ANNEX 2

WORKSHEETS

All the Worksheets in Annex I to Volume 4 of 2006 IPCC Guidelines remain valid. In the 2019 Refinement, 10 new worksheets are added here as new guidance consistent with main chapters of Volume 4 of 2019 Refinement related to Biochar Amendments to Soils for Cropland and Grassland and Flooded Land.

BIOCHAR AND SOILS - CROLAND AND GRASSLAND WORKSHEETS

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FLOODED LAND WORKSHEETS

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CHAPTER 2 CROPLAND

CROPLAND REMAINING CROPLAND

| | Sector | Agriculture, For | , Forestry and Other Land Use | | | | | | | |
|-------------------|--------------------------------|--------------------------------|--|--|---|---|--|--|--|--|
| | Category | Cropland Rema | naining Cropland: Annual change in carbon stocks in mineral soils | | | | | | | |
| | Category code | 3B2a (Updated) | B2a (Updated) | | | | | | | |
| | Sheet | 1 of 4 | | | | | | | | |
| | Equation | Equation 2.2 | | Equation 2.25, Formulation | A in Box 2.1 of Section 2.3.3.1 | | | | | |
| Land-use category | | Subcategories for reporting | Mineral Soil Organic C stock in the last year of the inventory time period | Mineral Soil Organic C stock at the beginning of the inventory time period | Time dependence of stock change factors (D) or number of years over a single inventory time period (T) | Annual change in carbon stocks in mineral soils | | | | |
| | Land use during reporting year | year | (tonnes C) | (tonnes C) | (yr) | (tonnes C yr ⁻¹) | | | | |
| Initial land use | | Land use during | SOC ₍₀₎ in Equation 2.25 | SOC _(0-T) in Equation 2.25 | (default is 20 yr; if T>D then use the value of T) | ΔC _{Mineral} as in Equation 2.25 | | | | |
| | | | $SOC_{(0)}$ | $\mathrm{SOC}_{(0	ext{-}\mathrm{T})}$ | D | $\Delta 	ext{C}_{	ext{Mineral}}$ | | | | |
| | | (a) | | | 20 | | | | | |
| CL | CL | (b) | | | 20 | | | | | |
| | | (c) | | | 20 | | | | | |
| | Total | | | | | | | | | |

| | Sector | Agriculture, For | estry and Other Land | Use | | | | |
|-------------------|--------------------------------|-----------------------------|--|-------------------------------|---|---|---|--|
| | Category | Cropland Rema | ining Cropland: Annua | al change in carbon sto | ocks in mineral soils | | | |
| | Category code | 3B2a (Updated) | | | | | | |
| | Sheet | 2 of 4 | | | | | | |
| | Equation | Equation 2.2 | | Equati | ion 2.25, Formulation | A in Box 2.1 of Section | 2.3.3.1 | |
| Land-use category | | Subcategories for reporting | Area in the last year of an inventory period | Reference carbon stock | Stock change factor for land-use system or sub-system | Stock change factor for management regime | Stock change factor for input of organic matter | Mineral Soil Organic C stock in the last year of the inventory time period |
| | | year | (ha) | (tonnes C ha ⁻¹) | (-) | (-) | (-) | (tonnes C) |
| Initial land use | Land use during reporting year | | | Table 2.3 | Table 5.5 | Table 5.5 | Table 5.5 | SOC ₍₀₎ in Equation 2.25 |
| | | | A(0) | $\mathbf{SOC}_{\mathbf{ref}}$ | $\mathbf{F}_{\mathbf{L}\mathbf{U}}$ | $\mathbf{F}_{\mathbf{MG}}$ | $\mathbf{F}_{\mathbf{I}}$ | $SOC_{(0)}$ |
| | | (a) | | | | | | |
| CL | CL | (b) | | | | | | |
| | | (c) | | | | | | |
| | Total | | | | | | | |

| | Sector | Agriculture, Fore | stry and Other Land I | Use | | | | | |
|-------------------|--------------------------------|--|---|------------------------------|---|---|---|--|--|
| | Category | Cropland Remain | Remaining Cropland: Annual change in carbon stocks in mineral soils | | | | | | |
| | Category code | 3B2a (Updated) | | | | | | | |
| | Sheet | 3 of 4 | | | | | | | |
| | Equation | Equation 2.2 | | Equati | on 2.25, Formulation | A in Box 2.1 of Section | 2.3.3.1 | | |
| Land-use category | | Subcategories for reporting year | Area at the beginning of an inventory period | Reference carbon stock | Stock change factor for land-use system or sub-system | Stock change factor for management regime | Stock change factor for input of organic matter | Mineral Soil Organic C stock at the beginning of the inventory time period | |
| | | | (ha) | (tonnes C ha ⁻¹) | (-) | (-) | (-) | (tonnes C) | |
| Initial land use | Land use during reporting year | | | Table 2.3 | Table 5.5 | Table 5.5 | Table 5.5 | SOC _(0-T) in Equation 2.25 | |
| | | | A(0-T) | SOC_{ref} | $\mathbf{F}_{\mathbf{L}\mathbf{U}}$ | F _{MG} | Fı | SOC _(0-T) | |
| | | (a) | | | | | | | |
| CL | CL | (b) | | | | | | | |
| | | (c) | | | | | | | |
| | Total | | | | | | | | |

| | Sector | Agriculture, Fore | estry and Other Land Use | | |
|------------------|--------------------------------|-----------------------|--|---|--|
| | Category | Cropland Remain | ning Cropland: Annual change in carbon sto | ocks in organic soils | |
| | Category code | 3B2a | | | |
| | Sheet | 4 of 4 | | | |
| | Equation | Equation 2.2 | | Equation 2.26 | |
| Land-use | category | Subcategories | Land area of cultivated organic soil | Emission factor for climate type | Annual carbon loss from cultivated organic soils |
| | Land use during reporting year | for reporting year | (ha) | (tonnes C ha ⁻¹ yr ⁻¹) | (tonnes C yr ⁻¹) |
| Initial land use | | year | | Table 5.6 | $L_{\text{Organic}} = A * EF$ |
| | | | A | EF | L _{Organic} |
| | | (a) | | | |
| CL | CL | (b) | | | |
| | | (c) | | | |
| | Total | | | | |

