TU-CDES & MOPE-GON COOPERATION

National Greenhouse Gases Inventory

for Third National Communication to the UNFCCC

A Brief Introduction

2016-2017 Nepal

UNFCCC and National Communication

- The United Nations Framework Convention on Climate Change (UNFCCC), Rio Summit 1992

- Annex and Non-annex countries

- National Communication
  - ✓ GHG Inventory (Emission and Source by Source)
  - ✓ Vulnerability Assessment
  - ✓ Mitigation Measures

Methods of GHGs inventory (IPCC Process)

- *2006 IPCC Guidelines* - provide methodologies for estimating national inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases;
- Provide guidance on ensuring quality on all steps of the inventory compilation – from data collection to reporting;

- **Transparency, Completeness, Consistency, Comparability, Accuracy**

$$Emission = \sum_{i=1}^{n} (EF * Ac)_i$$

Where, *EF* = emission factor,

Ac = activity,

i = various type of activities (*1, 2, 3…n*).

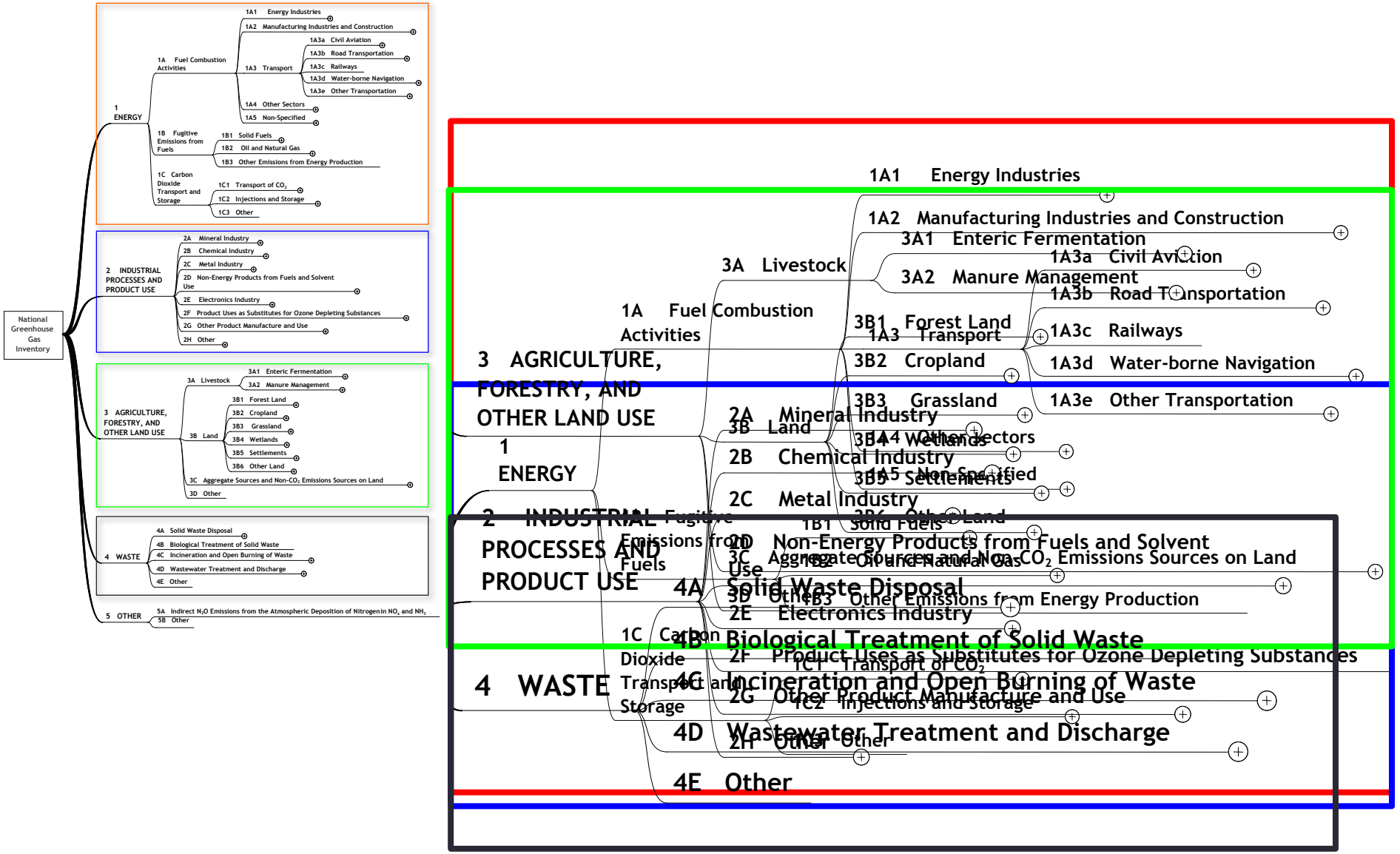
- 2006 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC, 2006);
- IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (IPCC, 2000);
- IPCC Good Practice Guidance for Land Use, Land-Use Change, and Forestry (IPCC, 2003);

