Documentation of activity data and emission factors used for the GHG inventory for the LULUCF sector in Bangladesh

Bangladesh Forest Department

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Contents

1. Forestland

1.1 Annual change in carbon stocks in living biomass (includes above and below ground biomass)

Reporting Year: 1976

Activity data on forestland area for the year 1976 were derived from (Hasan, Hossain et al. 2013).

Table 1: Average annual net increment in volume suitable for industrial processing.

Average annual net increment in volume suitable for industrial processing			
	Iv	**Reference**	**Notes**
	m^3 ha^{-1} yr^{-1}		
Hill	10.36	(Rahman, Akter et al. 2015). Table 2	
Sal	9.15	(Rahman, Akter et al. 2015). Table 2	The paper reports net increment in volume for Wet deciduous (moist sal) and Dry deciduous (dry sal) sal forest. Mean annual precipitation (MAP) of Dry deciduous (dry sal) was not matched either with tropical moist (MAP: 1000-2000 mm) and tropical rain forest (MAP > 2000 mm). So, we didn't consider the value reported for the Dry deciduous (dry sal) and considered the Wet deciduous (moist sal) forest value,
Sundarban	8.95	(Rahman, Akter et al. 2015). Table 2	
Plantations	10.15	(Rahman, Akter et al. 2015). Table 2	

Table 2: Basic wood density.

Basic wood density			
Wood density values from India, South-east Asia, and South-east Asia Tropical were obtained by DRYAD's Global wood density database (Zanne, Lopez-Gonzalez et al. 2009)			
		D	**Notes**
	Species	**g cm^{-3}**	
Hill forest	Dipterocarpus sp.	0.6454	DBH:2.3-120 cm , Height:-2.4 -44.5 m
	Artocarpus sp.	0.4838	DBH:1.3 to 117 cm, Height:1- 49 m
	Hopea odorata	0.635	DBH:2.5 to 87.9 cm, Height:6.7 -39.7 m
	Palaquium polyanthrum	0.585	DBH:3.5 to 56 cm, Height-8-24 m
	Mangifera sylvatica	0.5166	DBH:2.5 to 71.2 cm, Height-7.3 to 46 m
Mean		0.57316	Since the the hill forest consist of mixed tree species, the average wood density of the

			above species was taken. (0.57316 t m^{-3})
Sal Forest	Shorea robusta	0.73	DBH:10 to 65 cm, Height-5 to 31.3 m. Sal is the dominant species in the Sal forest, and so, only the wood density of Sal was considered
Sundarban		0.5784	DBH: 0.1 to 170 cm, Height-1.3 to 89.4 m
Plantations		0.56247	The mean wood desnity (0.56247) of 44 tree species found in plantations was considered. The wood density of coastal plantations is 0.5784 which is close to the mean estimated.

Table 3: Biomass Expansion factor for conversion of annual net increment (including bark) to above ground tree biomass increment.

Biomass Expansion factor for conversion of annual net increment (including bark) to above ground tree biomass increment			
	BEF_1	**Reference**	**Notes**
Hill	1.5	(Penman, Gytarsky et al. 2003), Table 3A.1.10	Default value for tropical forests
Sal	1.5	(Penman, Gytarsky et al. 2003), Table 3A.1.10	Default value for tropical forests
Sundarban	1.5	(Penman, Gytarsky et al. 2003), Table 3A.1.10	Default value for tropical forests
Plantations	1.5	(Penman, Gytarsky et al. 2003), Table 3A.1.10	Default value for tropical forests

Table 4: Root-shoot ratio appropriate to increments.

Root-shoot ratio appropriate to increments			
	R	**Reference**	**Notes**
Hill	0.24	(Penman, Gytarsky et al. 2003), Table 3A.1.8	Default value for primary tropical/sub-tropical moist forest
Sal	0.24	(Penman, Gytarsky et al. 2003), Table 3A.1.8	Default value for primary tropical/sub-tropical moist forest
Sundarban	0.24	(Penman, Gytarsky et al. 2003), Table 3A.1.8	Default value for primary tropical/sub-tropical moist forest
Plantations	0.24	(Penman, Gytarsky et al. 2003), Table 3A.1.8	Default value for primary tropical/sub-tropical moist forest

Table 5: Carbon fraction of dry matter.

Carbon fraction of dry matter			
	CF (tonnes C tonne d.m.$^{-1}$)	**Reference**	**Notes**
Hill	0.5	(Penman, Gytarsky et al. 2003),	Default value
Sal	0.5	(Penman, Gytarsky et al. 2003),	Default value
Sundarban	0.5	(Penman, Gytarsky et al. 2003),	Default value

Plantations	0.5	(Penman, Gytarsky et al. 2003),	Default value

Table 6: Annually extracted volume of roundwood in 1976.

Annually extracted volume of roundwood in 1976			
	H (m^3 yr^{-1})	**References**	**Notes**
Hill			Extraction of roundwood from Hill forest is illegal.
Sal			Extraction of roundwood from Sal forest is illegal.
Sundarban			Extraction of roundwood from Sundarban is illegal.
Plantations	919,000	(FRA 2000)	According to (FRA 2000) the annual extracted value of round wood was 1999000 m^3 yr^{-1} in 2000 and 2224000 m^3 yr^{-1} in 2005. Based on these values we estimated that the annual increase of extracted volume of roundwood at 45,000 m^3 yr^{-1} (2224000-1999000)/5. Therefore, it was estimated that the extraction of roundwood in 1976 was 919,000 m^3 yr^{-1}. We assumed that this amount was evenly removed from the 5 sub-categories of plantations. Hence it was estimated that 183,800 m^3 yr^{-1} of roundwood were removed from each sub-category of plantation.
TMF_LAC_Plantation	183,800	(FRA 2000)	
TMF_WET_Plantation	183,800	(FRA 2000)	
TRF_HAC_Plantation	183,800	(FRA 2000)	
TRF_LAC_Plantation	183,800	(FRA 2000)	
TRF_WET_Plantation	183,800	(FRA 2000)	

Table 7: Biomass expansion factor for converting volumes of extracted roundwood to total aboveground biomass (including bark).

