CGE SUPPLEMENTARY TRAINING MATERIAL FOR THE TEAM OF TECHNICAL EXPERTS

Module 2.2

Technical analysis of biennial update reports: thematic elements

National greenhouse gas inventories

Version	Date	Changes
Version 1.0	April 2015	
Version 1.1	November 2015	Table 1: update based on revised summary report template

CONTENTS

LIST OF TABLES

ABBREVIATIONS

BUR	biennial update report
COP	Conference of the Parties
GHG	greenhouse gas
GPG 2000	Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories
GPG LULUCF	Good Practice Guidance for Land Use, Land-Use Change and Forestry
ICA	international consultation and analysis
IPCC	Intergovernmental Panel on Climate Change
Non-Annex I Parties	Parties not included in Annex I to the Convention
TTE	team of technical experts

1. BACKGROUND AND INTRODUCTION

The content of this course provides the nominated expert with a sound knowledge of what and how information on national greenhouse gas (GHG) inventories is expected to be reported in the biennial update reports (BURs) from Parties not included in Annex I to the Convention (non-Annex I Parties). This is in accordance with the "Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention" (NC guidelines) contained in the annex to decision 17/CP.8, as well as the "UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention" (BUR guidelines) contained in annex III to decision 2/CP.17.

It also takes into account the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (the Revised 1996 IPCC Guidelines), as well as the *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (GPG 2000), and the *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (GPG LULUCF) that Parties should use in the updates of their national GHG inventories of their BURs, in accordance with decision 2/CP.17, annex III, paragraph 5.

The course will thus enhance the knowledge and expertise of the team of technical experts (TTE) to perform the specific tasks of technical analysis of BURs under the international consultation and analysis (ICA) process, as outlined in decision 20/CP.19, annex, paragraph 15:

a) Identify the extent to which the elements of information listed in paragraph 3(a) of the guidelines contained in decision 2/CP.17, annex IV, are included in the BUR of the Party concerned;

b) Undertake a technical analysis of information contained in the BUR as outlined in the "UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention" contained in annex III to decision 2/CP.17, and any additional technical information that may be provided by the Party concerned;

c) In consultation with the Party concerned, identify capacity-building needs in order to facilitate reporting in accordance with annex III to decision 2/CP.17, and participating in international consultation and analysis in accordance with annex IV to decision 2/CP.17, taking into account Article 4, paragraph 3, of the Convention.

2. BASIS FOR PREPARING AND REPORTING GREENHOUSE GAS INVENTORIES

This chapter highlights the relevant paragraphs of decision 2/CP.17, that form the basis for the analysis of information on national GHG inventories.

The basis for preparing and reporting of national GHG inventories in BURs is specified in paragraph 41 of decision 2/CP.17 and paragraphs 3–10 of the BUR guidelines contained in annex III to decision 2/CP.17 (see boxes 1 and 2):

[Extract from decision 2/CP.17 relevant to reporting greenhouse gas inventories in biennial update reports]

The Conference of the Parties

…….

41. Decides:

(a) …….

…….

(g) That the first biennial update report submitted by non-Annex I Parties shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available, and that subsequent biennial update reports shall cover a calendar year that does not precede the submission date by more than four years;

…….

[Extract from annex III to decision 2/CP.17, relevant to preparing and reporting greenhouse gas inventories in biennial update reports]

…….

3. Non-Annex I Parties should submit updates of national GHG inventories according to paragraphs 8–24 in the "Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention" (hereinafter referred to as the UNFCCC guidelines for the preparation of national communications from non-Annex I Parties) as contained in the annex to decision 17/CP.8. The scope of the updates on national GHG inventories should be consistent with capacities, time constraints, data availabilities and the level of support provided by developed countries Parties for biennial update reporting.

4. Non-Annex I Parties should use the methodologies established by the latest UNFCCC guidelines for the preparation of national communications from non-Annex I Parties approved by the Conference of the Parties (COP) or those determined by any future decision of the COP on this matter.

5. The updates of the sections on the national inventories of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol should contain updated data on activity levels based on the best information available using the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (hereinafter referred to as the Revised 1996 IPCC Guidelines), the Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, and the Good Practice Guidance for Land Use, Land-Use Change and Forestry (hereinafter referred to as the IPCC good practice guidance for LULUCF); any change to the emission factor may be made in the subsequent full national communication.

