

Review Comments by Experts on First Draft of Glossary of 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories

Comment ID	Volume	Chapter	Page	From line	To line	Comment	Expert	Response	Authors note
1042	General	Glossary	2	1	6	Accuracy. It is perhaps time to update this definition, considering that many exist and that the one adopted here is not necessarily the best for NGHGI implementation. ISO has a different definition, for instance. In any case, just as noted above, deviations from other existing definitions could be mentioned.	francesco nicola tubiello	Accepted	The definition has been amended
1044	General	Glossary	2	1	6	Accuracy. It should be mentioned that the "true" emission value is often not known.	francesco nicola tubiello	Noted	the first sentence of the definition uses the word "relative" our view is that this takes care of the comment raised.
1046	General	Glossary	2	1	6	Accuracy. There appear to be some inconsistency in this definition. If it is to be a measure of (paraphrasing) lack of bias AND reduced uncertainty, and considering that precision later in this glossary is defined as the inverse of uncertainty, then again paraphrasing, increased Accuracy should involve low bias AND high precision. Thus Accuracy AND precision cannot be independent, as stated in this definition. What is independent are the concepts of "bias" and "precision" that combined give the meaning of "accuracy" as defined herein.	francesco nicola tubiello	Accepted	the definition has been revised.
1048	General	Glossary	2	12	13	Activity. As defined, "activity" is indistinguishable from the definition of "land use" given elsewhere in the glossary. One of the two needs to be refined.	francesco nicola tubiello	Accepted	The definition of "Land use" has been changed maintaining consistency with the current definition of activity. As a consequence the definition of "activity" does not need to be changed.
1050	General	Glossary	2	15	15	Activity data. Kindly remove "resulting in emissions or removals". It is not needed to define "activity".	francesco nicola tubiello	Rejected	activity data is integral to the emission estimation methodology which relates to emissions or sinks. Therefore without this text, the definition does not hold a meaning.
1052	General	Glossary	2	18	22	Agricultural Pond. Is this definition consistent with FAO? I am not sure one exist, but the following link may be helpful: http://www.fao.org/fileadmin/templates/cpesap/C-RESAP_Info_package/Links/Module_5/Water_harvesting.pdf .	francesco nicola tubiello	Rejected	No change. We believe we have provided an accurate definition of Agricultural ponds for the purpose of inventory compilation. Adding a subjective qualifier, such as 'small-dam ponds' would require a technical definition of what is meant by a small dam. Note that we have defined ponds more generally as being impounded behind a structure < 15 m tall. Small and large dams have distinct definitions - typically based on the height of the structure - which probably varies between countries as a result of different national engineering standards.

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6106	General	Glossary	2	27	27	I suggest that the authors delete "The term allometry refers to" in page 2.2 to be consistent with the style applied to other words. The similar issues are observed in the following words: "climate sub-domain", "degassing emissions", "hymopolimnion", "pumped storage reservoirs", "rice paddies", "river emissions", "storage volume", "trophic state", "watercourse", "wetland".	Naofumi Kosaka	Accepted	Style changes implemented following the reviewer's recommendation
1054	General	Glossary	2	35	38	Aquaculture Pond. Please ensure that this definition is in line with FAO, see for instance https://www.slideshare.net/FAOoftheUN/census-themes-12-and-14-aquaculture-and-fisheries-79720151 . At a minimum indicate the differences.	francesco nicola tubiello	Noted	We have provided an accurate definition of Agricultural ponds for the purpose of inventory compilation in the context of this refinement report. FAO document cited provides definition of all aquaculture, not aquaculture ponds.
1056	General	Glossary	2	39	40	Arithmetic mean. Is this definition really necessary?	francesco nicola tubiello	Noted	This definition may be obvious to many users, but it may still help some inventory compilers. So it is not necessary to delete it.
1058	General	Glossary	3	12	18	Bias. The text should refer to "a systematic error" in the observation and ESTIMATION method. The example provided refers to estimation bias, as appropriate since the topic is NGHGI	francesco nicola tubiello	Accepted	change implemented as suggested
3740	General	Glossary	3	13	13	Entry Bias: Why is 'whose magnitude in most cases is unknown' included in the definition? It would be better to mention it separately.	Andrea TILCHE	Noted	it is important to qualify that such bias might prove to be difficult to quantify and therefore most times not known.
1060	General	Glossary	3	24	26	Biofuels. Considering the reasons given for not including peat, should the text rather refer to "renewable biomass" instead of simply to "biomass"	francesco nicola tubiello	Rejected	The definition is from the 2006 Guidelines.
1062	General	Glossary	3	34	37	Biomass. It seems to this reviewer that the term "biomass" used in these guidelines only refers to "plant biomass" and does not include animals. If correct, perhaps refine this definition.	francesco nicola tubiello	Rejected	The 2006 Guidelines Glossary's definition includes both plant and animal biomass by the word "living organisms", so we do not need to change this definition or add the references to include herbaceous material. See also the comment #7110 (in the government comment sheet).
3720	General	Glossary	3	36	37	It is mentioned that peat is excluded. What about organic matter in mineral soils?	Andrea TILCHE	Noted	This definition refers only to living organisms.
3742	General	Glossary	3	42	42	Entry Bootstrap technique: remove the word 'typically' and add 'with replacement' after 'repeated resampling'.	Andrea TILCHE	Accepted	change implemented as suggested
3744	General	Glossary	3	42	42	Entry Bootstrap technique: it could be mentioned that the bootstrap technique is a specific case of a Monte Carlo method, which would also allow cross-referencing to that entry.	Andrea TILCHE	Accepted	Added at the end: Bootstrap technique is a specific case of a Monte Carlo method.

