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METHODOLOGICAL ISSUES

ONGOING ACTIVITIES ON REPORTING AND REVIEW OF GREENHOUSE GAS INVENTORIES IN PARTIES INCLUDED IN ANNEX I TO THE CONVENTION (IMPLEMENTING DECISIONS 3/CP.5 AND 6/CP.5)

Report on the use of the UNFCCC reporting guidelines on annual inventories

Note by the secretariat

Addendum

CONTENTS

I. INTRODUCTION

1. This addendum should be read in conjunction with the main body of this report (FCCC/SBSTA/2001/5), which contains sections entitled *Introduction, Preliminary results with the use of the reporting guidelines* and *Future work*. It also includes an overview of the inventory submissions received in 2000 and 2001 from Parties included in Annex I to the Convention (Annex I Parties) and of the extent to which information has been provided according to the reporting guidelines.[1]

2. This addendum contains information on the experience in using the reporting guidelines, including the common reporting format (CRF). The information is provided in this separate document as an addendum because of its technical and detailed nature. It focuses on experience gained with, and current problems in the use of, the reporting guidelines as identified in submissions from Parties based on their experience in preparing their 2000 and 2001 inventory submissions, and the experience gained by the secretariat based on the technical review of inventories submitted in 2000 and, to a very limited extent, those inventories submitted in 2001. This addendum and its main document should be read taking into consideration the submissions from Parties contained in document FCCC/SBSTA/2001/MISC.4.

3. The discussion that follows notes issues addressed by Parties and, where appropriate, by the secretariat, and raises questions which would require clarification prior to any revision of the guidelines and the CRF. These questions have been prepared in order to facilitate the consideration of any revision of the guidelines, taking into account information available so far. They are not comprehensive and therefore do not prejudge the consideration of any other issues which might also deserve clarification prior to any revision of the guidelines.

4. For the purpose of this report, issues addressed by Parties have been classified as follows:

(a) Cross-cutting issues in the reporting guidelines;

(b) Issues relating to the national inventory report (NIR);

(c) Issues relating to the CRF;

(d) Issues relating to the Intergovernmental Panel on Climate Change (IPCC) good practice guidance;[2]

(e) Technical and software issues pertaining to the CRF.

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[1] The guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories (see FCCC/CP/1999/7) are referred to as "the reporting guidelines" in this document.

[2] The IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* is referred to as the "IPCC good practice guidance" in this document.

II. EXPERIENCE WITH THE USE OF THE REPORTING GUIDELINES

A. Cross-cutting issues in the reporting guidelines

1. Annual reporting of all inventory years from the base year to the year of current annual inventory submission

Background:

5. The reporting guidelines currently request that Parties submit a national inventory report containing detailed and complete information on their inventories, including, *inter alia*, the CRF and calculation sheets containing disaggregated national emission factors and activity data, for all years from the base year to the year of current annual inventory submission. The CRF should be submitted in both electronic and hard copy form, while the NIR should be submitted either as a printed document or electronically.

Experience of Parties:

6. Recognizing the need for reporting detailed inventory information, some Parties stated that:

(a) Under the current guidelines, the reporting requirements will increase annually from the base year inventory, resulting in a very large amount of data;

(b) Submitting inventories annually for the entire time-series would be of little value once a complete submission covering all years was made, when there had been no changes in the methodologies or underlying data;

(c) The need to supply all information annually for the entire time-series should be clarified and possibly re-examined;

(d) Provision of the CRF for multiple years results in a large amount of repetitive information within an annual submission;

(e) Provision of all or part of this information as a printed document might become impractical.

Experience of the secretariat:

7. Some Parties, in their annual inventory submissions, provide the CRF only for the latest inventory year, but refer to the previous year's submission for CRFs of the entire time-series, mentioning that no substantive changes had been made. It is not sufficiently clear whether or not the secretariat and expert review teams should consider this as an omission in the reporting. If not, it would be necessary for the Parties to indicate clearly the validity of the previous years' data for performing analyses on time-series.

8. More frequently, Parties submitted only the latest inventory year, but did not make any references to earlier submissions. In other cases, Parties provided recalculated estimates (table 8 of the CRF) without providing the CRFs for those recalculated years, thus limiting any analysis of time-series.

9. Reporting of redundant information increases requirements for data and information processing, and the maintenance thereof.