6. Non-Annex I Parties are encouraged to include, as appropriate and to the extent that capacities permit, in the inventory section of the biennial update report, tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF and the sectoral report tables annexed to the Revised 1996 IPCC Guidelines.

7. Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in the previous national communications.

8. Non-Annex I Parties which have previously reported on their national GHG inventories contained in their national communications are encouraged to submit summary information tables of inventories for previous submission years (e.g. for 1994 and 2000).

9. The inventory section of the biennial update report should consist of a national inventory report as a summary or as an update of the information contained in chapter III (National greenhouse gas inventories) of the annex to decision 17/CP.8, including table 1, on "National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol and greenhouse gas precursors", and table 2, on "National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF6".

10. Additional or supporting information, including sector-specific information, may be supplied in a technical annex.

…….

3. THE TECHNICAL ANALYSIS OF NATIONAL GREENHOUSE GAS INVENTORIES

Decision 20/CP.19, annex, paragraph 15 (Composition, modalities and procedures of the team of technical experts under international consultation and analysis) states the following:

The technical analysis under international consultation and analysis will aim to increase transparency of mitigation actions and their effects; discussion on the appropriateness of such domestic policies and measures is not part of the process. The TTE shall:

a) Identify the extent to which the elements of information listed in paragraph 3(a) of the guidelines contained in decision 2/CP.17, annex IV, are included in the BUR of the Party concerned;

b) Undertake a technical analysis of information contained in the BUR as outlined in the "UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention" contained in annex III to decision 2/CP.17, and any additional technical information that may be provided by the Party concerned;

c) In consultation with the Party concerned, identify capacity-building needs in order to facilitate reporting in accordance with annex III to decision 2/CP.17, and participating in international consultation and analysis in accordance with annex IV to decision 2/CP.17, taking into account Article 4, paragraph 3, of the Convention.

Decision 2/CP.17, annex IV, paragraph 3(a) of the guidelines states the following:

The ICA process will consist of the following two steps:

a) A technical analysis of the biennial update reports submitted by Parties not included in Annex I to the Convention either, as a summary of parts of their national communication in the year in which the national communication is presented or as a stand-alone update report, by a team of technical experts in consultation with the Party, and will result in a summary report. **The information considered should include the national greenhouse gas inventory report, information on mitigation actions, including a description of such actions, an analysis of their impacts and the associated methodologies and assumptions, the progress made in their implementation and information on domestic measurement, reporting and verification, and on support received**.

b) A facilitative sharing of views, which will have as input the biennial update report and summary report referred to in paragragh 3(a) above.

Therefore, the TTE should first assess whether the BUR includes the national GHG inventory report.

The main tasks of the TTE member(s) responsible for undertaking the technical analysis of information on national GHG inventories shall be those referred to in

decision 20/CP.19, annex, paragraph 15, and converting the findings of the analysis into a summary report. The guidance for undertaking these tasks is further elaborated in the following sections.

4. GUIDANCE FOR UNDERTAKING THE TECHNICAL ANALYSIS OF GREENHOUSE GAS INVENTORIES

The following section will provide guidance on each of the three elements of the technical analysis. The background materials contained in modules 2.2a–2.2e serve to deepen the understanding of the topic and provide experts with a comprehensive insight into the methods involved in estimating GHG emissions by sources and removals by sinks, to facilitate better understanding of the information provided.

4.1. IDENTIFY INFORMATION

Decision 20/CP.19, annex, paragraph 15 (Composition, modalities and procedures of the team of technical experts under international consultation and analysis) states the following:

The technical analysis under international consultation and analysis will aim to increase transparency of mitigation actions and their effects; discussion on the appropriateness of such domestic policies and measures is not part of the process. The TTE shall:

a) *Identify* ***the extent to which the elements of information listed in decision 2/CP.17, annex IV, paragraph 3(a) of the guidelines are included in the BUR*** *of the Party concerned;*

Decision 2/CP.17, paragraph 41 and BUR guidelines in annex III of the same decision, paragraphs 3–10, define the basis for preparation and reporting of information on national GHG inventories within BURs. In addition, paragraphs 8–24 of the NC guidelines, contained in the annex to decision 17/CP.8, define the basis for the preparation and reporting of information on national GHG inventories in national communications. These requirements fall into three main categories: ‘shall’, ‘should’, and ‘encouraged’. Tables 1–5 provide a completeness checklist based on the BUR and NC guidelines.