Biomass expansion factor for converting volumes of extracted roundwood to total aboveground biomass (including bark)			
	BEF_2	**References**	**Notes**
Hill	1.59	(Haripriya 2002)	BEF_2 developed in India for evergreen, semi-evergreen forest for trees with diameter class <10 cm.
Sal	1.59	(Haripriya 2002)	BEF_2 developed in India for Sal forest for trees with diameter class <10 cm.
Sundarban	1.59	(Haripriya 2002)	Assumed 1.59.
Plantations	1.59	(Haripriya 2002)	BEF_2 developed in India for Dipteocarpus and Teak forest for trees with diameter class <10 cm.

Table 8: Fraction of biomass left to decay in forest.

Fraction of biomass left to decay in forest			
	f_{BL}	Reference	Notes
Hill	0	(Penman, Gytarsky et al. 2003)	Total biomass associated with the volume of the extracted roundwood is considered as an immediate emission. This is the default assumption and implies that f_{BI} should be set to 0.
Sal	0	(Penman, Gytarsky et al. 2003)	
Sundarban	0	(Penman, Gytarsky et al. 2003)	
Plantations	0	(Penman, Gytarsky et al. 2003)	

Table 9: Annual volume of fuelwood gathering in 1976.

Annual volume of fuelwood gathering in 1976			
	FG (m^3 yr^{-1})	References	Notes
Hill			Firewood collection in Hill forest is illegal although in some parts of hill forest the collection of firewood is permitted. However, it was assumed that there was no firewood collection in Hill forests.
Sal			Same as above. The collection in Sal is illegal and therefore it was set to 0.
Sundarban			Same as above.
Plantations	140,200	(FRA 2005)	According to FRA 2005, the total volume of fuelwood gathering in 2000 was 865,000 m^3 yr^{-1} and in 2005 was 1,016,000 m^3 yr^{-1}. Based on these two values, we estimated that the annual increase in fuelwood removal was 30,200 m^3 yr^{-1} (1,016,000 - 865,000)/5. Therefore, it was calculated that the total amount of fuelwood removed was 140,200 m^3 yr^{-1} in 1976. We assumed that this amount was evenly removed from the 5 sub-categories of plantations.
TMF_LAC_Plantation	28,040		
TMF_WET_Plantation	28,040		
TRF_HAC_Plantation	28,040		
TRF_LAC_Plantation	28,040		
TRF_WET_Plantation	28,040		

No data on Forest areas affected by disturbances were found for the year 1976.

Table 10: Average biomass stock of forest areas [Harmonization file from previous inventories]

Average biomass stock of forest areas			
	B_w	**References**	**Notes**
	tonnes d.m. ha^{-1}		
Hill			
Sal			
Sundarban			
Plantations			

Reporting Year: 1996

Activity data on forestland area for 1996 were derived from (SRDI 1996).

The values of emission factors that were used in 1996 were the same as in 1976.

Table 11: Annually extracted volume of roundwood in 1996.

Annually extracted volume of roundwood in 1996			
	H (m^3 yr^{-1})	**References**	**Notes**
Hill			Extraction of roundwood from Hill forest is illegal.
Sal			Extraction of roundwood from Sal forest is illegal.
Sundarban			Extraction of roundwood from Sundarban is illegal.
Plantations	1,819,000	(FRA 2000)	According to (FRA 2000) the annual extracted value of round wood was 1999000 m^3 yr^{-1} in 2000 and 2224000 m^3 yr^{-1} in 2005. Based on these values we estimated that the annual increase of extracted volume of roundwood at 45,000 m^3 yr^{-1} (2224000-1999000)/5. Therefore, it was estimated that the extraction of roundwood in 1996 was 1,819,000m^3 yr^{-1}. We assumed that this amount was evenly removed from the 5 sub-categories of plantations. Hence it was estimated that 363,800 m^3 yr^{-1} of roundwood were removed from each sub-category of plantation.
TMF_LAC_Plantation	363,800		
TMF_WET_Plantation	363,800		
TRF_HAC_Plantation	363,800		
TRF_LAC_Plantation	363,800		
TRF_WET_Plantation	363,800		

Table 12: Annual volume of fuelwood gathering in 1996

Annual volume of fuelwood gathering in 1996			
	FG (m^3 yr^{-1})	References	Notes
Hill			Firewood collection in Hill forest is illegal although in some parts of hill forest the collection of firewood is permitted. However, it was assumed that there was no firewood collection in Hill forests.
Sal			Same as above. The collection in Sal is illegal and therefore it was set to 0.
Sundarban			Same as above.
Plantations	744,200	(FRA 2005)	According to FRA 2005, the total volume of fuelwood gathering in 2000 was 865,000 m^3 yr^{-1} and in 2005 was 1,016,000 m^3 yr^{-1}. Based on these two values, we estimated that the annual increase in fuelwood removal was 30,200 m^3 yr^{-1} (1,016,000 - 865,000)/5. Therefore, it was calculated that the total amount of fuelwood removed was 744,200 m^3 yr^{-1} in 1996. We assumed that this amount was evenly removed from the 5 sub-categories of plantations.
TMF_LAC_Plantation	148,840		
TMF_WET_Plantation	148,840		
TRF_HAC_Plantation	148,840		
TRF_LAC_Plantation	148,840		
TRF_WET_Plantation	148,840		

No data on Forest areas affected by disturbances were found for the year of 1996.

Reporting Year: 2000

Activity data on forestland area for 2000 were derived from (Hasan, Hossain et al. 2013).

The values of emission factors that were used in 2000 were the same as in 1976.

Table 13: Annually extracted volume of roundwood in 2000.