Comm ent ID	Volume	Chapter	Page	From line	To line	Comment	Expert	Response	Authors note
1064	General	Glossary	4	4	8	Canal. Kindly ensure consistency on how definitions are provided. The one offered here is a good one, taken from the Ramsar conventoin, with a link to it and a date of access. Should this be the format across all definitions? Regardless, some coherent format should be applied throughout the glossary.	francesco nicola tubiello	Noted	It's not practical to provide a similar format across the glossary given the combination of entries already accepted in the 2006 Guidelines and unable to be modified.
1066	General	Glossary	4	9	11	Carbon Budget. It does not seem that this definition is consistent with what is used elsewhere, including in IPCC Assessment Reports. Please check with other definitions, including from the Global Carbon Project.	francesco nicola tubiello	Accepted with modification	In these guidelines, the term "carbon budget" is used in a more generic sense than in the other IPCC Reports such as Special Report on Global Warming of 1.5°C. The definition cannot be changed in these guidelines, but a note to explain the difference can be added. See also the comment #7112 (in the government comment sheet).
1068	General	Glossary	4	12	15	CO2 equivalent. The reference to (2005) is unclear. It probably refers to the SAR, whose GWP values are in use for non-Annex I countries. Either way, a pointer to specific GWP values, even indirectly as possibly done here, is outside the scope of these guidelines.	francesco nicola tubiello	Accepted with modification	The description should be changed to avoid referring to "currently" in order to prevent it from being outdated. More policy-neutral definition is better, therefore the definition of "Carbon dioxide equivalent emission" in the Glossary of Special Report on 1.5 C has been introduced here to replace the current definition.
1070	General	Glossary	4	16	19	Category. It is suggested to also provide definitions of the four main sectors. When doing so, kindly indicate IPCC specificities with respect to other international classifications used in countries, to facilitate the task of data compilers.	francesco nicola tubiello	Rejected	Definition of 4 sectors is given in Table 8.2 in Chapter 8, Vol.1. A reference to Chapter 8 of Volume 1 has been included in the Glossary.
1072	General	Glossary	4	20	21	Census. The "census" is a process rather than simply data. Kindly consult FAO for a better definition. See e.g. http://www.fao.org/world-census-agriculture/en/	francesco nicola tubiello	Accepted	definition has been changed
1074	General	Glossary	4	22	23	Channel. It does not appear that this definition is in line with similar others in use internationally. Either adapt to those or specify it is for IPCC use only.	francesco nicola tubiello	Noted	The term has been revised clarifying that it is defined in a manner consistent with use in the 2019 refinement report.
1076	General	Glossary	4	27	32	Chronosequence. The term is of general validity beyond land use management. Kindly edit to distinguish the general case from the specific IPCC application, or specify at the outset that the IPCC uses this term exclusively for AFOLU.	francesco nicola tubiello	Accepted	The definition has been refined to clarify that chronosequence is specifically used in the context of the AFOLU sector for this report.
1078	General	Glossary	4	33	34	Climatic Sub-domain. It appears that the definition as written is rather circular. It does not define what is a climate sub-domain.	francesco nicola tubiello	Noted	Definition revised to remove the circularity and more clearly explain the concept.

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1080	General	Glossary	4	35	38	Coefficient of variation. The definitoin should be re-written with the help of a statistician. Both definitions given are statistical in nature, only one refers to probability vs. a set of measurements.	francesco nicola tubiello	Rejected	no change seems to be needed. This term was so defined in the Glossary of the 2006 Guidelines.
1082	General	Glossary	5	1	4	Comparability. TCCCA. Perhaps a defintion of NGHGI "quality" should also be given for completeness, following text used in Vol 1 Ch 1	francesco nicola tubiello	Noted	Not sure if we understand the comment. Quality is a function of manney variables and therefore providing its definitoin might prove complicated. However, the definition of "comparability" has been slightly changed, not in response to this comment, but to the comment #3746.
3746	General	Glossary	5	2	2	Entry Comparability: rephrase to exclude the normative 'should' from the definition. Comparability is the extent to which estimates of emissions and removals reported by countries in inventories are comparable.	Andrea TILCHE	Accepted	change implemented as suggested
1084	General	Glossary	5	9	13	First, if the term differs substantially from the statistical definition used in "confidence interval", and considering that the latter is defined immediately below--why use the term"confidence" at all? Use naother term, considering this is supposed to be understood for IPCC applications only anyway. Second, it is nonetheless good to introduce language that explains how a specific IPCC definition may differ from others used elsewhere, and especially in the statistical community. Kindly apply this "disclaimer", as appropriate, throughout the gloassary.	francesco nicola tubiello	Accepted	A confidence interval (CI) is a type of interval estimate, computed from the statistics of the observed/estimated data, that might contain the true value of an unknown population parameter. The interval has an associated confidence level that quantifies the level of confidence that the parameter lies in the interval. Most commonly, the 95% confidence level is used.
3748	General	Glossary	5	10	11	Entry Confidence: trust should be based on accuracy, precision and having a system in place to ensure these. The statement: 'Having confidence in inventory estimates does not make those estimates more accurate or precise' is of course correct, but at first reading it appears to disconnect confidence from accuracy and precision entirely. The entry should be rephrased to make it more clear.	Andrea TILCHE	Noted	Our understanding is that the word "trust" in the first sentence implies accuracy, precision and other attrbutes related to confidence such as quality.
1086	General	Glossary	5	14	21	Confidence Interval. Please consider re-writing this definition by a statistician! It is first unreadable and secondly wrong.	francesco nicola tubiello	Accepted with modification	in the IPCC guidelines applies a 95% confidence interval and this is described in the definition of the term. The terms has been kept as is.
3752	General	Glossary	5	23	23	Entry Consistency: rephrase to exclude 'should' from the definition.	Andrea TILCHE	Accepted	suggestion implemented as proposed