- Categories, sub-categories, activities
- Emission factors
- Tiers I, II, and III

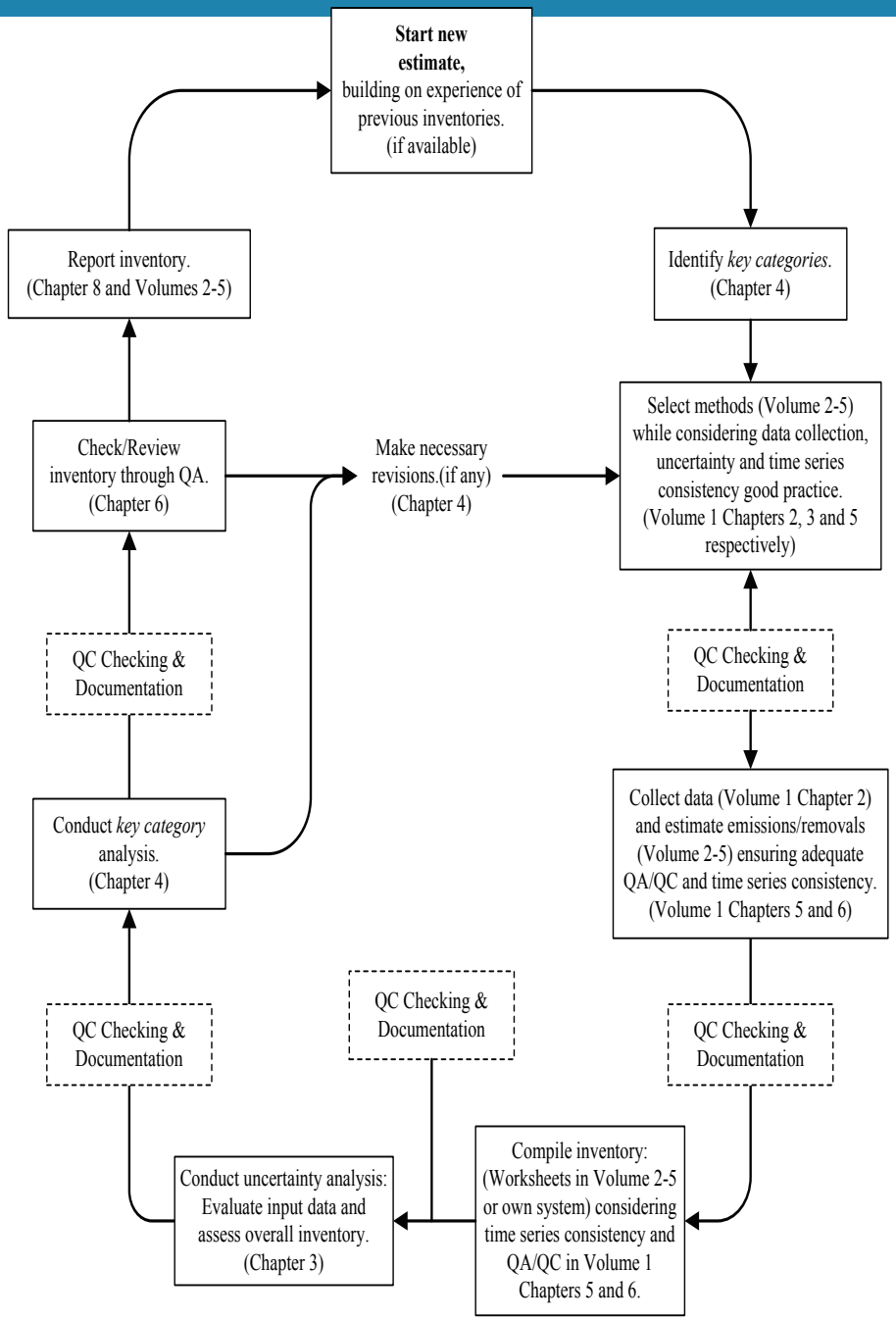
Thematic Areas, Categories, Sub-categories, and Activities