Annually extracted volume of roundwood in 2000			
	H (m^3 yr^{-1})	References	Notes
Hill	0		Extraction of roundwood from Hill forest is illegal.
Sal	0		Extraction of roundwood from Sal forest is illegal.
Sundarban	0		Extraction of roundwood from Sundarban is illegal.
Plantations	1999000	(FRA 2000)	Only extraction of roundwood from plantation was

			considered. The data were taken from FRA 2000 which are based on the Forestry Master Plan 1992 (FMP 1992). It was assumed that the amount of roundwood was evenly removed from the 5 sub-categories of plantations.
TMF_LAC_Plantation	399800	(FRA 2000)	
TMF_WET_Plantation	399800	(FRA 2000)	
TRF_HAC_Plantation	399800	(FRA 2000)	
TRF_LAC_Plantation	399800	(FRA 2000)	
TRF_WET_Plantation	399800	(FRA 2000)	

Table 14: Annual volume of fuelwood gathering in 2000.

Annual volume of fuelwood gathering in 2000			
	FG (m^3 yr^{-1})	**References**	**Notes**
Hill			Firewood collection in Hill forest is illegal although in some parts of hill forest the collection of firewood is permitted. However, it was assumed that there was no firewood collection in Hill forests.
Sal			Same as above. The collection in Sal is illegal and therefore it was set to 0.
Sundarban			Same as above.
Plantations	865,000	(FRA 2005)	The data are based on data sources from (Anon 2004), (SYB 1997), (GOB 1992). The data quality has been characterized as medium. It was assumed that the amount of fuelwood was evenly removed from the 5 sub-categories of plantations.
TMF_LAC_Plantation	173000	(FRA 2005)	
TMF_WET_Plantation	173000	(FRA 2005)	
TRF_HAC_Plantation	173000	(FRA 2005)	
TRF_LAC_Plantation	173000	(FRA 2005)	
TRF_WET_Plantation	173000	(FRA 2005)	

No data on Forest areas affected by disturbances were found for the year of 2000.

Reporting Year: 2004

Activity data on forestland area for 2004 were derived from (SRDI 2004)

The same values of emission factors were used in 2004 as in 1976.

Table 15: Annually extracted volume of roundwood in 2004

Annually extracted volume of roundwood in 2004

	H (m^3 yr^{-1})	References	Notes
Hill	0		Extraction of roundwood from Hill forest is illegal.
Sal	0		Extraction of roundwood from Sal forest is illegal.
Sundarban	0		Extraction of roundwood from Sundarban is illegal.
Plantations	2,179,000	(FRA 2000)	According to (FRA 2000) the annual extracted value of round wood was 1999000 m^3 yr^{-1} in 2000 and 2224000 m^3 yr^{-1} in 2005. Based on these values we estimated that the annual increase of extracted volume of roundwood at 45,000 m^3 yr^{-1} (2224000-1999000)/5. Therefore, it was estimated that the extraction of roundwood in 2004 was 2,179,000m^3 yr^{-1}. We assumed that this amount was evenly removed from the 5 sub-categories of plantations. Hence it was estimated that 435800 m^3 yr^{-1} of roundwood were removed from each sub-category of plantation.
TMF_LAC_Plantation	435800		
TMF_WET_Plantation	435800		
TRF_HAC_Plantation	435800		
TRF_LAC_Plantation	435800		
TRF_WET_Plantation	435800		

Table 16: Annual volume of fuelwood gathering in 2004.

Annual volume of fuelwood gathering in 2004			
	FG (m^3 yr^{-1})	**References**	**Notes**
Hill			Firewood collection in Hill forest is illegal although in some parts of hill forest the collection of firewood is permitted. However, it was assumed that there was no firewood collection in Hill forests.
Sal			Same as above. The collection in Sal is illegal and therefore it was set to 0.
Sundarban			Same as above.
Plantations	986,000	(FRA 2005)	The data are based on data sources from (Anon 2004), (SYB 1997), (GOB 1992). The data quality has been characterized as medium. It was assumed that the amount of fuelwood was evenly removed from the 5 sub-categories of plantations.
TMF_LAC_Plantation	197,200	(FRA 2005)	
TMF_WET_Plantation	197,200	(FRA 2005)	
TRF_HAC_Plantation	197,200	(FRA 2005)	
TRF_LAC_Plantation	197,200	(FRA 2005)	
TRF_WET_Plantation	197,200	(FRA 2005)	

Table 17: Forest areas affected by disturbances in 2004

Forest areas affected by disturbances in 2004			
2005	$A_{disturbance}$	Reference	Notes
	ha		
TMF_HAC_Hill	454	(FRA 2015)	The FRA 2015 data are based on Fire occurrence map of Bangladesh International Centre for Integrated Mountain Development (ICIMOD) launched real time forest fire detection and monitoring system. (FRA 2015)reports that the total forest area burnt in **2004 was 6,810 ha**. It was assumed that an even area of forest was burnt across the 15 sub-categories of forest.
TMF_HAC_Sal	454		
TMF_LAC_Sundarban	454		
TMF_LAC_Plantation	454		
TMF_LAC_Sal	454		
TMF_WET_Hill	454		
TMF_WET_Sundarban	454		
TMF_WET_Plantation	454		
TMF_WET_Sal	454		
TRF_HAC_Hill	454		
TRF_HAC_Plantation	454		
TRF_LAC_Hill	454		
TRF_LAC_Plantation	454		
TRF_WET_Hill	454		
TRF_WET_Plantation	454		

Reporting Year: 2005

Activity data on forestland area for 2005 were derived from the Forest Department (BFD 2005). The values of emission factors that were used in 2005 were the same as in 2010.

Table 18: Annually extracted volume of roundwood in 2005.