In assessing the extent to which the elements of information are included, the TTE should assess whether the GHG inventory section of the BUR includes the reporting elements required by the UNFCCC decisions.

Section III of the annex III to decision 2/CP.17 provides the guidelines on reporting on the national GHG inventory. Paragraph 4 states the following:

Non-Annex I Parties should use the methodologies established by the latest UNFCCC guidelines for the preparation of national communications from non-Annex I Parties approved by the Conference of the Parties (COP) or those determined by any future decision of the COP on this matter.

This implies that, when considering the extent to which the elements of information of the BUR guidelines are included in the BUR of the Party concerned, the TTE member should take into consideration section III of the annex III to decision 2/CP.17 and decision 17/CP.8 which are the most recent UNFCCC guidelines.

The following table 1 shows all the requirements for non-Annex I Parties in regards to GHG inventories as described in annex III to decision 2/CP.17, and decision 17/CP.8.

Table 1
Identification of the extent to which the elements of information on greenhouse gases are included in the [first] biennial update report

Decision	*Reporting requirements*	*Yes/ Partly/No/NA*	*Comments on the extent of the information provided*
Decision 2/CP.17, paragraph 41(g)	The first BUR shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available		
Decision 2/CP.17, annex III, paragraph 5	The updates of the sections on the national inventories of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol should contain updated data on activity levels based on the best information available using the Revised 1996 IPCC Guidelines for National GHG Inventories, the IPCC good practice guidance and Uncertainty Management in National GHG Inventories, and the IPCC good practice guidance for LULUCF; any change to the emission factor may be made in the subsequent full national communication		
Decision 2/CP.17, annex III, paragraph 9	The inventory section of the BUR should consist of a national inventory report as a summary or as an update of the information contained in decision 17/CP.8, annex, chapter III (National greenhouse gas inventories), including: • Table 1 (National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol and greenhouse gas precursors) • Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF_6)		
Decision 2/CP.17, annex III, paragraph 6	Non-Annex I Parties are encouraged to include, as appropriate and to the extent that capacities permit, in the inventory section of the BUR: • Tables included in annex 3A.2 to chapter 3 of the IPCC good practice guidance for LULUCF • The sectoral report tables annexed to the Revised 1996 IPCC Guidelines		
Decision 2/CP.17, annex III, paragraph 7	Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in the previous national communications		
Decision 2/CP.17, annex III, paragraph 8	Non-Annex I Parties that have previously reported on their national GHG inventories contained in their national communications are encouraged to submit summary information tables of inventories for previous submission years (e.g. for 1994 and 2000)		
Decision 2/CP.17, annex III, paragraph	Additional or supporting information, including sector-specific information, may be supplied in a technical annex		

Decision	*Reporting requirements*	*Yes/ Partly/No/NA*	*Comments on the extent of the information provided*
10			
Decision 17/CP.8, annex, paragraph 13	Non-Annex I Parties are encouraged to describe procedures and arrangements undertaken to collect and archive data for the preparation of national GHG inventories, as well as efforts to make this a continuous process, including information on the role of the institutions involved		
Decision 17/CP.8, annex, paragraph 14	Each non-Annex I Party shall, as appropriate and to the extent possible, provide in its national inventory, on a gas-by-gas basis and in units of mass, estimates of anthropogenic emissions of the following gases by sources and removals by sinks: • CO_2 • CH_4 • N_2O		
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of HFCs, PFCs and SF_6		
Decision 17/CP.8, annex, paragraph 19	Non-Annex I Parties should, to the extent possible, and if disaggregated data are available, report emissions from international aviation and marine bunker fuels separately in their inventories: • International aviation • Marine bunker fuels		
Decision 17/CP.8, annex, paragraph 16	Non-Annex I Parties are encouraged, as appropriate, to report on anthropogenic emission by sources of other GHGs such as: • CO • NO_x • NMVOCs		
Decision 17/CP.8, annex, paragraph 17	Other gases not controlled by the Montreal Protocol, such as SO_x, included in the Revised 1996 IPCC Guidelines, may be included at the discretion of the Parties		
Decision 17/CP.8, annex, paragraph 21	Non-Annex I Parties are encouraged to provide information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol, including a brief explanation of the sources of emission factors and activity data. If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe the source and/or sink categories, methodologies, emission factors and activity data used in their estimation of emissions, as appropriate. Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building: • Information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol • Explanation of the sources of emission factors		

