



Technical Assessment of IPCC Inventory Guidelines – Results of Questionnaire Survey AFOLU

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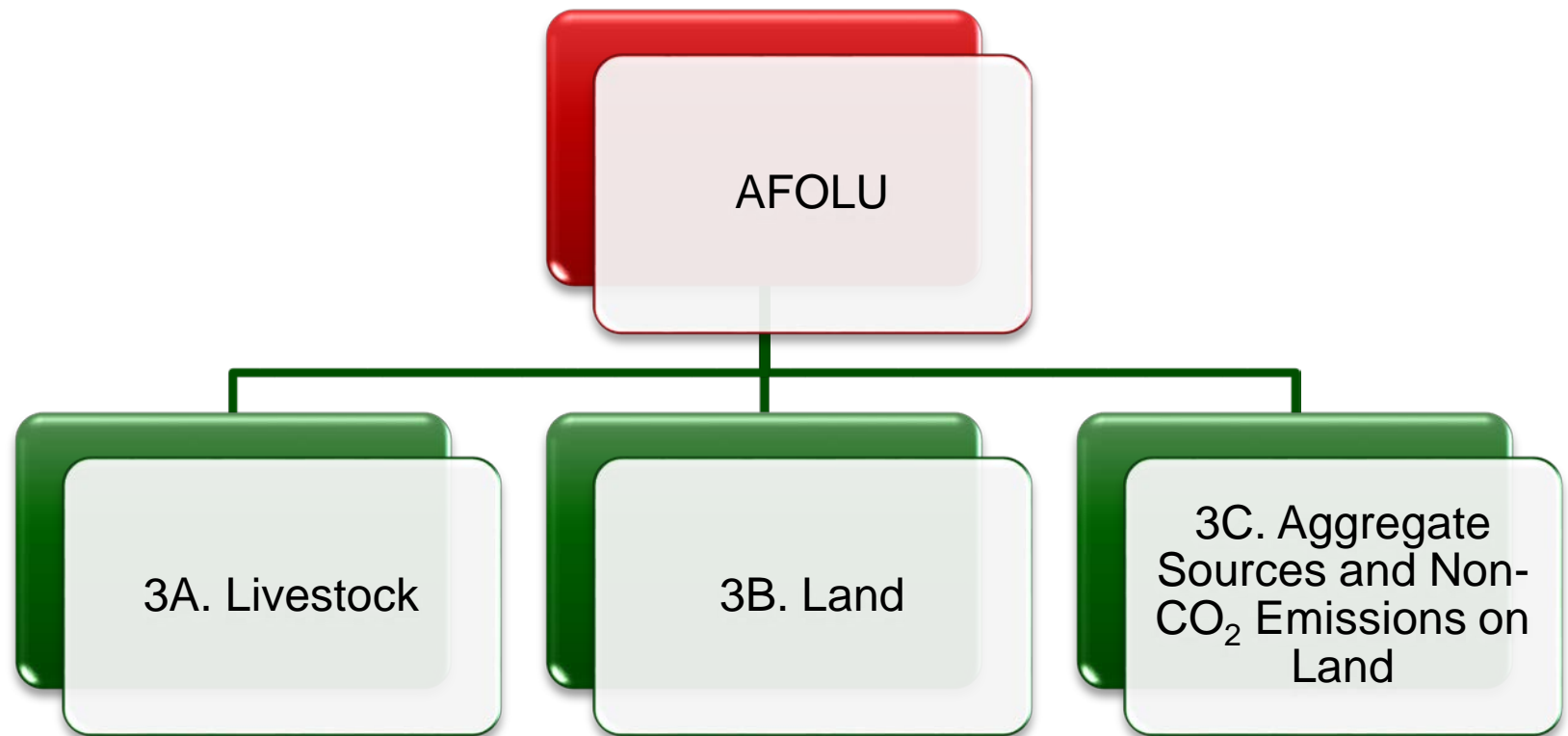
Technical Support Unit

