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ACTIVITIES OF THE TASK FORCE ON NATIONAL GREENHOUSE GAS INVENTORIES

(Submitted by the Co-Chairs of the Task Force Bureau)

IPCC Secretariat

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Activities of the Task Force on National Greenhouse Gas Inventories

Activities relevant to Wetlands

1. The 2006 IPCC Guidelines note that the guidance on wetlands is incomplete. When the Wetlands chapter in the 2006 IPCC Guidelines was compiled there was insufficient scientific information available to complete methodologies for all sub-categories, and so methods are only available for some emissions from flooded lands; harvesting of peatlands and some organic soils.
2. The UNFCCC's Subsidiary Body for Scientific and Technological Advice (SBSTA) at its 32nd session, as part of its consideration of the use of the IPCC 2006 Guidelines, invited the IPCC to "to organize an expert meeting to explore the need and ways to clarify methodological issues related to reporting on harvested wood products, wetlands and nitrous oxide emissions from soils. (FCCC/SBSTA/2010/L.12, paragraph 7).
3. In response to this an Expert Meeting on Harvested Wood Products, Wetlands and N₂O Emissions from Soils was held on 19th-21st October, 2010 in Geneva, which concluded that:

"The meeting ... in general considered that the methodological advice contained in the 2006 IPCC Guidelines still reflects the latest science... Since the 2006 IPCC Guidelines were completed much new scientific information is now available about various wetlands that enable emissions and removals to be estimated from wetland restoration and rewetting especially for peat lands. The meeting recommended that the IPCC provide additional methodological guidelines for the rewetting and restoration of peat land; emissions from fires, ditches and waterborne carbon; and constructed wetlands for waste water disposal, to fill gaps in the existing guidelines."

4. The meeting's conclusions were summarised in Co-Chairs Summary that was presented at the UNFCCC Workshop on the Annex I Reporting Guidelines (3rd-4th November 2010) and at a side event at the UNFCCC COP 16 session in Cancun on 30th November, 2010.
5. The UNFCCC SBSTA at its 33rd session held in December 2010 in Cancun invited the IPCC to prepare additional guidance on wetlands, focusing on the rewetting and restoration of peatland. Document FCCC/SBSTA/2010/L.18, paragraph 4 states:

"The SBSTA took note of the summary of the co-chairs of the IPCC expert meeting on harvested wood products, wetlands and N₂O emissions from soils. Noting that science has developed in some areas with regard to wetlands, the SBSTA invited the IPCC to undertake further methodological work on wetlands, focusing on the rewetting and restoration of peatland, with a view to filling in the gaps in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories ... in these areas and to complete this work for the thirty-ninth session of the SBSTA."

6. In response to this SBSTA invitation, and utilising the contingency funds in the 2011 budget which allowed for this possibility, the "IPCC Expert Meeting on Scoping Additional Guidance on Wetlands" was held at the WMO in Geneva, Switzerland from 30th March to 1st April, 2011.
7. This meeting produced a draft Terms of Reference (ToR), including annotated chapter outline and work plan for a "2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands" (Annex 1). This includes an "Instructions to Experts and Authors" which ensures compatibility with the 2006 IPCC Guidelines and a common understanding for all the experts involved in this work.

Other Meetings

8. The 2006 IPCC Guidelines Software Review meeting and Emission Factor Database Editorial Board and Data Meetings were held on 15th-18th December, 2010 in Sao Paulo, Brazil.
9. The IPCC Software for the IPCC 2006 Inventory Guidelines is in its final stage of development, and this meeting was held to review the latest progress and get feedback from potential users. The meeting's discussions will be reflected in the final stages of the software development. The software will be launched in June 2011, but final testing work will continue through 2011 and 2012.
10. EFDB Editorial Board and data meetings on soil N₂O and wetlands were held concurrently with the software meeting and have resulted in the identification and approval of new data for the EFDB.

Principles of work for TFI

11. The TFB agreed the "Interim General Principles for those involved in the IPCC TFI". (Annex 2). The Task Force Bureau intends to apply these to all its work, including the work on the 2013 Supplement to the 2006 IPCC Guidelines, until such time as the IPCC Plenary updates its principles and procedures.

2011 TFI Workplan

12. The TFI work plan for the remainder of 2011 is under development by the TFB and is dependent on the Panel decision on the 2013 Supplement to the 2006 Guidelines, but would include;
 - One session of wetlands authors meeting, (using funds for one budgeted expert meeting),
 - One session of the TFB,
 - One inventory expert meeting on bottom-up inventory methodologies,
 - One session of the Editorial Board of the IPCC Emission Factor Database and two meetings to address EFDB data,
 - Evaluation meeting of the Software for the 2006 IPCC Guidelines,
 - One expert meeting in Japan with travel support partially funded by the IPCC Trust Fund.
13. The TFI intends to hold a side-event in June at the UNFCCC SB sessions in Bonn to present progress in response to the UNFCCC invitation on wetlands and the IPCC software developments

Annex 1

Proposal for “2013 Supplement to 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands”

1. The Co-Chairs of the Task Force on National Greenhouse Gas Inventories (TFI) are pleased to present to the IPCC the following proposal for its consideration. This proposal, endorsed by the Bureau of the TFI, for additional guidance covering wetlands (but not flooded lands such as reservoirs) fills gaps already identified in the 2006 Guidelines at the time it was finalised, and for which it is believed sufficient information is now available to complete methodological guidance. This proposal comprises a Terms of Reference and a table of Contents. Also attached are the Instructions to Experts and Authors that will ensure compatibility with the 2006 Guidelines.