Decision	*Reporting requirements*	*Yes/ Partly/No/NA*	*Comments on the extent of the information provided*
	• Explanation of the sources of activity data • If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe: o Source and/or sink categories o Methodologies o Emission factors o Activity data • Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building		
Decision 17/CP.8, annex, paragraph 24	Non-Annex I Parties are encouraged to provide information on the level of uncertainty associated with inventory data and their underlying assumptions, and to describe the methodologies used, if any, for estimating these uncertainties: • Level of uncertainty associated with inventory data • Underlying assumptions • Methodologies used, if any, for estimating these uncertainties		

Abbreviations: BUR = biennial update report, GHG = greenhouse gas, IPCC = Intergovernmental Panel on Climate Change, IPCC good practice guidance = *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, IPCC good practice guidance for LULUCF = *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, NMVOC = non-methane volatile organic compound, Revised 1996 IPCC Guidelines = *Revised 1996 Guidelines for National Greenhouse Gas Inventories*, 2006 IPCC Guidelines = *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

In the evaluation of information provided, the TTE needs to consider the fact that some of the information is not a strict requirement ('should' or 'may'), and that even some required information ('shall'), is to be provided "as appropriate and to the extent possible".

Should the TTE find the information provided within the BUR and its eventual technical annex(es) incomplete, the TTE should, through the secretariat, engage with the Party and seek clarification on the reasons for the lack of information. This exchange should also aim to support the identification of capacity-building and support needs.

4.2. TECHNICAL ANALYSIS

Decision 20/CP.19, annex, paragraph 15(b) states the following:

The technical analysis under international consultation and analysis will aim to increase transparency of mitigation actions and their effects; discussion on the appropriateness of such domestic policies and measures is not part of the process. The TTE shall: … (b) ***Undertake a technical analysis of information contained in the BUR*** *as outlined in the "UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention" contained in annex III to decision 2/CP.17, and* ***any additional technical information that may be provided*** *by the Party concerned.*

The TTE is aiming at undertaking a technical analysis of the information provided by a Party on national GHG inventories contained in the BUR, and any additional technical information that may be provided by the Party concerned.

This section provides guidance to the TTE on how to analyse the transparency of the information reported on national GHG inventories, as well as the choice and application of the Intergovernmental Panel on Climate Change (IPCC) methods used for estimating and reporting GHG estimates. This will be done through checklists, which include questions, examples and key considerations, as appropriate, for the general, as well as sector-specific issues.

4.2.1. GENERAL ISSUES

The checklists in tables 1–5 cover all general aspects to be considered during the analysis of national GHG inventory submissions from non-Annex I Parties. The questions below will assist the TTE in conducting a more in-depth analysis of the information reported:

- Has the Party provided an adequate description of the methodologies it used, thus making it possible to understand the GHG estimate calculations performed?
- Has the Party provided an adequate description of sources of activity data, emission factors and other parameters used, and how they have been used in the estimation of emissions? When the description of methods, activity data and emission factors is not adequate, this could be identified as a potential area for future capacity-building, to be confirmed by the Party. Further, where information on methods, activity data and emission factors are not provided adequately, the TTE should seek an explanation from the Party on how it could do so in the subsequent submission in order to ensure transparency. In doing so, the TTE will need to look out for methodological tables or descriptions of the use of an IPCC methodology.
- For categories where a numerical value is not reported, has the Party reported the appropriate notation keys instead? Has the Party explained the reasons for reporting the notation keys? Has the Party established the necessary institutional arrangements to ensure the regular development and submission of national GHG inventories? In addition, do the institutional arrangements ensure that improvements can be made to future national GHG inventories?

- Has the Party taken into account the need to continuously improve transparency, consistency, comparability, completeness and accuracy[1] in its national GHG inventories, and which steps have been taken in order to allow this?
- If emissions and removals are reported for a time series, are the methods used consistent throughout the complete time series? Have recalculations been applied to all relevant categories?
- If the Party used country-specific emission factors or methods, or reported categories which are country specific, did the Party provide a description of all the country-specific information?
- Has the Party taken into consideration the decision trees provided in the GPG 2000 to choose methods?
- If the Party used higher tier methodology, did the uncertainty decrease as a result compared to the tier 1 methodology? Higher tier methods generally result in lower uncertainty, but in some cases, this is not true. If this is the case, what are the reasons for the uncertainties not decreasing, and has the Party provided such an explanation?
- Did the Party incorporate any quality assurance and quality control plan in the inventory preparation cycle? Did the Party have a system in place that allowed it to build on the previous inventory cycle?

