the highest uncertainty. It was noted that the fact that everyone had uncertainty in their data and methods meant there is a lot that the group can learn from each other.

IMPROVING GREENHOUSE GAS EMISSIONS AND REMOVALS ESTIMATION - ROUND TABLE PRESENTATIONS

19. Countries were asked to provide a brief presentation on their experiences, opportunities and challenges regarding their inventory. Most used powerpoint, which are provided separately.

20. Some key opportunities/issues that were identified during the round table presentations were:

- Communicating the level of success that countries have had with their Tier 2 N_2O inventory and the issues that they have encountered
- The need for improved activity data and how to actually obtain that data
- The need to estimate non forest woody biomass affected by agriculture
- The knowledge that inventories are important for more than just reporting to the UNFCCC
- Regional networks are an important tool to use to share information, encourage collaboration and to improve the technical understanding of participants
- Understanding that institutional knowledge is vital and working out how to retain it
- The need for the inventory team in each country to have close connections with their scientists and inventory teams in other countries so that knowledge can be shared and there is a shared understanding between compilers and scientists of the requirements for research and reporting.

- The difficulty in scaling up information from farm level information to the national level

- The knowledge that if agricultural emissions are not addressed they will become a larger proportion of national emissions and may appear to be an increasing burden if other sectors are reducing their emissions.

INVENTORY AND MEASUREMENT AND CROSS-CUTTING GROUP ROLES

21. This session addressed where the I&M Cross Cutting Group should focus its effort, it potential role/s and the involvement of international organisations in this group.

22. The session began with the co-chairs from the other Research and Cross-cutting Groups outlining their group's focus and sharing their views on where they saw opportunities for the I&M Group to contribute.

Croplands Research Group

23. Canada presented on behalf of the Croplands Group as the US was unable to attend the meeting. A summary of the Croplands Group meetings and action plan to date, and the three components that the group is focusing on, was provided (see separate presentation).

24. Opportunities that the Croplands Group felt were relevant to the I&M Group included:

- Improvement of National Inventories
    - Tier 2 and 3 (modelling)
- Standardised (field) methods for both soil organic carbon and N_2O
    - N_2O – continuous measurements
    - Soil organic carbon – unified sampling protocol

Livestock Research Group

25. The New Zealand co-chair of the Livestock Research Group (LRG) gave a summary of the discussions at the recent LRG meeting (4-5 November 2011) and an overview of the group's action plan (see separate presentation). The LRG had identified some possible areas for interaction with the I&M group as being:

- Measurement of baseline soil carbon stocks and changes in stocks in grazed grassland
- The measurement of emissions, in particular the use of new measurement methods
- An integrated approach to measuring emissions that incorporates all aspects of the farm management system. This is a cross cutting issue but to date it is still unsure how it should be handled
- The development and use of regional networks, particular in the areas of capability and capacity development

Paddy Rice Research Group

26. As the Paddy Rice Research Group meeting was happening the week following the I&M meeting (18 November 2011), the Japanese co-chair presented on the group's focus and a summary of their action plan (see separate presentation). The co-chair suggested that the I&M Group could help the Paddy Rice Group in the areas of:

- Measurement data on CH_4 emissions from rice cultivation from countries where growing conditions are unique.

- Measurement data on rice cultivation from every country, to be used for the base of national mitigation plans.

- Further work in obtaining data and developing methodologies for N_2O and soil carbon stock change.

- Research into the development for Tier 3 methodologies to estimate emission from rice cultivation.

- Providing opportunities for countries to share information and experiences related to the development of GHG inventories.

Soil Carbon and Nitrogen Cycling Cross-cutting Group

27. Canada presented an overview of the group, on behalf of its co-chairs France and Australia (see separate presentation). Areas where the I&M Group might aid the Soil C&N Group are:

- Carbon and Nitrogen modelling for the development of:
    - Tier 2 factors
    - Tier 3 models
- Ensure consistency of measurements and models within the Alliance.

Initial Roles for the Inventories and Measurement Cross-cutting Group

28. The co-chairs presented draft roles for the I&M Group and definitions for the terms "inventory" and "measurement" for discussion. Generally the group was happy with the co-chairs' drafting, with only a few suggestions on the wording. The co-chairs would develop a final version for presentation to the group on the final day of the meeting (refer to paragraph 43).

Involvement with International Organisations

29. This discussion was to determine how this group would interact with international organisations. The group agreed that the I&M group should follow the same protocol as the LRG, that is that relevant international/regional organisations should being invited to participate in the I&M Group but should not be part of any formal decision-making.