Terms of Reference

Background

2. The UNFCCC Subsidiary Body for Scientific and Technological Advice (SBSTA) at its 33rd session held in December 2010 in Cancun invited the IPCC to prepare additional methodological guidance on wetlands, focusing on the rewetting and restoration of peatland.
3. The 2006 IPCC Guidelines themselves note that the guidance on wetlands is incomplete. When the Wetlands chapter in the 2006 IPCC Guidelines was compiled there was insufficient scientific information available to complete methodologies for all sub-categories, and so methods are only available for some emissions from flooded lands and from peatlands being harvested.
4. This was considered at the “IPCC expert meeting on Harvested Wood Products, Wetlands and N₂O Emissions from Soils”, held in Geneva, 19th-21st October 2010, that concluded,
“Since the 2006 IPCC Guidelines were completed much new scientific information is now available about various wetlands that enable emissions and removals to be estimated from wetland restoration and rewetting especially for peat lands. The meeting recommended that the IPCC provide additional methodological guidelines for the rewetting and restoration of peat land; emissions from fires, ditches and waterborne carbon; and constructed wetlands for waste water disposal, to fill gaps in the existing guidelines.”
5. Finally this was considered by the UNFCCC SBSTA at its 33rd session that concluded (Document FCCC/SBSTA/2010/L.18, paragraph 4):
“The SBSTA took note of the summary of the co-chairs of the IPCC expert meeting on harvested wood products, wetlands and N₂O emissions from soils. Noting that science has developed in some areas with regard to wetlands, the SBSTA invited the IPCC to undertake further methodological work on wetlands, focusing on the rewetting and restoration of peatland, with a view to filling in the gaps in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (hereinafter referred to as the 2006 IPCC Guidelines) in these areas and to complete this work for the thirty-ninth session of the SBSTA.”
6. This task aims to fulfil this invitation by filling gaps in the 2006 IPCC Guidelines.

Scope

7. In response to the decision of IPCC XX and the invitation from the SBSTA at its 33rd session, the IPCC will provide a Supplement to the 2006 IPCC Guidelines as an IPCC Methodology Report, as outlined in the Table of Contents.

8. The overall aim of this work is:

To develop additional national-level inventory methodological guidance, including default emission factor values, on wetlands to address the gaps identified in the 2006 IPCC Guidelines.

9. This 2013 Supplement:

- does not revise or replace the 2006 IPCC Guidelines, but provides a reference that complements and is consistent with these Guidelines.
- will be completed before the 39th session of SBSTA in 2013, as noted in the work plan (table 1).
- will be consistent with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (2000), and the IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry (2003) as well as the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Recent advances in science will be taken into account.
- will contain the methodological guidance to fill the gaps identified in the 2006 IPCC Guidelines in the sub-categories of peatland rewetting and restoration as well as anthropogenic emissions and removals from additional coastal and freshwater wetland types.
- does not cover flooded lands (such as reservoirs).

Approach

10. The result of this work will be an IPCC Methodology Report “**2013 Supplement to 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands.**” (See the Table of Contents, below)

11. The authors will follow guidelines (see annex 1 “Instructions to Experts and Authors”) to ensure compatibility with the 2006 IPCC Guidelines. Key elements of the work will be:

- **Structure:** This 2013 Supplement will contain methodological guidance in a consistent structure with that for other categories in the 2006 IPCC Guidelines. Specific references or citation will be made to related chapters and guidance in the 2006 IPCC Guidelines. As applicable, reporting tables for the new sub-categories will be provided.
- **Content of guidance:** This 2013 Supplement will include tiered methodological approaches; decision trees; new and/or updated methods and default emission factors, where appropriate; cross-references as necessary to avoid double counting or omissions of emissions and removals; and reporting and documentation guidance. The elements for cross-cutting issues will generally rely on the general guidance on Volume 1 of the 2006 IPCC Guidelines, and only additional guidance specifically relevant to the issues contained in this 2013 Supplement will be provided.
- **Coverage:** The 2013 Supplement will cover the same greenhouse gases included in the 2006 IPCC Guidelines.

12. Literature will be considered up to a cut-off date at the start of the Government/Expert Review.

13. Table 1 provides the time table for this task.

Table 1 Work Plan for 2013 Supplement

Date	Action	Comment
May 2011	IPCC 33	Plenary approves ToR, Chapter outline and this work plan, guidance to authors
June – Aug 2011	Call for Nomination of Authors	IPCC invites nominations for authors and Review Editors from Governments and International Organizations.
Aug 2011	TFB select Authors	Selection by TFB considering expertise and geographical coverage, (The IPCC Bureau will be informed.).
Nov 2011	1 st Author Meeting	To develop zero order draft
Feb 2012	2 nd Author Meeting	To develop first order draft for review
Apr – May 2012	1 st Expert Review	8 weeks review by experts
July 2012	3 rd Author Meeting	To consider comments and produce second order draft for review
Oct 2012	Literature cut-off date	Only papers published before this date will be considered
Oct – Nov 2012	2 nd Expert & Government Review	8 weeks review by experts and governments
Feb 2013	4 th Author Meeting	To consider comments and produce final draft
April – May 2013	Government Consideration	Distribute to governments for their consideration prior to approval (at least 4 weeks prior to the Panel)
2013 (tbc)	Adoption/acceptance by IPCC 36	Final draft submitted to IPCC Panel for adoption/acceptance
Oct 2013	Distribute Guidelines	Distribute document to governments and Parties to UNFCCC (before SBSTA39 in December 2013)

