2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories - refinements in guidance on agriculture

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In order to build mutual trust and confidence among the Parties and to promote effective implementation of the Paris Agreement, a transparency framework for action needs to be enhanced.

To that end, it is essential that all the Parties produce and report high-quality and reliable national GHG inventories (national emission data).

Paris Agreement Article 13, paragraph 7:
- Each Party shall regularly provide ...:
  (a) A national inventory report of anthropogenic emissions by sources and removals by sinks of greenhouse gases, prepared using good practice methodologies accepted by the Intergovernmental Panel on Climate Change and...
Currently, Non Annex I Parties use these under the UNFCCC.

Non-Annex I Parties are encouraged to use GPGs.

GPG2000 (non-LULUCF)  GPG2003 (LULUCF)

Annex I Parties must use from 2015

2006 IPCC Guidelines

1995 IPCC Guidelines

Revised 1996 IPCC Guidelines

Actually, 2006 Guidelines are being used by more and more Non-Annex I Parties.

Revision/Update by the IPCC
2019 Refinement to the 2006 IPCC Guidelines

• 2006 IPCC Guidelines – 13 years ago!!

• The 2006 IPCC Guidelines continue to provide a technically sound methodological basis for measuring national greenhouse gas inventories.

• The 2019 Refinement updates, supplements and elaborates them where the authors identified gaps or out-of-date science. The 2019 Refinement is to be used in conjunction with the 2006 IPCC Guidelines.
The 2019 Refinement provides an updated and sound scientific basis for supporting the preparation and continuous improvement of national greenhouse gas inventories.

Over 280 scientists and experts worked on the 2019 Refinement.

Authors have examined a wide range of inventory methodologies and updated them where scientific advances and new knowledge made this necessary, following the IPCC decision.
2019 Refinement was produced following IPCC Procedures

- **Scoping**: The outline is drafted and developed by experts nominated by governments and observer organizations.
- **Approval of Outline**: The Panel then approves the outline.
- **Nomination of authors**: Governments and observer organizations nominate experts as authors.
- **Government and Expert Review - 2nd Order Draft**: The 2nd draft of the report and 1st draft of the Summary for Policymakers (SPM) is reviewed by governments and experts.
- **Expert Review - 1st Order Draft**: Authors prepare a 1st draft which is reviewed by experts.
- **Selection of authors**: Bureaux select authors.
- **Final draft report and SPM**: Authors prepare final drafts of the report and SPM which are sent to governments.
- **Government review of final draft SPM**: Governments review the final draft SPM in preparation for its approval.
- **Approval & acceptance of report**: Working Group/Panel approves SPMs and accepts reports.

Peer reviewed and internationally available scientific technical and socio-economic literature, manuscripts made available for IPCC review and selected non-peer reviewed literature produced by other relevant institutions including industry.
General Guidance

• National GHG inventory arrangements & management tools
• Data collection strategy
• Comparison of greenhouse gas emission estimates with atmospheric measurements

etc

Waste

• Estimation of CH4 emission from landfill
• Incineration and open burning of waste
• CH4 and N2O emissions from wastewater treatment

etc
**Energy**

- Fugitive CH4 and CO2 emissions from mining, processing, storage and transportation of coal
- Fugitive emissions from oil and natural gas systems
- Fugitive emissions from fuel transformation

**Industrial Processes and Product Use**

- New categories and new gases
  - production of hydrogen, rare earth metals, etc
- Update of existing guidance
  - nitric acid production, fluorochemical production, etc
Agriculture, Forestry and Other Land Use

- Interannual variability
- Biomass estimates
- Soil carbon
- Rice cultivation
- Flooded Lands
- Livestock and manure management
- Harvested Wood Products
- etc
Agriculture is an integral part of national GHG inventory

Terrestrial sources/sinks of GHGs

Terrestrial sources/sinks of GHGs

Photosynthesis

Oxidation

Methanogenesis

Nitrification & denitrification
Refinements in Guidance on Agriculture

- Soil carbon

• Tier 1 carbon stock change factors have been updated for tillage management, grassland management and land use.

• Reference carbon stocks have also been updated - more representative reference stocks for different soil types by climate regions.

• Tier 2 and Tier 3 methods have also been refined to estimate the impact of biochar amendments on soil carbon stocks in mineral soils for cropland and grassland.
Refinements in Guidance on Agriculture
- Rice cultivation

- Tier 1 factors have been updated for the baseline emission factors, scaling factors for water management regimes before and during cultivation periods, and conversion factors for organic amendments.

- Default cultivation periods have also been added for estimating annual emission factors.
Refinements in Guidance on Agriculture
- Livestock

- Tier 1 emission factors have been updated considering current productivity data and integrating differential emission factors and for high & low productivity systems.

- Tier 1 method to estimate $\text{CH}_4$ emissions from manure management has been updated for consistency with $\text{N}_2\text{O}$ emissions.
Refinements in Guidance on Agriculture - Livestock

- The methane conversion factor (MCF) for animal waste management systems are presented based on climatic regions, as opposed to annual temperatures.
- A simple calculation model for deriving the MCF based on monthly temperature regimes has been presented.
- Improved guidance has been developed for the treatment of nitrogen transfers among livestock emission source categories and transfers to agricultural soils.
Refinements in Guidance on Agriculture

- Soil $\text{N}_2\text{O}$

- Tier 1 estimates have been updated based on the latest science for direct and indirect emission factors.
- A key development is the disaggregation of emission factors by climate region.
2019 Refinement and Paris Agreement

- “Katowice Climate Package” was adopted by the UNFCCC COP24/CMA1 in December 2018 to operationalize the Paris Agreement. It stipulates:
  - Each Party shall use the 2006 IPCC Guidelines, and shall use any subsequent version or refinement of the IPCC guidelines agreed upon by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA).

The 2019 Refinement which was adopted/accepted at IPCC-49 in Kyoto is nothing but this “subsequent version or refinement of the IPCC Guidelines”!!
Thank you very much.
For details on IPCC TFI, please visit:
http://www.ipcc-nggip.iges.or.jp/