Dinner Presentation

BioCarbon Fund: Experience from the ground – Ellysar Baroudy (World Bank)

Baroudy presented to the group on the BioCarbon Fund and the early lessons learnt from this fund (see separate presentation). These lessons were based on two examples; (i) Kenya Soil Carbon Project and (ii) Democratic Republic of Congo Agroforestry Project.

Some of the lesson learnt from the portfolio of projects included:

- Co-benefits – These are an important incentive for local participation in the land-use carbon projects
- The temporary crediting approach to non-permanence, in the Clean Development Mechanism (CDM) provides useful information increasing information in the voluntary space
- There are rigor and practicality imbalance issues around the GHG accounting with activity data collection potentially being problematic. It is important that training is provided to project developers to help alleviate some of the GHG accounting issues.

- Preparing and carrying out projects can be time consuming, costly and difficult to develop. Therefore, highly motivated people and good project management is necessary.
- Pursuing forest carbon credits with environmental integrity, efficiency, and effectiveness can be time-intensive.
- A strict audit process is required involving validation, registration and verification.
- There are many issues relating to the land itself, including land eligibility, land tenure and the boundaries of the project.
- Land-based carbon projects face disproportionately large investment barriers because carbon finance has limited impact in a projects cash flow and it has been difficult to front load carbon finance
- Institutional arrangements can be a key success factor for projects as they can help clarify carbon ownership and ensure adequate project implementation.

WEDNESDAY 9 NOVEMBER

PRESENTATIONS

30. The second day of the meeting began with a recap of the first day and then followed with a series of presentations on work related to the group.

Overview of Canada's LULUCF and Agricultural Inventory

31. Canada presented an overview of their Land Use, Land Use Change and Forestry (LULUCF) and agricultural inventory, and the models that use the inventory information as an example of how Inventory data can be used (see separate presentation). The models use the information from the inventory to provide decision-makers with relevant information, including those in policy and farmers. For example, CanAg-MARS is a model that provides information to policy makers on abatement costs; and a farm GHG calculator, HOLOS, provides information to farmers on farm-level emissions to aid them in developing mitigation strategies. Both models use information from the inventory and use Tier 2 methods as much as possible. Some challenges of these models were noted, including:

- Keeping the tools useable by high level users without training.
- The possible need to move towards a model where the target audience are trained professionals who work with individual farmers or farmer groups.
- Including economics and emission intensity in the models.
- The requirement for additional complexity so that feedback from GHG management decisions to farm output and production costs can be included.

32. Inventory data is going to be used is carbon markets and the inventory platform is useful for broader quantification of environmental performance.

Engaging Agriculture in Climate Change- Jessica Boyle (IISD)

33. The International Institute for Sustainable Development (IISD) is a Canadian-based, public policy research institute that conducts research into sustainable development specialising in policy research, analysis and information exchange. Boyle provided an overview of the IISD's role in land-use management policy.

34. One of IISD's initiatives is the Food Security and Climate Change Initiative. This initiative is focused on the "triple dividend" – that is, food security, adaptation and mitigation. This initiative has shown that although there are many avenues to engaging agriculture in climate change, it is important to acknowledge the challenges, e.g.:

- Scale and governance – one size does not fit all. However there is a role for international organisations to provide support at the different levels to various projects.
- Incentives and benefits – mitigation is not the main driver for most farmers in developing countries therefore there is a need to find drivers that go beyond mitigation, e.g. benefit to the wider community.
- Technical issues – there are often capability issues at the level of research in different countries.
- Financing and investment – it is important that solutions are designed to support both mitigation and adaptation to better utilise the resources available.

Climate Smart Agriculture – Jan Verhagen, Wageningen UR

35. Verhagen presented to the group on the concept of "Climate Smart Agriculture" and how this relates to the I&M group (see separate presentation). In summary it was noted that in reducing the emissions intensity of agriculture there is a need to be ambitious but also a need to be realistic. For example, it is going to be difficult to increase food production while also reducing fertiliser use.

36. It is important to find a way to identify effective and efficient mitigation options. Data and models are required and an understanding of the entire farm system. Although there is a lot of signalling about climate change at the global level, there is a need to go back to the farm level to actually encourage and ensure that action happens. There are a wide variety of models that can be used at the farm level. However, good data is scarce and existing experiments may not always be useful. There is an understanding of the farm systems and farm level management, but effectiveness and efficiency are not always easy. Uncertainty and variability are also key issues in this area and there needs to be better communication and estimation of this.

Broadening international collaboration – Brian McConkey, Agriculture and AgriFood Canada

37. McConkey gave an overview of a recent FAO/CCAFS[1] workshop on whole farm and landscape GHG quantification (see separate presentation) where the Alliance was invited to attend as a potential partner. It was noted that inventories and measurements does not exist in other international research networks and therefore is a good opportunity here.