Annually extracted volume of roundwood in 2005			
	H (m^3 yr^{-1})	References	Notes
Hill	0		Extraction of roundwood from Hill forest is illegal.
Sal	0		Extraction of roundwood from Sal forest is illegal.
Sundarban	0		Extraction of roundwood from Sundarban is illegal.
Plantations	2,224,000	(FRA 2000)	Only extraction of roundwood from plantation was considered. The data were taken from FRA 2000 which are based on the Forestry Master Plan 1992 (FMP 1992). It was assumed that the amount of

			roundwood was evenly removed from the 5 sub-categories of plantations. Data from FRA 2005 and and FRA 2010 were not considered because they had medium quality. FAOSTAT does not have new data on roundwood removal for Bangaldesh for 2010. The data on roundwood reported by FAOSTAT are repeated since 2003.
TMF_LAC_Plantation	444,800	(FRA 2000)	
TMF_WET_Plantation	444,800	(FRA 2000)	
TRF_HAC_Plantation	444,800	(FRA 2000)	
TRF_LAC_Plantation	444,800	(FRA 2000)	
TRF_WET_Plantation	444,800	(FRA 2000)	

Table 19: Annual volume of fuelwood gathering in 2005.

Annual volume of fuelwood gathering in 2005			
	FG (m^3 yr^{-1})	**References**	**Notes**
Hill	0		Firewood collection in Hill forest is illegal although in some parts of hill forest the collection of firewood is permitted. However, it was assumed that there was no firewood collection in Hill forests.
Sal	0		Same as above. The collection in Sal is illegal and therefore it was set to 0.
Sundarban	0		Same as above.
Plantations	1,016,000	(FRA 2005)	The data are based on data sources from (Anon 2004), (SYB 1997), (GOB 1992). The data quality has been characterized as medium. It was assumed that the amount of fuelwood was evenly removed from the 5 sub-categories of plantations.
TMF_LAC_Plantation	203,200		
TMF_WET_Plantation	203,200		
TRF_HAC_Plantation	203,200		
TRF_LAC_Plantation	203,200		
TRF_WET_Plantation	203,200		

Table 20: Forest areas affected by disturbances in 2005

Forest areas affected by disturbances in 2005			
2005	**$A_{disturbance}$**	**Reference**	**Notes**
	ha		
TMF_HAC_Hill	858	(FRA 2015)	Based onFire Occurrence map of Bangladesh International Centre for Integrated Mountain Development (ICIMOD) launched realtime forest fire detection and monitoring system. (FRA 2015)reports that the total forest area

			burnt in 2010 was 12,870 ha. It was assumed that an even area of forest was burnt across the 15 sub-categories of forest.
TMF_HAC_Sal	858		
TMF_LAC_Sundarban	858		
TMF_LAC_Plantation	858		
TMF_LAC_Sal	858		
TMF_WET_Hill	858		
TMF_WET_Sundarban	858		
TMF_WET_Plantation	858		
TMF_WET_Sal	858		
TRF_HAC_Hill	858		
TRF_HAC_Plantation	858		
TRF_LAC_Hill	858		
TRF_LAC_Plantation	858		
TRF_WET_Hill	858		
TRF_WET_Plantation	858		

Reporting Year: 2010

Activity data on forestland area for the year 2010 were derived from the report written by (Hasan, Hossain et al. 2013).

The land has been classified by

- Ecological zone based on FAO global ecological zones (FAO 2012)
- Soil type. The soil map FAO-UNDP 1988

Table 21: Annually extracted volume of roundwood in 2010.

Annually extracted volume of roundwood in 2010			
	H (m^3 yr^{-1})	**References**	**Notes**
Hill	0		Extraction of roundwood from Hill forest is illegal.
Sal	0		Extraction of roundwood from Sal forest is illegal.
Sundarban	0		Extraction of roundwood from Sundarban is illegal.
Plantations	2,478,000	(FRA 2000)	Only extraction of roundwood from plantation was considered. The data were taken from FRA 2000 which are based on the Forestry Master Plan 1992 (FMP 1992). It was assumed that the amount of roundwood was evenly removed from the 5 sub-categories of plantations. Data from FRA 2005 and and FRA 2010 were not considered because they had medium quality. FAOSTAT does not have new data on roundwood removal for Bangaldesh for 2010. The data on roundwood reported by FAOSTAT are repeated since 2003.

TMF_LAC_Plantation	495,600	(FRA 2000)	
TMF_WET_Plantation	495,600	(FRA 2000)	
TRF_HAC_Plantation	495,600	(FRA 2000)	
TRF_LAC_Plantation	495,600	(FRA 2000)	
TRF_WET_Plantation	495,600	(FRA 2000)	

Table 22: Annual volume of fuelwood gathering in 2010.

Annual volume of fuelwood gathering			
2010	**FG (m^3 yr^{-1})**	**References**	**Notes**
Hill	0		Firewood collection in Hill forest is illegal although in some parts of hill forest the collection of firewood is permitted. However, it was assumed that there was no firewood collection in Hill forests.
Sal	0		Same as above. The collection in Sal is illegal and therefore it was set to 0.
Sundarban	0		Same as above.
Plantations	1167000	(FRA 2005)	According to FRA 2005, the total volume of fuelwood gathering in 2000 was 865,000 m^3 yr^{-1} and in 2005 was 1,016,000 m^3 yr^{-1}. Based on these two values, we estimated that the annual increase in fuelwood removal was 30,200 m^3 yr^{-1} (1,016,000 - 865,000)/5. Therefore, it was calculated that the total amount of fuelwood removed was 1167000 m^3 yr^{-1} in 2010. We assumed that this amount was evenly removed from the 5 sub-categories of plantations.
TMF_LAC_Plantation	233400		
TMF_WET_Plantation	233400		
TRF_HAC_Plantation	233400		
TRF_LAC_Plantation	233400		
TRF_WET_Plantation	233400		

Table 23: Forest areas affected by disturbances in 2010.

Forest areas affected by disturbances in 2010			
	$A_{disturbance}$	**Reference**	**Notes**
	ha		
TMF_HAC_Hill	634.6666667	(FRA 2015)	Based onFire Occurrence map of Bangladesh International Centre for Integrated Mountain Development (ICIMOD) launched realtime forest fire detection and monitoring system.

