



INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE  
NATIONAL GREENHOUSE GAS INVENTORIES PROGRAMME



# IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry

Leandro Buendia  
Programme Officer, IPCC-NGGIP-TSU

2nd Workshop on GHG Inventories in Asia Region (WGIA)  
7-8 February 2005, Shanghai, China

1



## Contents

- Background Information
- What is good practice guidance?
- Contents of GPG-LULUCF
- Summary of steps in LULUCF Inventory
- Conclusions

2

## Background Information

- **Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (3 Volumes & software)**
- **Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (GPG2000)**
  - ✓ Energy
  - ✓ Industrial Processes
  - ✓ Agriculture
  - ✓ Waste
- ❖ **to avoid the risk of inconsistency with the SR-LULUCF**
- ❖ **KP sink negotiations were not concluded in 2000**

3

## Background Information

### **Good Practice Guidance for Land Use, Land-use Change and Forestry (GPG-LULUCF)**

- **Published in 2003**



4



## What is good practice guidance?

GPG2000 defines inventories consistent with *good practice* as those which contain **neither over- nor underestimates** so far as can be judged, and in which **uncertainties** are reduced as far as is practicable given national circumstances.

5



Good practice guidance further supports the development of inventories that are:

- ✓ transparent
- ✓ documented
- ✓ consistent over time
- ✓ complete
- ✓ comparable
- ✓ assessed for uncertainties
- ✓ subject quality control and assurance
- ✓ efficient in the use of resources available to inventory agencies
- ✓ uncertainties are reduced as better information becomes available

6



## Contents of GPG-LULUCF

- 1 Overview**
- 2 Basis for Consistent Representation of Land Areas**
- 3 LUCF Sector Good Practice Guidance**
- 4 Supplementary methods and good practice guidance arising from the Kyoto Protocol**
- 5 Cross-Cutting Issues**

7



## 1. Overview

- sets out the mandate or the overall intent of the GPG
- summarizes the practical advice provided to inventory agencies
- provides relationship to 1996 GL
- short summaries of the other chapters
- discusses policy relevant issues

8



## 2. Basis for Consistent Representation of Land Areas

- Provides guidance on the selection of methods for identifying and representing land areas and land-use change
- Identifies 6 land-use categories
  - ✓ Forest Land
  - ✓ Cropland
  - ✓ Grassland
  - ✓ Wetland
  - ✓ Settlements
  - ✓ Other Land

9



## 2. Basis for Consistent Representation of Land Areas

- Describes 3 approaches to identifying land areas:
  - Use of basic (and usually existing) land-use data
  - Survey of land use and land-use change
  - Geographically explicit land-use mapping
- Advice on the development of land-use databases and some examples on their usage to approaches

10



## 2. Basis for Consistent Representation of Land Areas (Annexes)

- **Examples of Approaches in Individual Countries**
- **Examples of International Land Cover Datasets**

11



## 3. LUCF Sector Good Practice Guidance

- **Provides methodological options for the estimation of emissions and removals of CO<sub>2</sub> and non-CO<sub>2</sub> GHG for the LULUCF sector**
  - ✓ **Methodological Issues**
    - Choice of Method (3 tiers; decision trees)
    - Choice of EF
    - Choice of Activity Data
    - Completeness
    - Developing a Consistent Time Series
  - ✓ **Uncertainty Assessment**
  - ✓ **Inventory QA/QC**
  - ✓ **Reporting and Documentation**

...**Mapping back table to GL96 (Chapter 5)**

12

### 3. LUCF Sector Good Practice Guidance

- **Addresses five carbon pools**
  - ✓ Aboveground biomass
  - ✓ Belowground biomass
  - ✓ Dead wood
  - ✓ Litter
  - ✓ Soil C
- **Annexes and Appendices**
  - ✓ Biomass Default Tables for Forest Land
  - ✓ Reporting Tables and Worksheets
  - ✓ Basis for Future Methodological Development (e.g. HWP, etc.)

13

### 4. Supplementary methods and good practice guidance arising from the Kyoto Protocol

- **General concepts of land-use change monitoring and reporting for KP.**
- **Summary tables of all reporting requirements, before, during, and after each Commitment Period.**
- **Decision trees that outline criteria to determine areas subject to afforestation (A), reforestation (R), deforestation (D), and management activities.**
- **Supplementary methods for estimating carbon stock changes and non-CO<sub>2</sub> emissions for land-use change (AR, D) and land use (forest management, cropland management, grazing land management and revegetation).**

14



## 4. Supplementary methods and good practice guidance arising from the Kyoto Protocol

### 4.3 LULUCF Projects

- Guidance for LULUCF projects on designing and implementing multi-tier measuring and monitoring plans
- Guidance is stand-alone, with cross-linkages to Chapters 3 and 5
- Does not cover:
  - ✓ baseline definition
  - ✓ Additionality
  - ✓ Leakage
  - ✓ non-permanence
  - ✓ monitoring of socio-economic/environmental impacts

15



## 4. Supplementary methods and good practice guidance arising from the Kyoto Protocol

### Annexes...

- Tool for estimation of changes in soil carbon stocks associated with management changes in cropland and grazing lands based on IPCC default data (software in CD-ROM); **see slides**
- Examples of allometric equations for estimating aboveground biomass and belowground biomass of trees

16

The screenshot displays the 'IPCC Soil Carbon Tool - [Calculate Soil Carbon Stocks]' window. The title bar indicates the tool's purpose: 'Tool for Estimation of Changes in Soil Carbon Stocks associated with Management Changes in Croplands and Grazing Lands based on IPCC Default Data'. The interface is divided into several sections:

- Country:** A list box containing Iran, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, and Kazakhstan. A note below says 'Press the F1 key or click on the help button for assistance'.
- Climate Region:** A list box with 'Cold temperate, moist' and 'Warm temperate, moist'.
- Native Soil Type:** A list box with 'Aquic', 'High clay activity mineral', and 'Low clay activity mineral'. Below it are two buttons: 'Select from WRB soil classifications' and 'Select from USDA soil classifications'.
- FROM System:** A section for the initial state, including 'Land Use Type' (Grassland, Long term cultivated, Native ecosystem/nominal mgmt, Set aside (<20 yrs), Wetland (paddy) rice), 'Mgmt System' (Does not apply), 'Mgmt Factor' (1), 'Inputs' (Does not apply), 'Input Factor' (1), and 'Land Use Factor' (1). The 'Predicted Carbon Stock' is 63.0 MgC/ha.
- TO System:** A section for the final state, including 'Land Use Type' (Grassland, Long term cultivated, Native ecosystem/nominal mgmt, Set aside (<20 yrs), Wetland (paddy) rice), 'Mgmt System' (Full Tillage, Reduced Tillage, No Tillage), 'Mgmt Factor' (1), 'Inputs' (Low, Medium, High-without manure, High-with manure), 'Input Factor' (1), and 'Land Use Factor' (0.71). The 'Predicted Carbon Stock' is 40.7 MgC/ha.
- Existing Carbon Stock:** 63 MgC/ha.
- Annual Carbon Stock Change:** -1.12 MgC/ha/yr.
- Buttons:** 'Help' and 'Exit'.
- Default Settings:** 'Management Factors', 'C\_Stocks', 'Systems', and 'Input Factors'.

17

## 5 Cross-Cutting Issues

- **Uncertainty Assessment**
- **Collecting and analysing data by sampling**
- **Reconstruction of missing data**
- **Identification of Key Categories (to cover sink)**
- **Quality Assurance and Quality Control**
- **Time Series Consistency and Recalculations**
- **Verification approaches (e.g. comparison of inventories, modelling approaches, and direct measurements)**

18

## Steps in LULUCF inventory preparation

1. Use the 3 approaches (Chapter 2) to estimate land areas for each land-use category relevant to your country
2. Follow the good practice guidance (Chapter 3) to estimate the emissions and removals of GHGs for each land use, land-use change and pool relevant to your country. If necessary collect additional data to improve data quality. Perform key category analysis (Chapter 5).
3. Estimate uncertainties, report emissions/removals, and implement Quality assurance/quality control procedures (Chapter 5).
4. If required: prepare supplementary information for Kyoto Protocol reporting (follow Chapter 4))

## Conclusions

- GPG produces more reliable estimates of the magnitude of uncertainties in GHG inventories
- GPG provides improved understanding of how uncertainties may be managed to produce emissions estimates that are acceptable to UNFCCC (i.e. **transparency, consistency, comparability, completeness and accuracy** in inventories)



## Conclusions

### Draft COP/MOP decision contained in Decision -/CP.10 (FCCC/CP/2004/L.26/Add.1)

- ✓ The Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, ...  
Decides that for the first commitment period Parties included in Annex I to the Convention that have ratified the Kyoto Protocol shall apply the [good practice guidance for land use, land-use change and forestry, as developed by the Intergovernmental Panel on Climate Change](#), in a manner consistent with the Kyoto Protocol and draft decision -/CMP.1 (Land use, land-use change and forestry) and the annex to this draft decision,<sup>1</sup> for the purpose of providing information on anthropogenic greenhouse gas emissions by sources and removals by sinks from land use, land-use change and forestry activities under Article 3, paragraph 3, and, if any, elected activities under Article 3, paragraph 4, in accordance with Article 5, paragraph 2 of the Kyoto Protocol;
  - **(footnote1)** Noting that reporting methods contained in [Chapter 4 of the Intergovernmental Panel on Climate Change Good Practice Guidance for Land Use, Land-use Change and Forestry](#), should ensure that areas of land subject to land use, land-use change and forestry activities under Article 3, paragraphs 3 and 4, are identifiable

21



## Conclusions

- **Default EF/parameters in GPG-LULUCF are soon to be accessible from the EFDB**  
<http://www.ipcc-nggip.iges.or.jp/EFDB/main.php>
- **The IPCC is in the process of preparing the 2006 Guidelines that will be based on:**
  - ✓ 1996 GL, GPG2000, GPG-LULUCF
  - ✓ Emission Factor Database (EFDB)
  - ✓ Advances in science and technology
  - ✓ The experience in the use of GLs/GPGs as well as experience from UNFCCC inventory reviews

22



# http://www.ipcc-nggip.iges.or.jp

**INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE**  
National Greenhouse Gas Inventories Programme

WMO UNEP

IPCC web sites

- Organization
- Technical Support Unit
- Publications
- Meetings
- Electronic Discussion Group (EDG)
- Links

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) in 1988. Its main objective was to assess scientific, technical and socio-economic information relevant to the understanding of human induced climate change, potential impacts of climate change and options for mitigation and adaptation. The IPCC has completed two assessment reports, developed methodology guidelines for national greenhouse gas inventories, special reports and technical papers. For more information on the IPCC, its activities and publications, please see the [IPCC homepage](#).

The IPCC has three working groups and a task force.

- [Working Group I \(WG I\)](#) : The science of climate change
- [Working Group II \(WG II\)](#) : Impacts, adaptation and vulnerability
- [Working Group III \(WG III\)](#) : Mitigation of climate change
- [Task Force on National Greenhouse Gas Inventories \(TFI\)](#)