TABLE 3 SECTORAL REPORT FOR AGRICULTURE
(Sheet 1 of 2)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	CH_4	N_2O	NO_x	CO	NMVOC
	(kt)					
3. Total agriculture						
I. Livestock						
A. Enteric fermentation						
1. Cattle[(1)]						
Option A:						
Dairy cattle						
Non-dairy cattle						
Option B:						
Mature dairy cattle						
Other mature cattle						
Growing cattle						
Option C (country-specific):						
Drop down list						
Other *(as specified in table 3(I).A)*						
2. Sheep						
3. Swine						
Drop down list						
4. Other livestock						
Buffalo						
Camels						
Deer						
Goats						
Horses						
Mules and asses						
Poultry						
Rabbit						
Reindeer						
Other *(as specified in table 3(I).A)*						
B. Manure management						
1. Cattle[(1)]						
Option A:						
Dairy cattle						
Non-dairy cattle						
Option B:						
Mature dairy cattle						
Other mature cattle						
Growing cattle						
Option C (country-specific):						
Drop down list						
Other *(as specified in table 3(I).B)*						
2. Sheep						
3. Swine						
Drop down list						
4. Other livestock						
Buffalo						
Camels						
Deer						
Fox and raccoon						
Fur-bearing animals						
Goats						
Horses						
Mink and polecat						
Mules and asses						
Poultry						
Rabbit						
Reindeer						
Ostrich						
Other (as specified in table 3(I).B)						
5. Indirect N_2O emissions						

Note: All footnotes for this table are given at the end of the table on sheet 2.

TABLE 3 SECTORAL REPORT FOR AGRICULTURE
(Sheet 2 of 2)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2	CH_4	N_2O	NO_x	CO	NMVOC
	(kt)					
C. Rice cultivation						
D. Agricultural soils[2] [3] [4]						
E. Prescribed burning of savannas						
F. Field burning of agricultural residues						
G. Liming						
H. Urea application						
I. Other *(please specify)*						

[1] The sum for cattle would be calculated on the basis of entries made under either option A (dairy and non-dairy cattle), option B (mature dairy cattle, other mature-cattle and growing-cattle) or option C (other disaggreagtion of cattle categories).

[2] Categories reported under "Agricultural soils" are those reported under table 3.D.

[3] Direct nitrous oxide (N_2O) emissions generated by manure in the system "Pasture, range and paddock" are to be reported under the category "Direct N_2O emissions from managed soils". See also section 10.5 of Volume 4 of the 2006 IPCC Guidelines.

[4] Indirect N_2O emissions generated by manure in the system "Pasture, range and paddock" are to be reported under the category "Indirect N_2O emissions from managed soils". See also section 10.5 of Volume 4 of the 2006 IPCC Guidelines.

Note: The 2006 IPCC Guidelines do not provide methodologies for the calculation of methane (CH_4) emissions and CH_4 and N_2O removals from agricultural soils, or carbon dioxide (CO_2) emissions from prescribed burning of savannas and field burning of agricultural residues. Parties that have estimated such emissions should provide, in the national inventory report (NIR), additional information (activity data and emission factors) used to derive these estimates and include a reference to the section of the NIR in the documentation box of the corresponding Sectoral background data tables.

Documentation box:

• Parties should provide detailed explanations on the agriculture sector in chapter 6: Agriculture (CRF sector 3) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• If estimates are reported under category 3(II).H.Other, use this documentation box to provide information regarding activities covered under this category and to provide reference to the section in the NIR where background information can be found.

TABLE 3.A SECTORAL BACKGROUND DATA FOR AGRICULTURE
Enteric Fermentation
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION			IMPLIED EMISSION FACTORS[3]	EMISSIONS
	Population size[1] (1000s)	Average gross energy intake (GE) (MJ/head/day)	Average CH_4 conversion rate (Y_m)[2] (%)	CH_4 (kg CH_4/head/yr)	CH_4 (kt)
1. Cattle					
Option A:					
Dairy cattle[3]					
Non-dairy cattle					
Option B:					
Mature dairy cattle					
Other mature cattle					
Growing cattle					
Option C (country-specific[4]):					
Drop down list					
Other *(please specify)*					
2. Sheep					
3. Swine					
Drop down list					
4. Other livestock					
Buffalo					
Camels					
Deer					
Goats					
Horses					
Mules and asses					
Poultry					
Rabbit					
Reindeer					
Other					

Additional information (only for those livestock types for which tier 2 was used)[a]

Disaggregated list of animals[b]		Dairy Cattle	Non-Dairy Cattle	Other (specify)	
Indicators:					
Weight	(kg)				
Feeding situation[c]					
Milk yield	(kg/day)				
Work	(h/day)				
Pregnant	(%)				
Digestibility of feed	(%)				
Gross energy	MJ/day				

[1] Parties are encouraged to provide detailed livestock population data by animal type and region, if available, in the national inventory report (NIR), and provide in the documentation box below a reference to the relevant section. Parties should use the same animal population statistics to estimate methane (CH_4) emissions from enteric fermentation, CH_4 and nitrous oxide (N_2O) from manure management, N_2O direct emissions from soil and N_2O emissions associated with manure production, as well as emissions from the use of manure as fuel, and sewage-related emissions reported in the waste sector.

[2] Y_m refers to the fraction of gross energy in feed converted to CH_4 and should be given in per cent in this table.

[3] Including data on dairy heifers, if available.

[4] Option C should be used when Parties want to report a more disaggregate livestock categorization compared with option A and option B.

[a] See also tables 10A.1, 10A.2 and 10A.3 of volume 4 of the 2006 IPCC Guidelines. These data a Parties do not have data on average feed intake.

[b] Disaggregate to the split actually used. Add columns to the table if necessary.

[c] For cattle, buffalo and sheep specify feeding situation in accordance with table 10.5 of volume 4 of the 2006 IPCC Guidelines.

Documentation box:

• Parties should provide detailed explanations on the agriculture sector, including information from the additional information box, in chapter 6: Agriculture (CRF sector 3) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• Provide a reference to the relevant section in the NIR, in particular with regard to:

(a) Disaggregation of livestock population (e.g. according to the classification recommended in the 2006 IPCC guidelines;

(b) Parameters relevant to the application of the 2006 IPCC Guidelines.

TABLE 3.B(a) SECTORAL BACKGROUND DATA FOR AGRICULTURE
CH_4 Emissions from Manure Management
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION							IMPLIED EMISSION FACTORS	EMISSIONS
	Population size	Allocation by climate region[1]			Typical animal mass (average)	VS[2] daily excretion (average)	CH_4 producing potential (Bo)[2] (average)	CH_4	CH_4
		Cool	Temperate	Warm					
	(1000s)	(%)			(kg)	(kg dm/head/day)	(m^3 CH_4/kg VS)	(kg CH_4/head/yr)	(kt)
1. Cattle									
Option A:									
Dairy cattle[3]									
Non-dairy cattle									
Option B:									
Mature dairy cattle									
Other mature cattle									
Growing cattle									
Option C (country-specific) [4] :									
Drop down list									
Other *(please specify)*									
2. Sheep									
3. Swine									
Drop down list									
4. Other livestock									
Buffalo									
Camels									
Deer									
Fur-bearing animals									
Goats									
Horses									
Mules and Asses									
Poultry									
Rabbit									
Reindeer									
Ostrich									
Other									

[1] Climate regions are defined in terms of annual average temperature as follows: cool = less than 15 °C; temperate = 15–25 °C inclusive; and warm = greater than 25 °C (see table 10.17 of chapter 10, volume 4 of the 2006 IPCC Guidelines).