[1] **Transparency** means that the assumptions and methodologies used for an inventory should be clearly explained to facilitate replication and assessment of the inventory by users of the reported information;
Consistency means that an inventory should be internally consistent in all its elements with inventories of other years. An inventory is consistent if the same methodologies are used for the base and all subsequent years and if consistent data sets are used to estimate emissions or removals from sources or sinks;
Comparability means that estimates of emissions and removals reported by Parties in inventories should be comparable among Parties. For this purpose, Parties should use the methodologies and formats agreed by the COP for estimating and reporting inventories;
Completeness means that an inventory covers all categories, as well as all gases, included in the IPCC Guidelines as well as other existing relevant categories which are specific to individual Parties and, therefore, may not be included in the IPCC Guidelines. Completeness also means full geographic coverage of categories of a Party;
Accuracy is a relative measure of the exactness of an emission or removal estimate. Estimates should be accurate in the sense that they are systematically neither over nor under true emissions or removals, as far as can be judged, and that uncertainties are reduced as far as practicable.

Box
Notation keys and their definitions

- **NO** (not occurring): Activities or processes in a particular category that do not occur within a country.
- **NE** (not estimated): Existing emissions and removals which have not been estimated. Where NE is used in an inventory for emissions or removals, the Party should indicate why they have not been estimated.
- **NA** (not applicable): Activities in a given category that do not result in emissions or removals of a specific gas.
- **IE** (included elsewhere): Emissions by sources and removals by sinks estimated but included elsewhere in the inventory instead of the expected category. Where IE is used in an inventory, the Party should indicate where in the inventory the emissions or removals from the displaced category have been included and the Party should explain such a deviation from the expected category;
- **C** (confidential): Emissions by sources and removals by sinks of greenhouse gases which could lead to the disclosure of confidential information.

4.2.2. ENERGY SECTOR

- Is the national energy balance available? If so, how often are the calorific values and carbon content updated? Or are they default values (if default, did the Party use the correct values)? What level of disaggregation of the energy balance is performed, for example for transport or industry?
- Did the Party estimate CO_2 from fuel combustion using both the reference approach and the sectoral approach? If so, what is the difference between the approaches? What are the challenges in matching the emissions in both approaches? If both approaches are not estimated, exist plans to report the two approaches in the future?
- Does the Party use any higher tier approaches? If so, is there enough documentation on the method to understand the assumptions, methods, results, and any gaps?
- What kinds of emission factors are used for fuel? If country-specific factors are used, are they comparable to the default values provided by the IPCC?
- Is there any coal, oil or natural gas production occurring in the country?
- What is the relationship between the data providers and the inventory team? Can the inventory team access the data easily and can the inventory team make suggestions to the data providers to make improvements to the data?
- Has the Party reported any energy emissions in other sectors? Does the Party report emissions from other sectors in the energy sector? If so, why? This is to check for double counting and/or misallocation of emissions.

- Has the Party disaggregated data emissions from domestic and international aviation and marine fuels? How was this done?
- What is the emissions profile of the energy sector? Does the emissions profile make sense given the national circumstances of the Party? For example, if the Party is a small country that relies on agriculture, the emissions from the energy sector may be relatively low compared to other sectors while, for a country that has a large manufacturing industry, the emissions may be larger compared to other sectors.
- What, if any, are the most important challenges in estimating emissions from the energy sector and are there any specific capacity building needs that the Party has identified?

4.2.3. INDUSTRIAL PROCESSES SECTOR

- Are national industrial statistics available in the country? If not, what kind of arrangements are in place between the inventory agency and the data providers to collect the necessary activity data?
- Has the Party reported the appropriate notation keys for the categories where emissions have not been reported? What plans, if any, are in place to investigate the categories which were not reported?
- Has the Party been able to collect any data directly from a plant or company? If so, what were the procedures for this and are there any confidentiality issues?
- Has the Party used any country-specific emission factors or parameters? If so, are the country-specific values comparable to the default values provided by the IPCC? If not, can the Party explain why the values are not comparable to the default values?
- If the Party reports emissions from limestone and dolomite use, how has the Party ensured the coverage of the activity data used?
- Are consumption of natural gas and other fossil fuels used as feedstock? If so, are the calorific values for the fuels available? Are the calorific values the same as those used in the energy sector?
- If the Party reported fluorinated gases, did they report both potential and actual emissions?
- If the Party reported fluorinated gases, did the Party provide information by type of gas?

