

<Review comments by experts on Second Order Draft of Chapter 6 of Wetlands Supplement>

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E_6_0001	Brown, Lynette	6		1	1	In previous Chapters et al. has been italicized in the text and a comma included between al. and the publication year - format for consistency.		Accepted with modifications	We changed it to italic but no comma between et and al according to 2006 IPCC Guidelines.
E_6_0002	Batisha, Ayman	6		21	21	6.1.1Relation to 2006 IPCC Guidelines Maybe 6.1.1 Constructed Wetlands for Wastewater Treatment And 6.1.1 Relation to 2006 IPCC Guidelines Maybe 6.1.2 Relation to 2006 IPCC Guidelines		Accepted	We revised it as you recommend.
E_6_0003	Brown, Lynette	6		67	82	Please define wastewater, it is not included in the glossary. Line 86 suggests non-point source runoff is included in this Chapter's definition of wastewater. What else is included? Please clarify.		Accepted with modifications	The coverage of wastewater types is explained in table 6.3 comprised of domestic wastewater, industrial wastewater including agro-industry and dairy farm wastewater, collected runoff from agricultural land and leachate from landfill. Non-point source is not considered in this chapter. Paragraph that cover line 86 is rewritten. Terminology of wastewater is defined in 2006 GLs (Vol.5, chapter 6, 6.1 Introduction).

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E_6_0004	Chen, Kelin	6		74	80	in lines from 74-75, the sentence of “In general the size of constructed wetlands is varied from 5,000 m2 to 34,000 m2” gives specific range for constructed wetlands as from 5,000 m2 ~ 34,000 m2. It is suggested to give the reasons or evidences about the figures. Taking Ramsar Convention as reference, Human-made wetlands defined in certain size are only in two cases: (a): Ponds; includes farm ponds, stock ponds, small tanks; (generally below 8 ha); (b). Water storage areas; reservoirs/barrages/dams/impoundments (generally over 8 ha). The Convention only specifies the upper limit for ponds and lower limits for water storage areas. It is suggested to adjust the range of constructed wetlands in the document referring to Ramsar Convention. However, if the range is a must requirement, it is suggested to use vague descriptions using order of magnitude such as from 1000 m2 to 10000 m2 instead of using certain figures.		Accepted with modifications	The range of the size comes from Kadlec RH, and Knight RL (1996). We mentioned the size of CWs/SNTWs for compilers to realize it easily. It was just example but made confusion. So we decided to remove it. This chapter "Constructed wetlands for wastewater treatment" does not follows Ramsar Convention, therefore any size of CWs for wastewater treatment must be considered. Generally, the size of CWs depends on the amount of influent wastewater.
E_6_0005	Brown, Lynette	6		75	75	Replace "is varied" with "varies".		Accepted with modifications	This sentence was deleted according to other comments.
E_6_0006	Radunsky, Klaus	6		75	75	The indication of the size of constructed wetlands should be reconsidered. The following wording seems to be more appropriate: In general the size of constructed wetlands is between a few thousand m2 and can reach up to several tenthousand m2."		Accepted with modifications	We mentioned the size of CWs/SNTWs for compilers to realize it easily. It was just example but made confusion for some reviewer. So we decided to remove it.

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E_6_0007	Chen, Kelin	6		79	80	the sentence of "In general the size of semi-natural treatment wetlands is approximately 405,000 m ² " provides certain figures for the size of semi-natural treatment wetlands. It is suggested to provide the source and reason for the figure. Furthermore, the size of semi-natural treatment wetlands differs greatly and it is not reasonable to use an accurate average size of 405,000m ² . It is suggested to provide only lower limit (e.g.8ha) for the size of semi-natural treatment wetlands according to Ramsar Convention.		Rejected	This size of semi-natural treatment wetlands is average value in the literature "Treatment Wetlands" (Kaldec and Knight, 1996). The definition of CWs is not follows Ramsar Convention. We mentioned the size of CWs/SNTWs for compilers to realize it easily. It was just example but made confusion. So we decided to remove it.
E_6_0008	Radunsky, Klaus	6		79	80	The sentence on the size of semi-natural treatment wetlands should be re-written because now the message is that there are no such wetlands smaller 400,000m ² and no larger ones than 410,000 m ² . Reality might be however quite different and not so narrow in size.		Accepted with modifications	We mentioned the size of CWs/SNTWs for compilers to realize it easily. It was just example but made confusion. So we decided to remove it.
E_6_0009	Ueda, Hiroyuki	6		80	80	The size of semi-natural treatment wetland is set as 405,000m ² . However, the value of 405,000 seems to be not scientific. For example, range of the size of semi-natural treatment wetlands seems to be better than the value of 405,000.		Accepted with modifications	This size of semi-natural treatment wetlands is an average value in the literature "Treatment Wetlands" (Kaldec and Knight, 1996). The definition of CWs is not follows Ramsar Convention. We mentioned the size of CWs/SNTWs for compilers to realize it easily. It was just example but made confusion. So we decided to remove it.
E_6_0010	Brown, Lynette	6		82	82	Capitalize the s in "supplement".		Accepted	
E_6_0011	Batisha, Ayman	6		83	83	APPLICATION OF CONSTRUCTED WETLANDS FOR WASTEWATER TREATMENT		Noted	