[2] VS = volatile solids; Bo = maximum methane producing capacity for manure (pp. 10.42 and 10.43 of chapter 10, volume 4 of the 2006 IPCC Guidelines); dm = dry matter. Provide average values for VS and Bo where original calculations were made at a more disaggregated level of these livestock categories.

[3] Including data on dairy heifers, if available.

[4] Option C should be used when Parties want to report a more disaggregated livestock categorization compared with option A and option B.

Documentation box:

• Parties should provide detailed explanations on the agriculture sector in chapter 6: Agriculture (CRF sector 3) of the national invenotry report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and further details are needed to understand the content of this table.

• Provide a reference to the relevant section in the NIR, in particular with regard to:

(a) Disaggregation of livestock population (e.g. according to the classification recommended in the 2006 IPCC Guidelines;

(b) Parameters relevant to the application of the 2006 IPCC Guidelines;

(c) Information on how the MCFs are derived, if relevant data could not be provided in the additional information box.

Additional information (for Tier 2)[a]

Animal category		Indicator	Climate region	Animal waste management system [b]						
				Anaerobic lagoon	Liquid system	Daily spread	Solid storage	Dry lot	Pasture range paddock	Other
Option A	Dairy cattle	Allocation (%)	Cool							
			Temperate							
			Warm							
		MCF[c]	Cool							
			Temperate							
			Warm							
	Non-dairy cattle	Allocation (%)	Cool							
			Temperate							
			Warm							
		MCF[c]	Cool							
			Temperate							
			Warm							
Option B	Mature dairy cattle	Allocation (%)	Cool							
			Temperate							
			Warm							
		MCF[c]	Cool							
			Temperate							
			Warm							
	Other mature cattle	Allocation (%)	Cool							
			Temperate							
			Warm							
		MCF[c]	Cool							
			Temperate							
			Warm							
	Growing cattle	Allocation (%)	Cool							
			Temperate							
			Warm							
		MCF[c]	Cool							
			Temperate							
			Warm							
Option C	Other *(please specify)*	Allocation (%)	Cool							
			Temperate							
			Warm							
		MCF[c]	Cool							
			Temperate							
			Warm							
Swine		Allocation (%)	Cool							
			Temperate							
			Warm							
		MCF[c]	Cool							
			Temperate							
			Warm							
Other livestock *(please specify)*		Allocation (%)	Cool							
			Temperate							
			Warm							
		MCF[c]	Cool							
			Temperate							
			Warm							

[a] The information required in this table may not be directly applicable to country-specific methods developed for MCF calculations. In such cases, information on MCF derivation should be described in the NIR and references to the relevant sections of the NIR should be provided in the documentation box.

[b] Animal waste management systems not included in the columns of this table should be reported under "Other".

[c] MCF = Methane Conversion Factor (p. 10.43 of chapter 10, volume 4 of the 2006 IPCC Guidelines).

TABLE 3.B(b) SECTORAL BACKGROUND DATA FOR AGRICULTURE
N_2O Emissions from Manure Management
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION																IMPLIED EMISSION FACTORS (IEF)			EMISSIONS		
	Population size	Nitrogen excretion rate	Typical animal mass	Nitrogen excretion per animal waste management system (AWMS) (kg N/yr)										Total N excreted	Total N volatilised as NH_3 and NO_X [3]	N lost through leaching and run-off	Emission factor per animals			N_2O		
				Anaerobic lagoon	Liquid system	Daily spread	Solid storage and dry lot	Pasture range and paddock [1]	Composting	Digesters	Burned for fuel or as waste [2]	Other	(Pit storage, deep bedding, poultry manure with and without liter, aerobic treatment)				Direct	Indirect		Direct	Indirect	
																		Atmospheric deposition	Nitrogen leaching and run-off		Atmospheric deposition	Nitrogen Leaching and Run-off
	(1000s)	(kg N/ head/yr)	(kg/ animal)											(kg N/yr)	(kg N/yr)	(kg N/yr)	(kg N_2O/ head/yr)	(kg N_2O-N/kg N)		(kt)		
1. Cattle																						
Option A:																						
Dairy cattle[3]																						
Non-dairy cattle																						
Option B:																						
Mature dairy cattle																						
Other mature cattle																						
Growing cattle																						
Option C (country-specific) [4] :																						
Drop down list																						
Other *(please specify)*																						
2. Sheep																						
3. Swine																						
Drop down list																						
4. Other livestock																						
Buffalo																						
Camels																						
Deer																						
Fox and raccoon																						
Fur-bearing animals																						
Goats																						
Horses																						
Mink and polecat																						
Mules and asses																						
Poultry																						
Rabbit																						
Reindeer																						
Ostrich																						
Other																						
5. Indirect N_2O emission																						
Total N handled per AWMS (kg N/year)																						
IEF direct N_2O (kg N_2O-N/kg N handled)																						
Direct N_2O emissions per AWMS (Gg[kt] N_2O)																						

[1] Direct and indirect nitrous oxide (N_2O) emissions associated with the manure deposited on agricultural soils and pasture, range and paddock systems are included under N_2O emissions from managed soils (see table 3(III).D-E).
[2] The emissions associated with the burning of dung are to be reported under fuel combustion, if used as fuel and under waste incineration, if burned without energy recovery.
[3] Total nitrogen (N) volatilized does not include N volatilized from manure deposited in pasture, range and paddock systems.
[4] Option C should be used when Parties want to report a more disaggregated livestock categorization compared with option A and option B.

Documentation box:
• Parties should provide detailed explanations on the agriculture sector in chapter 6: Agriculture (CRF sector 3) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further
• Provide a reference to the relevant section in the NIR, in particular with regard to:
(a) Disaggregation of livestock population (e.g. according to the classification recommended in the 2006 IPCC Guidelines;
(b) Information on other AWMS, if reported.

TABLE 3.C SECTORAL BACKGROUND DATA FOR AGRICULTURE
Rice Cultivation
(Sheet 1 of 1)

Year

Submission

Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA AND OTHER RELATED INFORMATION			IMPLIED EMISSION FACTOR [1]	EMISSIONS
		Harvested area[2]	Organic amendments added[3]		CH_4	CH_4
		(10^9 m^2/yr)	type	(t/ha)	(g/m^2)	(kt)
1. Irrigated						
Continuously flooded						
Intermittently flooded	Single aeration					
	Multiple aeration					
2. Rainfed						
Flood prone						
Drought prone						
3. Deep water						
Water depth 50–100 cm						
Water depth > 100 cm						
4. Other *(please specify)*						
Upland rice[4]						
Total[4]						

[1] The implied emission factor implicitly takes account of all relevant corrections for continuously flooded fields without organic amendment, the correction for the organic amendments and the effect of different soil characteristics, if considered in the calculation of methane (CH_4) emissions.

[2] Harvested area is the cultivated area multiplied by the number of cropping seasons per year.

[3] Specify dry weight or wet weight for organic amendments in the documentation box.

[4] These rows are included to allow comparison with international statistics. CH_4 emissions from upland rice are assumed to be zero.