CHAPTER 2 CROPLAND

LAND CONVERTED TO CROPLAND

| | Sector | Agriculture, For | Agriculture, Forestry and Other Land Use | | | | | | | |
|------------------|--------------------------------|-----------------------------|--|--|---|---|--|--|--|--|
| | Category | Land Converted | Converted to Cropland: Annual change in carbon stocks in mineral soils | | | | | | | |
| | Category code | 3B2b (Updated) | lated) | | | | | | | |
| | Sheet | 1 of 4 | | | | | | | | |
| | Equation | Equation 2.2 | | Equation 2.25, Formulation | | | | | | |
| Land-use | e category | Subcategories for reporting | Mineral Soil Organic C stock in the last year of the inventory time period | Mineral Soil Organic C stock at the beginning of the inventory time period | Time dependence of stock change factors (D) or number of years over a single inventory time period (T) | Annual change in carbon stocks in mineral soils | | | | |
| | | year | (tonnes C) | (tonnes C) | (yr) | (tonnes C yr ⁻¹) | | | | |
| Initial land use | Land use during reporting year | | $SOC_{(0)}$ in Equation 2.25 | SOC _(0-T) in Equation 2.25 | (default is 20 yr; if T>D then use the value of T) | $\Delta C_{Mineral}$ as in Equation 2.25 | | | | |
| | | | $SOC_{(0)}$ | $SOC_{(0-T)}$ | D | $\Delta \mathbf{C}_{	ext{Mineral}}$ | | | | |
| FL | CL | (a) | | | 20 | | | | | |
| 1 L | CL | (b) | | | 20 | | | | | |
| | Sub-total | | | | | | | | | |
| GL | CL | (a) | | | 20 | | | | | |
| GL | | (b) | | | 20 | | | | | |
| | Sub-total | | | | | | | | | |
| WL | CL | (a) | | | 20 | | | | | |
| WE | CL | (b) | | | 20 | | | | | |
| | Sub-total | | | | | | | | | |
| SL | CL | (a) | | | 20 | | | | | |
| DL . | CL | (b) | | | 20 | | | | | |
| | Sub-total | | | | | | | | | |
| OL | CL | (a) | | | 20 | | | | | |
| OL | CL | (b) | | | 20 | | | | | |
| | Sub-total | | | | | | | | | |
| | Total | | | | | | | | | |

| | Sector | Agriculture, Fore | Agriculture, Forestry and Other Land Use | | | | | | | | |
|-------------------|--------------------------------|--|--|------------------------------|---|---|---|--|--|--|--|
| | Category | Land Converted | and Converted to Cropland: Annual change in carbon stocks in mineral soils | | | | | | | | |
| | Category code | 3B2b (Updated) | B2b (Updated) | | | | | | | | |
| | Sheet | 2 of 4 | | | | | | | | | |
| | Equation | Equation 2.2 | | | on 2.25, Formulation A | | | | | | |
| Land-use category | | Subcategories for reporting year | Area in the last year of an inventory period | Reference carbon stock | Stock change factor for land-use system or sub-system | Stock change factor for management regime | Stock change factor for input of organic matter | Mineral Soil Organic C stock in the last year of the inventory time period | | | |
| | | | (ha) | (tonnes C ha ⁻¹) | (-) | (-) | (-) | (tonnes C) | | | |
| Initial land use | Land use during reporting year | | | Table 2.3 | Table 5.5 | Table 5.5 | Table 5.5 | SOC ₍₀₎ in Equation 2.25 | | | |
| | | | A(0) | ${ m SOC}_{ m ref}$ | $\mathbf{F}_{\mathbf{L}\mathbf{U}}$ | $\mathbf{F}_{\mathbf{MG}}$ | Fı | $SOC_{(0)}$ | | | |
| FL | CL | (a) | | | | | | | | | |
| FL | CL | (b) | | | | | | | | | |
| | Sub-total | | | | | | | | | | |
| GL | CL | (a) | | | | | | | | | |
| GL | | (b) | | | | | | | | | |
| | Sub-total | | | | | | | | | | |
| WL | CL | (a) | | | | | | | | | |
| WL | CL | (b) | | | | | | | | | |
| | Sub-total | | | | | | | | | | |
| SL | CL | (a) | | | | | | | | | |
| SL | CL | (b) | | | | | | | | | |
| | Sub-total | | | | | | | | | | |
| OL | CL | (a) | | | | | | | | | |
| OL. | CL | (b) | | | | | | | | | |
| | Sub-total | | | | | | | | | | |
| | Total | | | | | | | | | | |

| | Sector | Agriculture, Fore | criculture, Forestry and Other Land Use | | | | | | |
|-------------------|--------------------------------|--|---|------------------------------|---|---|---|--|--|
| | Category | Land Converted | onverted to Cropland: Annual change in carbon stocks in mineral soils | | | | | | |
| | Category code | 3B2b (Updated) | | | | | | | |
| | Sheet | 3 of 4 | | | | | | | |
| | Equation | Equation 2.2 | | | ion 2.25, Formulation | | | | |
| Land-use category | | Subcategories for reporting year | Area at the beginning of an inventory period | Reference carbon stock | Stock change factor for land-use system or sub-system | Stock change factor for management regime | Stock change factor for input of organic matter | Mineral Soil Organic C stock at the beginning of the inventory time period | |
| | | | (ha) | (tonnes C ha ⁻¹) | (-) | (-) | (-) | (tonnes C) | |
| Initial land use | Land use during reporting year | | | Table 2.3 | Table 5.10 | Table 5.10 | Table 5.10 | SOC _(0-T) in Equation 2.25 | |
| | | | A(0-T) | SOCref | FLU | F _{MG} | Fı | SOC _(0-T) | |
| FL | CL | (a) | | | | | | | |
| TL | CL | (b) | | | | | | | |
| | Sub-total | | | | | | | | |
| GL | CL | (a) | | | | | | | |
| GL | | (b) | | | | | | | |
| | Sub-total | | | | | | | | |
| WL | CL | (a) | | | | | | | |
| WL | CL | (b) | | | | | | | |
| | Sub-total | | | | | | | | |
| CI. | CI | (a) | | | | | | | |
| SL | CL | (b) | | | | | | | |
| | Sub-total | | | | | | | | |
| OL | CL | (a) | | | | | | | |
| OL | CL | (b) | | | | | | | |
| | Sub-total | | | | | | | | |
| | Total | | | | | | | | |

