

IPCC Inventory Software for National GHG inventories Overview of the AFOLU Sector

IPCC TFI Side Event Sharm el-Sheikh - Climate Change Conference UNFCCC COP27 November 2022



Major updates



Land Representation Manager

Higher Tiers methods in 2006 IPCC Guidelines (Vol 4) and additional methods in Wetlands Supplement

Improvements in worksheet structure and layout



Subnational disaggregation

🖳 Application Database Inventory	Year Worksheets	Reports Tools Ex	port/Import Adn	ninistrate Wi	ndow Help									- 5
2006 IPCC Categories	SOM Organic Draine Biomass increase (G Worksheet Sector: A Category: F Subcategory: 3 Sheet: 1	d SOM Organic Rewett AL 1/4) Biomass loss (griculture, Forestry and Oth orest Land .B.1.b.i - Cropland converte of 4 Annual increase in ca	ed GAL 2/4) Biomass I ner Land Use ed to Forest Land rbon stocks in biomass	oss (GAL 3/4) s (includes above	Biomass loss (GAL 4 -ground and below-gro	1/4) Biomass o	hange (SD) Bio	omass change (Å	Abrupt) DOM	(GAL 1/1) DOM	(SD 1/1) SOM M	ineral (Approach 2,	3) SOM Mineral (^{SD)} 1990
	Region Kanaga	awa 🗸	Approach 3											
3.A.2.j - Other (please sp		Land use category		Equation 2.9				Equation 2.10				Equa	tion 2.9	
3.8 - Land 3.8.1 - Forest land 3.8.1 - Forest land Re 3.8.1.5 - Land Converted 3.8.1.b - Land Converted 3.8.1.b.ii - Greasland 3.8.1.b.ii - Greasland 3.8.1.b.ii - Vetlands 3.8.1.b.iv - Settleme 3.8.1.b.v - Other Lan				Area (ha)	Average net annual increment of growing stock (m3 / ha / yr)	Biomass expansion factor for conversion of annual net increment to above-ground biomass increment (t d.m. /m3 fresh volume)	Basic wood density (t d.m. / m3 fresh volume)	Biomass conversion and expansion factor for increment (t d.m. / m3 wood volume)	Average annual above -ground biomass growth (tonnes d.m. i (ha * yr))	Ratio of below- ground biomass to above- ground biomass (t bg d.m. / t ag d.m.)	Average annual biomass growth above- and below-ground (tonnes d.m. / (ha * yr))	Carbon fraction of dry matter (tonnes C / tonne d.m.)	Annual increase in biomass carbon stocks due to biomass growth (tonnes C / yr)	
 3.B.2 - Cropland 3.B.2.a - Cropland Rema 3.B.2.b - Land Converted 3.B.2.b - Land Converted 3.B.2.b.ii - Forest Lan 3.B.2.b.ii - Grassland 3.B.2.b.iii - Wetlands 2.D.2.b.iii - Wetlands 	Land unit code	Initial land use	Land use during reporting year	National statistics or international data sources	National statistics or international data sources	Table 3.A.1.10 / National statistics or international data sources	Tables 4.13 / 4.14 / 4.6 WS / National statistics or international data sources	BCEFi = BEF1 * D / Specified	Gw = Iv * BCEFi / Specified	Zero (0) or Table 4.4 / 4.5 WS / National statistics or international data sources	Gtotal = Gw * (1+R)	0.47 / Table 4.3 / 0.451 WS mangroves	ΔCG =A*Gtotal *CF	
3.B.2.b.v - Settleme				A	lv	BEF1	D	BCEFI	Gw	R	Gtotal	CF	ΔCG	
3.B.3 - Grassland	Total													
				0							0		0	l

Region/Geographical zone stratification allows to report at subnational level as well as to further disaggregate estimates according to e.g. drivers/stakeholders and/or relevant variables



Land Representation Manager (LRM)

> Allows to use any of the three IPCC approaches:

- ✓ Approach 1 -no land use change identification-
- ✓ Approach 2 -land use change identification-
- ✓ Approach 3 -land use change identification and tracking across time-

Ensures consistency of land representation -including through fully spatially explicit tracking of units of land-

Unit of land, an area homogenous per

- ✓ physical conditions -climate/vegetation zone and soil type- and
- ✓ current and historical socio-economic functions -land use & management type-

An excel-based tool to input at once the entire land representation is under preparation



Regions Tab (LRM)

	1				
ions Land representation table Annual land representation m	natrix (Approach 2 & 3)				
ble country area (ha) 19,000.000					
Region name	Area	Approach	Rer	nark	
Persion 2	(ha) 1700	Approach 2			
Region 1	100	Approach 1	_		
Region 2	100	Approach 2			
	,	, pproson 2			_
	19000.00	0			
e single region in case you wish to report for the whole country					

 A country can be represented in a single set of National data or in a number of Regions

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✓ For each Region the land representation approach is to be selected



Land Representation Tab

legion	Regi	on 3 🗸 🗸 🗸	Region area (ha)	17,100.000	Discrepa	ancy (ha) OK		Approach	3			199
			egory			Area (1990) (ha)			Remark			
Fo	orest Li	and					14100					
		Land us	se subcategory			Area (1990) (ha)			Remar	k		
	Mana	ged Forest Land					14100					
			Current Land use	e subdivision					Remark			
e	N	anaged Forest										
		Land unit code (Automatic)	Land unit code (User defined)	Previous La subcateg	ind use Jory	Previous Land use subdivision	Transition perio [T] (years)	d Year of conversion	Area (1990) (ha)	Remark	Р	см
	⊕ -	MFL-MF-NF-OB-10<-UFL-P_	Unit 1.1	Unmanaged Fore	est Land	Protected area	20	1990	1000 ↔		2	
	MFL-MF-NF-OB-18<-OSL-A. Unit 6 Settlements (ner)	Abandoned	20	1990	1000 💮		2	
		MFL-MF-NF-OB-21<-ACL-A		Cropland Annual	Crops	Annual Crops	20	1981	100 ↔		2	ق
	*				~	×			{·· }			
			Current Land use	e subdivision					Remark			
æ	N	anaged Forest (drained)										
()	- P	lantation (intensive)										
Đ	- F	antation										
	*				1		<u> </u>					
		Land us	se subcategory			Area (1990) (ha)			Remar			
Đ	Unm	anaged Forest Land					0					
		Land use cat	egory			Area (1990) (ha)			Remark			
Cr	ropland						2500					
G	rasslar	d					500					
W	etlands	ata					0					
0	ther I a	nts					0					

- ✓ A Table for each Region
- \checkmark All info on land use and land use changes is to be input in this Tab
- Each unit of land is identified by a code and contains information on the current and previous land use/management
- ✓ For each conversion, input *Transition Period* and *Conversion Year*, so the software tracks it across time
- ✓ Data input in the time series is to be done from its first year forward

Annual land representation matrix Tab

Land Representation Manager																	
egions	Land repres	sentation table	nnual land r	epresentation r	natrix (Approa	ach 2 & 3)	00.000									20	00
region	Region 3	Initial	Eore	stland	(na)	niand	Grad	siand	Wet	lande	Settle	mants	Othe	er Land		20	00
Fi	inal		Managed Forest Land	Unmanaged Forest Land	Cropland Annual Crops	Cropland Perennial Crops	Managed Grassland	Unmanage d Grassland	Managed Wetlands	Unmanage d Wetlands	Settleme nts (Treed)	Settleme nts (Other)	Managed Other Land	Unmanage d Other Land	Final Area (ha)	Net cha (ha)	inge)
Fores	t Land	Managed Forest Land	14100												14100	0	
		Unmanaged Forest Land													0	0	
Cropi		Cropland Annual Crops			500										500	0	
		Cropland Perennial Crops				2000									2000	0	
Grass		Managed Grassland					500								500	0	
10/-01-	- 1-	Grassland													0	0	
vvetia		Wetlands													0	0	
Settle	ments	Wetlands													0	0	
		(Treed) Settlements													0	0	
Other	Land	(Other) Managed Other													0	0	
		Land Unmanaged									1				0	0	
		Other Land Initial Area (ha)	14100	0	500	2000	500	0	0	0	0	0	0	0	17100	0	-
																Close	e