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1088	General	Glossary	5	28	29	Correlation. "Correlation does not imply causation". Yet to some extent this is what this definition seems to suggest?	francesco nicola tubiello	Accepted with modification	the definition has been revised. The word "dependence" has been replaced with "relationship"
1090	General	Glossary	5	30	31	Correlation coefficient. Please consider the same two comments made above. Consider re-writing by a statistician.	francesco nicola tubiello	Accepted with modification	the definition has been revised. The word "dependence" has been replaced with "relationship"
1092	General	Glossary	5	41	43	Please add "artificial structure". Is this consistent with definitions given elsewhere, including Ramsar cited earlier in the glossary?	francesco nicola tubiello	Accepted	This clarification has been added along with the context that the definition is based on the way it is applied in the AFOLU sector for national greenhouse gas inventories.
1094	General	Glossary	6	20	22	Distribution function. Please ask a mathematician or statistician to re-write.	francesco nicola tubiello	Rejected	no change seems to be needed
8610	General	Glossary	6	28	28	“diffusive emission that would not occur in the absence of the reservoir, from the river downstream of the dam” rather than “diffusive emission from the river downstream of the dam”	Elizabeth Sikar	Accepted	Glossary entry changed as suggested.
6110	General	Glossary	7	42	44	I suggest that the authors delete the word "flooded land proxy" in page 2.7. Although "managed land proxy" appears several times in main chapters of the 2019 Refinement, it seems "flooded land proxy" does not appear at all.	Naofumi Kosaka	Accepted	
1096	General	Glossary	8	4	9	Flux. Perhaps consider giving the more general definition first. Else it reads funny.	francesco nicola tubiello	Accepted	The order of different definitions should be changed.
3756	General	Glossary	8	31	31	Entry Good Practice: 'reduced so far as possible', or 'reduced as far as practicable, as written in the Overview? Is there a difference?	Andrea TILCHE	Accepted with modification	The definition text for "good practice" has been revised with a footnote to explain its background.
3758	General	Glossary	9	1	3	Entry Harvested wood products: the definition seems very imprecise. The word 'include' suggests that there are more relevant products outside wood and paper products. Other IPCC documents, among which the related chapter of the Guidelines (Vol 4, Ch 12) offer more useful definitions, which would be along the lines of: all wood-based materials that leave harvest sites	Andrea TILCHE	Accepted	More precise definition has been provided.
6098	General	Glossary	9	1	3	I suggest that the authors reconsider the definition of "harvested wood products" in page 2.9. The definition is unclear. It is preferable to mention the 2006 IPCC Guidelines rather than IPCC good practice guidance (2003).	Naofumi Kosaka	Accepted	More precise definition has been provided, including reference to 2006 Guidelines.

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3722	General	Glossary	9	17	17	The sentence on Hypolimnetic should be moved to a separate line	Andrea TILCHE	Accepted	
8612	General	Glossary	9	18	18	“Hypolimnion” rather than “Hypolimnion”	Elizabeth Sikar	Accepted	change implemented as suggested
8614	General	Glossary	9	20	20	“metalimnion” rather than “meatalimnion”	Elizabeth Sikar	Accepted	
6108	General	Glossary	9	32	34	I suggest that the authors reconsider the definition of "inflow" in page 2.9. Although the proposed definition limits to water flow, the word is also used in the context of harvested wood products (see Volume 4, Chapter 12, page 12.15). The definition text does not match in that context. The similar issue is observed in "outflow".	Naofumi Kosaka	Accepted with modification	Context has been added so that the definition only applied to water bodies
1038	General	Glossary	10	4	5	Land Cover. The definition of Land Cover could be refined. Kindly consult international definitions endorsed by UNSC and FAO	francesco nicola tubiello	Accepted	The definition has been revised according to the refinements made in Vol 4 Chapter 3
1030	General	Glossary	10	7	10	Land Use. The glossary should also report the definitions of the various land use categories from Vol. 4	francesco nicola tubiello	Accepted	Definitions have been added for all 6 land uses.
1032	General	Glossary	10	7	7	Land Use. There may be more than one type of activity being carried out on a unit of land, so kindly use the plural. It may be added that the naming of a specific class is determined by the concept of 'predominant use.'	francesco nicola tubiello	Accepted	This clarification has been added.
1034	General	Glossary	10	7	7	Land Use. This definition coincides in essence with the one given by the international statistical community, as codified in the Land Use classification of the SEEA Central Framework and the SEEA Agriculture, Forestry and Fisheries (see e.g., http://www.fao.org/economic/ess/environment/methodology/en/). However, it is unclear whether and how specific activities that are "non-land" IPCC sectors (IPPU, Waste) do not use land. In fact all economic activities use land, and in this respect all IPCC sectors should find a place under AFOLU. Kindly engage with the statistical community for appropriate writing and possible linkages to other classifications.	francesco nicola tubiello	Rejected	The other sectors in this guidance are treated separately from AFOLU to distinguish overarching anthropogenic activities that lead to emissions. While, for example, a power plant occupies a parcel of land, the emissions occurring for combustion are not primarily characterized by the land that the power plant occupies, but rather the engineering of the plant and type of fuel. The association of the power plants with land uses in the AFOLU sector would lead to an unnecessary burden for compilers in terms of estimating emissions from power plants. In addition the classification of land uses is beyond the scope of the refinement as directed in the table of contents approved by the IPCC panel.