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E_6_0012	Wiseman, Michael	6		91	91	The fourteenth word should be THE		Accepted	
E_6_0013	Gao, Qingxian	6		94	104	The description about TYPE OF CW is inconsistent with the figure 6.1. There are three macrophyte growth forms listed in the bracket, such as emergent, submerged and free-floating, but in the figure 6.1, there are 4 macrophyte growth forms, also include floating leaved plants. Please to add "floating leaved plants" in the bracket or to add "etc." in the text. The figure 6.1 is suggested to be modified to cover all CWs types, such as "semi-natural treatment wetlands"		Accepted	"floating leaved plants" was added to the text. We added comment to figure 6.1 " Most of semi-natural treatment wetlands represent surface flow type wetlands."
E_6_0014	Wang, Hanjie	6		100	101	PLEASE ADD: Chu et al, (2006) use a series of artificial wetlands to purify mining water issued from a coalmine and then used for pithead virescence, which made the desolate pithead located in the desertification area being full of vitality. The technique integrated wetland construction, mining water purification, as well as the pithead landscape architecture together, provide a new technique of water-saving and mining water recycling for virescence in desertification area.		Rejected	This paper is good in terms of wetlands technology to treat mining wastewater. However, we focus on emission of CH4 and N2O from wetlands.
E_6_0015	Ueda, Hiroyuki	6		101	103	It seems to be difficult to get intuitive understanding of the function of horizontal flow from the picture of the "Horizontal flow" in the figure 6.1.		Accepted with modifications	Figure 6.1 has been developed to address the clear function of all CW types.
E_6_0016	Yamada, Masato	6		101	112	Oxidation/Stabilization Pond/Dich/Lagoon for wastewater treatment often have heavy vegetation inside. Are they surface flow constructed wetland? If not, how to distinguish?		Noted	Heavy vegetation will not occur in well managed oxidation/stabilization pond/ditch/lagoon. But if it is usual, it can be considered as semi-natural treatment wetlands or surface flow CWs.

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E_6_0017	Brown, Lynette	6		102	103	Add a dash between "Free Floating" to match line 96 and delete the dash between "Sub-Surface" to match line 95. If the Figure cannot be edited, revise all occurrences in Chapter text to match the Figure.		Accepted	Figure was revised as proposed.
E_6_0018	Kantawanichkul, Suwasa	6		102	103	Figure 6.1: Most of submerged plant in constructed wetland system are growing near the surface.		Accepted with modifications	Figure 6.1 has been developed to address the clear function of all CW types.
E_6_0019	Lyde, Gund	6		102	103	Figure 6.1 Good set of illustrations.		Noted	
E_6_0020	Wiseman, Michael	6		102	103	Both outflow arrows in the box for Horizontal flow and the Hybrid systems are too big so therefore not clear		Accepted with modifications	Figure 6.1 has been developed to address the clear function of all CW types.
E_6_0021	Brown, Lynette	6		116	116	This line is awkward. I suggest deleting "in VSSF CWs" and delete the s in "percolates" and change the word "is" to "are".		Accepted	
E_6_0022	Brown, Lynette	6		117	118	Delete one occurrence of "thus".		Accepted	
E_6_0023	Brown, Lynette	6		132	133	Insert comma before "having" and after "bed".		Accepted	
E_6_0024	Brown, Lynette	6		149	149	Previous Chapters have abbreviated greenhouse gas (GHG). I suggest introducing this abbreviation here and using it throughout the remainder of the Chapter.		Rejected	This abbreviation (GHG) was spelled out in consistent with the 2006 IPCC Guidelines.
E_6_0025	Penman, Jim	6		149		No need for inverted commas to surround 'byproduct' (editorial only)		Accepted	