2013 Supplement to 2006 IPCC Guidelines for National Greenhouse Gas Inventories:
Wetlands

Table of contents

OVERVIEW CHAPTER

- Background – request from UNFCCC
- This supplementary guidance addresses gaps identified in the 2006 IPCC Guidelines as far as possible. It focuses on those anthropogenic activities and management that give rise to emissions or removals by wetlands
- Policy Relevance
- Summary

Chapter 1- INTRODUCTION

- Coherence and compatibility with 2006 Guidelines.
- What is covered by the 2006 Guidelines and what are the gaps it identifies?
- Definitions & Coverage (coastal wetlands, peatlands and other freshwater wetlands) and
 - Definition and delineation of wetlands taking into account the RAMSAR definitions
 - Completeness and potential overlaps
 - Roles and functions of constructed wetlands
 - Flooded lands are NOT covered (such as reservoirs)
- Significance of human activities on wetlands emissions and removals.
 - (Annex could include examples)
- Assessment of data available (current and historical) for wetland types of the world

Chapter 2 – CROSS-CUTTING GUIDANCE ON ORGANIC SOILS

(Supplemental guidance to Chapter 2 on Generic methods relating to organic soils)

- Introduction (generic guidance for all systems with organic soils)
- Relationships to other chapters
- Methodologies¹:
 - Drainage. (Water table - drainage classes, Ditches and Water-borne carbon)
 - Land use and land use intensity changes on organic soils
 - Fires (both wildfires on drained peatlands and managed fires)
- Use of these additional generic methods Forestlands, Croplands, Grasslands, Settlements and Wetlands

Chapter 3 – REWETTING AND RESTORATION OF PEATLANDS

(Supplemental Guidance to Chapter 7)

- Introduction
- Methodologies¹:
 - Rewetting (reversal of drainage)
 - Restoration/rehabilitation
 - Restored/rewetted peatlands remaining restored/rewetted peatlands

¹ Throughout this chapter outline "Methodologies" includes tiered methodologies, choice of methodology, default Emission Factors, Activity Data, uncertainty assessment and other category specific good practice issues. All GHGs as applicable would be considered. See the "Instructions for Authors" for more details

Chapter 4 – **COASTAL WETLANDS**

(Coastal wetlands are those that are tidally influenced and include mangroves, saltmarsh, seagrass and tidal freshwater systems. Supplemental Guidance to Chapters 2&7)

- Introduction,
- Relationships to other chapters – e.g. Constructed wetlands and wastewater treatments, prevention of double-counting
- Important and unique characteristics of these wetland types (e.g. Soil- organic vs mineral; Hydrology and water quality; and Vegetation types)
- Methodologies¹:
 - Activities², Management practices and how these effect emissions (use 5 IPCC pools)
 - Restoration, Creation, and recovery of coastal wetlands – sequestration and changes in emissions

Chapter 5 - **OTHER FRESHWATER WETLANDS**

(Covers inter alia, Seasonally Flooded Wetlands, Riparian, Swamps, marshes etc, Supplemental Guidance to Chapters 2 & 7)

- Introduction
- Relationships to other chapters – e.g. Constructed wetlands and wastewater treatments, prevention of double-counting
- Important and unique characteristics of these wetland types (e.g. Soil- organic vs mineral; Hydrology and water quality; and Vegetation types)
- Methodologies¹:
 - Activities², management practices and land uses and how these affect emissions (use 5 IPCC pools)
 - Restoration, Creation, and recovery of wetlands – sequestration and changes in emissions

Chapter 6 - **CONSTRUCTED WETLANDS – Wastewater Treatment**

(Supplemental Guidance to Volume 5 Chapter 6)

- Introduction
- Relationships to other chapters – e.g. wastewater treatments, prevention of double-counting and discussion on natural wetlands that are used as wastewater treatments
- Types of constructed wetlands for waste water disposal
 - Surface-flow constructed wetlands; Subsurface –flow wetlands (Vertical and horizontal flows)
 - Main Parameters that affects GHG emissions e.g. – Inputs such as Nutrient loading (e.g., N loading, P loading); Hydrological regime and species of plant (macrophytes)
- Methodologies¹:
 - emissions and removals from constructed wetlands

² Activities that may be significant for individual categories of wetlands include clearance (followed by biomass combustion, filling, drainage, aquaculture, conversion to agriculture); changes in hydrology; application of waste water; restoration and fires. The impacts of these need specific methodologies particularly for soils.

Chapter 7 – **GOOD PRACTICE AND IMPLICATIONS FOR REPORTING**

- General Good Practice Issues
 - Quality and quantity of data
 - Completeness, Time Series consistency, QA/QC
- Completeness, Time-series consistency, QA/QC for wetlands as a whole
- Need for, and how to, maintain 2006 Reporting Approaches
- Reporting according to the 2006 Guidelines
- Mapping Wetlands emissions into 2006 Guidelines reporting
- Areas for further work
- Worksheet