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1036	General	Glossary	10	7	7	Land Use. When definitions for the 6 IPCC land use classes are given, pointers to relevant international classifications used by countries for reporting in non-IPCC processes should be given. For instance, cropland, grassland and forest definitions by FAO, used for reporting activity data to FAO as well as for computing specific SDG indicators.	francesco nicola tubiello	Noted	The definitions in this guidance are not prescriptive and countries may choose to harmonize or adjust the general definitions to align with other policy programs.
1098	General	Glossary	10	8	10	Land Use. All six IPCC land use categories are in fact Land Cover, as it can be seen by checking any land cover map legend from either NASA or ESA. It is true that is straightforward to associated land use to land cover categories cropland and settlements.	francesco nicola tubiello	Noted	
6154	General	Glossary	10	18	19	recommend normal typeface, not bold	Carolyn Maxwell	Accepted	This comment refers to the lines 18-19 on page 10, about "Large dam". As pointed out, the definition sentence should be changed to normal, from bold.
1040	General	Glossary	10	28	30	Manure. The term "manure," as defined by FAO and UNSC, does not only include livestock, but more generally one could also speak of "vegetable" manure, compost, etc. If this is a specific definition to IPCC, it would be wise to alert the reader that this is restrictive with respect to definitions used elsewhere and endorsed internationally.	francesco nicola tubiello	Accepted	We have added the specification: vegetative material such as green manures are considered to be crop residues or compost" to the definition.
1100	General	Glossary	10	31	35	Mean. It is suggested to have this reviewed by a statistician.	francesco nicola tubiello	Rejected	no change seems to be needed
3724	General	Glossary	10	36	36	The sentence starting "Measurement-based" should be moved to the next line	Andrea TILCHE	Accepted	
6156	General	Glossary	10	36	37	Measurement based approach: correct formatting of heading for definition of measurement based approach	Carolyn Maxwell	Accepted	
3760	General	Glossary	11	8	8	Entry Model: why only 'quantitative'? A model can be a qualitative abstraction of a real-world situation or set of situations.	Andrea TILCHE	Accepted	The words "qualitatively-based" have been added.
1102	General	Glossary	12	34	35	Pasture. Kindly ensure consistency with FAO definitions of "meadows and pastures. Note that "grassland" was declared a land cover category under "land use", but here it is described as a land use.	francesco nicola tubiello	Accepted with modification	The definition has been made more consistent with the FAO definition, while also maintaining consistent with the IPCC classification of grassland systems.

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1104	General	Glossary	12	41	44	Peatland. Is this definition in line with Ramsar's? Secondly, there are plenty of peatlands in tropical areas, but according to this definition there may be peatlands only in cold zones. The statement on the content of total C is out of scope with the definition in my opinion and inconsistent with the style of any other definition given in this glossary. Finally, the correct term is "soil organic C".	francesco nicola tubiello	Accepted	The definition is revised to be broader and include all peatlands. The definition is consistent with the RAMSAR classification of wetlands.
1380	General	Glossary	12	45	47	Percentile. Kindly ensure this definition is reviewed by a statistician. Also, it is likely that such definition is not limited to operations performed over a PDF	francesco nicola tubiello	Accepted with modification	The definition has been reviewed. A percentile (or a centile) is a measure used in statistics indicating the value below which a given percentage of observations in a group of observations fall.
1106	General	Glossary	13	11	12	Plant-mediated emissions. The definition appears to be referring to plants, whether the subject of the topic is emissions. In any case, plant-mediated emissions involve more trace gases than simply methane. If the scope of the definition is narrower for IPCC then say so explicitly specifying what other emissions may be.	francesco nicola tubiello	Accepted with modification	The definition has been revised so that it is referring to the flow of emissions to the atmosphere that are influenced by plants, such as the production, oxidation and transport of methane in wetland soils.
6102	General	Glossary	13	11	12	I suggest that the authors reconsider the definition of "plant-mediated emission" in page 2.13. According to the proposed definition, emission is plants.	Naofumi Kosaka	Accepted	
1108	General	Glossary	13	16	17	Ponds. Again, the definition given is far narrower than the terms used widely outside of IPCC. It is suggested to say this explicitly, and better yet to change the name to something more specific (e.g., "small-dam ponds"?)	francesco nicola tubiello	Rejected	No change. There is no universally accepted definition of a pond. We have provided an explicit definition in terms of dam height to provide clarity to compilers.
1110	General	Glossary	13	18	21	Pool/Carbon Pool. Pool and carbon pool cannot be used interchangeably. Carbon pools only store carbon ©, not GHG. Likewise, while there may be methane pools (although in non-gaseous forms, i.e. clathrates), the only "N ₂ O" pool as a reservoir is the atmosphere. Else we speak of N pools, etc. Kindly re-write this definition and consult the IPCC Assessment Reports Vol I for guidance and consistency.	francesco nicola tubiello	Accepted	
1112	General	Glossary	13	22	24	Population. Again, the correct term should be more specific, as "population" means so many different things. As for other technical terms, kindly have a statistician revise it.	francesco nicola tubiello	Rejected	no change seems to be needed, considering that this is a glossary for national GHG inventory