10. *Questions:*

Does the current guidance on the annual reporting requirements need to be changed? If so,

- Should the CRF and calculation sheets for the entire time-series be provided only when there have been recalculations or revisions?
    - If so, should the provision of the CRF and calculation sheets be limited to those years that have been recalculated or revised?
    - Should the provision of calculation sheets be limited to those sectors for which the methodology or data have changed (but the CRF still be provided in its entirety for the years affected by recalculations)?
    - Once the entire time-series, including the base year, has been submitted and data has not been recalculated/revised should, in addition to the latest inventory year, full annual reporting be required for any other year, e.g. the base year and/or the previous year (latest reported inventory year –1)?
- Should there be a subset of CRF tables which are submitted only once within a submission, even if multiple inventory years are covered in the submission? If so, which tables should such a subset include? (For example, Summary 3 on methods and emission factors used, table 7 Overview, table 8(b) Explanatory information on recalculations, table 9 Completeness, table 10 Emission trends, table 11 Check list)?
- Should the entire CRF and calculation sheets for all requested inventory years, as appropriate, always be provided in both electronic form and hard copy? Or should a distinction be made between information to be submitted electronically and that to be submitted in hard copy (for instance, a distinction according to inventory years and/or types of tables)?

2. Recalculations

Background:

11. The current reporting guidelines refer to recalculations as a result of changes in methodologies or in the manner in which underlying activity data and emission factors are gathered. Recalculations should result in improvements in the accuracy and completeness of the inventory and should ensure consistency in the time-series.

Experience of Parties:

12. One Party highlighted the usefulness of recalculation tables for the ease and transparency of reporting recalculated estimates. Some Parties, however, noted that:

(a) The guidelines should clarify further what is considered as recalculation;

(b) Recalculations are currently recorded only in terms of CO_2 equivalent, without reflecting the impact of each single recalculation on the total inventory.

Experience of the secretariat:

13. The information given in the recalculation tables did not always correspond to the information actually reported in the previous years' submission as recorded by the secretariat. This was due either to recalculated estimates being omitted in the recalculation table, or to changes in the estimates being considered as minor revisions only, and not as recalculations.

14. *Questions*:

- Should minor changes since the previous inventory submission, such as corrections of transcription errors or minor revisions in national statistics, be considered as recalculations? If not, where and how should such changes or revisions of the data be recorded and explained, and processed by the secretariat?
- Should the differences in recalculated data be expressed also with respect to national total emissions in order to highlight those recalculations which have a major impact on the total inventory?

3. Precursor gases

Background:

15. The current guidelines state: "Parties should provide information on the indirect greenhouse gases CO, NO_x, NMVOC, and are encouraged to provide information on SO_2". The CRF tables require the reporting of such gases only at the level of sectoral reports and summary tables, but not at the level of sectoral background data tables. Reporting requirements are therefore lower than for the direct greenhouse gases (GHGs), which results in, for example, no implied emission factors (IEFs) being calculated for these gases.

16. Parties agreed during negotiations on the development of the CRF that precursor gases should not be included in the sectoral background data tables, the main reason for this provision being that the information in the sectoral background data tables, such as activity data and IEFs, would be used only for reviewing estimates of direct GHGs. Furthermore, it was agreed that sectoral reports should follow as closely as possible the sectoral reports of the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (hereinafter referred to as the IPCC Guidelines) as long as the reporting transparency for the direct GHGs is not affected. This defined the coverage of gases in each sectoral report table. Since the development of the CRF, the IPCC Third Assessment Report has provided additional information on the role of the ozone troposphere and aerosols, which may need to be taken into consideration.

Experience of Parties:

17. Some Parties expressed the view that

(a) The reporting obligations for these gases are not sufficiently clear;

(b) For some source/sink categories there are no provisions for reporting some of the precursors in the sectoral reports, although they should be reported in table Summary 1.A;

(c) The calculation of IEFs in sectoral background data tables is lacking.

18. *Questions*:

Should the current reporting requirements for precursors be changed? If so,

- Should the CRF reflect any differences between strict and less strict reporting requirements for these gases as compared to the direct GHGs?
- Should, where relevant, the reporting of all precursor gases be requested in the sectoral reports as a minimum? Or should reporting of precursor gases even be included in the sectoral background data tables calling for information on activity data and calculation of IEFs?

B. Issues relating to the national inventory report

1. Information required in the national inventory report

Background:

19. Items (a) to (j) of paragraph 33 of the reporting guidelines indicate the reporting requirements under the NIR, such as descriptions of methodologies and assumptions used in each sector. It is important to note the different levels of experience among Parties in preparing national inventory reports, some of them benefiting from long experience in inventory development and the preparation of inventory reports.

Experience of Parties:

20. One Party highlighted the NIR as a key element for ensuring transparency in reporting, while allowing flexibility to accommodate country-specific circumstances. Regarding the current guidance, some Parties recognized that

(a) The guidelines need to be clearer with regard to the NIR, which would be helpful both to Parties compiling the NIR and to reviewers of the inventory;

(b) Some Parties using country-specific methodologies document their methodologies in separate reports.

Experience of the secretariat:

21. The first year of experience gained with the technical review of inventories has demonstrated that without an NIR, inventories are not transparent and expert review teams have more difficulty in fulfilling their task; the NIRs are generally proving to be an excellent supplement to the CRF. For the submissions received in 2000 and in 2001, as at the time of writing, only one third and one half of the Parties respectively, also included an NIR in their submissions (see table 2 of the main document of this report (FCCC/SBSTA/2001/5)).