IPCC Task Force on National Greenhouse Gas Inventories

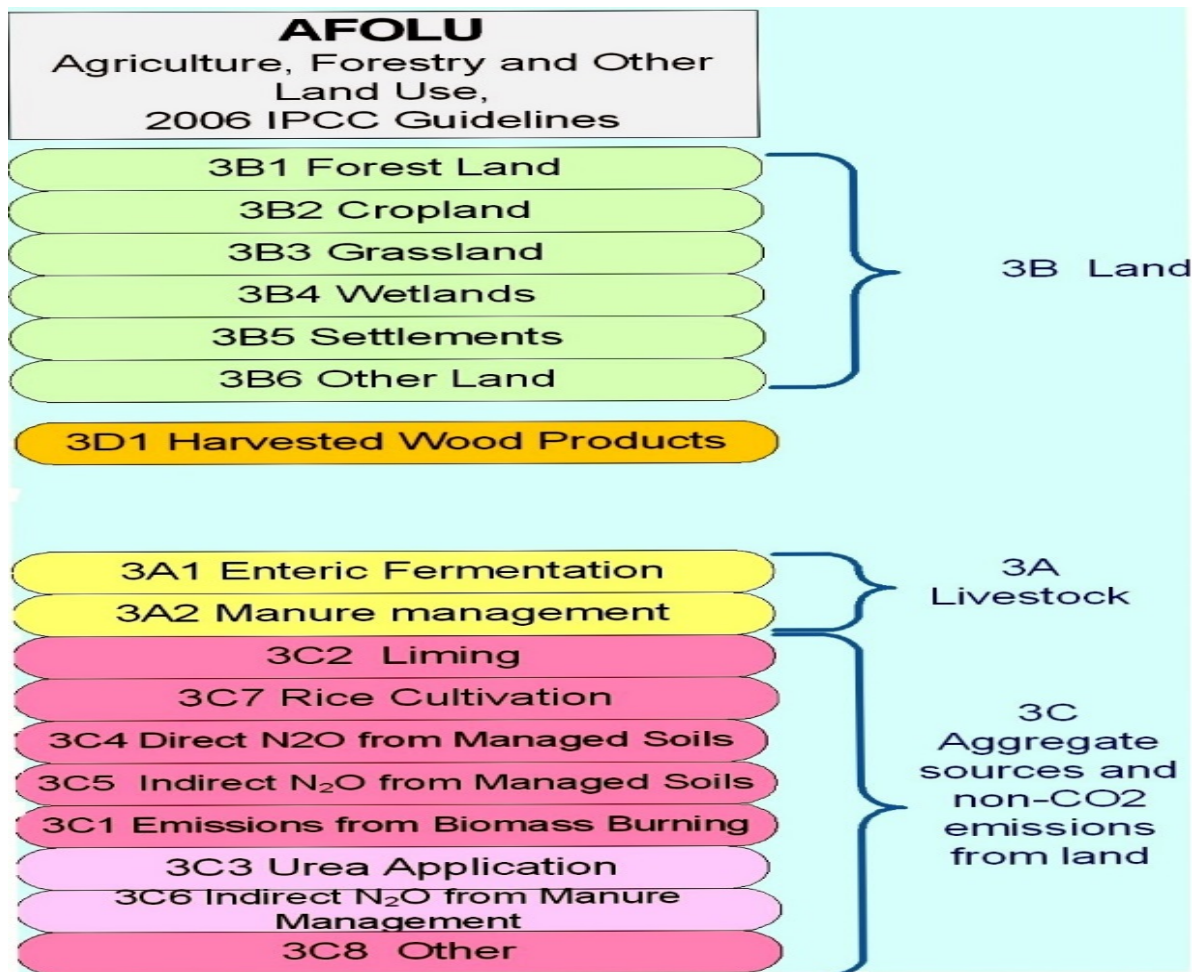
Outline

- AFOLU in the *2006 IPCC Guidelines*
- Technical Assessment of the IPCC Inventory Guidelines: Results of Questionnaire Survey
 - Statistics of comments and high priority issues
 - Livestock (3A) and Aggregate Sources and Non-CO₂ Emissions on Land (3C)
 - Land (3B) and Other (3D)