**2013 Supplement to 2006 IPCC Guidelines for National Greenhouse Gas Inventories:
Wetlands.**

**Instructions to Experts and Authors
Approach for authors of the 2013 Supplement report**

Principles of the Guidelines

1. This 2013 Supplement will include tiered methodological approaches; decision trees; new and/or updated methods and default emission factors, where appropriate; cross-references as necessary to avoid double counting or omissions of emissions and removals; and reporting and documentation guidance. The elements for cross-cutting issues will generally rely on the general guidance on Volume 1 of the 2006 IPCC Guidelines, and only additional guidance specifically relevant to the issues contained in this 2013 Supplement will be provided.
2. Guidelines should be understandable and easy to implement. Authors should balance the need to produce a comprehensive report consistent with the 2006 IPCC Guidelines and with reasonable limits to the length and detail of the guidance. In particular:
 - a. The guidance should follow a cookbook approach by providing clear step by step instructions. It should not be a textbook. Detailed background information on emission processes, scientific studies, etc. is generally referenced rather than included.
 - b. Authors should consider all recent scientific developments and national methods used by countries in their inventories.
 - c. Significant changes from the 2006 IPCC Guidelines will have significant implications for all countries. Parties to the UNFCCC use the IPCC Guidelines to prepare national inventories and national communications. Substantial changes are discouraged and could only be introduced if they can be justified on sound scientific and technical grounds.
 - d. Authors should bear in mind that the target audience is a diverse group of readers who are primarily concerned with the development of national inventories. For this reason, the emphasis should be on ensuring clear communication of practical and understandable guidance.
3. This work aims to develop additional national-level inventory methodological guidance, including default emission factor values, on wetlands to address the gaps identified in the 2006 IPCC Guidelines. However flooded lands (reservoirs) are excluded as the TFB does not consider the science to be sufficiently developed.
4. These guidelines will cover the same greenhouse gases included in the 2006 IPCC Guidelines.
5. The general structure, approach and definitions used in the 2006 IPCC Guidelines, such as tiered approach and decision trees will be used. Annexes may be used where necessary to contain additional data to support the methodologies, although large numbers of annexes will probably not be necessary. Appendices are not ruled out where scientific knowledge is insufficient to develop methodologies. Authors should avoid work on areas that have to be relegated to an appendix as far as possible. Appendices should be sub-titled by "Basis for future methodological development".

6. The general structure of the category-specific methodological guidance will be:
 - a. Methodological Issues
 - i. Choice of Method, including decision trees and definition of tiers.
 - ii. Choice of Emission Factor
 - iii. Choice of Activity Data
 - iv. Completeness
 - v. Developing a Consistent Time Series
 - b. Uncertainty Assessment
 - i. Emission Factor Uncertainties
 - ii. Activity Data Uncertainties
 - c. Quality Assurance/Quality Control, Reporting and Documentation

Worksheets

7. Worksheets should be included. Worksheets will reflect the application of tier 1 methods only, due to the varied implementation of higher tier methods by countries. Authors should stress the importance of documentation and archiving particular types of information of relevance to each sub-category, although advice may be given of what needs to be reported for transparency at higher tiers.

Emission factors and methods

8. Authors should provide default emission factors. In doing this work, they should draw on the widest possible range of available literature, including the IPCC Emission Factor Database (EFDB), scientific articles and country reports.
9. All new default data should be evaluated for scientific and technical appropriateness, and should be clearly referenced. The attached form (Appendix 1) should be used as the means for documenting data which will also facilitate future integration of the EFDB. Authors should be familiar with the draft cross-cutting guidance on data collection in Volume 1 of the 2006 IPCC Guidelines and the guidance on cross-cutting issues in this note on terms, data types, data demands of methods and stratification requirements. Default data should also meet the EFDB evaluation criteria – robustness, documentation, and applicability.
10. Single IPCC default emission factors might not be ideal for any one country, but they can be recommended provided that regional factors are unavailable, and the defaults are representative of typical conditions as far as can be determined. It may be necessary or appropriate to provide a range of default emission factors along with clear guidance about how countries should select from within the range. Authors may also provide multiple default emission factors, disaggregated by region, technology, or another classification scheme (e.g., livestock type),
11. It is important to provide more default emission factors that reflect the unique conditions of developing countries.
12. Users of the guidance should be encouraged to develop and use country specific data. Emission factors for higher tiers need not be specified. Default information is included primarily to provide users with a starting point from which they can develop their own national assumptions and data. Indeed, national assumptions and data are always preferred because the default assumptions and data may not always be appropriate for specific national contexts.
13. The basic principle concerning national methods will continue to apply – countries are encouraged to use national data or methods so long as they are consistent with the IPCC guidelines as developed and indeed it is a function of the 2006 IPCC Guidelines to promote consistency via the sectoral and cross-cutting guidance provided.