No data Input, just for verification (not exportable yet)





Higher Tiers and additional methods

Stock difference approach

in each carbon pool of each land use

Formulation B for SOC change in mineral soils

✓ When Approach 3 for land representation is applied, the software calculates SOC net changes associated with land use/management change based on the actual SOC content of the unit of land

Wetlands Supplement

- ✓ Additional methods provided, identified through the use of Lilac color
- ✓ Additional source/sink categories, identified through the use of Lilac color



- Combination of Tiers within the same set of worksheets, where the structure of IPCC equations allows e.g. Enteric fermentation
- Addition of (set of) worksheets for each different Tier, where IPCC equations do not allow combination of multiple tiers e.g. Gain & Loss vs Stock-Difference
- ➢ 492 worksheets in total available, among which the user selects those that better deal with national circumstances.
- Such a large number allows any combinations of tiers to be composed to estimate GHG emissions from the AFOLU sector.



ivestock populatio	on Average Daily	Feed Intake - Tie	er 2 (Detailed) Averag	e Daily Feed Intal	ke - Tier 2 (Sin	nplified) CH4	Emission Fact	tor for Enteric Fer	mentation - Tie	er 2 CH4 E	missions from	Enteric ferme	entation			
Vorksheet Sector: Category: Subcategory: Sheet: Data	Agriculture, Forest Livestock 3.A.1.a.i - Dairy Co Livestock populati	y and Other Land ws on	Use													202	20
Geographical z	one (All)		✓ Live:	stock Sub	category (All)		~										
										Per animal							
Geographical zone	Livestock Subcategory	Livestock Subdivision	Tier (3.A.1)	Annual Averag e Populati on (head)	Typical Animal Mass (kg)	Gross Energy calculation method	Feeding situation	Mean daily temperatur e during winter season (*C)	Coefficient for calculating Net Energy for Maintenance (MJ/day/kg)	Coefficient for calculating Net Energy for Maintenanc e (in_cold) (MJ/day/kg)	Average daily milk production (kg/day)	Fat content of milk (% by weight)	% of females that give birth in a year (%)	Coefficient for calculating Net Energy for Pregnancy	Feed digestibility (%)		
z	т	т		AAP	ТАМ		Ca	Tw	Cfi	Cfi(in_cold) =Cfi+ (0.0048*(20				Ср	DE%		
region 1	Mature Dairy	average	Tier 1	2000	600		#1									2	
		High-produci	Tier 2	1000	900	Detailed	(10	0.386	0.434	90	4	80	0.1	90) 🛃	
•	_	Low-produci	Tier 2	500	300	Simplified					30	2			30	1 🛃 🛃	2
region 2		average	Tier 1	100	275											3	-
		High-produci	Tier 1													3	1
		Low-produci	Tier 1													3	
Total																	
				3600													