22. The scope and level of detail of the information provided in the NIR differs substantially across Parties; Parties seem to have different understandings of the content of the NIR.

23. Some CRF submissions are accompanied by additional documentation without being identified as the “national inventory report”. It is not clear (1) how such information should be

considered within the review process, (2) what the criteria are for a report, or any other inventory information provided within a submission, to be considered as the "national inventory report".

24. *Questions*:

Should the current guidance on the NIR be changed? If so,

- Should the guidelines list more explicitly the elements to be included in the NIR?
- Should the guidelines define the structure it should have?
- What reporting requirements for the NIR should apply to Parties which document their methodologies in separate reports?

C. Issues relating to the common reporting format

1. General reporting requirements

Background:

25. The CRF consists mainly of summary, reporting and overview tables from the IPCC Guidelines, plus newly-developed sectoral background data tables calling for the reporting of aggregate activity data and other methodological information. Other newly-developed tables provide for reporting on recalculations, methods and emission factors used, completeness and trends.

Experience of Parties:

26. Regarding the current reporting requirements in the CRF, some Parties noted that

(a) In many cases the requested information was not used in the actual derivation of emission estimates, and was therefore often not available;

(b) No distinction is made in the CRF between the data actually used in the calculation of emission estimates and the data provided for information purposes only;

(c) In some cases, the CRF tables do not accommodate the amount of data that a country could provide if the variables in the CRF tables were to go beyond the variables used for IPCC methods;

(d) There is some duplication between the CRF and the NIR with regard to methodological information.

Experience of the secretariat:

27. The provision of detailed methodological information, as requested for example in some sectoral background data tables and in additional information boxes, has generally been low (see table 1 of this addendum).

28. *Questions:*

- Should the reporting requirements, in particular on additional methodological information, be re-evaluated on the basis of the data that was actually used during the review process? Should, for facilitating the review, data provided only for information purposes be distinguished from the data that was actually used in deriving emissions estimates?

2. Standard indicators

Background:

29. The guidelines currently request the use of standard indicators (NO, NE, NA, IE, C, 0)[3] to indicate source/sink categories not considered in the inventory but included in the IPCC Guidelines. These indicators should be used to fill the blanks in *all* the tables of an inventory. The notes to the CRF further indicate that Parties should complete *all cells* calling for emissions or removals estimates, activity data or emission factors. Table 9 of the CRF requires Parties to provide an explanation for each source/sink category for which "NE" or "IE" has been entered.

Experience of Parties:

30. Some Parties noted that the use of standard indicators may become important in the future. Specifically they noted that:

(a) More clarity could be provided in the reporting guidelines on the use of standard indicators;

(b) There are no directions on the use of indicators for category totals or totals in summary tables for which the underlying subcategories/categories have been labelled with different indicators (NE, NO etc.);

(c) When the indicator "NA" has been used, or if a cell has been left blank, no explanation is currently required in the completeness table (table 9);

(d) The current guidelines do not specify how to use indicators in individual tables in which no numerical values are required, such as Summary 3, where the use of standard indicators could be interpreted differently by Parties;

(e) The terminology for "standard indicator" is not used consistently throughout the guidelines and the CRF, and is in some cases referred to as "notation keys".

Experience of the secretariat:

31. Some Parties enter indicators under either activity data or emissions estimates or both; it is not clear whether entering indicators under one column only (under "estimates", for instance, thereby leaving cells for "activity data" blank) should be considered as a reporting gap.

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[3] Standard indicators to be used in the CRF where data are not entered are as follows: NO: not occurring, NE: not estimated, NA: not applicable, IE: included elsewhere, C: confidential, and 0: for emissions/removals of GHGs which are estimated to be less than one half the unit being used to record the inventory table and which appear as zero after rounding.

(a) Parties seem to consider the reporting requirements under the categories "other" differently, some of them entering indicators throughout all categories "other", while others use indicators only for the pre-defined source categories.

(b) Some Parties seem to use the indicator "0" for filling in blanks in the CRF. Not only might this practice reduce the transparency of the inventory but it could also hamper the proper processing of the data. The indicator "NA" often seems to be misused; review activities revealed that, in some cases, it had been used where "NE" or "NO" would have been more appropriate. Other Parties use indicators that are not defined in the reporting guidelines.