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1114	General	Glossary	13	25	28	Precision. I completely disagree with this definition. First of all, uncertainty and precisoin mean completely different things and are not related inversely. Second, in the definition of accuracy, it was already mention that lack of bias and precision are independent, so how can precision be inversely ralted to uncertainty? If the bias is unknown, we cannot know whether a precise measurement reduces "uncertainty" or not.	francesco nicola tubiello	Accepted with modification	a new sentence has been added.
1116	General	Glossary	13	31	34	Process-based modelling. There are so many definitions out there. This one does not appear to be the best one. If this glossary aims at providing clarity in the cotext of NGHGI compilation, then some text indicating how these are used in that context (tier3) may be useful.	francesco nicola tubiello	Accepted with modification	Definition expanded. Eexplanation of how process based models are used in the context of GHG accounting is beyond scope for the Glossary.
1118	General	Glossary	13	35	39	Probability. The text makes it sound as if this definition is a mater of opinion. Kindly revise and have a statistician help.	francesco nicola tubiello	Accepted with modification	The probability of an event is a measure of the likelihood that the event will occur. Statisticians have agreed on the following rules and conventions. The probability of any event can range from 0 to 1. The sum of probabilities of all sample points in a sample space is equal to 1.
3762	General	Glossary	13	35	39	Entry Probability: the entry lacks a straightforward definition, e.g. 'likelihood of an event's occurance'.	Andrea TILCHE	Accepted with modification	The probability of an event is a measure of the likelihood that the event will occur. Statisticians have agreed on the following rules and conventions. The probability of any event can range from 0 to 1. The sum of probabilities of all sample points in a sample space is equal to 1.
1120	General	Glossary	13	40	46	PDF. Please have a statistician revise the text.	francesco nicola tubiello	Accepted	A probability density function (PDF) is a function, whose value at any given sample (or point) in the sample space (the set of possible values taken by the random variable) can be interpreted as providing a relative likelihood that the value of the random variable would equal that sample.
1148	General	Glossary	13	40	46	PDF. Kindly considere editing some of the text. Do total emissions really have a "fixed value"? In the same definition. "fixed" is used in reference to a physical constant. Do you not rather mean "true" value? Using the latter would more easily connect this concept to that of úncertainty" given later in the glossary.	francesco nicola tubiello	Accepted	A probability density function (PDF) is a function, whose value at any given sample (or point) in the sample space (the set of possible values taken by the random variable) can be interpreted as providing a relative likelihood that the value of the random variable would equal that sample.
3726	General	Glossary	14	7	7	Delete "store"	Andrea TILCHE	Accepted with modification	This comment refers to the line 7 on page 14 of SOD, about "Pumped storage reservoirs". The definition text has been changed in response to the other comment, and the problem pointed out by this comment has been addressed in that change.

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1122	General	Glossary	14	35	37	Reservoir. The definition given under (2) is best singled out as a specific definition of "water reservoir". Therein it can also be stated that within the guidelines sometimes a water reservoir is referred to as a reservoir (although the authors should strive to avoid this in relevant chapters).	francesco nicola tubiello	Noted	The second definition for this term was modified to be clear that reservoir is referring to water impounded behind a dam.
1124	General	Glossary	14	38	40	Residence time. This term is of much wider usage than in relation to water, in fact has wide use in the description of the lifetime of climate change relevant GHGs. Please modify the name accordingly, for instance "water reservoir residence time".	francesco nicola tubiello	Accepted	Changed to 'water residence time'.
1126	General	Glossary	14	41	44	Rice paddies. Kindly check FAO definitions or IRRI definitions for consistency. "Arable land" includes fallow and temporary meadows and pastures (FAO).	francesco nicola tubiello	Accepted	Removed the word arable land that has led to confusion.
1128	General	Glossary	15	4	7	Run-of-the-river. I believe that in the UNFCCC CDM world this term was referred to as "run-of-river"	francesco nicola tubiello	Rejected	Run-of-river and run-of-the-river are both in common usage. No change
6100	General	Glossary	15	4	7	It seems that the definition of "run-of-the-river reservoirs" in page 2.15 does not exactly match the term. It is preferable to start the definition text with "Reservoirs" (e.g. Reservoirs for hydroelectric systems that ...).	Naofumi Kosaka	Accepted	Definition revised
6158	General	Glossary	15	7	7	Run-of-the-rivers: It is unclear to me what the words "one day's annual mean inflow" are intended to mean. Is the interpretation supposed to be - 1/365th of the annual mean inflow?	Carolyn Maxwell	Accepted	Clarified the definition of one day's mean inflow as per suggestion
1130	General	Glossary	15	10	11	Sequestration. The correct term should be "carbon sequestration", as the simpler term is very generic and has many more meanings that was is meant herein.	francesco nicola tubiello	Accepted	
1132	General	Glossary	15	15	18	Soil carbon pool. Kindly re-write for clarity, listing the name of the reservoirs first (Active, Slow and Passive Pools), each followed in parenthesis by the turnover time, characterizes as fast, intermediate and long. Are the values given those specified at Tier 1? Why should they be specified in this definition? Are countries not free to define these pools as they preferred? If not, why in this case and not in all others?	francesco nicola tubiello	Accepted	
6104	General	Glossary	15	15	18	It seems that the definition of "soil carbon pool" in page 2.15 does not exactly match the term.	Naofumi Kosaka	Accepted	
6160	General	Glossary	15	26	26	Spillway: "high" should be replaced with "higher"	Carolyn Maxwell	Accepted	Made the replacement
1134	General	Glossary	15	29	31	SD. Have a statistician review the text.	francesco nicola tubiello	Noted	no change seems to be needed