Decision trees

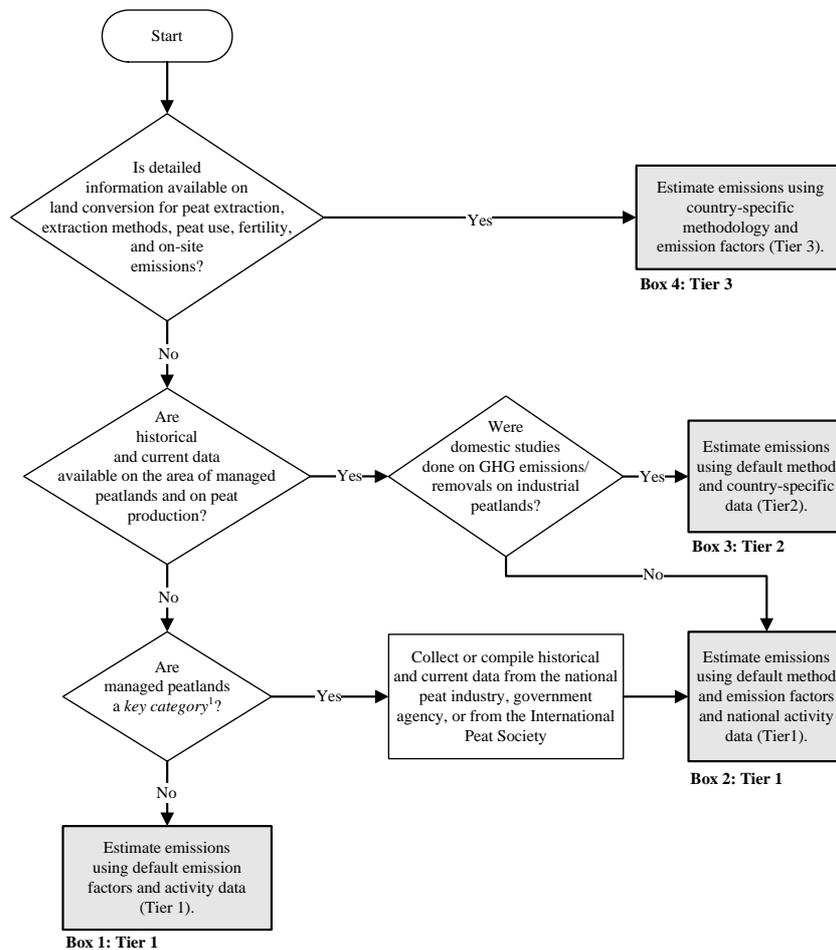
14. Consistent with the format and structure of the 2006 IPCC Guidelines, the 2013 Supplement report will contain decision trees for each sub-category to assist countries in selecting from the IPCC methods. These decision trees link the choice of IPCC methods to national circumstances via specific questions about data availability and status as a key category³.
15. To ensure consistency in decision tree logic and format across categories, authors should adhere to the following requirements:
 - a. The decision trees should be based on a series of questions with clear yes/no answers, and two subsequent branches along yes/no paths.
 - b. The decision trees should start with assessing data availability for the highest tier method, and then direct countries step-wise towards lower tier methods if activity data, emission factors or other parameters are not available.
 - c. The decision tree should indicate the lowest tier method that is judged to be appropriate for estimating emissions/removals from a key category.
 - d. If data are not available for the method referred to in c, the 'No' response should direct the reader to the question "Is this a key category?" If the answer to this is 'Yes', the decision tree should recommend that the country collect the necessary data to implement a higher tier method. If the answer is 'No', then the decision tree can recommend a lower tier method. There is no need to deal with the case for a key category where a country does not have the resources to gather additional data needed to implement higher tier methods. This is dealt with in the cross cutting volume of the 2006 IPCC Guidelines.
 - e. The branches of the decision trees should end in 'out-boxes' that correspond to specific tiers identified in the guidance for that category and are labelled by tier. Authors may also recommend out-boxes for hybrids tiers.
 - f. Authors may develop separate decision trees for different sub-categories. Alternatively, they may include decision tree options for selecting different tiers for different sub-categories. This second option is appropriate if it is advantageous to recommend a higher tier method only for significant sub-categories rather than for the entire category. Decision trees that use the 'significance' criterion should include the "25-30% rule" (i.e., a significant sub-category is one that makes up more than 25-30% of emissions/removals from a category).

³ The most appropriate choice of estimation method (or tier) may also depend on national circumstances, including the availability of resources and advice on this will be given in the cross-cutting volume.

16. Additional Formatting Guidelines (see example):

- a. Decision trees should be drafted in separate Microsoft Word format files. The TSU will integrate these files into the main text at a later date.
- b. Decision trees should NOT ask the question: “Does this category occur in the country?” This is because decision trees will only be used for categories which occur.
- c. There should be a “START” box.
- d. “Diamonds” should be used for questions/decisions.
- e. “Squares” should be used for all other information.
- f. The out-boxes should be individually numbered.
- g. The text font should be Times New Roman 10pt.
- h. Text should be centred within the boxes.

Decision tree to estimate CO₂-C and N₂O emissions from *Peatlands Remaining Peatlands*



Note:
1: See Volume 1 Chapter 4, "Methodological Choice and Identification of Key Categories" (noting Section 4.1.2 on limited resources), for discussion of *key categories* and use of decision trees.

IPCC Emission Factor Database (EFDB)

17. The EFDB is an important resource for this work, both as a source of emission factors for consideration by the authors and as a repository of emission factors once agreed for use in the 2013 Supplement report.
18. The 2013 Supplement report will be self-contained with regard to Tier 1 methods and the corresponding default emission factors (once the 2013 Supplement report is approved by the IPCC, the default emission factors cannot change). These defaults need to be recorded in to the EFDB..

19. The evolving information on peer reviewed emission factors in the EFDB will also be a useful source of information for countries to refer to in applying Tier 2 and 3 methods. In applying these methods (Tier 2 and/or 3) it will remain the country's responsibility to ensure that the choice of emission factors properly reflects national circumstances and is consistent with the requirements of the 2013 Supplement report, and to document that this is the case. The relationship has been made clear in Volume 1 of the 2006 IPCC Guidelines.
20. It should be noted that the 2013 Supplement report go through IPCC reviews, but the EFDB does not. The EFDB is a continuous exercise. The TSU will provide technical advice/information to authors.