(c) When the indicator "0" is used, the actual amount of the gas is in most cases not accounted for in the totals (as requested by the guidelines) due to the fact that totals are calculated by the Excel software on the basis of the individual entries made into the CRF. If used for GHGs with high global warming potential values, amounts omitted from the inventory could be significant;

32. *Questions*:

Should the current guidance on the use of indicators be expanded to address all possible situations, for example,

- What rules should apply for the use of indicators in categories for which different indicators were used under the corresponding subcategories?
- Should Parties also be requested to explain the use of "NA" in the completeness table or to explain any cells left blank in the CRF?
- For categories for which the indicator "NO" is used, should there still be a requirement to fill in this information for that source in all tables of the CRF?
- Should specific guidance be developed for the use of indicators in individual tables, e.g. Summary 3, Overview table, Recalculation table, and for the categories "other"?
- Should "0" still be considered as an indicator?

Should the term "standard indicator" be replaced by "notation key"?

3. Additional information and documentation boxes

Background:

33. The notes on the CRF annexed to the reporting guidelines state that Parties should complete the data in the additional information boxes or use the indicator "not applicable" (NA) if the information called for is inappropriate for the methodology used by the Party. It is further stated that Parties should use the documentation boxes provided at the foot of the sectoral background data tables to improve clarity. In some cases, the footnotes to a table indicate what type of information should be provided in the corresponding documentation box.

Experience of Parties:

34. As noted by one Party, documentation boxes are extremely important for adding additional information for reviewers, particularly where non-default methodologies were used. Some Parties noted

(a) A lack of documentation boxes for some tables;

(b) A lack of guidance in relation to the use of documentation boxes;

(c) Too many requests for specific information when such information could be better reported in the NIR (such as finest level of livestock classification in the agriculture sector).

Experience of the secretariat:

35. The use of documentation boxes has in general been low, even in cases where the request for specific information is explicitly stated (see for example the use of documentation boxes on bunker fuel emissions, paragraph 56). The extent to which numerical information was provided in additional information boxes is shown in table 1 below.

Table 1. Extent of information provided in "additional information boxes" of the common reporting format

CRF table	Additional information on:	2000 submissions	2001 submissions
		Percentage of CRF reporting Parties	
1A(d) – Feedstocks	Source categories from which non-emitted CO_2 has been subtracted	0 - 39	0 - 26
1B1 – Fugitive: solid fuels	CH_4 recovery and numbers of mines	13 - 26	19 - 26
1B2 – Fugitive: oil and natural gas	Pipelines, oil and gas wells and throughput	17 - 26	15 - 22
4A – Enteric fermentation	Livestock parameters (for tier 2)	0 - 17	0 - 44
4B(a) – CH_4 from manure management	Parameters on animal waste management systems (for tier 2)	9 - 35	11 - 37
4D – Agricultural soils	Fractions of nitrogen	35 - 61	44 - 63
5B – Forest and grassland conversion	Fractions on biomass, burning, oxidation etc.	0 - 13	0 - 19
5D – CO_2 emissions and removals from soils	Soil types, climate	0	0 - 4
6A, C – Waste disposal and incineration	Waste composition and other parameters	0 - 61	0 - 67
6B – Waste-water handling	Parameters on waste water	0 - 39	0 - 52

36. *Questions*:

- Should more specific guidance be developed for reporting information in documentation boxes? How should duplication of methodological information provided in additional information and/or documentation boxes of the CRF and information provided in the NIR be avoided?

4. Shaded cells

Background:

37. In the CRF, grey shading of cells indicates cells in which no entries should be made because it is anticipated that no gases are expected to be emitted from a given activity.

Experience of Parties:

38. Some Parties noted that emissions estimates are indeed available for shaded cells in some cases; on the other hand the shadings are not consistently applied across the CRF tables.

Experience of the secretariat:

39. Some Parties report estimates in shaded cells, but due to the nature of the embedded formulae in the Excel software application, these estimates were often not included in the national totals. Other Parties, although not reporting values in shaded cells, reported their estimates in other cells (such as under the category "other"), which sometimes resulted in incorrect information for the category in question and for the national total. Conversely, there are cells in the CRF in which no data entries have been made so far by any Party.

40. *Questions*:

- Should, on the basis of the current reporting experience, the shading of specific source/sink categories be re-examined?

5. Reporting on methods and emission factors used

Background:

41. Summary 3 of the CRF calls for the provision of information on methods and emission factors used at the level of category disaggregation of IPCC summary tables. Specific notation keys to specify the methods and emission factors used were defined for the purpose of that table.

Experience of Parties:

42. Some Parties noted that

(a) The current definitions used to describe the methods and emission factors were not sufficiently precise (particularly those for distinguishing between country-specific methods/emission factors, and the use of a model method);

(b) Table Summary 3 does not require Parties to specify the tier used for their emission factors.

Experience of the secretariat:

43. The current level of aggregation of that table does not allow Parties to provide the information at the level of source category disaggregation at which methods and emission factors were actually applied, which reduces the usefulness of the information provided for the review process.