| | Sector | Agriculture, Forestry an | d Other Land Use | | |
|--|--------------------------------|--------------------------|---|---|--|
| | Category | Land Converted to Crop | land: Annual change in carbon stocks in | n organic soils | |
| | Category code | 3B2b | | | |
| | Sheet | 4 of 4 | | | |
| | Equation | Equation 2.2 | | Equation 2.26 | |
| Land-use category | | Subcategories for | Land area of cultivated organic soil | Emission factor for climate type | Annual carbon loss from cultivated organic soils |
| | Land use during | reporting year | (ha) | (tonnes C ha ⁻¹ yr ⁻¹) | (tonnes C yr ⁻¹) |
| Initial land use ¹ | Land use during reporting year | 11. 27. | | Table 5.6 | $L_{Organic} = A * EF$ |
| | | | A | EF | Lorganic |
| FL | CL | (a) | | | |
| I'L | | (b) | | | |
| | Sub-total | | | | |
| GL | CL | (a) | | | |
| OL . | | (b) | | | |
| | Sub-total | | | | |
| WL | CL | (a) | | | |
| WE | | (b) | | | |
| | Sub-total | | | | |
| SL | CL | (a) | | | |
| DL | | (b) | | | |
| | Sub-total | | | | |
| OL | CL | (a) | | | |
| OL | | (b) | | | |
| | Sub-total | | | | |
| | Total | | | | |
| ¹ If data by initial land use | are not available, use only "r | non-CL" in this column. | | | |

CHAPTER 3 GRASSLAND

GRASSLAND REMAINING GRASSLAND

| | Sector | Agriculture, For | restry and Other Land Use | | | | | | | | | |
|------------------|---------------------|-----------------------------|--|--|---|---|--|--|--|--|--|--|
| | Category | Grassland Rema | nining Grassland: Annual change in | n carbon stocks in mineral soils | | | | | | | | |
| | Category code | | 3B3a (Updated) | | | | | | | | | |
| | Sheet | 1 of 4 | | | | | | | | | | |
| | Equation | Equation 2.2 | | Equation 2.25, Formulation | A in Box 2.1 of Section 2.3.3.1 | | | | | | | |
| Land-use | category | Subcategories for reporting | Mineral Soil Organic C stock in the last year of the inventory time period | Mineral Soil Organic C stock at the beginning of the inventory time period | Time dependence of stock change factors (D) or number of years over a single inventory time period (T) | Annual change in carbon stocks in mineral soils | | | | | | |
| | Land use | year | (tonnes C) | (tonnes C) | (yr) | (tonnes C yr ⁻¹) | | | | | | |
| Initial land use | during reporting | | SOC ₍₀₎ in Equation 2.25 | SOC _(0-T) in Equation 2.25 | (default is 20 yr; if T>D then use the value of T) | ΔC _{Mineral} as in Equation 2.25 | | | | | | |
| | year | | $SOC_{(0)}$ | $\mathrm{SOC}_{(0	ext{-}\mathrm{T})}$ | D | $\Delta \mathbf{C}_{\mathbf{Mineral}}$ | | | | | | |
| | | (a) | | | | | | | | | | |
| GL | GL | (b) | | | | | | | | | | |
| | | (c) | | | | | | | | | | |
| | Total | | | | | | | | | | | |

| | Sector | Agriculture, For | estry and Other Land U | Jse | | | | |
|------------------|--------------------------------------|-----------------------------|--|-------------------------|---|---|---|--|
| | Category | Grassland Rema | ining Grassland: Annu | al change in carbon sto | ocks in mineral soils | | | |
| | Category code | 3B3a (Updated) | | | | | | |
| | Sheet | 2 of 4 | | | | | | |
| | Equation | Equation 2.2 | | Equat | tion 2.25, Formulation | A in Box 2.1 of Section | 2.3.3.1 | |
| Land-use | e category | Subcategories for reporting | Area in the last year of an inventory period | Reference carbon stock | Stock change factor for land-use system or sub-system | Stock change factor for management regime | Stock change factor for input of organic matter | Mineral Soil Organic C stock in the last year of the inventory time period |
| | | | (ha) | (tonnes C ha-1) | (-) | (-) | (-) | (tonnes C) |
| Initial land use | Land use during reporting year | year | | Table 2.3 | Table 6.2 | Table 6.2 | Table 6.2 | SOC ₍₀₎ in Equation 2.25 |
| | reporting year | | A(0) | SOCref | $\mathbf{F}_{\mathbf{L}\mathbf{U}}$ | $\mathbf{F}_{\mathbf{MG}}$ | $\mathbf{F_{I}}$ | $SOC_{(0)}$ |
| | | (a) | | | | | | |
| GL | GL | (b) | | | | | | |
| | | (c) | | | | | | |
| | Total | | | | | | | |

| | Sector | Agriculture, For | estry and Other Land | Use | | | | |
|------------------|-----------------|-----------------------------|--|------------------------------|---|---|---|--|
| | Category | Grassland Rema | nining Grassland: Annu | al change in carbon st | ocks in mineral soils | | | |
| | Category code | 3B3a (Updated) | | | | | | |
| | Sheet | 3 of 4 | | | | | | |
| | Equation | Equation 2.2 | | Equat | tion 2.25, Formulation | A in Box 2.1 of Section | 2.3.3.1 | |
| Land-use | category | Subcategories for reporting | Area at the beginning of an inventory period | Reference carbon stock | Stock change factor for land-use system or sub-system | Stock change factor for management regime | Stock change factor for input of organic matter | Mineral Soil Organic C stock at the beginning of the inventory time period |
| | | year | (ha) | (tonnes C ha ⁻¹) | (-) | (-) | (-) | (tonnes C) |
| Initial land use | Land use during | | | Table 2.3 | Table 6.2 | Table 6.2 | Table 6.2 | SOC _(0-T) in Equation 2.25 |
| | reporting year | | A(0-T) | SOCref | F _{LU} | F _{MG} | FI | SOC _(0-T) |
| | | (a) | | | | | | |
| GL | GL | (b) | | | | | | |
| | | (c) | | | | | | |
| | Total | | | | | | | |