			(FRA 2015)reports that the total forest area burnt in 2010 was **9,520** ha. It was assumed that an even area of forest was burnt across the 15 sub-categories of forest.
TMF_HAC_Sal	634.6666667		
TMF_LAC_Sundarban	634.6666667		
TMF_LAC_Plantation	634.6666667		
TMF_LAC_Sal	634.6666667		
TMF_WET_Hill	634.6666667		
TMF_WET_Sundarban	634.6666667		
TMF_WET_Plantation	634.6666667		
TMF_WET_Sal	634.6666667		
TRF_HAC_Hill	634.6666667		
TRF_HAC_Plantation	634.6666667		
TRF_LAC_Hill	634.6666667		
TRF_LAC_Plantation	634.6666667		
TRF_WET_Hill	634.6666667		
TRF_WET_Plantation	634.6666667		

1.2 Annual change in carbon stocks in dead organic matter (dead wood and litter)

The *IPCC Guidelines*, consistent with reporting under Tier 1, assume that the average transfer rate into the dead wood pool is equal to the transfer rate out of the dead wood pool so the net change is zero. This assumption means that magnitude of the dead wood carbon pool need not be quantified (Penman, Gytarsky et al. 2003).

1.3 Annual change in carbon stocks in mineral soils

Tier 1 also assumes that the net change in carbon in mineral soil for forest land remaining forestland is zero (Penman, Gytarsky et al. 2003).

1.4 Annual change in carbon stocks in organic soils

The total land area in organic soils was estimated at 2.48 % (331976.3 ha), based on the soil map entitled “Bangladesh General Soil Type” developed by FAO-UNDP 1988. In order to assess where these organic soils are located in Bangladesh another zoning map of forest areas was used developed by (Akhter 2016). The results showed that most organic soils were found in non-forest areas and therefore were not considerd in the inventory.

1.5 Non-CO_2 emissions from vegetation fires

Reporting Year: 1976

Non-CO_2 emissions derived from fires were not assessed because there were no data on area burnt for the year of 1976.

Reporting Year: 1996

Non-CO_2 emissions derived from fires were not assessed because there were no data on area burnt for the year of 1996.

Reporting Year: 2000

Non-CO_2 emissions derived from fires were not assessed because there were no data on area burnt for the year of 2000.

Reporting Year: 2004

Table 24: Mass of available fuel.

Sub-categories	Mass of available fuel	Reference	Notes
	kg d.m. ha^{-1}		
TMF_HAC_Hill	160400	(Penman, Gytarsky et al. 2003). Table 3.A.1.13	The default data for primary tropical moist forest were used The default value is 160.4 t/ha or 160400 kg d.m ha^{-1}.
TMF_HAC_Sal	160400		Same as above
TMF_LAC_Sundarban	160400		Same as above
TMF_LAC_Plantation	160400		Same as above
TMF_LAC_Sal	160400		Same as above
TMF_WET_Hill	160400		Same as above
TMF_WET_Sundarban	160400		Same as above
TMF_WET_Plantation	160400		Same as above
TMF_WET_Sal	160400		Same as above
TRF_HAC_Hill	160400	(Penman, Gytarsky et al. 2003). Table	There were no data on tropical rainforest and therefore the default for tropical moist forest

		3.A.1.13	was used.
TRF_HAC_Plantation	160400		
TRF_LAC_Hill	160400		
TRF_LAC_Plantation	160400		
TRF_WET_Hill	160400		
TRF_WET_Plantation	160400		

Table 25: Combustion efficiency or fraction of biomass combusted.

Combustion efficiency or fraction of biomass combusted.			
	Dimensionless	**References**	**Notes**
Hill	0.5	(Penman, Gytarsky et al. 2003)	IPCC default
Sal	0.5	(Penman, Gytarsky et al. 2003)	IPCC default
Sundarban	0.5	(Penman, Gytarsky et al. 2003)	IPCC default
Plantations	0.5	(Penman, Gytarsky et al. 2003)	IPCC default

Table 26: CH_4 Emission factor

CH_4 Emission factor			
	g /kg d.m	**References**	**Notes**
Hill	7.1	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires
Sal	7.1	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires
Sundarban	7.1	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires
Plantations	7.1	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires

Table 27: CO Emission factor.

CO Emission factor			
	g /kg d.m	**References**	**Notes**
Hill	112	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires
Sal	112	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires
Sundarban	112	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires
Plantations	112	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires

Table 28: N_2O Emission factor.

N_2O Emission factor			
	g /kg d.m	**References**	**Notes**

Hill	0.11	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires
Sal	0.11	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires
Sundarban	0.11	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires
Plantations	0.11	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires

Table 29: NOx Emission factor.

NOx Emission factor			
	g /kg d.m	**References**	**Notes**
Hill	0.7	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires
Sal	0.7	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires
Sundarban	0.7	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires
Plantations	0.7	(Penman, Gytarsky et al. 2003), Table 3A.1.16	Default value for forest fires

Reporting Year: 2005

The same emissions factors were used as in 2004.

Reporting Year: 2010

The same emissions factors were used as in 2004.

2. Cropland

2.1 Annual change in carbon stocks in living biomass

Reporting Year: 1976

Table 30: Annual growth rate of perennial woody biomass.

Annual growth rate of perennial woody biomass			
	tonnes C ha^{-1} yr^{-1}	**References**	**Notes**
TMF_LAC_Orchard	2.6	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical moist region
TMF_WET_Orchard	2.6	(Penman, Gytarsky et al. 2003),	Default values for tropical

		Table 3.3.2	moist region
TRF_HAC_Orchard	10	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical wet region
TRF_HAC_TeaGarden	10	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical wet region
TRF_LAC_Orchard	10	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical wet region
TRF_WET_Orchard	10	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical wet region
TRF_WET_TeaGarden	10	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical wet region

Table 31: Annual carbon stock in biomass removed.