44. *Questions*:

Does the current Summary 3 need to be modified to allow for more transparent and detailed reporting on methods and emission factors used? If so,

- Should that table have a higher level of disaggregation? Should it also request indication of the tier for the emission factors used?
- Should additional guidance be provided as to the definitions for the specific notation keys used to describe the methods and emission factors used?

6. Issues relating to the energy sector

Background:

45. Parties are requested to compare their national CO_2 emissions estimates from fuel combustion with those estimates obtained using the reference approach. The CRF includes a table for directly comparing both actual CO_2 emissions and apparent energy consumption from the reference approach with the total CO_2 emissions and energy consumption from the sectoral approach. On the other hand, the current tables on the reference and the sectoral approach were developed following the IPCC Guidelines. In the latter case, the disaggregation into fuel types according to liquid, solid, gas, biomass and other was agreed by Parties in order to avoid increasing the number of tables in the CRF.

Experience of Parties:

46. Some Parties noted that

(a) For the sectoral approach, the usefulness of the current split into fuel groups for comparing IEFs (liquid, solid, gaseous, biomass and other) might be limited. Under the national approach, some Parties' inventories are not compiled according to the fuel groups listed in the CRF, and therefore individual fuels have to be classified into those fuel groups for CRF reporting. This could result in differences in classifying certain fuels by Parties which may affect the comparability of data, such as IEFs, across countries;

(b) In the current table for the reference approach the list of some fuel types is insufficiently disaggregated and does not offer the option of reporting "other";

(c) The level of comparison between the reference and the sectoral approach as currently described in the guidelines might not be useful and may require further clarification. For example, energy consumption between the reference and the national approach cannot be reconciled because the reference approach includes energy consumption from some sources that are netted out in the national approach and reported elsewhere in the inventory.

Experience of the secretariat:

47. The meaning of "sectoral approach" and "reference approach" is not always the same for all Parties, and therefore the comparison of the two could lead to different values and different interpretations under the review process. Experts who participated in the review process indicated the need for more precise guidance in assessing the results of the comparison between the reference and the national approach.

48. Parties do not always indicate whether fuel combustion estimates were calculated on the basis of fuel consumption data expressed in gross calorific value (GCV) instead of on the basis of net calorific value (NCV). This lack of clarity affects the comparability of IEFs.

49. Regarding fugitive emissions from oil and natural gas activities, experts involved in the review process noted that the current flexibility in the use of different units hampers an efficient review of the data from this subsector.

50. *Questions*:

- Should the sectoral approach table of the CRF (table 1.A(a)) allow for the reporting of data on the basis of individual fuel types in the various subsectors, rather than following the current breakdown into solid, liquid, gaseous, biomass and other? In addition, should general guidance on the classification of fuels into fuel categories (liquid, solid, gas, biomass and other) be developed?
- Should the reference approach table of the CRF (table 1.A(b)), which closely follows that of the IPCC Guidelines, be modified to provide for more disaggregated reporting of some liquid and gaseous fuel types and to allow for the reporting of "other" under liquid, solid and gaseous fuels?
- Should the current approach of comparing CO_2 estimates between the national and the reference approach (table 1.A(c) of the CRF) be modified, and if so, should more guidance be developed with the aim of obtaining more useful information for the review process?
- Should Parties in their CRFs, or the secretariat in the relevant tables of the synthesis and assessment, convert different units used under the oil and natural gas categories into a common unit?

7. Issues relating to bunker fuel emissions

Background:

51. The new reporting guidelines, including the CRF, require more information on bunker fuel emissions than the reporting tables of the IPCC Guidelines. A separate table was included in the CRF (table 1.C) solely for reporting on bunker fuel emissions. In addition, Parties are required to explain how the consumption of international marine and aviation bunker fuels was estimated and separated from domestic consumption.

52. The Subsidiary Body for Scientific and Technological Advice (SBSTA) requested the secretariat to provide information on the reporting of emissions based upon fuel sold to ships and aircraft engaged in international transport. However, information contained in this note is limited, as it is based only on the 2000 inventory submissions which have been processed and reviewed so far.

Experience of Parties:

53. Some Parties noted some inconsistencies in the presentation of the information in the CRF tables.

Experience of the secretariat:

54. Ninety per cent of the Parties which used the CRF for reporting inventories in 2000 and 2001 provided CO_2 emissions estimates for international bunkers, with around 85 per cent reporting aviation emissions, and around 70 per cent reporting marine emissions. Reporting of estimates for non-CO_2 gases was lower than for CO_2, (around 60-75 per cent for CH_4, N_2O and precursors).