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E_6_0026	Brown, Lynette	6		151	151	Delete "nitrous oxide" and replace with abbreviation.		Accepted	
E_6_0027	Wiseman, Michael	6		151	151	fifth word should be A		Accepted	
E_6_0028	Wiseman, Michael	6		158	158	Is there any need for the second set of brackets around (GROUND)		Rejected	The parentheses are inserted for a case of SF CWs.
E_6_0029	Brown, Lynette	6		170	170	Delete "in".		Accepted	
E_6_0030	Brown, Lynette	6		175	175	Previous Chapters have abbreviated emission factors (EFs). I suggest introducing this abbreviation here and using it throughout the remainder of the Chapter.		Rejected	This abbreviation (EF) was spelled out in consistent with the 2006 IPCC Guidelines.
E_6_0031	Brown, Lynette	6		178	179	A table should be able to stand alone without referring to the text, therefore, at the end of the table title insert "(CWs)". Also, the "Type of CW" should be spelled out either in a footnote or as in Table 6.4. Source d and y are the same, delete y and update table. Several of these sources are not listed in the References (Tanner, Tai, Gui, Strom, Liu, Sha, Chiemchaishri, Xue, and Mander et al., 2005) - please add to References or delete from table.		Accepted with modifications	Table 6.2 was updated and modified to be understandable in itself with reference checked.
E_6_0032	Lyde, Gund	6		178	179	Liu et al 2009; Nahlik & Mitsch 2010; Van der Zaag 2010; Sha et al 2011; Mander et al 2005; Chiemchaishri et al 2009; Xue et al 1999;		Accepted	References in Table 6.2 were checked and corrected.
E_6_0033	Wang, Hanjie	6		181	181	insert volume 5 after "chapter 6"		Accepted	

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E_6_0034	Brown, Lynette	6		187	187	Delete "treating ones".		Accepted	
E_6_0035	Smith, Keith	6		187	187	Revise English expression: delete "..treating domestic wastewater treating ones" at the end of the sentence and replace by "..from wetlands treating domestic wastewater."		Accepted with modifications	
E_6_0036	Lyde, Gund	6		191	193	Figure 6.2. The use of bold frames of the treatment systems makes the flowchart easy to follow and the black colored box links it all with this supplement and chapter.		Accepted	
E_6_0037	Brown, Lynette	6		192	193	This Figure does not match the text in line 89-90. Constructed wetlands can be used for sole/primary treatment or secondary, or tertiary treatment. Perhaps the Figure title should be revised to clarify these are the systems and pathways considered in the IPCC Guidelines.		Accepted	We added footnote to clarify this figure considered in IPCC 2006 Guidelines.
E_6_0038	Brown, Lynette	6		194	194	Insert "in" before 2006.		Accepted	
E_6_0039	Brown, Lynette	6		199	200	Pluralize "wetland", capitalize "supplement" and change "is" to "are".		Accepted	

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E_6_0040	Ueda, Hiroyuki	6		205	207	<p>The line 205 indicates that CH₄ emissions from solid waste landfill leachate have already been considered in solid waste disposal on land in Chapter 3, Volume 5 in 2006 IPCC GL. According to this explanation, CH₄ emission from solid waste landfill leachate is included in CH₄ emission from solid waste disposal on land regardless of leachate treatment methods. However, CH₄ generation from leachate treatment is different depend on leachate treatment methods (e.g. anaerobic treatment produces more CH₄ than aerobic treatment). So, explanation in the line 205 is not enough scientific and should be revised. Furthermore, explanation in the cell for "Methane" and "leachate from landfill" in the table 6.3 neglects DOC lost with leachate because DOC lost with leachate is less than 1 percent. However, this explanation is not in line with explanation in the 205.</p> <p>For referential information, Landfills in Japan have to equip leachate collection and treatment facilities according to waste management ordinance. Therefore, Japan reports CH₄ and N₂O emissions from leachate treatment facilities in annual GHG inventory in section 6.B.1.</p>		Rejected	<p>According to Chapter 3, Volume 5 in the 2006 IPCC Guidelines, all amount of carbon in solid waste is subjected to estimation of CH₄ in landfill site, and carbon loss with leachate is not considered because of its low percentage. That means CH₄ emission from leachate treatment is already covered.</p> <p>If CH₄ emission from CWs treating leachate is accounted, the amount of carbon in leachate must be subtracted from that in solid waste to avoid double counting. Normally carbon in leachate is indicated in terms of COD, conversion rate from COD in leachate to TOC in solid waste must be needed. This estimation can be applied in tier 2 or 3 estimation.</p> <p>We added this explanation in the text.</p>