Annual carbon stock in biomass removed.			
	tonnes C ha^{-1} yr^{-1}	**References**	**Notes**
TMF_LAC_Orchard	21	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical moist region
TMF_WET_Orchard	21	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical moist region
TRF_HAC_Orchard	50	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical wet region
TRF_HAC_TeaGarden	50	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical wet region
TRF_LAC_Orchard	50	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical wet region
TRF_WET_Orchard	50	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical wet region
TRF_WET_TeaGarden	50	(Penman, Gytarsky et al. 2003), Table 3.3.2	Default values for tropical wet region

Reporting Year: 1996

The same values of annual growth rate of perennial woody biomass and annual carbon stock in biomass removed were used for the year of 1996 as in 1976.

Reporting Year: 2000

The same values of annual growth rate of perennial woody biomass and annual carbon stock in biomass removed were used for the year of 2000 as in 1976.

Reporting Year: 2004

The same values of annual growth rate of perennial woody biomass and annual carbon stock in biomass removed were used for the year of 2004 as in 1976.

Reporting Year: 2005

The same values of annual growth rate of perennial woody biomass and annual carbon stock in biomass removed were used for the year of 2005 as in 1976.

Reporting Year: 2010

The same values of annual growth rate of perennial woody biomass and annual carbon stock in biomass removed were used for the year of 2010 as in 1976.

2.2 Annual change in carbon stocks in mineral soils

Reporting Year:1976

Table 32: Inventory time period.

Inventory time period.			
	T (years)	**References**	**Notes**
TMF_LAC_Orchard	20	(Penman, Gytarsky et al. 2003),	Default time period
TMF_WET_Orchard	20	(Penman, Gytarsky et al. 2003)	Default time period
TRF_HAC_Orchard	20	(Penman, Gytarsky et al. 2003)	Default time period
TRF_HAC_TeaGarden	20	(Penman, Gytarsky et al. 2003)	Default time period
TRF_LAC_Orchard	20	(Penman, Gytarsky et al. 2003)	Default time period
TRF_WET_Orchard	20	(Penman, Gytarsky et al. 2003)	Default time period
TRF_WET_TeaGarden	20	(Penman, Gytarsky et al. 2003)	Default time period

Table 33: Reference Carbon stock.

Reference Carbon stock (tonnes C ha^{-1})			
	SOC_{ref}	**References**	**Notes**
TMF_LAC_Orchard	47	(Penman, Gytarsky et al. 2003), Table 3.3.3	Default reference SOC for tropical moist, LAC soils
TMF_WET_Orchard	86	(Penman, Gytarsky et al. 2003), Table 3.3.3	Default reference SOC for tropical moist, WET soils
TRF_HAC_Orchard	44	(Penman, Gytarsky et al. 2003), Table 3.3.3	Default reference SOC for tropical wet, HAC soils
TRF_HAC_TeaGarden	44	(Penman, Gytarsky et al. 2003), Table 3.3.3	Default reference SOC for tropical wet, HAC soils
TRF_LAC_Orchard	60	(Penman, Gytarsky et al. 2003), Table 3.3.3	Default reference SOC for tropical wet, LAC soils
TRF_WET_Orchard	86	(Penman, Gytarsky et al. 2003), Table 3.3.3	Default reference SOC for tropical wet, WET soils
TRF_WET_TeaGarden	86	(Penman, Gytarsky et al. 2003), Table 3.3.3	Default reference SOC for tropical wet, WET soils

Table 34: Stock change factor for land use or land-use change type in the beginning of inventory year.

Stock change factor for land use or land-use change type in the beginning of inventory year			
	$FLU_{(0-T)}$	**References**	**Notes**
TMF_LAC_Orchard	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	The Default for long-term cultivated tropical wet cropland was used for all categories
TMF_WET_Orchard	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_HAC_Orchard	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_HAC_TeaGarden	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_LAC_Orchard	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_WET_Orchard	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_WET_TeaGarden	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	

Table 35: Stock change factor for management regime in the beginning of inventory year.

Stock change factor for management regime in the beginning of inventory year			
	$FMG_{(0-T)}$	**References**	**Notes**
TMF_LAC_Orchard	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	Default for no-till tropical wet
TMF_WET_Orchard	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_HAC_Orchard	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_HAC_TeaGarden	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_LAC_Orchard	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_WET_Orchard	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_WET_TeaGarden	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	

Table 36: Stock change factor for input of organic matter in the beginning of inventory year

Stock change factor for input of organic matter in the beginning of inventory year

	$FI_{(0-T)}$	References	Notes
TMF_LAC_Orchard	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	Default for low input tropical wet
TMF_WET_Orchard	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_HAC_Orchard	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_HAC_TeaGarden	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_LAC_Orchard	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_WET_Orchard	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_WET_TeaGarden	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	

Table 37: Stock change factor for land use or land-use change type in current inventory year

Stock change factor for land use or land-use change type in current inventory year			
	$FLU_{(0)}$	References	Notes
TMF_LAC_Orchard	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	It was assume that the same land-use regime was applied in the current inventory years as in the beginning of the inventory year and therefore the same Default values were used.
TMF_WET_Orchard	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_HAC_Orchard	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_HAC_TeaGarden	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	

TRF_LAC_Orchard	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_WET_Orchard	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_WET_TeaGarden	0.58	(Penman, Gytarsky et al. 2003), Table 3.3.4	

Table 38: Stock change factor for management regime in current inventory year

Stock change factor for management regime in current inventory year			
	$FMG_{(0)}$	**References**	**Notes**
TMF_LAC_Orchard	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	It was assume that the same management regime was applied in the current inventory years as in the beginning of the inventory year and therefore the same Default values were used.
TMF_WET_Orchard	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_HAC_Orchard	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_HAC_TeaGarden	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_LAC_Orchard	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_WET_Orchard	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_WET_TeaGarden	1.23	(Penman, Gytarsky et al. 2003), Table 3.3.4	

Stock change factor for input of organic matter in the beginning of inventory year			
	$FI_{(0)}$	**References**	**Notes**
TMF_LAC_Orchard	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	It was assume that the same input management regime was applied in the current inventory years as in the beginning of the inventory year and therefore the same Default values were used.
TMF_WET_Orchard	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_HAC_Orchard	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_HAC_TeaGarden	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	

TRF_LAC_Orchard	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_WET_Orchard	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	
TRF_WET_TeaGarden	0.91	(Penman, Gytarsky et al. 2003), Table 3.3.4	

Reporting Year: 1996

The same values of emission factors were used in 1996 as in 1976.