55. Table 1.C of the CRF, which calls for, *inter alia*, the reporting of fuel consumption according to individual fuels used in aviation and marine bunkers, was used by only 19 Parties in 2000 and 23 Parties in 2001(approximately 80 per cent of the Parties that used the CRF (see table 3 of the main document (FCCC/SBSTA/2001/5))). The level of reporting of consumption data and emission estimates in table 1.C varied depending on the fuel type; most Parties reported consumption of gas/diesel and residual fuel oil under marine (65-70 per cent), and jet kerosene under aviation (74-78 per cent). However, for some fuel types listed in table 1.C of the CRF, such as coal and gasoline under marine, Parties either did not report any numerical data at all, or reported only very small amounts of consumption and emissions (less than 0.00 Gg CO_2).

56. With regard to the 2000 inventory submissions, only half the Parties that used the CRF provided information on the consumption of international marine and aviation bunker fuels in the documentation box of table 1.C of the CRF. However, this information did not always include an explanation as to how the consumption of international marine and aviation bunker fuels was estimated and separated from domestic consumption, as requested. For many Parties, the information provided in the documentation box was limited to a reference to the country's national statistics.

57. *Questions*:

- Should the current guidance on reporting bunker fuel emissions be further specified? For example, should the current list of fuel types provided in table 1.C be revised?

8. Issues relating to land-use change and forestry

Background:

58. The sectoral report for land-use change and forestry (LUCF) (table 5 of the CRF) requires CO_2 emissions and removals to be reported separately (except for 5.B Forest and grassland conversion). The Excel software application includes embedded formulae which calculate "net CO_2 emissions/removals" for each source category. This approach is different from that in the sectoral report of the IPCC Guidelines, where Parties should calculate only the "net CO_2" and place the estimate in either the "emissions" or "removals" column as appropriate, but not in both. However, for reporting LUCF estimates in table Summary 1.A the approach from the IPCC is followed.

59. The notes on the CRF annexed to the reporting guidelines indicate that the sectoral background data tables 5.A-5.D on LUCF follow the IPCC Guidelines and should be completed by those Parties using IPCC default methods. Parties which do not use sectoral background data tables 5.A-D should complete alternative formats, when they are available.

60. The current provisions in the CRF allow the reporting of CO_2 emissions and removals from soils under either the agriculture sector (under 4.D Agricultural soils) or the LUCF sector (5.D CO_2 emissions and removals from soils).[4]

Experience of Parties:

61. Some Parties noted that

(a) Parties choosing to report CO_2 estimates from soils under agriculture can do so only in the Summary tables;

(b) Summary table 1.A does not give a clear indication as to whether both emissions and removals of CO_2 from agricultural soils should be reported, or only net emissions or removals, as is the requirement for LUCF estimates in this table;

(c) The national total without LUCF may not represent the same set of activities across countries, since for Parties choosing to report CO_2 fluxes from agricultural soils under agriculture this estimate is included in the national total.

(d) The national totals without LUCF expressed in terms of CO_2 equivalent differ across tables in the CRF, depending on whether or not non-CO_2 gases from LUCF have been accounted for.

62. Some Parties provided separate submissions on alternative formats for sectoral background data tables on LUCF.[5] Suggested alternative formats were designed by Parties to allow, *inter alia*, for more suitable reporting, taking into account national circumstances, and to allow for the separate reporting of emissions and removals from 5.B Forest and grassland conversion. Consideration of these formats and their interrelation with the current CRF could improve the quality and completeness of the reporting, and at the same time facilitate the review of the information from this sector.

Experience of the secretariat:

63. The level of reporting sectoral background data tables 5.A–5.D in both the 2000 and 2001 submissions was low (see table 2); a few Parties which did not use these tables provided alternative data tables in their NIR. However, national data tables in an NIR do not allow for easy comparison of data across countries. This general lack of reporting, in addition to the lack of reporting of data from this sector in standardized formats, significantly affected the comparability of data during the technical review of inventories and, therefore, the effectiveness of the review of that sector.

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[4] Without prejudging the usefulness of comments made by Parties in relation to the accounting of CO_2 from soils under either the agriculture or the LUCF sector, the secretariat would like to clarify that the current provisions in the CRF resulted from negotiations by Parties during the development of the CRF.

[5] Submissions on alternative formats for sectoral background data tables 5.A-D on LUCF of the CRF are reproduced in document FCCC/SBSTA/2001/MISC.4.

Table 2. Provision of common reporting format tables in the land-use change and forestry sector

	Submission year	2000	2001
	Inventory year	1998	1999
	Total number of CRFs	23[a]	29[a]
Number of Parties providing:	Sectoral report on LUCF (table 5)	22	26
	All SBDTs[b] (5.A-5.D)	1	3
	5.A	9	14
	5.B	4	7
	5.C	3	5
	5.D	5	9

Notes:
The values given in this table reflect only the number of those Parties using the CRF that have actually used a given LUCF table by providing numerical information; cases in which only standard indicators were used to fill in a table were not taken into account in the above values.

[a] The total number of CRF submissions in 2000 and 2001 received by 31 July 2001 was 24 and 30, respectively. However, one Party submitted only tables Summary 1.A and 2 of the CRF. This submission is not taken into account in this table.