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E_6_0041	Yamada, Masato	6		205	208	CH4 emissions from landfill leachate treatment was not considered in Ch3 Vol5. In the note at p3.15, "In countries with high precipitation rates the amount of DOC lost through leaching may be higher. In Japan, where the precipitation is high, SWDS with high penetration rate, have been found to leach significant amounts of DOC (sometimes more than 10 percent of the carbon in the SWDS) (Matsufuji et al., 1996)." Most of SWDSs in developing countries treat leachate by CW/lagoon. In tropical region with high precipitation, CH4 emission from such source should be not negligible. And this CW chapter including N2O emissions is inconsistent with that the chapter do not deal with CH4. Because there are no evidence that N load by leachate from total stored N in landfill is quite larger than C load by leachate from total stored C in landfill. Then CH4 emissions from leachate treatment by Cw should be included in this chapter.		Rejected	According to Chapter 3, Volume 5 in the 2006 IPCC Guidelines, all amount of carbon in solid waste is subjected to estimation of CH4 in landfill site, and carbon loss with leachate is not considered because of its low percentage. That means CH4 emission from leachate treatment is already covered. If CH4 emission from CWs treating leachate is accounted, the amount of carbon in leachate must be subtracted from that in solid waste to avoid double counting. Normally carbon in leachate is indicated in terms of COD, conversion rate from COD in leachate to TOC in solid waste must be needed. This estimation can be applied in tier 2 or 3 estimation. We added this explanation in the text. On the other hand, no methodology is provided for N2O emissions from solid waste disposal site in 2006 IPCC Guidelines. So N2O emissions from leachate treatment can be accounted.
E_6_0042	Brown, Lynette	6		210	211	This Table is not referenced in the text. If it is not needed, delete it - otherwise add reference in text. Also spell out 1st occurrence of DOC in table.		Accepted with modifications	We refered table 6.3 in the text. DOC was spelled out.
E_6_0043	Lyde, Gund	6		210	211	Table 6.3 Consider giving the location in the supplement rather than saying 'included in this supplement'. Makes it easier for the user to follow.		Accepted	We checked it and added location such as section 6.2"

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E_6_0044	Federici, Sandro	6	6.1.1.	211	210	Table 6.3: CH4 and N2O emissions from dairy farm wastewater should be already counted under manure management in Agriculture. Is'nt it?		Rejected	Dairy farm wastewater does not cover manure itself but comes from other activities in the farm.
E_6_0045	Garcia-Diaz, Cristina	6		213	213	given that this chapter is only about constructed wetlands for wastewater treatment, it should be clearly specified, mainly adding this fact to the titles and subtitles in the chapter. Here, in 6.2., it should read "methane emissions from constructed wetlands for wastewater management" to avoid that people using the guidelines think that this could be applied to all constructed wetlands		Accepted with modifications	The title of chapter 6 was revised as CONSTRUCTED WETLANDS FOR WASTEWATER TREATMENT to give clear and accurate explanation.
E_6_0046	Brown, Lynette	6		226	226	Should be "conditions occur".		Accepted	
E_6_0047	Brown, Lynette	6		228	228	Should be "harvested from constructed wetlands".		Accepted	
E_6_0048	Yamada, Masato	6		228	231	When the amount of vegetation harvesting will not be considered, where to go C and N in dead plant? Amount of C (and in some cases for N) in CW should be increase by assimilation of plants. At least emissions from dead plants should be including the range of uncertainty.		Rejected	Dead plants remain inside CWs and must be a source of CH4 and N2O. However, EFs provided in this chapter derived from many field data which include emissions from dead plants. The data include harvesting case, too. Although mass balance of C and N is important, there are so many factors such as vegetation harvesting, taking away by insects and animals, plant fixation, and volatilization. It is so complicated, and we do not have enough scientific data to develop EFs considering these factors.
E_6_0049	Lyde, Gund	6		260	271	Figure 6.3. Consider defining 'bottom-up data' perhaps in a footnote.		Accepted	Bottom-up data means site specific measurement data. The words were changed.