Definitions

21. The following terms will be used throughout the 2013 Supplement report, and it is essential that all authors have a common understanding of their meaning and relevance:
22. **Tier** refers to a description of the overall complexity of a methodology and its data requirements. Higher tier methods are generally more complex and data-intensive than lower tier methods. The guidance for each category should contain at least a Tier 1 method, and in many cases there will be a Tier 2 and Tier 3. The general expectation is that Tier 2 and Tier 3 methods will both be consistent with good practice guidance for key categories, although in some cases Tier 3 will be preferred, for example with methane emissions from coal mines where Tier 1 is a global default value, Tier 2 basin specific and Tier 3 mine specific.
23. **Tier 1** approaches are basic methods that can be applied by all countries in all circumstances. Default values for the emission factors and any other parameters needed must be supplied (see below for documentation needed). They should be similar to the Tier 1 methodological approaches in the 2006 IPCC Guidelines.
24. **Tier 2** methods should follow the same methodological approach as Tier 1, but allow for higher resolution country specific emissions factors and activity data. These methods should better replicate the parameters affecting the emissions. Country specific emission factors are needed and possibly more parameters will also be needed.
25. **Tier 3** methods give flexibility either for country specific methods including modelling or direct measurement approaches, or for a higher level of disaggregation, or both. This is a more complex method, often involving a model. This will replicate many features of nation emissions and require specific parameters for each country.
26. **Default information** is data that are appropriate for use where there is no better detailed, country specific information. If appropriate, authors may specify regional default data. Users of the 2013 Supplement report should be encouraged to try to find better country specific data. Default data are appropriate for Tier 1 methods and the 2013 Supplement report should contain all the default values needed. Emission factors for higher tiers may not need to be specified because it is a function of higher tier methods to find data reflecting national circumstances. The cross cutting volume will suggest that the EFDB may help identify data reflecting national circumstances, but reference to the EFDB should not be used as a device for evading the necessity of finding data for default methods. Default information is included primarily to provide users with a starting point from which they can develop their own national assumptions and data. Indeed, national assumptions and data are always preferred because the default assumptions and data may not always be appropriate for specific national contexts. In general, default assumptions and data should be used only when national assumptions and data are not available.
27. **Decision Tree** is a graphical tool to assist countries in selecting from the IPCC methods.

28. **Sector** refers to the four sectors of the guidelines (Energy; Industrial Process and Product Use (IPPU); Agriculture, Forestry and Other Land Use (AFOLU) and Waste). These are divided into source/sink categories and sub categories.
- Sector 1
 - Category 1.A
 - Sub-category 1st order 1.A.1
 - Sub-category 2nd order 1.A.1.a
 - Sub-category 3rd order, 1.A.1.a.i,
29. **Worksheets** are printed versions of spreadsheet tables, that, when filled in, enable to user to perform the emission estimation. They should contain all the calculations and written text with any formulae. Additional worksheets may be required to compile the results of the worksheets into the reporting tables.
30. **Reporting Tables** are tables that present the calculated emission inventory and sufficient detail of other data used to prepare the inventories for others to understand the emission estimates.
31. Usage:
- Good Practice** is defined as a set of procedures intended to ensure that greenhouse gas inventories are accurate in the sense that they are systematically neither over nor underestimates so far as can be judged, and that uncertainties are reduced so far as possible. Inventories consistent with good practice are those which contain neither over-nor under-estimates so far as can be judged, and in which uncertainties are reduced as far as is practicable. To say that “It is *good practice* to do x” implies x is part of the good practice procedures.
 - “**Shall**” should not be used. Either say “*Good practice* is...” or say what needs to be done or what should be done. These all indicate what needs to be done to comply with good practice.
 - “**Be encouraged to**” indicates a step or activity that will lead to higher quality inventory, but are not required for ensuring consistency with the 2006 IPCC Guidelines.
 - “**Recommend**” should not be used. The word “recommend” should be avoided and “suggested” should be used instead.
 - “**Inventory agency**” is the body responsible for actually compiling the inventory, perhaps from contributions from a number of other bodies while “**inventory compiler**” is the person actually compiling the inventory,

Units

32. SI units shall be used throughout: in text, equations, worksheets and tables. Emissions have to be expressed in mass units and units have to be used consistently within the each sector. When similar activity data is used for different sectors same units need to be used (Coordinating Lead Authors (CLAs) have to take care about such harmonization). Conversion factors have to be provided (for example to estimate N₂O from N). Where input data available may not be in SI units conversions should be provided.
33. Standard abbreviations for units and chemical compounds are given in Appendix 2. (See also a complete discussion available at http://www.bipm.org/utis/common/pdf/si_brochure_8_en.pdf)
34. For the purpose of reporting, the sign convention is positive (+) for emissions, and negative (-) for removals (uptake). Where needed, for estimation of removals and carbon stock increases are counted positive, and the sign reversed for reporting purposes. This is consistent with the 2006 IPCC Guidelines.

Appendix 1. Data Documentation

This form should be used to document all data used in the 2013 Supplement report. This gives the minimum information that should be considered by the authors.

Author ¹					
IPCC Source/Sink Category					
Fuel ² (applicable only in the Energy Sector):					
Gas ³ :	CO ₂	CH ₄	N ₂ O		
Value:					
Unit:					
Uncertainty (as +/-% or 2.5 and 97.5 percentiles) ⁴					
Applicability⁵ – fill in as necessary if data not generally applicable. Describe appropriate Technologies, Practices, Abatement Technologies, Region, and/or Regional Conditions					
Source of data (chose one)	Measurement - Scientific Literature Other Measurement National Inventory Report Calculated Based on fuel quality Expert Judgement				
Reference ⁶					

Note:

1. The author is the LA/CA/CLA who writes the relevant section and proposes the data.
2. Fuels as defined in the Energy volume
3. Add additional gases as required
4. As defined by cross-cutting volume
5. Only to be completed where it is necessary to specify the applicability of the data
6. As reference to document, report, calculation or if expert judgement to those involved (Names or group e.g. "Waste BOG on Solid Waste Disposal Sites")