[b] SBDT: sectoral background data table.

64. Emissions and removals were often not reported separately in table 5 of the CRF; in addition, the rules for using the signs (+/-), which were established following the IPCC Guidelines, were sometimes not followed by Parties.

65. *Questions*:

Should the current reporting tables on LUCF be modified? If so,

- Should any modification take place in the context of any revision to the guidelines at the seventh or eighth session of the Conference of the Parties (COP), or should such a process be deferred until the IPCC good practice guidance on LUCF is completed and adopted by the COP?
- Should the alternative formats for sectoral background data tables on LUCF suggested by Parties be used as a basis for modifying the current ones in the CRF?

Should general rules for the accounting of LUCF in national totals be established? If so,

- For the accounting of LUCF in the national totals, should the exclusion or inclusion of LUCF always refer to only the gas CO_2 or to the LUCF sector as a whole (including the non-CO_2 gases)?
- For the purpose of calculating national totals (without LUCF), should the CO_2 from agricultural soils, if reported under agriculture, be excluded? Or, conversely, should the national total without LUCF always include the net CO_2 from agricultural soils, independently of the sector to which it has been allocated?
- Do the rules for using the signs (+/-) for emissions and removals in the LUCF sector need to be modified?

Should reporting of CO_2 fluxes from agricultural soils be allowed only in one sector? If it is allowed in both sectors, should CRF tables of the agriculture sector also provide for full reporting of CO_2 from agricultural soils (for example, reporting of activity data and calculation of IEFs)?

D. Issues relating to the IPCC good practice guidance

Background:

66. The reporting guidelines make provision for the application of the IPCC good practice guidance. At its twelfth session the SBSTA considered the *IPCC report on Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* and concluded that the good practice guidance should be applied by Parties to the extent possible for inventories due in 2001 and 2002, and should be used for inventories due in 2003 and beyond.[6] The SBSTA also requested the secretariat to consider in its report on the use of the reporting guidelines whether any modifications to these guidelines are needed to reflect the IPCC good practice guidance.

Experience of Parties:

67. Some Parties noted that the CRF is not fully compatible with the IPCC good practice guidance and made specific proposals for reflecting some elements in the CRF, both at the level of cross-cutting issues and at the sectoral level. Some Parties proposed specifically

(a) To revise Summary 3 "Summary report for methods and emission factors used" to provide more detailed information on the choice of method selected for each sector and gas; consideration should be given to how to provide more useful and detailed information in this table following the approach for methodological choice (and decision trees);

(b) To revise table 7 "Overview table for national GHG inventories" in order to record indicators of quality and uncertainty better, or to replace this table with two new tables:

(i) a table to cover uncertainty estimates (e.g. reporting on both the tier applied and the percentage value for uncertainty as a percentage of category emissions below and above the inventory values, or other uncertainty indicators described in the IPCC good practice guidance);

(ii) a table to report on quality assurance/quality control (QA/QC) (e.g. to indicate which tier for QA/QC has been used for each source category and gas).

Experience of the secretariat:

68. Given that, for the 2000 inventory submissions, most Parties have not reported on the application of the IPCC good practice guidance, as explained in paragraph 66 above, the secretariat is currently not in a position to provide information on experience with the good practice guidance.

69. To facilitate analysis of the inventory data during the review process, the secretariat has identified, for each individual Party that has submitted a CRF in its 2000 submission, those source categories that are *key sources* in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC good practice guidance.[7] For the 2001

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[6] Annex I Parties with economies in transition may phase in the IPCC good practice guidance two years later than other Annex I Parties.

[7] Chapter 7 "Methodological choice and recalculation" of the IPCC Good Practice Guidance and Uncertainty Management.

submissions, *key sources* were also calculated using the trend assessment. With regard to categories, this identification has been performed at the level of detail recommended in that guidance.

70. However, once Parties start implementing the IPCC good practice guidance, including the identification of key sources, they might use different levels of category disaggregation, which may lead to the identification of other key sources than those identified by the secretariat. It can be expected that a determination of key sources will contribute to improving the quality of the data and self-assessment by Parties. On the other hand, the use of key sources determined on the basis of different aggregation levels might affect the development of a technical review in a consistent manner across Parties.

71. *Questions*:

Should the reporting guidelines, including the CRF, be revised in order to reflect the reporting of the application of the IPCC good practice guidance? If so,

- What elements of the IPCC good practice guidance should be incorporated into the current guidelines and become an explicit reporting requirement (for instance, methodological choice, determination of key sources, uncertainty, recalculation and splicing of time-series, quality assurance/quality control (QA/QC))?
- Should additional tables be developed for the CRF to ensure standardized reporting on the use of the IPCC good practice guidance? What minimum reporting requirements should such tables include (e.g. tier 1 key source determination, recalculation tables that calculate changes in the trend due to recalculation, tier 1 uncertainty estimates)?
- Should additional guidance be developed to define what elements in the application of the IPCC good practice guidance should be reported in the NIR?
- Should the current categories as used in the CRF (following IPCC Guidelines categories) be re-examined in the light of slight changes in category disaggregation used in the IPCC good practice guidance (e.g. for categories relevant for HFCs, PFCs, SF_6)?