4.2.4. AGRICULTURE SECTOR

- Were emissions from enteric fermentation and manure management of major animals estimated? The TTE should cross-check the major animal populations of Parties by consulting statistics from the Food and Agriculture Organization of the

United Nations.[2] In addition, it is desirable to calculate emissions by using the tier2 method for major animals.

- Were emissions from manure management estimated, taking into consideration the climate of the region populated by livestock?
- In estimating the nitrous oxide (N_2O) emissions from manure management, were the N_2O emissions estimated for each manure management system?
- In estimating the methane (CH_4) emissions from rice cultivation, were the CH_4 emissions estimated taking into consideration the conditions of rice cultivation, for example rice ecosystem type, water management regime, type and amount of organic amendments, and soil type?
- Were the direct N_2O emissions from all subcategories estimated for the agricultural soils? In addition, were the indirect N_2O emissions from the agricultural soils estimated?
- Is the same activity data for indirect N_2O emissions used for direct N_2O emissions in agricultural soils? The activity data should be consistent.
- Is the amount of nitrogen (N) of animal manure applied to soils consistent with that of animal manure excreted by animals? The amount of N of animal manure applied to soils should be calculated using the amount of N of animal manure excreted by animals.
- In estimating the direct and indirect N_2O emissions from agricultural soils, was all organic fertilizer except animal manure considered as activity data?
- Were the N_2O emissions from the pasture, range and paddock of manure management reported in agricultural soils?
- In estimating the indirect N_2O emissions, was amount of N from grazing animals included as activity data?

4.2.5. LAND USE, LAND-USE CHANGE AND FORESTRY SECTOR

- Which of the IPCC guidelines (Revised 1996 IPCC Guidelines or GPG LULUCF) was applied? Were the reporting categories and carbon pools in line with the IPCC guidelines and good practice guidance?
- What categories, carbon pools and gases were estimated by the Party? Did the estimated emissions cover the main sources and sinks? For most tropical countries, deforestation and living biomass pools under forest land are the main source and sink, was it the case for the Party?
- Which data and approach were used for identifying the land-use and management changes? When the Party applied the GPG LULUCF, how did it define the six broad land-use categories?
- What level of disaggregation of forest was used? Were the parameters, such as annual increment (growth rate), biomass volume per area and emission factors, selected appropriately from the relevant climate zone, forest type, etc.?

[2] http://faostat.fao.org/

- Was the main activity data source (such as land area information or forest inventory data) available for the year of GHG inventory? If not, how did the party assume and derive the GHG inventory year data based on available information?
- Were the annual land-use change area data and cumulative land-use change area data (e.g. past 20 years) properly used for the calculation of land-use change in each carbon pool level? In general, all carbon pools of conversion to forest land and soil carbon pools associated with land-use change need cumulative land-use change area data from the past, while other estimations use annual land-use change area data.
- Was there no double counting of emissions and removals among land-use categories? For example, were agroforestry, silvo-pastoral system or plantations (such as cocoa, coffee, tea, oil palm, urban trees) included in only one land-use category and excluded in other land-use categories?
- Was there any double counting or misallocation of emissions among sectors? Were the categories such as non-CO_2 gas emissions from rice cultivation, biomass burning and fertilization, which are already covered under the agriculture sector and/or non-CO_2 gas emission from bio-energy combustion, which are covered by the energy sector, not reported under LUCF/LULUCF?
- Was there unmanaged land? If so, were the emissions and removals from unmanaged land excluded from net total emissions? Did the Party explain sufficiently why it reported unmanaged land as considered as land where no human interventions and practices have occurred?
- What, if any, are the most important challenges in estimating emissions from the LUCF/LULUCF sector and are there any specific capacity-building needs that the Party has identified?