Appendix 2 Units and Abbreviations

Abbreviations of, and how to Spell, Chemical Compounds

CH ₄	Methane
N ₂ O	Nitrous oxide ⁴
CO ₂	Carbon dioxide
CO	Carbon monoxide
NO _x	Nitrogen oxides
NMVOCs	Non-methane volatile organic compounds
NH ₃	Ammonia
CFCs	Chlorofluorocarbons
HFCs	Hydrofluorocarbons
PFCs	Perfluorocarbons
SF ₆	Sulphur hexafluoride
CCl ₄	Carbon tetrachloride
C ₂ F ₆	Hexafluoroethane
CF ₄	Tetrafluoromethane
S	Sulphur

Units and abbreviations

cubic metre	m ³
Hectare	ha
Gram	g
Gigagram	Gg
Tonne	t
Gigatonne	Gt
Joule	J
degree Celsius	°C
Calorie	cal
Year	yr
Capita	cap
Gallon	gal
dry matter	dm

⁴ According to the IUPCA N₂O is officially named "Dinitrogen Oxide". However, "nitrous oxide" is widely used and understood in the emission inventory community and by the UNFCCC and so, to avoid confusion, will be used.

Prefixes and multiplication factors

Multiplication Factor	Abbreviation	Prefix	Symbol
1 000 000 000 000 000	10^{15}	peta	P
1 000 000 000 000	10^{12}	tera	T
1 000 000 000	10^9	giga	G
1 000 000	10^6	mega	M
1 000	10^3	kilo	k
100	10^2	hector	h
10	10^1	deca	da
0.1	10^{-1}	deci	d
0.01	10^{-2}	centi	c
0.001	10^{-3}	milli	m
0.000 001	10^{-6}	micro	μ

Standard equivalents

1 tonne of oil equivalent (toe)	1×10^{10} calories
10^3 toe	41.868 TJ
1 short ton	0.9072 tonne
1 tonne	1.1023 short tons
1 tonne	1 megagram
1 kilotonne	1 gigagram
1 megatonne	1 teragram
1 gigatonne	1 petagram
1 kilogram	2.2046 lbs
1 hectare	10^4 m ²
1 calorie _{IT}	4.1868 joule
1 atmosphere	101.325 kPa

Annex 2

Interim General Principles for those involved in the IPCC TFI

Introduction

1. The IPCC is currently reviewing its procedures with a view to implement improvements in line with those suggested by the Inter-Academy Council (IAC) 2010 review of the IPCC, "Climate Change Assessments: Review of the Processes and Procedures of the IPCC"⁵. As TFI activities are continuing before the IPCC has decided on responses to IAC recommendations, these instructions are being proposed by the Co-chairs of the Task Force Bureau of the IPCC's Task Force on National greenhouse Gas Inventories (TFB) on an interim basis. They were applied to all participants in the IPCC Expert Meeting on Scoping Additional Guidance on Wetlands (30 March to 1 April 2011), and will be applied to all participants of all subsequent TFI activities until the IPCC procedures are finalized, when these instructions will be updated accordingly.
2. In this document the term "experts" covers Co-Chairs, members of the TFB, staff of Technical Support Unit (TSU), Coordinating Lead Authors (CLAs), Lead Authors (LAs), and Review Editors (REs) as well as any resource persons or other experts including those from international organizations invited to expert meetings, scoping meetings or workshops.
3. These notes are intended as guidance to experts contributing to all TFI activities including Expert Meetings; new methodological work and Emission Factor Database Editorial Board and Data Meetings. They are intended to ensure a consistent and coherent approach across all TFI activities.

Confidentiality

4. Expert meetings and workshops, as well as the authors meetings are closed meetings. Any discussions are confidential except for any published report of the meeting. This is to ensure that participants can express themselves and discuss issues freely and openly.
5. Draft reports are circulated on the basis that they should not be quoted or cited.
6. The TSU will keep draft reports sent for the IPCC review, any comments received on them and the responses by authors and these will be made publicly available.⁶

Conflict of Interest

7. It is important that all experts involved in the IPCC avoid any conflict of interest or the direct and substantial appearance of a conflict of interest. It is recognized that many experts in Emission Inventories are employed by, or funded by, parties with some interest in the outcome (e.g. most inventory compilers are funded by national governments or industry). It is therefore important to be open and transparent about financial and other interests.
8. Appendix 1 outlines the TFI approach which will be replaced by an IPCC-wide policy following a panel decision.
9. All experts involved in TFI activities will be asked to complete and sign a conflict of interest form (See appendix 1). These forms will be kept confidential (if the IPCC Panel were to agree to a public register then experts would be asked to submit that information separately) and will be reviewed by the TFI Co-Chairs. The TFI Co-Chairs will ensure that serious conflicts are avoided and that different interest groups (e.g. government, academia and industry) are balanced.

⁵ InterAcademy Council, 2010: Climate Change Assessments, Review of the Processes and Procedures of the IPCC, InterAcademy Council, Amsterdam, The Netherlands. Available at: <http://reviewipcc.interacademycouncil.net/>

⁶ The method and timing of this will be decided by the IPCC Panel.

Responsibilities of experts

10. The role of experts is to impartially review and assess all the literature available to them up to a cut-off date to be decided by the TFB as part of the agreed work plan, and to describe the best methodologies available. Experts should be impartial.
11. After drafting the document authors will be asked to consider all comments received on the drafts and to adjust and revise the text as necessary. They should document their responses. If they do not accept a comment this should be explained.
12. Responsibilities and duties of authors and other experts are currently explained in more detail in the IPCC Principles available from http://www.ipcc.ch/organization/organization_procedures.shtml, which are subject to future modifications.