3 methodological options

- ✓ IPCC Default
- ✓ Tier 2 Detailed
- ✓ Tier 2 Simplified



SOM Mineral	(Approach 2,3) S	SOM Mineral (SD) SOI	M Organic	Drained	SOM Or	rganic Rewet	ted	Riomass change (SD)	Diamag	o observe (Abruet) DOM/GAL 1/1	DOM (SE	1/1) COM	Minoral (Ann	ranah 1 Jafa	constian i	iom)	
Norksheet Sector: Category: Subcategor Sheet: Data	Agriculture, Fr Forest Land ny: 3.B.1.a - Fore Annual net C	orestry and Other Land Us st land Remaining Forest stock change in biomass	se land - Stock diff	ference met	thod	iomass ioss	(GAL 4/4)	Dombas change (SD)	Diomas	i change (Abrupti DOM (GAL IN) DOM (SE	500	i Minerai (App	roach i - imo	mation	20	20
negion	Theyion 5	* - Appro	bach S															
	Land use categ	ory			Biomace		(Equa	ation 2.8							
			Area (ha)	Biomass conversion and expansion factor for standing stock (t d.m. / m3 volume)	expansion factor for conversion of merchantable volume to bove-ground biomass 't d.m. / m3 fr	Basic wood density (t d.m. / m3 fresh volume)	Merchantable growi stock volume at th beginning of the inventory period (1 (m3 / ha)	ing te t tt) (t d.m./ha)	Mercha stock end o P	ntable growing volume at the the inventory eriod (t2) (m3 / ha)	Total final above-ground biomass (t d.m. / ha)	Ratio of below- ground biomass to above-ground biomass (R) (t bg d.m. / t ag d.m.)	Biomass carbon fraction (tonnes C / tonne d.m.)	Total initial biomass C stock (tonne C / ha)	Total final biomass C stock (tonne C / ha)	Time period between two inventories (Year)	Annual change in carbon stocks in biomass (tonnes C / yr)	
Land unit code	Initial land use	Land use during reporting year	National statistics or international data sources	BCEFs=BEF2 *D or specified	Table 3.A.1.10 / National statistics or international data sources	Tables 4.13 / 4.14 / 4.6 WS / National statistics or international data sources	National statistics international data sources	or AB(t1)=V(t1)*BCEFs or specified	Nation	al statistics or national data sources	AB(t2)=V(t2)*BCEFs or specified	Zero (0) or Table 4.4 / 4.5 WS / National statistics or international data sources	0.47 / Table 4.3 / 0.451 WS mangroves	CB(t1) = AB(t1) * (1+R) * CF	CB(t2) = AB(t2) * (1+R) * CF	T = t2 - t1	ΔCB = (CB(t2) - CB(t1)) / T *A	
			A	BCEFs	BEF2		V(t1)	AB(t1)	i –	V(t2)	AB(t2)	R	CF	CB(t1)	CB(t2)	т	ΔCB	
Unit 7.2	Managed For Plantation	Managed Fore Plantation	6500	1			1	200 Calculated	200	220	Calculated 220	0.29	0.51	131.58	144.738	5	17105.4	329
Total														131.58	144.738		17105.4	

BCEFs or BEF2 x D

> Aboveground biomass (both, initial and final values):

✓ either calculated as Growing Stock (merchantable volume) x BCEF

✓ or input



Biomass increase (G SOM Mineral (Appro Norksheet Sector: A	GAL 1/4) Biomass loss (GA bach 2,3) SOM Mineral (SE Agriculture, Forestry and Other	AL 2/4) Biomass loss (GAL 3/4) D) SOM Organic Drained SOM (Biomass loss (GAL 4/4) Bioma Organic Rewetted	ass change (SD)	Biomass change	(Abrupt) DOM (GAL 1/1) DOM (SD 1/1) SOM 1	Mineral (Approach	1 - Information item)	2020
Category: F Subcategory: 3 Sheet: A Data	Forest Land 3.B.1.a - Forest land Remainin Annual net C stock change in	g Forest land soil organic matter of rewetted organi	c soils							
Region Tempe	erate 🗸 🗸	- Approach 2								
	Land us	e category				Equation 3.3,	3.4, 3.5, 4.9 WS			
			Area (ha)	CO2 on-site emission factor for climate type and nutrient status of peat and drainage class in rewetted soils (tonnes CO2- C / ha / yr)	Net flux of DOC from natural (undrained) and rewetted organic soil (tonnes C / ha / yr)	Conversion factor for proportion of DOC converted to CO2 following export from site	CO2 off-site emission factor for climate type and nutrient status of peat and drainage class in rewetted soils (tonnes CO2-C / ha / yr)	CO2 emissions from peat fire in rewetted land (tonnes CO2- C / ha / yr)	Annual carbon loss from rewetted organic soils (tonnes C / yr)	
Land unit code	e Initial land u	use Land use during re	Porting year National statistics or international data sources	Table 3.1 WS / 4.12 WS or national statistics	Table 3.2 WS or national statistics	0.9 (0.8-1) or national statistics	Table 3.2 WS / Eq. 3.6 or national statistics	From 3.C.1	CO2-C(r) = A(r) * (EF(os) + EF (DOC)) + L(fr)	
			A(r)	EF(os)	DOC(flux)	Frac(DOC)	EF(DOC)	L(fr)	CO2-C(r)	
Total										
			0						0	
				1. C						