2006 IPCC Guideline,

- Energy
- Industrial Processes and Product Use
- Agriculture, Forestry, and Other Land Use
- Waste


National Greenhouse Gas Inventory
1 ENERGY
1A Fuel Combustion Activities
1A1 Energy Industries
1A2 Manufacturing Industries and Construction
1A3 Transport
1A3a Civil Aviation
1A3b Road Transportation
1A3c Railways
1A3d Water-borne Navigation
1A3e Other Transportation
1A4 Other Sectors
1A5 Non-Specified
1B Fugitive Emissions from Fuels
1B1 Solid Fuels
1B2 Oil and Natural Gas
1B3 Other Emissions from Energy Production
1C Carbon Dioxide Transport and Storage
1C1 Transport of CO2
1C2 Injections and Storage
1C3 Other
2 INDUSTRIAL PROCESSES AND PRODUCT USE
2A Mineral Industry
2B Chemical Industry
2C Metal Industry
2D Non-Energy Products from Fuels and Solvent Use
2E Electronics Industry
2F Product Uses as Substitutes for Ozone Depleting Substances
2G Other Product Manufacture and Use
2H Other
3 AGRICULTURE, FORESTRY, AND OTHER LAND USE
3A Livestock
3A1 Enteric Fermentation
3A2 Manure Management
3B Land
3B1 Forest Land
3B2 Cropland
3B3 Grassland
3B4 Wetlands
3B5 Settlements
3B6 Other Land
3C Aggregate Sources and Non-CO2 Emissions Sources on Land
3D Other
4 WASTE
4A Solid Waste Disposal
4B Biological Treatment of Solid Waste
4C Incineration and Open Burning of Waste
4D Wastewater Treatment and Discharge
4E Other
5 OTHER
5A Indirect N2O Emissions from the Atmospheric Deposition of Nitrogen in NOx and NH3
5B Other

Inventory development cycle



IPCC, 2006

Nepal's National Communication to the UNFCCC

- Nepal- Adopted and become Party to UNFCCC, Rio Earth Summit in June 1992.

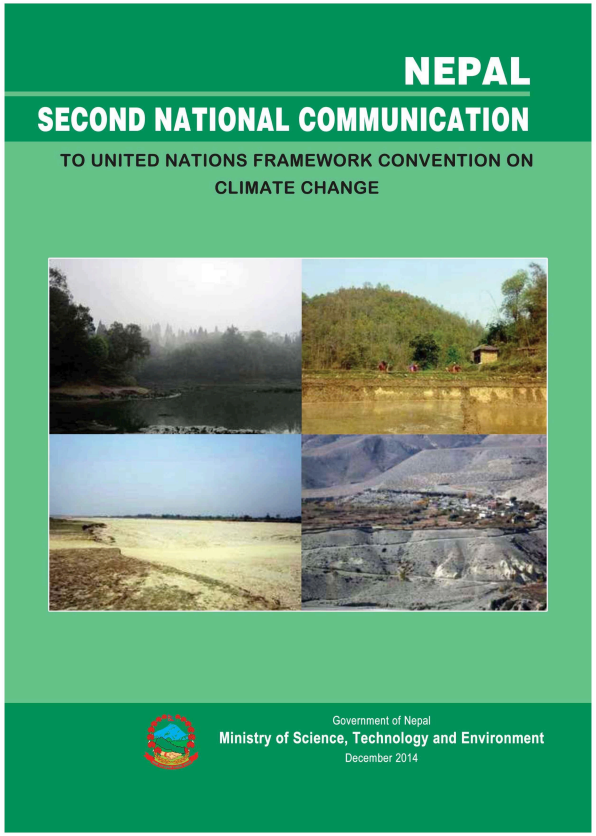
- Under the UNFCCC, National Commitment,