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E_6_0050	Federici, Sandro	6	6.1.1.	285	287	What is a "key pathway"?		Accepted	The word 'key pathway' has been used in 2006 GLs to identify flow of wastewater treatment technology that is dominant in the key categories. It is depended on country situation
E_6_0051	Wiseman, Michael	6		285	286	In first diamond box the second IS isn't required (Is CW (is) a key.....)		Accepted	
E_6_0052	Brown, Lynette	6		287	287	The o in Bo should be subscript.		Accepted	
E_6_0053	Ueda, Hiroyuki	6		287	287	In the 5th decision box in the figure 6.3, question is "Is CW is a key pathway of key category?". However, it seems to be difficult to decide whether the answer is Yes or No, because there is no definition of "key pathway". Concrete explanation for "key pathway" should be added.		Accepted	The word 'key pathway' has been used in 2006 GLs to identify flow of wastewater treatment technology that is dominant in the key categories. It is depended on country situation
E_6_0054	Ueda, Hiroyuki	6		287	287	If the answer of Yes is selected in the 5th decision box in the figure 6.3 ("Is CW is a key pathway of key category?"), next direction is "Estimate country specific B0 and MCF". However, in the 4th decision box ("Are country-specific EFs available for CW treatment?"), the answer of No was already selected and there seems to be contradiction with "Estimate country specific B0 and MCF". So, this decision box should be revised. Furthermore, the way to set country specific B0 and MCF should be explained in the Guideline.		Rejected	If the answer of Yes is selected in the 5th decision box "Is CW is a key pathway of key category?", country specific Bo and MCF must be developed because CW is a key pathway of key category.
E_6_0055	Ueda, Hiroyuki	6		296	328	There is no explanation for CH4 estimation method from "Hybrid Constructed Wetlands" in the 6.2.1.2. So, CH4 estimation method should be explained in the Guideline.		Accepted	Area-weighted average of MCF can be used for hybrid systems. Detailed explanation of method for Hybrid CWs was added.

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E_6_0056	Zheng, Xunhua	6		317	318	Change "...each type of constructed wetland treating domestic and industrial wastewater is provided..." to "...SF, VSSF and HSSF is provided..."; Change "... rates: each MCF is..." to "...rates. Each MCF in Table 4 is..."		Accepted	
E_6_0057	Ueda, Hiroyuki	6		320	320	In the table 6.4, explanation for HSSF is located upper than VSSF. However, in other figure or paragraph (e.g. Chapter 6.1), explanation for VSSF is prior to HSSF. This inconsistency should be revised.		Accepted	We explain the order SF, HSSF and VSSF. Figures and paragraphs were revised in this order.
E_6_0058	Wang, Chunfeng	6		326	327	Being focused on artificial wetlands, this chapter did not discuss semi-natural wetlands in full, which cannot be replaced with a single default value. Therefore, it is suggested to remove "Generally semi-natural treatment wetlands are surface flow type, therefore, the default MCF of 327 0.35 can be used."		Accepted with modifications	The word "generally" was changed to "Most commonly". Reference was also added to this sentence. Then, we consulted the literature and found most of semi-natural treatment wetlands are surface flow type.
E_6_0059	Zheng, Xunhua	6		326	326	Between "...tier approach." and "Generally...", please add "There was insufficient actual measurement data of hybrid systems to derive MCF values. If the area fractions of SF, VSSF and HSSF for hybrid systems can be determined, the MCF values of the hybrid systems may be estimated as the area-weighted averages of the MCFs for SF, VSSF and HSSF; otherwise, arithmetic means of the MCFs for SF, VSSF and HSSF may be used to estimate the MCF of hybrid systems."		Accepted	Explanation of area-weighted average of MCF was added.
E_6_0060	Wiseman, Michael	6		339	339	This should be on the next page		Accepted	

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E_6_0061	Gao, Qingxian	6		346	348	In equation 6.4, the industry sector is not included in this equation. Because the COD concentration is obviously different from different industrial sector, in order to be consists with 2006 IPCC guideline, so the industrial sector is suggested to be included in this section.		Rejected	To avoid duplication with the 2006 IPCC Guidelines, we explained in the text as follows. "Examples of industrial wastewater data from various industries are provided in Table 6.9, Chapter 6, Volume 5 of the 2006 IPCC Guidelines."
E_6_0062	Brown, Lynette	6		350	350	Delete dash in "domestic-or".		Accepted	
E_6_0063	Ueda, Hiroyuki	6		357	358	According to the equation 6.4 and line 357, activity data is explained as COD. However, BOD is also applicable for the equation 6.4. So, further explanation or footnote should be added to the line 357.		Noted	Organics in industrial wastewater are often expressed in terms of COD. In general, BOD can be applicable based on BOD/COD ratio for each industrial wastewater.
E_6_0064	Wang, Hanjie	6		360	360	insert "chapter 6, volume 5"after"Equation 6.3 in the"		Accepted	
E_6_0065	Nair, Malini	6		362	373	the time series consistency needs examples		Rejected	There are some examples in Volume 1 General Guidance and Reporting of the 2006 IPCC Guidelines. To avoid duplicate, we explained that in 6.2.2 in this chapter.
E_6_0066	Wang, Xia hui	6		372	373	The conditions of hydrology, macrophyte growth, the population served by constructed wetland systems and other factors influencing emissions of methane and nitrous oxide may change year to year. So, these words "Emissions from wastewater treated in constructed wetlands typically do not fluctuate significantly from year to year" is suggested to be deleted.		Noted	The hydrology and macrophyte growth should be stable in well managed CWs. Different loading resulting from population change does not have much impact on emission factors because emissions are correlated with loading (see Annex). Other factors such as abnormal weather are not often occurred, and emissions affected by these phenomenon can be taking into account in tier 2 or 3.