Wetlands Supplement additional methods, identified through the use of Lilac color



		Number of Worksheets				
IPCC Category	Total	IP	CC Tier (Equations)			
	TOLAI	Tier 1	Tier 2	Tier 3		
3.A.1 – Enteric fermentation	44					
3.A.1.a – Cattle	10					
3.B.1.a.i – Dairy Cow	5	2				
3.A.1.a.ii – Other Cattle	5	2				
3.A.1.b – Buffalo	5	2	2			
3.A.1.c – Sheep	5	2	2 3			
3.A.1.d – Goats	4	2	2 2			
3.A.1.e – Camels	4	2	2 2			
3.A.1.f – Horses	4		2 2			
3.A.1.g – Mules and Assess	4		2 2			
3.A.1.h – Swine	4		2 2			
3.A.1.j – Other	4	2	2 2			

Tier 2 requires an energy balance -i.e. feed intake vs energy uses + manure- to estimate the fraction of energy used by enteric flora and requires stratification of livestock populations by age, diet, productivity and husbandry system. The energy balance can be calculated through a detailed calculation or simply derived from the dry matter intake and its quality (energy content and digestibility)



INTERGOVERNMENTAL PANEL ON Climate change

		Number of Worksheets					
IPCC Category	Total	IP	CC Tier (Equations)				
	Total	Tier 1	Tier 2	Tier 3			
3.A.2 – Manure management	104						
3.A.2.a – Cattle	22						
3 B 2 a i – Dairy Cow	11	5	5				
		1	5				
3 A 2 a ii – Other Cattle	11	5	5				
		1	5				
3 A 2 h – Buffalo	11	Ę	5				
		1	5				
3 A 2 c – Sheep	11	Ę	5				
		1	5				
3.A.2.d – Goats	10	Ę	5				
		1	4				
3.A.2.e – Camels	10)				
		1	4				
3.A.2.f – Horses	10						
		1	4				
3.A.2.g – Mules and Assess	10	5					
		1	4				
3.A.2.h – Swine	10	5					
		1	4				
3.A.2.j – Other	10	5					
		1	4				

Tier 2 requires an energy balance -i.e. feed intake vs energy uses + manure- to estimate the fraction of energy used by enteric flora and requires stratification of livestock populations by age, diet, productivity and husbandry system. The energy balance can be calculated through a detailed calculation or simply derived from the dry matter intake and its quality (energy content and digestibility). Further Tier 2 requires daily estimates of:

- Volatile solid excretion rate, base don additional info on the urinary energy and ash content of manure
- N excretion rate, based on daily N intake and N retention rate