Comment ID	Volume	Chapter	Page	From line	To line	Comment	Expert	Response	Authors note
6162	General	Glossary	15	33	34	Storage volume: suggest reconsider definition of 'active' storage level. The assumption that reservoirs are filled to their spillways does not always hold. In order to maintain safe operation of dam, the operator may decide to reduce the level to which the dam can routinely be filled (eg to reduce stress on the structure in order to prevent expensive capital maintainenance). 'Active' storage level should be the region of the dam used for storing water, ie the region between full supply level and the minmium level of the outlet, where Full Supply Level (FSL) is the maximum level at which water can be stored indefinitely.	Carolyn Maxwell	Accepted	Replace references to spillway crest with 'full supply level' and incorporated the reviewer's definition of full supply level.
1136	General	Glossary	15	39	39	Surrogate data. Is this the same as "proxy data?" If so perhaps mention it to facilitate understanding.	francesco nicola tubiello	Accepted	Proxy data added as synonym for surrogate data.
1914	General	Glossary	15	39	42	Entry Surrogate data: the more common term used in statistics is 'proxy variable'. It would be useful to mention this term, because much guidance on the use of proxy variables is available from the statistical literature.	Jessica Chan	Accepted with modification	Proxy data added as synonym for surrogate data.
2178	General	Glossary	15	39	42	Entry Surrogate data: the more common term used in statistics is 'proxy variable'. It would be useful to mention this term, because much guidance on the use of proxy variables is available from the statistical literature.	Julian Chow	Accepted with modification	Proxy data added as synonym for surrogate data.
3766	General	Glossary	15	39	42	Entry Surrogate data: the more common term used in statistics is 'proxy variable'. It would be useful to mention this term, because much guidance on the use of proxy variables is available from the statistical literature.	Andrea TILCHE	Accepted with modification	Proxy data added as synonym for surrogate data.
1138	General	Glossary	15	43	46	Survey data. It appears this definition is is very dire need of a revisoin by an actual statistician in charge of runing surveys. I am unaware that surrogate data and assumptions are part of a survey activity.	francesco nicola tubiello	Accepted with modification	It is suggested to substitute the current definition by a definition of 'survey' as agreed by OECD: A survey is an investigation about the characteristics of a given population by means of collecting data from a sample of that population and estimating their characteristics through the systematic use of statistical methodology.
1916	General	Glossary	15	46	46	Entry Survey data: the entry seems incomplete or the phrasing is unfortunate. How is a survey related to 'more general surrogate data and assumptions'...? Compare against the text in Box 2.2 in Voll Ch.2.	Jessica Chan	Accepted with modification	It is suggested to substitute the current definition by a definition of 'survey' as agreed by OECD: A survey is an investigation about the characteristics of a given population by means of collecting data from a sample of that population and estimating their characteristics through the systematic use of statistical methodology.

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2180	General	Glossary	15	46	46	Entry Survey data: the entry seems incomplete or the phrasing is unfortunate. How is a survey related to 'more general surrogate data and assumptions'...? Compare against the text in Box 2.2 in Vol1 Ch.2.	Julian Chow	Accepted with modification	It is suggested to substitute the current definition by a definition of 'survey' as agreed by OECD: A survey is an investigation about the characteristics of a given population by means of collecting data from a sample of that population and estimating their characteristics through the systematic use of statistical methodology.
3768	General	Glossary	15	46	46	Entry Survey data: the entry seems incomplete or the phrasing is unfortunate. How is a survey related to 'more general surrogate data and assumptions'...? Compare against the text in Box 2.2 in Vol1 Ch.2.	Andrea TILCHE	Accepted with modification	It is suggested to substitute the current definition by a definition of 'survey' as agreed by OECD: A survey is an investigation about the characteristics of a given population by means of collecting data from a sample of that population and estimating their characteristics through the systematic use of statistical methodology.
1382	General	Glossary	15	47	54	Systematic and random errors. Again, please revise with a statistician. Secondly, is "lack of systematic error" in a set of measurments the same as emissoins estimates that are "neither an over or underestimate" language used in the definitoin of accuracy? If so does not "accurate" mean minimization of small systematic errors and of random errors (precision)?	francesco nicola tubiello	Rejected	no change seems to be needed. This term was so defined in the Glossary of the 2006 Guidelines.
3728	General	Glossary	16	7	10	The glossary defines climate in terms of temperature (temperate, tropical). It would be useful if the definitions of climate in terms of wet and dry were also included in the glossary. These are used in volume 4 chapter 11.	Andrea TILCHE	Accepted	Definitions have been added for each of the climates subdivided by temperature and moisture regimes. See the entry "Template", "Tropical" and "Polar/boreal".
1140	General	General	16	7	8	Temperate, cold. This comment applies to the definitions of climatic zones in this glossary. Are they consisten with how the same terms are used in other IPCC Assessment Reports and more in general in the scientific literature? If so, why can't a link to where this definitoin comes from be given?	francesco nicola tubiello	Noted	The climate classification in this guidance is used to derive emission and stock change factors in the AFOLU volume. It is not feasible to make changes in the classification at this point in the review process because developing the new default factors requires a synthesis of the literature that has taken 6-12 months for many of the author teams. The proposed change may be possible in the next refinement if harmonization of climate classifications is brought to the attention of the IPCC experts during the scoping process before preparation of the report begins.
1142	General	Glossary	16	15	17	Time series. Is this the correct definitoin. Why would it be limited to values affected by random processes. Also, does not involve only observed values, as it obviously applies to estimates of emissions as well.	francesco nicola tubiello	Rejected	the word "observed" referes to values in a time series that may be generated through data observations and/or estimated data