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E_6_0067	Wang, Xia hui	6		386	387	In developing countries, the rural population usually is large, the dispersed small or medium-scale constructed wetlands is common. This maybe an factor influenced the emissions of methane and nitrous oxide. Otherwise, it is very difficult to estimate these emissions. These words "The amount of industrial TOW from small or medium-scale industries that is discharged into constructed wetlands in developing countries" is suggested to revised to "The amount of TOW from small or medium-scale industries and rural domestic wastewater that is discharged into constructed wetlands in developing countries".		Accepted	This sentence was revised as suggested.
E_6_0068	Brown, Lynette	6		389	390	Table 6.5 is not referenced in the text - if not needed delete, otherwise add reference to table in text. Also the o in Bo should be subscript.		Accepted	
E_6_0069	Li, Fadong	6		389	389	the data sources in table 6.5 are unclear. More information on data is recommend to be add as Annex.		Accepted	Uncertainty of MCF calculated as 95% confidence interval is shown in Table 1 in Annex. Uncertainty of COD loading from industrial wastewater is calculated based on Table 6.10 in Chapter 6 in Volume 5 of the 2006 IPCC Guidelines. Others are the same to Tables 6.7 in Chapter 6 in Volume 5 of the 2006 IPCC Guidelines. These explanation was added to Table 6.5.
E_6_0070	Brown, Lynette	6		398	398	Delete space in "per cent" it is one word.		Accepted	
E_6_0071	Brown, Lynette	6		447	447	This line is awkward - please revise.		Accepted	This sentence was rewritten.
E_6_0072	Smith, Keith	6		447	447	Insert "in" after "treatment".		Accepted	
E_6_0073	Federici, Sandro	6	6.3.1	451	451	replace "two" with "three"		Accepted	

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E_6_0074	Kantawanichkul, Suwasa	6		451		Two tier methods for N2O....are summarized below : there are 3 tiers.		Accepted	
E_6_0075	Ueda, Hiroyuki	6		451	451	In the line 451, "Three" is correct (not "Two").		Accepted	
E_6_0076	Wang, Xia hui	6		451	451	Two tier methods for N2O should be revised to "Three tier methods for N2O".		Accepted	
E_6_0077	Wang, Chunfeng	6		462	484	<p>Nitrogen removal by uptake of macrophytes is one of the main ways in constructed wetlands, particularly in surface flow wetlands. The amount of nitrogen uptake by various macrophytes in CW is listed in the reference [Kootatep and Polprasert, 1997]. In Table 1 of the literature, the ratio of N removal by harvesting of plants accounted for about 20% of total N of wastewaters, with highest ratio of 70%.</p> <p>It is suggested, therefore, that:</p> <p>1) One sentence be added to the end of the paragraph Line 462-465: "If the amount of vegetation harvested from constructed wetlands is significant, it is necessary to remove it from the calculation."</p> <p>2) Line 476-478 Equation 6.5 should be modified as $N_{2O\text{ emission}} = (N_{\text{EFFLUENT}} - N_{\text{EXPORT}}) \cdot EF \cdot 44/28$ $N_{\text{EXPORT}} = \text{Total N in plant biomass that is removed from the wetland by harvesting. Subtraction of } N_{\text{EXPORT}} \text{ in equation (6.5) makes it so that represents only the fraction of N from effluent wastewater that is directly available for transforming to nitrous oxide gas, thereby avoiding double counting of N.}$</p>		Rejected	<p>This is good suggestion, however, the harvesting, which has effects of C and N removals, affects gas exchange condition too. The proposed references show data regarding nutrient removal, however, N2O emissions are not discussed with harvesting. EFs provided in this chapter were calculated based on many literatures including harvesting case.</p>