| | Sector | Agriculture, Fore | Agriculture, Forestry and Other Land Use | | | | | | |
|--------------|------------------------|-------------------|--|---|--|--|--|--|--|
| | Category | Grassland Remai | Grassland Remaining Grassland: Annual change in carbon stocks in organic soils | | | | | | |
| | Category code 3B3a | | | | | | | | |
| | Sheet | 4 of 4 | | | | | | | |
| | Equation | Equation 2.2 | | Equation 2.26 | | | | | |
| Land-use | e category | Subcategories | Land area of cultivated organic soil | Emission factor for climate type | Annual carbon loss from cultivated organic soils | | | | |
| T 20 11 1 | Land use for reporting | for reporting | (ha) | (tonnes C ha ⁻¹ yr ⁻¹) | (tonnes C yr ⁻¹) | | | | |
| Initial land | during | year | | Table 6.3 | $L_{Organic} = A * EF$ | | | | |
| use | reporting year | | A | EF | $ m L_{Organic}$ | | | | |
| | | (a) | | | | | | | |
| GL | GL | (b) | | | | | | | |
| | | (c) | | | | | | | |
| | Total | | | | | | | | |

CHAPTER 3 GRASSLAND

LAND CONVERTED TO GRASSLAND

| | Sector | Agriculture, Fore | stry and Other Land Use | | | | | |
|------------------|----------------|--------------------------------|--|--|---|---|--|--|
| | Category | Land Converted t | o Grassland: Annual change in carbon stocks in mineral soils | | | | | |
| | Category code | 3B3b (Updated) | | | | | | |
| | Sheet | 1 of 4 | | | | | | |
| | Equation | Equation 2.2 | | Equation 2.25, Formulation | A in Box 2.1 of Section 2.3.3.1 | | | |
| Land-use | e category | Subcategories for reporting | Mineral Soil Organic C stock in the last year of the inventory time period | Mineral Soil Organic C stock at the beginning of the inventory time period | Time dependence of stock change factors (D) or number of years over a single inventory time period (T) | Annual change in carbon stocks in mineral soils | | |
| | Land use | year | (tonnes C) | (tonnes C) | (yr) | (tonnes C yr ⁻¹) | | |
| Initial land use | during | 3 *** | SOC ₍₀₎ in Equation 2.25 | SOC _(0-T) in Equation 2.25 | (default is 20 yr; if T>D then use the value of T) | ΔC _{Mineral} as in Equation 2.25 | | |
| | reporting year | | $SOC_{(0)}$ | $\mathrm{SOC}_{(0	ext{-}\mathrm{T})}$ | D | ΔCMineral | | |
| FL | GL | (a) | | | 20 | | | |
| FL | GL | (b) | | | 20 | | | |
| | Sub-total | | | | | | | |
| CL | GL | (a) | | | 20 | | | |
| CL | GL | (b) | | | 20 | | | |
| | Sub-total | | | | | | | |
| WL | GL | (a) | | | 20 | | | |
| WL | GL | (b) | | | 20 | | | |
| | Sub-total | | | | | | | |
| SL | GL | (a) | | | 20 | | | |
| SE | GE | (b) | | | 20 | | | |
| | Sub-total | | | | | | | |
| OL | GL | (a) | | | 20 | | | |
| OL | GL | (b) | | | 20 | | | |
| | Sub-total | | | | | | | |
| | Total | | | | | | | |

| Sector Agriculture, Foresti | | | try and Other Land Use | 2 | | | | |
|-----------------------------|--------------------------|----------------------------------|--|------------------------------|---|---|---|--|
| | Category | Land Converted to | o Grassland: Annual change in carbon stocks in mineral soils | | | | | |
| | Category code | 3B3b (Updated) | | | | | | |
| | Sheet | 2 of 4 | | | | | | |
| | Equation | Equation 2.2 | | | tion 2.25, Formulation | | | |
| Land-use | category | Subcategories for reporting year | Area in the last year of an inventory period | Reference carbon stock | Stock change factor for land-use system or sub-system | Stock change factor for management regime | Stock change factor for input of organic matter | Mineral Soil Organic C stock in the last year of the inventory time period |
| | Land use | | (ha) | (tonnes C ha ⁻¹) | (-) | (-) | (-) | (tonnes C) |
| Initial land use | during reporting year | | | Table 2.3 | Table 6.2 | Table 6.2 | Table 6.2 | SOC ₍₀₎ in Equation 2.25 |
| | reporting year | | $\mathbf{A}_{(0)}$ | SOCref | $\mathbf{F}_{	ext{LU}}$ | $\mathbf{F}_{\mathbf{MG}}$ | Fı | SOC ₍₀₎ |
| FL | GL | (a) | | | | | | |
| T.L. | GL | (b) | | | | | | |
| | Sub-total | | | | | | | |
| CL | GL | (a) | | | | | | |
| CL | GL | (b) | | | | | | |
| | Sub-total | | | | | | | |
| WL | GL | (a) | | | | | | |
| WL | GL | (b) | | | | | | |
| | Sub-total | | | | | | | |
| SL | GL | (a) | | | | | | |
| SL | GL | (b) | | | | | | |
| | Sub-total | | | | | | | |
| OL | GL | (a) | | | | | | |
| OL. | GL | (b) | | | | | | |
| | Sub-total | | | | | | | |
| | Total | | | | | | | |