2006 IPCC Guidelines: Agriculture Forestry and Other Land Use (AFOLU)



2006 IPCC Guidelines: AFOLU Categories



3A. Livestock & 3C. Aggregate Sources and Non-CO₂ Emissions on Land

Outline

- Technical Assessment of the IPCC Inventory Guidelines:
Results of Questionnaire Survey
 - Statistics of the comments (3A&3C)
 - High priority issues (3A&3C)
- Summary

Technical Assessment of the IPCC Inventory Guidelines: Statistics of Questionnaire Survey Comments

- Total 380 comments on the AFOLU sector from 137 experts
 - 109 comments on 3A and 3C categories

AFOLU Sector Category List	Number
Livestock (3.A)	62
Enteric Fermentation (3.A.1)	20
Manure Management (3.A.2)	34
Aggregate sources and non-CO2 emissions sources on land (3.C)	47
Burning (3.C.1)	4
Liming (3.C.2)	0
Urea Fertilization (3.C.3)	0
Direct N2O Emissions from Managed Soils (3.C.4)	26
Indirect N2O Emissions from Managed Soils (3.C.5)	6
Indirect N2O Emissions from Manure Management (3.C.6)	2
Rice Cultivations (3.C.7)	4
CH4 from Drained Organic Soils (3.C.8)	0
CH4 from Drainage Ditches on Organic Soils (3.C.9)	0
CH4 from Rewetting of Organic Soils (3.C.10)	0
CH4 Emissions from Rewetting of Mangroves and Tidal Marshes (3.C.11)	0
N2O Emissions from Aquaculture (3.C.12)	0
CH4 Emissions from Rewetted and Created Wetlands on Inland Wetland Mineral Soils (3.C.13)	1
Other (please specify) (3.C.14)	3

Technical Assessment of the IPCC Inventory Guidelines: High Priority Issues

- Total 11 areas or specific issues that may need to be given high priority are identified for discussion at the upcoming expert meeting
 - Enteric fermentation (3A1): 2
 - Develop new models based on breed/geographical location
 - Improve parameters based on different feeding strategies

Technical Assessment of the IPCC Inventory Guidelines: High Priority Issues

– Manure management (3A2): 4

- Refine parameters based on new science
- Illustrate conceptual models of dairy systems, beef production systems, swine production systems, and poultry production systems and resulting GHGs from enteric fermentation and housing and manure management systems to facilitate communication of sources of GHGs and interrelationships between sources
- Reconsider method of estimating nitrogen excretions, development of the MCF factors, N₂O estimation from liquid manure storage based on surface area of manure storage
- Guidance on how to deal with avoided methane emissions due to biogas production

Technical Assessment of the IPCC Inventory Guidelines: High Priority Issues

- Aggregate sources and non-CO₂ emissions sources on land (3C): 5
 - Consider improved means for estimating crop management impacts in cropland N₂O fluxes, including manure and nitrification inhibitors and tillage and account for asymbiotic fixation
 - Factors could be developed for new practices such as nitrification inhibitors for direct N₂O emissions from soils
 - Update parameters such as 1% of the N applied to soils, pasture, range and paddock by grazing animals, and other emission factors
 - Derive new emissions factors for indirect N₂O, both the amount of leaching/runoff and volatilization, as well as the indirect emission factor
 - Update emission factor for rice cultivation based on country-specific publications

Summary (3A&3C)