Reporting Year: 2000

The same values of emission factors were used in 2000 as in 1976.

Reporting Year: 2004

The same values of emission factors were used in 2004 as in 1976.

Reporting Year: 2005

The same values of emission factors were used in 2005 as in 1976.

Reporting Year: 2010

The same values of emission factors were used in 2010 as in 1976.

2.3 Annual change in carbon stocks in organic soils

The annual change in carbon stocks in organic coils was not assessed because there were no organic soils in the cropland areas.

2.4 Carbon emissions from agricultural lime application

2.5 Annual emissions of N_2O from mineral soils

3. Wetland

3.1 Organic soils managed for peat extraction

The GHG emissions from organic soils managed for peat extraction were not assessed because this category was not relevant in the context of Bangladesh.

3.2 Flooded Land Remaining Flooded Land

Reporting Year: 1976

Table 39: Total flooded surface area, including flooded land, flooded lake and flooded river surface area in 1976.

Sub-categories	Total Area (ha)	Managed Inland water (ha) (50% of the total land area)	Reference
TMF_LAC_Inland_ water_body	3397.12	1698.56	(Hasan, Hossain et al. 2013).
TMF_WET_Inland_ water_body	15114.40	7557.2	(Hasan, Hossain et al. 2013).
TRF_HAC_ Inland_water_body	112222.56	56111.28	(Hasan, Hossain et al. 2013).
TRF_LAC_ Inland_water_body	1371.75	685.875	(Hasan, Hossain et al. 2013).
TRF_WET_ Inland_water_body	89344.26	44672.13	(Hasan, Hossain et al. 2013).
Notes: The inland water bodies include lake, beel, haor, mudflat, pond and excavated wetlands for aquaculture. Therefore, inland water bodies include both managed and unmanaged wetlands. In the GHG inventory we considered that50% of the inland water bodies were managed and therefore we estimated emissions only from the managed inland water bodies. The flooded lake and the flooded river surface area were not considered in the inventory due to the lack of data on estimation of the area that was flooded besides lakes and rivers.			

Table 40: Average daily diffusive emissions for CO_2

Sub-categories	$E(CO_2)diff$	References	Notes
	Gg CO_2 ha^{-1} day^{-1}		
TMF_LAC_ Inland_water_body	11.65	(Penman, Gytarsky et al. 2003), Table 3A.3.5	In Bangladesh the duration of the dry period is 6 months (January to April and November-December). The rainy season is from March to October. Therefore, we consider that there was no short-dry season in Bangladesh and the default for the tropical moist long dry season was used.
TMF_WET_	11.65	(Penman,	

Inland_water_body		Gytarsky et al. 2003), Table 3A.3.5	
TRF_HAC_ Inland_water_body	60.4	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default for tropical, wet climate
TRF_LAC_ Inland_water_body	60.4	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default for tropical, wet climate
TRF_WET_ Inland_water_body	60.4	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default for tropical, wet climate

Table 41: Average daily diffusive emissions for CH_4.

Sub-categories	**E(CH4)diff**	**References**	**Notes**
	(Gg CH_4 ha^{-1} day^{-1})		
TMF_LAC_ Inland_water_body	0.31	(Penman, Gytarsky et al. 2003), Table 3A.3.5	In Bangladesh the duration of the dry period is 6 months (January to April and November-December). The rainy season is from March to October. Therefore, we consider that there was no short-dry season in Bangladesh and the default for the tropical moist long dry season was used.
TMF_WET_ Inland_water_body	0.31	(Penman, Gytarsky et al. 2003), Table 3A.3.5	
TRF_HAC_ Inland_water_body	0.64	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default for tropical, wet climate
TRF_LAC_ Inland_water_body	0.64	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default for tropical, wet climate
TRF_WET_ Inland_water_body	0.64	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default for tropical, wet climate

Table 42: Average daily bubble emissions.

Sub-categories	E(CH_4)bubble	References	Notes
	Gg CH_4 ha^{-1} day^{-1}		
TMF_LAC_ Inland_water_body	1.9	(Penman, Gytarsky et al. 2003), Table 3A.3.5	In Bangladesh the duration of the dry period is 6 months (January to April and November-December). The rainy season is from March to October. Therefore, we consider that there was no short-dry season in Bangladesh and the default for the tropical moist long dry season was used.
TMF_WET_ Inland_water_body	1.9	(Penman, Gytarsky et al. 2003), Table 3A.3.5	
TRF_HAC_ Inland_water_body	2.83	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default for tropical, wet climate
TRF_LAC_ Inland_water_body	2.83	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default for tropical, wet climate
TRF_WET_ Inland_water_body	2.83	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default for tropical, wet climate

Table 43: Average daily diffusive emissions for Gg N_2O ha^{-1} day^{-1}.

Sub-categories	E(N_2O)diff	References	Notes
	Gg N_2O ha^{-1} day^{-1}		
TMF_LAC_Inland_water_body	NA	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default emission factor for tropical moist was not available/measured.
TMF_WET_Inland_water_body	NA	(Penman, Gytarsky et al. 2003), Table 3A.3.5	
TRF_HAC_Inland_water_body	0.05	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default for tropical, wet climate
TRF_LAC_Inland_water_body	0.05	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default for tropical, wet climate
TRF_WET_Inland_water_body	0.05	(Penman, Gytarsky et al. 2003), Table 3A.3.5	The default for tropical, wet climate

Reporting Year: 1996

Table 44: Total flooded surface area, including flooded land, flooded lake and flooded river surface area in 1996.