  - Initial National Communication → July 2004
  - Second National Communication → December 2014

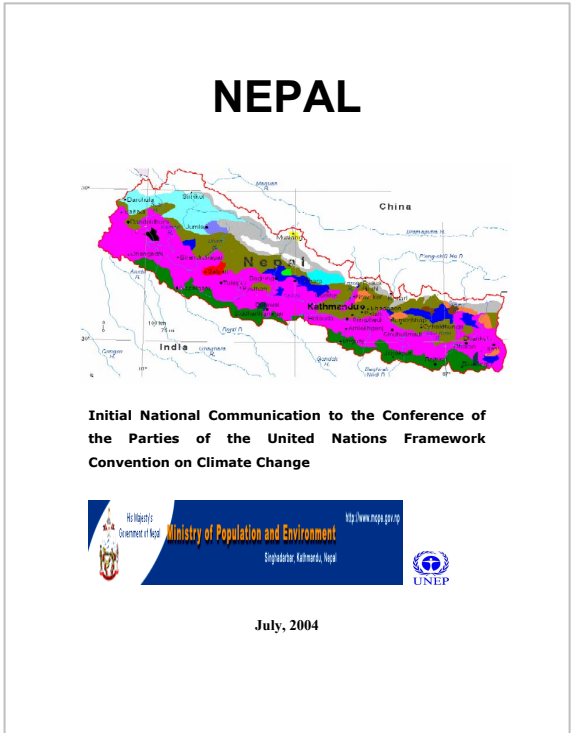
National GHG Inventory Report,

- ✓ 1990-91: in 1997
- ✓ 1994-95: INC
- ✓ 2000-01: SNC

Second, December 2011



Initial, July 2004



- CO_2, N_2O, CH_4, NO_x, CO, NMVC, SO_2 as well as for HFCs, PFCs and SF_6;
- Nepal's GHG emission contribution
- INC: 0.025%
- SNC: 0.027%

Central Department of Environmental Science, Tribhuvan University – TNC – National GHG inventory report

Ministry of Population and Environment, GoN

Third National Communication Project

UNEP, GEF

	Initial National Communication	**Second National Communication**
Submission	Jul 2004	Dec 2014
Base year	1994/95	2000/01
Sectors	• Energy • Industrial processes • Forestry and land-use • Agriculture • Waste	• Energy • Industrial processes • Agriculture • Land use, Land use change and forestry • Waste • Memo items: International bunkers Biomass
Reference Guidelines	Revised IPCC Guidelines for National GHG Inventories 1996	IPCC Guidelines for National GHG Inventories 1996
GHGs Used	CH_4, CO_2, NO_2	Direct gases: CH_4, CO_2, NO_2 Indirect gases: NO_x, CO, NMVOC, and SO_2
Future projection	2000, 2010, 2020	2015, 2025, 2030

GHG Inventory for TNC

To prepare a detailed and representative report on the national GHGs inventory for TNC of Nepal, following 2006 IPCC guidelines

(i) Compile GHG emissions 2011-2014 for the estimation of CO_2, N_2O, CH_4, NO_x, CO, NMVC, SO_2 as well as for HFCs, PFCs and SF_6; using 2011 as the base year;