Documentation box:

• Parties should provide detailed explanations on the agriculture sector in chapter 6: Agriculture (CRF sector 3) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

• When disaggregating by more than one region within a country, and/or by growing season, provide additional information on disaggregation and related data in the NIR and provide a reference to the relevant section in the NIR.

• Where available, provide activity data and scaling factors by soil type and rice cultivar in the NIR.

TABLE 3.D SECTORAL BACKGROUND DATA FOR AGRICULTURE
Direct and indirect N_2O emissions from agricultural soils
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION		IMPLIED EMISSION FACTORS	EMISSIONS
	Description	Value		N_2O
		kg N/yr	kg N_2O-N/kg N[1, 3]	(kt)
a. Direct N_2O emissions from managed soils				
1. Inorganic N fertilizers[2]	N input from application of inorganic fertilizers to cropland and grassland			
2. Organic N fertilizers[2]	N input from organic N fertilizers to cropland and grassland			
a. Animal manure applied to soils	N input from manure applied to soils			
b. Sewage sludge applied to soils	N input from sewage sludge applied to soils			
c. Other organic fertilizers applied to soils	N input from application of other organic fertilizers			
3. Urine and dung deposited by grazing animals	N excretion on pasture, range and paddock			
4. Crop residues	N in crop residues returned to soils			
5. Cultivation of organic soils (i.e. histosols)[3]	Area of cultivated organic soils (ha/yr)			
6. Other				
b. Indirect N_2O Emissions from managed soils				
1. Atmospheric deposition[4]	Volatilized N from agricultural inputs of NH_3-N			
2. Nitrogen leaching and run-off	N from fertilizers and other agricultural inputs that is lost through leaching and run-off			

Additional information

Fraction [a]	Description	Value
$Frac_{GASF}$	Fraction of synthetic fertilizer N applied to soils that	
$Frac_{GASM}$	Fraction of livestock N excretion that volatilises as NH_3 and NO_X	
$Frac_{LEACH-(H)}$	Fraction of N input to managed soils that is lost through leaching and run-off	
Other fractions *(please specify)*		

[a] Use the definitions for fractions as specified in the 2006 IPCC Guidelines (pp. 11.13-11.22 of chapter 11 of volume 4)

[1] To convert from N_2O-N to N_2O emissions, multiply by 44/28.
[2] Include the application of fertilizers on cropland and grassland. If the application of fertilizers to other land categories cannot be separately identified, this application should be included here.
[3] For cultivation of histosols the unit of the IEF is kg N_2O-N/ha. The emissions from cultivation/management of croplands and grasslands are to be included. For a definition of organic soils, see footnote 4, page 11.6 of chapter 11 of volume 4 of the 2006 IPCC Guidelines.
[4] Only atmospheric deposition of nitrogen (N) volatilised from agricultural inputs of N are to be reported here, including NO_X associated with the burning of savannas and crop residues.

Documentation box:
• Parties should provide detailed explanations on the agriculture sector in chapter 6: Agriculture (CRF sector 3) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.
• Provide a reference to the relevant section in the NIR, in particular with regard to:
(a) Background information on methane (CH_4) emissions from agricultural soils, if accounted for under the agriculture sector;
(b) Full list of assumptions and fractions used.

TABLE 3.E SECTORAL BACKGROUND DATA FOR AGRICULTURE

Prescribed burning of savannas

(Sheet 1 of 1)

Year

Submission

Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION					IMPLIED EMISSION FACTORS		EMISSIONS	
	Area of savanna burned (k ha/yr)	Average above-ground biomass density (t dm/ha)	Fraction of savanna burned	Biomass burned (kt dm)	Nitrogen fraction in biomass	CH_4 (kg/t dm)	N_2O (kg/t dm)	CH_4 (kt)	N_2O (kt)
Forest land (specify ecological zone) [(1)]									
Grassland *(specify ecological zone)* [(1)]									

[(1)] If possible, fires on forest land and grassland defined as savanna should be separately identified and reported here. If it is not possible to separate those fires from other forest and grassland fires reported under category 4(II).A Biomass Burning, this should be clearly documented in the documentation box and in the national inventory report (NIR).

Additional information

	Living Biomass	Dead Biomass
Fraction of above-ground biomass		
Fraction oxidized		
Carbon fraction		

Documentation box:

Parties should provide detailed explanations on the agriculture sector in chapter 6: Agriculture (CRF sector 3) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 3.F SECTORAL BACKGROUND DATA FOR AGRICULTURE
Field burning of agricultural residues[1]
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED				IMPLIED EMISSION		EMISSIONS	
	Area burned (k ha/yr)	Fuel available[1] (t dm/ha)	Combustion factor	Total biomass burned[2] (kt dm)	CH_4	N_2O	CH_4	N_2O
					(kg/t dm)		(kt)	
1. Cereals								
Wheat								
Barley								
Maize								
Other (please specify)								
2. Pulses								
Other (please specify)								
3. Tubers and roots								
Other (please specify)								
4. Sugar cane								
5. Other *(please specify)*								

Additional information

	Wheat	Barley	Maize	Other (specify)
Crop production (t)				
Residue/ Crop ratio				
Dry matter (dm)				
Fraction burned in				
Fraction oxidized				

Note: Parties are encouraged to supply the additional information regardless of the methodology applied.

[1] Mass of fuel available for combustion.

[2] If Parties use a different methodology than the IPCC default, e.g. based on crop production, the estimate for total biomass burned can be reported without data on area, fuel available and combustion factor. In this case the additional information table should be used to report the parameters used to derive the total biomass burned.

Documentation box:
Parties should provide detailed explanations on the agriculture sector in chapter 6: Agriculture (CRF sector 3) of the national invnetory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 3.G-H SECTORAL BACKGROUND DATA FOR AGRICULTURE
CO_2 emissions from liming and urea application
(Sheet 1 of 1)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA Amount applied (t/yr)	IMPLIED EMISSION FACTORS CO_2-C per unit (t CO_2–C /t)	EMISSIONS CO_2 (kt)
G. Liming[1]			
Limestone $CaCO_3$			
Dolomite $CaMg(CO_3)_2$			
H. Urea application			

Documentation box:
Parties should provide detailed explanations on the agriculture sector in chapter 6: Agriculture (CRF sector 3) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

[1] Emissions should include all national liming regardless of land use. A Party should report total estimates for total lime application.

TABLE 4 SECTORAL REPORT FOR LAND USE, LAND-USE CHANGE AND FORESTRY
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Net CO_2 emissions/removals[1], [2]	CH_4[2]	N_2O[2]	NO_x	CO	NMVOC
	(kt)					
4. Total LULUCF						
A. Forest land						
1. Forest land remaining forest land						
2. Land converted to forest land						
B. Cropland						
1. Cropland remaining cropland						
2. Land converted to cropland						
C. Grassland						
1. Grassland remaining grassland						
2. Land converted to grassland						
D. Wetlands[3]						
1. Wetlands remaining wetlands						
2. Land converted to wetlands						
E. Settlements						
1. Settlements remaining settlements						
2. Land converted to settlements						
F. Other land						
1. Other land remaining other land						
2. Land converted to other land						
G. Harvested wood products						
H. Other *(please specify)*						

[1] For the purposes of reporting, the signs for removals are always negative (–) and for emissions positive (+).