- 109 comments on 3A and 3C categories of AFOLU sector
- Total 11 areas/issues may need to be given high priority
 - Enteric Fermentation (3A1): 2
 - Manure Management (3A2): 4
 - Aggregate sources and non-CO₂ emissions sources on land (3C): 5

3B. Land and 3D. Other

Outline

- Survey results
- High priority issues identified for 3B and 3D
 - Issues addressing updates/development of Emission Factors (EF) and Activity Data (AD) by land use category
 - Issues addressing addition/further development of methods to estimate emissions/removals (including equations)
 - Refinement of Content and Structure of the 2006 GL and the 2013 Wetlands Supplement
 - Issues where no guidance exist in the 2006GL
- Cross-sectoral issues
 - Summary – Key messages

Technical Assessment of the IPCC Inventory Guidelines: Statistics of Questionnaire Survey Comments

- Comments relevant to the categories in the *2006 IPCC Guidelines* (3B&3D)

AFOLU Sector Category List	Number of comments
Land (3B)	200
Forest Land (3.B.1)	62
Cropland (3.B.2)	30
Grassland (3.B.3)	8
Wetlands (3.B.4)	43
Settlements (3.B.5)	5
Other land (3.B.6)	8

AFOLU Sector Category List	Number of comments
Other (3D)	21
Harvested Wood products (3.D.1)	16
Other (3.D.2)	4

- Total of 32 AFOLU high priority issues: 11 Agriculture and 21 were Land 3B

High Priority issues Land 3B- Updates /development of EF/AD by land use

Land 3B: Gas CO₂

- Update default values for soil organic carbon, examples of international land cover dataset can now be extended. (Issue 8)

Forest (3.B.1) Gas CO₂

- Update values for litter and develop default values for deadwood,
- Update values for BEF/BCEF, harvest losses and root/shoot ratio,
- Update average biomass stocks and average volume increments (Issue 10)

Forest (3.B.1) Gas CO₂

- Improve guidance on the process and analysis of satellite data, other statistics such as FAOSTAT emission database (Issue 11)

Forest (3.B.1) Gas CO₂

- Update default values for soil organic carbon in particular for forests on organic soils (depth considerations)(Issue 27)

High Priority issues Land 3B- Updates /development of EF/AD by land use

Cropland remaining Cropland (3.B.2.a) Gas CO₂, CH₄ and N₂O

- Update or addition of default emission factors for cropland management by management activities on organic soils following drainage (in particular organic soils drained for intensive management/agriculture) (Issue 30)

Land converted to Cropland (3.B.2.b.i) Gas CO₂, CH₄ and N₂O

- Improve user-friendliness in relation to emissions from deforestation by bringing together all the relevant sections on deforestation in the 2006GL into one chapter (For example as in GOFC-GOLD, section 2.5) (Issue 14)

Grassland remaining Grassland (3.B.3.a) Gas CO₂, CH₄ and N₂O

- Update or addition of default emission factors for grassland management by management activities on organic soils following drainage (in particular organic soils drained for intensive management) (Issue 31)

Issues addressing addition or further development of methods to estimate emissions/removals (including Equations)

Forest Land Remaining Forest Land Forest (3.B.1.a), Gas CO₂ and N₂O

➤ Addition or improvement of methods (equations)

i. *Degradation (plus EF/AD)*

ii. *REDD+*

(a) ad-hoc guidance on use of Remote Sensing - to detect deforestation/degradation,

(b) update default values for tropical forest and disaggregate by intact/non-intact forest

iii) General Improvements of equations for FLRFL (Issue 29)

Land Converted to Forest Land - (3.B.1), Gas CO₂, CH₄ and N₂O

➤ Reconsider or improve methods to estimate emissions and removals from forests

i. *Selective logging and regrowth in tropical forests*

ii. *Natural disturbances (update 2006 GL in accordance with the respective Section 2.3.9 in the 2013 KP Supplement)*

iii. *BEF or BCEF (Issue 12)*

Issues addressing addition or further development of methods to estimate emissions/removals (including Equations)