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1144	General	Glossary	16	22	26	Trend. What is described here is a rate of change, not a trend. If this is a specific IPCC meaning, please say so for clarity of distinguishing it from many other possible uses, including in IPCC assessment reports and the overall scientific and socio-economic literature	francesco nicola tubiello	Noted	This is an IPCC definition relevant for the estimation of key category analysis and uncertainty analysis
1146	General	Glossary	16	27	42	Trophic state. First, this term does not apply in general to water bodies only. Second, it is good to reference a definition, provided that this is done throughout the glossary, and second, that the primary reference to the definition (better if from a recognized statistical or appropriate UN process) is given rather than a secondary paper.	francesco nicola tubiello	Rejected	Carlson (1977) is perhaps the most fundamental reference regarding trophic state in the Aquatic Sciences. This chapter is about water bodies and we believe the glossary entry provides a clear definition of its use for the purposes of inventory calculations regarding inundated lands.
1384	General	Glossary	16	45	53	Unbiased estimator. First, kindly consider re-writing the text with the help of a statistician. Second, it is actually unclear why this definition should be given in this glossary, i.e., how are unbiased estimators being used--or referred to-- in this guidelines.	francesco nicola tubiello	Rejected	no change seems to be needed. This term was so defined in the Glossary of the 2006 Guidelines.
3730	General	Glossary	17	4	8	Uncertainty really covers both precision and accuracy. Reference should be made to these two concepts	Andrea TILCHE	Noted	Uncertainty covers the two concepts, indeed. However, the definition text in the Glossary of the 2006 Guidelines covers both concepts, and has been well accepted by inventory compilers for many years, therefore no need to change.
1150	General	Glossary	17	4	8	Uncertainty. The possibility to describe uncertainty with a PDF implies zero bias --which is instead itself unknown. The use of the term "uncertainty" is problematic, considering that you really mean "confidence interval". Perhaps indicate that this is "measurement uncertainty" and that is not an exactly statistical concept, but one taken from metrology.	francesco nicola tubiello	Noted	no change seems to be needed
1152	General	Glossary	17	12	16	Validation. Of all the terms given in this glossary that have multiple meanings outside of the GHGI, and for which a strict narrow definition was given instead (see several comments herein), this is instead a term for which this glossary gives a rather generic definition. It is suggested conversely that this is one of those terms that need to be defined narrowly with respect to its meaning in NGHGI reporting and review process.	francesco nicola tubiello	Rejected	The definition does have a sentence that talks to the relevance of validation in the context of emissions inventories.

Comment ID	Volume	Chapter	Page	From line	To line	Comment	Expert	Response	Authors note
6164	General	Glossary	17	31	34	Wetland: Many wetlands fill at timescales beyond the annual timescale included in this definition, especially in arid regions. For example, they may fill for 3 years and dry for 7 (on average over a decadal period) Eg, Lake Eyre. the inclusion of wetland plants as a defining character should be softened (eg includes words such as often or usually). Recommend expanding definition to either specifically include ephemeral wetlands or explicitly exclude them.	Carolyn Maxwell	Accepted	We removed the reference to wetland plants, and have revised the definition so it is clear that the land may be saturated for all or part of the year.
1154	General	Glossary	17	31	34	Wetland. This definition should be in line with those of the six IPCC land use classes. Also, if this is given, than definitions for all six should be given in this glossary.	francesco nicola tubiello	Accepted	Definition that was given by IPCC in 2003 has been added.
1156	General	Glossary	17	35	39	Withdrawal. Kindly indicate that hti sis a specific, narrow use of the term for the purpose of these GLs. I actually suspect that this term is used in so many different ways throughout the GLs as well as in IPCC Assessment reporst. Better use a more spefici term, e.g. "Water Dam Withdrawal"	francesco nicola tubiello	Accepted	Changed glossary entry to 'Water withdrawal'. IN Chapter 7 most occurrences are as 'water withdrawal'. When just 'withdrawal' is used in ch7 it is clear from the context that it is referring to water withdrawal.
6166	General	Glossary	17	37	38	Withdrawal: ensure metalimnion, epilimnion, hypolimnion are included in glossary	Carolyn Maxwell	Accepted	Added entry for metalimnion
1026	General	Glossary		1	1	GENERAL. Although it is fully understood that the definitions presented are those used purely for the purpose of compiling MGHGs, it is nonetheless advise to involve the international statistical community to ensure consistency of definitions where possible. At the same time, inserting pointers linking specific IPCC definitions to international definitions of more general applicability should be seen as an opportunity to facilitate teh work of users across different communities.	francesco nicola tubiello	Noted	
1028	General	Glossary		1	1	A definition of "Tier" is missing but would be welcome --for instance the one given in Vol 1.	francesco nicola tubiello	Accepted	suggestion implemented as suggested
6096	General	Glossary		1	1	New terms are related to wetlands only. It is preferable to add cross-sectoral terms (e.g. "peat" is used in AFOLU as well as energy sectors). One of alternative ways is inserting glossary section in Chapter 7, Volume 4.	Naofumi Kosaka	Noted	It is consistent with the 2006 guidelines to have terms for AFOLU in this glossary.