[2] For each land-use category and subcategory, this table sums the net carbon dioxide (CO_2) emissions and removals shown in tables 4.A to 4.F, and the CO_2, methane (CH_4) and nitrous oxide (N_2O) emissions shown in tables 4(I) – 4(V) and 4.G.

[3] Parties may decide not to prepare estimates for CO_2 emissions from land converted to permanently flooded land and CH_4 emissions from flooded land contained in appendices 2 and 3 of volume 4 of the 2006 IPCC Guidelines, although they may do so if they wish.

Documentation box:
• Parties should provide detailed explanations on the land use, land-use change and forestry sector in chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 4) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.
• If estimates are reported under the category 4.H. Other, use this documentation box to provide information regarding activities covered under this category and to provide a reference to the section in the NIR where background information can be found.

Table 4.1 LAND TRANSITION MATRIX

Areas and changes in areas between the previous and the current inventory year[1]

Year

Submission

Country

TO: / FROM:	Forest land (managed)	Forest land (unmanaged)	Cropland (managed)	Grassland (managed)	Grassland (unmanaged)	Wetlands (managed)	Wetlands (unmanaged)	Settlements	Other land	**Initial area**
FROM:	**(kha)**									
Forest land (managed)[2]										
Forest land (unmanaged)[3]										
Cropland (managed)[4]										
Grassland (managed)[5]										
Grassland (unmanaged)[3]										
Wetlands (managed)[6]										
Wetlands (unmanaged)[3]										
Settlements[7]										
Other land[8]										
Final area										
Net change[9]										

[1] For Parties using reporting approach 1 to represent land areas, only data on the initial and final area per land use should be filled in. Notation key "NA" (not applicable) should be used in such cases for the specific land use transitions, allowing for the formulas in the cells for final and initial areas to be overwritten.

[2] Forest land includes all land with woody vegetation consistent with thresholds used to define forest land in the national GHG inventory. It also includes systems with a vegetation structure that currently falls below (but in situ could potentially reach) the threshold values used by a country to define the forest land category.

[3] Parties may decide not to differentiate areas and changes in areas classified as unmanaged.

[4] Cropland includes cropped land, including rice fields and agro-forestry systems where the vegetation structure falls below the threshold values used for the forest land category.

[5] Grassland includes rangelands and pasture land that is not considered cropland. It also includes systems with woody vegetation and other non-grass vegetation such as herbs and brushes that fall below the threshold values used in the forest land category. The category also includes all grassland from wild lands to recreational areas as well as agricultural systems, consistent with national definitions.

[6] Wetlands include areas of peat extraction and land that is covered or saturated by water for all or part of the year (e.g. peatlands) and that does not fall into the forest land, cropland, grassland or settlements categories. It includes reservoirs as a managed subdivision and natural rivers and lakes as unmanaged subdivision.

[7] Settlements include all developed land, including transportation infrastructure and human settlements of any size, unless they are already included under other categories.

[8] Other land includes bare soil, rock, ice and all land areas that do not fall into any of the other five categories.

[9] Net change is the final area minus the initial area for each of the conversion categories shown at the head of the corresponding row. In the final area row the net change equals zero.

TABLE 4.A SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY
Forest land
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA		IMPLIED CARBON-STOCK-CHANGE FACTORS							CHANGES IN CARBON STOCK							
Land-use category	Subdivision[1]	Total area[2] (kha)	Area of organic soil[2] (kha)	Carbon stock change in living biomass per area[3] [4]			Net carbon stock change in dead wood per area[4]	Net carbon stock change in litter per area[4]	Net carbon stock change in soils per area[4]		Carbon stock change in living biomass[3] [4]			Net carbon stock change in dead wood[4]	Net carbon stock change in litter[4]	Net carbon stock change in soils[4] [6]		Net CO_2 emissions/ removals[7] [8]
				Gains	Losses	Net change			Mineral soils[5]	Organic soils	Gains	Losses	Net change			Mineral soils	Organic soils	
				(t C/ha)							(kt C)							(kt)
A. Total forest land																		
1. Forest land remaining forest land																		
2. Land converted to forest land[9]																		
2.1 Cropland converted to forest land																		
2.2 Grassland converted to forest land																		
2.3 Wetlands converted to forest land																		
2.4 Settlements converted to forest land																		
2.5 Other land converted to forest land																		

[1] Land categories may be further divided according to climate zone, management system, soil type, vegetation type, tree species, ecological zone or national land classification.

[2] The total area of the subcategories, in accordance with the subdivision used, should be entered here. For lands converted to forest land report the cumulative area remaining in the category in the reporting year.

[3] Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.

[4] The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (–).

[5] Implied carbon-stock-change factors for mineral soils are calculated by dividing the net carbon (C) stock change estimate for mineral soils by the difference between the total area and the area of organic soils.

[6] When Parties cannot estimate carbon stock changes for organic and mineral soil separately, these should be reported under mineral soils.

[7] According to the 2006 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (–) and for emissions are positive (+). Net changes in carbon stocks are converted to carbon dioxide (CO_2) by multiplying C by 44/12 and changing the sign for net CO_2 removals to be negative (–) and for net CO_2 emissions to be positive (+). Note that carbon stock changes in a single pool are not necessarily equal to emissions or removals to/from the atmosphere, because some carbon stock changes result from carbo transfers among pools rather than exchanges with the atmosphere.

[8] Where Parties directly estimate emissions and removals rather than carbon stock changes, they may report emissions/removals directly in this column and use notation keys in the stock change columns.

[9] A Party may report aggregated estimates for all conversions of land to forest land when data are not available to report them separately. A Party should specify in the documentation box which types of land conversion are includ

Documentation box:

Parties should provide detailed explanations on the land use, land-use change and forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 4) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 4.B SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY
Cropland
(Sheet 1 of 1)

Year
Submission
Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA		IMPLIED CARBON-STOCK-CHANGE FACTORS						CHANGES IN CARBON STOCK						
Land-use category	Subdivision[1]	Total area[2] (kha)	Area of organic soil[2] (kha)	Carbon stock change in living biomass per area[3] [4]			Net carbon stock change in dead organic matter per area[4]	Net carbon stock change in soils per area[4]		Carbon stock change in living biomass[3], [4], [6]			Net carbon stock change in dead organic matter[4] [7]	Net carbon stock change in soils[4] [8]		Net CO_2 emissions/ removals[9] [10]
				Gains	Losses	Net change		Mineral soils[5]	Organic soils	Gains	Losses	Net change		Mineral soils	Organic soils	
		(t C/ha)								(kt C)						(kt)
B. Total Cropland																
1. Cropland remaining cropland																
2. Land converted to cropland[11]																
2.1 Forest land converted to cropland																
2.2 Grassland converted to cropland																
2.3 Wetlands converted to cropland																
2.4 Settlements converted to cropland																
2.5 Other land converted to cropland																

[1] Land categories may be further divided according to climate zone, management system, soil type, vegetation type, tree species, ecological zone or national land classification.
[2] The total area of the subcategories, in accordance with the subdivision used, should be entered here. For lands converted to cropland report the cumulative area remaining in the category in the reporting year.
[3] Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.
[4] The signs for estimates of gains in carbon stocks are positive (+) and for losses in carbon stocks are negative (–).
[5] Implied carbon-stock-change factors for mineral soils are calculated by dividing the net carbon (C) stock change estimate for mineral soils by the difference between the total area and the area of organic soils.
[6] For category 5.B.1 Cropland remaining cropland this column only includes changes in perennial woody biomass.
[7] No reporting on dead organic matter pools is required for category 5.B.1. Cropland remaining cropland.
[8] When Parties cannot estimate carbon stock changes for organic and mineral soil separately, these should be reported under mineral soils.
[9] According to the 2006 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (–) and for emissions positive (+). Net changes in carbon stocks are converted to carbon dioxide (CO_2) by multiplying C by 44/12 and changing the sign for net CO_2 removals to be negative (–) and for net CO_2 emissions to be positive (+). Note that carbon stock changes in a single pool are not necessarily equal to emissions or removals to/from the atmosphere, because some carbon stock changes result from carbon transfers among pools rather than exchanges with the atmosphere.
[10] Where Parties directly estimate emissions and removals rather than carbon stock changes, they may report emissions/removals directly in this column and use notation keys in the stock change columns.
[11] A Party may report aggregated estimates for all land conversions to cropland, when data are not available to report them separately. A Party should specify in the documentation box which types of land conversion are included.