38. The CCAFS preliminary proposal from the workshop was presented. This proposed three year research program will enhance methods and data for the quantification of net emissions at the whole farm and landscape levels for developing countries and smallholders. Activities include development of a protocol to be linked with other data collection efforts, methods for better characterisation of activity data, approaches for simplifying systems analysis, and a PhD network to support broad-based collection efforts and capacity building. Key research networks will participate in the project and should facilitate coordination of sufficient minimum data to inform mitigation decision-making in developing countries.

[1] The CGIAR Research Program on Climate Change, Agriculture and Food Security

39. The I&M Group felt that this discussion might be a bit soon given that the group had not had a chance to clearly define itself. However, they agreed that there was an opportunity here to connect with the FAO and CCAFS on inventory and measurement issues.

40. At the end of the presentations, there was also a brief discussion on collaboration with international organisations more broadly. It was clarified that individual countries should still be collaborating with whoever they want to – the I&M Group is not trying to replace these. Also, while work from the Alliance will probably feed into the IPCC, especially in the area of the emission factor database, a **formal** partnership with the IPCC is not considered to be within in the boundaries of the Alliance at this time.

SHARE KNOWLEDGE AND EXPERTISE ON "HOLISTIC ACCOUNTING"

41. In preparation for identifying work areas for the group, individual countries were asked to share their experiences, opportunities, and challenges regarding "holistic accounting" (see separate presentations). This term meant different things to different people and therefore the presentations ranged from information on LCA work, emissions trading schemes, carbon markets, the development of a countries inventory system, overview on measurement, analysis and modelling systems, research into estimating emission at a whole farm scale, and model development.

IDENTIFICATION AND FILLING OF GAPS IN GHG ESTIMATIONS

42. During this session the group was split into smaller groups to identify areas where there were gaps in estimating GHG emissions and where the I&M Group could possibly assist. During the report-back from the smaller group discussions, a list of 11 areas was identified. This list would be consolidated by the co-chairs and presented to the group the following day (paragraph 44).

THURSDAY 10 NOVEMBER

WORK OF THE I&M CROSS-CUTTING GROUP

Final group roles and definitions

43. The co-chairs presented to the group a further draft of the definitions for "inventories" and "measurements" and the five roles for the group that were discussed on the first day (paragraph 28). A few minor amendments were incorporated and the group accepted the tabled document as final. Refer to section "ROLES OF INVENTORY AND MEASUREMENT CROSS CUTTING GROUP" within meeting outcomes in overview section of this report for details.

Identified gaps for attention

44. The areas identified as gaps on the previous day (paragraph 42) were presented back to the group. The co-chairs had split this into 13 areas from the original 11 identified as it was felt that if some were combined too much they would be difficult to work on (refer to table "INITIAL AREAS OF WORK FOR THE INVENTORIES & MEASUREMENTS CROSS-CUTTING GROUP" in meeting outcomes in overview section of this report). It was agreed that addressing these gaps should become the work plan for the group.

45. The first step in creating this work plan is to develop a short (e.g. one page) "terms of reference" that covered: (i) the objectives for addressing the gap; (ii) the activities that would be undertaken; and (iii) the high level resource that may be required. Countries were asked to volunteer to lead the development of each of these terms of reference, working closely with other countries

interested in the same area. It was clarified that if a country volunteers to lead the development of the terms of reference this does not obligate them to then lead or even contribute to that area later. As by developing the terms of reference, and therefore a greater understanding of what is required in each area, countries may find they can no longer contribute.

46. Countries that were unable to attend the meeting should also be given an opportunity to contribute to the terms of reference. This invitation would be extended by the Secretariat when meeting report was circulated.

47. By the end of the discussion, 11 of the 13 areas had a country to lead and help with the terms of reference. It was agreed that the remaining two areas were actually linked (they were on 'producing an inventory (and guidance on the issue) of tools and methods for GHG estimation' and 'sharing approaches and lessons learned on application of Tier 3 methods'). It was hoped that a country that did not attend the meeting may be able to lead the development of the terms of reference for these areas. A country that actually has a Tier 3 method may be appropriate. The final list of areas that terms of references will be developed for, along with the countries who have currently volunteered to help with the terms of reference can be found in the section entitled "ROLES OF INVENTORY AND MEASUREMENT CROSS CUTTING GROUP" within meeting outcomes in overview section of this report.