	Number of Worksheets						
IPCC Category	Total	I	PCC Tier (Equation	s)			
	Total	Tier 1	Tier 2	Tier 3			
3.B.1 – Forest land	73						
		4 <mark>B</mark> + (1**)					
2 D 4 a Essectional new siging Essectional	13	1* SOM 2.	1* SOM 2.25A +1 +1				
3.B. I.a – Forest land remaining Forest land			1** SOM 2.25B	3 SD			
			M G&L				
3.B.1.b – Land converted to Forest land	60						
		4 B + (1)					
3.B.1.b.i – Cropland converted to Forest land	12	1 SOM 2.2	25B +1 +1	3 SD			
			1 DO	M G&L			
3.B.1.b.ii – Grassland converted to Forest land	12	1 SOM 2.2	25B +1 +1	3 SD			
			1 DOM G&L				
			4 <mark>B</mark> + (1)				
3.B.1.b.iii – Wetlands converted to Forest land	12	1 SOM 2.2	25B +1 +1	3 SD			
			1 DO	M G&L			
			4 <mark>B</mark> + (1)				
3.B.1.b.iv – Settlements converted to Forest land	12	1 SOM 2.2	25B +1 +1	3 <mark>SD</mark>			
			1 DO	M G&L			
			4 <mark>B</mark> + (1)				
3.B.1.b.v – Other land converted to Forest land	12	1 SOM 2.2	25B +1 +1	3 SD			
		1 DOM G&L					

The IPCC Default –i.e. the Gain & Loss– method applies to all Tiers (where default values are provided by IPCC), while the Stock-Difference method applies to Tier 3 only

A worksheet for "abrupt biomass loss" is provided (eq 2.16), although it does not apply to harvesting losses



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	Number of Worksheets						
IPCC Category	Total	IF	PCC Tier (Equations	s)			
	TOLAI	Tier 1	Tier 2	Tier 3			
3.B.2 – Cropland	55						
			1 <mark>B</mark> + (1)	-			
3.B.2.a – Cropland remaining Cropland	10	1 SOM 2.25B & 1*	3 SD				
		1 DOM G&L					
3.B.2.b – Land converted to Cropland	45						
			1 B + (1)				
3.B.2.b.i – Forest land converted to Cropland	9		M G&L				
		1 SOM 2.2	5B +1 +1	3 SD			
			1 B + (1)				
3.B.2.b.ii – Grassland converted to Cropland	9		M G&L				
		1 SOM 2.2	25B +1 +1	3 SD			
		1 B + (1)					
3.B.2.b.iii – Wetlands converted to Cropland	9		1 DOI	M G&L			
		1 SOM 2.2	25B +1 +1	3 <mark>SD</mark>			
			1 <mark>B</mark> + (1)				
3.B.2.b.iv – Settlements converted to Cropland	9		1 DOI	M G&L			
		1 SOM 2.2	25B +1 +1	3 <mark>SD</mark>			
			1 <mark>B</mark> + (1)				
3.B.2.b.v – Other land converted to Cropland	9	1 DOM G&L		M G&L			
		1 SOM 2.2	3 <mark>SD</mark>				

The IPCC Default –i.e. the Gain & Loss– method applies to all Tiers (where default values are provided by IPCC), while the Stock-Difference method applies to Tier 3 only



	Number of Worksheets						
IPCC Category	Total	I	PCC Tier (Equation	s)			
	TOLAT	Tier 1	Tier 2	Tier 3			
3.B.3 – Grassland	55						
			1 B + (1)				
3.B.3.a – Grassland remaining Grassland	10	1 SOM 2.25B & 1*	SOM 2.25A +1 +1	3 SD			
		1 DOM G&L					
3.B.3.b – Land converted to Grassland	45						
		1 B + (1)					
3.B.3.b.i – Forest land converted to Grassland	9		M G&L				
		1 SOM 2.2	25B +1 +1	3 SD			
			1 B + (1)	•			
3.B.3.b.ii – Cropland converted to Grassland	9		M G&L				
		1 SOM 2.2	25B +1 +1	3 SD			
		1 B + (1)					
3.B.3.b.iii – Wetlands converted to Grassland	9	1 DOM G&L					
		1 SOM 2.2	25B +1 +1	3 <mark>SD</mark>			
			1 B + (1)				
3.B.3.b.iv – Settlements converted to Grassland	9		1 DO	M G&L			
		1 SOM 2.25B +1 +1 3 SD					
		1 B + (1)					
3.B.3.b.v – Other land converted to Grassland	9	1 DOM G&L		M G&L			
		1 SOM 2.2	25B +1 +1	3 <mark>SD</mark>			