Documentation box:

Parties should provide detailed explanations on the land use, land-use change and forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 4) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 4.C SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY Year

Grassland Submission

(Sheet 1 of 1) Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA		IMPLIED CARBON-STOCK-CHANGE FACTORS						CHANGES IN CARBON STOCK						
Land-use category	Subdivision[1]	Total area[2] (kha)	Area of organic soil[2] (kha)	Carbon stock change in living biomass per area[3] [4]			Net carbon stock change in dead organic matter per area[4]	Net carbon stock change in soils per area[4]		Carbon stock change in living biomass[3], [4], [6]			Net carbon stock change in dead organic matter[4] [7]	Net carbon stock change in soils[4] [8]		Net CO_2 emissions/ removals[9] [10]
				Gains	Losses	Net change		Mineral soils[5]	Organic soils	Gains	Losses	Net change		Mineral soils	Organic soils	
				(t C/ha)						(kt C)						(kt)
C. Total grassland																
1. Grassland remaining grassland																
2. Land converted to grassland[11]																
2.1 Forest land converted to grassland																
2.2 Cropland converted to grassland																
2.3 Wetlands converted to grassland																
2.4 Settlements converted to grassland																
2.5 Other Land converted to grassland																

[1] Land categories may be further divided according to climate zone, management system, soil type, vegetation type, tree species, ecological zone or national land classification.

[2] The total area of the subcategories, in accordance with the sub-division used, should be entered here. For lands converted to Grassland report the cumulative area remaining in the category in the reporting year.

[3] Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.

[4] The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (–).

[5] Implied carbon-stock-change factors for mineral soils are calculated by dividing the net carbon (C) stock change estimate for mineral soil by the difference between the area and the area of organic soil.

[6] For category 5.C.1 Grassland remaining grassland this column only includes changes in perennial woody biomass.

[7] No reporting on dead organic matter pools is required for category 5.C.1 Grassland remaining grassland.

[8] When Parties cannot estimate carbon stock changes for organic and mineral soil separately, these should be reported under mineral soils.

[9] According to the 2006 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (–) and for emissions positive (+). Net changes in carbon stocks are converted to carbon dioxide (CO_2) by multiplying C by 44/12 and changing the sign for net CO_2 removals to be negative (–) and for net CO_2 emissions to be positive (+). Note that carbon stock changes in a single pool are not necessarily equal to emissions or removals to/from the atmosphere, because some carbon stock changes result from carbon transfers among pools rather than exchanges with the atmosphere.

[10] Where Parties directly estimate emissions and removals rather than carbon stock changes, they may report emissions/removals directly in this column and use notation keys in the stock change columns.

[11] A Party may report aggregated estimates for all land conversions to grassland, when data are not available to report them separately. A Party should specify in the documentation box which types of land conversion are included.

Documentation box:

Parties should provide detailed explanations on the land use, land-use change and forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 4) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 4.D SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY
Wetlands
(Sheet 1 of 1)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA	IMPLIED CARBON-STOCK-CHANGE FACTORS					IMPLIED EMISSION FACTOR		CHANGES IN CARBON STOCK					Net CO_2 emissions/ removals[5] [6] [7]	EMISSIONS[5]	
Land-use category	Subdivision[1]	Area[2] (kha)	Carbon stock change in living biomass per area[3] [4]			Net carbon stock change in dead organic matter per area[4]	Net carbon stock change in soils per area[4]	CH_4	N_2O	Carbon stock change in living biomass[3] [4]			Net carbon stock change in dead organic matter[4]	Net carbon stock change in soils[4]		CH_4[8]	N_2O[9]
			Gains	Losses	Net change					Gains	Losses	Net change					
			(t C/ha)					kg/ha		(kt C)					(kt)		
D. Total wetlands																	
1. Wetlands remaining wetlands																	
1.1 Peat extraction																	
1.2 Flooded land remaining flooded land																	
2. Land converted to wetlands[10]																	
2.1 Land being converted for peat extraction																	
Drop down list																	
1. Forest land being converted for peat extraction																	
2. Cropland being converted for peat extraction																	
3. Grassland being converted for peat extraction																	
4. Settlements being converted for peat extraction																	
5. Other land being converted for peat extraction																	
2.2 Land converted to flooded land																	
Drop down list																	
1. Forest land converted to flooded land																	
2. Cropland converted to flooded land																	
3. Grassland converted to flooded land																	
4. Settlements converted to flooded land																	
5. Other land converted to flooded land																	
2.3 Land converted to other wetlands																	
Drop down list																	
1. Forest land converted to other wetlands																	
2. Cropland converted to other wetlands																	
3. Grassland converted to other wetlands																	
4. Settlements converted to other wetlands																	
5. Other land converted to other wetlands																	

[1] Land categories may be further divided according to climate zone, management system, soil type, vegetation type, tree species, ecological zone or national land classification.
[2] The total area of the subcategories, in accordance with the subdivision used, should be entered here. For lands converted to wetlands report the cumulative area remaining in the category in the reporting year.
[3] Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.
[4] The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (–
[5] According to the 2006 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (–) and for emissions positive (+). Net changes in carbon stocks are converted to carbon dioxide (CO_2) by multiplying carbon (C) by 44/12 and changing the sign for net CO_2 removals to be negative (–) and for net CO_2 emissions to be positive (+). Note that carbon stock changes in a single pool are not necessarily equal to emissions or removals to/from the atmosphere, because some carbon stock changes result from carbon transfers among pools rather than exchanges with the atmosphere.
[6] Where Parties directly estimate emissions and removals rather than carbon stock changes, they may report emissions/removals directly in this column and use notation keys in the stock change columns.
[7] There is no default methodology for estimating CO_2 emissions from flooded land remaining flooded land.
[8] There is no default methodology for estimating methane (CH_4) emissions and information for the methods is provided in appendix 3, volume 4 of the 2006 IPCC Guidelines.
[9] The nitrous oxide (N_2O) emissions from Flooded land are included in the estimates of indirect N_2O from agricultural or other run-off, and waste water.
[10] A Party may report aggregated estimates for all land conversions to wetlands, when data are not available to report them separately. A Party should specify in the documentation box which types of land conversion are included.