| | Sector | Agriculture, Forest | ry and Other Land Us | se | | | | _ |
|------------------|-----------------------|---------------------|--|------------------------------|---|---|---|--|
| | Category | Land Converted to | verted to Grassland: Annual change in carbon stocks in mineral soils | | | | | |
| | Category code | 3B3b (Updated) | | | | | | |
| | Sheet | 3 of 4 | | | | | | |
| | Equation | Equation 2.2 | | Equat | tion 2.25, Formulation | A in Box 2.1 of Section | 2.3.3.1 | |
| Land-use | Land-use category | | Area at the beginning of an inventory period | Reference carbon stock | Stock change factor for land-use system or sub-system | Stock change factor for management regime | Stock change factor for input of organic matter | Mineral Soil Organic C stock at the beginning of the inventory time period |
| | Land use | | (ha) | (tonnes C ha ⁻¹) | (-) | (-) | (-) | (tonnes C) |
| Initial land use | during reporting year | | | Table 2.3 | Table 5.5 (Cropland); 1 for other uses | Table 5.5 (Cropland); 1 for other uses | Table 5.5 (Cropland); 1 for other uses | SOC _(0-T) in Equation 2.25 |
| | reporting year | | A (0-T) | SOCref | $\mathbf{F}_{	ext{LU}}$ | $\mathbf{F}_{\mathbf{MG}}$ | Fı | SOC _(0-T) |
| FL | GL | (a) | | | | | | |
| FL | GL | (b) | | | | | | |
| | Sub-total | | | | | | | |
| CL | GL | (a) | | | | | | |
| CL | OL. | (b) | | | | | | |
| | Sub-total | | | | | | | |
| WL | GL | (a) | | | | | | |
| WL | GL | (b) | | | | | | |
| | Sub-total | | | | | | | |
| SL | GL | (a) | | | | | | |
| SL | GL | (b) | | | | | | |
| | Sub-total | | | | | | | |
| OI | CI | (a) | | | | | | |
| OL | GL | (b) | | | | | | |
| | Sub-total | | | | | | | |
| | Total | | | | | | | |

| | Sector | Agriculture, Forestr | y and Other Land Use | | | | | |
|--------------------------------------|----------------------------|--|--------------------------------------|---|--|--|--|--|
| | Category | Land Converted to Grassland: Annual change in carbon stocks in organic soils | | | | | | |
| | Category code | 3B3b | | | | | | |
| | Sheet | 4 of 4 | | | | | | |
| | Equation | Equation 2.2 | | Equation 2.26 | | | | |
| Land-use | category | Subcategories for | Land area of cultivated organic soil | Emission factor for climate type | Annual carbon loss from cultivated organic soils | | | |
| | Land use during | reporting year | (ha) | (tonnes C ha ⁻¹ yr ⁻¹) | (tonnes C yr ⁻¹) | | | |
| Initial land use ¹ | reporting year | 1 01 | | Table 6.3 | $L_{Organic} = A * EF$ | | | |
| | reporting year | | A | EF | L _{Organic} | | | |
| FL | GL | (a) | | | | | | |
| T.L. | GL | (b) | | | | | | |
| | Sub-total | | | | | | | |
| CI | GL | (a) | | | | | | |
| CL | | (b) | | | | | | |
| | Sub-total | | | | | | | |
| 3371 | CI | (a) | | | | | | |
| WL | GL | (b) | | | | | | |
| | Sub-total | | | | | | | |
| SL | GL | (a) | | | | | | |
| SL | GL | (b) | | | | | | |
| | Sub-total | | | | | | | |
| OI. | CI | (a) | | | | | | |
| OL | OL GL | | | | | | | |
| | Sub-total | | | | | | | |
| | Total | | | | | | | |
| ¹ If data by initial land | l use are not available, u | use only "non-GL" in this | column. | - | - | | | |

CHAPTER 7 WETLANDS

FLOODED LAND REMAINING FLOODED LAND

| | Sector | Agriculture, For | griculture, Forestry and Other Land Use | | | | | | |
|-------------------|--|---|--|--|--|--|--|--|--|
| | Category | Non CO ₂ emissions for Flooded Land remaining Flooded Land | | | | | | | |
| | Category code | 3B4aii | | | | | | | |
| | Sheet | 1 of 3 | | | | | | | |
| | | Equation 2.2 | Non CO ₂ emis | ssions/removals from Flooded Land remaining Equation 7.10B | Flooded Land | | | | |
| Land-use category | | Subsetagories | Annual surface reservoir CH ₄ emissions (for Reservoirs >20 years old | Annual downstream reservoir CH ₄ emissions (for Reservoirs >20 years old | Annual total reservoir CH ₄ emissions (for Reservoirs >20 years old (Flooded Land remaining Flooded Land) | | | | |
| | | during | kg CH ₄ yr ⁻¹ | kg CH ₄ yr ⁻¹ | kg CH ₄ yr ⁻¹ | | | | |
| Initial land use | Land use during | | | Equation 7.10B | Equation 7.10C | $F_{\mathit{CH_4tot}} = F_{\mathit{CH_4res}} + F_{\mathit{CH_4downstreame}}$ | | | |
| | reporting year | | F _{CH4res} | F _{CH4downstream} | F _{CH4tot} | | | | |
| $WL_{Flooded}$ | $\operatorname{WL}_{\operatorname{Flooded}}$ | | | | | | | | |
| | Total | | | | | | | | |
| | | | | | | | | | |

| | Sector | Agriculture, For | restry and Other Land Use | | | | | | |
|-------------------|--------------------------------------|---|---|--|---|--|--|--|--|
| | Category | Non CO ₂ emission | Non CO ₂ emissions for Flooded Land remaining Flooded Land | | | | | | |
| | Category code | 3B4aii | | | | | | | |
| | Sheet | 2 of 3 | | | | | | | |
| | | Equation 2.2 Non CO ₂ emissions/removals from Flooded Land remaining Flooded Land Equation 7.10B | | | | iining Flooded Land | | | |
| Land-use category | | tegory | | Emission factor for CH ₄ emitted from <i>Flooded</i> <i>Land</i> for reservoir > 20 yrs located in a climate zone "j" | Emission factor adjustment for trophic state (α_i) in reservoir i within a given climate zone. | Annual surface reservoir CH ₄ emissions (for Reservoirs >20 years old (Flooded Land remaining Flooded Land) | | | |
| | | for reporting | ha | kg CH ₄ ha ⁻¹ yr ⁻¹ | Dimension-less | kg CH4 yr ⁻¹ | | | |
| Initial land use | Land use during reporting year | during | | Table 7.9 | 1.0 for Tier1 | $F_{CH_4 res} = \sum_{j=1}^{6} \sum_{i=1}^{nres_j} \alpha_i \left(EF_{CH_4 age > 20, j} \bullet A_{tot \ j, i} \right)$ | | | |
| | | | Atot | EF | αi | F _{CH4res} | | | |
| 11/1 | | | | | | | | | |
| $WL_{Flooded}$ | WL _{Flooded} | | | | | | | | |
| | | | | | | | | | |
| | Total | | | | | | | | |
| | | | | | | | | | |