Forest Land Remaining Forest Land Forest (3.B.1.a) Gas CO₂

- Emissions from soils disturbed during forest operations on large forest areas and carbon stock changes in soils due to land use changes need to be estimated (Issue 28)

Land (3B) - Gas CO₂, CH₄ and N₂O

- Update or further develop guidance on activity data on land representation to link land classification system and digital maps (remote sensing data or GIS data).
- This should allow for aggregation of relevant classes into the main six IPCC Land Categories defined in the IPCC Good Practice Guidelines (Forest Land, Cropland, Grassland, Wetlands, Settlements and Other Land). Also stratified by climate, soil and land use type (Examples of Global Initiatives MDG-GFOI, FAO, e.t.c., (Issue 26)

Refinement of content and structure of the 2006 GL and the 2013 Wetlands Supplement

Wetlands (3.B.4), Gas CO₂, N₂O and CH₄

- Clarify how both the guidance from the 2006 IPCC guidelines and the Wetlands supplement should be applied together to develop estimates for Wetlands.
 - I. Clarifying that guidance from the Wetlands Supplement can apply to any LULUCF land use category.
 - II. Clarifying that Wetlands land use category is restricted to wetlands that do not fall under the other LULUCF land categories
 - III. Derivation of new EF for Peat stock piles and Offsite Peat (Issue 15)

Harvested Wood Products (3. D. 1), Gas CO₂

- Harmonize the approach for estimating HWP between the 2006 GLs and the 2013 KP Supplement (Issue 24)

Refinement of content and structure of the 2006 GL and the 2013 Wetlands Supplement

Wetlands (3.B.4), Flooded Land :Gas CH₄

- Development of a methodology for constructed wetlands, particularly those that occur in regions of salinity >15ppt - CH₄ from flooded land
- i. 2013 Wetlands Supplement did not include guidance for estimating CH₄ from flooded lands. (Issue 16)

Wetlands (3.B.4), Flooded Land: Gas CO₂ N₂O and CH₄

- Revision of emission factors for flooded land taking into consideration the following: the quantity and type of carbon pool flooded; management activities prior to flooding and during reservoir management; inflow/outflow rates and drawdown area; upstream watershed and erosional estuarine exchange; and other new scientific literature. (Issue 17)

Issues where no guidance exists in the 2006GL

Cross-sectoral (Land (3B), Energy and Agriculture)

Land (3. B)

- Development of guidance and methodologies for estimating emissions from land conversion due to mining and development of non-renewable energy resources to extract minerals and fossil fuels (Issue 9)
 - i. Guidance on methods for estimating emissions following reclamation of these lands to reforestation, afforestation and revegetation activities or agricultural land- stratified by climate, ecosystem and soils types
 - ii. Development of tier 2 guidance (2006 GL) for a broad range of subcategories for more specific land use conversions including land management practices associated with surface mine development (drainage, clearing , land excavation) and site abandonment and rehabilitation
 - iii. Development of EF for different ecological zones, land management practices, whilst maintaining consistency with, Land (3B), Energy and agriculture sectors

Summary of presentation – Key messages

- Survey results highlighted key emerging issues to be considered in the refinement of the 2006GL
- Key areas for consideration include:
 - i. Updates for Emission Factors/Activity Data for FOLU sector in particular, forestland, cropland and grassland management activities and wetlands
 - ii. Addition/further development of methods to estimate emissions/removals (including equations) for Forest Land Remaining Forest Land Forest/Land converted to Forest Land, grassland and cropland.
 - iii. Development of guidance on activity data on land representation to link land classification system and digital maps (remote sensing data or GIS data).
 - iv. Refinement of content and structure of the 2006 GL and the 2013 Wetlands Supplement
 - v. Development of guidance on issues where no guidance exists in the 2006GL



Any questions?