The IPCC Default –i.e. the Gain & Loss– method applies to all Tiers (where default values are provided by IPCC), while the Stock-Difference method applies to Tier 3 only



		Number of Worksheets			
IPCC Category	Total	IPCC Tier (Equations)			
		Tier 1	Tier 2	Tier 3	
3.B.4 – Wetlands	28				
3.B.4.a – Wetlands remaining Wetlands	12				
3.B.4.a.i – Peat Extraction remaining Peat Extraction	3	+1 +2			
3.B.4.a.ii – Flooded land remaining Flooded land					
3.B.4.a.iii – Other Wetlands remaining Other Wetlands		+2		3 SD	
	0	1* SOM2.25A			
	9		2 B&DOM G&L		
			1 SOM2.25B		
3.B.4.b – Land converted to Wetlands	16				
3.B.4.b.i – Land converted for Peat Extraction	6	2 B&DOM +1 +2		1 SD	
3.B.4.b.ii – Land converted to Flooded land	1	1			
3.B.4.b.iii – Land converted to Other Wetlands		1 SOM2.25B +2		3 SD	
	9	2 B			
		1 DOM G&L		M G&L	

The IPCC Default –i.e. the Gain & Loss– method applies to all Tiers (where default values are provided by IPCC), while the Stock-Difference method applies to Tier 3 only





IPCC Category	Number of Worksheets			
	Total	IPCC Tier (Equations)		
		Tier 1	Tier 2	Tier 3
3.B.5 – Settlements	61			
	11 -	+1 +2		
2 D. C. Cottlemente remaining Cottlemente		1* SOM 2.25A		
3.B.5.a – Settlements remaining Settlements			2 B&DOM G&L + (1**)	
			1** SOM 2.25B	3 SD
3.B.5.b – Land converted to Settlements	50			
		1 B + (1)		
3.B.5.b.i – Forest land converted to Settlements	10	1 DOM G&L		M G&L
		1 SOM 2.2	25B +1 +2	3 SD
	10	1 <mark>B</mark> + (1)		
3.B.5.b.ii – Cropland converted to Settlements		1 DOM G&L		
		1 SOM 2.2	25B +1 +2	3 SD
3.B.5.b.iii – Grassland converted to Settlements	10	1 B + (1)		
		1 DOM G&L		
		1 SOM 2.2	25B +1 +2	3 SD
3.B.5.b.iv – Wetlands converted to Settlements	10	1 B + (1)		
		1 DOM G&L		
		1 SOM 2.2	25B +1 +2	3 <mark>SD</mark>
3.B.5.b.v – Other land converted to Settlements	10	1 B + (1)		
			1 DOM G&L	
		1 SOM 2.2	25B +1 +1	3 SD

The IPCC Default -i.e. the Gain & Loss- method applies to all Tiers (where default values are provided by IPCC), while the Stock-Difference method applies to Tier 3 only CC



INTERGOVERNMENTAL PANEL ON Climate change

IPCC Category	Number of Worksheets			
	Total	IPCC Tier (Equations)		
		Tier 1	Tier 2	Tier 3
3.B.6 – Other land	20			
3.B.6.a – Other land remaining Other land				
3.B.6.b – Land converted to Other land	20			
3.B.6.b.i – Forest land converted to Other land	4	(1)		
		1 DOM SD		M SD
		1 SOM 2	2.25B +1	
3.B.6.b.ii – Cropland converted to Other land	4	(1)		
		1 DOM SD		
		1 SOM 2		
3.B.6.b.iii – Grassland converted to Other land	4	(1)		
		1 DOM SD		
		1 SOM 2	2.25B +1	
3.B.6.b.iv – Wetlands converted to Other land	4	(1)		
		1 DOM SD		M SD
		1 SOM 2	2.25B +1	
3.B.6.b.v – Settlements converted to Other land	4	(1)		
			1 DOM SD	
		1 SOM 2	2.25B +1	