| | Sector | Agriculture, For | estry and Other Land Use | | | | |
|-------------------|--|-----------------------|---|--|---|---|--|
| | Category Non CO ₂ emissions for Flooded Land remaining Flooded Land | | | | | | |
| | Category code | 3B4aii | | | | | |
| | Sheet | 3 of 3 | | | | | |
| | Equation | Equation 2.2 | | Non CO ₂ emission | s/removals from <i>Flooded I</i> Equation 7.100 | Land remaining Flooded Land | |
| Land-use category | | | Total Area of Flooded Land remaining Flooded Land (Reservoir > 20 yrs old "i") located in a climate zone "j" Emission fac CH4 emitted Flooded Land reservoir > 2 located in a climate zone "j" zone "j" | | Emission factor adjustment for trophic state (α_i) in reservoir i within a given climate zone. | Annual downstream reservoir CH ₄ emissions (for Reservoirs >20 years old (Flooded Land remaining Flooded Land) | |
| | | Subcategories | ha | kg CH ₄ ha ⁻¹ yr ⁻¹ | Dimension-less | kg CH ₄ yr ⁻¹ | |
| Initial land use | Land use during reporting year | for reporting year | | Table 7.9 | 1.0 for Tier 1 | $F_{CH_{4}downstreame} = \sum_{j=1}^{6} \sum_{i=1}^{nres_{j}} \alpha_{i} \left(EF_{CH_{4}age > 20, j} \bullet A_{tot j, i} \right) \bullet R_{d, i}$ | |
| | | | A _{tot} | EF | $\alpha_{\rm i}$ | F _{CH4downstream} | |
| **** | **** | | | | | | |
| WLFlooded | WLFlooded | | | | | | |
| | m | | | | | | |
| | Total | | | | | | |
| | | | | | | | |

CHAPTER 7 WETLANDS

LAND CONVERTED TO FLOODED LAND

| of CO ₂ -C from Land dervoirs ≤ 20 years old) |
|---|
| yr ⁻¹ |
| $_{i}$ • $EF_{CO_{2}age \leq 20, j}$ |
| |
| |
| |
| |
| |
| |

¹ Sub-totals of emissions for each land pre-conversion land-use category will have to be calculated for conversion categories.

² For conversion categories, insert initial land use here. If data by initial land use are not available, use only "non-LU" in this column.

| | Sector | r Agriculture, Forestry and Other Land Use | | | | | | | |
|--------------------------------|---|--|-------------------------------------|--|---|--|--|--|--|
| | Category Non CO ₂ emissions for Land Converted to Flooded Land | | | | | | | | |
| | Category code 3B4bii | | | | | | | | |
| | Sheet | Sheet 1 of 3 | | | | | | | |
| | Equation | Equation 2.2 | Non CO ₂ en | missions/removals from <i>Land Converted to Fl</i> Equation 7.15A | ooded Land | | | | |
| Land-use category ¹ | | Annual surface reservoir CH ₄ emissions (for Reservoirs >20 years old emissions (for Reservoirs >20 years old | | Annual total reservoir CH ₄ emissions (for Reservoirs >20 years old (Flooded Land remaining Flooded Land) | | | | | |
| | | Subcategories for reporting | kg CH ₄ yr ⁻¹ | kg CH ₄ yr ⁻¹ | kg CH ₄ yr ⁻¹ | | | | |
| Initial land use ² | Land use during reporting year | year | Equation 7.15B | Equation 7.15C | $F_{CH_4tot} = F_{CH_4res} + F_{CH_4downstreame}$ | | | | |
| | | | F _{CH4res} | F _{CH4downstream} | F _{CH4tot} | | | | |
| | | | | | | | | | |
| | WLFlooded | | | | | | | | |
| | | | | | | | | | |
| | Total | | | | | | | | |
| 101 | | | | | | | | | |

¹ Sub-totals of emissions for each land pre-conversion land-use category will have to be calculated for conversion categories.
² For conversion categories, insert initial land use here. If data by initial land use are not available, use only "non-LU" in this column.

| | Sector | Agriculture, For | estry and Other Land Use | | | | | | | | |
|-------------------------------|--------------------------------|-----------------------------|---|---|---|--|--|--|--|--|--|
| | Category | Non CO ₂ emissio | on CO ₂ emissions for Flooded Land remaining Flooded Land | | | | | | | | |
| Ca | tegory code | 3B4bii | | | | | | | | | |
| | Sheet | 2 of 3 | | | | | | | | | |
| | Equation | Equation 2.2 | | Non CO ₂ emissions/rei | novals from Land Converted to Equation 7.15B | Flooded Land | | | | | |
| Land-use | Land-use category ¹ | | Total Area of Flooded Land remaining Flooded Land (Reservoir > 20 yrs old "i") located in a climate zone "j" | Emission factor for CH ₄ emitted from <i>Flooded Land</i> for reservoir > 20 yrs located in a climate zone "j" | Emission factor adjustment for trophic state (α_i) in reservoir i within a given climate zone. | Annual surface reservoir CH ₄ emissions (for Reservoirs >20 years old (Flooded Land remaining Flooded Land) | | | | | |
| | | | ha | kg CH ₄ ha ⁻¹ yr ⁻¹ | Dimension-less | kg CH ₄ yr ⁻¹ | | | | | |
| Initial land use ² | Land use during reporting year | | | Table 7.15 | 1.0 for Tier1 | $F_{CH_4 res} = \sum_{j=1}^{6} \sum_{i=1}^{nres_j} \alpha_i (EF_{CH_4 \ age \le 20, j} \bullet A_{tot \ j, i})$ | | | | | |
| | | | Atot | EF | $\alpha_{\rm i}$ | F _{CH4res} | | | | | |
| | WLFlooded | | | | | | | | | | |
| | Total | | | | | | | | | | |

¹ Sub-totals of emissions for each land pre-conversion land-use category will have to be calculated for conversion categories.