Documentation box:

Parties should provide detailed explanations on the land use, land-use change and forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 4) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 4.E SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY Year

Settlements Submission

(Sheet 1 of 1) Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA	IMPLIED CARBON-STOCK-CHANGE FACTORS					CHANGES IN CARBON STOCK					
Land-use category	Subdivision[1]	Total area[2] (kha)	Carbon stock change in living biomass per area[3] [4]			Net carbon stock change in dead organic matter per area[4]	Net carbon stock change in soils per area[4]	Carbon stock change in living biomass[3], [4], [5]			Net carbon stock change in dead organic matter[4]	Net carbon stock change in soils[4]	Net CO_2 emissions/ removals[6] [7]
			Gains	Losses	Net change			Gains	Losses	Net change			
			(t C/ha)					(kt C)					(kt)
E. Total settlements													
1. Settlements remaining settlements[8]													
2. Land converted to settlements[8]													
2.1 Forest land converted to settlements													
2.2 Cropland converted to settlements													
2.3 Grassland converted to settlements													
2.4 Wetlands converted to settlements													
2.5 Other Land converted to settlements													

[1] Land categories may be further divided according to climate zone, management system, soil type, vegetation type, tree species, ecological zone or national land classification.

[2] The total area of the subcategories, in accordance with the subdivision used, should be entered here. For lands converted to settlements report the cumulative area remaining in the category in the reporting year.

[3] Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.

[4] The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (–).

[5] For category 5.E.1 Settlements remaining settlements this column only includes changes in perennial woody biomass.

[6] According to the 2006 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (–) and for emissions positive (+). Net changes in carbon stocks are converted to carbon dioxide (CO_2) by multiplying carbon (C) by 44/12 and changing the sign for net CO_2 removals to be negative (–) and for net CO_2 emissions to be positive (+). Note that carbon stock changes in a single pool are not necessarily equal to emissions or removals to/from the atmosphere, because some carbon stock changes result from carbon transfers among pools rather than exchanges with the atmosphere.

[7] Where Parties directly estimate emissions and removals rather than carbon stock changes, they may report emissions/removals directly in this column and use notation keys in the stock change columns.

[8] A Party may report aggregated estimates for all land conversions to settlements, when data are not available to report them separately. A Party should specify in the documentation box which types of land conversion are included.

Documentation box:

Parties should provide detailed explanations on the land use, land-use change and forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 4) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 4.F SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY

Year

Other land

Submission

(Sheet 1 of 1)

Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA	IMPLIED CARBON-STOCK-CHANGE FACTORS					CHANGES IN CARBON STOCK					
Land-use category	Subdivision[1]	Total area[2] (kha)	Carbon stock change in living biomass per area[3] [4]			Net carbon stock change in dead organic matter per area[4]	Net carbon stock change in soils per area[4]	Carbon stock change in living biomass[3] [4]			Net carbon stock change in dead organic matter[4]	Net carbon stock change in soils[4]	Net CO_2 emissions/ removals[5] [6]
			Gains	Losses	Net change			Gains	Losses	Net change			
			(t C/ha)					(kt C)					(kt)
F. Total other land													
1. Other land remaining other land[7]													
2. Land converted to other land[8]													
2.1 Forest land converted to other land													
2.2 Cropland converted to other land													
2.3 Grassland converted to other land													
2.4 Wetlands converted to other land													
2.5 Settlements converted to other land													

[1] Land categories may be further divided according to climate zone, management system, soil type, vegetation type, tree species, ecological zone or national land classification.

[2] The total area of the subcategories, in accordance with the subdivision used, should be entered here. For lands converted to Other land report the cumulative area remaining in the category in the reporting year.

[3] Carbon stock gains and losses should be listed separately except in cases where, due to the methods used, it is technically impossible to separate information on gains and losses.

[4] The signs for estimates of gains in carbon stocks are positive (+) and of losses in carbon stocks are negative (–).

[5] According to the 2006 IPCC Guidelines, for the purposes of reporting, the signs for removals are always negative (–) and for emissions positive (+). Net changes in carbon stocks are converted to carbon dioxide (CO_2) by multiplying carbon (C) by 44/12 and changing the sign for net CO_2 removals to be negative (–) and for net CO_2 emissions to be positive (+). Note that carbon stock changes in a single pool are not necessarily equal to emissions or removals to/from the atmosphere, because some carbon stock changes result from carbon transfers among pools rather than exchanges with the atmosphere.

[6] Where Parties directly estimate emissions and removals rather than carbon stock changes, they may report emissions/removals directly in this column and use notation keys in the stock change columns.

[7] This land-use category is to allow the total of identified land area to match the national area. It includes bare soil, rock, ice and all land areas that do not fall into any other of the other five land-use categories.

[8] A Party may report aggregated estimates for all land conversions to other land, when data are not available to report them separately. A Party should specify in the documentation box which types of land conversion are included.

Documentation box:

Parties should provide detailed explanations on the land use, land-use change and forestry sector in chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 4) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 4(I) SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY

Year

Direct nitrous oxide (N_2O) emissions from nitrogen (N) inputs[(1)] to managed soils

Submission

Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION		IMPLIED EMISSION FACTORS	EMISSIONS[(4)]
Land-use category[(2)]	Description	Value kg N/yr	N_2O–N emissions per unit of N-input kg N_2O–N/kg N[(3)]	N_2O (kt)
Total for all land use categories				
A. Forest land[(5)]				
1. Forest land remaining forest land				
1. Inorganic N fertilizers	N input from application of inorganic fertilizers to land use categories other than cropland and grasslands			
2. Organic N fertilizers	N input from organic N fertilizers to land use categories other than cropland and grassland			
2. Land converted to forest land				
1. Inorganic N fertilizers	N input from application of inorganic fertilizers to land use categories other than cropland and grasslands			
2. Organic N fertilizers	N input from organic N fertilizers to land use categories other than cropland and grassland			
H. Other (please specify)[(5)][(6)]				
1. Inorganic N fertilizers	N input from application of inorganic fertilizers to land use categories other than cropland and grasslands			
2. Organic N fertilizers	N input from organic N fertilizers to land use categories other than cropland and grassland			

(1) Direct N_2O emissions from N input to managed soils are estimated using equations 11.1, 11.2, 11.3, 11.4, 11.5 and 11.6 of the volume 4 of the 2006 IPCC Guidelines based on the amounts of N input applied.

(2) N_2O emissions from N fertilization of cropland and grassland are reported in the agriculture sector.

(3) In the calculation of the implied emission factor, N_2O emissions are converted to N_2O–N by multiplying by 28/44.

(4) Emissions are reported with a positive sign.

(5) If a Party is not able to separate the N inputs applied to land-use categories, other than cropland and grasslands, it may report all N_2O emissions from N inputs to managed soils in the agriculture sector. This should be explicitly indicated in the documentation box.

(6) If a Party is not able to separate the N inputs applied to forest land and to other land-use categories, other than cropland and grasslands, it may report all N_2O emissions from N inputs to managed soils under the category H. Other. This should be explicitly indicated in the documentation box.

Documentation box:
Parties should provide detailed explanations on the land use, land-use change and forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 4) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 4(II) SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY Year

Non-CO_2 emissions from management and drainage of organic soils Submission

(Sheet 1 of 1) Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES		ACTIVITY DATA	IMPLIED EMISSION FACTORS		EMISSIONS	
Land-use category[1]	Subdivision[2]	Area (kha)	N_2O–N per area[3] (kg N_2O–N/ha)	CH_4 per area (kg CH_4/ha)	N_2O (kt)	CH_4 (kt)
Total for all land use categories						
A. Forest land[5]						
Organic soil						
D. Wetlands						
Peatland[6]						
Flooded lands[6]						
H. Other (please specify)						

[1] Nitrous oxide (N_2O) emissions from drained cropland and grassland soils are covered in the agriculture tables of the CRF under cultivation of organic soils.