The IPCC Default -i.e. the Gain & Loss- method applies to all Tiers (where f\default values are provided by IPCC)





		Number of Worksheets			
IPCC Category	Total	IPCC Tier (Equations)			
		Tier 1	Tier 2	Tier 3	
3.C.1 – Biomass burning	12				
3.C.1.a – Biomass burning in Forest land	3	3			
3.C.1.b – Biomass burning in Cropland	3	3			
3.C.1.c – Biomass burning in Grassland	3	3			
3.C.1.d – Biomass burning in all other lands	3	3			
3.C.2 – Liming	1	1			
3.C.3 – Urea application	1	1			
3.C.4 – Direct N ₂ O emissions	10	9 +1			
3.C.5 – Indirect N ₂ O emissions from managed soils	2	2			
3.C.6 – Indirect N ₂ O emissions from manure management	4	4			
3.C.7 – Rice cultivation	1	1			
3.C.8 – CH ₄ emissions from drained inland organic soils	1	1			
3.C.9 – CH ₄ from drainage ditches on organic soils	1	1			
3.C.10 – CH ₄ from rewetting of inland organic soils	1	1			
3.C.11 – CH ₄ from rewetting of mangroves and tidal marshes	1	1			
3.C.12 – N ₂ O emissions from aquaculture	1	1			
3.C.13 – CH ₄ from rewetted and created Wetlands in inland	1	1			
wetland mineral soils	I				
3.C.14 – Other	1		1***		
3.D.1 – Harvested Wood Products	13	13	}		
3.D.2 – Other	1		1***		

The methodological tier of CO₂ emissions estimated as C stock losses in 3.B categories could be higher than that of non-CO₂ emissions



	Worksheets Number
IFCC Calegoly	Total
3.A. – Livestock	148
3.A.1 – Enteric fermentation	44
3.A.2 – Manure management	104
3.B. – Land	292
3.B.1 – Forest land	73
3.B.2 – Cropland	55
3.B.3 – Grassland	55
3.B.4 – Wetlands	28
3.B.5 – Settlements	61
3.B.6 – Other land	20
3.C. – Aggregated Sources and non-CO ₂ emissions sources on land	38
3.C.1 – Biomass burning	12
3.C.2 – Liming	1
3.C.3 – Urea application	1
3.C.4 – Direct N ₂ O emissions	10
3.C.5 – Indirect N ₂ O emissions from managed soils	2
3.C.6 – Indirect N ₂ O emissions from manure management	4
3.C.7 – Rice cultivation	1
3.C.8 – CH ₄ emissions from drained inland organic soils	1
3.C.9 – CH ₄ from drainage ditches on organic soils	1
3.C.10 – CH ₄ from rewetting of inland organic soils	1
3.C.11 – CH ₄ from rewetting of mangroves and tidal marshes	1
3.C.12 – N ₂ O emissions from aquaculture	1
3.C.13 – CH ₄ from rewetted and created Wetlands in inland wetland mineral soils	1
3.C.14 – Other	1
3.D Other	14
3.D.1 – Harvested Wood Products	13
3.D.2. – Other	1
TOTAL AFOLU SECTOR	492

Worksheets map [notes]

- () for biomass and in the year of change only
- +1 for drained organic soils only
- +2 on-site and off-site emissions associated with extracted peat decay
- +1 for rewetted organic soils only
- +2 for rewetted organic soil or for SOM excavation in Wetlands
- * for regions where Approach 1 of land representation is applied only
- ** for management changes only
- *** The IPCC generic methodology [ADxEF] applies, but no IPCC default values are provided for EF





All methods in the 2006 IPCC Guidelines are implemented in the IPCC Inventory Software

Thus, needed flexibility to deal with any national circumstances, as per IPCC tiered approach, is ensured

Subnational disaggregation

Thus, tracking of specific activities/projects, and associated emission level & trend, within a national GHG inventory is allowed

> AFOLU sector Guidebook – version 1 under development





Thank you

https://www.ipcc-nggip.iges.or.jp/index.html