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1910	General	Glossary		-	-	General comment: the Glossary does not systematically define terms. Not every entry starts with a definition, some are formal definitions, some more informal. Entries are found to be any mix of definitional elements, explanations of the purpose and use of the term, and examples. This undermines the perceived quality of the Glossary. The Glossary would benefit from an integral review, instead of focusing on revising/adding individual items, as seems to have been done.	Jessica Chan	Noted	Glossary is not within the scope of major refinement approved by the IPCC at its 44th Session. In principle major changes should not be made to keep consistency with the Glossary in the 2006 IPCC Guidelines. The suggested changes may be considered in the future full revision of the guidelines.
1912	General	Glossary		-	-	General comment: the Glossary includes a selection of terms with very specific statistical definitions. For some of these terms this is explicitly noted (e.g. for 'Coefficient of variation), but not for others. Some entries explain the usage of the term in the Guidelines (e.g. Confidence), some stay close to a formal statistical definition without referencing to the use. A uniform approach to presenting these terms would help to a) identify them, preferably distinguishing clearly between the generic definition and the Guidelines definition and b) to explain usage in the Guidelines context	Jessica Chan	Noted	Glossary is not within the scope of major refinement approved by the IPCC at its 44th Session. In principle major changes should not be made to keep consistency with the Glossary in the 2006 IPCC Guidelines. The suggested changes may be considered in the future full revision of the guidelines.
2174	General	Glossary		-	-	General comment: the Glossary does not systematically define terms. Not every entry starts with a definition, some are formal definitions, some more informal. Entries are found to be any mix of definitional elements, explanations of the purpose and use of the term, and examples. This undermines the perceived quality of the Glossary. The Glossary would benefit from an integral review, instead of focusing on revising/adding individual items, as seems to have been done.	Julian Chow	Noted	Glossary is not within the scope of major refinement approved by the IPCC at its 44th Session. In principle major changes should not be made to keep consistency with the Glossary in the 2006 IPCC Guidelines. The suggested changes may be considered in the future full revision of the guidelines.
2176	General	Glossary		-	-	General comment: the Glossary includes a selection of terms with very specific statistical definitions. For some of these terms this is explicitly noted (e.g. for 'Coefficient of variation), but not for others. Some entries explain the usage of the term in the Guidelines (e.g. Confidence), some stay close to a formal statistical definition without referencing to the use. A uniform approach to presenting these terms would help to a) identify them, preferably distinguishing clearly between the generic definition and the Guidelines definition and b) to explain usage in the Guidelines context	Julian Chow	Noted	Glossary is not within the scope of major refinement approved by the IPCC at its 44th Session. In principle major changes should not be made to keep consistency with the Glossary in the 2006 IPCC Guidelines. The suggested changes may be considered in the future full revision of the guidelines.

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3732	General	Glossary		-	-	General comment: the Glossary does not systematically define terms. Not every entry starts with a definition, some are formal definitions, some more informal. Entries are found to be any mix of definitional elements, explanations of the purpose and use of the term, and examples. This undermines the perceived quality of the Glossary. The Glossary would benefit from an integral review, instead of focusing on revising/adding individual items, as seems to have been done.	Andrea TILCHE	Noted	Glossary is not within the scope of major refinement approved by the IPCC at its 44th Session. In principle major changes should not be made to keep consistency with the Glossary in the 2006 IPCC Guidelines. The suggested changes may be considered in the future full revision of the guidelines.
3734	General	Glossary		-	-	General comment: the Glossary includes a selection of terms with very specific statistical definitions. For some of these terms this is explicitly noted (e.g. for 'Coefficient of variation), but not for others. Some entries explain the usage of the term in the Guidelines (e.g. Confidence), some stay close to a formal statistical definition without referencing to the use. A uniform approach to presenting these terms would help to a) identify them, preferably distinguishing clearly between the generic definition and the Guidelines definition and b) to explain usage in the Guidelines context	Andrea TILCHE	Noted	Glossary is not within the scope of major refinement approved by the IPCC at its 44th Session. In principle major changes should not be made to keep consistency with the Glossary in the 2006 IPCC Guidelines. The suggested changes may be considered in the future full revision of the guidelines.
3736	General	Glossary		-	-	General comment: the use of italic font is not uniform. In some cases it is to identify terms with entries in the Glossary, while in other cases it seems to be to signify a keyword without entry. As this is confusing, the suggestion would be to use different formatting for these distinctive purposes.	Andrea TILCHE	Noted	The 2019 Refinement follows the 2006 Guidelines with regard to use of italic fonts. Italic fonts in the 2006 Guidelines does not mean that word is included in the Glossary, but are used to highlight some key words (e.g. "good practice".)
3738	General	Glossary		-	-	General comment: some use is made of cross-referencing between terms, but it could be done more systematically, especially among related statistical terms (e.g. bias, systematic error, accuracy etc.)	Andrea TILCHE	Accepted	This will be taken into account in preparing the final draft.
3750	General	Glossary		-	-	Entries Confidence interval and Normal distribution: spell out PDF or make clear by using e.g. italics that there is an entry for this term	Andrea TILCHE	Accepted with modification	PDF spelt out in Normal distribution. Confidence Interval definition has been changed
3754	General	Glossary		-	-	Entries Correlation and Correlation coefficient: consider using the term 'relationship' instead of 'dependence'. The word dependence suggests causation.	Andrea TILCHE	Accepted	change implemented as suggested
3764	General	Glossary		-	-	Entry Quality Assurance and Quality Control: it would be useful to indicate how these entries relate to the entries 'validation' and 'verification', including cross-referencing within the Glossary, but also to Box 6.1, Vol.1 Ch. 6.	Andrea TILCHE	Accepted with modification	comment addressed in chapter 6 of the Volume 1