[2] A Party should report further disaggregations of drained soils corresponding to the methods used. Tier 1 disaggregates soils into "nutrient rich" and "nutrient poor" areas, whereas higher-tier methods can further disaggregate soils into different peatland types, soil fertility or tree species.

[3] In the calculation of the implied emission factor, N_2O emissions are converted to N_2O-N by multiplying by 28/44.

[5] In table 4, these emissions will be added to 4.A.1 Forest land remaining forest land.

[6] In table 4, these emissions will be added to 4.D.2 Land converted to wetlands.

Documentation box:

Parties should provide detailed explanations on the land use, land-use change and forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 4) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 4(III) SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY

Year

Direct nitrous oxide (N_2O) emissions from nitrogen (N) mineralization/immobilization associated with loss/gain of soil organic matter resulting from change of land use or management of mineral soils[1]

Submission

Country

(Sheet 1 of 1)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA	IMPLIED EMISSION FACTORS	EMISSIONS
Land-use category[2]	**Land area remaining or converted (kha)**	**N_2O–N emissions per unit area[3] (kg N_2O–N/ha)**	**N_2O (kt)**
Total all land-use categories			
A. Forest land			
1. Forest land remaining forest land			
2. Lands converted to forest land			
Drop down list			
2.1 Cropland converted to forest land			
2.2 Grassland converted to forest land			
2.3 Wetlands converted to forest land			
2.4 Settlements converted to forest land			
B. Cropland[2]			
2. Lands converted to cropland			
Drop down list			
2.1 Forest land converted to cropland			
2.2 Grassland converted to cropland			
2.3 Wetlands converted to cropland			
2.4 Settlements converted to cropland			
C. Grasslands			
1. Grasslands remaining grasslands			
2. Lands converted to grasslands			
Drop down list			
2.1 Forest land converted to grasslands			
2.2 Cropland converted to grasslands			
2.3 Wetlands converted to grasslands			
2.4 Settlements converted to grasslands			
D. Wetlands			
1. Wetlands remaining wetlands			
2. Lands converted to wetlands			
Drop down list			
2.1 Forest land converted to wetlands			
2.2 Cropland converted to wetlands			
2.3 Grassland converted to wetlands			
2.4 Settlements converted to wetlands			
E. Settlements			
1. Settlements remaining settlements			
2. Lands converted to settlements			
Drop down list			
2.1 Forest Land converted to settlements			
2.2 Cropland converted to settlements			
2.3 Grassland converted to settlements			
2.4 Wetlands converted to settlements			
F. Other land			
H. Other *(please specify)*			

[1] Methodologies for N_2O emissions from N mineralization/immobilization associated with loss/gain of soil organic matter resulting from change of land use or management of mineral soils are based on equations 11.1 and 11.18 of the 2006 IPCC Guidelines.

[2] N_2O emissions from Cropland remaining cropland are included in the agriculture sector

[3] In the calculation of the implied emission factor, N_2O emissions are converted to N_2O–N by multiplying by 28/44.

Documentation box:
Parties should provide detailed explanations on the land use, land-use change and forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 4) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 4(IV) SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY

Indirect nitrous oxide (N_2O) emissions from managed soils[(1)]

Year

Submission

Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA AND OTHER RELATED INFORMATION		IMPLIED EMISSION FACTORS	EMISSIONS
	Description	Value kg N/yr	kg N_2O–N/kg N[(2)]	N_2O (kt)
1. Atmospheric deposition[(3)]	N volatilized from managed soils from inputs of N			
2. Nitrogen leaching and run-off[(3)]	N from fertilizers and other that is lost through leaching and run-off from managed soils			

[(1)] If nitrogen (N) application to other land categories cannot be separately identified, they should be included in the agriculture sector. This should be explicitly indicated in the documentation box. Emissions from this category should be reported under category I. Other in table 3.

[(2)] To convert from N_2O–N to N_2O emissions, multiply by 44/28.

[(3)] Only atmospheric deposition of N volatilized from the following sources of N inputs: synthetic N fertilizer; organic N fertlizer; and N mineralization associated with loss of soil organic matter resulting from land use or management of organic soils on land use categories other than cropland and grasslands are to be reported here.

Documentation box:
Parties should provide detailed explanations on the land use, land-use change and forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 4) of the national inventory report (NIR). Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 4(V) SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY

Year

Biomass Burning[1]

Submission

(Sheet 1 of 1)

Country

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	ACTIVITY DATA			IMPLIED EMISSION FACTOR			EMISSIONS		
	Description[3]	Unit	Values	CO_2	CH_4	N_2O	CO_2[4]	CH_4	N_2O
Land-use category[2]		(ha or kg dm)		(t/activity data unit)			(kt)		
Total for land-use categories									
A. Forest land									
1. Forest land remaining forest land									
Controlled burning									
Wildfires									
2. Land converted to forest land									
Controlled burning									
Wildfires									
B. Cropland									
1. Cropland remaining cropland[5]									
Controlled burning									
Wildfires									
2. Land converted to cropland									
Controlled burning									
Wildfires									
C. Grassland									
1. Grassland remaining grassland[6]									
Controlled burning									
Wildfires									
2. Land converted to grassland									
Controlled burning									
Wildfires									
D. Wetlands									
1. Wetlands remaining wetlands									
Controlled burning									
Wildfires									
2. Land converted to wetlands									
Controlled burning									
Wildfires									
E. Settlements									
F. Other land									
H. Other (please specify)									

[1] The methodology for estimating non-CO_2 emissions from biomass burning is described in section 2.4 of chapter 2 of volume 4 of the 2066 IPCC Guidelines.

[2] Parties should report both controlled/prescribed burning and wildfires emissions, where appropriate, in a separate manner.

[3] For each category, activity data should be selected between area burned or biomass burned. The units for area will be ha and for biomass burned will be kg dm. The implied emission factor will refer to the selected activity data with an automatic change in the units.

[4] If carbon dioxide (CO_2) emissions from biomass burning are not already included in tables 4.A – 4.F, they should be reported here. This should be clearly documented in the documentation box and in the national inventory report (NIR). Double counting should be avoided. Parties that include all carbon stock changes in the carbon stock tables (4.A – 4.F), should report "IE" (included elsewhere) in this column.

[5] Insitu above-ground woody biomass burning is reported here. Agricultural residue burning is reported in the agriculture sector.

[6] Includes only emissions from controlled biomass burning on grasslands outside the savannas (forest land and grassland defined as savanna should be reported under the agriculture sector).

Documentation box:
Parties should provide detailed explanations on the land use, land-use change and forestry sector in Chapter 7: Land Use, Land-Use Change and Forestry (CRF sector 4) of the NIR. Use this documentation box to provide references to relevant sections of the NIR if any additional information and/or further details are needed to understand the content of this table.