48. The co-chairs will work with the countries that volunteered to develop the terms of reference over the next few months. It is then expected that the group as a whole will meet again in about six months time to revisit the areas and determine if they should be in the work plan or not, and if so, which countries could contribute to them. It was noted that the terms of reference will be a product of the group, not of individuals, hence the need for the co-chairs to work closely with countries in developing the terms of reference.

CLOSING REMARKS

49. The group found the meeting to be productive, well organised and relaxed, and considered it to be a great success. The co-chairs and facilitator were thanked for their efforts over the last day and half and in organising a very effective meeting. Participants were also thanked for their contributions to the meeting, including through all the presentations. As noted in the previous session, the next meeting will likely be in approximately six months time and participants were asked to think about where it could be held and to get back to the co-chairs regarding this.

APPENDIX 1: Participants List

Country	Attendees
Alliance Member Countries	
Argentina	Laura Finster, INTA; Guillermo Berra, INTA (lfinster@cnia.inta.gov.ar)
Australia	Unable to attend
Brazil	Unable to attend
Canada	Brian McConkey, Agriculture and Agri-food Canada (brian.mcconkey@agr.gc.ca), Ian D Campbell, Agriculture and Agri-Food Canada (IanD.Campbell@agr.gc.ca), Jamshed Merchant, Agriculture and Agri-Food Canada (jamshed.merchant@agr.gc.ca), Alexandra Conliffe, Agriculture and Agr-Food Canada (Alexandra.concliffe@agr.gc.ca), Marie Boehm, Agriculture and Agr-Food Canada (marie.boehm@agr.gc.ca), Denis Angers, Agriculture and Agr-Food Canada (denis.angers@agr.gc.ca); Denise Guignard, Agriculture and Agr-Food Canada (denise.guignard@agr.gc.ca)
Chile	Paulo Gonzalo Cornejo Guajardo, Ministry of Environment (pcornejo@mna.gob.cl)
China	Gao Qingzhu, Chinease Academy of Agricultural Sciences (gaoqzg@ami.ac.cn)
Colombia	Unable to attend
Costa Rica	Unable to attend
Denmark	Unable to attend
Finland	Unable to attend
France	Unable to attend
Germany	Unable to attend
Ghana	Nicholas Iddi, Ministry of Environment, Science and Technology (nicholasiddi@yahoo.com)
Indonesia	Prihasto Setyanto, Indonesian Agro Climate and Hydrology Research Institute (prihasto_setyanto@yahoo.com)
Ireland	Phiilip O'Brien, Environmental Protection Agency (p.obrien@epa.ie)
Italy	Cristina Martinez, Research and Innovation Centre (cristina.martinez@iasma.it)
Japan	Kazuyuki Yagi, National Institute for Agro-Environmental Services (kyagi@affrc.go.jp)
Korea	Suel Bi Ji-Hyuk Lee Kim, National Academy of Agricultural Science (seulvi23@korea.kr); Kyu-Hyun Park, National Institute of Animal Science (kpark74@korea.kr)
Malaysia	Zulkefli bin Malik, Strategic Resources Research Centre (zulmalik@mardi.gov.my)
Mexico	Unable to attend
Netherlands	Jan Verhagen, Wageningen UR (adrianus.verhagen@wur.nl), Sjoerd Croqué, Ministry of Economic Affaires (s.r.r.croque@minlnv.nl)
New Zealand	Harry Clark, NZ Agricultural Greenhouse Gas Research Centre (harry.clark@nzagrc.org.nz)
Norway	Unable to attend
Peru	Unable to attend
Philippines	Esteban Godilano, Department of Agriculture (sgodilano@yahoo.com)
Spain	Unable to attend
Sweden	Unable to attend
Switzerland	Unable to attend
UK	Mike Roper, DEFRA (mike.roper@defra.gsi.gov.uk); Luke Spadavecchia, DEFRA (luke.spadavecchia@defra.gsi.gov.uk)
USA	Unable to attend
Uruguay	Walter Oyhantcabal, Ministry of livestock, Agriculture and fisheries (woyhantcabal@mgap.gub.uy)
Vietnam	Quang Duc Ho, Vietnam Academy of Agricultural Sciences (hqduc@hn.vnn.vn)
Alliance Observer Countries	

Pakistan	Unable to attend
Russia	Unable to attend
South Africa	Unable to attend
Thailand	Unable to attend
Invited participants	
IISD	Jessica Boyle, (jboyle@issd.ca)
World Bank	Ellysar Baroudy (ebaroudy@worldbank.org)
Facilitator	
Facilitator	Warran Wilson, Intersol (wwilson@intersol.ca)
Secretariat: Andrea Pickering, NZ Ministry of Agriculture and Forestry (andrea.pickering@maf.govt.nz)	