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ID	Expert (Last Name, First Name)	Chapter /Section	Start Line	End Line	Sub-section	Comment	Supplementary documents	Authors' Action	Authors' note
E_6_0077	Wang, Chunfeng	6		462	484	<p>NEXPORT removed from plants was estimated as the product of biomass and N content in each plants.</p> <p>References:</p> <p>Browning, K and Greenway, M. 2003. Nutrient removal and plant biomass in a subsurface flow constructed wetland in Brisbane, Australia. Water Science and Technology, 48(5): 183-189.</p> <p>Greenway, M. 2003. Suitability of macrophytes for nutrient removal from surface flow constructed wetlands receiving secondary treated sewage effluent in Queensland, Australia. Water Science and Technology, 48(2): 121-128.</p> <p>Koottatep T, Polprasert C. Role of plant uptake on nitrogen removal in constructed wetlands located in the tropics. Water Science& Technology, 1997, 36 (12) : 1~8.</p> <p>Tanner, C C. 1996. Plant for constructed wet land treatment systems - A comparison of the growth and nutrient uptake of eight emergent species. Ecological Engineering, 7(1) : 56-83.</p> <p>Reddy and Debusk. 1985. Nutrient removal potential of selected aquatic macrophytes. Journal of Environmental Quality, 14(4) : 459~ 462.</p> <p>Meuleman Arthur F M, et al . 2003. Water and mass budgets of a vertical-flow constructed wetland used for wastewater treatment. Ecological Engineering, 20(1) :</p>		Rejected	<p>This is good suggestion, however, the harvesting, which has effects of C and N removals, affects gas exchange condition too. The proposed references show data regarding nutrient removal, however, N₂O emissions are not discussed with harvesting. EFs provided in this chapter were calculated based on many literatures including harvesting case.</p>
E_6_0078	Yamada, Masato	6		462	465	<p>When the amount of vegetation harvesting will not be considered, where to go C and N in dead plant? Amount of C (and in some cases for N) in CW should be increase by assimilation of plants. At least emissions from dead plants should be including the range of uncertainty.</p>		Rejected	<p>Emission factors in this chapter are derived from field experiment and therefore have taken into account the synergy activity of vegetation and the dead plant. In case country has more precise and specific data, tier 2 or 3 can be employed. Uncertainty estimated has covered the derived field data include dead plants.</p>

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E_6_0079	Federici, Sandro	6	6.3.1.1	525	528	What is a "key pathway"?		Accepted	Key pathway is used in 2006 IPCC Guidelines which in general refer to the dominant treatment technology in the wastewater discharge pathway. This pathway is depended on country situation.
E_6_0080	Wiseman, Michael	6		525	526	Same as lines 285/286		Accepted	The word 'key pathway' has been used in 2006 GLs to identify flow of wastewater treatment technology that is dominant in the key categories. It is depended on country situation
E_6_0081	Zheng, Xunhua	6		540	540	Immediately before "Good practice", please add "There was insufficient actual measurement data of hybrid systems to derive MCF values. If the area fractions of SF, VSSF and HSSF for hybrid systems can be determined, the MCF values of the hybrid systems may be estimated as the area-weighted averages of the MCFs for SF, VSSF and HSSF; otherwise, arithmetic means of the MCFs for SF, VSSF and HSSF may be used to estimate the MCF of hybrid systems."		Accepted	This suggestion is related to both CH4 and N2O emission factors. So the suggested explanation was added to 6.2.1.2 and 6.3.1.2.
E_6_0082	Brown, Lynette	6		559	559	Change "municipal" to "domestic" to match abbreviation in defined term.		Accepted	
E_6_0083	Brown, Lynette	6		575	576	Format Industry type for consistency (sometime only 1st word capitalized, other times all words capitalized).		Accepted	

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E_6_0084	Yamada, Masato	6		575	578	In table 6.6, W of landfill leachate, 15-25% of annual precipitation, is too low. Rate of amount of leachate/precipitation will be varies by amount of evaporation, shape, surface material, compaction, drain and operation. And concepts of leachate management at landfill between western countries and others are quite different. In western countries, they avoid the penetration of precipitation into landfill by capping at surface. Other countries allow some amount of penetration for stabilization of organics. In Japan, we usually use this rate at 50-80% during operation and 15-30% after closure.		Accepted with modifications	We revised the figures as 15-20% of annual precipitation in well compacted landfill site and 25-50% of annual precipitation for not well compacted landfill site. References were added to this table 6.6. These ranges are for closed cell. During operation, most cells in the landfill site should be covered by soil, and only small area are open for operation.
E_6_0085	Brown, Lynette	6		578	578	Revise font size.		Accepted	
E_6_0086	Nair, Malini	6		579	585	same as above		Rejected	Font size in this part is correct.
E_6_0087	Brown, Lynette	6		585	585	Insert "(Table 6.7)" at end of sentence.		Accepted	
E_6_0088	Batisha, Ayman	6		588	588	6.3.4 QA/QC, Completeness, Reporting and Documentation Maybe replaced by 6.3.4 QA/QC, Features and Documentation		Rejected	The topic needs to be consistent with 2006 IPCC Guidelines.
E_6_0089	Federici, Sandro	6	6.3.4	588	606	This text need to be moved to Chapter 7 to avoid lengthy repetition and potential inconsistencies among text written in different chapters of this report		Accepted with modifications	Documentation is moved to chapter 7, but QA/QC, completeness and reporting which is specific for this chapter were left here.
E_6_0090	Brown, Lynette	6		593	593	Insert the word "a" after the word "in" and after the word "into".		Accepted with modifications	Revised as constructed wetlands and semi-natural treatment wetlands.