4.2.6. WASTE SECTOR

- Were the emission estimates for solid waste disposal sites based on population statistics or actual waste data? If estimations were based on population statistics, what plans are in place to collect national waste statistics in the future, and what relationship does the inventory team have with the waste management agencies?
- How were historical data collected? If not collected, how was this data estimated?
- Did the Party estimate GHG emissions from incineration?
- If the Party applied the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, did it report national data to estimate composting or open burning?
- What, if any, is the role of private sector industries in industrial waste collection and reporting in the required format for GHG inventories for the waste sector?
- If the Party uses any country-specific parameters or emission factors, are they comparable to the default values provided by the IPCC? If not, can the Party explain the reasons for this?
- What is the emissions profile of the waste sector? In most cases, emissions from solid waste disposal sites should be the dominant subsector. If not, there may be some issues with the estimation of the wastewater subsector (for example, a miscalculation or misinterpretation of the methodology). The TTE should ask why

emissions from other subsectors are so high compared to the emissions from solid waste disposal sites.

- Was there any mitigation policy reported that may facilitate the collection of waste statistics that could also be used for estimating GHG emissions of the waste sector? What was the relationship between the inventory agency and the agency responsible for mitigation policies?

4.3. IDENTIFYING CAPACITY-BUILDING NEEDS

Decision 20/CP.19, annex, paragraph 15(c) states the following:

The technical analysis under international consultation and analysis will aim to increase transparency of mitigation actions and their effects; discussion on the appropriateness of such domestic policies and measures is not part of the process. The TTE shall:…

(c) In consultation with the Party concerned, ***identify capacity-building needs in order to facilitate reporting*** *in accordance with annex III to decision 2/CP.17, and participating in international consultation and analysis in accordance with annex IV to decision 2/CP.17, taking into account Article 4, paragraph 3, of the Convention.*

The capacity-building needs will need to be determined in close collaboration with the Party, and will vary depending on national circumstances. While some countries will already have strong analytical and institutional arrangements in place for developing and reporting BURs, others will require more in-depth support to enhance their capacity.

Capacity-building needs can arise from any of the elements outlined in modules 1 and 2 of these TTE training materials, as well as the outcomes of the identification of information and conduct of the technical analysis. For example, if a Party has not reported GHG emissions and removals which are no more than four years prior to the date of the submission (a 'shall' requirement), the TTE should ask why the Party was unable to do this, and then identify what kind of capacity-building is necessary to address this issue in the next submission.

Some of the more frequent capacity-building needs could include, but are not limited to:

- Enhancing the institutional arrangements to collect and process data;
- Developing reliable statistics to estimate GHG emissions and removals;
- Developing country-specific emission factors and other parameters; and
- Enhancing the country's capacity to prepare the inventory on a regular basis.

5. REPORTING FINDINGS

Based on the analysis conducted related to the elements outlined in this section, as well as from other sections covering topics other than national GHG inventories, the TTE will prepare a summary report. For each of the reporting elements identified in the BUR guidelines, the TTE needs to assess whether there are issues related to completeness and transparency of the information reported in the BUR. In doing so, it is important to keep in mind the voluntary nature of some of the information, as well as the capacity constraints faced by the Party. The information the TTE will consider includes the national GHG inventories report, associated methodologies and assumptions under the ICA process referred to in decision 2/CP.17, annex III, paragraph 2(b).

In cases where issues regarding completeness or transparency arise, it is advisable to first seek clarification with the Party concerned. This should be obtained through a constructive exchange with the Party, through the UNFCCC secretariat, and provide additional insights that may alleviate the issues raised. It can also help identify support needs to enhance the reporting capacity of the Party.

If the Party provides additional information to the BUR through the exchange process, the TTE could be in a better position to provide suggestions that aim to improve the reporting of information in future BURs. Areas where information is incomplete or lacks transparency are likely to provide an opportunity for such.

REFERENCES

UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention (annex III to decision 2/CP.17)[3].

UNFCCC Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention (annex to decision 17/CP.8)[4].

Updated CGE training materials on national GHG inventories for non-Annex I Parties[5],

Supplementary CGE training materials on biennial update reports[6].

Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories[7].

Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, (GPG 2000)[8].

Good Practice Guidance for Land Use, Land-Use Change and Forestry (GPG LULUCF)[9].

2006 IPCC Guidelines for National Greenhouse Gas Inventories[10].

[3] Available at < http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf#page=4>.
[4] Available at < http://unfccc.int/resource/docs/cop8/07a02.pdf#page=4>.
[5] Available at <unfccc.int/349.php>.
[6] Available at <unfccc.int/7915.php>.
[7] Available at < http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html>.
[8] Available at < http://www.ipcc-nggip.iges.or.jp/public/gp/english/index.html>.
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[10] Available at < http://www.ipcc-nggip.iges.or.jp/public/2006gl/>.