Literature

13. The use of literature should be open and transparent. Journal and some non-journal-based sources can provide crucial information for an IPCC Report. This includes information about experience and practice with emissions and mitigation (e.g. reports from governments, industry, and other organizations, reports or working papers of research institutions, workshop proceedings). Personal communications from other experts can also be valuable input to discussions. All sources of significant information should be referenced. In general, newspapers and magazines are secondary information and not valid sources of scientific knowledge. Blogs, social networking sites, and broadcast media are not acceptable sources of information for IPCC Reports.
14. Authors are requested to critically assess any information they would like to include especially those from non-journal-based sources. Each chapter team should review the quality and validity of each source before incorporating information from the source into an IPCC Report. Authors who wish to include information from a non-journal based source that is widely available through usual channels are requested to send a copy of the full reference, preferably electronically, to the TFI Co-Chairs who are coordinating the report preparation.
15. For any sources written in a language other than English, an executive summary or abstract in English is required.
16. All sources will be integrated into a reference section.
17. The Review Editors will ensure that these sources are selected and used consistently with the procedures in these instructions.
18. The TFI Co-Chairs will (a) ensure collection of these sources received from authors, as well as the accompanying information about each source at the TSU and (b) make these sources available to reviewers who request them during the review process.

Appendix 1 Interim General Principles for those involved in the IPCC TFI: Conflict of Interest – Interim TFI Approach

A “conflict of interest” refers to any current financial or other interest which could: i) significantly impair, or could be seen to impair, the individual’s objectivity in carrying out his or her duties and responsibilities for the IPCC, or ii) create an unfair advantage for any person or organization. Conflicts of interest may be real, perceived, or potential. Financial conflicts may be direct or indirect.

Disclosure in the context of this policy means making known any interests which might conflict with the capacity of IPCC to fulfil its role or undermine its credibility. Interests are declared via a Declaration of Interest form and recorded in an IPCC TFI Register of Interests.

An interest is relevant in the context of this policy if it could have, or could be perceived to have, an impact on IPCC’s fulfilment of its role, or the credibility of its products or advice. An interest that does not have a bearing on IPCC’s role or credibility, such as general share holdings or property ownership, is not relevant and need not be declared.

It is acknowledged that highly qualified people may have interests. This policy is intended to encourage the participation of these individuals. This policy sets a framework for the management of interests so that IPCC can best meet its goals as. This policy should be applied in a way that encourages the participation of individuals from developing countries.

This policy applies to all individuals directly involved in the preparation of IPCC TFI reports: the TFI Co-chairs and other members of the TFI Bureau, authors with responsibilities for report content (Coordinating Lead Authors and Lead Authors), Review Editors, the technical staff directly involved in report preparation (the staff of Technical Support Units and the IPCC Secretariat) and any other individuals directly involved in the development of IPCC products or advice.. The implementation of the policy will be commensurate with the level of responsibility held by individuals in the preparation of IPCC reports. To engender public trust, those who hold higher office, especially those who represent IPCC publicly, should exhibit the highest standards of adherence to the policy.

This policy allows for flexibility in individual instances of conflict of interest in the work of the IPCC in certain cases where an individual’s of particular expertise is required, so long as this conflict is transparent and managed.

The responsibility for the disclosure of interests lies with the individual.

The confidentiality of information disclosed will be observed by the TFI. If the IPCC panel were to agree a public register then experts would be asked to submit that information separately. Information will be used only for the purpose for which it was collected.

Individuals covered by this policy will need to disclose their interests in writing using the approved IPCC TFI Disclosure of Interest form (attached). The form should be submitted to the TFI Co-Chairs.

TFI Co-Chairs
April 2011

IPCC TFI Interim Disclosure of Relevant Interests Form

NOTE: The IPCC is not asking for comprehensive lists of activities under each heading below, only those that are relevant to the expert's role within the IPCC thus making known any current interests that might conflict with the capacity of IPCC to fulfil its role or undermine its credibility. The disclosure of an interest on this form does not automatically mean that a conflict is present or that an individual will be unable to properly perform their designated role with the IPCC.

Name	
Role in IPCC	

RELEVANT ORGANIZATIONAL AFFILIATIONS (please list remunerated <i>and</i> voluntary current and recent affiliations, which may include, eg. employment, relationships with for-profit organizations, relationships with not-for-profit organizations)	
RELEVANT PUBLIC AND PROFESSIONAL SERVICE (which may include eg. current elected positions, advisory bodies and boards, government representation including membership of international delegations, posts in professional organizations, or journal editorships).	
RELEVANT FINANCIAL INTERESTS (which may include eg. Direct and/or indirect sources of financial support for research or consultancy from private and public organizations, current ownership of intellectual property, investments in property, stocks, shares or other financial interests).	
ADDITIONAL INFORMATION (any other current relevant interest not disclosed elsewhere)	

This form completely lists my interests, direct and indirect, that relate to the IPCC. I will send updates to this list to the TFI Co-Chairs as my interests change. I understand that information about my interests as outlined above will be held and used by the TFI Co-Chairs to prevent conflicts of interest.

I understand that these forms will be kept confidential and will be reviewed by the TFI Co-Chairs. The Co-Chairs will ensure that serious conflicts are avoided and that different interest groups (e.g. government, academia and industry) are balanced.

Signature: _____

Date: _____