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E_6_0091	Brown, Lynette	6		608	702	The year of the publication should not be in (), format rest of References for consistency with previous Chapters.		Noted	Although we followed chapter 6, volume 5 in the 2006 IPCC Guidelines, consistency with other chapter in this Supplement will be considered.
E_6_0092	Lyde, Gund	6		610	611	Not cited in text		Accepted	This article was removed from reference list.
E_6_0093	Wang, Hanjie	6		614	615	ADD. Chu J.,Liu Y., Wang H., and Jin Y.(2006).Water Recycle and Pithead Gardening Technique in Drought Desertification Area. -- A case study at Yangchangwan Coal Mine, Ningxia Hui Autonomous region, China. The degraded ecosystem restoration in the arid and semi-arid Northern China-Mongolian Region, in Wang Hanjie Ed.,China Forestry Publishing House. Beijing, China, 2006, pp 76-82.		Rejected	This paper is good in terms of wetlands technology to treat mining wastewater. However, we focus on emission of CH4 and N2O from wetlands.
E_6_0094	Lyde, Gund	6		623	624	List all the co-authors		Accepted	
E_6_0095	Brown, Lynette	6		627	627	Delete comma before 2010.		Accepted	
E_6_0096	Brown, Lynette	6		630	631	These references are not in alphabetical order.		Accepted	
E_6_0097	Lyde, Gund	6		642	644	Refernce is out of sequence		Accepted	
E_6_0098	Lyde, Gund	6		654	655	Not cited in text		Accepted with modifications	Added to Table 6.1, although it had been cited in section 6.1 (just after Table 6.1).
E_6_0099	Lyde, Gund	6		687	689	Not cited in text		Accepted	Removed.

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E_6_0100	Garcia-Diaz, Cristina	6		general	general	There are other constructed wetlands that serve for other purposes than the one specified in this chapter (e.g. impoundment ponds, water supply,...). Are they included within this chapter or elsewhere? Whatever the case is, it should be explicitly mentioned in this chapter. It would be useful to add a list of what is included here, what is included somewhere else, and what is not included at all in the supplementary guidelines. The inclusion of the definition in chapter 1 (lines 108-111) would help, but saying what other guidelines can be found in this supplement on constructed wetlands (what has been included in other chapters) and what has not been included in the supplement (for example, water supply constructions apparently are not included)		Accepted with modifications	This chapter deals with CWs that serve wastewater treatment. Other types of CWs that serve other purposes will not be taken into account in this chapter. However, if the conditions of other chapters are in accordance with other chapters in this supplement GL, they are taken into account in other chapters. Chapter 1 has been revised and presented clear information about other wetlands. Information of wastewater sources are revised in 6.1.1.
E_6_0101	Smith, Keith	6		General		The draft reads very well		Noted	
E_6_0102	Kantawanichkul, Suwasa	6		136	144	in Hybrid systems : shows free water surface bed followed by 2 horizontal subsurface flow beds but in the explanation (line 136-144) mentioned VF followed by HF or vice versa .Though hybrid system is the combination of any different systems but it would be better to have figure related to the explanation.		Accepted	Figure 6.1 was revised to be consistent with text. It would be more understandable.

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E_6_0103	Hatano, Ryusuke	6	187	189		Sentence "CO2 emissions are not included in greenhouse gases emissions from wastewater treatment as CO2 from wastewater is considered biogenic." is strange, because all GHGs produced in soil are biogenic. Carbon budget including sedimentation, DOC runoff, CO2 emission, plant C uptake may be required.		Rejected	This chapter is supplement for Chapter 6, Volume 5 WASTEWATER TREATMENT AND DISCHARGE in the 2006 IPCC Guidelines. The IPCC Guidelines consider CO2 from biomass in wastewater as "carbon neutral" because the biomass is thought to be produced sustainably. Almost all carbon in wastewater should be biomass. For example, carbon in detarget is counted separately. In terms of the issue of CWs as source or sink for CO2 is still pre-mature at this stage so we decided not to take it into account. So, our target is only CH4 and N2O derived from wastewater processes.