TABLE 4.G SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY Year
Harvested wood products (HWP)[1] Submission
(Sheet 1 of 2) Country

APPROACH A[2]

GREENHOUSE GAS SOURCE AND SINK CATEGORIES[3]	HWP in use (IU) from domestic consumption				Net emissions/ removals from HWP in use
	Gains[4]	Losses[4]	Half-life[5]	Annual change in stock (ΔC HWP IU DC)	
	(t C)		(yr)	(kt C)	(kt CO_2)
TOTAL HWP consumed domestically (ΔC HWPdom IU DC)					
1. Solid wood					
Drop down list					
Sawnwood					
Wood panels					
Other solid wood products					
...[6]					
2. Paper and paperboard					
...[6]					

Information item:[15]

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HWP in solid waste disposal sites (SWDS) from domestic consumption[7]				Net CO_2 emissions/ removals from HWP in SWDS	Net CO_2 emissions/ removals from HWP from domestic consumption (IU+SWDS)
	Gains[4]	Losses[4]	Half-life[8]	Annual change in stock (ΔC HWP SWDS DC)		
	(t C)		(yr)	(kt C)	(kt CO_2)	(kt CO_2)
HWP in SWDS[9]						

APPROACH B[10]

GREENHOUSE GAS SOURCE AND SINK CATEGORIES[3]	HWP in use from domestic harvest				Net emissions/ removals from HWP in use
	Gains[4]	Losses[4]	Half-life[5]	Annual Change in stock (ΔC HWP IU DH)	
	(t C)		(yr)	(kt C)	(kt CO_2)
TOTAL HWP from domestic harvest (ΔC HWP IU DH)					
1. Solid wood					
Drop down list					
Sawnwood					
Wood panels					
Other solid wood products					
...[6]					
2. Paper and paperboard					
...[6]					
HWP produced and consumed domestically (ΔC HWPdom IU DH)[11]					
Total					
1. Solid wood					
Drop down list					
Sawnwood					
Wood panels					
Other solid wood products					
...[6]					
2. Paper and paperboard					
...[6]					
HWP produced and exported (ΔC HWPexp IU DH)[11]					
Total					
1. Solid wood					
Drop down list					
Sawnwood					
Wood panels					
Other solid wood products					
...[6]					
2. Paper and paperboard					
...[6]					

Information item:[15]

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HWP in solid waste disposal sites (SWDS) produced from domestic harvest[7]				Net CO_2 emissions/ removals from HWP in SWDS	Net CO_2 emissions/ removals from HWP from domestic harvest (IU + SWDS)
	Gains[4]	Losses[4]	Half-life[8]	Annual change in stock (ΔC HWP SWDS DH)		
	(t C)		(yr)	(kt C)	(kt CO_2)	(kt CO_2)
HWP in SWDS[9]						

APPROACH C[12]

GREENHOUSE GAS SOURCE AND SINK CATEGORIES[3]	HWP in use from domestic consumption			
	Gains[4]	Losses[4]	Half-life[5]	Annual change in stock (ΔC HWP IU DC)
	(t C)		(yr)	(kt C)
TOTAL				
1. Solid wood				
Drop down list				
Sawnwood				
Wood panels				
Other solid wood products				
...[6]				
2. Paper and paperboard				
...[6]				

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Additional variables			Net CO_2 emissions/ removals from HWP in use[13]
	Annual domestic harvest (H)	Annual imports of wood, and paper products + wood fuel, pulp, recovered paper, roundwood/chips (Pim)	Annual exports of wood, and paper products + wood fuel, pulp, recovered paper, roundwood/chips (Pex)	
	(kt C)	(kt C)	(kt C)	(kt CO_2)

Information item:[15]

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	HWP in solid waste disposal sites (SWDS) from domestic consumption[7]				Net CO_2 emissions/ removals from HWP in SWDS	Net CO_2 emissions/ removals from HWP (IU+SWDS)[14]
	Gains[4]	Losses[4]	Half-life[8]	Annual change in stock (ΔC HWP SWSD DC)		
	(t C)		(yr)	(kt C)	(kt CO_2)	(kt CO_2)
HWP in SWDS[9]						

[1] A Party should only provide data for the approach it has chosen to use for reporting on harvested wood products.
[2] Approach to estimate net emissions from the overall HWP pool from domestic consumption within the reporting country.
[3] Includes solid wood products (sawnwood, wood panels) and paper and paperboard only, as defined in table 12.5 of volume 4 of the 2006 IPCC Guidelines. A Party may apply different categories in case tier 3 methods are available.
[4] Gains refers to annual carbon inflow to HWP pool, losses refers to annual carbon outflow from HWP pool.
[5] Half-lives are needed when applying flux data methodology as suggested in equation 12.1 of volume 4 of the 2006 IPCC Guidelines.
Following default half-lives may be used for HWP in use: sawnwood 35 years, wood panels 25 years, paper and paperboard 2 years (based on Table 3a.1.3 of the IPCC good practice guidance for LULUCF).
[6] Subcategories such as land area classification may be used.
[7] Data on HWP in SWDS may be provided on a voluntary basis. It excludes the carbon in CH_4 emissions which is reported in the waste sector.
[8] Waste subcategories as suggested in chapter 2.3.1 of volume 5 of the 2006 IPCC Guidelines may be used.
[9] See table 3.4 of volume 5 of the 2006 IPCC Guidelines.
[10] Approach to estimate net emissions from HWP pool from domestic harvest.
[11] A Party may choose to separately report HWP for domestically produced and consumed, and domestically produced and exported HWP.
[12] Approach to estimate net-emissions from HWP within the reporting country.
[13] See equations used in IPCC 2006 HWP Spreadsheet model: H – (H + Pim – Pex – ΔC HWP IU DC) * -(44/12)
[14] See Equation used in IPCC 2006 HWP Spreadsheet model: H - (H + Pim – Pex – ΔC HWP IU DC – $\Delta C\ HW_{P\ SWSD\ DC}$) * -(44/12)
[15] Information reported in this table as an information item should be used to check consistency with the estimation in the waste sector.

Documentation box:

TABLE 4.G SECTORAL BACKGROUND DATA FOR LAND USE, LAND-USE CHANGE AND FORESTRY

Harvested wood products (HWP)[1]

(Sheet 2 of 2)

Year

Submission

Country

HWP activity data[2]

	Sawnwood			Wood panels			Paper and paperboard		
	Production	Imports	Exports	Production	Imports	Exports	Production	Imports	Exports
year	m^3	m^3	m^3	m^3	m^3	m^3	metric t	metric t	metric t
….[3]									
1961									
1962									
1963									
1964									
1965									
1966									
1967									
1968									
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2006									
2007									
2008									
2009									

[1] This table is only included for the latest reported inventory year in the CRF.

[2] Information should be provided on how activity data from the period from 1900 to the first year of the tabulated time series has been computed (equations 12.1 and 12.6 of volume 4 of the 2006 IPCC Guidelines).

[3] Provide activity data from the first year for which they are available.

Note: Information as outlined in the table above should be provided where tier 1 or tier 2 methods have been used (volume 4 of the 2006 IPCC Guidelines). Further information shall be provided in the relevant sections of the NIR.

Documentation box:

Additional information

Factors used to convert from product units to carbon

1. Solid wood[a]	
Drop down list	
Sawnwood	
Wood panels	
Other solid wood products	
…[b]	
2. Paper and paperboard[a]	
…[b]	

[a] A Party may apply different categories in case tier 3 methods are available.

[b] Subcategories may be used.