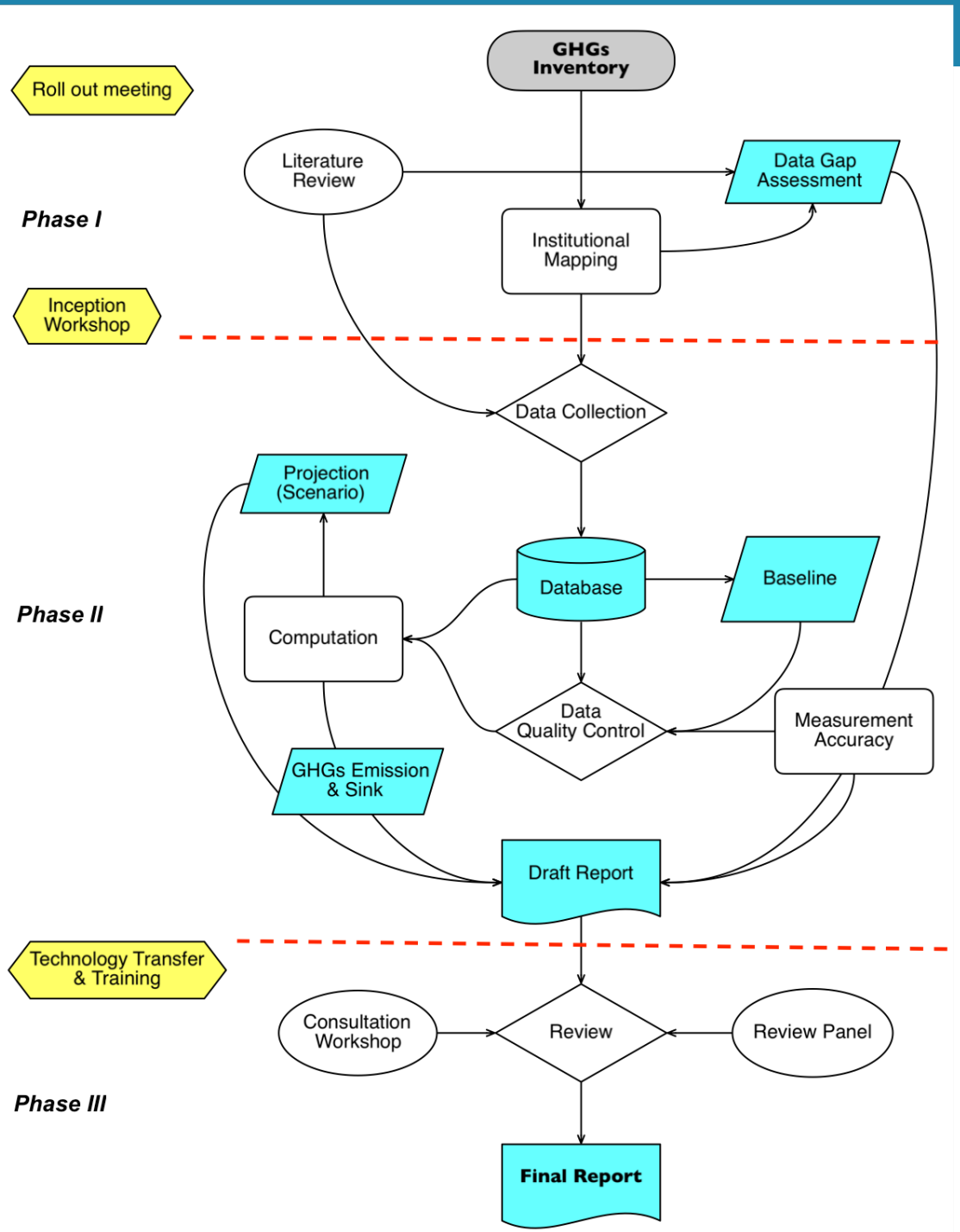
(ii) Conduct quality control and quality assurance of inventory data based on IPCC Good Practice Guidance and Uncertainty Management in National GHG Inventory, including key category analysis;

(iii) Analyze data using sectoral and reference approaches based on 2006 IPCC Guidelines on national inventories;

(iv) Establish and maintain a database for CO_2, N_2O, CH_4 and other greenhouse gases as appropriate; and

(v) Project GHG emission trends up to 2030.

- Data collection
- Data base prepara
- Computation
- Final Draft



Methodological framework

Linkage with revised curriculum

- **Tiers ?** - Next Communication (fourth)
- Data gaps?
- Data quality?

Data, Gaps, and Opportunity

- Categories, sub-categories, activities
- Emission factors
- Tiers I, II, and III