AFOLU BOG Report

Joint 1st and 2nd IPCC Expert Meeting on Short-Lived Climate Forcers (SLCFs)

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ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

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Highlights of sectoral issues (1)

Manure management

- **SLCFs:** NOx, NH_3, NMVOCs.
- **IPCC methods for estimating N_2O and CH_4 emissions** provide a good basis for globally applicable estimation methods for NO_x/NH_3 and NMVOCs respectively.
- **Need** to reconcile TAN (Total Ammonia Nitrogen) and Nex (Total Nitrogen Excreted) in the EMEP and IPCC methods to estimate NO_x and NH_3 vs. N_2O.

Highlights of sectoral issues (2)

Managed Soils (IPCC 3.C.4 and 3.C.5 – Direct and Indirect N_2O Emissions from Managed Soils)

- **SLCFs:** NOx, NH_3
- **IPCC methods for estimating direct and indirect N_2O emissions** provide a good basis for estimating direct and indirect NO_x and NH_3.
- This is a **nomenclature issue**. As existing IPCC category cannot be changed, but new categories for NO_x and NH_3 emissions could be added for both direct and indirect emissions.
- **Note:** NO_x and NH_3 emissions are part of the same process that determines N_2O emissions
- **Need** to separate EF(NO_x) and EF(NH_3), unlike that indicated in the 2019 Refinement GLs.

Highlights of sectoral issues (3)

Burning

- **SLCFs:** NO_x, NH_3, SO_2, CO, NMVOC, BC, OC
- **Note:** BOG recommends to keep focus on the **use of fire as a management tool/practice.**
- **Burning in Forest Land**
  - **Underlying assumptions of parameters/calculations** used in IPCC and alternative methods need likely to be reconciled.
  - Factors/parameters values used for emission estimation need to be **updated** with new literature.
- **Burning in Cropland**
  - **IPCC 2006 GLs could be expanded to include open burning on cropland**, which is not adequately represented in "prescribed burning" or "slash and burn".
  - There is a **need of more specific emission factors** (NO_x, SO_2, etc.) for sugarcane burning, particularly in South and Central America, Southeast Asia.
  - During COVID-19 pandemic, connections were observed between **solid waste burning and crop residue burning** in Southeast Asia, can be cross-sectoral with the Waste sector.
- **Burning in all other lands**
  - Need to reconcile nomenclatures of **soil types and land use categories**.
  - **Consistency** in the land use definitions/categories should be assured.

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Highlights of sectoral issues (4)

Others: No IPCC method available

- **Livestock manure applied to soils:**
  - **SLCFs:** NMVOCs
  - **Insufficient knowledge** to be considered.
- **Urine and dung deposited by grazing livestock:**
  - **SLCFs:** NMVOCs
  - This source deserves **further consideration and investigation.**
- **Pesticide application:**
  - **SLCFs:** NMVOCs
  - This source deserves **further consideration and investigation.**
- **Cultivated crops; Managed deciduous/coniferous forests; Grassland; Tundra; Other Low Vegetation; Other Vegetation (Mediterranean shrub)**
  - **SLCFs:** NMVOCs
  - This source deserves **further consideration and investigation.**

Highlights of sectoral issues (5)

Others: No IPCC method available

- **Fugitive dust from tilling:**
  - **SLCFs:** BC, OC, NOx
  - Tilling is recognized as a significant source of **OC and EC from PM_{10}.**
  - Estimation method is **complex and likely not applicable globally**, since parameters used seems to be land-use specific.

- **Fugitive dust from animals:**
  - **SLCFs:** OC, NO_x, NH_3
  - **Insufficient knowledge** to be considered.

Cross-sectoral issues (1)

Manure incineration

- This is cross-sectoral between **Energy, AFOLU and Waste** sectors.
- **SLCFs:** NO_x, NH_3, SO_2, CO, NMVOC, BC, OC
- Need to **reconcile TAN and Nex** in the methods to estimate NO_x.
- **All manure incineration** for the purpose of **generating energy** should be reported in the **Energy sector** (IPCC). This includes combustion emissions and pre-treatment emissions.

[**Note:** Pre-treatment emissions from manure are actually reported under AFOLU, burning manure is a manure management system and it covers the emissions from manure before being actually incinerated/burned (IPCC 2006 GLs).]

- If the **pre-treatment emission is significant**, it could be reported in the **solid fuel transformation** source category.
- **All other manure incineration and open burning** should be reported in the **Waste** sector.

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Cross-sectoral issues (2)

Anaerobic digestion

- This is cross-sectoral between **AFOLU, Energy and Waste** sectors.
- **SLCFs:** NH_3, NO_x
- Should use the **same allocation as IPCC** for reporting emissions from on-farm digesters (AFOLU), with clarification regarding the allocation of emissions.
- **Need** to collect activity data on the transfer of manure, digestate and other waste type between facilities and farms.
- Should **maintain** on-farm manure storage and application of digestate in **AFOLU** sector.
- Should ensure **methodological integrity** in all manure-related emission sources (**N mass balance**).

List of knowledge gaps (1)

Managed soil

- **Disaggregate default IPCC EF** for NO_X and NH_3 (in 2019 Refinement).

Land burning

- Availability of specific values for **fuel load, combustion factors, and emission factors.**
- **Method for open burning on cropland** (≠ prescribed burning, slash and burn).
- **Crop-specific EF for regionally important crops** (e.g. sugar cane in Central and South America and some countries in Southeast Asia).

List of knowledge gaps (2)

Manure management, incineration and digestion

- **Reconcile N sources in manure** (Total N excreted (Nex) vs. Total Ammonia N (TAN))
- **Integrate methods** to estimate emissions across categories to maintain integrity of N balance.
- **Find AD** on manure and digestate transfer between farms and waste treatment facilities.
- **Methods** to estimate SLCFs emissions from the treatment, storage and spreading of digestate.
- **Methods** to estimate "On-farm co-digestion".

Urine and dung deposited by grazing livestock

- **Improve representation** of grazing practices.

List of knowledge gaps (3)

Fugitive dust from tilling

- **Tilling** is recognized as a significant source of **OC and EC from PM_{10}**, based on an assessment of available data and monitoring tools.
- **Existing methods** may **not be applicable globally** due to its **complexity**.
- **Parameters** involved in the existing methods may not reflect crops, technologies or practices in all countries.

Fugitive dust from animals

- **Insufficient knowledge** to be considered.

Thank You
Any Questions?

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