Key sources: How should differences in the key sources identified by Parties and key sources identified by the secretariat be addressed during the review process?

E. Technical and software issues pertaining to the common reporting format

Background:

72. Following the adoption of the new reporting guidelines on GHG inventories (6/CP.5), the secretariat developed a software application for submitting GHG inventories in the CRF. The CRF software application consists of a file of the spreadsheet application Microsoft Excel 97 in which all the tables of the CRF are contained in worksheets. The CRF software application has a number of inbuilt links and formulae, CRF-specific menus, and various macros to assist the user to enter data. Most Parties have used the CRF application for both their 2000 and 2001 GHG inventory submissions.

Experience of Parties:

73. Several Parties have addressed a number of technical issues in their submissions, such as units used, rounding of figures, general consistency between data sheets, functioning of formulae with respect to indicators, width of columns and alignment of information/tables, changes in numeration and headings of tables, and other issues relating to the use of MS Excel, which are not addressed in detail here.

74. In general most Parties have found the software to be suitable for the presentation of the data requested in the CRF. However, Parties have mentioned issues specifically relating to the CRF software application in their submissions, and have made a number of suggestions for its improvement. These suggestions might be considered in more detail during the expert meeting mentioned in paragraph 10 of the main document to this addendum. The following points were noted by many Parties:

(a) The large burden associated with entering most of the information manually into the CRF;

(b) The fact that CRF files take up much storage space and are time-consuming to handle (opening, saving, navigating, printing, etc.);

(c) Throughout the CRF, the lack of automation in entering standard indicators in related cells;

(d) The occurrence of error messages and locking up of the software;

(e) The fact that only one person at a time can work on a file, for example, national experts responsible for different sectors cannot work on the same file at any one time.

Experience of the secretariat:

75. The provision of inventory data in an electronic format over the last few years has greatly facilitated the secretariat's ability to process and maintain information, and it has also increased the amount of information the secretariat is able to provide to Parties in support of various activities, in particular the technical review of inventories. Specifically, the provision of data in the standardized electronic format of the CRF application has allowed the implementation of a highly automated processing procedure for Parties' submissions, and has increased data integrity within the database. The availability of comparable data has allowed the development of software tools for analysis.

76. The secretariat has, however, encountered some difficulties in the processing and maintenance of data reported by Parties in the CRF application. Due to the flexible nature of the spreadsheet application, and to some extent the CRF, Parties have in some instances submitted information with modifications to the standard format of the software application, such as changes to names of worksheets and categories, manual insertion of rows/columns or footnotes, addition of non-standard tables, and replacement/removal of standard tables. Although the present software to import data developed by the secretariat identifies such changes prior to importing, and necessary adjustments are made, this limits to some extent the automation of the data processing.

77. Major problems in the importation of the data arise, for example, if Parties report according to the CRF but do not use the CRF software application. It is important to note that reporting in the standardized formats is crucial for the processing of the data. Problems of data integrity also arise when users perform manual interventions in the embedded formulae of the CRF; this often results in inconsistent values/totals being shown in different tables of the CRF. In some cases such inconsistencies are due to reporting "other" categories in sectoral reports, but not in the corresponding sectoral background data table, which leads to the calculation of different totals. It is a time-consuming task for reviewers to work out the source of inconsistent values being recorded in the CRF.

78. In the development and testing of the importation software, a number of instances of software problems/limitations have arisen due to the nature of the spreadsheet application. The secretariat has also noted that some Parties have had problems with reporting in a spreadsheet format. To avoid such problems, it may be necessary to consider different reporting software in the future.

79. *Questions*:

Should an entirely different software for reporting the CRF be developed or should the spreadsheet format simply be revised? For such modifications or development, different time-scales might need to be considered. Specifically,

- Should some/all of the elements within the CRF that are redundant (i.e. entire tables such as table Summary 1.B, and some values, for instance in the summary and trend tables) be removed from the CRF? If duplicate information is not removed, should the software prevent the reporting of inconsistencies with regard to similar values in different parts of the CRF?
- Should a modified spreadsheet format be developed that would contain separate files for the sectoral and summary sections of the CRF?
- Should a new software be developed on the basis of a database platform rather than a spreadsheet format? Or should simple data files be requested (i.e. comma delimited files)?
- Should the software encompass different facilities for data entry (input) and CRF table production (output)?
- Should the software have a checking facility to assist users in verifying the correctness/completeness of data entered before submission?

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