Sub-categories	Total Area (ha)	Managed Inland water (ha) (50% of the total land area)	Reference
TMF_LAC_Inland_water_body	3703.50	1851.75	(SRDI 1996)
TMF_WET_Inland_water_body	16521.88	8260.94	(SRDI 1996)
TRF_HAC_ Inland_water_body	122657.07	61328.54	(SRDI 1996)
TRF_LAC_ Inland_water_body	1501.73	750.865	(SRDI 1996)
TRF_WET_ Inland_water_body	97658.91	48829.46	(SRDI 1996)
Notes: The inland water bodies include lake, beel, haor, mudflat, pond and excavated wetlands for aquaculture. Therefore, inland water bodies include both managed and unmanaged wetlands. In the GHG inventory we considered that50% of the inland water bodies were managed and therefore we estimated emissions only from the managed inland water bodies. The flooded lake and the flooded river surface area were not considered in the inventory due to the lack of data on estimation of the area that was flooded besides lakes and rivers.			

The values of emission factors that were used in 1996 were the same as in 1976.

Reporting Year: 2000

Table 45: Total flooded surface area, including flooded land, flooded lake and flooded river surface area in 2000.

Sub-categories	Total Area (ha)	Managed Inland water (ha) (50% of the total land area)	Reference
TMF_LAC_Inland_water_body	3777.63	1888.815	(Hasan, Hossain et al. 2013).
TMF_WET_Inland_water_body	16807.40	8403.7	(Hasan, Hossain et al. 2013).
TRF_HAC_ Inland_water_body	124792.86	62396.43	(Hasan, Hossain et al. 2013).
TRF_LAC_ Inland_water_body	1525.39	762.695	(Hasan, Hossain et al. 2013).
TRF_WET_ Inland_water_body	99351.91	49675.955	(Hasan, Hossain et al. 2013).
Notes: The inland water bodies include lake, beel, haor, mudflat, pond and excavated wetlands for aquaculture. Therefore, inland water bodies include both managed and unmanaged wetlands. In the GHG inventory we considered that50% of the inland water bodies were managed and therefore we estimated emissions only from the managed inland water bodies. The flooded lake and the flooded river surface area were not considered in the inventory due to the lack of data on estimation of the area that was flooded besides lakes and rivers.			

The values of emission factors that were used in 2000 were the same as in 1976.

Reporting Year: 2004

Table 46: Total flooded surface area, including flooded land, flooded lake and flooded river surface area in 2004.

Sub-categories	Total Area (ha)	Managed Inland water (ha) (50% of the total land area)	Reference
TMF_LAC_Inland_water_body	3846.03	1923.015	(SRDI 2004)
TMF_WET_Inland_water_body	17157.76	8578.88	(SRDI 2004)
TRF_HAC_ Inland_water_body	127377.79	63688.9	(SRDI 2004)
TRF_LAC_ Inland_water_body	1559.54	779.77	(SRDI 2004)
TRF_WET_ Inland_water_body	101417.51	50708.76	(SRDI 2004)
Notes: The inland water bodies include lake, beel, haor, mudflat, pond and excavated wetlands for aquaculture. Therefore, inland water bodies include both managed and unmanaged wetlands. In the GHG inventory we considered that50% of the inland water bodies were managed and therefore we estimated emissions only from the managed inland water bodies. The flooded lake and the flooded river surface area were not considered in the inventory due to the lack of data on estimation of the area that was flooded besides lakes and rivers.			

The values of emission factors that were used in 2004 were the same as in 1976.

Reporting Year: 2005

Table 47: Total flooded surface area, including flooded land, flooded lake and flooded river surface area in 2005.

Sub-categories	Total Area (ha)	Managed Inland water (ha) (50% of the total land area)	Reference
TMF_LAC_Inland_water_body	3865.87	1932.935	(SRDI 2004)
TMF_WET_Inland_water_body	17246.23	8623.115	(SRDI 2004)
TRF_HAC_ Inland_water_body	128034.61	64017.31	(SRDI 2004)
TRF_LAC_ Inland_water_body	1567.58	783.79	(SRDI 2004)
TRF_WET_ Inland_water_body	101940.47	50970.24	(SRDI 2004)
Notes: The inland water bodies include lake, beel, haor, mudflat, pond and excavated wetlands for aquaculture. Therefore, inland water bodies include both managed and unmanaged wetlands. In the GHG inventory we considered that50% of the inland water bodies were managed and therefore we estimated emissions only from the managed inland water bodies. The flooded lake and the flooded river surface area were not considered in the inventory due to the lack of data on estimation of the area that was flooded besides lakes and rivers.			

The values of emission factors that were used in 2005 were the same as in 1976.

Reporting Year: 2010

Table 48: : Total flooded surface area, including flooded land, flooded lake and flooded river surface area in 2010.

Sub-categories	Total Area (ha)	Managed Inland water (ha) (50% of the total land area)	Reference
TMF_LAC_Inland_water_body	3976.45562	1988.228	(Hasan, Hossain et al. 2013)

TMF_WET_Inland_water_body	17692.01527	8846.007635	(Hasan, Hossain et al. 2013)
TRF_HAC_ Inland_water_body	131361.06463	65680.53232	(Hasan, Hossain et al. 2013)
TRF_LAC_ Inland_water_body	1605.68309	802.841545	(Hasan, Hossain et al. 2013)
TRF_WET_ Inland_water_body	104581.09137	52290.54569	(Hasan, Hossain et al. 2013)
Notes: The inland water bodies include lake, beel, haor, mudflat, pond and excavated wetlands for aquaculture. Therefore, inland water bodies include both managed and unmanaged wetlands. In the GHG inventory we considered that50% of the inland water bodies were managed and therefore we estimated emissions only from the managed inland water bodies. The flooded lake and the flooded river surface area were not considered in the inventory due to the lack of data on estimation of the area that was flooded besides lakes and rivers.			

The values of emission factors that were used in 2010 were the same as in 1976.

4. Settlements

4.1 Annual carbon stock change in living biomass

Reporting Year: 1976

Reporting Year: 1996

Reporting Year: 2000

Reporting Year: 2004

Reporting Year: 2005

Reporting Year: 2010

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