2 For conversion categories, insert initial land use here. If data by initial land use are not available, use only "non-LU" in this column.

| | Sector | Agriculture, For | griculture, Forestry and Other Land Use | | | | | | | | |
|--------------------------------|---|-----------------------------|--|--|---|---|---|--|--|--|--|
| | Category | Non CO ₂ emissio | ns for Flooded Land remai | ning Flooded Land | | | | | | | |
| Ca | tegory code | 3B4bii | | | | | | | | | |
| | Sheet | 3 of 3 | | | | | | | | | |
| | Equation | Equation 2.2 | | Non CO ₂ emi | ssions/removals from <i>Land</i> Equation 7.15 | l Converted to Flooded Land C | | | | | |
| Land-use category ¹ | | Subcategories | Total Area of Flooded Land remaining Flooded Land (Reservoir > 20 yrs old "i") located in a climate zone "j" | Emission factor for CH ₄ emitted from <i>Flooded</i> <i>Land</i> for reservoir > 20 yrs located in a climate zone "j" | Emission factor adjustment for trophic state (α_i) in reservoir i within a given climate zone. | Annual downstream reservoir CH4 emissions (for Reservoirs >20 years old (Flooded Land remaining Flooded Land) | | | | | |
| | | | ha | kg CH ₄ ha ⁻¹ yr ⁻¹ | Dimension-less | kg CH ₄ yr ⁻¹ | | | | | |
| Initial land use ² | Land use during reporting year | | | | Table 7.15 | 1.0 for Tier1 | $F_{CH_4 downstream} = \sum_{j=1}^{6} \sum_{i=1}^{nres_j} \alpha_i (EF_{CH_4 \ age \le 20, j} \bullet A_{tot j, i}) \bullet R_{d, i}$ | | | | |
| | | | Atot | EF | α_{i} | F _{CH4downstream} | | | | | |
| | WLFlooded | | | | | | | | | | |
| | Total | | | | | | | | | | |

Sub-totals of emissions for each land pre-conversion land-use category will have to be calculated for conversion categories.
 For conversion categories, insert initial land use here. If data by initial land use are not available, use only "non-LU" in this column.

CHAPTER 7 WETLANDS

FLOODED LAND REMAINING FLOODED LAND

INDICATIVE ESTIMATES OF THE ANTHROPOGENIC COMPONENT OF TOTAL EMISSIONS

| | Sector | Agriculture, Forestry and Other Land Use | | | | | | | |
|---------------------|---|---|--|--|---|--|---|--|--|
| | Category | Non CO ₂ emissions for Flooded Land Remaining Flooded Land | | | | | | | |
| Ca | tegory code | 3B4aii ¹ | | | | | | | |
| | Sheet | 1 of 2 | | | | | | | |
| | Equation | Equation 2.2 | Non CO ₂ emissions/removals from Flooded Land remaining Flooded Land Equation 7.16 | | | | | | |
| Land-use | category | Subcategories for reporting year | Areas of reservoir water surface for reservoir > 20 years old 'i' located in climate zone 'j', but excluding areas that were unmanaged waterbodies (lakes and rivers) and unmanaged wetlands | Emission factor for CH4 emitted from Flooded Land for reservoir > 20 yrs located in a climate zone "j" | Emission factor adjustment for trophic state (α _i) in reservoir <i>i</i> within a given climate zone. | annual downstream reservoir CH ₄ emissions (for Reservoirs >20 years old | Indicative estimates of the anthropogenic component of total CH ₄ emissions (for Reservoirs >20 years old (Flooded Land Remaining Flooded Land) | | |
| | т 1 | | ha | kg CH ₄ ha ⁻¹ yr ⁻¹ | Dimension- less | kg CH ₄ yr ⁻¹ | kg CH₄ yr⁻¹ | | |
| Initial land use | Land use during reporting year | | | Table 7.9 | 1.0 for Tier1 | Eq. 10C | $F_{\textit{CH}_{4}\textit{anthrop}} = \sum_{j=1}^{6} \sum_{i=1}^{\textit{nres}_{j}} \alpha_{i} \Big(EF_{\textit{CH}_{4}\textit{age} > 20, j} \bullet A_{\textit{anthrop}, j, i} \Big) + F_{\textit{CH}_{4}\textit{downstream}}$ | | |
| | | | AAnthrop | EF | $\alpha_{\rm i}$ | FCH4downstream | F _{CH4res} | | |
| | | | | | | | | | |
| WLFlooded | WLFlooded | | | | | | | | |
| | | | | | | | | | |
| Total | | | | | | | | | |

| | Sector | Agriculture, Forestry and Other Land Use | | | | | | | | |
|-------------------------------|---|---|--|---|--|--|--|--|--|--|
| | Category | Non CO ₂ emissions for Flooded Land Remaining Flooded Land | | | | | | | | |
| Ca | tegory code | 3B4aii | | | | | | | | |
| | Sheet | 2 of 2 | | | | | | | | |
| | Equation | Equation 2.2 | Non CO ₂ emissions/removals from <i>Flooded Land Remaining Flooded Land</i> Equation 7.10C | | | | | | | |
| Land-use | category ¹ | Subcategories for reporting | Total Area of Flooded Land remaining Flooded Land (Reservoir > 20 yrs old "i") located in a climate zone "j" | Emission factor for CH ₄ emitted from <i>Flooded</i> Land for reservoir > 20 yrs located in a climate zone "j" | Emission factor adjustment for trophic state (a_i) in reservoir i within a given climate zone. | Annual downstream reservoir CH ₄ emissions (for Reservoirs >20 years old (Flooded Land remaining Flooded Land) | | | | |
| | | year | ha | kg CH ₄ ha ⁻¹ yr ⁻¹ | Dimension-less | kg CH ₄ yr ⁻¹ | | | | |
| Initial land use ² | Land use during reporting year | | | Table 7.9 | 1.0 for Tier1 | $F_{CH_4downstream} = \sum_{j=1}^{6} \sum_{i=1}^{nres_j} \alpha_i (EF_{CH_4 \ age>20,j} \bullet A_{tot \ j,i}) \bullet R_{d, \ i}$ | | | | |
| | | | A _{tot} | EF | αi | FCH4downstream | | | | |
| | WLFlooded | | | | | | | | | |
| | Total | | | | | | | | | |

¹ Sub-totals of emissions for each land pre-conversion land-use category will have to be calculated for conversion categories.
² For conversion categories, insert initial land use here. If data by initial land use are not available, use only "non-LU" in this column.

CHAPTER 7 WETLANDS

LAND CONVERTED TO FLOODED LAND

INDICATIVE ESTIMATES OF THE ANTHROPOGENIC COMPONENT OF TOTAL EMISSIONS

| | Sector | | restry and Other Land Use | | | | | | |
|--|---|--------------------------------|---|--|---|--|--|--|--|
| Category CO ₂ emissions from Land converted to Flooded Land | | | | | | | | | |
| (| Category code | 3B4bii | | | | | | | |
| | Sheet | 1 of 1 | | | | | | | |
| Equation | | Equation 2.2 | CO ₂ -C emissions/removals for <i>Land converted to Flooded Land</i> Equation 7.17 | | | | | | |
| Land-use category ¹ | | Subcategories for reporting | Areas of reservoir water surface for reservoir > 20 years old 'i' located in climate zone 'j' but excluding areas that were unmanaged waterbodies (lakes and rivers) and unmanaged wetlands | Emission factor for CO ₂ -C for reservoir \leq 20 years old in climate zone 'j' | Indicative estimates of the anthropogenic component of total emissions of CO₂-C from Land Converted to Flooded Land (Reservoirs ≤ 20 years old) | | | | |
| | Land use during reporting year | year | ha | tonnes CO ₂ -C ha ⁻¹ y ⁻¹ | tonnes CO ₂ -C yr ⁻¹ | | | | |
| Initial land use ² | | luring porting | | Table 7.13 | $F_{CO_2 anthrop} = \sum_{j=1}^{6} \sum_{i=1}^{nres_j} \left(EF_{CO_2 age \leq 20, j} \bullet A_{anthrop, j, i} \right)$ | | | | |
| | | | Aanthrop | EF | FCO2tot | | | | |
| | | | | | | | | | |
| | $WL_{Flooded}$ | | | | | | | | |
| | - | | | | | | | | |
| | Total | | | | | | | | |

Sub-totals of emissions for each land pre-conversion land-use category will have to be calculated for conversion categories.

For conversion categories, insert initial land use here. If data by initial land use are not available, use only "non-LU" in this column.

| | Sector | Agriculture, Forestry and Other Land Use | | | | | | | | | |
|--------------------------------|---|--|--|---|---|---|---|--|--|--|--|
| | Category | Non CO ₂ emissio | Non CO ₂ emissions for Land converted Flooded Land | | | | | | | | |
| Cat | egory code | 3B4bii ¹ | | | | | | | | | |
| | Sheet | 1 of 2 | | | | | | | | | |
| | Equation | Equation 2.2 | Non CO ₂ emissions/removals from Land Converted to Flooded Land Equation 7.18 | | | | | | | | |
| Land-use category ¹ | | Subcategories | Areas of reservoir water surface for reservoir > 20 years old 'i' located in climate zone 'j', but excluding areas that were unmanaged waterbodies (lakes and rivers) and unmanaged wetlands | Emission factor for CH4 emitted from Flooded Land for reservoir > 20 yrs located in a climate zone "j" | Emission factor adjustment for trophic state (α_i) in reservoir i within a given climate zone. | annual downstream reservoir CH ₄ emissions (for Reservoirs >2 0 years old | Indicative estimates of the anthropogenic component of total CH₄ emissions (for Reservoirs ≤20 years old (Land converted to Flooded Land) | | | | |
| | | for reporting year | ha | kg CH ₄ ha ⁻¹ yr ⁻¹ | Dimension-less | kg CH ₄ yr ⁻¹ | kg CH ₄ yr ⁻¹ | | | | |
| Initial land use ² | Land use during reporting year | yeu | | Table 7.15 | 1.0 for Tier1 | Eq. 10C | $F_{CH_4anthrop}$ $= \sum_{j=1}^{6} \sum_{i=1}^{nres_j} \alpha_i \Big(EF_{CH_4age \le 20, j} \bullet A_{anthrop, j, i} \Big)$ $+ F_{CH_4downstream}$ | | | | |
| | | | AAnthrop | EF | $\alpha_{\rm i}$ | FCH4downstream | F _{CH4res} | | | | |
| | | | | | | | | | | | |
| | WLFlooded | | | | | | | | | | |
| | | | | | | | | | | | |
| | Total | | | | | | | | | | |

¹ Sub-totals of emissions for each land pre-conversion land-use category will have to be calculated for conversion categories.
² For conversion categories, insert initial land use here. If data by initial land use are not available, use only "non-LU" in this column.

| | Sector | tor Agriculture, Forestry and Other Land Use | | | | | | | | |
|-------------------------------|---|---|--|---|--|---|--|--|--|--|
| | Category | Non CO ₂ emissions for Flooded Land remaining Flooded Land | | | | | | | | |
| Category code 3B4bii | | | | | | | | | | |
| | Sheet | 2 of 2 | | | | | | | | |
| Equation | | Equation 2.2 | Non CO ₂ emissions/removals from Land Converted to Flooded Land Equation 7.15C | | | | | | | |
| Land-use | e category ¹ | Subcategories for reporting year | Total Area of Flooded Land remaining Flooded Land (Reservoir > 20 yrs old "i") located in a climate zone "j" | Emission factor for CH ₄ emitted from <i>Flooded</i> Land for reservoir > 20 yrs located in a climate zone "j" | Emission factor adjustment for trophic state (a_i) in reservoir i within a given climate zone. | Annual downstream reservoir CH ₄ emissions (for Reservoirs ≤20 years old (Land Converted to <i>Flooded Land</i>) | | | | |
| | | | ha | kg CH ₄ ha ⁻¹ yr ⁻¹ | Dimension-less | kg CH ₄ yr ⁻¹ | | | | |
| Initial land use ² | Land use during reporting year | you | | Table 7.15 | 1.0 for Tier1 | $F_{CH_4 downstream} = \sum_{j=1}^{6} \sum_{i=1}^{nres_j} \alpha_i (EF_{CH_4 \ age \le 20, j} \bullet A_{tot \ j, i}) \bullet R_{d, i}$ | | | | |
| | | | Atot | EF | α_{i} | F _{CH4downstream} | | | | |
| | | | | | | | | | | |
| | WLFlooded | | | | | | | | | |
| | | | | | | | | | | |
| | Total | | | | | | | | | |

¹ Sub-totals of emissions for each land pre-conversion land-use category will have to be calculated for conversion categories.

² For conversion categories, insert initial land use here. If data by initial land use are not available, use only "non-LU" in this column.